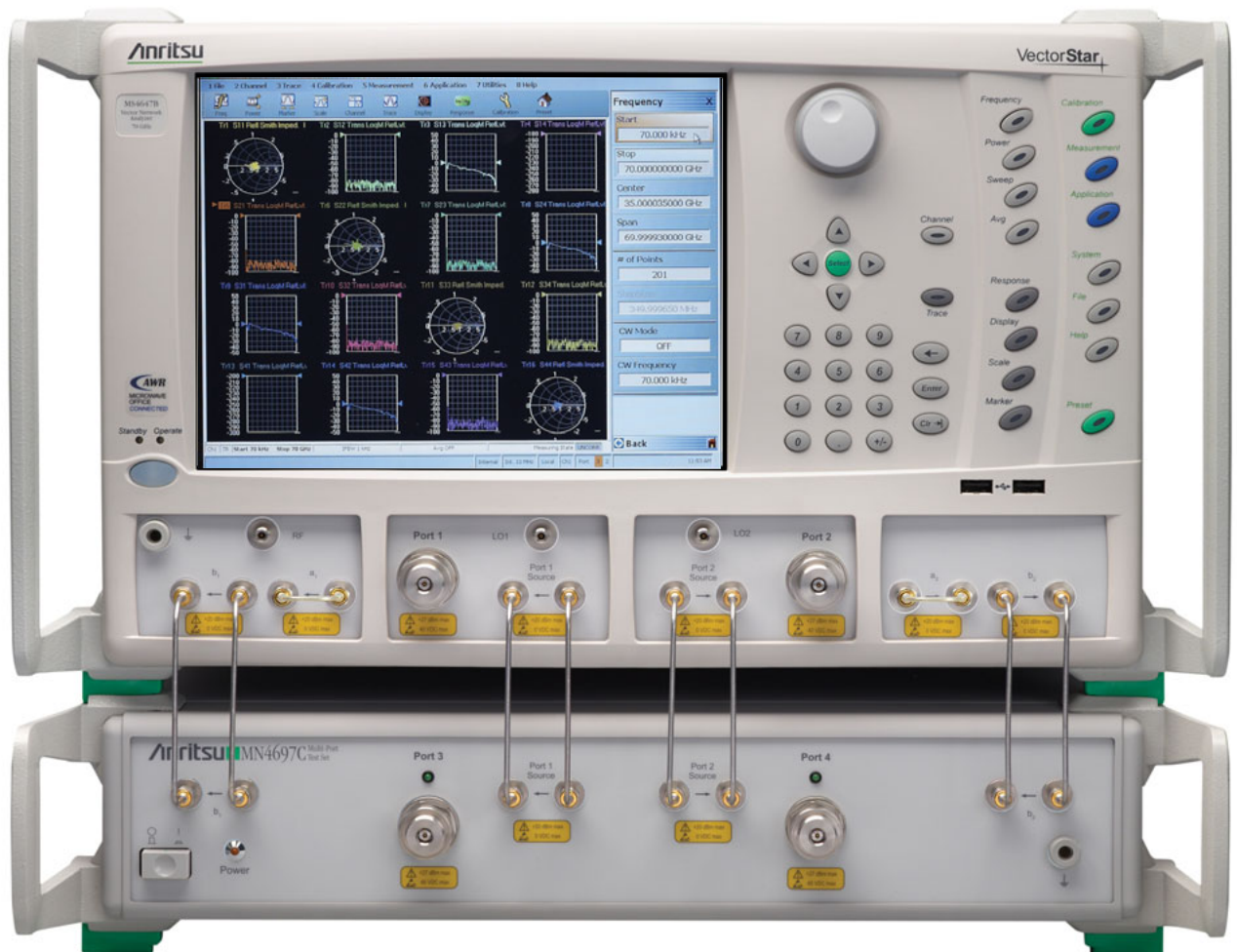


Installation Guide

VectorStar™ MN469xC Series Multiport Test Set

VectorStar MN4694C, K Connectors, for the MS4642A/B or MS4644A/B VNA
VectorStar MN4697C, V Connectors, for the MS4645A/B or MS4647A/B VNA



Anritsu

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DECLARATION OF CONFORMITY

Manufacturer's Name: ANRITSU COMPANY

Manufacturer's Address: Microwave Measurements Division
490 Jarvis Drive
Morgan Hill, CA 95037-2809
USA

declares that the product specified below:

Product Name: Multi-Port Test Set

Model Number: MN469XB, MN469XC

conforms to the requirement of:

EMC Directive: 2004/108/EC

Low Voltage Directive: 2006/95/EC

Electromagnetic Compatibility: EN61326-1:2006

Emissions: EN55011:2009 +A1:2010 Group 1 Class A

Immunity:	EN 61000-4-2:2009	4 kV CD, 8 kV AD
	EN 61000-4-3:2006 +A2:2010	3 V/m
	EN 61000-4-4:2004	0.5 kV S-L, 1 kV P-L
	EN 61000-4-5:2006	0.5 kV L-L, 1 kV L-E
	EN 61000-4-6: 2009	3 V
	EN 61000-4-11: 2004	100% @ 20 ms

Electrical Safety Requirement:

Product Safety: EN 61010-1:2010

Morgan Hill, CA



Eric McLean, Corporate Quality Director

20 Feb 2014

Date

European Contact: For Anritsu product CE information, contact Anritsu EMEA Limited, 200 Capability Green, Luton, Bedfordshire, LU1 3LU, England. (Telephone: +44 (0)1582 433200; Email: bert.francis@anritsu.com)

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For Chinese Customers Only NLNB

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 [Cr(VI)]	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板 (PCA)	×	○	×	×	○	○
机壳、支架 (Chassis)	×	○	×	×	○	○
其他(电缆、风扇、连接器等) (Appended goods)	×	○	×	×	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

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注) 生产日期标于产品序号的前四码(如 S/N 0728XXXX 为 07 年第 28 周生产)。

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 risk from a very dangerous condition or procedure that could result in serious injury or death and possible loss related to equipment malfunction. Follow all precautions and procedures to minimize this risk.

Warning



This indicates a risk from a hazardous condition or procedure that could result in light-to-severe injury or loss related to equipment malfunction. Follow all precautions and procedures to minimize this risk.

Caution



This indicates a risk from a hazardous procedure that could result in loss related to equipment malfunction. Follow all precautions and procedures to minimize this risk.

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



or



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 can not 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.

Warning



Use two or more people to lift and move this equipment, or use an equipment cart. There is a risk of back injury if this equipment is lifted by one person.

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	Test Set Description	1-1
1-3	Test Set Components	1-2
1-4	Functional Description	1-3
1-5	Technical Specifications	1-4
1-6	Related Documentation	1-4
	MS464xA Series Vector Network Analyzer	1-4
	MS464xB Series Vector Network Analyzer	1-4
	MN469xC Series Multiport Vector Network Analyzer Measurement System	1-4
	Calibration, Verification, and System Performance Verification	1-4
1-7	Contacting Anritsu	1-5

Chapter 2—Hardware Installation

2-1	Introduction	2-1
2-2	Initial Inspection	2-1
2-3	Power Requirements	2-1
2-4	Preparation for Use	2-1
2-5	System Connections	2-2
	Front Panel Connections	2-2
	Rear Panel Connections	2-3
2-6	Rear Panel DIP Switch GPIB Address Setting	2-6
	Changing the Test Set Addresses	2-6
	Changing VNA Addresses for the Test Set	2-7
2-7	Power Up Sequence	2-8
	Procedure	2-8

Chapter 3—Initial System Checkout

3-1	Introduction	3-1
3-2	Power Up	3-1
3-3	MN469xC Multiport Test Set Configuration Verification	3-1

Chapter 4—Troubleshooting and Maintenance

4-1	Introduction	4-1
4-2	Verifying VNA 4-Port Mode	4-1
4-3	Troubleshooting GPIB Addresses	4-1
4-4	Troubleshooting Power Up Failure	4-3
4-5	Checking/Changing the Rear Panel Fuse	4-4
	Procedure	4-4
4-6	Preparation for Storage	4-5

Table of Contents (Continued)

4-7	Preparation for Shipment	4-5
	Use a Suitable Container	4-5
	Dimensions	4-5
	Protect the Instrument	4-5
	Cushion the Instrument	4-5
	Seal the Container	4-5
	Address the Container	4-5

Index

Chapter 1 — General Information

1-1 Introduction

This manual provides general information, installation, operating, and maintenance information for the VectorStar MN469xC Series Multiport Test Sets. The following model Multiport Test Sets are discussed in this manual:

- MN4694C, K Connectors, for the VectorStar MS4642A/B or MS4644A/B VNAs
- MN4697C, V Connectors, for the VectorStar MS4645A/B or MS4647A/B VNAs

Throughout this manual, the term **test set** is used to refer to the MN469xC Series Multiport Test Set, the term **VNA** is used to refer to the VectorStar MS464xA/B Series Vector Network Analyzer, and the term **DUT** is used to refer to the device under test.

This chapter contains general information about the Multiport Test Sets shown in [Figure 1-1](#) on the following page. It includes a general description and functional details of the instrument, and provides technical specifications for each test set model.

1-2 Test Set Description

The Multiport Test Set provides multiple test port capabilities for the Anritsu VectorStar MS464xA/B Series Vector Network Analyzers. The test set contains a switch matrix and switch matrix controller that facilitates multiple test port connections to the device under test. The test set is controlled by the connected VectorStar VNA (except for power on/off) via the IEEE-488 General Purpose Interface Bus (GPIB).

Below, [Figure 1-1](#) shows the front and rear panels for the MN469xC Series Multiport Test Set.

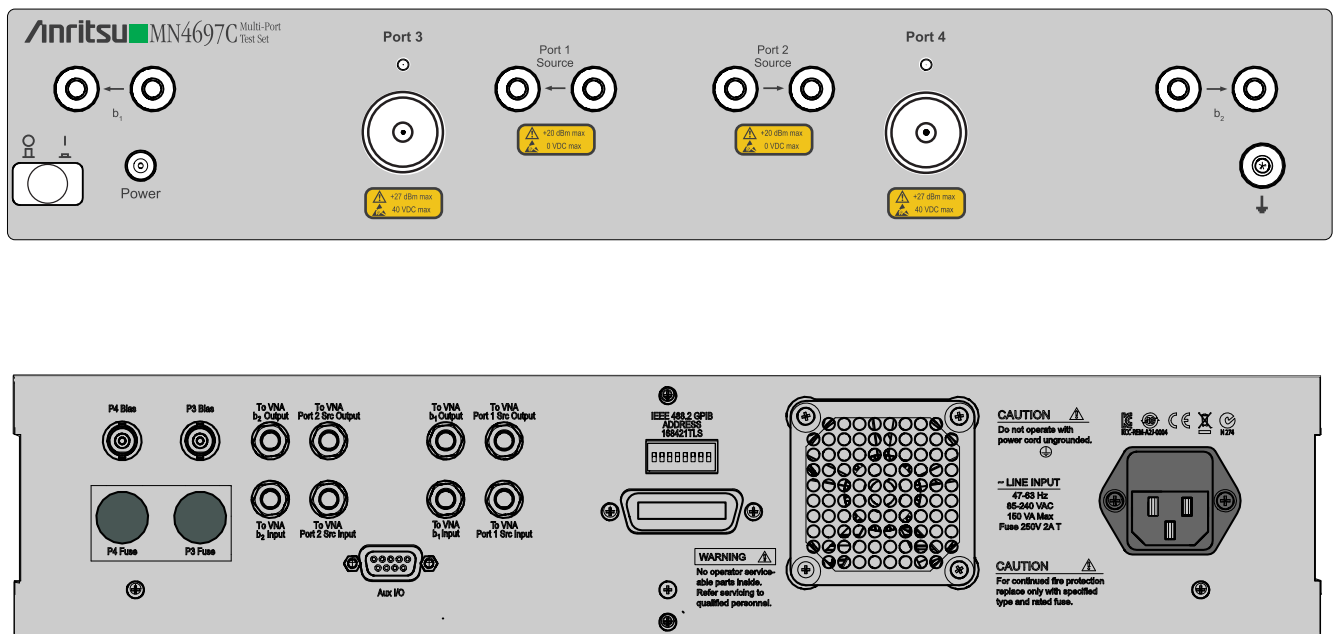


Figure 1-1. MN469xC Series Multiport Test Set Front (top) and Rear (bottom) Panels

1-3 Test Set Components

The MN469xC Series Multiport Test Set comes with the following components.

Table 1-1. MN469xC Multiport Test Set Components and Cables

Part Numbers	Description	Connection From	Connection To
62109-142 V (m-m) (MN4697C) -or- 67357-146 K (m-m) (MN4694C)	Front Panel RF Cable (8 each) V or K male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	VNA port labeled: b1 (In)	MN469xC port labeled: b1 (In)
		VNA port labeled: b1 (Out)	MN469xC port labeled: b1 (Out)
		VNA port labeled: Port 1 Source (In)	MN469xC port labeled: Port 1 Source (In)
		VNA port labeled: Port 1 Source (Out)	MN469xC port labeled: Port 1 Source (Out)
		VNA port labeled: Port 2 Source (In)	MN469xC port labeled: Port 2 Source (In)
		VNA port labeled: Port 2 Source (Out)	MN469xC port labeled: Port 2 Source (Out)
		VNA port labeled: b2 (In)	MN469xC port labeled: b2 (In)
		VNA port labeled: b2 (Out)	MN469xC port labeled: b2 (Out)
62112-141	Rear Panel Cable, SMA male-male semi-rigid	MS464xB port labeled: b2 loop out	MN469xC port labeled: TO VNA b2 OUTPUT
62112-140	Rear Panel SMA male-male semi-rigid	MS464xB port labeled: b2 loop in	MN469xC port labeled: TO VNA b2 INPUT
62112-141	Rear Panel SMA male-male semi-rigid	MS464xB port labeled: P2 source loop out	MN469xC port labeled: TO VNA Port 2 Src OUTPUT
62112-140	Rear Panel SMA male-male semi-rigid	MS464xB port labeled: P2 source loop in	MN469xC port labeled: TO VNA Port 2 Src INPUT
62112-141	Rear Panel SMA male-male semi-rigid	MS464xB port labeled: b1 loop out	MN469xC port labeled: TO VNA b1 OUTPUT
62112-140	Rear Panel SMA male-male semi-rigid	MS464xB port labeled: b1 loop in	MN469xC port labeled: TO VNA b1 INPUT
62112-141	Rear Panel SMA male-male semi-rigid	MS464xB port labeled: P1 source loop out	MN469xC port labeled: TO VNA Port 1 Src OUTPUT
62112-140	Rear Panel SMA male-male semi-rigid	MS464xB port labeled: P1 source loop in	MN469xC port labeled: TO VNA Port 1 Src INPUT
2100-1	Rear Panel GPIB Cable 1 meter (39.3") long	IEEE 488.2 GPIB	Dedicated GPIB
–	Rear Panel Power Cord	Line Input connects to AC Mains	
MS464xA/B	VNA with Option 051, 061, or 062		
MN469xC	Multiport Test Set		

1-4 Functional Description

The functional description is based on the functional block diagram of the MN469xC Series Test Set shown below (Figure 1-2).

The VectorStar VNA sends switch control commands via the GPIB bus to the GPIB to Parallel Digital Interface PCB in the test set. The logic in this PCB is translated by the switch driver board to the appropriate levels to control each of the RF switches designated SW1 through SW4. Any one or two test ports may be selected for forward and/or reverse measurements. This enables any one of a variety of connections to be selected.

An LED below each test port (Ports 1 to 4) and an LED above the AC Power switch indicate an active status. When AC power is first applied, the Power LED will light. This is the default state where all test ports are terminated into a nominal 50 Ohm termination and none of the test ports are selected for a measurement. When the connection paths are set via GPIB commands, the Test Port LEDs light according to the connections. A lit LED under a test port indicates that it is selected as an active test port.

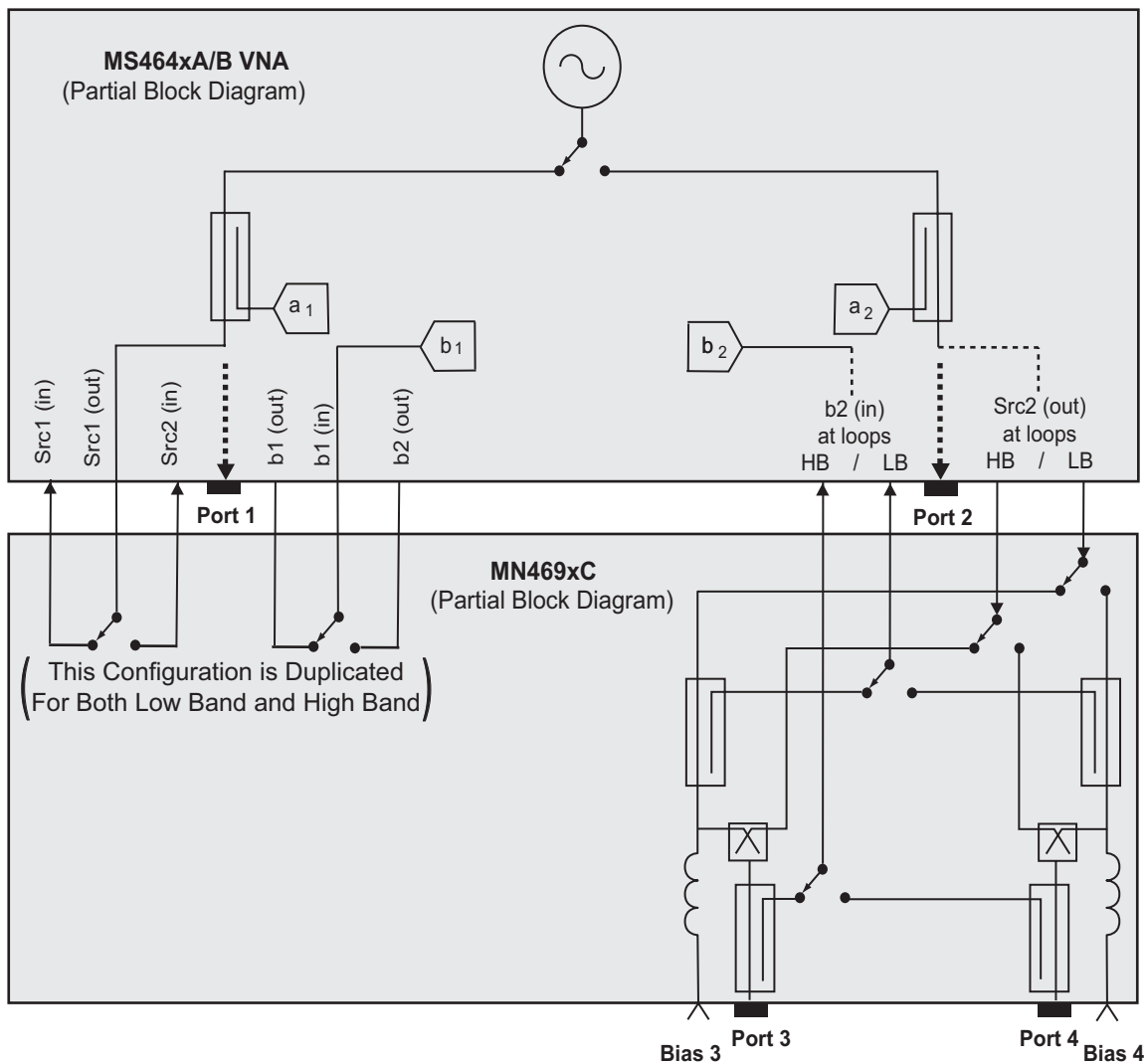


Figure 1-2. VectorStar MN469xC Series Multiport Test Set Functional Block Diagram

1-5 Technical Specifications

For complete technical specifications, refer to the **VectorStar MN469xC Series Multiport Technical Data Sheet – 11410-00777**.

1-6 Related Documentation

This section lists other documents that are available for the VectorStar instrument line.

MS464xA Series Vector Network Analyzer

- MS464xA Series VNA Technical Data Sheet – 11410-00432
- MS464xA Series VNA Operation Manual (OM) – 10410-00266
- MS464xA Series VNA Measurement Guide (MG) – 10410-00269
- MS464xA Series VNA Programming Manual (PM) – 10410-00267
- MS464xA Series VNA Help System (OM, PM, and MG) – 10450-00008
- MS464xA Series VNA Maintenance Manual (MM) – 10410-00268
- MS464xA Series VNA User Documentation CD (OM, PM, MG, TDS, HELP) – 10920-00049

MS464xB Series Vector Network Analyzer

- MS464xB Series VNA Technical Data Sheet – 11410-00611
- MS464xB Series VNA Operation Manual – 10410-00317
- MS464xB Series VNA Measurement Guide – 10410-00318
- MS464xB Series VNA User Interface Reference Manual – 10410-00319
- MS464xB Series VNA Maintenance Manual – 10410-00320
- MS464xB Series VNA Programming Manual – 10410-00322
- MS464xB Series VNA Programming Manual Supplement – 10410-00323
- MS464xB Series VNA User Help System – 10450-00040
- MS464xB Series VNA User Documentation CD – 10920-00067

MN469xC Series Multiport Vector Network Analyzer Measurement System

- MN469xC Series Multiport VNA Measurement System Technical Data Sheet – 11410-00777
- MN469xC Series Multiport Test Set Quick Start Guide – 10410-00738
- MN469xC Series Multiport Test Set Installation Guide – 10410-00737

Calibration, Verification, and System Performance Verification

- For MS464xA/B Series VNA:
 - 36585K and 36585V Precision Auto Calibrator (AutoCal) Module Reference Manual – 10410-00279
 - 3650A, 3652A, and 3654D Mechanical Calibration Kit Reference Manual – 10410-00278
 - 366xX-1 Verification Kits and 2300-527 Performance Verification Software (PVS) for VectorStar™ MS464xA/B Series VNA Quick Start Guide – 10410-00285
 - 3666-1, 3668-1, 3669B-1 Verification Kits and 3-2300-527 Performance Verification Software (PVS) User Guide – 10410-00270

For additional literature related to the Anritsu VectorStar family of products, refer to:

<http://www.us.anritsu.com/VectorStar>

1-7 Contacting Anritsu

To contact Anritsu, please visit:

<http://www.anritsu.com/contact.asp>

From here, you can select the latest sales, service and support contact information in your country or region, provide online feedback, complete a "Talk to Anritsu" form to get your questions answered, or obtain other services offered by Anritsu.

Updated product information can be found on your product page:

<http://www.anritsu.com/en-us/products-solutions/products/ms4640b-series.aspx>

On this web page, you can select various tabs for more information about your instrument. Included is a "Library" tab which contains links to all the latest technical documentation related to this instrument.

Chapter 2 — Hardware Installation

2-1 Introduction

This chapter provides installation instructions for the Multiport Test Set. It includes information on initial inspection, preparation for use, front and rear panel connections, and General Purpose Interface Bus (GPIB) setup and interconnections.

2-2 Initial Inspection

Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, retain until the contents of the shipment have been checked against the packing list and the test set has been checked for mechanical and electrical operation.

If the shipment is incomplete or if the test set is damaged mechanically or electrically, notify your local sales representative or Anritsu Customer Service. If either the shipping container is damaged or the cushioning material shows signs of stress, notify the carrier as well as Anritsu. Keep the shipping materials for the carrier's inspection.

2-3 Power Requirements


The test set accepts 85 to 240 VAC, 47 to 63 Hz, single-phase power. Power consumption is 255 VA maximum. The test set is intended for Installation Category (Over Voltage Category) II.

Caution When supplying power to this test set, always use a three-wire power cable connected to a three-wire power line outlet. If power is supplied without grounding the equipment in this manner, there is a risk of receiving a severe or fatal electric shock.

2-4 Preparation for Use

Preparation for use consists of placing the VNA on top of the test set, cabling the test set to the VNA with front and rear panel connections, and connecting both units to AC power. The test set comes factory configured for GPIB address 16, which is set by the rear panel DIP switches.

Caution



A MS464xA/B VNA unit is heavy. To avoid personal injury, it must be lifted and maneuvered by at least two people during installation.

If mounting on a workbench surface, first position the MN469xC Multiport Test Set with access to its front and rear panels. Place the VNA on top.

If mounting into rack or console, make sure the Test Set has been installed, and that the rack/console is carefully positioned on a flat and level surface. If equipped, make sure any casters are locked. Use two people to lift the VNA unit and two to guide it into its shelf rails.

The test loops on the front and rear panels of the VNA are delicate. Be careful not to bump or bend the test loops.

2-5 System Connections

The figure below shows the front panel connections between the Test Set and VNA. Make the semi-rigid cable connections as shown in [Figure 2-1](#), [Figure 2-2](#), and in [Table 2-1](#).

Note Before installing the test set in its operating environment, ensure that the airflow hole pattern at the right side of the instrument is clear. This is necessary to provide adequate ventilation for the test set.

Front Panel Connections

1. Place the VNA on top of the Test Set as shown in [Figure 2-1](#).
2. Disconnect the front panel RF cable loops from ports that will be connected to the test set.

Note When front panel loops on a VectorStar MS464xA/B are removed and then reinstalled for any reason, ensure they are returned to their original locations. If they are reconnected to locations other than their original, this can affect the VNA factory calibration. If the loop locations are forgotten and the calibration has been compromised, refer to the VectorStar Maintenance Manual for instructions on performing a new factory RF calibration.

3. Use the eight provided RF (K or V) male-to-male cables, or other semi-rigid or phase stable male-to-male RF cables to make the connections as shown in [Figure 2-1](#) and in [Table 2-1](#).

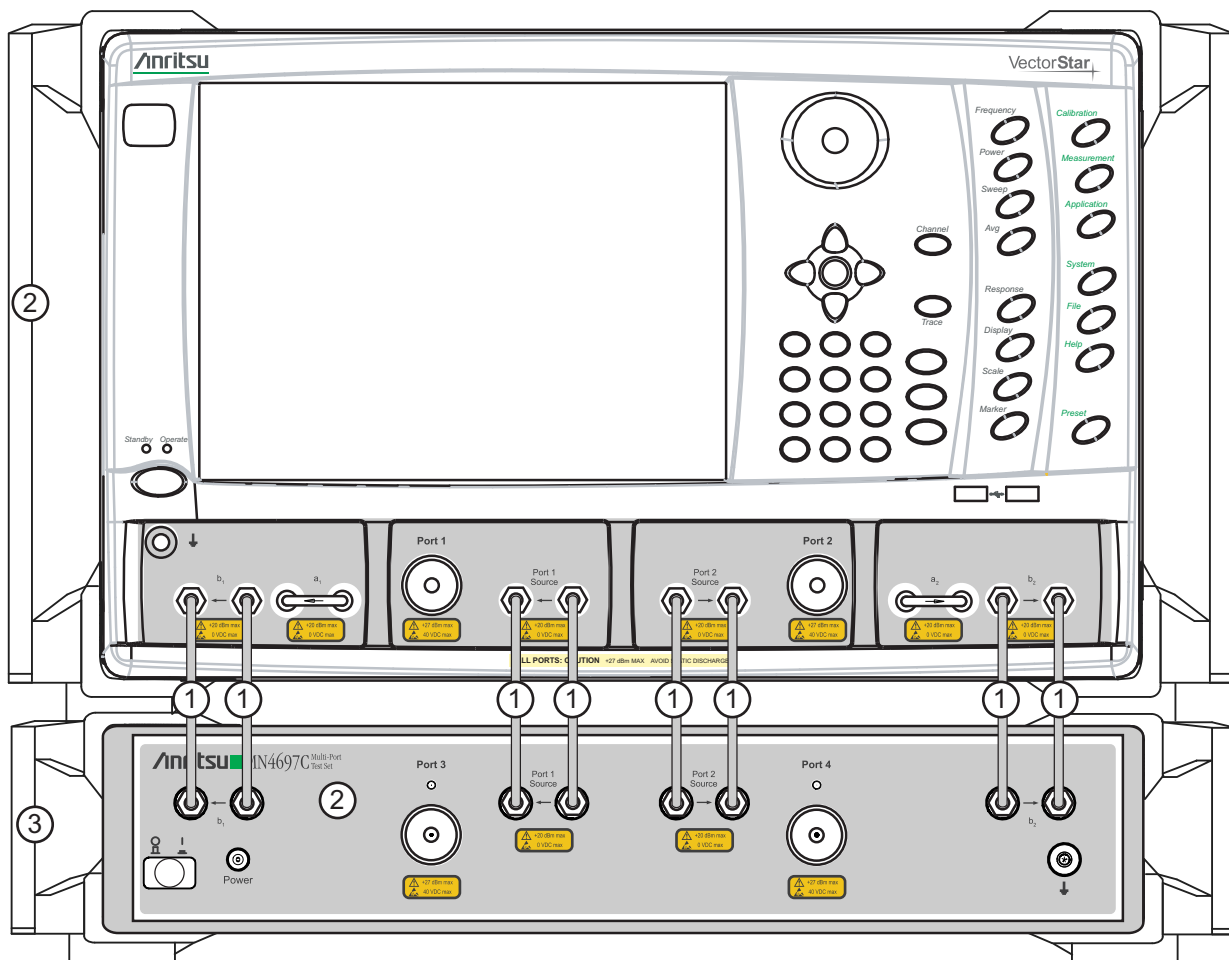


Figure 2-1. Front Panel Connections

Rear Panel Connections

1. Connect the GPIB cable between the VNA Rear Panel **Dedicated GPIB** connector and the Test Set **IEEE 488.2 GPIB** connector as shown in [Figure 2-2](#).
2. On the VNA rear panel, remove and set aside the eight SMA (m-m) loops.
3. Install the eight semi-rigid cables provided as shown in [Figure 2-2](#) and [Table 2-1](#).
4. Connect the **AC Power Cords** to the VNA and the Test Set and then to the AC Mains.

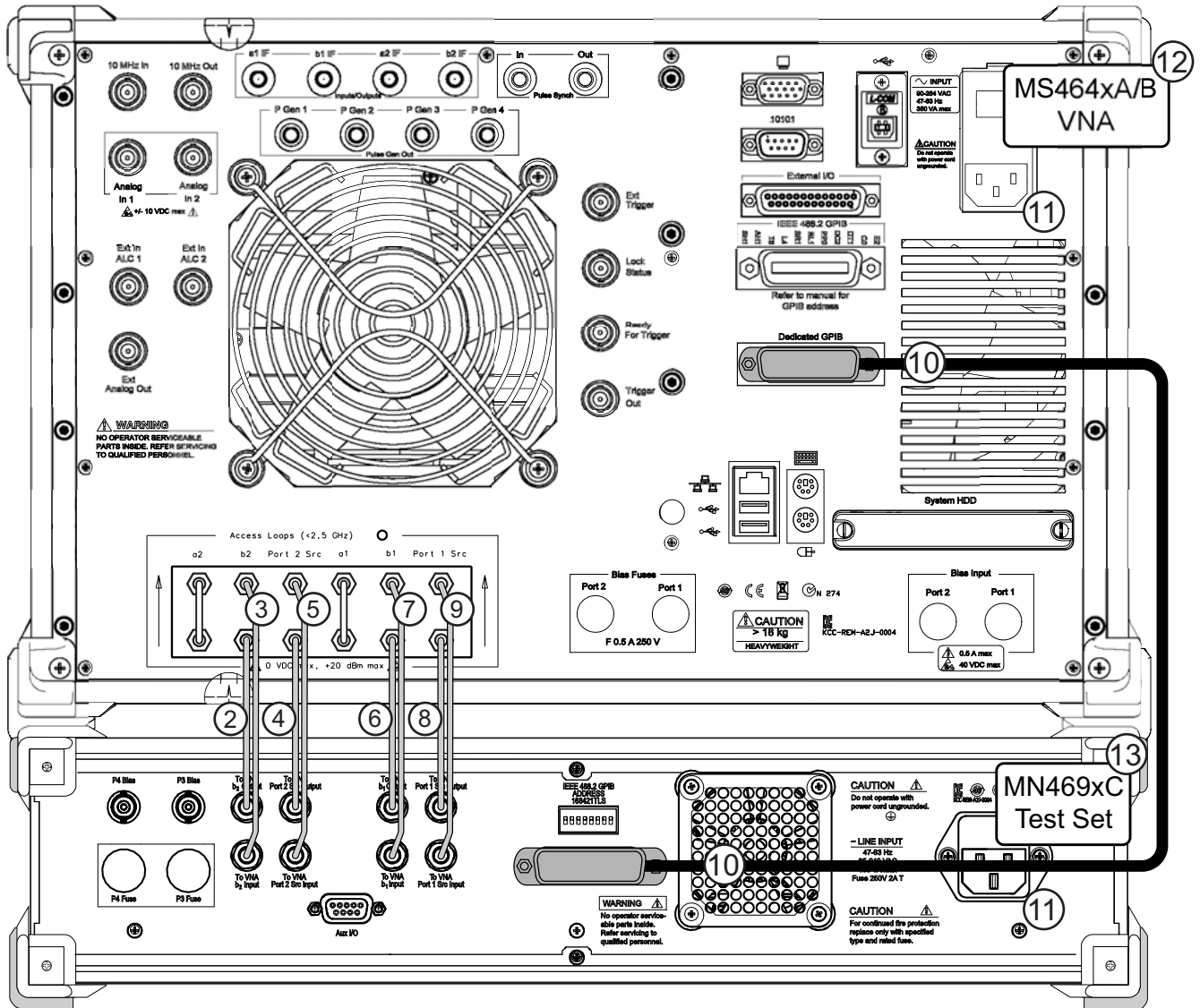


Figure 2-2. MS464xA/B VNA and MN469xC Test Set Rear Panel Connections (MS464xB shown)

Table 2-1. MN469xC Multiport semi-rigid Cable Interconnect Part Numbers and Locations

Index	Part Numbers	Description/Torque	Connection From	Connection To
Front Panel Connections				
1	62109-142 V (m-m) (MN4697C) -or- 67357-146 K (m-m) (MN4694C)	Front Panel RF Cable (8 each) V or K male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	VNA port labeled: b1 (In)	MN469xC port labeled: b1 (In)
			VNA port labeled: b1 (Out)	MN469xC port labeled: b1 (Out)
			VNA port labeled: Port 1 Source (In)	MN469xC port labeled: Port 1 Source (In)
			VNA port labeled: Port 1 Source (Out)	MN469xC port labeled: Port 1 Source (Out)
			VNA port labeled: Port 2 Source (In)	MN469xC port labeled: Port 2 Source (In)
			VNA port labeled: Port 2 Source (Out)	MN469xC port labeled: Port 2 Source (Out)
			VNA port labeled: b2 (In)	MN469xC port labeled: b2 (In)
			VNA port labeled: b2 (Out)	MN469xC port labeled: b2 (Out)
Rear Panel Connections				
2	62112-141	SMA male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	MS464xB port labeled: b2 loop out	MN469xC port labeled: TO VNA b2 OUTPUT
3	62112-140	SMA male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	MS464xB port labeled: b2 loop in	MN469xC port labeled: TO VNA b2 INPUT
4	62112-141	SMA male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	MS464xB port labeled: P2 Source loop out	MN469xC port labeled: TO VNA Port 2 Src OUTPUT
5	62112-140	SMA male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	MS464xB port labeled: P2 Source loop in	MN469xC port labeled: TO VNA Port 2 Src INPUT
6	62112-141	SMA male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	MS464xB port labeled: b1 loop out	MN469xC port labeled: TO VNA b1 OUTPUT
7	62112-140	SMA male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	MS464xB port labeled: b1 loop in	MN469xC port labeled: TO VNA b1 INPUT

Table 2-1. MN469xC Multiport semi-rigid Cable Interconnect Part Numbers and Locations

Index	Part Numbers	Description/Torque	Connection From	Connection To
8	62112-141	SMA male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	MS464xB port labeled: P1 Source loop out	MN469xC port labeled: TO VNA Port 1 Src OUTPUT
9	62112-140	SMA male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	MS464xB port labeled: P1 Source loop in	MN469xC port labeled: TO VNA Port 1 Src INPUT
10	2100-1	Rear Panel GPIB Cable 1 meter (39.3") long	IEEE 488.2 GPIB	Dedicated GPIB
11		Rear Panel Power Cord Varies with country	Line Input connects to AC Mains	
12	MS464xA VNA with Option 051, 061, or 062			
	MS464xB VNA with Option 051, 061, or 062			
13	MN469xC Test Set			

2-6 Rear Panel DIP Switch GPIB Address Setting

The MN469xC Series Test Set GPIB address must match the GPIB address set on the VNA and is set on the Test Set by rear panel DIP switches. The factory default GPIB address is 16 (Switch 1 ON and all other switches OFF). Note that the VNA GPIB connection must be made to the VNA **Dedicated GPIB** connector and not to the VNA **IEEE-488.2 GPIB** connector.

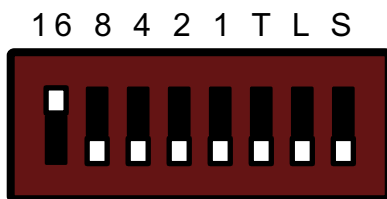


Figure 2-3. MN469xC DIP Switches (factory setting)

Changing the Test Set Addresses

In general, there should be no reason to change the address setting. If a change of test set address is required, match the Test Set DIP switch settings to the VNA address setting. To change the Test Set address, make sure the Test Set is disconnected from power, and then selectively turn switches **1** through **5** ON where the sum of the ON switch values equals the required GPIB address. All switch values are labeled on the rear panel as:

- Switch 1 = 16
- Switch 2 = 8
- Switch 3 = 4
- Switch 4 = 2
- Switch 5 = 1
- Switch 6 = T
- Switch 7 = L
- Switch 8 = S

For example, to set GPIB 28:

- Set switch 1 ON = 16
- Set switch 2 ON = 8
- Set switch 3 ON = 4

The resultant GPIB address is $16 + 8 + 4$ or 28.

The **T**, **L**, and **S** switches at positions **6**, **7**, and **8** stand for talker-only, listener-only, and system controller. These switches are not used in the VectorStar MS464xA/B VNA application and must be left in the down or OFF position.

Changing VNA Addresses for the Test Set

The default VNA GPIB address for the MN469xC Series Test Set is GPIB 16 and must match the address set on the Test Set through the rear panel DIP switches. To change the GPIB address on the VNA, navigate to the REMOTE INTER menu.

- Navigation: MAIN | System | SYSTEM | Remote Interface | REMOTE INTER. | Multiport Test Set

On the REMOTE INTER. (REMOTE INTERFACE) menu (shown below), select the Multiport Test Set button and set the same GPIB address as set at the Test Set rear panel.

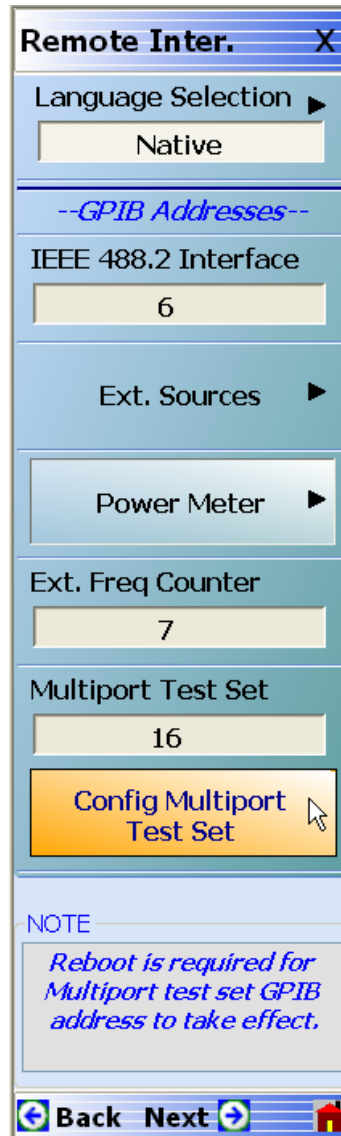


Figure 2-4. VectorStar REMOTE INTER. (REMOTE INTERFACE) Menu

If setting the GPIB Address for the MN469xC Test Set to a value **OTHER** than 16, select the Config Multiport Test Set button and follow the instructions. Note that this will require a reboot for both the Test Set and VNA for the new address to take effect.

2-7 Power Up Sequence

Note

The VNA application must be started after the Test Set is connected and powered up. If the VNA application is started before the Test Set, the VNA will remain in 2-port mode and the 4-port functions will not be available. If this happens, exit the VNA application, make sure the Test Set is powered up, and launch the VNA application.

Procedure

1. Make sure all of the cables are properly installed as illustrated in the previous sections.
2. Turn on the Test Set prior to launching the VNA application on the VNA. The VNA can be powered on, but the application must be off.
3. Once the Test Set is on, launch the VNA application. During the launch sequence, the VNA application recognizes the Test Set on the GPIB bus and is configured for 4-port mode. If the VNA application is powered up and launched before the test set, the VNA application will stay in 2-port mode and only 2-port mode features and functions will be available.
4. If the 4-port functions fail to appear, exit the VNA application by selecting File | Exit from the VectorStar Menu Bar and then clicking Yes in the confirmation dialog box.
 - Navigation: **MENU BAR** | File | FILE Drop-Down Menu | Exit Command
5. After the Windows desktop appears, launch the VNA application by doing one of the following:
 - a. On the desktop, click the VectorStar icon. If the VNA was running in 100,000 point mode, the icon is annotated with “100K”.
 - b. If running in 25,000 point mode, select **Start** | All Programs | VectorStar | VectorStar.
 - c. If running in 100,000 point mode, select **Start** | All Programs | VectorStar_100K | VectorStar.

Chapter 3 — Initial System Checkout

3-1 Introduction

This chapter provides the general initial system checkout for a completely assembled multiport system. Once this procedure is complete, the system is ready for calibration and available to make measurements up to a 4-port configuration.

3-2 Power Up

1. Ensure the AC main line supply to both the MN469xC Test Set and MS464xA/B VNA is turned ON.
2. Turn on the Test Set prior to launching the VNA application on the VNA. The VNA can be powered on, but the VNA application must be off.
3. Once the Test Set is on, launch the VNA application. During the launch sequence, the VNA application recognizes the Test Set on the GPIB bus and is configured for 4-port mode. If the VNA application is powered up and launched before the test set, the VNA application will stay in 2-port mode and only 2-port mode features and functions will be available.
4. Connect a USB mouse to the VNA.

3-3 MN469xC Multiport Test Set Configuration Verification

1. On the VNA, push the front panel **Preset** key.
 - a. Ensure the system is sweeping from 70 kHz to 40 GHz (for MN4694C) or 70 kHz to 70 GHz (for MN4697C).
 - b. Ensure that Trace 1 is set to S11, Trace 2 set to S12, Trace 3 set to S21, and Trace 4 set to S22.

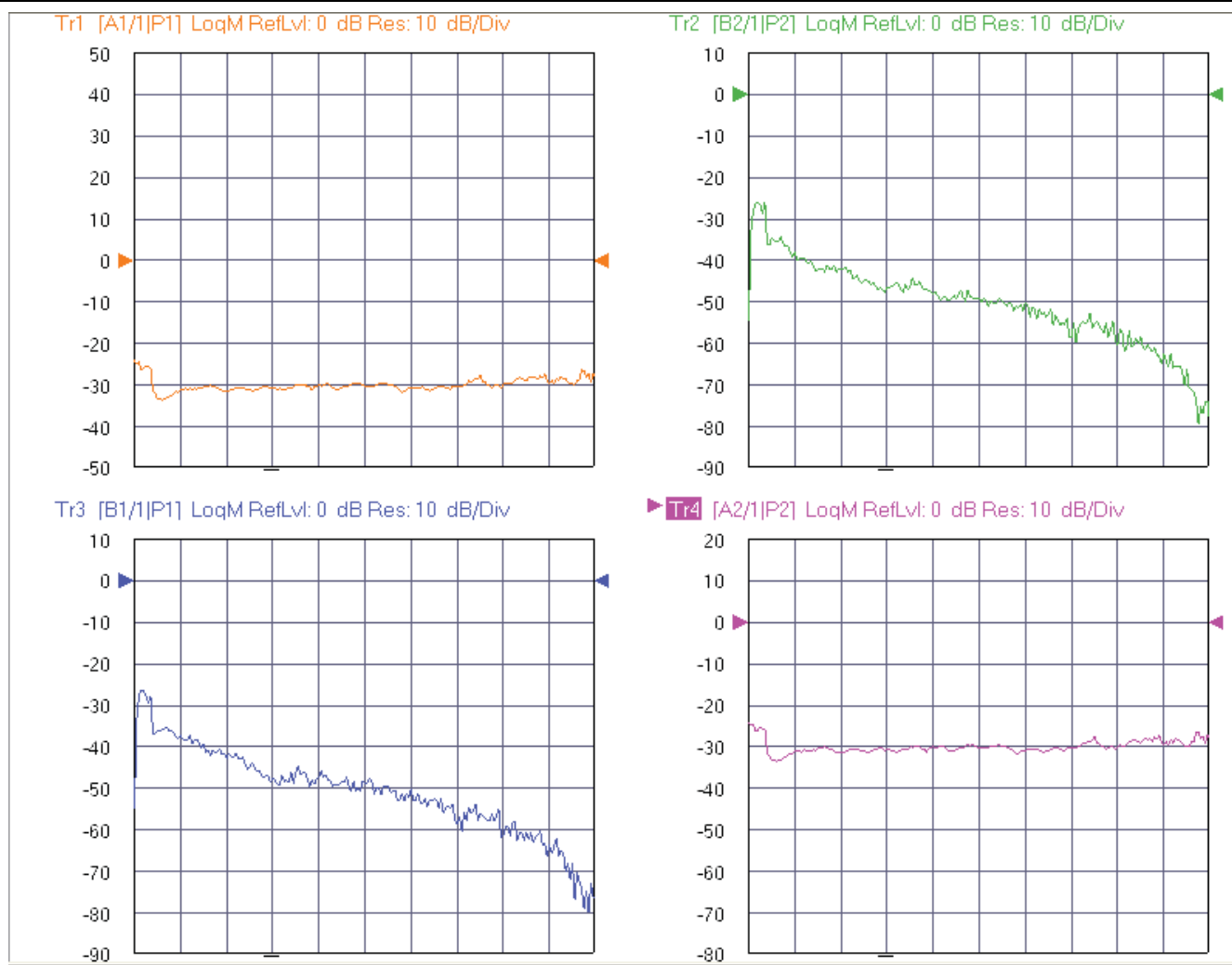
Note	If Option 70 is not installed on the VNA, the start frequency will be 10 MHz. If the MN4694C is connected to an MS4642A/B, the Stop Frequency will be 20 GHz. If the MN4697C is connected to an MS4645A/B, the Stop Frequency will be 50 GHz.
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2. At the top of the display, select MENU BAR | Utilities | System.
 - The right side SYSTEM menu appears.
3. On the right-side, select SYSTEM | Utility | UTILITY | Factory Receiver Cal and toggle the Factory Receiver Cal button to OFF.
4. Select Trace 1 and then from Main Menu select Display | DISPLAY | Trace Format, and set to **Log Mag**.
5. From Main Menu select Response | RESPONSE | User-defined. The USER-DEFINED menu appears.
 - a. Set USER-DEFINED | Numerator to **A1**.
 - b. Set USER-DEFINED | Denominator to **1**.
 - c. On the USER-DEFINED menu, select **Port 1** as the Driver Port.
 - d. Using a mouse, move the Reference Line as shown below ([Figure 3-1 on page 3-2](#)) to Reference Position = **5**.

Note	The Reference Line position can also be set from the SCALE menu in the Reference Position field.
-------------	--------------------------------------------------------------------------------------------------

6. Select Trace 2 and repeat Step 3, setting Numerator = **B2**, Denominator = **1**, Driver Port = **2**.

7. Select Trace 3 and repeat Step 3 setting Numerator = **B1**, Denominator = **1**, Driver Port = **1**.
8. Select Trace 4 and repeat Step 3, setting Numerator = **A2**, Denominator = **1**, Driver Port = **2**.
9. Connect **shorts** to **Ports 1 and 2** on the MS464xB VNA, and ensure the resultant display looks similar to [Figure 3-1 on page 3-2](#) (70 GHz shown).

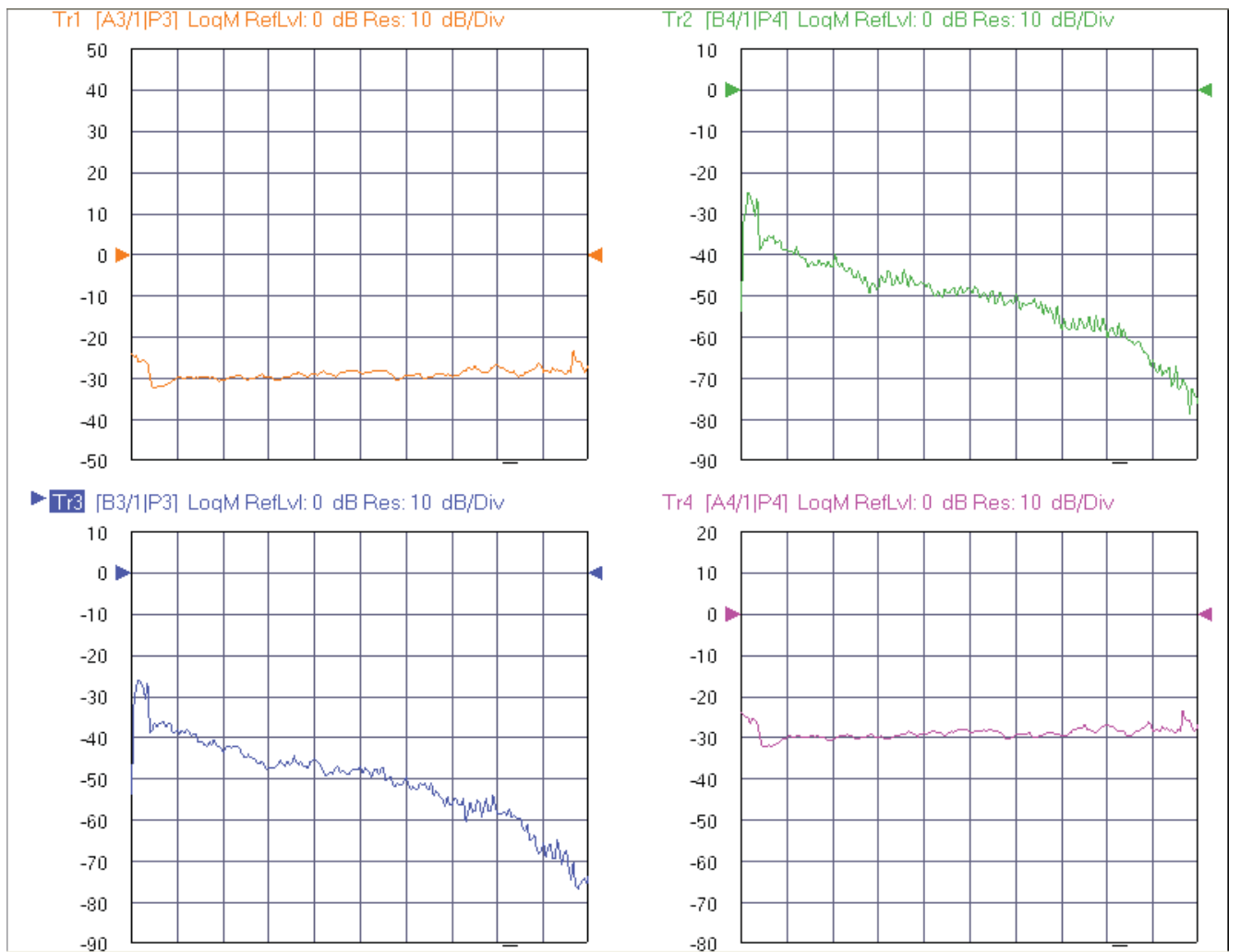


Non-Ratioed Parameters for Initial Checkout

Figure 3-1. Typical Four-Trace Display for 70 GHz VNAs - Shorts on MS464xB VNA Port 1 and Port 2

10. Select Trace 1 and then from Main Menu select Response | RESPONSE | User-defined. The USER-DEFINED menu appears.
 - a. Set USER-DEFINED | Numerator to **A3**.
 - b. Set USER-DEFINED | Denominator to **1**.
 - c. On the USER-DEFINED menu, select **Port 3** as the Driver Port.
 - d. Using a mouse, move the Reference Line as shown below ([Figure 3-2 on page 3-3](#)) to Reference Position = **5**.
11. Select Trace 2 and repeat Step 8, setting Numerator = **B4**, Denominator = **1**, Driver Port = **4**, Reference Position = **9**.
12. Select Trace 3 and repeat Step 8, setting Numerator = **B3**, Denominator = **1**, Driver Port = **3**, Reference Position = **9**.

13. Select Trace 4 and repeat Step 8., setting Numerator = **A4**, Denominator = **1**, Driver Port = **4**, Reference Position = **8**.
14. Connect **shorts** to **Ports 3 and 4** on the MN469xC Test Set, and ensure the resultant display looks similar to [Figure 3-2 on page 3-3](#) (70 GHz shown).



Non-Ratioed Parameters for Initial Checkout

Figure 3-2. Typical Four-Trace Display for 70 GHz VNAs - Shorts on MN469xC Test Set Port 3 and Port 4

Chapter 4 — Troubleshooting and Maintenance

4-1 Introduction

This section provides the information necessary for maintenance of the Multiport Test Set. Operator maintenance is limited to troubleshooting and repairs that can be made without removing the instrument covers. All other maintenance should be performed by qualified Anritsu service technicians.

Caution

There are no operator serviceable components inside the Test Set. Refer servicing of the instrument to qualified Anritsu service technicians.

To prevent the risk of electrical shock or damage to precision components, do not remove the equipment covers.

4-2 Verifying VNA 4-Port Mode

To verify the VNA is in 4-Port mode, do one of the following:

1. Check the SINGLE-MODE menu display.
 - a. Navigate to the RESPONSE | More Single-Mode | SINGLE-MODE menu.
 - b. S-Parameter selections should be available for S13, S14, S23, S24, S31, S32, S33, S34, S41, S42, S43, and S44.
2. Check the MANUAL CAL menu display.
 - a. Navigate to the CALIBRATION | Calibrate | CALIBRATE | Manual Cal | MANUAL CAL menu.
 - b. Calibration mode selections should be available for 4-Port Cal, 3-Port Cal, 2-Port Cal, and 1-Port Cal.

4-3 Troubleshooting GPIB Addresses

In the event the VNA system does not come up in 4-Port mode, perform the procedure below.

1. Ensure that the GPIB cable is properly connected between the MN469xC Series Test Set and the **Dedicated GPIB** connector on the MS464xA/B Series VNA.
2. Ensure that the MN469xC Series Test Set **Rear Panel DIP Switch** is set to 16.
 - Refer to the section on [“Rear Panel DIP Switch GPIB Address Setting”](#) on page 2-6.
3. Ensure that power is applied to the MN469xC Test Set before the MS464xA/B VNA application is launched (the VNA may be powered on, but the application must be launched after power is applied to the Test Set).
4. Verify the Multiport Test Set GPIB address is set to 16 in the REMOTE INTERFACE menu ([Figure 4-1 on page 4-2](#)):
 - Navigation: MAIN | System | SYSTEM | Remote Interface | REMOTE INTER.
5. Select the Config Multiport Test Set button, follow the Multiport Test Set Configuration instructions, and then re-boot both the MN469xC Test Set and MS464xA/B VNA.

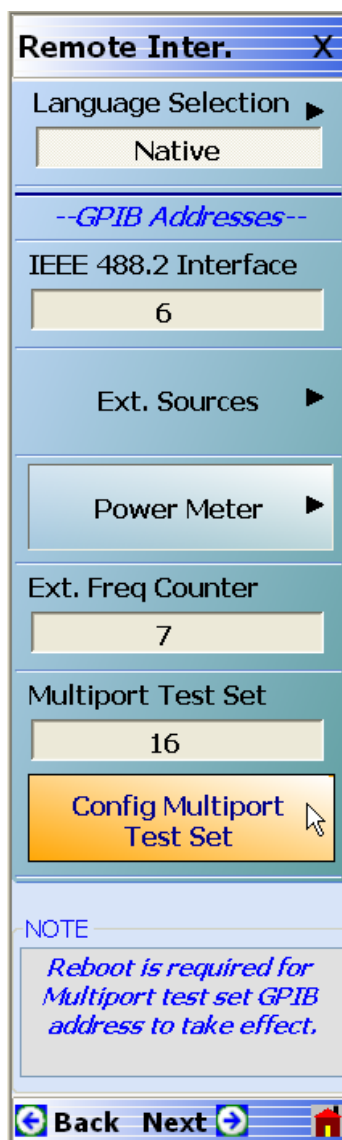


Figure 4-1. REMOTE INTER. (REMOTE INTERFACE) Menu for GPIB Addresses

4-4 Troubleshooting Power Up Failure

Troubleshooting by the operator consists of determining the cause of test set power up failure. The procedure below provides the necessary troubleshooting steps.

1. Test Set will not turn on.

Note	Normal operation for the test set is to connect the set to the power source, and then push in the front panel POWER button. The LED above the switch should illuminate and the instrument should power up.
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2. If the test set does not turn on, disconnect the test set from the power source, then check the line fuse on the rear panel as described in the [“Checking/Changing the Rear Panel Fuse”](#) section below.
3. If the fuse is defective, replace the fuse.
4. If the fuse is good, go to the next step.
5. Check to see if power is available at the power receptacle.
6. If not, move to a working receptacle.
7. If power is available, go to the next step.
8. Check the power cable.
9. If defective, replace the power cable.
10. If Test Set still will not turn on, call service technician.

4-5 Checking/Changing the Rear Panel Fuse

The value of the line fuse used in the Test Set is printed on the rear panel next to the line voltage module.

Caution

Before changing the fuse, always remove the power cord from the power outlet. There is the risk of receiving a fatal electric shock if the fuse is replaced with the power cord connected.

Always use a new fuse of the type and rating specified by the fuse markings on the rear panel of the instrument.

Procedure

Replace the defective line fuse as follows:

1. Remove the power cord from the rear panel line voltage module.
2. Pull out the fuse holder assembly as shown in [Figure 4-2](#).



Figure 4-2. Replacing the Line Fuse

3. Remove the fuse.
4. Change the fuse and install the fuse holder assembly.
5. Reconnect the power cord.
6. Reconnect the test set to the power source.

4-6 Preparation for Storage

Preparing the test set for storage consists of cleaning the unit, packing the inside with moisture-absorbing desiccant crystals, and storing the unit in a temperature environment that is maintained between -40°C and $+75^{\circ}\text{C}$ (-40°F to $+167^{\circ}\text{F}$).

4-7 Preparation for Shipment

To provide maximum protection against damage in transit, the test set should be repackaged in the original shipping container. If this container is no longer available and the unit is being returned to Anritsu for repair, advise Anritsu Customer Service; they will send a new shipping container free of charge. In the event neither of these two options is possible, instructions for packaging and shipment are given below.

Use a Suitable Container

Obtain a corrugated cardboard carton with a 125 kg (275 pound) test strength. This carton should have inside dimensions of no less than 15 cm (6.0") larger than the unit dimensions to allow for cushioning.

Dimensions

The MN4640C Multiport Test Set dimensions are 108 mm H x 487 mm W x 590 mm D (4.25 in H x 19.1 in W x 23.2 in D)

Protect the Instrument

Surround the unit with polyethylene sheeting to protect the finish.

Cushion the Instrument

Cushion the instrument on all sides by tightly packing dunnage or urethane foam between the carton and the unit. Provide at least three inches of dunnage on all sides.

Seal the Container

Seal the carton by using either shipping tape or an industrial stapler.

Address the Container

If the instrument is being returned to Anritsu for service, mark the address of the appropriate Anritsu service center and your return address on the carton in one or more prominent locations.

Subject Index

Symbols		
"L" Rear Panel DIP Switch	2-6	
"S" Rear Panel DIP Switch	2-6	
"T" Rear Panel DIP Switch	2-6	
Numerics		
100,000 point mode	2-8	
25,000 point mode	2-8	
4-Trace Display	3-2	
A		
AC Power		
Power Cords	2-3	
Power Up Sequence	3-1	
Airflow Clearance	2-2	
Anritsu		
Contacting	1-5	
Email	Front Matter-2	
Product Information	1-5	
Web site	Front Matter-2	
Anritsu Documents		
11410-00771 - Multiport TDS	1-4	
Anritsu Part Numbers		
2100-1 GPIB cable	2-5	
MN4694C Test Set - K connectors	1-1	
MN4697C Test Set - V connectors	1-1	
MS4642A/B VNA - K connectors	1-1	
MS4644A/B VNA - K connectors	1-1	
MS4645A/B VNA - V connectors	1-1	
MS4647A/B VNA - V connectors	1-1	
B		
Block diagrams	1-3	
C		
CE Conformity	Front Matter-4	
Changing the Test Set Addresses	2-6	
Changing VNA Addresses	2-7	
Chinese RoHS Compliance	Front Matter-5	
Components	1-2	
Configure Multiport Test Set button	2-7	
Connections		
Front Panel	2-2	
Connectors		
Front Panel	1-1	
Rear Panel connectors	1-1	
Contacting Anritsu	1-5	
Container Requirements	4-5	
Cooling Airflow	2-2	
C-tick Conformity	Front Matter-4	
D		
Description	1-1, 1-3	
DIP Switch		
"L" Switch	2-6	
"S" Switch	2-6	
"T" switch	2-6	
DIP Switches	2-6	
Documentation	1-4	
Driver Port	3-1	
Dual-Inline-Package (DIP) Switches	2-6	
E		
EPCD 2002/96/EC	Front Matter-5	
Exit VNA Application	2-8	
Export Management	Front Matter-4	
F		
Four Trace Display	3-2	
Front Panel		
Connections	2-2	
Connectors and ports	1-1	
Overview	1-1	
Functional Block Diagram	1-3	
Functional Description	1-3	
Fuse	4-4	
G		
General Purpose Interface Bus (GPIB)	1-1	
GPIB Networking		
Addressing Switches	2-6	
GPIB Addressing	2-6, 4-1	
IEEE 488.2 GPIB Port	2-3	
IEEE-488-2 Rear Port	1-1	
Overview	1-1	
Test Set Default Address 16	2-1	
I		
IEEE-488-2 General Purpose Interface Bus	1-1	
Initial Inspection	2-1	
K		
K Connectors		
MN4694C Test Set	1-1	
MS4642A/B VNA	1-1	
MS4644A/B VNA	1-1	
M		
Maintenance	4-1	
Manual Updates	1-5	
Mercury Notification	Front Matter-4	
MN4694C Test Set - K connectors	1-1	
MN4697C Test Set - V connectors	1-1	
MS4642A/B VNA - K connectors	1-1	
MS4644A/B VNA - K connectors	1-1	
MS4645A/B VNA - V connectors	1-1	
MS4647A/B VNA - V connectors	1-1	

N

NLNM Compliance Front Matter-5

Non-Ratioed Parameters 3-2, 3-3

P

Power

 Power Cord 2-5

 Power Requirements 2-1

 Power Up Sequence 2-8, 3-1

Preparation for Use 2-1

Preset key (VNA) 3-1

Product Information 1-5

R

Rear Panel

 Connectors and Ports 1-1

 Power Cord 2-5

Reference Position 3-1

Related Documents

 MS464xA/B VNA Operation Manual (OM) .. 1-4

REMOTE INTER Menu 2-7

Restart VNA Application 2-8

RoHS Compliance Front Matter-5

S

Safety Symbols

 For Safety Safety-2

 In Manuals Safety-1

 On Equipment Safety-1

Shipment 4-5

Software Updates Front Matter-2

Storage 4-5

T

Technical Documentation 1-4

Test Set

 Components 1-2

 Default GPIB Address 16 2-1

 General Description 1-1

Test Set Rear Panel Ports

 AC Line Fuse 4-4

 DIP Switches 2-6

 GPIB Addressing DIP Switches 4-1

 IEEE 488.2 GPIB 1-2, 2-3, 2-5

Trace Display 3-1, 3-2, 3-3

Trace Settings 3-1, 3-2

Trademarks Front Matter-2

Troubleshooting

 GPIB Addresses 4-1

 Power Up Failure 4-3

 Power-up sequence 4-1

U

Updated Manuals 1-5

Updates Front Matter-2

USB mouse 3-1

V

V Connectors

 MN4697C Test Set 1-1

 MS4645A/B VNA 1-1

 MS4647A/B VNA 1-1

VectorStar Models

 MN4694C Test Set - K connectors 1-1

 MN4697C Test Set - V connectors 1-1

 MS4642A/B VNA - K connectors 1-1

 MS4644A/B VNA - K connectors 1-1

 MS4645A/B VNA - V connectors 1-1

 MS4647A/B VNA - V connectors 1-1

VectorStar Web Site 1-4

VNA Application Stop/Start 2-8

VNA Keys

 Preset key 3-1

VNA Menus

 Config Multiport Test Set button 4-1

 DENOMINATOR menu 3-2

 MANUAL CAL menu 4-1

 NUMERATOR menu 3-2

 REMOTE INTERFACE menu 4-1

 RESPONSE menu 3-1, 4-1

 SINGLE-MODE menu 4-1

 USER-DEFINED menu 3-1, 3-2

VNA Rear Panel Ports

 Dedicated GPIB 1-2, 2-3, 2-5

VNA Settings

 Sweeping Range 3-1

 Trace Reference Position 3-1

 Trace Settings 3-1, 3-2

W

Warranty Front Matter-2

Web Links

 Contact 1-5

 Product Page 1-5

Web Site 1-4

Notes

Notes

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