

Maintenance Manual

Site Master Model S312D Cable, Antenna, and Spectrum Analyzer

The Anritsu logo is located in the bottom right corner of the page. It consists of the word "Anritsu" in a bold, sans-serif font. The letter "A" is stylized with a diagonal slash through it.

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Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Company uses the following symbols to indicate safety-related information. For your own safety, please read the information carefully *before* operating the equipment.

Symbols Used in Manuals

Danger



This indicates a very dangerous procedure that could result in serious injury or death, and possible loss related to equipment malfunction, if not performed properly.

Warning



This indicates a hazardous procedure that could result in light-to-severe injury or loss related to equipment malfunction, if proper precautions are not taken.

Caution



This indicates a hazardous procedure that could result in loss related to equipment malfunction if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manuals

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions *before* operating the equipment. Some or all of the following five symbols may or may not be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.



This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



This indicates a compulsory safety precaution. The required operation is indicated symbolically in or near the circle.



This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.



These indicate that the marked part should be recycled.



For Safety

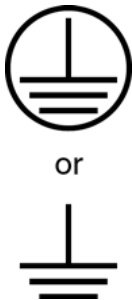
Warning



Always refer to the operation manual when working near locations at which the alert mark, shown on the left, is attached. If the operation, etc., is performed without heeding the advice in the operation manual, there is a risk of personal injury. In addition, the equipment performance may be reduced.

Moreover, this alert mark is sometimes used with other marks and descriptions indicating other dangers.

Warning



When supplying power to this equipment, connect the accessory 3-pin power cord to a 3-pin grounded power outlet. If a grounded 3-pin outlet is not available, use a conversion adapter and ground the green wire, or connect the frame ground on the rear panel of the equipment to ground. If power is supplied without grounding the equipment, there is a risk of receiving a severe or fatal electric shock.

Warning



This equipment cannot be repaired by the operator. Do not attempt to remove the equipment covers or to disassemble internal components. Only qualified service technicians with a knowledge of electrical fire and shock hazards should service this equipment. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel. In addition, there is a risk of damage to precision components.

Caution



Electrostatic Discharge (ESD) can damage the highly sensitive circuits in the instrument. ESD is most likely to occur as test devices are being connected to, or disconnected from, the instrument's front and rear panel ports and connectors. You can protect the instrument and test devices by wearing a static-discharge wristband. Alternatively, you can ground yourself to discharge any static charge by touching the outer chassis of the grounded instrument before touching the instrument's front and rear panel ports and connectors. Avoid touching the test port center conductors unless you are properly grounded and have eliminated the possibility of static discharge.

Repair of damage that is found to be caused by electrostatic discharge is not covered under warranty.

Table of Contents

Chapter 1—General Information

1-1	Introduction	1-1
1-2	Description	1-1
1-3	Recommended Test Equipment	1-2
1-4	Replaceable Parts	1-3
	Important Information Regarding Service of Anritsu Equipment	1-3

Chapter 2—Performance Verification

2-1	Performance Verification	2-1
2-2	VNA Frequency Accuracy	2-2
2-3	VNA Return Loss Verification	2-4
2-4	InstaCal Module Verification	2-5
2-5	Spectrum Analyzer Frequency Accuracy	2-7
2-6	Spectrum Analyzer Phase Noise Verification	2-9
2-7	Input Related Spurious Response Verification	2-10
2-8	Spectrum Analyzer Resolution Bandwidth Accuracy Verification	2-12
	1 MHz RBW Test	2-12
	300 kHz RBW Test	2-12
	100 kHz RBW Test	2-13
	30 kHz RBW Test	2-13
	10 kHz RBW Test	2-13
	3 kHz RBW Test	2-13
	1 kHz RBW Test	2-13
	300 Hz RBW Test	2-14
	100 Hz RBW Test	2-14
2-9	Spectrum Analyzer Level Accuracy Verification	2-15
	Level Accuracy with Frequency Test	2-16
	Level Accuracy with Power Test	2-19
2-10	Spectrum Analyzer Residual Spurious Response Verification	2-22
2-11	Spectrum Analyzer Displayed Average Noise Level (DANL)	2-24
2-12	Power Monitor Verification (Option 5)	2-25
2-13	Bias Tee Verification (Option 10A)	2-26
	Bias Tee Test	2-26
	Fault Test	2-27
2-14	Transmission Measurement Verification (Option 21)	2-27
2-15	Power Meter Verification (Option 29)	2-28

Chapter 3—Removal and Replacement

3-1	Battery Pack Removal and Replacement	3-1
3-2	Battery Information	3-2
	Battery Testing Procedure	3-3

Table of Contents (Continued)

3-3	Removal and Replacement Procedures	3-4
	Important Information Regarding Service of Anritsu Equipment	3-4
3-4	Opening the Case	3-5
3-5	Removal of the LCD and Keypad Assemblies	3-5
3-6	Removal of the Main PCB, Option 5 PCB, Spectrum Analyzer Assembly	3-6
3-7	RTC Battery Information	3-7

Appendix A—Test Records

	Spectrum Analyzer Frequency Accuracy	A-3
	Spectrum Analyzer Level Accuracy Verification (continued)	A-6

Appendix B—Test Fixture Schematics

Chapter 1 — General Information

1-1 Introduction

This manual provides maintenance instructions for the Site Master Model S312D Cable, Antenna and Spectrum Analyzer. It describes the product and provides performance verification procedures, parts replacement procedures, and a replaceable parts list.

1-2 Description

The Site Master is a handheld SWR/RL (standing wave ratio/return loss), Distance-To-Fault, spectrum analysis, and power meter (optional) measurement instrument. It combines a synthesized source, VSWR bridge, receiver, and spectrum analyzer circuitry in a compact instrument.

Throughout this manual, the term “VNA” (Vector Network Analyzer) denotes Return Loss, SWR, Cable Loss, and DTF modes, and the term “SPA” denotes Spectrum Analyzer mode. All other modes are referenced individually.

1-3 Recommended Test Equipment

Table 1-1. Required Equipment for Performance Verification

Instrument	Critical Specification	Recommended Manufacturer/Model
Synthesized Signal Generator	Frequency: 0.1 Hz to 20 GHz	Anritsu Model MG3692A or B with Option 2A and Option 4
Power Meter	Power Range: -70 dBm to +20 dBm	Anritsu Dual Channel Power Meter Model ML2438A
Power Sensor	Frequency: 10 MHz to 18 GHz Power Range: -67 dB to +20 dB	Anritsu Model MA2442D or equivalent (quantity 2)
Frequency Reference	Frequency: 10 MHz	Symmetricom Model RubiSource T&M
50 MHz Lowpass Filter	N(m) to N(f)	Anritsu Part Number 1030-96
Power Splitter	Frequency: DC to 18 GHz	Aeroflex/Weinschel Model 1870A
Adapter	N(m)-N(m), 50 Ohm	Anritsu Model 34NN50A
Adapter	Frequency: DC to 20 GHz, K(m)-N(f), 50 Ohm	Anritsu Model 34RKNF50
50 Ohm Termination	Frequency: DC to 18 GHz	Anritsu Model 28N50-2
RF Coaxial Cable	N(m)-N(f), 50 Ohm	Anritsu Model 15NN50-1.5C or equivalent
Spectrum Analyzer	9 kHz to 21.2 GHz	Anritsu Model MS2665C or equivalent
Open/Short	DC to 18 GHz N(m)	Anritsu Model 22N50
InstaCal Module	2 MHz to 6.0 GHz, N(m), 50 Ohm	Anritsu Part Number ICN50
Fixed Attenuator	10 dB	Aeroflex/Weinschel Model 44-10
Fixed Attenuator	20 dB	Aeroflex/Weinschel Model 44-20
Fixed Attenuator	30 dB	Aeroflex/Weinschel Model 44-30
Offset Termination	20 dB, 4 GHz	Anritsu Model SC5270
Offset Termination	6 dB, 4 GHz	Anritsu Model SC5237
RF Detector (for Option 5)	10 MHz to 20 GHz	Anritsu Model 560-7N50B
Low Current Load Fixture (for Option 10A)	105 Ohm, 1 Watt	Anritsu Part Number T3377
High Current Load Fixture (for Option 10A)	40 Ohm, 5 Watt	Anritsu Part Number T2904

1-4 Replaceable Parts

Table 1-2. List of Replaceable Assemblies

Part Number	Description
ND67965	S312D Main/SPA Assembly (without Option 10A, without Option 31)
ND67967	S312D Main/SPA Assembly (with Option 31, without Option 10A)
ND67969	S312D Main/SPA Assembly (with Option 10A, without Option 31)
ND67971	S312D Main/SPA Assembly (with both Option 31 and Option 10A)
ND66432	Option 5 PCB
3-633-26	Coin Battery for RTC
15-123	LCD Display
46649-6	Keypad Membrane
67199-3	Keypad PCB
633-27	Rechargeable battery
790-523	Speaker
48231-1	Battery Door
61440-1	Case Top
58214	Case Bottom
46655	Corner Bumper
40-168-R	AC Adapter

Important Information Regarding Service of Anritsu Equipment

Only qualified service personnel should attempt to perform repairs on this instrument. During the warranty period, opening of the case by non-Anritsu Service personnel will void the warranty.

Extreme care must be used when handling internal assemblies. Careless handling will cause damage.

Unless authorized by the factory, no attempts should be made to repair a defective assembly. (Discharged RTC batteries on the main PCB may be replaced). Exchange assemblies that are determined to have been damaged by improper handling will not be accepted for credit.

Chapter 2 — Performance Verification

2-1 Performance Verification

The following sections contain tests that can be used to verify the performance of the Site Master S312D. Before performing any of the tests in these sections, ensure that the S312D has had a minimum of 30 minutes warm up and that the test equipment has been warmed up to the specifications of its manufacturer. [Table 1-1, “Required Equipment for Performance Verification”](#) on page 1-2 lists the required equipment for performance verification.

Note

Anritsu Company recommends that you use an AC/DC power adapter during performance verification of the S312D.

2-2 VNA Frequency Accuracy

The following test can be used to verify the VNA CW frequency accuracy of the Site Master. Measurement calibration of the Site Master is not required for this test.

Required Equipment (refer to [Table 1-1](#)):

- Spectrum Analyzer, Anritsu Model MS2665C
- Frequency Reference Symmetricom Rubisource T&M
- Site Master S312D

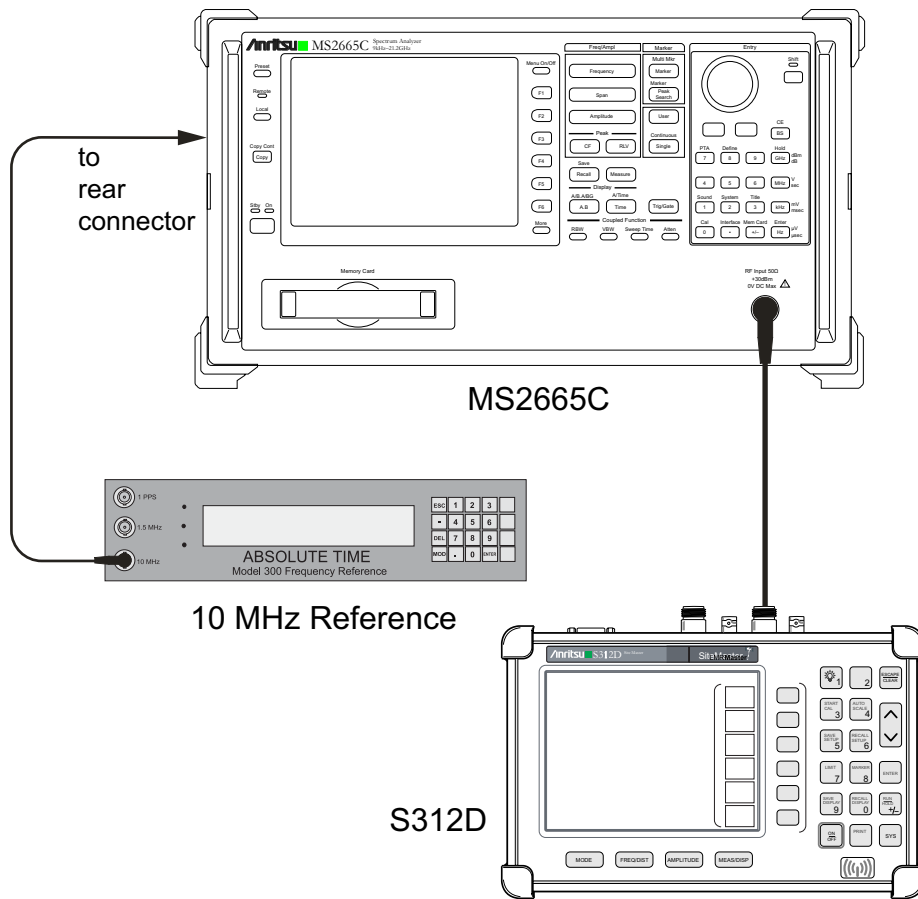


Figure 2-1. VNA Frequency Accuracy Test Setup

Procedure:

1. Connect a 10 MHz Reference signal to the 10 MHz STD Ref In of the Spectrum Analyzer as shown in [Figure 2-1](#).
2. Press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
3. Press the **FREQ/DIST** key, then press the F1 soft key and set F1 to 1000 MHz.
4. Press the F2 soft key, set F2 to 1000 MHz.
5. Press the **MEAS/DISP** key, then press the Fixed CW soft key to turn on Fixed CW.
6. Connect the RF cable from the Site Master Reflection Test Port to the RF Input on the Spectrum Analyzer.
7. Set up the Spectrum Analyzer as follows:
 - a. Press the **Preset** key, then press Preset All (F1).

- b. Press the **Frequency** key.
- c. Set the Center Frequency to 1 GHz.
- d. Press the **Span** key.
- e. Set the frequency span to 750 kHz.
- f. Press the **RBW** key.
- g. Set the RBW to 10 kHz.
- h. Press the **VBW** key.
- i. Press the **Filter Off** soft key (F3) to turn off the VB filter.
- j. Press the **Amplitude** key.
- k. Set the Reference Level to 0 dBm.
- l. Press the **Log Scale** soft key (F5).
- m. Press 2 dB/Div (F3) and then press the Return soft key.

Note

If the Site Master has entered into the hold mode, then press the **RUN/HOLD** key to return to normal mode.

8. When a peak response appears on the Spectrum Analyzer, press the **Marker Peak Search** key on the Spectrum Analyzer. Record the frequency in [Table A-1, "VNA Frequency Accuracy" on page A-2](#).
9. On the Site Master, press the **MEAS/DISP** key then the Fixed CW soft key to turn off Fixed CW.

2-3 VNA Return Loss Verification

The following test can be used to verify the accuracy of return loss measurements. Measurement calibration of the Site Master is required for this test.

Required Equipment (refer to [Table 1-1](#)):

- Site Master S312D
- Open/Short, Anritsu Model 22N50
- 50 ohm termination, Anritsu Model 28N50-2

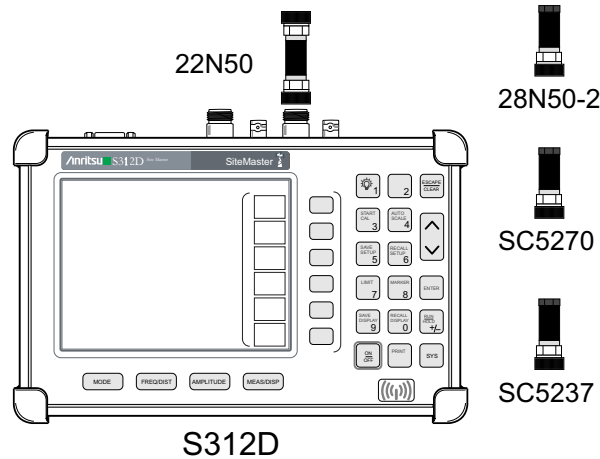


Figure 2-2. VNA Return Loss Verification Test Setup

Procedure:

1. Press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
2. Press the **MODE** key.
3. Use the **Up/Down** arrow key to highlight Return Loss, then press **ENTER**.
4. Press the **START CAL** key.
5. Follow the instructions on the screen to perform a calibration using a 22N50 Open/Short and 28N50-2 Termination.
6. Connect the 20 dB offset to the RF Out port and record the minimum and maximum values in [Table A-2](#), “VNA Return Loss Verification” on page A-2.
7. Connect the 6 dB offset to the RF Out port and record the minimum and maximum values in [Table A-2](#).

2-4 InstaCal Module Verification

This test verifies the performance of the Anritsu Site Master InstaCal Calibration Module. The InstaCal Module (part number ICN50) is an optional accessory for the S312D.

Required Equipment (refer to Table 1-1):

- Site Master S312D
- InstaCal Module
- Offset Termination, 6 dB, Anritsu Model SC5237
- Offset Termination, 20 dB, Anritsu Model SC5270

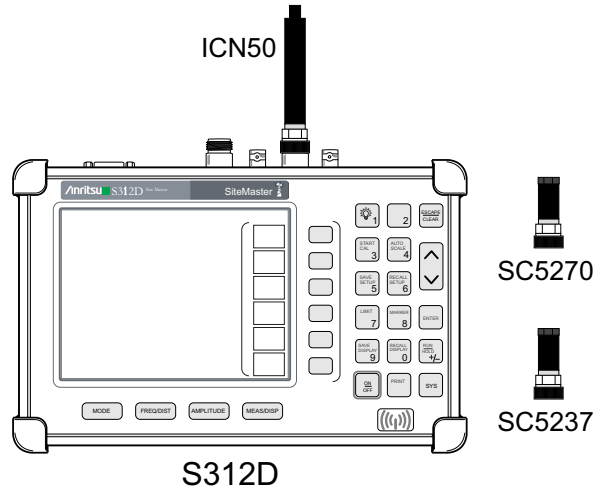


Figure 2-3. InstaCal Module Verification Test Setup

Procedure:

1. Press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)

Note Before continuing, allow a five-minute warm-up for the internal circuitry to stabilize.

2. Press the **MODE** soft key.
3. Use the **Up/Down** arrow key to highlight **RETURN LOSS**, then press **ENTER**.
4. Press the **START CAL** key. The message “CONNECT OPEN or InstaCal TO RF Out PORT” appears in the display.
5. Connect the InstaCal Module to the RF Out port (as shown in Figure 2-3) and press the **ENTER** key.

If this particular InstaCal Module has been used previously to calibrate this Site Master, then the Site Master senses the familiar InstaCal Module and automatically calibrates the instrument by using the OSL procedure.

If the Site Master senses that the characterization data for the InstaCal Module that is connected to this Site Master is different than the characterization data that is currently stored, then it displays soft key options to keep or to replace the InstaCal characterization data.

Note

Pressing the YES soft key transfers all of the characterization data from this InstaCal Module to the Site Master. The transfer may take up to three minutes. This option is preferred if this InstaCal Module is to stay with this particular Site Master. After calibration is completed, the data need not be transferred again for this combination of Site Master and InstaCal Module.

Pressing the NO soft key temporarily transfers only the portion of the characterization data that is necessary for this particular calibration. This transfer takes approximately 30 minutes to 60 minutes and must be repeated every time that a calibration is performed by using this combination of Site Master and InstaCal Module.

6. Verify that the calibration has been properly performed by checking that the **CAL ON!** message is displayed in the upper-left corner of the display.
7. Remove the InstaCal Module from the RF Out port and connect the 20 dB Offset (SC5270) to the RF Out port.
8. Measure the return loss of the 20 dB Offset. The level should be $20 \text{ dB} \pm 2 \text{ dB}$ across the calibrated frequency range.
9. Remove the 20 dB Offset from the RF Out port and connect the 6 dB Offset (SC5237) to the RF Out port.
10. Measure the return loss of the 6 dB Offset. The level should be $6 \text{ dB} \pm 1.2 \text{ dB}$ across the calibrated frequency range.

2-5 Spectrum Analyzer Frequency Accuracy

The following test can be used to verify the CW frequency accuracy of the Site Master Spectrum Analyzer.

Required Equipment (refer to Table 1-1):

- Anritsu Model MG3692x Synthesized Signal Generator
- Frequency Reference Symmetrcom Rubisource T&M
- Site Master S312D

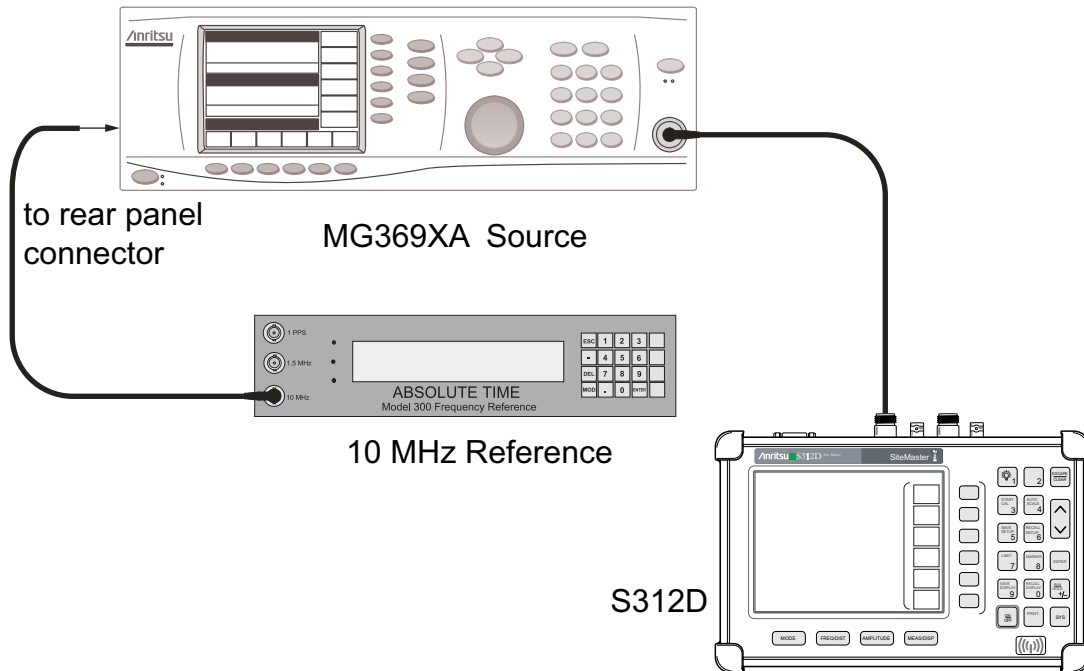


Figure 2-4. Spectrum Analyzer Frequency Accuracy Test Setup

Procedure:

1. Connect the 10 MHz reference source to the Synthesized Signal Generator.
2. Connect the output of the source to the Spectrum Analyzer RF Input of the Site Master.
3. Press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
4. Set the Synthesized Signal Generator output to 1000 MHz CW, with an RF output level of 0 dBm.
5. On the Site Master, press the **MODE** key. Use the **Up/Down** arrow key to highlight Spectrum Analyzer and press **ENTER** to select spectrum analyzer mode.
6. Press the **AMPLITUDE** key and the Ref Level soft key.
7. Enter 20 and press the **ENTER** key to set the Reference Level to 20 dBm.
8. Press the **FREQ/DIST** key and the Center soft key.
9. Enter 1000 and press **ENTER** to set the center frequency to 1000 MHz.
10. Press the **Span** soft key, enter 20, and press the **kHz** soft key to set the span to 20 kHz.
11. Confirm that the RBW is 100 Hz, and the VBW is 30 Hz. If adjustment of the RBW and VBW are required:
 - a. Press the **MEAS/DISP** key and the Bandwidth soft key.

2-6 Spectrum Analyzer Phase Noise Verification

This test can be used to verify the phase noise of the Site Master Spectrum Analyzer.

Required Equipment (refer to [Table 1-1](#)):

- Anritsu Model MG3692x Synthesized Signal Generator
- Frequency Reference Symmetricom Rubisource T&M
- Site Master S312D

Procedure:

1. Connect the output of the Synthesized Signal Generator to the Site Master RF Input. (Refer to [Figure 2-4](#).)
2. Press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
3. Set the Synthesized Signal Generator output to 1000 MHz CW, with an RF output level of -30 dBm.
4. On the Site Master, press the **MODE** key. Use the **Up/Down** arrow key to highlight Spectrum Analyzer, then, press the **ENTER** key to select spectrum analyzer mode.
5. Press the **MEAS/DISP** key and the Bandwidth soft key.
6. Press the RBW Manual soft key and use the **Up/Down** arrow key to select 1 kHz. Press **ENTER** to set the resolution bandwidth to 1 kHz.
7. Press the VBW Manual soft key and use the **Up/Down** arrow key to select 30 Hz. Press **ENTER** to set the video bandwidth to 30 Hz.
8. Press the **FREQ/DIST** key and the Center soft key.
9. Enter 1000 and press the **ENTER** key to set the center frequency to 1000 MHz.
10. Press the Span soft key and enter 0.1. Press the **ENTER** key to set the span to 0.100 MHz.
11. Press the **AMPLITUDE** key.
12. Press the Ref Level soft key and enter -27 . Press **ENTER** to set the reference level to -27 dBm.
13. Press the **MARKER** key, then the M1 soft key.
14. Press **EDIT** and enter 1000. Press **ENTER** to set the M1 marker frequency to 1000 MHz.
15. Press the **BACK** soft key and the M2 soft key.
16. Press **EDIT** and enter 1000.03. Press **ENTER** to set the M2 marker frequency to 1000.03 MHz (30 kHz higher than the center frequency).
17. Press the **DELTA (M2–M1)** soft key.
18. Press the **RUN/HOLD** key and read and record the $\Delta 2$ reading into [Table A-4](#), “Spectrum Analyzer Phase Noise Verification” on page A-3.
19. Press the **RUN/HOLD** key to read and record a total of five values into [Table A-4](#), then calculate the average of the five recorded values, and enter the average into [Table A-4](#).
20. To convert to dBc/Hz, subtract 30 dB from the average value and record the calculated value into [Table A-4](#). Verify that the result is ≤ -75 dBc/Hz.
For example: -45 dBc measured $- 30$ dB = -75 dBc/Hz
21. Press the **BACK** soft key and the M3 soft key.
22. Press the **EDIT** key and enter 999.97. Press **MHZ** to set the M3 marker frequency to 999.97 MHz (30 kHz lower than the center frequency).
23. Press the **DELTA (M3–M1)** soft key.
24. Press the **RUN/HOLD** key. Read and record the $\Delta 3$ reading into [Table A-4](#).

25. Press the **RUN/HOLD** key to read and record a total of five values into [Table A-4](#), then calculate the average of the five recorded values, and enter the average into [Table A-4](#).
26. Subtract 30 dB from the average value and record the calculated value into [Table A-4](#), Verify that the result is ≤ -75 dBc/Hz.

2-7 Input Related Spurious Response Verification

The following test can be used to verify the input related spurious response of the Site Master Spectrum Analyzer.

Required Equipment (refer to [Table 1-1](#)):

- Anritsu Model MG3692x Synthesized Signal Generator
- Frequency Reference Symmetricom Rubisource T&M
- Lowpass Filter, Anritsu Part Number 1030-96 (RLC Electronics)
- Site Master S312D

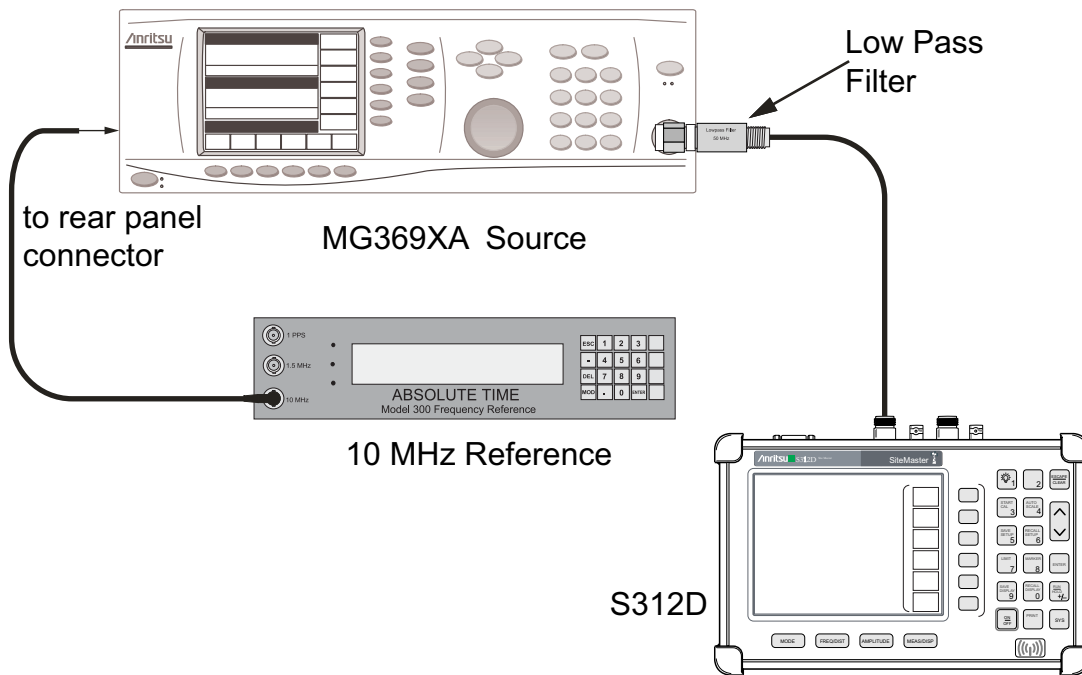


Figure 2-5. Input Related Spurious Response Verification Test Setup

Procedure:

1. Connect the 10 MHz reference source to the Synthesized Signal Generator as shown in [Figure 2-5](#).
2. Connect one end of the 50 MHz Low Pass Filter to the output of the source and the other end to the Site Master Spectrum Analyzer RF Input with the coaxial cable.
3. On the Site Master, press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
4. Set the Synthesized Signal Generator output to 40 MHz CW, with an RF output level of -30 dBm.
5. On the Site Master, press the **MODE** key. Use the **Up/Down** arrow key to highlight Spectrum Analyzer, then, press the **ENTER** key to select spectrum analyzer mode.
6. Press the **AMPLITUDE** key and the Ref Level soft key.
7. Enter -27 and press the **ENTER** key to set the Reference Level to -27 dBm.

8. Press the **Scale** soft key and enter 7 then press **ENTER**.
9. Press the **Atten/Preamp** soft key and then the **Manual** soft key.
10. Enter 0 and press **ENTER** to set the attenuation to 0 dB.
11. Press the **FREQ/DIST** key and then the **Center** soft key.
12. Enter 40 and press the **MHz** soft key to set the center frequency to 40 MHz.
13. Press the **Span** soft key and enter 0.2. Press the **MHz** soft key to set the span to 0.200 MHz.
14. Press the **MEAS/DISP** key and the **Bandwidth** soft key.
15. Press the **RBW Manual** soft key and use the **Up/Down** arrow key to select 10 kHz. Press **ENTER** to set the resolution bandwidth to 10 kHz.
16. Press the **VBW Manual** soft key and use the **Up/Down** arrow key to select 3 kHz. Press **ENTER** to set the video bandwidth to 3 kHz.
17. Press the **MARKER** key, then the **M1** soft key.
18. Press the **Edit** soft key, then enter 40. Press the **MHz** soft key to set M1 to 40 MHz.
19. On the Synthesized Signal Generator, adjust the output level so that the M1 reading of Site Master Spectrum Analyzer is -30 dBm at 40 MHz.
20. On the Site Master, press the **FREQ/DIST** key and then the **Center** soft key.
21. Enter 80 and press the **MHz** soft key to set the center frequency to 80 MHz.
22. Press the **MARKER** key and the **M1** soft key.
23. Press the **Edit** soft key, then enter 80. Press the **MHz** soft key to set M1 to 80 MHz.
24. Record the measured value of M1 into [Table A-5, "Spectrum Analyzer Input Related Spurious Response Verification" on page A-4](#). Add 30 dB to the value measured at M1 to calculate the Input Related Spurious Response. Record the calculated value into [Table A-5](#), and verify that it is within specification.
Calculation example: if the M1 data is -80, then record -50

2-8 Spectrum Analyzer Resolution Bandwidth Accuracy Verification

The following tests can be used to verify the resolution bandwidth accuracy of the Site Master Spectrum Analyzer at different frequencies.

Required Equipment (refer to [Table 1-1](#)):

- Anritsu Model MG3692x Synthesized Signal Generator
- Frequency Reference Symmetricom Rubisource T&M
- Site Master S312D

Procedure:

1. Connect the 10 MHz reference source to the Synthesized Signal Generator and the Ext Freq Ref input of the Site Master. (Refer to [Figure 2-4](#).)
2. Connect the output of the Synthesized Signal Generator to the Site Master Spectrum Analyzer RF Input.
3. On the Site Master, press and hold the **ESCAPE/CLEAR** key, then press the **On/Off** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
4. Set the Synthesized Signal Generator output to 1 GHz, with an RF output level of -30 dBm.
5. On the Site Master, press the **MODE** key. Use the **Up/Down** arrow key to highlight Spectrum Analyzer, then, press the **ENTER** key to select spectrum analyzer mode.
6. Press the **AMPLITUDE** key and the Ref Level soft key.
7. Enter -27 and press the **ENTER** key to set the Reference Level to -27 dBm.
8. Press the **Scale** soft key and enter 3, then press **ENTER**.
9. Press the **FREQ/DIST** key and the Center soft key.
10. Enter 1 and press the **GHZ** soft key to set the center frequency to 1 GHz.

1 MHz RBW Test

1. Press the **Span** soft key, enter 1.5 and press the **MHZ** soft key to set the span to 1.5 MHz.
2. Press the **MEAS/DISP** key and the **Bandwidth** soft key.
3. Press the **RBW Manual** soft key and use the **Up/Down** arrow key to select 1 MHz. Press **ENTER** to set the resolution bandwidth to 1 MHz.
4. Press the **VBW Manual** soft key and use the **Up/Down** arrow key to select 3 kHz and press **ENTER** to set the video bandwidth to 3 kHz and press **BACK**.
5. Press the **Measure** soft key, the **OBW** soft key, the **dBc** soft key, and then the **ENTER** key.
6. Press the **Measure** soft key, then the **MARKER** key. Press the **M2** soft key and then the **Delta (M2-M1)** soft key. Record the $\Delta 2$ frequency in [Table A-6](#), “Spectrum Analyzer Resolution Bandwidth Accuracy Verification” on page A-4.

300 kHz RBW Test

1. Press the **FREQ/DIST** key.
2. Press the **Span** soft key, enter 450 and press the **KHz** soft key to set the span to 450 kHz.
3. 450 kHz.
4. Press the **MEAS/DISP** key and the **Bandwidth** soft key.
5. Press the **RBW Manual** soft key and use the **Up/Down** arrow key to select 300 kHz. Press **ENTER** to set the resolution bandwidth to 300 kHz and press **BACK**.
6. Press the **Measure** soft key and then the **MARKER** key.
7. Press the **M2** soft key. Record the $\Delta 2$ frequency in [Table A-6](#).

100 kHz RBW Test

1. Press the **FREQ/DIST** key.
2. Press the Span soft key, enter 150 and press the kHz soft key to set the span to 150 kHz.
3. Press the **MEAS/DISP** key and the Bandwidth soft key.
4. Press the RBW Manual soft key and use the **Up/Down** arrow key to select 100 kHz. Press **ENTER** to set the resolution bandwidth to 100 kHz and press **BACK**.
5. Press the Measure soft key and then the **MARKER** key.
6. Press the M2 soft key. Record the $\Delta 2$ frequency in [Table A-6](#).

30 kHz RBW Test

1. Press the **FREQ/DIST** key.
2. Press the Span soft key, enter 45 and press the kHz soft key to set the span to 45 kHz.
3. Press the **MEAS/DISP** key and the Bandwidth soft key.
4. Press the RBW Manual soft key and use the **Up/Down** arrow key to select 30 kHz. Press **ENTER** to set the resolution bandwidth to 30 kHz and press **BACK**.
5. Press the Measure soft key to measure the bandwidth, then press the **MARKER** key.
6. Press the M2 soft key. Record the $\Delta 2$ frequency in [Table A-6](#).

10 kHz RBW Test

1. Press the **FREQ/DIST** key.
2. Press the Span soft key, enter 15 and press the kHz soft key to set the span to 15 kHz.
3. Press the **MEAS/DISP** key and the Bandwidth soft key.
4. Press the RBW Manual soft key and use the **Up/Down** arrow key to select 10 kHz. Press **ENTER** to set the resolution bandwidth to 10 kHz and press **BACK**.
5. Press the VBW Manual soft key and use the **Up/Down** arrow key to select 30 Hz. Press **ENTER** to set the video bandwidth to 30 Hz and press **BACK**.
6. Press the Measure soft key, then the **MARKER** key.
7. Press the M2 soft key. Record the $\Delta 2$ frequency in [Table A-6](#).

3 kHz RBW Test

1. Press the **FREQ/DIST** key.
2. Press the Span soft key, enter 4.5 and press the kHz soft key to set the span to 4.5 kHz.
3. Press the **MEAS/DISP** key and the Bandwidth soft key.
4. Press the RBW Manual soft key and use the **Up/Down** arrow key to select 3 kHz. Press **ENTER** to set the resolution bandwidth to 3 kHz and press **BACK**.
5. Press the Measure soft key to measure the bandwidth, then press the **MARKER** key.
6. Press the M2 soft key. Record the $\Delta 2$ frequency in [Table A-6](#).

1 kHz RBW Test

1. Press the **FREQ/DIST** key.
2. Press the Span soft key, enter 1.5 and press the kHz soft key to set the span to 1.5 kHz.
3. Press the **MEAS/DISP** key and the Bandwidth soft key.

4. Press the RBW Manual soft key and use the **Up/Down** arrow key to select 1 kHz. Press **ENTER** to set the resolution bandwidth to 1 kHz and press **BACK**.
5. Press the Measure soft key then the **MARKER** key.
6. Press the M2 soft key. Record the $\Delta 2$ frequency in [Table A-6](#).

300 Hz RBW Test

1. Press the **FREQ/DIST** key.
2. Press the Span soft key, enter 450 and press the Hz soft key to set the span to 450 Hz.
3. Press the **MEAS/DISP** key and the Bandwidth soft key.
4. Press the RBW Manual soft key and use the **Up/Down** arrow key to select 1 kHz. Press **ENTER** to set the resolution bandwidth to 300 Hz and press **BACK**.
5. Press the Measure soft key then the **MARKER** key.
6. Press the M2 soft key. Record the $\Delta 2$ frequency in [Table A-6](#).

100 Hz RBW Test

1. Press the **FREQ/DIST** key.
2. Press the Span soft key, enter 150 and press the Hz soft key to set the span to 150 Hz.
3. Press the **MEAS/DISP** key and the Bandwidth soft key.
4. Press the RBW Manual soft key and use the **Up/Down** arrow key to select 100 Hz. Press **ENTER** to set the resolution bandwidth to 100 Hz and press **BACK**.
5. Press the Measure soft key then the **MARKER** key.
6. Press the M2 soft key. Record the $\Delta 2$ frequency in [Table A-6](#).

2-9 Spectrum Analyzer Level Accuracy Verification

The tests in this section verify the level accuracy of the Site Master Spectrum Analyzer. The two parts to this test are:

- “Level Accuracy with Frequency Test”
- “Level Accuracy with Power Test”

Required Equipment (refer to Table 1-1):

- Anritsu Model MG3692x Synthesized Signal Generator
- Power Meter, Anritsu Model ML2438A
- Power Sensor, Anritsu Model MA2442D
- Power Splitter, Aeroflex/Weinschel Model 1870A
- Fixed Attenuator, Aeroflex/Weinschel Model 44-10
- Fixed Attenuator, Aeroflex/Weinschel Model 44-30
- RF Coaxial Cable, Anritsu Model 15NN50-1.5C
- Adapter, Anritsu Model 34RKNF50
- Adapter, Anritsu Model 34NN50A
- Site Master S312D

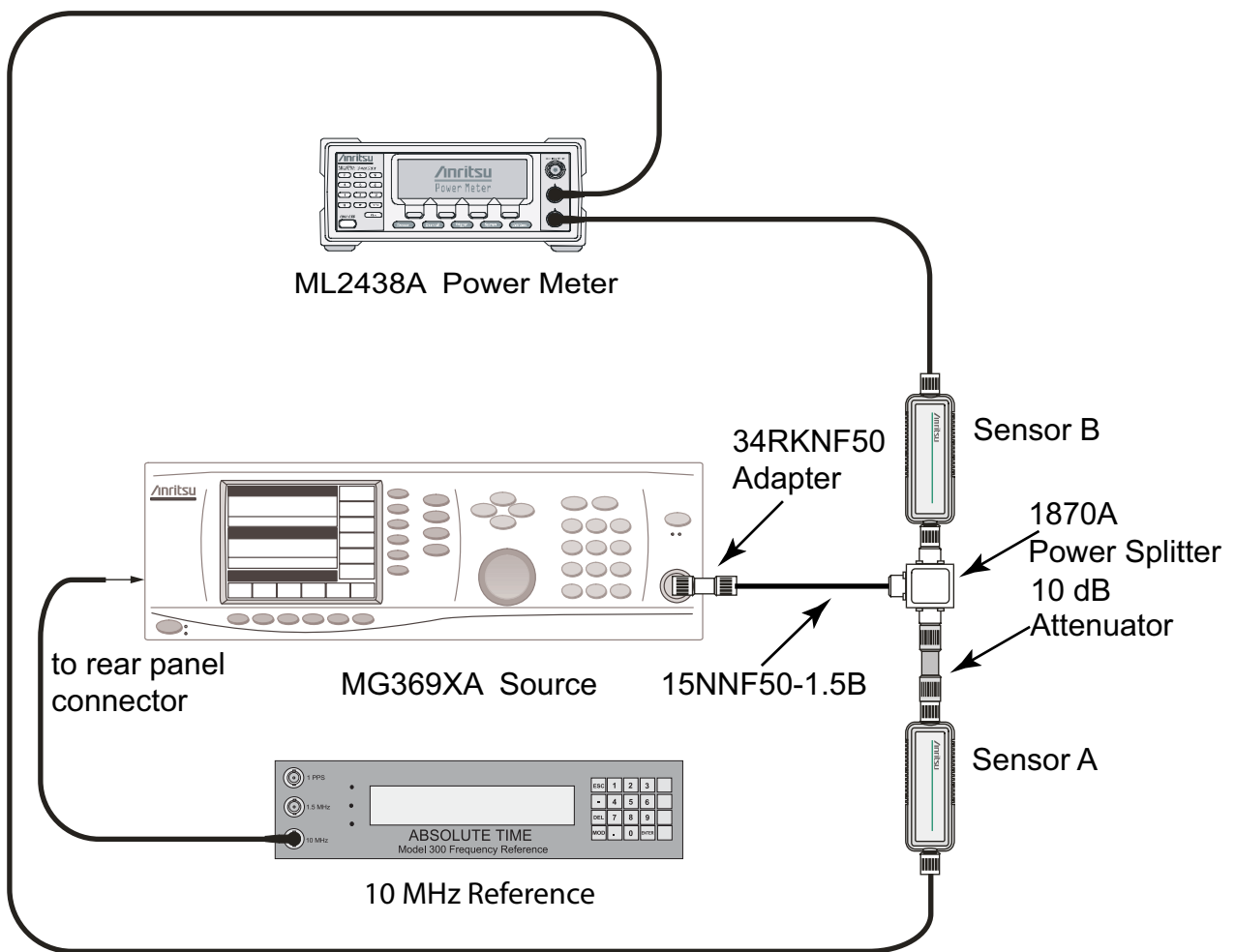


Figure 2-6. Spectrum Analyzer Level Accuracy Verification Characterization Setup

Level Accuracy with Frequency Test

Procedure:

1. Turn on the power meter and the Synthesized Signal Generator as shown in [Figure 2-6](#).
2. On the power meter, press the **Channel** key, the **Setup** soft key, and then the **CHANNEL** soft key to display the Channel 2 setup menu. Press the **INPUT** key twice to set the Input Configuration to B. Press the **Sensor** key to display both Sensor A and Sensor B readings.
3. Connect the power sensors to the power meter and calibrate the sensors.
4. Set the Synthesized Signal Generator output power level to 5 dBm.
5. Set the Synthesized Signal Generator output to 30 MHz CW.
6. On the power meter, press the **Sensor** key, the **Cal Factor** soft key, and then the **FREQ** soft key. Use the keypad to enter 30 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the **System** key to display the power reading.
7. Connect Sensor A to the Synthesized Signal Generator output, measure the output power level, and record the value in column A of [Table A-7](#), “[Spectrum Analyzer Level Accuracy Verification Output Power Levels](#)” on [page A-5](#).
8. Disconnect Sensor A from the Synthesized Signal Generator output.
9. Connect the power splitter to the Synthesized Signal Generator output and connect Sensor B to one of the power splitter output connections. Install the 10 dB Fixed Attenuator to the other power splitter output connection and then connect Sensor A to the end of the Attenuator. Refer to [Figure 2-6](#).
10. Record the new Sensor A reading in column B of [Table A-7](#).
11. Record the Sensor B reading in column D of [Table A-7](#).
12. Calculate the Splitter/Attenuator Combined Loss using the formula $C = A - B$, and record the result in column C of [Table A-7](#).
13. Calculate the Sensor B Path Power Splitter Loss using the formula $E = A - D$, and record the result in column E of [Table A-7](#).
14. Repeat [Step 5](#) through [Step 13](#) for all of the frequencies that are listed in [Table A-7](#).
15. Calculate the “Desired Sensor B Reading” for 0 dBm and –39 dBm Desired Test Power Levels by using the following formula (where C and E have been recorded in [Table A-7](#)):
$$\text{Desired Sensor B Reading} = \text{Desired Test Power Level} + C - E$$

where “Desired Test Power Level” is 0 dBm, then –39 dBm.
16. Record the calculated results in the “Desired Sensor B Reading” columns of [Table A-8](#), “[Spectrum Analyzer Level Accuracy Verification with Frequency Test Settings](#)” on [page A-5](#).
17. Using the power splitter, coaxial cable, adapters, and fixed attenuator, connect the Site Master to the signal source and to the power Sensor as shown in [Figure 2-7](#).

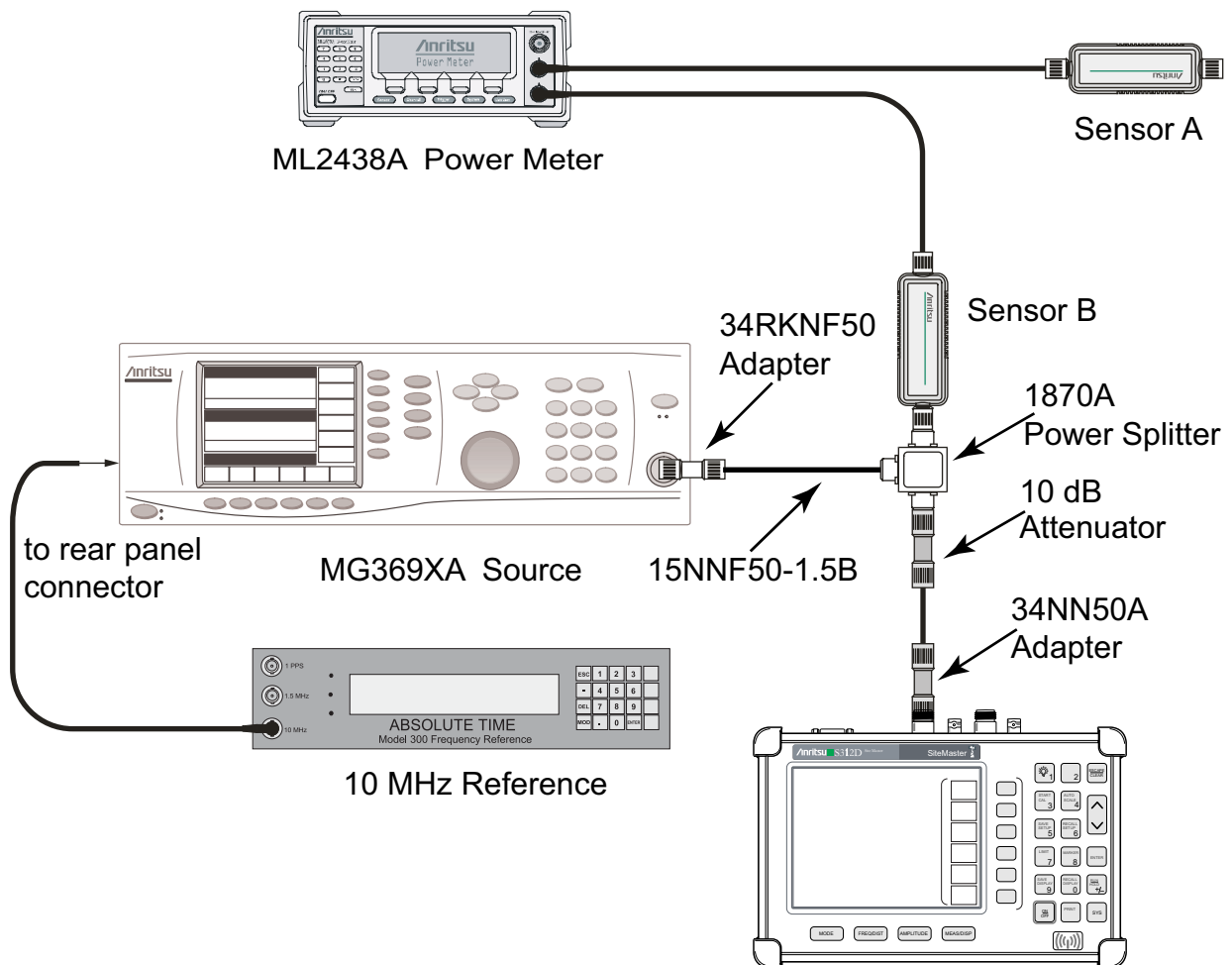


Figure 2-7. Spectrum Analyzer Level Accuracy Verification Test Setup

18. On the Site Master, press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
19. On the Site Master, press the **MODE** key. Use the **Up/Down** arrow key to highlight Spectrum Analyzer and press **ENTER** to select spectrum analyzer mode.
20. Press the **MEAS/DISP** key and the Bandwidth soft key.
21. Press the RBW Manual soft key and use the **Up/Down** arrow key to select 1 kHz. Press **ENTER** to set the resolution bandwidth to 1 kHz.
22. Press the VBW Manual soft key and use the **Up/Down** arrow key to select 100 Hz. Press **ENTER** to set the video bandwidth to 100 Hz.
23. Press the **FREQ/DIST** key.
24. Press the Span soft key and enter 0.10, then press the MHz key to set the span to 0.10 MHz.
25. Press the **AMPLITUDE** key.
26. Press the Ref Level soft key, enter 10 and press the **ENTER** key to set the reference level to +10 dBm.
27. Press the **FREQ/DIST** key and the Center soft key.
28. Enter 30 and press the MHz soft key to set the center frequency to 30 MHz.

29. On the Power Meter, press the **Sensor** key and then the CalFactor soft key. Press the FREQ soft key and enter 30 MHz for the Input Signal Frequency. This sets the power meter to the proper power sensor calibration factor. Press the **System** key to display the power reading.
30. Set the Synthesized Signal Generator output to 30 MHz CW. Adjust the source power level so that the power meter displays the corresponding “Desired Sensor B Reading” for 0 dBm (as calculated and recorded in [Table A-8, “Spectrum Analyzer Level Accuracy Verification with Frequency Test Settings” on page A-5](#)).
31. On the Site Master, press the **MARKER** key, then the M1 soft key.
32. Press the Marker To Peak soft key to position the marker at the center of the response for the test frequency.
33. Record the M1 reading in [Table A-9, “Spectrum Analyzer Level Accuracy with Frequency” on page A-6](#) and verify that the M1 reading is within the specification in [Table A-9](#).
34. Repeat Step [27](#) through Step [33](#) for all frequencies shown in [Table A-9](#).
35. Repeat Step [27](#) through Step [34](#) for a power level of -39 dBm.

Note In Step 35 , change the reference level to -30 dBm.

Level Accuracy with Power Test

Procedure:

1. Use the recorded values of **C** and **E** for 50 MHz in [Table A-7, “Spectrum Analyzer Level Accuracy Verification Output Power Levels”](#) on page A-5 to calculate the desired Sensor B Reading for Test Power Level > -50 dBm at 50 MHz by using the following formula:

$$\text{Desired Sensor B Reading} = \text{Test Power Level} + C - E$$
2. Record the calculated results in [Table A-10, “Spectrum Analyzer Level Accuracy with Power Test Settings”](#) on page A-6.
3. Using the power splitter, coaxial cable, adapters and fixed attenuator, connect the Site Master to the signal source and the power sensor as shown in [Figure 2-7](#).
4. On the power meter, press the **Sensor** key and then the **CalFactor** soft key. Press the **FREQ** soft key and enter 50 MHz for the Input Signal Frequency. This sets the power meter to the proper power sensor calibration factor. Press the **System** key to display the power reading.
5. On the Site Master, press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
6. On the Site Master, press the **MODE** key. Use the **Up/Down** arrow key to highlight Spectrum Analyzer and press **ENTER** to select spectrum analyzer mode.
7. Press the **MEAS/DISP** key and the **Bandwidth** soft key.
8. Press the **RBW Manual** soft key and use the **Up/Down** arrow key to select 1 kHz. Press **ENTER** to set the resolution bandwidth to 1 kHz.
9. Press the **VBW Manual** soft key and use the **Up/Down** arrow key to select 100 Hz. Press **ENTER** to set the video bandwidth to 100 Hz.
10. Press the **FREQ/DIST** key.
11. Press the **Span** soft key and enter 0.10, then press the **MHZ** soft key to set the span to 0.10 MHz.
12. Press the **AMPLITUDE** key.
13. Press the **Ref Level** soft key, enter 10 and press the **ENTER** key to set the reference level to +10 dBm.
14. Press the **FREQ/DIST** key and the **Center** soft key.
15. Enter 50 and press the **MHZ** soft key to set the center frequency to 50 MHz.
16. Set the Synthesized Signal Generator output to 50 MHz CW. Adjust the source power so that the power meter displays the corresponding desired Sensor B Reading for +3 dBm (as recorded in [Table A-10](#)).
17. Press the **MARKER** key, then the **M1** soft key.
18. Press the **Marker To Peak** soft key to position the marker at the center of the response for the test frequency.
19. Record the **M1** value in [Table A-11, “Spectrum Analyzer Level Accuracy with Power”](#) on page A-7 and verify that the **M1** reading is within the specification from the input signal.
20. Repeat Step 16 through Step 19 for input levels of 0 dBm, -11 dBm, -13 dBm, -19 dBm, -27 dBm, -32 dBm, -39 dBm, and -49 dBm.

Note Change the reference level as indicated in [Table A-11](#) for the corresponding test power levels.

21. Disconnect the power splitter and attenuator from the Site Master.
22. Set the Synthesized Signal Generator output power level to 5 dBm.
23. Connect Sensor A to the Synthesized Signal Generator output, measure the output power level and record the value in column A of [Table A-12, “Spectrum Analyzer Level Accuracy with Power — Output Power Levels”](#) on page A-7.

24. Disconnect Sensor A from the Synthesized Signal Generator output.
25. Connect the power splitter to the Synthesized Signal Generator output and connect Sensor B to one of the power splitter output connections. Install the 30 dB fixed attenuator to the other power splitter output connection, and connect Sensor A to the attenuator as shown in [Figure 2-8](#).

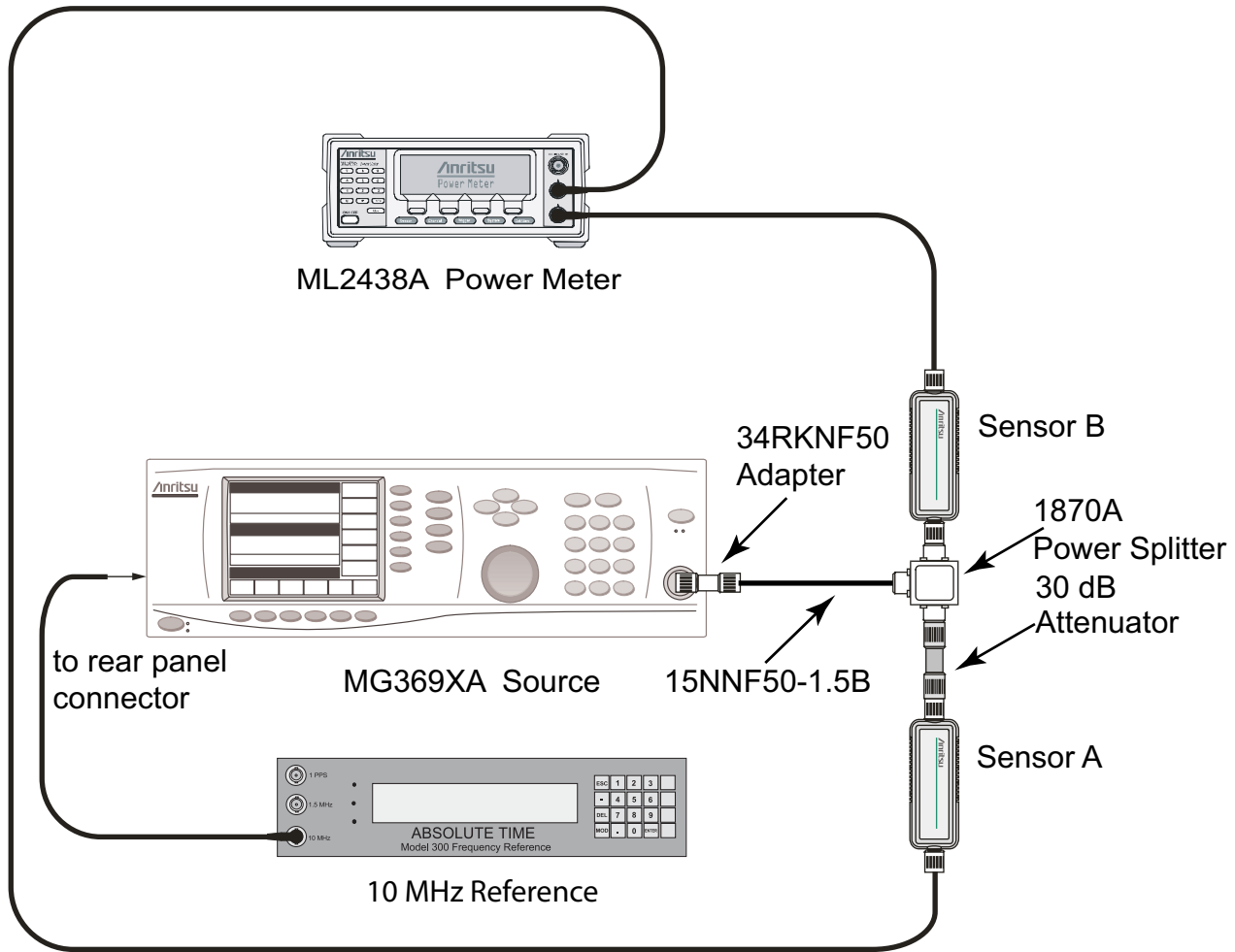


Figure 2-8. Spectrum Analyzer Level Accuracy Verification Characterization Setup

26. Record the new Sensor A reading in column B of [Table A-12](#).
27. Record the Sensor B reading in column D of [Table A-12](#).
28. Calculate the Splitter/Attenuator Combined Loss by using the following formula, and then record the result in column C of [Table A-12](#):

$$C = A - B$$
29. Calculate the Sensor B Path Power Splitter Loss by using the following formula, and then record the result in column E of [Table A-12](#):

$$E = A - D$$
30. Calculate the desired Sensor B Reading for Test Power Level < -50 dBm by using the following formula:

$$\text{Desired Sensor B Reading} = \text{Test Power Level} + C - E$$
31. Record the calculated results in [Table A-10](#), “[Spectrum Analyzer Level Accuracy with Power Test Settings](#)” on page A-6.

32. Using the power splitter, coaxial cable, adapters, and 30 dB fixed attenuator, connect the Site Master to the signal source and the power sensor as shown in [Figure 2-9](#).

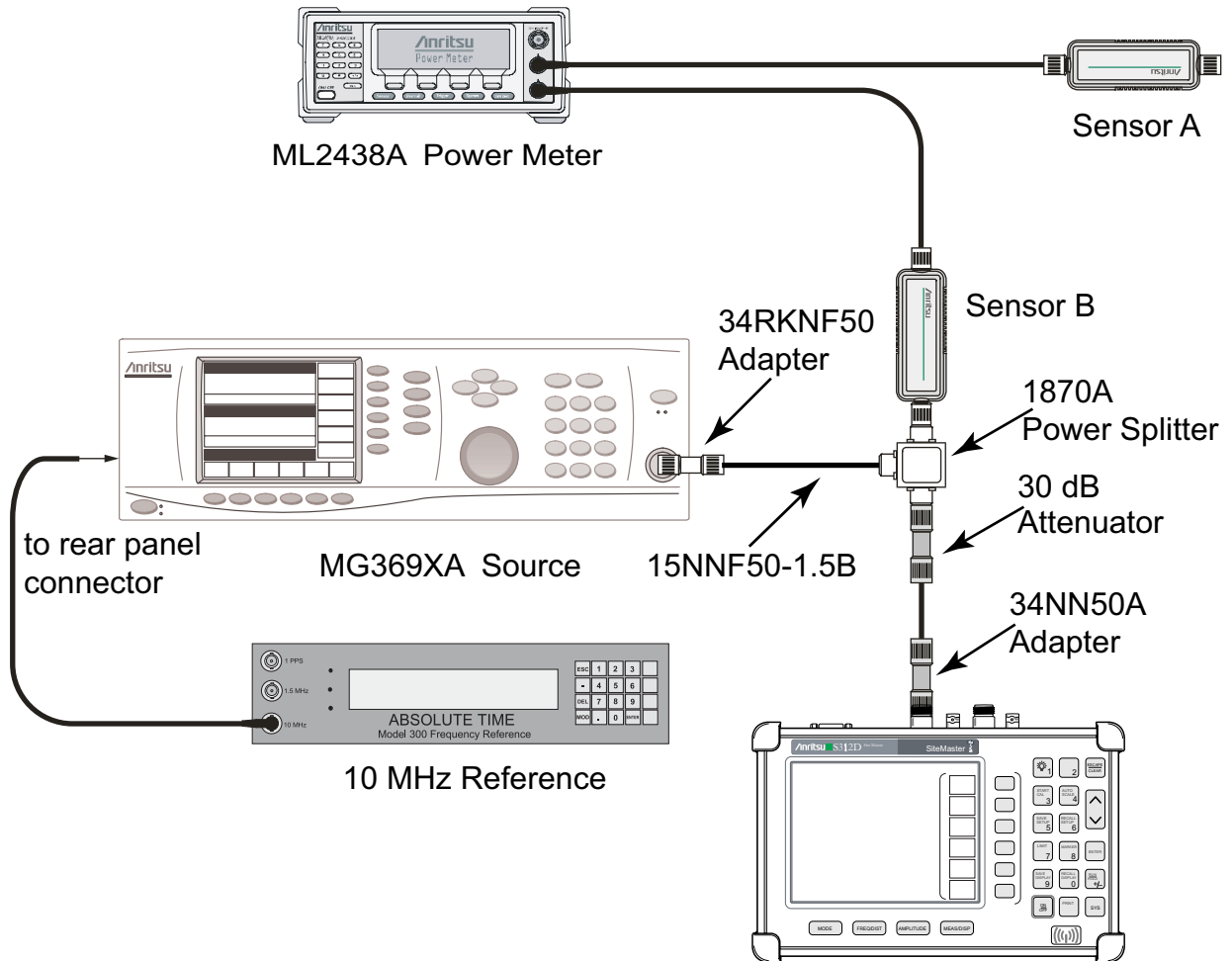


Figure 2-9. Spectrum Analyzer Level Accuracy Verification Test Setup — 30 dB Attenuator

33. Adjust the Synthesized Signal Generator output power level so that the power meter displays the corresponding desired Sensor B reading for -51 dBm (as recorded in [Table A-10](#)).
34. Press the **MARKER** key, then the M1 soft key.
35. Press the Marker To Peak soft key to position the marker at the center of the response for the test frequency.
36. Record the value of the marker in [Table A-11](#), “[Spectrum Analyzer Level Accuracy with Power](#)” on page A-7. Verify that the M1 reading is within the specification from the input signal.
37. Repeat Step 33 through Step 36 for Test Power Levels of -53 dBm and -60 dBm.

Note Change the reference level as indicated in [Table A-11](#) for the corresponding test power levels.

2-10 Spectrum Analyzer Residual Spurious Response Verification

The following test can be used to verify the residual spurious response of the Site Master Spectrum Analyzer. This test is performed using the positive peak detection mode.

Required Equipment (refer to Table 1-1):

- 50 ohm termination, Anritsu Model 28N50-2
- Site Master S312D

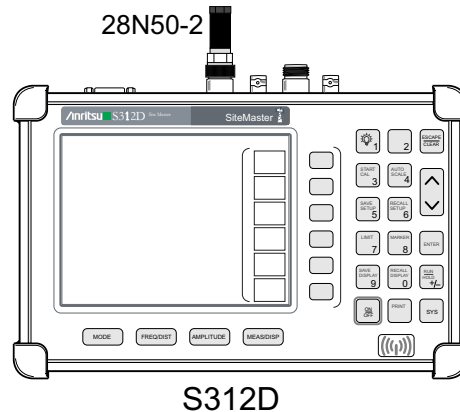


Figure 2-10. Spectrum Analyzer Residual Spurious Response Verification Test Setup

Procedure:

1. Connect the 50 Ohm termination to the Site Master RF Input.
2. On the Site Master, press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
3. On the Site Master, press the **MODE** key. Use the **Up/Down** arrow key to highlight Spectrum Analyzer, then, press the **ENTER** key to select spectrum analyzer mode.
4. Press the **AMPLITUDE** key and the Ref Level soft key.
5. Enter -75 and press the **ENTER** key to set the Reference Level to -75 dBm. If AMP is not showing in the lower-left of the display, set Preamp to ON.
6. Press the Scale soft key and enter 5, then press **ENTER**.
7. Press the **MEAS/DISP** key and the Bandwidth soft key.
8. Press the RBW Manual soft key and use the **Up/Down** arrow key to select 10 kHz. Press **ENTER** to set the resolution bandwidth to 10 kHz.
9. Press the VBW Manual soft key and use the **Up/Down** arrow key to select 3 kHz and press **ENTER** to set the video bandwidth to 3 kHz.
10. Press the **FREQ/DIST** key and the Start soft key.
11. Enter 100 and press the kHz soft key to set the start frequency to 100 kHz.
12. Press the Stop soft key and enter 10, then press the MHz soft key to set the stop frequency to 10 MHz.
13. Wait till one full sweep is complete.
14. Press the **MARKER** key and then the M1 soft key.
15. Press the Marker To Peak soft key.

- Record the M1 amplitude reading in [Table A-13](#), “Spectrum Analyzer Residual Spurious Response Verification” on page A-8 and verify that it is ≤ -80 dBm.

Note	If a spur with an amplitude larger than -80 dBm occurs, then wait another full sweep and observe whether the spur occurs at the same point on the second sweep. If the spur does not occur at the same point on the second sweep, then the spur on the first sweep does not cause the test to fail.
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- Press the **FREQ/DIST** key and the **Start** soft key.
- Enter 10 and press the **MHz** soft key to set the start frequency to 10 MHz.
- Press the **Stop** soft key and enter 1000, then press the **MHz** soft key to set the stop frequency to 1000 MHz.
- Wait until one full sweep is complete.
- Press the **MARKER** key and record the M1 amplitude reading in [Table A-13](#) and verify that it is ≤ -90 dBm.

Note	If a spur with an amplitude larger than -90 dBm occurs, wait another full sweep and observe whether the spur occurs at the same point on the second sweep. If the spur does not occur at the same point on the second sweep, then the spur on the first sweep does not cause the test to fail.
-------------	--

- Press the **FREQ/DIST** key and the **Start** soft key.
- Enter 1000 and press the **MHz** soft key to set the start frequency to 1000 MHz (1.0 GHz).
- Press the **Stop** soft key and enter 1600, then press the **MHz** soft key to set the stop frequency to 1600 MHz (1.6 GHz).
- Wait until one full sweep is complete.
- Press the **MARKER** key and turn on M1. Record the M1 reading in [Table A-13](#). Verify that it is ≤ -90 dBm.

Note	If a spur with an amplitude larger than -90 dBm occurs, then wait another full sweep and observe whether the spur occurs at the same point on the second sweep. If the spur does not occur at the same point on the second sweep, then the spur on the first sweep does not cause the test to fail.
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2-11 Spectrum Analyzer Displayed Average Noise Level (DANL)

The following test can be used to verify the Displayed Average Noise Level of the S312D. This test is performed using the RMS detection mode, with preamp on.

Required Equipment (refer to [Table 1-1](#)):

- 50 ohm termination, Anritsu Model 28N50-2
- Site Master S312D

Procedure:

1. Connect the 28N50-2 50 Ohm termination to the S312D Spectrum Analyzer RF In. (Refer to [Figure 2-10](#).)
2. Set the S312D to Spectrum Analyzer mode.
3. Press the **AMPLITUDE** key and press Atten/Preamp, then Preamp Control Manual. Press Preamp On/Off so that AMP* appears on the bottom-left of the display.
4. Press the **AMPLITUDE** key and press Atten/Preamp, then press Manual, and enter 0 for Atten.
5. Press the **AMPLITUDE** key and press Ref Level, and set the Reference Level to -75 dBm.
6. Press the **MEAS/DISP** key and press Trace, then Detection, then press RMS Average.
7. Press the **MEAS/DISP** key and press Bandwidth, then RBW Manual. Set RBW to 10 kHz.
8. Press the **FREQ/DIST** key and set Start Frequency to 100 kHz and set Stop Frequency to 10 MHz.
9. After the sweep has finished, press the **MARKER** key and set M1 to Marker to Peak.
10. Convert the marker reading from 10 kHz RBW to 100 Hz RBW value by subtracting 20 dB. (For example, if the marker shows a value of -100 dBm at 10 kHz RBW, then the computed value for 100 Hz RBW is -120 dBm.) Enter the computed value in [Table A-14](#), “Spectrum Analyzer Displayed Average Noise Level (DANL)” on page A-8.
11. Set Stop Frequency to 1.6 GHz and set Start Frequency to 10 MHz.
12. After the sweep has finished, press the **MARKER** key and set M1 to Marker to Peak.
13. Convert the marker reading from 10 kHz RBW to 100 Hz RBW value by subtracting 20 dB. (For example, if the marker shows a value of -120 dBm at 10 kHz RBW, then the computed value at 100 Hz RBW is -140 dBm.) Enter the computed value in [Table A-14](#).

2-12 Power Monitor Verification (Option 5)

The following test can be used to verify the operation of the Power Monitor (Option 5).

Required Equipment (refer to [Table 1-1](#)):

- Anritsu Model MG3692x Synthesized Signal Generator
- Power Meter, Anritsu Model ML2438A
- Site Master S312D
- Power Splitter, Aeroflex/Weinschel Model 1870A
- Power Sensor, Anritsu Model MA2442D
- RF Detector, Anritsu Model 560-7N50B
- Adapter, Anritsu Model 34RKNF50
- RF Coaxial Cable, Anritsu Model 15NN50-1.5C

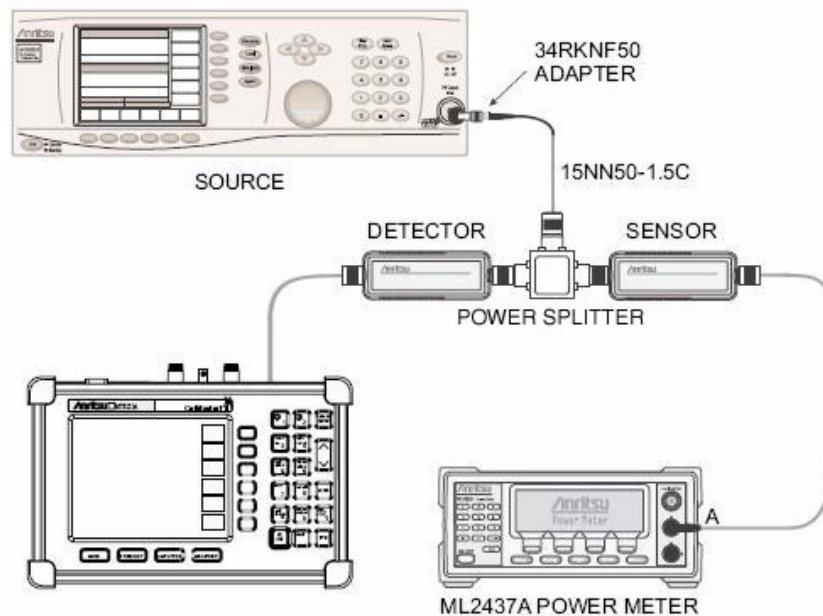


Figure 2-11. Power Monitor Verification (Option 5) Test Setup

Procedure:

1. Set the Synthesized Signal Generator output to 1 GHz CW, and the Level to +5 dBm.
2. Power cycle the S312D while depressing the **Escape/Clear** key to set to factory preset state. Set the mode of the S312D to Power Monitor.
3. On the power meter, set the sensor calibration factor to 1.0 GHz.
4. Connect the 560-7N50B detector, power splitter, MA2442D power sensor, and other equipment as shown in [Figure 2-11](#).
5. On the Synthesized Signal Generator, adjust the Level so that the power meter reads 0.0 dBm.
6. Record the power reading of the S312D in [Table A-15](#), “Power Monitor Verification (Option 5)” on page A-8.
7. Repeat Step 5 and Step 6 for the other power values in [Table A-15](#).

2-13 Bias Tee Verification (Option 10A)

If the Bias Tee (Option 10A) is installed in the S312D, then the following test can be used to verify the performance of the bias termination.

Required Equipment (refer to [Table 1-1](#)):

- Site Master S312D
- Low Current Load Fixture, 105 ohm, Anritsu Part T3377
- Low Current Load Fixture, 40 ohm, Anritsu Part T2904

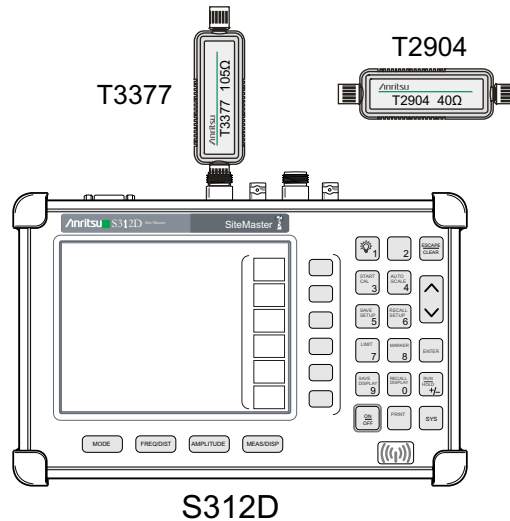


Figure 2-12. Bias Tee Verification (Option 10A) Test Setup

Procedure:

1. Connect the external power supply to the S312D.
2. Press the **On/Off** key to turn on the S312D.
3. Press the **Recall Setup** (6) key, then select the <Default> mode setting.
4. Press the **ENTER** key.

Note Before continuing, allow a 30-minute warm up for the internal circuitry to stabilize.

Bias Tee Test

1. Press the **SYS** key, then press the Application Options soft key and then press the Bias Tee soft key.
2. Press the Bias Tee Voltage soft key and enter 12 then press the **ENTER** key.
3. Connect the 105 Ohm load to the RF In test port.
4. Press the Bias Tee On/Off soft key to turn on the Bias Tee.
5. Verify the voltage and current readings displayed on the top left side of the screen are within the specifications that are listed in [Table 2-1](#).
6. Press the Bias Tee On/Off soft key to turn off the Bias Tee.

7. Select each of the voltage settings and verify the voltage and current readings displayed on the top-left side of the screen are within the specifications that are shown in [Table 2-1](#).

Table 2-1. Bias Tee Verification, 105 Ohm Load, Low Current

Voltage Setting (V)	Voltage Specification (V)	Current Specification (mA)
12	±0.5	85–145
15	±0.6	113–173
18	±0.7	142–202
21	±0.8	172–230
24	±1.0	199–259

Fault Test

1. Disconnect the 105 Ohm load and connect the 40 Ohm load to the RF In port.
2. Press the Bias Tee Voltage soft key and enter 17 then press the **ENTER** key.
3. Press the Bias Tee On/Off soft key to turn on the Bias Tee.
4. Verify that the instrument makes a clicking sound and the Bias Tee Error/Fault dialog appears on the screen.
5. Press the Bias Tee On/Off soft key to turn off the Bias Tee.

2-14 Transmission Measurement Verification (Option 21)

The test in this section can be used to verify the Dynamic Range of a Site Master equipped with Option 21.

Required Equipment (refer to [Table 1-1](#)):

- Site Master S312D
- RF Coaxial Cable, Anritsu Model 15NN50-1.5C
- 50 ohm termination, Anritsu Model 28N50-2

Procedure:

1. On the Site Master, press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
2. On the Site Master, press the **MODE** key. Use the **Up/Down** arrow key to highlight Transmission Measurement and press **ENTER** to select Transmission Measurement mode.
3. Press the **MEAS/DISP** key and then press the Calibrate TM soft key.
4. Connect the RF In port of the Site Master to the RF Out port using the 15NN50-1.5C RF Coaxial Cable. Press the **ENTER** key on the Site Master to calibrate. The Site Master will beep when one sweep is completed.
5. Disconnect the RF cable from the RF In Port and connect the 50 Ohm Termination (same as [Figure 2-10](#)).
6. Press the **Limit** key and press Single Limit.
7. Press the Edit soft key, enter –80, and then press the **ENTER** key.
8. Verify that the trace is below the limit line.
9. Press the **MARKER** key, press the M1 soft key, and then press Market to Peak. Record the Marker value in [Table A-16, “Transmission Measurement Verification \(Option 21\)”](#) on page A-8.

2-15 Power Meter Verification (Option 29)

The test in this section can be used to verify the level accuracy of the Internal Power Meter (Option 29) of the Site Master.

Required Equipment (refer to [Table 1-1](#)):

- Anritsu Model MG3692x Synthesized Signal Generator
- Power Meter, Anritsu Model ML2438A
- Site Master S312D
- Power Splitter, Aeroflex/Weinschel Model 1870A
- Power Sensor, Anritsu Model MA2442D
- Fixed Attenuator, Aeroflex/Weinschel Model 44-10
- Adapter, Anritsu Model 34RKNF50
- Adapter, Anritsu Model 34NN50A
- RF Coaxial Cable, Anritsu Model 15NN50-1.5C

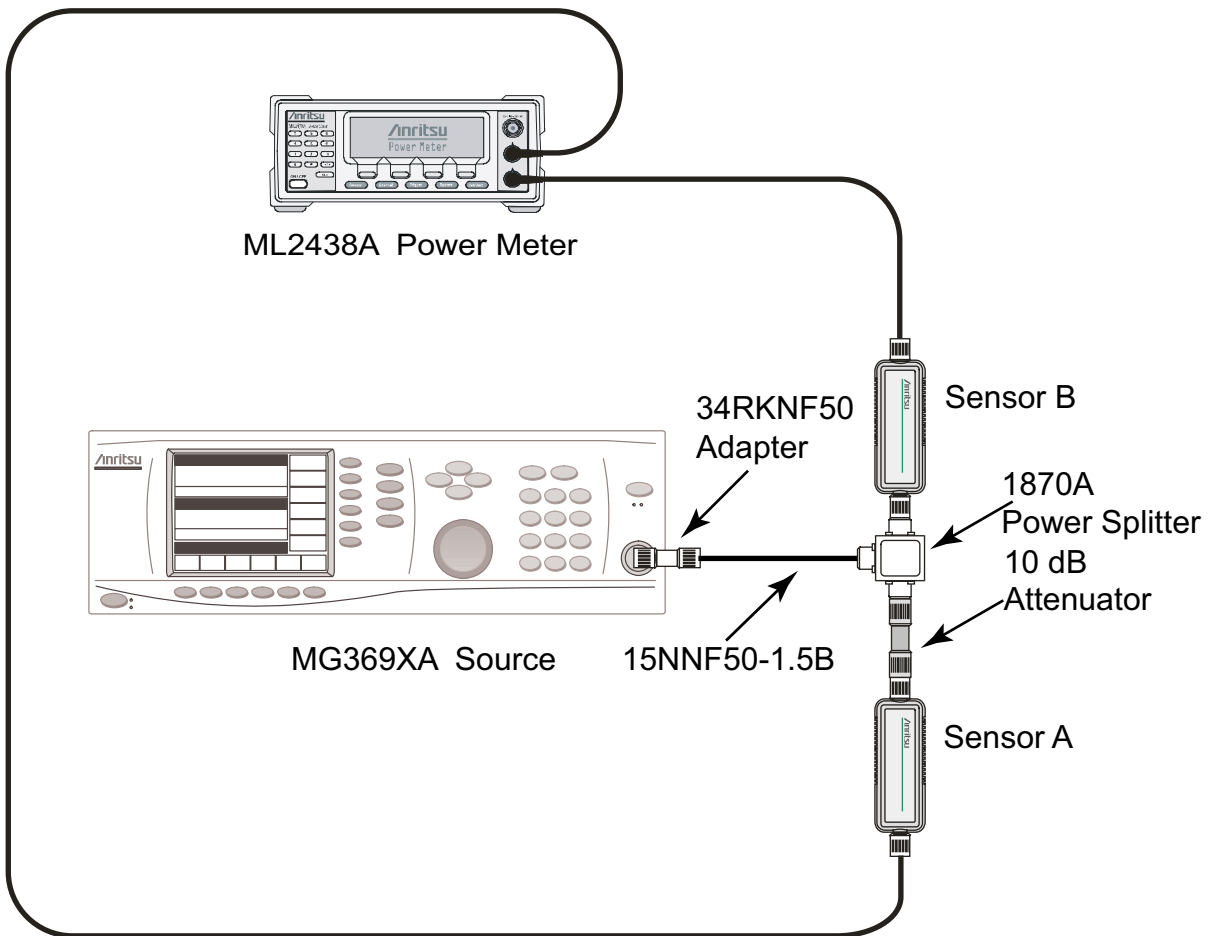


Figure 2-13. Power Meter Verification (Option 29) Characterization Setup

Procedure:

1. Turn on the power meter and signal source.
2. On the power meter, press the **Channel** key, the **Setup** soft key and then the **CHANNEL** soft key to display Channel 2 setup menu. Press the **INPUT** key twice to set the input configuration to B. Press the **Sensor key** to display both Sensor A and Sensor B Readings.
3. Connect the power sensors to the power meter and calibrate the sensors.
4. Set the Synthesized Signal Generator output power level to 5 dBm.
5. Set the Synthesized Signal Generator output to 50 MHz CW.
6. On the power meter, press the **Sensor** key, the **Cal Factor** soft key, and then the **FREQ** soft key. Use the keypad to enter 50 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Repeat for Sensor B. Press the **System** key on the power meter to display the power reading.
7. Connect Sensor A to the Synthesized Signal Generator output, measure the output power level, and record the value in column A of [Table A-17, “Power Meter Verification \(Option 29\) Output Power Level” on page A-9](#).
8. Disconnect Sensor A from the Synthesized Signal Generator output.
9. Connect the power splitter to the Synthesized Signal Generator output and connect Sensor B to one of the power splitter output connections. Install the 10 dB Fixed Attenuator to the other power splitter output connection, and then connect Sensor A to the end of the Attenuator. Refer to [Figure 2-13](#).
10. Record the new Sensor A reading in column B of [Table A-17](#).
11. Record the Sensor B reading in column D of [Table A-17](#).
12. Calculate the Splitter/Attenuator Combined Loss by using the following formula and record the result in column C of [Table A-17](#):
$$C = A - B$$
13. Calculate the Sensor B Path Power Splitter Loss by using the following formula and record the result in column E of [Table A-17](#):
$$E = A - D$$
14. Display Sensor A on the power meter.
15. Repeat Step 5 through Step 14 for 1000 MHz and 1580 MHz.
16. Calculate the desired Sensor B Readings for –30 dBm Test Power Level at the end of the 10 dB attenuator by using the following formula:
$$\text{Desired Sensor B Reading} = \text{Test Power Level} + C - E$$
17. Record the three calculated results in [Table A-18, “Power Meter Verification \(Option 29\) –30 dBm Test Power Level” on page A-9](#).
18. Using the power splitter, coaxial cable and adapters, connect the Site Master to the signal source and the power sensor as shown in [Figure 2-14](#).

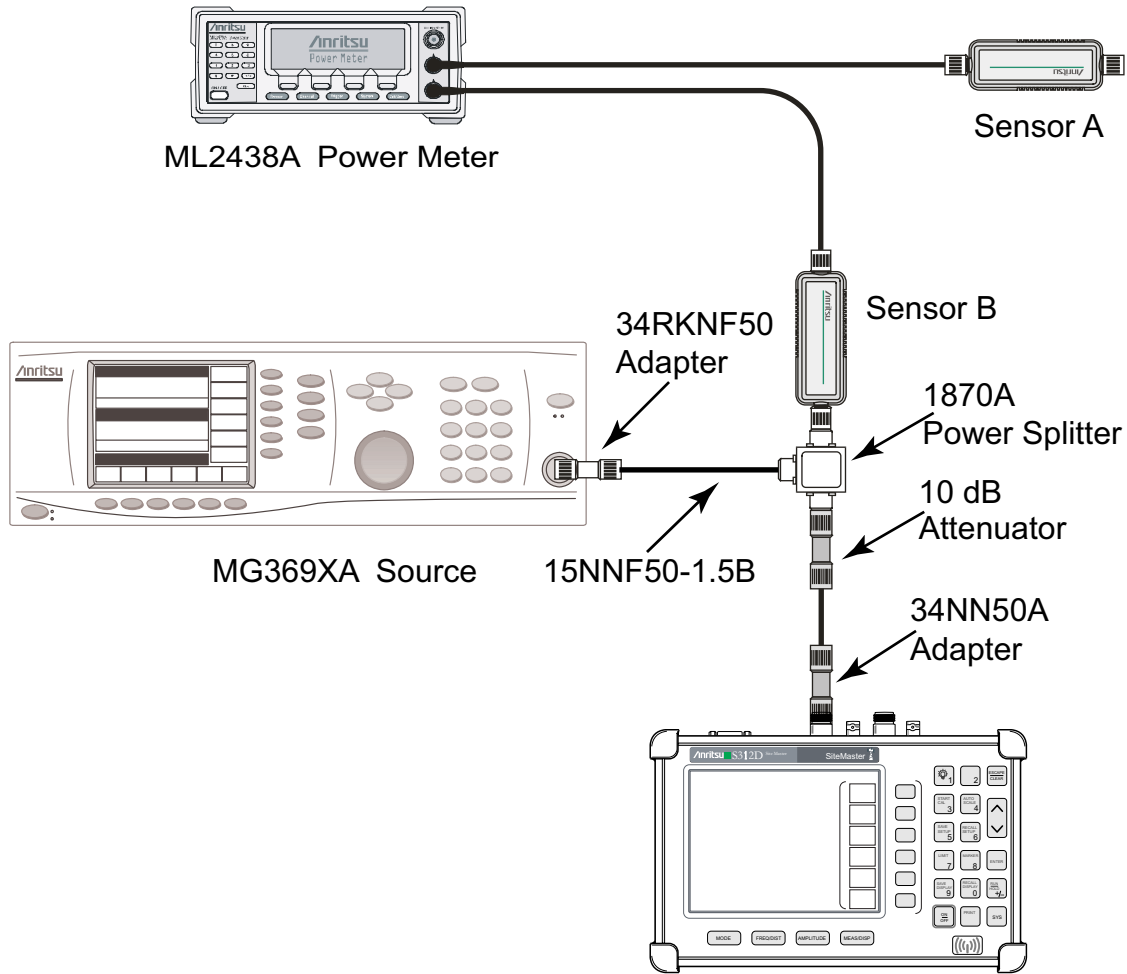


Figure 2-14. Power Meter Verification (Option 29) Test Setup

19. On the Site Master, press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. (This sets the instrument to the factory preset state.)
20. Press the **MODE** key. Use the **Up/Down** arrow key to highlight **Power Meter** and then press **ENTER**.
21. Press the **Center** soft key and enter 50, then press the **MHZ** soft key to set the center frequency to 50 MHz.
22. Press the **Span** soft key and enter 3, then press the **MHZ** key to set the span to 3 MHz.
23. On the Power Meter, press the **Sensor** key and then the **CalFactor** soft key. Press the **FREQ** soft key and enter 50 MHz for the Input Signal Frequency. This sets the power meter to the proper power sensor calibration factor. Press the **Sensor** key to display the power reading.
24. Set the Synthesized Signal Generator output to 50 MHz CW and adjust the power level so that the power meter displays the corresponding desired Sensor B Reading for -30 dBm as recorded in [Table A-18, “Power Meter Verification \(Option 29\) \$-30\$ dBm Test Power Level”](#) on page A-9.
25. Record the measured value in [Table A-19, “Power Meter Verification \(Option 29\)”](#) on page A-9.

Note

If the reading is unstable, then turn on RMS Averaging by pressing the **MEAS/DISP** key and then pressing the **RMS Averaging** soft key. The number of points to average can be set to low, medium, or high.

26. Repeat Step 21 through Step 24 for 1000 MHz and 1580 MHz.

Chapter 3 — Removal and Replacement

3-1 Battery Pack Removal and Replacement

This procedure provides instructions for removing and replacing the Site Master battery pack. [Table 2-1](#) in [Chapter 1, “General Information”](#) provides a list of replaceable assemblies.

Note

Many of the procedures in this section are generic, and apply to many similar instruments. Photos and illustrations that are used in this document are representative and may show instruments other than the Site Master.

1. With the Site Master standing upright on a stable surface, locate the battery access door ([Figure 3-1](#)).

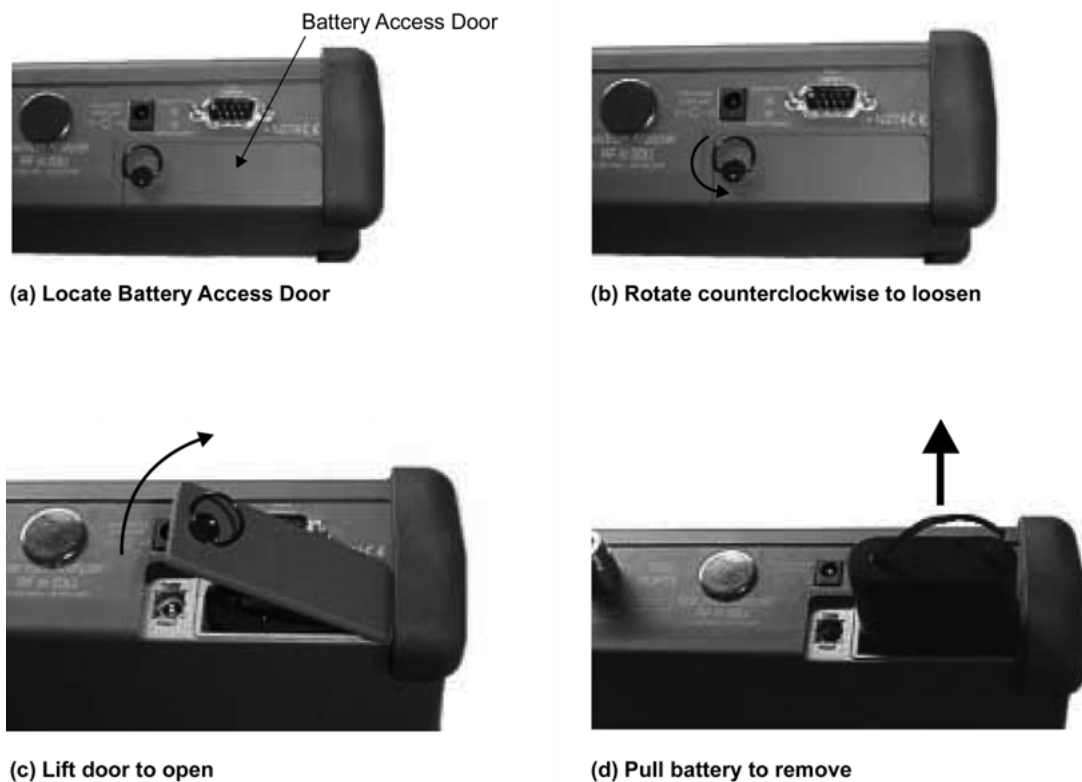


Figure 3-1. Battery Pack Removal

2. Lift up the access door handle and rotate it 90° counterclockwise, as illustrated in [Figure 3-1](#).
3. Lift the door and remove, as illustrated in [Figure 3-1](#).
4. Grasp the battery lanyard and pull the battery straight up and out of the instrument, as illustrated in [Figure 3-1](#).

5. Replacement of the battery is the reverse of removal. Note the orientation of the battery contacts, and be sure to insert the new battery with the contacts facing the rear of the instrument ([Figure 3-2](#)).

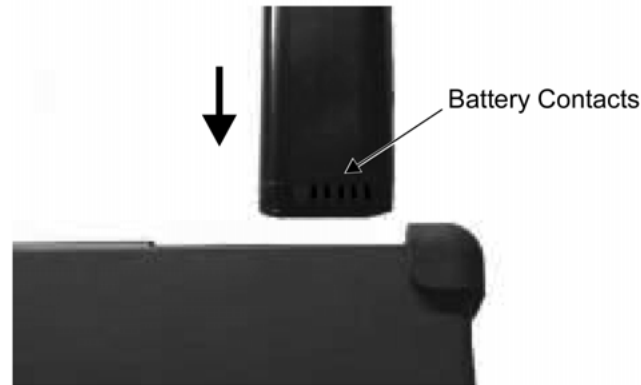


Figure 3-2. Battery Pack Replacement

3-2 Battery Information

The following information relates to the care and handling of the Site Master battery, and to NiMH batteries in general.

- The Nickel Metal Hydride (NiMH) battery that is supplied with the Site Master is shipped in a discharged state. Before using the Site Master, the internal battery must first be charged for three hours, either in the Site Master or in the optional battery charger (Anritsu part number: 2000-1029).
- Use only Anritsu approved battery packs.
- Recharge the battery only in the Site Master or in an Anritsu approved charger.
- With a new NiMH battery, full performance is achieved after three to five complete charge and discharge cycles.
- When the Site Master or the charger is not in use, disconnect it from the power source.
- Do not charge batteries for longer than 24 hours. Overcharging may shorten battery life.
- If left unused, a fully charged battery will discharge itself over time.
- Temperature extremes affect the ability of the battery to charge. Allow the battery to cool down or warm up as necessary before use or charging.
- Discharge an NiMH battery from time to time to improve battery performance and battery life.
- The battery can be charged and discharged hundreds of times, but it will eventually wear out.
- The battery may need to be replaced when the operating time between charging becomes noticeably shorter than normal.
- Never use a damaged or worn-out charger or battery.
- Storing the battery in extremely hot or cold places reduces the capacity and lifetime of the battery.
- Never short-circuit the battery terminals.
- Do not drop, mutilate, or attempt to disassemble the battery.
- Do not dispose of batteries in a fire!
- Batteries must be recycled or disposed of properly. Do not place batteries in household garbage.
- Always use the battery for its intended purpose only.

Battery Testing Procedure

1. With the Site Master Off and the battery installed, connect the Universal AC Adapter to the 12.5–15VDC (1350 mA) connector. The External Power LED and the Battery Charging LED will light.

Note

If the Battery Charging LED does not light, the battery may be too low to immediately begin full charging. Leaving the instrument connected to AC power for several hours may bring the battery up to a level at which full charging can begin. Turn the instrument off and back on to see if the Battery Charging LED lights indicate that a full charge cycle has begun.

Charging is inhibited below 0°C and above 45°C. If the instrument is too hot, the battery will not start charging until the instrument temperature has cooled to 43°C.

2. Disconnect the AC-DC Adapter when the Battery Charging LED turns off (indicating that the battery is fully charged).
3. Press and hold the **ESCAPE/CLEAR** key, then press the **ON/OFF** key to turn on the Site Master. This sets the instrument to the factory preset state. Press **ENTER** when prompted to continue.
4. Press the **SYS** key, followed by the **STATUS** soft key. Verify that the indicated battery charge is $\geq 80\%$. If the value is 80% or above, then press the **ESCAPE/CLEAR** key and continue with this procedure. If the value is lower than 80%, then a discharge/charge cycle may be needed in order to improve the battery capacity. Completely discharge the battery, as described in Step 5 and Step 6 below, and then recharge the battery as described in Step 1 and Step 2. If the battery capacity does not increase after a discharge/charge cycle, then replace the battery.
5. Press the **START CAL** key (to keep the Site Master from going into HOLD mode) and make note of the test start time.
6. When the Site Master display fades and the Site Master switches itself off, make note of the test stop time.
7. The total test time (Step 5 to Step 6) should be ≥ 1.5 hours. If the battery charge started at 80% or more, and if the total battery test time is < 70 minutes, then replace the battery.

3-3 Removal and Replacement Procedures

Table 1-2, “List of Replaceable Assemblies” on page 1-3 provides a list of replaceable assemblies.

Important Information Regarding Service of Anritsu Equipment

Only qualified service personnel should attempt to perform repairs on this instrument. During the warranty period, opening of the case by non-Anritsu Service personnel will void the warranty.

Extreme care must be used when handling internal assemblies. Careless handling will cause damage.

Unless authorized by the factory, no attempts should be made to repair a defective assembly. (Discharged RTC batteries on the main PCB may be replaced). Exchange assemblies that are determined to have been damaged by improper handling will not be accepted for credit.

Exchange Assemblies

The Base Assemblies and Option 5 PCB (as listed in Table 2-1) are factory-repairable exchange assemblies, which should be returned to Anritsu promptly for credit. AC adapters, batteries, LCDs, keypad parts and non-electrical parts are not exchange assemblies and need not be returned to Anritsu.

The Base Assembly consists of the main PCB and the spectrum analyzer assembly. They are a matched set. Failure of either assembly requires a new Base Assembly consisting of a main PCB with a spectrum analyzer PCB. Order the correct Base Assembly (determined by installed options) as shown in Table 2-1. Return both the main and spectrum analyzer assemblies (without the Option 5 PCB) to Anritsu for credit. After replacement, no recalibration is required.

If only Option 5 is found to be defective, then the Option 5 PCB should be removed from the main PCB (as described in Step 5 of Section 3-6 “Removal of the Main PCB, Option 5 PCB, Spectrum Analyzer Assembly” on page 3-6 below) and returned to Anritsu. Do not return the main or spectrum analyzer assembly if the problem is only with Option 5. After replacement of the PCB, no recalibration is required.

Note For all assemblies in the S312D, installation steps are the reverse of the removal steps.

3-4 Opening the Case

Caution

ESD Requirements: The model S312D contains components that can be easily damaged by electrostatic discharge (ESD). An ESD safe work area and proper ESD handling procedures that conform to ANSI/ESD S20.20-1999 or ANSI/ESD S20.20-2007 are mandatory to avoid ESD damage when handling subassemblies or components that are found in the S312D instrument.

Repair of damage that is found to be caused by electrostatic discharge is not covered under warranty.

1. Remove the four rubber corner bumpers by lifting and sliding them off the corners. This reveals the four screws that hold the front and rear of the case together.



Figure 3-3. Removing the Corner Bumpers

2. Remove the 4 screws that connect the front and rear of the case.
3. Separate the front and rear of the case by approximately 2 inches. Gently unplug the 4 cables that connect into the main PCB. The 2 halves of the instrument can then be completely separated.

3-5 Removal of the LCD and Keypad Assemblies

1. Remove the LCD wires from under the plastic retaining clips of the metal backing plate.
2. Remove the 14 screws that secure the backing plate to the case.
3. Lift up the backing plate. The LCD often remains attached to the backing plate by the friction of the rubber gasket.
4. Disconnect the flexible PCB from the LCD circuit board by pulling outward at each end of the connector with tweezers or other pointed tool.
5. Lift the LCD away from the backing plate.
6. Lift off the rubber cushion, the keyboard PCB, and the keypad membrane.

3-6 Removal of the Main PCB, Option 5 PCB, Spectrum Analyzer Assembly

1. Remove the 2 screws at the bottom of the main PCB, one screw in the center, and the 5-wire battery cable. (Refer to [Figure 3-4](#) for locations.)
2. Disconnect the SMA cable at the Spectrum Analyzer RF In, and disconnect the wire that is plugged into P5 near the RF Out connector.

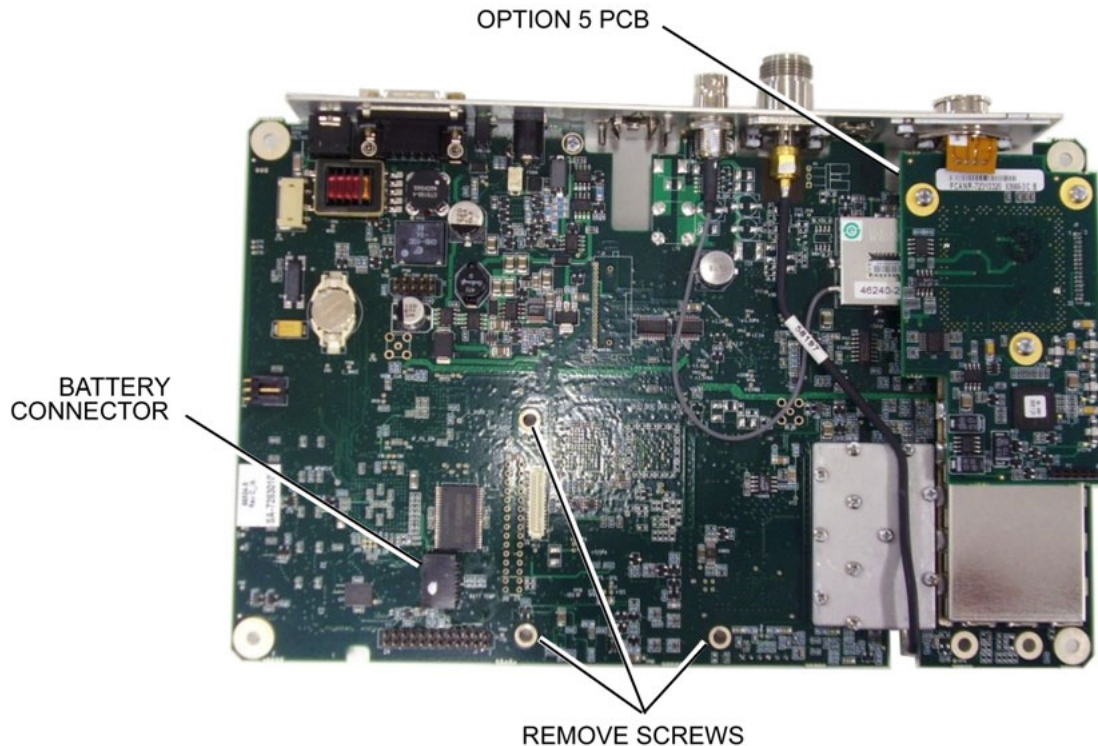


Figure 3-4. S312D Main PCB

3. Lift the main PCB about two inches out of the case and unplug the two cables that connect the spectrum analyzer board to the main PCB.
4. The main PCB and spectrum analyzer assemblies are now separated.
5. The Option 5 PCB must be removed if the main PCB has failed, the spectrum analyzer has failed, or Option 5 has failed. Unplug the 4-pin connector on the Option 5 PCB that connects to the front panel (refer to [Figure 3-4](#)). Remove the 3 screws holding the Option 5 PCB, and remove the PCB. It will be transferred to the replacement main PCB. Recalibration is not required after the replacement of Option 5.
6. The spectrum analyzer PCB can be removed from the case by removing the 4 screws and 3 standoffs that are located around the edge of the PCB.

Note Do not adjust any of the small screws that attach the RF shields of the PCB (Refer to [Figure 3-5](#)).

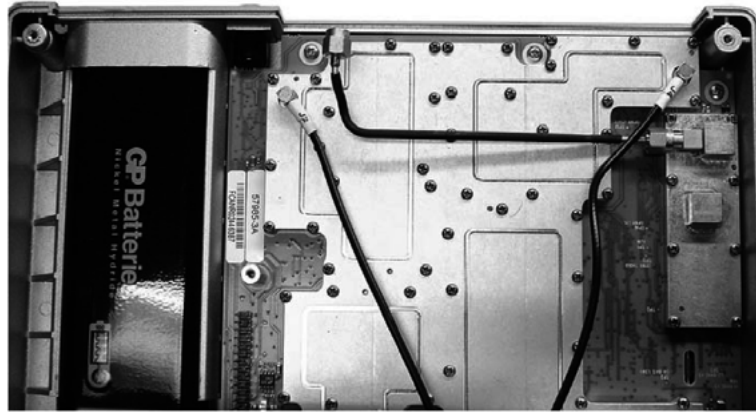


Figure 3-5. S312D Spectrum Analyzer PCB

3-7 RTC Battery Information

The date and time are saved using a +3 V coin-style battery that is mounted on the main PCB. (Refer to [Figure 3-6](#) for the location). This battery has a finite life span. When sufficiently discharged, the message RTC Invalid appears during the boot-up self-test.

When this message appears, it is necessary to replace the RTC battery. After replacing the battery, reenter the date, time, and year (under the **Sys** key menu) to remove the RTC Invalid message.

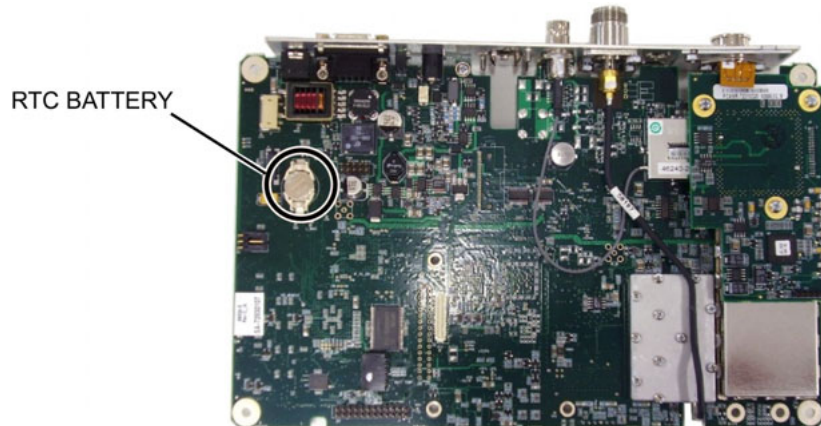


Figure 3-6. RTC Battery Location

Appendix A — Test Records

This appendix provides test records that can be used to record the performance of the S312D. Please make a copy of the following Test Record pages and document the measured values each time a Performance Verification is performed. Continuing to document this process each time it is performed provides a detailed history of the instrument's performance.

S312D Firmware Revision: _____ Operator: _____ Date: _____
 Serial Number: _____ Options: _____

VNA Frequency Accuracy

Table A-1. VNA Frequency Accuracy

Measured Value	Specifications
Hz	1000 MHz ± 75 kHz
Hz	1000 MHz ± 75 kHz

Use the first row for the VNA Frequency Accuracy test. If the test fails, then use the second row for the repeated test.

VNA Return Loss Verification

Table A-2. VNA Return Loss Verification

Offset	Measured Min. Value	Min. Specification	Measured Max. Value	Max. Specification
20 dB	dB	≥ -21.7 dB	dB	≤ -18.3 dB
6 dB	dB	≥ -7.2 dB	dB	≤ -4.8 dB

S312D Firmware Revision: _____ Operator: _____ Date: _____
 Serial Number: _____ Options: _____

Spectrum Analyzer Frequency Accuracy

Table A-3. Spectrum Analyzer Frequency Accuracy

Measured Value	Specifications
Hz	1000 MHz ± 2 kHz
Hz	1000 MHz ± 2 kHz

Use the first row for the VNA Frequency Accuracy test. If the test fails, then use the second row for the repeated test.

Spectrum Analyzer Phase Noise Verification

Table A-4. Spectrum Analyzer Phase Noise Verification

Reading	Delta 2	Delta 3	Specification
1	dBc	dBc	—
2	dBc	dBc	—
3	dBc	dBc	—
4	dBc	dBc	—
5	dBc	dBc	—
Average	dBc	dBc	—
Average – 30 dB	dBc/Hz	dBc/Hz	≤ -75 dBc/Hz

S312D Firmware Revision: _____ Operator: _____ Date: _____
 Serial Number: _____ Options: _____

Input Related Spurious Response Verification

Table A-5. Spectrum Analyzer Input Related Spurious Response Verification

M1	M1 + 30 dB	Specification
dBc	dBc	≤ -40 dBc

Spectrum Analyzer Resolution Bandwidth Accuracy Verification

Table A-6. Spectrum Analyzer Resolution Bandwidth Accuracy Verification

RWB Setting	Lower Limit	Measured Delta 2 Value	Upper Limit
1 MHz	0.95 MHz	MHz	1.05 MHz
300 kHz	285 kHz	kHz	315 kHz
100 kHz	95 kHz	kHz	105 kHz
30 kHz	28.5 kHz	kHz	31.5 kHz
10 kHz	9.5 kHz	kHz	10.5 kHz
3 kHz	2.85 kHz	kHz	3.15 kHz
1 kHz	0.95 kHz	kHz	1.05 kHz
300 Hz	285 Hz	Hz	315 Hz
100 Hz	95 Hz	Hz	105 Hz

Test Records

S312D Firmware Revision: _____ Operator: _____ Date: _____
 Serial Number: _____ Options: _____

Spectrum Analyzer Level Accuracy Verification

Table A-7. Spectrum Analyzer Level Accuracy Verification Output Power Levels

	A	B	C	D	E
Freq (MHz)	Sensor A Reading at Source Output	Sensor A Reading at Attenuator End	Splitter/Attenuator Combined Loss	Sensor B Reading at Power Splitter	Sensor B Path Power Splitter Loss
30	dBm	dBm	dBm	dBm	dBm
50	dBm	dBm	dBm	dBm	dBm
550	dBm	dBm	dBm	dBm	dBm
1000	dBm	dBm	dBm	dBm	dBm
1244	dBm	dBm	dBm	dBm	dBm
1411	dBm	dBm	dBm	dBm	dBm
1580	dBm	dBm	dBm	dBm	dBm

Calculations for power loss:

$$C = A - B$$

$$E = A - D$$

Table A-8. Spectrum Analyzer Level Accuracy Verification with Frequency Test Settings

Freq (MHz)	Desired Sensor B Reading for 0 dBm at Attenuator Output	Desired Sensor B Reading for -39 dBm at Attenuator Output
30	dBm	dBm
550	dBm	dBm
1000	dBm	dBm
1244	dBm	dBm
1411	dBm	dBm
1580	dBm	dBm

Calculations for Desired Sensor B Reading:

$$\text{Desired Sensor B Reading} = \text{Desired Test Power Level} + C - E$$

where "Desired Test Power Level" is 0 dBm, then -39 dBm.

S312D Firmware Revision: _____ Operator: _____ Date: _____
 Serial Number: _____ Options: _____

Spectrum Analyzer Level Accuracy Verification (continued)

Table A-9. Spectrum Analyzer Level Accuracy with Frequency

Frequency	Measured Value at 0 dBm	Measured Value at -39 dBm	Specification
30 MHz			± 1.5 dB
550 MHz			± 1.5 dB
1000 MHz			± 1.5 dB
1244 MHz			± 1.5 dB
1411 MHz			± 1.5 dB
1580 MHz			± 1.5 dB

Table A-10. Spectrum Analyzer Level Accuracy with Power Test Settings

Test Power Level at 50 MHz	Calculated Desired Sensor B Reading
+3 dBm	dBm
0 dBm	dBm
-11 dBm	dBm
-13 dBm	dBm
-19 dBm	dBm
-27 dBm	dBm
-32 dBm	dBm
-39 dBm	dBm
-49 dBm	dBm
-51 dBm	dBm
-53 dBm	dBm
-60 dBm	dBm

Calculations for Desired Sensor B Reading:

Desired Sensor B Reading = Test Power Level + C - E
 where "Test Power Level" is > -50 dBm at 50 MHz

S312D Firmware Revision: _____ Operator: _____ Date: _____
 Serial Number: _____ Options: _____

Spectrum Analyzer Level Accuracy Verification (continued)

Table A-11. Spectrum Analyzer Level Accuracy with Power

Input Power Level	Reference Level	Specification	Measured Marker M1 Reading
+3 dBm	+10 dBm	±1.5 dB	dBm
0 dBm	+10 dBm	±1.5 dB	dBm
-11 dBm	-10 dBm	±1.5 dB	dBm
-13 dBm	-10 dBm	±1.5 dB	dBm
-19 dBm	-10 dBm	±1.5 dB	dBm
-27 dBm	-20 dBm	±1.5 dB	dBm
-32 dBm	-30 dBm	±1.5 dB	dBm
-39 dBm	-30 dBm	±1.5 dB	dBm
-49 dBm	-40 dBm	±1.5 dB	dBm
-51 dBm	-40 dBm	±1.5 dB	dBm
-53 dBm	-50 dBm	±1.5 dB	dBm
-60 dBm	-50 dBm	±1.5 dB	dBm

Table A-12. Spectrum Analyzer Level Accuracy with Power — Output Power Levels

	A	B	C	D	E
Freq (MHz)	Sensor A Reading at Source Output	Sensor A Reading at Attenuator End	Splitter/Attenuator Combined Loss	Sensor B Reading at Power Splitter	Sensor B Path Power Splitter Loss
50	dBm	dBm	dBm	dBm	dBm

Calculations for power loss:

$$C = A - B$$

$$E = A - D$$

S312D Firmware Revision: _____ Operator: _____ Date: _____
 Serial Number: _____ Options: _____

Spectrum Analyzer Residual Spurious Response Verification

Table A-13. Spectrum Analyzer Residual Spurious Response Verification

Frequency Range	Measured Value (M1)	Specification
100 kHz to 10 MHz	dBm	≤ -80 dBm
10 MHz to 1.0 GHz	dBm	≤ -90 dBm
10 MHz to 1.6 GHz	dBm	≤ -90 dBm

Spectrum Analyzer Displayed Average Noise Level (DANL)

Table A-14. Spectrum Analyzer Displayed Average Noise Level (DANL)

Frequency Range	Computed Value for 100 Hz RBW (M1 – 20 dB)	Specification
100 kHz to 10 MHz	dBm	≤ -115 dBm
10 MHz to 1.6 GHz	dBm	≤ -135 dBm

Power Monitor Verification (Option 5)

Table A-15. Power Monitor Verification (Option 5)

Power	Site Master S312D Power Reading	Specification
0 dBm	dBm	0 dBm \pm 1.0 dB
-7 dBm	dBm	-7.0 dBm \pm 1.0 dB
-12 dBm	dBm	-21.0 dBm \pm 1.0 dB
-40 dBm	dBm	-40.0 dBm \pm 1.0 dB

Transmission Measurement Verification (Option 21)

Table A-16. Transmission Measurement Verification (Option 21)

Measured Value (M1)	Specification
dB	≤ -80 dB

Test Records

S312D Firmware Revision: _____ Operator: _____ Date: _____
 Serial Number: _____ Options: _____

Power Meter Verification (Option 29)

Table A-17. Power Meter Verification (Option 29) Output Power Level

	A	B	C	D	E
Freq (MHz)	Sensor A Reading at Source Output	Sensor A Reading at Attenuator End	Splitter/Attenuator Combined Loss	Sensor B Reading at Power Splitter	Sensor B Path Power Splitter Loss
50	dBm	dBm	dBm	dBm	dBm
1000	dBm	dBm	dBm	dBm	dBm
1580	dBm	dBm	dBm	dBm	dBm

Calculations for power loss:

$$C = A - B$$

$$E = A - D$$

Table A-18. Power Meter Verification (Option 29) –30 dBm Test Power Level

Frequency	Desired Sensor B Reading for –30 dBm Input to Site Master
50 MHz	dBm
1000 MHz	dBm
1580 MHz	dBm

Calculations for Desired Sensor B Reading:

$$\text{Desired Sensor B Reading} = \text{Test Power Level} + C - E$$

Table A-19. Power Meter Verification (Option 29)

Frequency	Measured Power	Specification
50 MHz	dBm	–30.0 dBm ± 1.5 dB
100 MHz	dBm	–30.0 dBm ± 1.5 dB
1580 MHz	dBm	–30.0 dBm ± 1.5 dB

Appendix B — Test Fixture Schematics

The following schematics are provided for those wishing to build their own test fixtures for the Option 10A verification test. The part numbers referenced in the schematics are Anritsu part numbers.

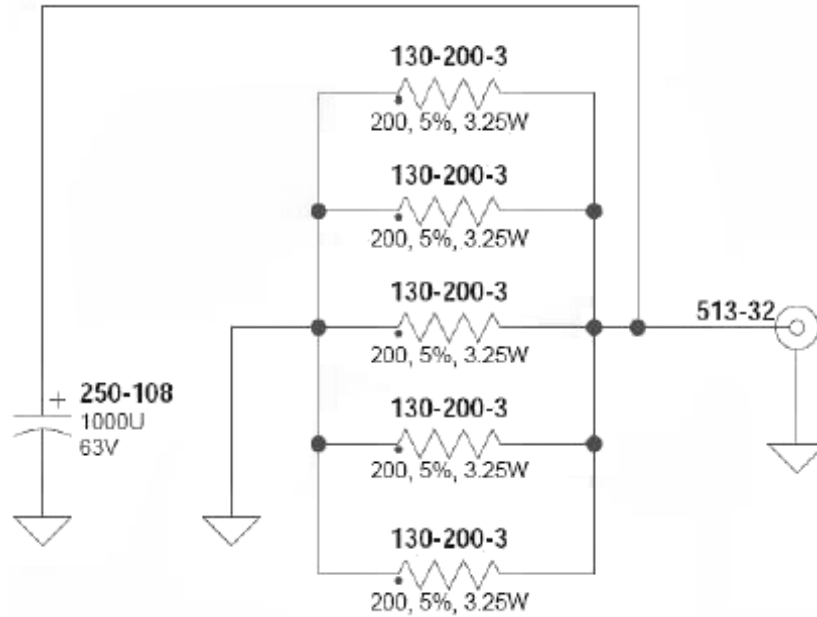


Figure B-1. Anritsu Model T2904 High Current Test Fixture (for Option 10A)

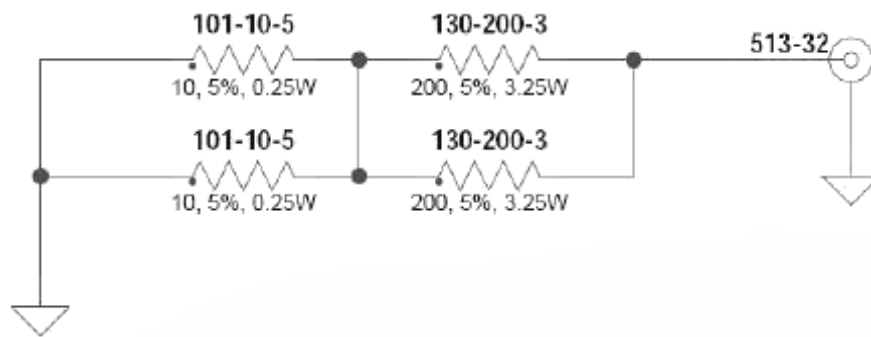


Figure B-2. Anritsu Model T3377 Low Current Test Fixture (for Option 10A)

Anritsu



Printed on Recycled Paper with Vegetable Soybean Oil Ink

Anritsu Company
490 Jarvis Drive
Morgan Hill, CA 95037-2809
USA
<http://www.anritsu.com/>