Installation Guide

VectorStar™ ME7838 Series
2-Port Broadband/Banded Millimeter-Wave VNA System

High Performance Modular Broadband/Banded Millimeter-Wave Vector Network Analyzer (VNA) Measurement System

ME7838A Millimeter-Wave VNA System, 70 kHz to 125 GHz
ME7838D Millimeter-Wave VNA System, 70 kHz to 145 GHz
ME7838E Millimeter-Wave VNA System, 70 kHz to 110 GHz
ME7838G Millimeter-Wave VNA System, 70 kHz to 220 GHz
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Appendix A — ME7838 Series Specifications

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Chapter 1 — System Overview

1-1 Introduction

This manual provides instructions for setup and initial test of the VectorStar™ ME7838 Series Broadband/Banded Millimeter-Wave Vector Network Analyzer (VNA) System. The ME7838 Series consists of the ME7838A, ME7838D, ME7838G, and ME7838E system models.

1-2 ME7838 Series Main Components

Broadband System Components

The ME7838 Broadband system consists of the following components:

- MS4647A/B VNA with Option 007 (Receiver Offset), Option 070 (70 kHz Low End Frequency Extension), Option 08x (Modular Broadband System – Refer to Applicable TDS) (MS4647B VNA required for the ME7838E and ME7838G systems)
- 3739B or 3739C Broadband Test Set
- Front and rear panel cables
- A pair of the following millimeter-wave modules:
  - MA25300A Broadband Millimeter-Wave Module
  - MA25400A Broadband Millimeter-Wave Module
  - 3743A Broadband Millimeter-Wave Module
  - 3743E Broadband Millimeter-Wave Module

Banded System Components

The ME7838 Banded Millimeter-Wave system consists of the following:

- MS4644A/B, MS4645A/B, or MS4647A/B or VNA with Option 08x (Modular Broadband System Option – Refer to Applicable TDS) (B series VNA required for ME7838G-based systems)
- 3739B or 3739C Broadband Test Set
- Front and rear panel cables
- A pair of the following millimeter-wave modules:
  - MA25300A Broadband Millimeter-Wave Module
  - MA25400A Broadband Millimeter-Wave Module
  - 3743A Broadband Millimeter-Wave Module
  - 3743E Broadband Millimeter-Wave Module
  - 3744A-EE Banded Millimeter-Wave Module
  - 3744E-EE Banded Millimeter-Wave Module
  - 3744A-EW Banded Millimeter-Wave Module
  - 3744E-EW Banded Millimeter-Wave Module
  - 3744A-Rx Receiver Millimeter-Wave Module
  - 3744E-Rx Receiver Millimeter-Wave Module
  - OML/VDI Millimeter-Wave Modules
1-3  System Component Identification

Below, Figure 1-1 shows the major ME7838A components set up on a bench top.

Figure 1-1.  ME7838A Modular Broadband mm-Wave VNA System
ME7838 Series Front Panel Identification

The 3739B/C Broadband Test Set has front panel connectors and controls which connect to the MS4647A/B VNA as shown in Figure 1-2.

---

**VNA**

1 – VectorStar MS4647A/B VNA  
2 – Test Port 1  
3 – Test Port 2  
4 – VNA RF to Test Set RF Cable Connection  
5 – VNA LO1 to Test Set LO1 Cable Connection  
6 – VNA LO2 to Test Set LO2 Cable Connection

**Test Set**

7 – 3739B/C Test Set  
8 – Power Switch  
9 – Power ON LED

**Port 1 Connections**

10 – RF  
11 – Test  
12 – LO  
13 – Ref  
14 – Power

**Port 2 Connections**

15 – Power  
16 – Ref  
17 – LO  
18 – Test  
19 – RF  
20 – Ground  
21 – Aux Power

**Figure 1-2.** 3739B/C Test Set to MS4647A/B VNA – Front Panel Connectors (shown is MS4647B)
ME7838 Series Rear Panel Identification
The 3739B/C Broadband Test Set has rear panel connectors and controls which connect to the MS4647A/B VNA. Figure 1-3 shows an ME7838 System using an MS464xB VNA.

VectorStar MS4647A/B and 3739B/C Test Set
1 – VectorStar MS4647A or MS4647B VNA
2 – 3739B/C Broadband Test Set

IF Inputs/Outputs
3 – VNA IF Inputs – From left to right:
   a1 IF Input, b1 IF Input, a2 IF Input, b2 IF Input
4 – 3739B/C Test Set IF Outputs – From left to right:
   • a1 IF Output
   • b1 IF Output
   • a2 IF Output
   • b2 IF Output

BNC Connections
5 – VNA External Analog Out
6 – Test Set External Analog In
7 – VNA External Automatic Level Control (ALC1)
8 – Test Set External ALC Out

I/O Connections
9 – VNA External I/O – Below, the IEEE 488.2 GPIB connector for VNA control over a GPIB network.
10 – Test Set External I/O

Power Connections
11 – VNA AC Power Input Module
12 – Test Set AC Power Input Module

Figure 1-3. 3739B/C Test Set to MS4647A/B VNA – Rear Panel Connectors (shown is MS4647B)
Millimeter-Wave Modules
The MA25300A, MA25400A, and 3743A/E connect to the 3739B/C Test Set ports and to Test Port 1 and Test Port 2 on the MS4647A/B VNA. The 3744A/E-xx modules connect only to the ports on the 3739B/C Test Set.

Figure 1-4. Millimeter-Wave Module in Bracket (1 of 2)
1 – 3743A Millimeter-Wave Module in Bracket
2 – W Connector
3 – Knurled M3 × 8 mm Mounting Screws; 3 per side
4 – Module Mounting Bracket (different brackets are used for the MA25300A and MA25400A, not shown)
5 – Module Power/Signal Cable Restraint
6 – SRC V connector
7 – RF V connector
8 – LO K connector
9 – REF SSMC connector
10 – TEST SSMC connector
11 – Power/Signal latching Bi-Lobe™ connector
12 – Factory Calibrated Port Assignment Label
13 – Module Serial Number Label
14 – Waveguide Adapter Bracket
15 – WR-10 or WR-12 Waveguide to 1 mm Adapter
16 – 0.8 mm connector
17 – 0.6 mm flange connector

**Note**
The left-side and right-side mmW modules are identical. The modules have the same connector orientation and sequence and can be used on either port. There is no module right-hand or left-hand orientation.

However, in the as-shipped configuration (except for the 3744A/E-Rx Module) each module is calibrated for a specific VNA serial number and a specific VNA Test Port. The module labels indicate the calibrated port assignment. Degradation in system performance will result if the mmW modules are installed opposite of the calibrated port assignment indicated on their label.

### 1-4 ME7838 Series Configuration Part Numbers
The ME7838 Series VNA system as-shipped configuration uses different combinations of the components listed in the table below. Additional configuration information is available in the relevant technical data sheet.

#### Table 1-1. ME7838 Series Modular Broadband/Millimeter-Wave VNA System Components (1 of 3)

<table>
<thead>
<tr>
<th>Applicable ME7838 System</th>
<th>Part Number</th>
<th>Name</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>VNA Configuration</strong></td>
<td></td>
</tr>
<tr>
<td>ME7838A ME7838D</td>
<td>MS464xA/B</td>
<td>VectorStar Vector Network Analyzer (VNA)</td>
<td>Refer to Applicable TDS</td>
</tr>
<tr>
<td>ME7838E ME7838G</td>
<td>MS464xB</td>
<td>VectorStar Vector Network Analyzer (VNA)</td>
<td>Refer to Applicable TDS</td>
</tr>
<tr>
<td>All</td>
<td>MS464xA/B-007</td>
<td>Receiver Offset Option</td>
<td>Refer to Applicable TDS</td>
</tr>
<tr>
<td>All</td>
<td>MS464xA/B-002</td>
<td>Time Domain Option</td>
<td>Refer to Applicable TDS</td>
</tr>
<tr>
<td>All</td>
<td>MS464xA/B-070</td>
<td>70 kHz Low End Frequency Extension Option</td>
<td>Refer to Applicable TDS</td>
</tr>
<tr>
<td>All</td>
<td>MS464xA/B-08X</td>
<td>Broadband System Options</td>
<td>Refer to Applicable TDS</td>
</tr>
<tr>
<td>All</td>
<td>3739B or 3739C</td>
<td>Broadband Test Set</td>
<td>With front/rear panel interface cables</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>MS464xA/B VNA Front Panel Options</strong></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>MS464xA/B-051</td>
<td>Direct Access Loops</td>
<td>Refer to Applicable TDS</td>
</tr>
<tr>
<td>All</td>
<td>MS464xA/B-061</td>
<td>Active Measurement Suite</td>
<td>Refer to Applicable TDS</td>
</tr>
<tr>
<td>All</td>
<td>MS464xA/B-062</td>
<td>Active Measurement Suite</td>
<td>Refer to Applicable TDS</td>
</tr>
</tbody>
</table>
### Table 1-1. ME7838 Series Modular Broadband/Millimeter-Wave VNA System Components (2 of 3)

<table>
<thead>
<tr>
<th>Applicable ME7838 System</th>
<th>Part Number</th>
<th>Name</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Millimeter Wave Modules</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME7838D</td>
<td>MA25300A</td>
<td>Broadband Millimeter-Wave Module</td>
<td>70 kHz to 145 GHz</td>
</tr>
<tr>
<td>ME7838G</td>
<td>MA25400A</td>
<td>Broadband Millimeter-Wave Module</td>
<td>70 kHz to 220 GHz</td>
</tr>
<tr>
<td>ME7838A</td>
<td>3743A</td>
<td>Broadband Millimeter-Wave Module</td>
<td>70 kHz to 125 GHz</td>
</tr>
<tr>
<td>ME7838E</td>
<td>3743E</td>
<td>Broadband Millimeter-Wave Module</td>
<td>70 kHz to 110 GHz</td>
</tr>
<tr>
<td>ME7838A</td>
<td>3744A-EE</td>
<td>Banded Millimeter-Wave Module</td>
<td>56 GHz to 95 GHz</td>
</tr>
<tr>
<td>ME7838A</td>
<td>3744A-EW</td>
<td>Banded Millimeter-Wave Module</td>
<td>65 GHz to 110 GHz</td>
</tr>
<tr>
<td>ME7838E</td>
<td>3744E-EE</td>
<td>Banded Millimeter-Wave Module</td>
<td>56 GHz to 95 GHz</td>
</tr>
<tr>
<td>ME7838E</td>
<td>3744E-EW</td>
<td>Banded Millimeter-Wave Module</td>
<td>65 GHz to 110 GHz</td>
</tr>
<tr>
<td>ME7838A</td>
<td>3744A-Rx</td>
<td>Receiver Module</td>
<td>30 GHz to 125 GHz</td>
</tr>
<tr>
<td>ME7838E</td>
<td>3744E-Rx</td>
<td>Receiver Module</td>
<td>30 GHz to 110 GHz</td>
</tr>
</tbody>
</table>

**ME7838G Accessory Kit**

| ME7838G                  | 2000-1956-R | Accessory Kit, ME7838G                          | 33GG50 Thru and 33WG50 (W1 male) adapters |

**Waveguide Adapter Kits**

| All                      | –           | Waveguide Accessory Kit³, 3744A-EE and 3744A-EW |
| All                      | SM6540      | Waveguide Adapter Kit, V Band                   | WR-15                          |
| All                      | 35WR12WF-EE | Waveguide Adapter Kit, E Band                   | WR-12                          |
| All                      | 35WR10WF-EW | Waveguide Adapter Kit, W Band                   | WR-10                          |
| All                      | ME7838-SS020 | On-Site System Assembly and Verification       | Refer to Applicable TDS       |

**Interconnect Cable Part Numbers**

| All                      | 67357-13   | Semi-Rigid (KM-KM) Cables                     | Standard (Non-Rack Mount)     |
| All                      | 67357-67   | Semi-Rigid (KM-KM) Cables                     | 3739B/C-001 Rack Mount Option |
| All                      | 75685-1    | mm-Wave Module Interface Cables (for MA25300, MA25400A, 3743A, 3744A-EE, 3744A-EW, 3744E-EE, 3744E-EW modules) | Group of 5 cables for each port |
| All                      | 75685-2    | OML Module Interface Cables                   | Refer to Applicable TDS       |
| All                      | 75685-3    | VDI Module Interface Cables                   | Refer to Applicable TDS       |
| All                      |            | mm-Wave Module Interface Cables (for 3744A-Rx and 3744E-Rx modules) | Group of 3 cables for one port |
The 3656B W1 (1 mm) Calibration and Verification Kit with 2300-584-R Performance Verification Software is recommended in applications using 1 mm coaxial cable. The kit comes with the calibration/verification hardware and the system performance verification software (PVS). For additional information, see:


The 0.8 mm verification process can be used with the ME7838G system up to 145 GHz with 33.8G50 adapters on both modules.

1-6 3659 0.8 mm Calibration/Verification Kit with 2300-580-R PVS

The 3659 0.8 mm Calibration and Verification Kit with 2300-580-R Performance Verification Software is recommended in applications using 0.8 mm coaxial cable. The kit comes with the calibration/verification hardware and the system performance verification software (PVS). For additional information, see:

- VectorStar 3659 0.8 mm Calibration/Verification Kit and 2300-580-R PVS User Guide – 10410-00327

The 0.8 mm verification process can be used with the ME7838G system up to 145 GHz with 33.8G50 adapters on both modules.

1-7 Related Documentation

All Documents listed in this section are available on the VectorStar User Documentation Disc – 10920-00067. Calibration, Verification, and System Performance Verification documents are included on a separate disc included with each kit.

VectorStar MS464xB Series Vector Network Analyzers

- 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
VectorStar 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 Disc (OM, PM, MG, TDS, HELP) – 10920-00049

VectorStar ME7838 Series 2-Port BB/mm-Wave VNA Measurement System
- ME7838A Modular BB/mm-Wave Technical Data Sheet (TDS) – 11410-00593
- ME7838D Modular BB/mm-Wave Technical Data Sheet (TDS) – 11410-00778
- ME7838E Modular BB/mm-Wave Technical Data Sheet (TDS) – 11410-00767
- ME7838G Modular BB/mm-Wave Technical Data Sheet (TDS) – 11410-01060
- ME7838A Modular BB/mm-Wave Quick Start Guide (QSG) – 10410-00292
- ME7838D/G Modular BB/mm-Wave Quick Start Guide (QSG) – 10410-00732
- ME7838E Modular BB/mm-Wave Quick Start Guide (QSG) – 10410-00729
- ME7838 Series Modular BB/mm-Wave Installation Guide (IG) – 10410-00293
- VectorStar Broadband/Banded Millimeter-Wave Modules Reference Manual (RM) – 10410-00311
- ME7838 Series Modular BB/mm-Wave Maintenance Manual (MM) – 10410-00306

VectorStar ME7838 Series Multiport BB/mm-Wave VNA Measurement System
- ME7838A4 4-Port Broadband VNA Technical Data Sheet (TDS) – 11410-00704
- ME7838D4 4-Port Broadband VNA Technical Data Sheet (TDS) – 11410-01099
- ME7838E4 4-Port Broadband VNA Technical Data Sheet (TDS) – 11410-01100
- ME7838A4 Multiport Broadband VNA Quick Start Guide (QSG) – 10410-00735
- ME7838D4 Multiport Broadband VNA Quick Start Guide (QSG) – 10410-00770
- ME7838E4 Multiport Broadband VNA Quick Start Guide (QSG) – 10410-00771
- ME7838x4 Series Multiport BB/mm-Wave Installation Guide (IG) – 10410-00734
- ME7838x4 Series Multiport Modular BB/mm-Wave Maintenance Manual (MM) – 10410-00736

VectorStar MN469xC Series Multiport VNA Measurement System
- MN469xC Series Multiport VNA Measurement System Technical Data Sheet – 11410-00777
- MN469xC Series Multiport Test Set Installation Guide – 10410-00737
- MN469xC Series Multiport Test Set Quick Start Guide – 10410-00738
- MN469xC Series Multiport Test Set Maintenance Manual – 10410-00730
Calibration, Verification, and System Performance Verification

- 366X-1 Verification Kits (3666-1 3.5mm Connectors, 3668-1 K Connectors, 3669B-1 V Connectors) and 2300-527 Performance Verification Software (PVS) User Guide – 10410-00270
- 366X-1 Verification Kit and 2300-527 PVS Quick Start Guide – 10410-00285
- 3656B W1 (1 mm) Calibration/Verification Kit and 2300-584-R System Performance Verification Software User Guide – 10410-00286
- 3659 Calibration/Verification Kit and 2300-580-R System Performance Verification Software – 10410-00327

Updates to Manuals

For updates to any of the VectorStar Series VNA documentation, visit Anritsu's Web site at: http://www.anritsu.com

Performance Specifications

System performance specifications for VectorStar ME7838 Series Broadband/Banded Systems are contained in the applicable Technical Data Sheet (TDS) They are available at http://www.anritsu.com. Refer to Appendix A — ME7838 Series Specifications for applicable TDS numbers.

1-8 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:

On this web page, you can select various tabs for more information about your instrument. Included is a Library tab that contains links to all the latest technical documentation related to this instrument.
Chapter 2 — ME7838 Series System Assembly

2-1 Introduction

This chapter describes unpacking, assembly, and cabling procedures for the VectorStar ME7838 Series Broadband/Millimeter-Wave VNA Measurement System. The major system components of this system are:

- VectorStar MS464xA or MS464xB VNA System (B series VNA required for ME7838E- and ME7838G-based systems)
- 3739B or 3739C Broadband Test Set
- Millimeter-Wave Modules (2 each)
- Optional OML or VDI Frequency Extension Modules (2 each)
- VNA to Test Set to Module Connection Cables
- Phase Stable RF Connection Cables (2 each) - (used with 3743A and 3743E, MA25300A, and MA25400A modules only).

Since the ME7838A and ME7838D supports both the MS464xA and MS464xB VNAs, this chapter has a rear panel cable connection section for each:

- Section 2-5 “Rear Panel Connections – MS464xA VNA and Test Set” on page 2-4
- Section 2-6 “Rear Panel Connections – MS464xB VNA and Test Set” on page 2-6

2-2 Assembly Notes

The following general assembly notes apply to the unpacking, installation, and assembly procedures:

- Heavy
  The VectorStar VNA instrument is quite heavy. Use at least two people when lifting the VNA.

- Fragile RF Cables and Cable Loops
  The VNA instrument has fragile RF cables (such as the Cable Loops) connected to both the front and rear panels. Be careful not to bend these cables when handling the instrument.

- V, K, SMA, and 3.5 mm RF Connectors
  Best practices recommend using an Anritsu 01-201 Torque End Wrench to tighten the 8 mm (5/16”) ME7838 V, K, and SMA/3.5 mm connectors. The correct torque setting is 0.9 N·m (8 lbf·in).

  Use the torque wrench with an open end backing wrench. Best practices recommend using an Anritsu 01-204 8 mm (5/16”) End Wrench.

- W1 RF Connectors
  Best practices recommend using an Anritsu 01-504 Torque End Wrench to tighten the 6 mm nut on W1 connectors. The correct torque setting is 0.45 N·m (4 lbf·in).

  Use a 6 mm end wrench with the torque wrench above. Best practices recommend using an Anritsu 01-505 6 mm/7mm Open End Wrench.

- 0.8 mm RF Connectors
  Best practices recommend using an Anritsu 01-524 Torque End Wrench to tighten the 6 mm nut on 0.8 mm connectors. The correct torque setting is 0.45 N·m (4 lbf·in).

  Use a 6 mm end wrench with the torque wrench above. Best practices recommend using an Anritsu 01-525 6 mm/7mm Open End Wrench.
• 0.6 mm Flange RF Connectors
Best practices recommend using an Anritsu 01-530-R Hex Drive Torque Wrench to tighten the mounting bolts for the flange assembly. The correct torque setting is 6 cN·m (0.5 lbf·in).
Certain devices that mate with the 0.6 mm flange RF connector (e.g., the 33GG50 through and on-wafer probes) have a male center pin that can move laterally if bumped. Check that this pin is roughly centered (using a magnifying loupe, such as the one in the ME7838G accessory kit, or a microscope) before mating to the MA25400A module.

• SSMC Connectors
For the 3743A, MA25300A, and MA25400A Modules, the TEST and REF connectors are SSMC-type connectors. Best practices recommend using an Anritsu 01-529-R 4 mm (5/32") Torque End Wrench set to 0.17 N·m (1.5 lbf·in).
Alternatively, use a 4 mm (5/32") end wrench and carefully hand tighten to less than 0.17 N·m (1.5 lbf·in).

• Knurled-Head Thumbscrews on Module Mounting Brackets
In the as-shipped module bracket configuration, each module is held into its bracket by knurled head thumbscrews, with two (2) M3 × 8 mm on each side of the MA25300A and MA25400A modules and with three (3) M2 × 8 mm on each side of all other module models. Only use hand tightening for these screws. If the module is installed in a user-provided bracket, use hand tightening and make sure that between 5 and 6 mm of screw threads are engaged in the module body. Do not bottom out screws. Do not over torque.

Note
While the MA25300A and MA25400A use the same screw threads, the head is smaller for the MA25400A (and can be used with the MA25300A bracket).

• Millimeter-Wave Module Operating Environment
The following notes should be considered before operating the MA25300A, MA25400A, 3743A, 3744x-Ex, and 3744x-Rx Millimeter-Wave Modules:
The modules require use of heatsink with adequate air circulation. Thermal heat sinking similar to the supplied mounting brackets of the Millimeter-Wave Module should be considered in custom mounting applications.
Each MA25300A Module consumes a maximum of 12 watts.
Each MA25400A Module consumes a maximum of 12 watts.
Each 3743x Module consumes a maximum of 12 watts.
Each 3744x-EE and 3744x-EW Module consumes a maximum of 12 watts.
Each 3744x-Rx Module consumes a maximum of 7 watts.
The primary heat sinking path for the module is on the two external side surfaces used to mount to the support brackets.
With the attached cable mounting brackets, the case temperature rise is approximately 15 °C to 20 °C above ambient.

Note

Caution
To avoid connector damage or inaccurate measurements, before making any connections, ensure the connectors are clean, undamaged, and meet pin depth specification. Observe connector torque requirements where indicated in this guide.
2-3 Required Tools

- **Anritsu 01-201 8mm (5/16 in) Torque Wrench** or equivalent rated at 0.9 N·m (8 lbf·in) for SMA, K, and V connectors
- **Anritsu 01-204 8 mm (5/16 in) End Wrench**
- **Anritsu 01-504 6 mm Torque End Wrench** or equivalent rated at 0.45 N·m (4 lbf·in)
- **Anritsu 01-505 6 mm/7mm Open End Wrench**
- **Anritsu 01-524 Torque End Wrench** or equivalent rated at 0.45 N·m (4 lbf·in) for 0.8 mm connectors
- **Anritsu 01-525 6 mm/7mm Open End Wrench**
- **Anritsu 01-524 Torque End Wrench** or equivalent rated at 0.45 N·m (4 lbf·in) for 0.8 mm connectors
- **Anritsu 01-529-R 4 mm Torque Wrench** or equivalent rated at 0.17 N·m (1.5 lbf·in) for SSMC connectors
- **Anritsu 01-530-R Hex Drive Torque Wrench**
- **4 mm (5/32 in) End Wrench** for Millimeter-Wave Module SSMC connectors
- **Small flat-blade screwdriver**
- **Phillips screwdriver**

2-4 Unpacking the Instruments

A fully loaded MS4647A/B VNA unit weighs approximately 22 kg (50 pounds) and must be installed by at least two people.

If mounting on a workbench surface, first position the 3739B/C Broadband Test Set with access to its front and rear panels.

If mounting into rack or console, make sure the 3739B/C 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.

Unpack the various components and set aside in a clean static-free environment. Note that the Millimeter-Wave Modules come in separate shipping containers.
In this section, connect the **IF** flexible coaxial cables, the **External Analog** and **ALC** BNC cables, and the **External I/O** DB-25 cable between the MS464xA VNA and 3739B/C Test Set as shown below in Figure 2-1 and Table 2-1.

---

**Figure 2-1.** ME7838 Broadband/Millimeter-Wave VNA System – Rear Panel Cables (MS464xA VNA)

<table>
<thead>
<tr>
<th>Caution</th>
<th>After attaching the power cords to the VNA and the Test Set, <em>do not</em> yet plug the power cords into main AC power source.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caution</td>
<td>To avoid connector damage or inaccurate measurements, before making any connections, ensure the connectors are clean, undamaged, and meet pin depth specification. Observe connector torque requirements where indicated in this guide.</td>
</tr>
<tr>
<td>Part Number</td>
<td>Index</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------</td>
</tr>
<tr>
<td>MS464xA VNA</td>
<td>1</td>
</tr>
<tr>
<td>3739B/C Test Set</td>
<td>2</td>
</tr>
<tr>
<td>73598-1 a (5 cable bundle)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>3-806-225</td>
<td>4</td>
</tr>
<tr>
<td>3-806-225</td>
<td>5</td>
</tr>
<tr>
<td>3-806-225</td>
<td>6</td>
</tr>
<tr>
<td>GPIB Cable (Not supplied)</td>
<td>7</td>
</tr>
<tr>
<td>GPIB Cable (Not supplied)</td>
<td>8</td>
</tr>
<tr>
<td>Ethernet Cable (Not supplied)</td>
<td>9</td>
</tr>
<tr>
<td>USB Type B Cable (Not supplied)</td>
<td>10</td>
</tr>
<tr>
<td>–</td>
<td>11</td>
</tr>
<tr>
<td>–</td>
<td>12</td>
</tr>
</tbody>
</table>

a. Tighten each cable in this group using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf-in).
b. Tighten the connector screws with a flat blade screwdriver.
c. Do not yet connect to AC power cords to the AC source.
2-6 Rear Panel Connections – MS464xB VNA and Test Set

In this section, connect the IF flexible coaxial cables, the External Analog and ALC BNC cables, and the External I/O DB-25 cable between the MS464xB VNA and 3739B/C Test Set as shown in Figure 2-2 and Table 2-2.

---

**Figure 2-2.** ME7838 Broadband/Millimeter-Wave VNA System – Rear Panel Cables (MS464xB VNA)

**Caution**
After attaching the power cords to the VNA and the Test Set, do not yet plug the power cords into main AC power source.

**Caution**
To avoid connector damage or inaccurate measurements, before making any connections, ensure the connectors are clean, undamaged, and meet pin depth specification. Observe connector torque requirements where indicated in this guide.
### Table 2-2. ME7838 Cable Rear Panel Connections – MS464xB VNA

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Index</th>
<th>Description</th>
<th>From VNA Location</th>
<th>To 3739B/C Test Set Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS464xB VNA</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3739B/C Test Set</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>73598-1 a (5 cable bundle)</td>
<td>3</td>
<td>IF Interface Cables</td>
<td>a1 IF</td>
<td>a1 IF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b1 IF</td>
<td>b1 IF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a2 IF</td>
<td>a2 IF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b2 IF</td>
<td>b2 IF</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>External I/O Cableb</td>
<td>External I/O</td>
<td>External I/O</td>
</tr>
<tr>
<td>3-806-225</td>
<td>5</td>
<td>BNC (M-M) Cable</td>
<td>Ext Analog Out</td>
<td>Test Set EXT ANALOG IN</td>
</tr>
<tr>
<td>3-806-225</td>
<td>6</td>
<td>BNC (M-M) Cable</td>
<td>Ext In ALC 1 (without Option 031)</td>
<td>Test Set EXT ALC OUT</td>
</tr>
<tr>
<td>GPIB Cable (Not supplied)</td>
<td>7</td>
<td>Cable for programmatic control</td>
<td>IEEE 488.2 GPIB (for remote controlling ME7838)</td>
<td>NA</td>
</tr>
<tr>
<td>GPIB Cable (Not supplied)</td>
<td>8</td>
<td>Cable for programmatic control</td>
<td>Dedicated GPIB (For controlling peripherals such as Power Meter)</td>
<td>NA</td>
</tr>
<tr>
<td>Ethernet Cable (Not supplied)</td>
<td>9</td>
<td>Cable for programmatic control</td>
<td>Ethernet Port</td>
<td>NA</td>
</tr>
<tr>
<td>USB Type B Cable (Not supplied)</td>
<td>10</td>
<td>Cable for programmatic control</td>
<td>USB Port (2)</td>
<td>NA</td>
</tr>
<tr>
<td>–</td>
<td></td>
<td>AC Power Cordc</td>
<td>AC Power Input</td>
<td>NA</td>
</tr>
<tr>
<td>–</td>
<td></td>
<td>AC Power Cordc</td>
<td>NA</td>
<td>AC Power Input</td>
</tr>
<tr>
<td>–</td>
<td></td>
<td>Module Interface Cable Length Switch (Included with Option 3739C-003)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Tighten each cable in this group using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).
b. Tighten the connector screws with a flat blade screwdriver.
c. Do not yet connect to AC power cords to the AC source.
### 2-7 Optional - Rear Panel VNA GPIB Connection

If the VNA is to be controlled over a GPIB network by a PC or other GPIB controller, install the GPIB cable to the **IEEE 488.2 GPIB** rear panel connector. Figure 2-3 shows an MS464xA rear panel. This connection is the same on both the MS464xA and MS464xB VNA.

---

1. **VNA Rear Panel – IEEE 488.2 GPIB Port** – For operational control of VNA by external GPIB Controller.
2. **GPIB Connector and Cable** – To GPIB network and GPIB Controller.

**Figure 2-3.** Optional – MS764xA/B Rear Panel – IEEE 488.2 GPIB Port – Cable Connection
2-8  Front Panel Connections

Make the cable connections between the VNA and the Test Set and install the cable assemblies for Test Port 1 and Test Port 2 on the Test Set front panel as described in Figure 2-4 and in Table 2-3. The cable ends will be connected later to the Millimeter-Wave Modules or OML/VDI Modules.

Example MS464xA VNA equipped with Option 051, 061, or 062 with included Front Panel Loops

**Note:** The cables for Test Port 1 to Module SRC (key 8 to 9) and Test Port 2 to Module SRC (key 12 to 13) are not used with mm-Wave modules 3744x-EE, 3744x-EW, or 3744x-Rx.

**Figure 2-4.** Front Panel Cables between 3739B/C Test Set, MS464xA/B VNA, and Modules
### Table 2-3. ME7838 Cable Interconnect Part Numbers and Locations

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Index</th>
<th>Description</th>
<th>Connection From</th>
<th>Connection To</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS464xA/B</td>
<td>1</td>
<td>MS464xA or MS464xB VNA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>3739B/C</td>
<td>2</td>
<td>3739B or 3739C Test Set</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>67357-xx</td>
<td>3</td>
<td>Semi-Rigid (KM-KM) Cable</td>
<td>VNA RF</td>
<td>Test Set RF</td>
</tr>
<tr>
<td>(See Note 1)</td>
<td></td>
<td>• Tighten using an 8 mm (5/16 in) torque end</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>wrench set to 0.9 N·m (8 lbf·in).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67357-xx</td>
<td>4</td>
<td>Semi-Rigid (KM-KM) Cable</td>
<td>VNA LO1</td>
<td>Test Set LO1</td>
</tr>
<tr>
<td>(See Note 1)</td>
<td></td>
<td>• Tighten using an 8 mm (5/16 in) torque end</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>wrench set to 0.9 N·m (8 lbf·in).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67357-xx</td>
<td>5</td>
<td>Semi-Rigid (KM-KM) Cable</td>
<td>VNA LO2</td>
<td>Test Set LO2</td>
</tr>
<tr>
<td>(See Note 1)</td>
<td></td>
<td>• Tighten using an 8 mm (5/16 in) torque end</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>wrench set to 0.9 N·m (8 lbf·in).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75685-1 a</td>
<td>6-7,</td>
<td>mm-Wave Module Interface Cables (for all BB/mmW</td>
<td>Test Set</td>
<td>Module</td>
</tr>
<tr>
<td>75685-2 a</td>
<td>10-11</td>
<td>modules except 3744A/E-Rx) Group of 5 cables for</td>
<td>(Port 1, Port 2)</td>
<td>(Port 1, Port 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>each port</td>
<td>RF, LO, Test,</td>
<td>RF, LO, Test,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tighten at Test Set using an 8 mm (5/16 in)</td>
<td>Ref, Power/Signal</td>
<td>Ref, Power/Signal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>torque end wrench set to 0.9 N·m (8 lbf·in).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75685-3 a</td>
<td>8-9,</td>
<td>mm-Wave Module Interface Cables (for 3744A/E-Rx</td>
<td>Test Set</td>
<td>Module</td>
</tr>
<tr>
<td>806-xxx-R a,b</td>
<td>12-13</td>
<td>modules) Group of 3 cables</td>
<td>(Port 1, Port 2)</td>
<td>(Port 1, Port 2)</td>
</tr>
<tr>
<td>(See Note 2)</td>
<td></td>
<td>Tighten at Test Set using an 8 mm (5/16 in)</td>
<td>LO, Test,</td>
<td>RF Input, LO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>torque end wrench set to 0.9 N·m (8 lbf·in).</td>
<td>Power/Signal</td>
<td>Input, Meas. IF,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ref IF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Cable Selection Notes

**Note 1**

<table>
<thead>
<tr>
<th>Cable Selection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>67357-13</td>
<td>Standard (Non-Rack Mount)</td>
</tr>
<tr>
<td>67357-67</td>
<td>3739B/C-001 Rack Mount Option</td>
</tr>
</tbody>
</table>

**Note 2**

<table>
<thead>
<tr>
<th>Cable Selection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>806-206-R</td>
<td>24 in, 1.85 mm M-F coaxial cable</td>
</tr>
<tr>
<td>806-209-R</td>
<td>36 in, 1.85 mm M-F coaxial cable</td>
</tr>
<tr>
<td>806-396-R</td>
<td>36 in, 1.85 mm M-F phase stable coaxial cable</td>
</tr>
</tbody>
</table>

---

a. Do not yet connect the cable ends to the Millimeter-Wave modules. Module connection instructions follow this section.
b. The 806-xxx-R Coaxial Cables are not included or required when using the 3744A-EE, 3744A-EW, 3744E-EE, 3744E-EW mm-Wave modules, or the 3744Ax-Rx Receiver Module.
2-9 Millimeter-Wave Module Connections

Connect the 3739B/C Broadband Test Set cables to the modules as shown below, observing the correct torque limits for each connector. See Figure 2-5, Figure 2-6, and Table 2-5.

1. Remove the module from its heatsink bracket.
2. Install the cable assembly to the module and then reinstall the module in the bracket.
3. Route the cable assembly through the cable restraint.

Note

- It is easier to first connect the cables to the module and then mount the module in its bracket. Observe torque instructions where indicated.
- Each module (except the 3744A-Rx and 3744E-Rx) is characterized for absolute power for a specific VNA Serial Number and VNA Test Port as designated on the module port assignment label (see item 10 in Figure 2-5 - Port Designation). Ensure the module matches the correct VNA and Test Set port.
- If an alternative 3743 series mm-Wave module is used there will be approximately 1 dB of absolute power inaccuracy which can be corrected by performing a power calibration.
- For more detailed information on the modules including DUT Waveguide (WG) connection alignment and custom bracket mounting, refer to 10410-00311-VectorStar Broadband/Banded Millimeter-Wave Modules.

Figure 2-5. Millimeter-Wave Module Connections—374x Modules
**Figure 2-6.** Millimeter-Wave Module Connections—MA25300A and MA25400A modules

**Table 2-4.** Millimeter-Wave Module Connections

<table>
<thead>
<tr>
<th>Cable P/N</th>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>1</td>
<td>Millimeter-Wave Module in bracket</td>
</tr>
<tr>
<td><strong>DUT Connector</strong></td>
<td>2</td>
<td><strong>0.8 mm Connector (MA25300A module)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using a torque end wrench and a plain end wrench</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6 mm Torque End Wrench set to 0.45 N·m (4 lbf·in). Recommended is Anritsu 01-524.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6 mm / 7 mm Open End Wrench. Recommended is Anritsu 01-525.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>0.6 mm Flange Connector (MA25400A module)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using a hex torque wrench set to 6 cN·m (0.5 lbf-in). Recommended is Anritsu 01-530-R.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>W1 - 1 mm Connector (3743A, 3743E, 3744Ax-Rx modules)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using a torque end wrench and a plain end wrench</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6 mm Torque End Wrench set to 0.45 N·m (4 lbf·in). Recommended is Anritsu 01-504.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6 mm / 7 mm Open End Wrench. Recommended is Anritsu 01-505.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>WR-10 or WR-12 to 1 mm connector (3744A-EE, 3744A-EW, 3744E-EE, 3744E-EW)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use Waveguide Adapter Toolkits (74394-2, 74394-3, or 74394-4).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using a torque end wrench and a plain end wrench</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6 mm Torque End Wrench set to 0.45 N·m (4 lbf·in). Recommended is Anritsu 01-504.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6 mm / 7 mm Open End Wrench. Recommended is Anritsu 01-505.</td>
</tr>
</tbody>
</table>
Inverting the Module

If necessary, a module can be turned over in the bracket to change the height of the DUT connector. To turn the module over:

1. Remove the six Knurled Head M2 × 8 mm thumbscrews (four M3 x 8 mm on the MA25300A or MA25400A); note that screws with smaller thumbwheels are needed with the MA25400A.
2. Turn the module over.
3. Install the cable assembly.
4. Install into the bracket and then install the thumbscrews.

Table 2-4. Millimeter-Wave Module Connections

<table>
<thead>
<tr>
<th>Cable P/N</th>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>75685-1 a</td>
<td>3</td>
<td><strong>TEST - SSMC Connector (Connected on all Modules)</strong></td>
</tr>
<tr>
<td>or 75685-3 b,c</td>
<td></td>
<td>• Tighten using a 4 mm (5/32 in) torque end wrench set to less than 0.17 N·m (1.5 lbf·in).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommended is Anritsu 01-529-R torque wrench.</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td><strong>REF - SSMC Connector (Connected on all Modules except 3744A-Rx and 3744E-Rx)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using a 4 mm (5/32 in) torque end wrench set to less than 0.17 N·m (1.5 lbf·in).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommended is Anritsu 01-529-R torque wrench.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td><strong>Power/Signal Latching Bi-Lobe™ Connector (Connected on all modules)</strong></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td><strong>LO - K Connector (Connected on all Modules)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommended is Anritsu 01-201.</td>
</tr>
<tr>
<td>806-206-R d</td>
<td>7</td>
<td><strong>Module Power and I/O Cable Restraint</strong></td>
</tr>
<tr>
<td>or 806-209-R d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or 806-396-R d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75685-1 a</td>
<td>8</td>
<td><strong>SRC - V Connector (Connected on MA25300A, MA25400A, 3743A, and 3743E only)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommended is Anritsu 01-201.</td>
</tr>
<tr>
<td>75685-1 a</td>
<td>9</td>
<td><strong>RF - V Connector (Connected on all Modules except 3744A-Rx and 3744E-Rx)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommended is Anritsu 01-201.</td>
</tr>
<tr>
<td>N/A</td>
<td>10</td>
<td><strong>Factory Calibrated Port Assignment Label</strong></td>
</tr>
<tr>
<td>N/A</td>
<td>11</td>
<td><strong>Module Serial Number Label</strong></td>
</tr>
</tbody>
</table>

a. Cable assembly 75685-1 is used on MA25300A, MA25400A, 3743A, 3743E, 3744A-EE, 3744A-EW, 3744E-EW, and 3744E-EW modules.
b. The REF cable is not used in the 75685-3 cable assembly.
c. Cable assembly 75685-3 is used on 3744A-Rx and 3744E-Rx modules.
d. The 806-xxx-R Coaxial Cables are used only with the MA25300A, MA25400A, 3743A, and 3743E modules.
2-10  OML/VDI Module Connections

Connect the front panel cables between the 3739B or 3739C Test Set, and the OML or VDI frequency extension modules as shown in Figure 2-7, Figure 2-8, and Figure 2-9, and as described in Table 2-5, Table 2-6, and Table 2-7.

**Caution**  To avoid connector damage, observe torque requirements where indicated.

![Diagram of 3739B or 3739C Test Set with connections to OML or VDI modules]

**Figure 2-7.**  Cable Connections between VNA, 3739B or 3739C Test Set, and OML or VDI Frequency Extension Modules
<table>
<thead>
<tr>
<th>Part Number</th>
<th>Index</th>
<th>Description</th>
<th>Connection From</th>
<th>Connection To</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS464xA or MS464xB</td>
<td>1</td>
<td>MS464xA or MS464xB VNA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3739B or 3739C</td>
<td>2</td>
<td>3739B or 3739C Test Set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67357-xx (See Note 1)</td>
<td>3</td>
<td>Semi-Rigid (KM-KM) Cable</td>
<td>VNA RF</td>
<td>Test Set RF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommended is Anritsu 01-201.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67357-xx (See Note 1)</td>
<td>4</td>
<td>Semi-Rigid (KM-KM) Cable</td>
<td>VNA LO1</td>
<td>Test Set LO1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommended is Anritsu 01-201.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67357-xx (See Note 1)</td>
<td>5</td>
<td>Semi-Rigid (KM-KM) Cable</td>
<td>VNA LO2</td>
<td>Test Set LO2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommended is Anritsu 01-201.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75685-2</td>
<td>6-7,</td>
<td>OML Module Interface Cables</td>
<td>Test Set</td>
<td>OML Module</td>
</tr>
<tr>
<td></td>
<td>8-9</td>
<td>Group of 4 cables for each port</td>
<td>(Port 1, Port 2)</td>
<td>(Port 1, Port 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ref</td>
<td>Ref IF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF</td>
<td>RF Input</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LO</td>
<td>LO Input</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test</td>
<td>Test IF</td>
<td></td>
</tr>
<tr>
<td>75685-2</td>
<td>6-7,</td>
<td>VDI Module Interface Cables</td>
<td>Test Set</td>
<td>VDI Module</td>
</tr>
<tr>
<td></td>
<td>8-9</td>
<td>Group of 4 cables for each port</td>
<td>(Port 1, Port 2)</td>
<td>(Port 1, Port 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF</td>
<td>RF Input</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ref</td>
<td>Ref. IF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test</td>
<td>Meas. IF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LO</td>
<td>LO Input</td>
<td></td>
</tr>
</tbody>
</table>

### Cable Selection Notes

<table>
<thead>
<tr>
<th>Note 1</th>
<th>Cable Selection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>67357-13</td>
<td>Standard (Non-Rack Mount)</td>
</tr>
<tr>
<td></td>
<td>67357-67</td>
<td>3739B/C-001 Rack Mount Option</td>
</tr>
</tbody>
</table>
### Table 2-6. OML Module Connections

<table>
<thead>
<tr>
<th>Cable P/N</th>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>1</td>
<td>OML Module</td>
</tr>
</tbody>
</table>
| 75685-2   | 2     | **Ref IF** - SMA Connector  
|           |       | • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).  
|           |       | • Recommended is Anritsu 01-201. |
|           | 3     | **RF Input** - SMA Connector  
|           |       | • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).  
|           |       | • Recommended is Anritsu 01-201. |
|           | 4     | **LO Input** - SMA Connector  
|           |       | • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).  
|           |       | • Recommended is Anritsu 01-201. |
|           | 5     | **Test IF** - SMA Connector  
|           |       | • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).  
|           |       | • Recommended is Anritsu 01-201. |
| N/A       | 6     | OML Module Power Supply |

---

**Figure 2-8.** VNA/Test Set Cable Connections to OML Modules
Figure 2-9. VNA/Test Set Cable Connections to VDI Modules

Table 2-7. VDI Module Connections

<table>
<thead>
<tr>
<th>Cable P/N</th>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>1</td>
<td>VDI Module</td>
</tr>
</tbody>
</table>
|           | 2     | RF Input - K (2.92 mm) Connector  
|           |       | • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).  
|           |       | • Recommended is Anritsu 01-201. |
| 75685-2   | 3     | Ref. IF - SMA Connector  
|           |       | • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).  
|           |       | • Recommended is Anritsu 01-201. |
|           | 4     | Meas. IF - SMA Connector  
|           |       | • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).  
|           |       | • Recommended is Anritsu 01-201. |
|           | 5     | LO Input- K (2.92 mm) Connector  
|           |       | • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).  
|           |       | • Recommended is Anritsu 01-201. |
|           | 6     | VDI Module Power Supply |

a. The VDI module connectors may differ slightly than on the illustration shown above. For example, depending on the model and date built, the power supply connector may be round instead of rectangular.
Chapter 3 — ME7838A Initial System Checkout

3-1 Introduction

This chapter provides the general initial system checkout for a completely assembled ME7838A Broadband/Banded Millimeter-Wave System. Since the ME7838A supports both the MS464xA and MS464xB Series VNAs, this chapter has an initial system checkout section for each VNA series:

• Section 3-4 “MS464xA VNA Broadband/Banded Configuration” on page 3-2
• Section 3-5 “MS464xB VNA Broadband/Banded Configuration” on page 3-10

Once this procedure is complete, the system is ready for full calibration and system performance verification.

3-2 Power Up Procedure

Use this procedure to power up the MS464xA/B VNA and the 3739B or 3739C Broadband Test Set. There are no AC power connections required for the Millimeter-Wave Modules.

1. At the 3739B/C Broadband Test Set Rear Panel, connect the AC Line Cord to AC main power.
2. At the VNA Rear Panel, connect the AC Line Cord to the AC main power.
   • Power requirements are 90 to 264 VAC, 47 to 63 Hz, power factor controlled.
3. Make sure a USB or PS2 mouse is connected to the VNA.
4. At the Test Set front panel press the left side AC Power Button. The green Power LED should light.
5. At the VNA Rear Panel, turn the AC Power Rocker Switch to “|” or ON.
   • The front panel Standby/Operate key illuminates with an orange Standby LED.
   • The VNA is in Standby mode.
6. Press and hold the Standby/Operate key for at least one (1) second.
   • The front panel Standby/Operate key illuminates with a green Operate LED.
   • The VNA is in Operate mode.

3-3 VNA Preset Procedure

1. If the VNA is configured to preset to the factory as-shipped default configuration:
   a. Press the VNA front panel Preset button.
      The VNA resets to the factory-default configuration,
   b. Continue with the next applicable section.
2. If the VNA has been configured to a user-defined preset:
   a. Use the right side menus to navigate to the PRESET SETUP menu.
      Utilities | System | Setup | Preset Setup
   b. Select the Default button, and then click the Preset icon on the icon toolbar.
      The VNA resets to the factory-default configuration.
   c. Continue with the next applicable section.
### 3-4 MS464xA VNA Broadband/Banded Configuration

#### Receiver Configuration for Broadband

Configure the VNA for Modular Broadband Operation by performing the following steps:

1. Make sure the MS4647A VNA and the 3739B/C Broadband Test Set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. At the MAIN menu, select Application. The APPLICATION menu appears.
4. MAIN | Application | APPLICATION
5. Select the BB/mmWave (3739 Test Set) button in the Receiver Configuration area.

The Standard, Multiple Source, and BB/mmWave (3738 Test Set) buttons are deselected.

![Broadband Configuration Selection (MS464xA Systems)](image-url)
3739 Setup for Broadband

Configure the VectorStar VNA for Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. Navigate to the Application menu and select:
   Application | BB/mmWave (3739 Setup) | Broadband to 125 GHz

---

![Image of VectorStar Application menu and 3739 Setup for Broadband Module](image_url)

**Figure 3-2.** 3739 Setup for Broadband Module (MS464xA Systems)
Frequency Setup

1. Navigate to the FREQUENCY menu.
   - MAIN | Frequency | FREQUENCY

2. At the FREQUENCY menu, set the following frequency parameters:
   - Start Frequency = 70.000000000 kHz
   - Stop Frequency = 125.000000000 GHz
   - # of Points = 201

3. The following frequency parameters are automatically set:
   - Center Frequency = 62.500035000 GHz
   - Span Frequency = 124.99930000 GHz
   - Step Size = 624.999650 MHz

4. The system should now be sweeping fully from 70 kHz to 125 GHz.

![Frequency Menu](image)

**Figure 3-3.** FREQUENCY Menu – Settings for 70 kHz to 125 GHz Sweep
Receiver Configuration for Multiple Source

Configure the VectorStar VNA for Multiple Source Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. From the Application menu select Multiple Source Setup.
4. If not already done, from the Multiple Source menu, toggle Multiple Source to ON.
5. Select Ext. Mod. Ctrl.
6. On the External Module Ctrl dialog, select 125 GHz.

Figure 3-4. Receiver Configuration for Multiple Source (MS464xA Systems)
Configure the VectorStar VNA for BB/mmWave Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. From the Application menu select BB/mmWave (3739 Setup).
4. Select E-Band or W-Band depending on your 3744A module.

**Figure 3-5. 3739 Setup for Banded Modules (MS464xA Systems)**
3739 Setup for OML/VDI Selection

Configure the VectorStar VNA for OML or VDI operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. Navigate to the Application menu and select:
   BB/mmWave (3739 Setup) | mm-OML (or mm-VDI)

![Figure 3-6. 3739 Setup for OML/VDI Selection (MS464xA Systems)]
OML Band Selection

Configure the VectorStar VNA for OML operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. Navigate to Application | BB/mmWave (3739 Setup).
   
   The 3739 Setup menu opens (Figure 3-7).
4. The External Module option is initially disabled. Select mm-OML; this will enable the External Module option. The applicable OML module band can then be selected from External Module and applied.
5. Select External Module option.
6. In the External Module Selection dialog box, select the applicable OML Module band and click Apply.

![External Module Selection dialog box](image)

Figure 3-7. 3739 Setup Menu – OML Selection (MS464xA Systems)
VDI Band Selection

Configure the VectorStar VNA for OML operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. Navigate to Application | BB/mmWave (3739 Setup).
   The 3739 Setup menu opens (Figure 3-8).
4. The External Module option is initially disabled. Select mm-VDI; this will enable the External Module option. The applicable VDI module band can then be selected from External Module and applied.
5. Select External Module option.
6. In the External Module Selection dialog box, select the applicable VDI Module band and click Apply.

Figure 3-8. 3739 Setup Menu – VDI Band Selection (MS464xA Systems)
3-5 MS464xB VNA Broadband/Banded Configuration

Configure the VNA for Modular Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.

Receiver Configuration for Broadband

1. At the MAIN menu, select Application. The APPLICATION menu appears as shown in Figure 3-9.
2. Select the Rcvr Config Button to open the Rcvr Config menu.
3. Select the BB/mmWave (3739 Test Set) button.

The Receiver Config button on the Application menu now shows 3739 Test Set is selected.

![APPLICATION Menu – Receiver Configuration to 3739 Test Set (MS464xB Systems)](image-url)
3739 Setup for Broadband

Configure the VectorStar VNA for Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. Navigate:
   
   Main | Application | Rcvr Config

4. Select the BB/mmWave (3739 Setup) button to open the 3739 SETUP menu.
5. Select Broadband to 125 GHz as shown in Figure 3-10

---

**Figure 3-10.** 3739 Setup for Broadband Modules (MS464xB Systems)
Frequency Setup

1. Navigate to the FREQUENCY menu.
   - MAIN | Frequency | FREQUENCY

2. At the FREQUENCY menu, set the following frequency parameters:
   - Start Frequency = \(70.000000000\) kHz
   - Stop Frequency = \(125.000000000\) GHz
   - # of Points = 201

3. The following frequency parameters are automatically set:
   - Center Frequency = \(62.500035000\) GHz
   - Span Frequency = \(124.999930000\) GHz
   - Step Size = \(624.999650\) MHz

4. The system should now be sweeping fully from 70 kHz to 125 GHz.

---

Figure 3-11. FREQUENCY Menu – Settings for 70 kHz to 125 GHz Sweep
Receiver Configuration for Multiple Source

Configure the VectorStar VNA for Multiple Source Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. Navigate: Main | Application | Rcvr Config | (See Figure 3-12).
4. From the Rcvr Config menu select the Multiple Source button, then in the Rcvr Setup area, select Multiple Source to open that menu.
5. From the Multiple Source menu select External Module Ctrl to open the dialog box.
6. Select Broadband to 125 GHz.

![Figure 3-12. Receiver Configuration for Multiple Source (MS464xB Menu)](image)
3739 Setup for Banded Modules

Configure the VectorStar VNA for Banded Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. Navigate: Application | Rcvr Config | BB/mmWave (3739 Setup)
4. From the 3739 Setup menu, select NLTL Module Bands.
5. From the NLTL Module menu, E-Band or W-Band (for 3744A-EE/EW modules).

Figure 3-13. 3739 Setup for Banded Modules (MS464xB Systems)
3739 Setup for OML/VDI Selection

Configure the VectorStar VNA for OML or VDI operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 3-3 “VNA Preset Procedure” on page 3-1.
3. Navigate to the Application menu and select:
   Rcvr Config | BB/mmWave (3739 Setup) | mmWave WG Bands | mm-OML (or mm-VDI)

---

**Figure 3-14.** 3739 Setup for OML/VDI Selection (MS464xB Systems)
OML Band Selection

1. At the MAIN menu, select Application. The APPLICATION menu appears.
   
   MAIN | Application | APPLICATION

2. From the Application menu select:
   
   Rcvr Config | BB/mmWave (3739 Setup) | External Module

3. Select the applicable OML module type and band and click Apply.

---

**Figure 3-15.** 3739 Setup Menu – OML Band Selection (MS464xB Systems)
VDI Band Selection

1. At the MAIN menu, select Application. The APPLICATION menu appears.
   
   MAIN | Application | APPLICATION

2. From the Application menu select:
   
   Rcvr Setup | BB/mmWave (3739 Setup) | External Module

3. Select the applicable VDI module type and band and click Apply.

---

Figure 3-16. 3739 Setup Menu – VDI Band Selection (MS464xB Systems)
3-6 ME7838A Configuration Verification – BB/mmW Modules

Preliminary

1. Ensure system is sweeping from 70 kHz to 125 GHz, with:
   • Trace 1 set to S11
   • Trace 2 set to S12
   • Trace 3 set to S21
   • Trace 4 set to S22

Configure Trace 1

2. Select Trace 1 and then select DISPLAY | Trace Format, and set to Log Mag.
3. Select the USER-DEFINED menu.
   • MAIN | Response | REPONSE | User-defined | USER-DEFINED
4. On the USER-DEFINED menu, set the parameters as:
   • Numerator = A1
   • Denominator = 1
   • Driver Port = 1
5. Using a mouse, move the Reference Line to one graticule below top scale.
   • Trace label changes to Tr1 [A1/1|P1] LogM

Configure Trace 2

6. Select Trace 2 and then select DISPLAY | Trace Format, and set to Log Mag.
7. Select the USER-DEFINED menu.
   • MAIN | Response | REPONSE | User-defined | USER-DEFINED
8. On the USER-DEFINED menu, set the parameters as:
   • Numerator = B1
   • Denominator = 1
   • Driver Port = 1
9. Using a mouse, move the Reference Line to one graticule below top scale.
   • The trace label changes to Tr2 [B1/1|P1] LogM

Configure Trace 3

10. Select Trace 3 and then select DISPLAY | Trace Format, and set to Log Mag.
11. Select the USER-DEFINED menu.
    • MAIN | Response | REPONSE | User-defined | USER-DEFINED
12. On the USER-DEFINED menu, set the parameters as:
    • Numerator = A2
    • Denominator = 1
    • Driver Port = 2
13. Using a mouse, move the Reference Line to one graticule below top scale.
    • The trace label changes to Tr3 [A2/1|P2] LogM

Note
This verification procedure applies when using 3743A broadband modules.
Configure Trace 4

14. Select Trace 4 and then select DISPLAY | Trace Format, and set to Log Mag.

15. Select the USER-DEFINED menu.
   - MAIN | Response | REPONSE | User-defined | USER-DEFINED

16. On the USER-DEFINED menu, set the parameters as:
   - Numerator = B2
   - Denominator = 1
   - Driver Port = 2

17. Using a mouse, move the Reference Line to one graticule below top scale.
   - The trace label changes to Tr4 [B2/1|P2] LogM.

Set Power

18. Navigate to the POWER menu:
   - MAIN | Power | POWER

19. Set the Port 1 Power to –10 dBm.
   - If Port Power = Coupled, this also sets Port 2 Power to –10 dBm.

20. If Port Power = Not Coupled, set the Port 2 Power to –10 dBm.

21. Connect shorts to both W1 connectors on the 3743A Modules, and ensure the resultant display looks similar to Figure 3-17 below.

Figure 3-17. Typical VNA Four-Trace Display of Non-Ratioed Parameters for Initial Checkout
VNA Power Down

1. With the VNA in operate mode, the front panel Standby/Operate button is illuminated with a green LED.
2. Press and hold the Standby/Operate button for at least one (1) second. The orange Standby LED is illuminated with an orange LED. The VNA is in Standby mode.
3. To completely shut down the VNA, at the rear panel, set the AC Power Rocker Switch in the AC Power Input Module to “O” or OFF.
4. If required, disconnect the VNA Power Cord from the AC Mains.

Test Set Power Down

5. At the Test Set front panel, press the AC Power Button. The green Power LED goes out.
6. If required, disconnect the Test Set rear panel AC Power Cord from the AC main power source.
Chapter 4 — ME7838D Initial System Checkout

4-1 Introduction

This chapter provides the general initial system checkout for a completely assembled ME7838D Broadband/Banded Millimeter-Wave System. Since the ME7838D supports both the MS464xA and MS464xB Series VNAs, this chapter has an initial system checkout section for each VNA series:

- Section 4-4 “MS464xA VNA Broadband/Banded Configuration” on page 4-2
- Section 4-5 “MS464xB VNA Broadband/Banded Configuration” on page 4-10

Once this procedure is complete, the system is ready for full calibration and system performance verification.

4-2 Power Up Procedure

Use this procedure to power up the MS464xA/B VNA and the 3739B or 3739C Broadband Test Set. There are no AC power connections required for the Millimeter-Wave Modules.

1. At the 3739B or 3739C Broadband Test Set Rear Panel, connect the AC Line Cord to AC main power.

2. At the VNA Rear Panel, connect the AC Line Cord to the AC main power.
   - Power requirements are 90 to 264 VAC, 47 to 63 Hz, power factor controlled.

3. Make sure a USB or PS2 mouse is connected to the VNA.

4. At the Test Set front panel press the left side AC Power Button. The green Power LED should light.

5. At the VNA Rear Panel, turn the AC Power Rocker Switch to “|” or ON.
   - The front panel Standby/Operate key illuminates with an orange Standby LED.
   - The VNA is in Standby mode.

6. Press and hold the Standby/Operate key for at least one (1) second.
   - The front panel Standby/Operate key illuminates with a green Operate LED.
   - The VNA is in Operate mode.

4-3 VNA Preset Procedure

1. If the VNA is configured to preset to the factory as-shipped default configuration:
   a. Press the VNA front panel Preset button.
      - The VNA resets to the factory-default configuration,
   b. Continue with the next applicable section.

2. If the VNA has been configured to a user-defined preset:
   a. Use the right side menus to navigate to the PRESET SETUP menu.
      Utilities | System | Setup | Preset Setup
   b. Select the Default button, and then click the Preset icon on the icon toolbar.
      - The VNA resets to the factory-default configuration.
   c. Continue with the next applicable section.
4-4 MS464xA VNA Broadband/Banded Configuration

Receiver Configuration for Broadband

Configure the VNA for Modular Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. At the MAIN menu, select Application. The APPLICATION menu appears.
4. Select the BB/mmWave (3739 Test Set) button.

---

Figure 4-1. Broadband Configuration Selection (MS464xA Systems)
3739 Setup for Broadband

Configure the VectorStar VNA for Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. Navigate to the Application menu and select:
   BB/mmWave (3739 Setup) | Broadband to 145 GHz

Figure 4-2. 3739 Setup for Broadband Module (MS464xA Systems)
Frequency Setup

1. Navigate to the FREQUENCY menu.
   - MAIN | Frequency | FREQUENCY

2. At the FREQUENCY menu, set the following frequency parameters:
   - Start Frequency = 70.000000000 kHz
   - Stop Frequency = 145.000000000 GHz
   - # of Points = 201

3. The following frequency parameters are automatically set:
   - Center Frequency = 72.500000000 GHz
   - Span Frequency = 144.999300000 GHz
   - Step Size = 769.99650000 MHz

4. The system should now be sweeping fully from 70 kHz to 145 GHz.

![Frequency Menu](image)

Figure 4-3. FREQUENCY Menu – Settings for 70 kHz to 145 GHz Sweep (MS464xA Systems)
Receiver Configuration for Multiple Source

Configure the VectorStar VNA for Multiple Source Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. From the Application menu select Multiple Source Setup.
4. If not already done, from the Multiple Source menu, toggle Multiple Source to ON.
5. Select Ext. Mod. Ctrl.

![Diagram](image)

Figure 4-4. Receiver Configuration for Multiple Source (MS464xA Systems)
3739 Setup for Banded Modules

Configure the VectorStar VNA for BB/mmWave Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. From the Application menu select BB/mmWave (3739 Setup).
4. Select E-Band or W-Band depending on your 3744A module.

---

**Figure 4-5.** 3739 Setup for Banded Modules (MS464xA Systems)
3739 Setup for OML/VDI Selection

Configure the VectorStar VNA for OML or VDI operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. Navigate to the Application menu and select:

   BB/mmWave (3739 Setup) | mm-OML (or mm-VDI)

---

**Figure 4-6.** 3739 Setup for OML/VDI Selection (MS464xA Systems)
OML Band Selection

Configure the VectorStar VNA for OML operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. Navigate to the Application menu and select BB/mmWave (3739 Setup).

   The 3739 Setup menu opens (Figure 4-7).

4. The External Module option is initially disabled. Select mm-OML; this will enable the External Module option. The applicable OML module band can then be selected from External Module and applied.
5. Select External Module option.

   In the External Module Selection dialog box, select the applicable OML Module band and click Apply.

---

Figure 4-7. 3739 Setup Menu – OML Selection (MS464xA Systems)
VDI Band Selection

Configure the VectorStar VNA for OML operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. Navigate to the Application menu and select BB/mmWave (3739 Setup).

   The 3739 Setup menu opens (Figure 4-8).
4. The External Module option is initially disabled. Select mm-VDI; this will enable the External Module option. The applicable VDI module band can then be selected from External Module and applied.
5. Select External Module option.
6. In the External Module Selection dialog box, select the applicable VDI Module band and click Apply.
4-5 MS464xB VNA Broadband/Banded Configuration

Configure the VNA for Modular Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.

Receiver Configuration for Broadband

3. At the MAIN menu, select Application. The APPLICATION menu appears as shown in Figure 4-9 on page 4-10.

4. Select the BB/mmWave (3739 Test Set) button in the Receiver Config menu.

The Standard, Multiple Source, and BB/mmWave (3738 Test Set) buttons are deselected.
The Receiver Config button on the Application menu now shows 3739 Test Set is selected.

Figure 4-9. APPLICATION Menu – Receiver Configuration to 3739 Test Set (MS464xB Systems)
3739 Setup for Broadband

Configure the VectorStar VNA for Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. Navigate:
   - Main | Application | Rcvr Config
4. Select the BB/mmWave (3739 Setup) button to open the 3739 SETUP menu.
5. Select Broadband to 145 GHz as shown in Figure 4-10.

---

**Figure 4-10.** 3739 Setup for Broadband Modules (MS464xB Systems)
Frequency Setup

1. Navigate to the FREQUENCY menu.
   - MAIN | Frequency | FREQUENCY
2. At the FREQUENCY menu, set the following frequency parameters:
   - Start Frequency = 70.000000000 kHz
   - Stop Frequency = 145.000000000 GHz
   - # of Points = 201
3. The following frequency parameters are automatically set:
   - Center Frequency = 72.499965000 GHz
   - Span Frequency = 144.999930000 GHz
   - Step Size = 721.392686 MHz
4. The system should now be sweeping fully from 70 kHz to 145 GHz.

---

**Figure 4-11.** FREQUENCY Menu – Settings for 70 kHz to 145 GHz Sweep (MS464xB Systems)
Receiver Configuration for Multiple Source

Configure the VectorStar VNA for Multiple Source Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. Navigate: Main | Application | Rcvr Config | (See Figure 4-12).
4. From the Rcvr Config menu select the Multiple Source button, then in the Rcvr Setup area, select Multiple Source to open that menu.
5. From the Multiple Source menu select External Module Ctrl to open the dialog box.
6. Select Broadband to 145 GHz.

![Figure 4-12. Receiver Configuration for Multiple Source (MS464xB Systems)]
3739 Setup for Banded Modules

Configure the VectorStar VNA for Banded Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. Navigate: Application | Rcvr Config | BB/mmWave (3739 Setup)
4. From the 3739 Setup menu, select NLTL Module Bands | E-Band or W-Band (for 3743A-EE/EW modules).

![Figure 4-13. 3739 Setup for Banded Modules (MS464xB Systems)]
3739 Setup for OML/VDI Selection
Configure the VectorStar VNA for OML or VDI operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 4-3 “VNA Preset Procedure” on page 4-1.
3. Navigate to the Application menu and select:
   Rcvr Config | BB/mmWave (3739 Setup) | mmWave WG Bands | mm-OML (or mm-VDI)

Figure 4-14. 3739 Setup for OML/VDI Selection (MS464xB Systems)
OML Band Selection

1. At the MAIN menu, select Application. The APPLICATION menu appears.

   MAIN | Application | APPLICATION

2. From the Application menu select:

   Rcvr Config | BB/mmWave (3739 Setup) | External Module

3. Select the applicable OML module type and band and click Apply.

---

Figure 4-15. 3739 Setup Menu – OML Band Selection (MS464xB Systems)
VDI Band Selection

1. At the MAIN menu, select Application. The APPLICATION menu appears.

   MAIN | Application | APPLICATION

2. From the Application menu select:

   Rcvr Config | BB/mmWave (3739 Setup) | External Module

3. Select the applicable VDI module type and band and click Apply.

---

Figure 4-16. 3739 Setup Menu – VDI Band Selection (MS464xB Systems)
4-6 ME7838D Configuration Verification – BB/mmW Modules

Preliminary

1. Ensure system is sweeping from 70 kHz to 145 GHz, with:
   • Trace 1 set to S11
   • Trace 2 set to S12
   • Trace 3 set to S21
   • Trace 4 set to S22

Configure Trace 1

2. Select Trace 1 and then select DISPLAY | Trace Format, and set to Log Mag.
3. Select the USER-DEFINED menu.
   • MAIN | Response | REPONSE | User-defined | USER-DEFINED
4. On the USER-DEFINED menu, set the parameters as:
   • Numerator = A1
   • Denominator = 1
   • Driver Port = 1
5. Using a mouse, move the Reference Line to one graticule below top scale.
   • Trace label changes to Tr1 [A1/1|P1] LogM

Configure Trace 2

6. Select Trace 2 and then select DISPLAY | Trace Format, and set to Log Mag.
7. Select the USER-DEFINED menu.
   • MAIN | Response | REPONSE | User-defined | USER-DEFINED
8. On the USER-DEFINED menu, set the parameters as:
   • Numerator = B1
   • Denominator = 1
   • Driver Port = 1
9. Using a mouse, move the Reference Line to one graticule below top scale.
   • The trace label changes to Tr2 [B1/1|P1] LogM

Configure Trace 3

10. Select Trace 3 and then select DISPLAY | Trace Format, and set to Log Mag.
11. Select the USER-DEFINED menu.
    • MAIN | Response | REPONSE | User-defined | USER-DEFINED
12. On the USER-DEFINED menu, set the parameters as:
    • Numerator = A2
    • Denominator = 1
    • Driver Port = 2
13. Using a mouse, move the Reference Line to one graticule below top scale.
    • The trace label changes to Tr3 [A2/1|P2] LogM

Note
This verification procedure applies when using MA25300A broadband modules.
Configure Trace 4

14. Select Trace 4 and then select DISPLAY | Trace Format, and set to Log Mag.

15. Select the USER-DEFINED menu.
   - MAIN | Response | REPONSE | User-defined | USER-DEFINED

16. On the USER-DEFINED menu, set the parameters as:
   - Numerator = B2
   - Denominator = 1
   - Driver Port = 2

17. Using a mouse, move the Reference Line to one graticule below top scale.
   - The trace label changes to Tr4 [B2/1|P2] LogM.

Set Power

18. Navigate to the POWER menu:
   - MAIN | Power | POWER

19. Set the Port 1 Power to –10 dBm.
   - If Port Power = Coupled, this also sets Port 2 Power to –10 dBm.

20. If Port Power = Not Coupled, set the Port 2 Power to –10 dBm.

21. Connect shorts to both 0.8 mm connectors on the MA25300A Modules, and ensure the resultant display looks similar to Figure 4-17 below.

![Typical VNA Four-Trace Display of Non-Ratioed Parameters for Initial Checkout](image-url)
VNA Power Down

1. With the VNA in operate mode, the front panel **Standby/Operate** button is illuminated with a green LED.

2. Press and hold the **Standby/Operate** button for at least one (1) second. The orange **Standby LED** is illuminated with an orange LED. The VNA is in Standby mode.

3. To completely shut down the VNA, at the rear panel, set the **AC Power Rocker Switch** in the AC Power Input Module to “O” or OFF.

4. If required, disconnect the VNA Power Cord from the AC Mains.

Test Set Power Down

5. At the Test Set front panel, press the **AC Power Button**. The green **Power LED** goes out.

6. If required, disconnect the Test Set rear panel AC Power Cord from the AC main power source.
Chapter 5 — ME7838G Initial System Checkout

5-1 Introduction

This chapter provides the general initial system checkout for a completely assembled ME7838G Broadband/Banded Millimeter-Wave System. Once this procedure is complete, the system is ready for full calibration and system performance verification.

5-2 Power Up Procedure

Use this procedure to power up the MS464xB VNA and the 3739C Broadband Test Set. There are no AC power connections required for the Millimeter-Wave Modules.

1. At the 3739C Broadband Test Set Rear Panel, connect the **AC Line Cord** to AC main power.

2. At the VNA Rear Panel, connect the **AC Line Cord** to the AC main power.
   - Power requirements are 90 to 264 VAC, 47 to 63 Hz, power factor controlled.

3. Make sure a USB or PS2 **mouse** is connected to the VNA.

4. At the Test Set front panel press the left side **AC Power Button**. The green **Power LED** should light.

5. At the VNA Rear Panel, turn the **AC Power Rocker Switch** to “|” or **ON**.
   - The front panel **Standby/Operate** key illuminates with an orange Standby LED.
   - The VNA is in Standby mode.

6. Press and hold the **Standby/Operate** key for at least one (1) second.
   - The front panel Standby/Operate key illuminates with a green Operate LED.
   - The VNA is in Operate mode.

5-3 VNA Preset Procedure

1. If the VNA is configured to preset to the factory as-shipped default configuration:
   a. Press the VNA front panel **Preset** button.
      - The VNA resets to the factory-default configuration,
   b. Continue with the next applicable section.

2. If the VNA has been configured to a user-defined preset:
   a. Use the right side menus to navigate to the **PRESET SETUP** menu.
      - Utilities | System | Setup | Preset Setup
   b. Select the **Default** button, and then click the **Preset** icon on the icon toolbar.
      - The VNA resets to the factory-default configuration.
   c. Continue with the next applicable section.
5-4 MS464xB VNA Broadband/Banded Configuration

Configure the VNA for Modular Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 5-3 “VNA Preset Procedure” on page 5-1.

Receiver Configuration for Broadband

3. At the MAIN menu, select Application. The APPLICATION menu appears as shown in Figure 5-1 on page 5-2.

   MAIN | Application | APPLICATION

4. Select the BB/mmWave (3739 Test Set) button in the Receiver Config menu.
   The Standard, Multiple Source, and BB/mmWave (3738 Test Set) buttons are deselected.
   The Receiver Config button on the Application menu now shows 3739 Test Set is selected.

![Application Menu – Receiver Configuration to 3739 Test Set (MS464xB Systems)](image)

Figure 5-1. APPLICATION Menu – Receiver Configuration to 3739 Test Set (MS464xB Systems)
3739 Setup for Broadband

Configure the VectorStar VNA for Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 5-3 “VNA Preset Procedure” on page 5-1.
3. Navigate:
   Main | Application | Rcvr Config
4. Select the BB/mmWave (3739 Setup) button to open the 3739 SETUP menu.
5. Select Broadband to 220 GHz as shown in Figure 5-2.

![Diagram of VectorStar VNA setup for Broadband](image)
Frequency Setup

1. Navigate to the FREQUENCY menu.
   - MAIN | Frequency | FREQUENCY

2. At the FREQUENCY menu, set the following frequency parameters:
   - Start Frequency = 70.000000000 kHz
   - Stop Frequency = 220.000000000 GHz
   - # of Points = 201

3. The following frequency parameters are automatically set:
   - Center Frequency = 110.000035 GHz
   - Span Frequency = 219.99993 GHz
   - Step Size = 1.099999650 GHz

4. The system should now be sweeping fully from 70 kHz to 220 GHz.

Figure 5-3. FREQUENCY Menu – Settings for 70 kHz to 220 GHz Sweep (MS464xB Systems)
Receiver Configuration for Multiple Source

Configure the VectorStar VNA for Multiple Source Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 5-3 “VNA Preset Procedure” on page 5-1.
3. Navigate: Main | Application | Rcvr Config | (See Figure 5-4).
4. From the Rcvr Config menu select the Multiple Source button, then in the Rcvr Setup area, select Multiple Source to open that menu.
5. From the Multiple Source menu select External Module Ctrl to open the dialog box.
6. Select Broadband to 220 GHz.

![Figure 5-4. Receiver Configuration for Multiple Source (MS464xB Systems)](image-url)
3739 Setup for Banded Modules

Configure the VectorStar VNA for Banded Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 5-3 “VNA Preset Procedure” on page 5-1.
3. Navigate: Application | Rcvr Config | BB/mmWave (3739 Setup)
4. From the 3739 Setup menu, select NLTL Module Bands | E-Band or W-Band (for 3743A-EE/EW modules).

**Figure 5-5.** 3739 Setup for Banded Modules (MS464xB Systems)
3739 Setup for OML/VDI Selection

Configure the VectorStar VNA for OML or VDI operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 5-3 “VNA Preset Procedure” on page 5-1.
3. Navigate to the Application menu and select:

   Rcvr Config | BB/mmWave (3739 Setup) | mmWave WG Bands | mm-OML (or mm-VDI)

---

**Figure 5-6.** 3739 Setup for OML/VDI Selection (MS464xB Systems)
OML Band Selection

1. At the MAIN menu, select Application. The APPLICATION menu appears.
   MAIN | Application | APPLICATION
2. From the Application menu select:
   Rcvr Config | BB/mmWave (3739 Setup) | External Module
3. Select the applicable OML module type and band and click Apply.

Figure 5-7. 3739 Setup Menu – OML Band Selection (MS464xB Systems)
VDI Band Selection

1. At the MAIN menu, select Application. The APPLICATION menu appears.
   
   MAIN | Application | APPLICATION

2. From the Application menu select:
   
   Rcvr Config | BB/mmWave (3739 Setup) | External Module

3. Select the applicable VDI module type and band and click Apply.

---

**Figure 5-8.** 3739 Setup Menu – VDI Band Selection (MS464xB Systems)
5-5 ME7838G Configuration Verification – BB/mmW Modules

Preliminary

1. Ensure system is sweeping from 70 kHz to 220 GHz, with:
   - Trace 1 set to S11
   - Trace 2 set to S12
   - Trace 3 set to S21
   - Trace 4 set to S22

Configure Trace 1

2. Select Trace 1 and then select DISPLAY | Trace Format, and set to Log Mag.
3. Select the USER-DEFINED menu.
   - MAIN | Response | RESPONSE | User-defined | USER-DEFINED
4. On the USER-DEFINED menu, set the parameters as:
   - Numerator = A1
   - Denominator = 1
   - Driver Port = 1
5. Using a mouse, move the Reference Line to one graticule below top scale.
   - Trace label changes to Tr1 [A1/1|P1] LogM

Configure Trace 2

6. Select Trace 2 and then select DISPLAY | Trace Format, and set to Log Mag.
7. Select the USER-DEFINED menu.
   - MAIN | Response | RESPONSE | User-defined | USER-DEFINED
8. On the USER-DEFINED menu, set the parameters as:
   - Numerator = B2
   - Denominator = 1
   - Driver Port = 1
9. Using a mouse, move the Reference Line to one graticule below top scale.
   - The trace label changes to Tr2 [B2/1|P1] LogM

Configure Trace 3

10. Select Trace 3 and then select DISPLAY | Trace Format, and set to Log Mag.
11. Select the USER-DEFINED menu.
    - MAIN | Response | RESPONSE | User-defined | USER-DEFINED
12. On the USER-DEFINED menu, set the parameters as:
    - Numerator = A2
    - Denominator = 1
    - Driver Port = 2
13. Using a mouse, move the Reference Line to one graticule below top scale.
    - The trace label changes to Tr3 [A2/1|P2] LogM

Note
This verification procedure applies when using MA25400A broadband modules.
Configure Trace 4

14. Select Trace 4 and then select DISPLAY | Trace Format, and set to Log Mag.

15. Select the USER-DEFINED menu.
   - MAIN | Response | RESPONSE | User-defined | USER-DEFINED

16. On the USER-DEFINED menu, set the parameters as:
   - Numerator = B1
   - Denominator = 1
   - Driver Port = 2

17. Using a mouse, move the Reference Line to one graticule below top scale.
   - The trace label changes to Tr4 [B1/1|P2] LogM.

Set Power

18. Navigate to the POWER menu:
   - MAIN | Power | POWER

19. Set the Port 1 Power to –20 dBm.
   - If Port Power = Coupled, this also sets Port 2 Power to –20 dBm.

20. If Port Power = Not Coupled, set the Port 2 Power to –20 dBm.

21. Connect the 33GG50 thru line between the MA25400A Modules, and ensure the resultant display looks similar to Figure 5-9. Variances in the absolute levels of up to 10 dB from those in the picture are normal.

---

Figure 5-9. Typical VNA Four-Trace Display of Non-Ratioed Parameters for Initial Checkout
VNA Power Down

1. With the VNA in operate mode, the front panel Standby/Operate button is illuminated with a green LED.
2. Press and hold the Standby/Operate button for at least one (1) second. The orange Standby LED is illuminated with an orange LED. The VNA is in Standby mode.
3. To completely shut down the VNA, at the rear panel, set the AC Power Rocker Switch in the AC Power Input Module to “O” or OFF.
4. If required, disconnect the VNA Power Cord from the AC Mains.

Test Set Power Down

5. At the Test Set front panel, press the AC Power Button. The green Power LED goes out.
6. If required, disconnect the Test Set rear panel AC Power Cord from the AC main power source.
Chapter 6 — ME7838E Initial System Checkout

6-1 Introduction

This chapter provides the general initial system checkout for a completely assembled ME7838E Broadband/Banded Millimeter-Wave System. Once this procedure is complete, the system is ready for full calibration and system performance verification.

6-2 Power Up Procedure

Use this procedure to power up the MS464xB VNA and the 3739B or 3739C Broadband Test Set. There are no AC power connections required for the Millimeter-Wave Modules.

1. At the 3739B or 3739C Broadband Test Set Rear Panel, connect the AC Line Cord to AC main power.
2. At the VNA Rear Panel, connect the AC Line Cord to the AC main power.
   • Power requirements are 90 to 264 VAC, 47 to 63 Hz, power factor controlled.
3. Make sure a USB or PS2 mouse is connected to the VNA.
4. At the Test Set front panel press the left side AC Power Button. The green Power LED should light.
5. At the VNA Rear Panel, turn the AC Power Rocker Switch to “|” or ON.
   • The front panel Standby/Operate key illuminates with an orange Standby LED.
   • The VNA is in Standby mode.
6. Press and hold the Standby/Operate key for at least one (1) second.
   • The front panel Standby/Operate key illuminates with a green Operate LED.
   • The VNA is in Operate mode.

6-3 VNA Preset Procedure

1. If the VNA is configured to preset to the factory as-shipped default configuration:
   a. Press the VNA front panel Preset button.
      The VNA resets to the factory-default configuration,
   b. Continue with the next applicable section.
2. If the VNA has been configured to a user-defined preset:
   a. Use the right side menus to navigate to the PRESET SETUP menu.
      Utilities | System | Setup | Preset Setup
   b. Select the Default button, and then click the Preset icon on the icon toolbar.
      The VNA resets to the factory-default configuration.
   c. Continue with the next applicable section.
6-4 MS464xB VNA Broadband/Banded Configuration

Configure the VNA for Modular Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 6-3 “VNA Preset Procedure” on page 6-1

**Receiver Configuration for Broadband**

3. At the MAIN menu, select Application. The APPLICATION menu appears as shown in Figure 6-1 on page 6-2.

4. Select the BB/mmWave (3739 Test Set) button in the Rcvr Config menu.
   - The Standard, Multiple Source, and BB/mmWave (3738 Test Set) buttons are deselected.
   - The Receiver Config button on the Application menu now shows 3739 Test Set is selected.

---

**Figure 6-1.** APPLICATION Menu – Receiver Configuration to 3739 Test Set
3739 Setup for Broadband

Configure the VectorStar VNA for Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 6-3 “VNA Preset Procedure” on page 6-1.
3. Navigate:
   Main | Application | Rcvr Config
4. Select the BB/mmWave (3739 Setup) button to open the 3739 SETUP menu.
5. Select Broadband to 110 GHz as shown in Figure 6-2.

Figure 6-2. 3739 Setup for Broadband Modules
Frequency Setup

6. Navigate to the FREQUENCY menu.
   - MAIN | Frequency | FREQUENCY

7. At the FREQUENCY menu, set the following frequency parameters:
   - Start Frequency = 70.000000000 kHz
   - Stop Frequency = 110.000000000 GHz
   - # of Points = 201

8. The following frequency parameters are automatically set:
   - Center Frequency = 55.000000000 GHz
   - Span Frequency = 109.999930000 GHz
   - Step Size = 549.999650000 MHz

9. The system should now be sweeping fully from 70 kHz to 110 GHz.
Receiver Configuration for Multiple Source

Configure the VectorStar VNA for Multiple Source Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 6-3 “VNA Preset Procedure” on page 6-1.
3. From the Application menu select Rcvr Setup (Figure 6-4).
4. From the Rcvr Setup menu select Multiple Source.
5. If not already done, from the Multiple Source menu, toggle Multiple Source to ON.
6. From the Multiple Source menu select External Module Ctrl.
7. On the External Module Ctrl dialog, select Broadband to 110 GHz.

Figure 6-4. Receiver Configuration for Multiple Source
3739 Setup for Banded Modules

Configure the VectorStar VNA for Banded Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 6-3 “VNA Preset Procedure” on page 6-1.
3. Navigate: Application | Rcvr Config | BB/mmWave (3739 Setup)
4. From the 3739 Setup menu, select NLTL Module Bands | E-Band or W-Band (for 3743E-EE/EW modules).

Figure 6-5. 3739 Setup for Banded Modules
3739 Setup for OML/VDI Modules

Configure the VectorStar VNA for OML or VDI operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform Section 6-3 “VNA Preset Procedure” on page 6-1.
3. Navigate to the Application menu and select:
   Rcvr Config | BB/mmWave (3739 Setup) | mmWave WG Bands | mm-OML (or mm-VDI)

Figure 6-6. 3739 Setup for OML/VDI Modules
OML Band Selection

1. At the MAIN menu, select Application. The APPLICATION menu appears.
   
   MAIN | Application | APPLICATION

2. From the Application menu select:
   
   Rcvr Config | BB/mmWave (3739 Setup) | External Module

3. Select the applicable OML module type and band and click Apply.

Figure 6-7. 3739 Setup Menu – OML Selection
VDI Band Selection

1. At the MAIN menu, select Application. The APPLICATION menu appears.

   MAIN | Application | APPLICATION

2. From the Application menu select:

   Rcvr Config | BB/mmWave (3739 Setup) | External Module

3. Select the applicable VDI module type and band and click Apply.

Figure 6-8. 3739 Setup Menu – VDI Selection
6-5 ME7838E Configuration Verification – BB/mmW Modules

Preliminary

1. Ensure system is sweeping from 70 kHz to 110 GHz, with:
   • Trace 1 set to S11
   • Trace 2 set to S12
   • Trace 3 set to S21
   • Trace 4 set to S22

Configure Trace 1

2. Select Trace 1 and then select DISPLAY | Trace Format, and set to Log Mag.
3. Select the USER-DEFINED menu.
   • MAIN | Response | REPONSE | User-defined | USER-DEFINED
4. On the USER-DEFINED menu, set the parameters as:
   • Numerator = A1
   • Denominator = 1
   • Driver Port = 1
5. Using a mouse, move the Reference Line to one graticule below top scale.
   • Trace label changes to Tr1 [A1/1|P1] LogM

Configure Trace 2

6. Select Trace 2 and then select DISPLAY | Trace Format, and set to Log Mag.
7. Select the USER-DEFINED menu.
   • MAIN | Response | REPONSE | User-defined | USER-DEFINED
8. On the USER-DEFINED menu, set the parameters as:
   • Numerator = B1
   • Denominator = 1
   • Driver Port = 1
9. Using a mouse, move the Reference Line to one graticule below top scale.
   • The trace label changes to Tr2 [B1/1|P1] LogM

Configure Trace 3

10. Select Trace 3 and then select DISPLAY | Trace Format, and set to Log Mag.
11. Select the USER-DEFINED menu.
    • MAIN | Response | REPONSE | User-defined | USER-DEFINED
12. On the USER-DEFINED menu, set the parameters as:
    • Numerator = A2
    • Denominator = 1
    • Driver Port = 2
13. Using a mouse, move the Reference Line to one graticule below top scale.
    • The trace label changes to Tr3 [A2/1|P2] LogM

Note: This verification procedure applies when using 3743E broadband modules.
Configure Trace 4

14. Select Trace 4 and then select DISPLAY | Trace Format, and set to Log Mag.

15. Select the USER-DEFINED menu.
   - MAIN | Response | REPONSE | User-defined | USER-DEFINED

16. On the USER-DEFINED menu, set the parameters as:
   - Numerator = B2
   - Denominator = 1
   - Driver Port = 2

17. Using a mouse, move the Reference Line to one graticule below top scale.
   - The trace label changes to Tr4 [B2/1|P2] LogM.

Set Power

18. Navigate to the POWER menu:
   - MAIN | Power | POWER

19. Set the Port 1 Power to –10 dBm.
   - If Port Power = Coupled, this also sets Port 2 Power to –10 dBm.

20. If Port Power = Not Coupled, set the Port 2 Power to –10 dBm.

21. Connect shorts to both W1 connectors on the 3743E Modules, and ensure the resultant display looks similar to Figure 6-9 below.

---

**Figure 6-9.** Typical VNA Four-Trace Display of Non-Ratioed Parameters for Initial Checkout
VNA Power Down

1. With the VNA in operate mode, the front panel Standby/Operate button is illuminated with a green LED.

2. Press and hold the Standby/Operate button for at least one (1) second. The orange Standby LED is illuminated with an orange LED. The VNA is in Standby mode.

3. To completely shut down the VNA, at the rear panel, set the AC Power Rocker Switch in the AC Power Input Module to “O” or OFF.

4. If required, disconnect the VNA Power Cord from the AC Mains.

Test Set Power Down

5. At the Test Set front panel, press the AC Power Button. The green Power LED goes out.

6. If required, disconnect the Test Set rear panel AC Power Cord from the AC main power source.
Appendix A — ME7838 Series Specifications

A-1 ME7838 2-Port Broadband/Banded VNA System Specifications

- VectorStar ME7838A Broadband/Millimeter-Wave VNA System Technical Data Sheet – 11410-00593
- VectorStar ME7838D Broadband/Millimeter-Wave VNA System Technical Data Sheet – 11410-00778
- VectorStar ME7838E Broadband/Millimeter-Wave VNA System Technical Data Sheet – 11410-00767
- VectorStar ME7838G Broadband/Millimeter-Wave VNA System Technical Data Sheet – 11410-01060
- VectorStar MS464xA Series VNA Technical Data Sheet – 11410-00432
- VectorStar MS464xB Series VNA Technical Data Sheet – 11410-00611
- VectorStar Broadband/Banded Millimeter-Wave Modules Reference Manual – 10410-00311
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01-524 ................................. 2-1
01-529-R ............................... 2-2
01-530-R ............................... 2-2
Anritsu utilizes recycled paper and environmentally conscious inks and toner.

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