

Instructions



VMUPG Option Upgrades VM700T, VM700A VMTB, or VM700A VMTX Video Measurement Set

075-0294-07

Warning

The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

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Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

Do Not Service Alone. Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect Power. To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

Use Care When Servicing With Power On. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

Kit Description

This kit includes instructions for VMUPG software and hardware upgrades. Only those parts needed to install the options are provided in this kit. Parts are also provided to preserve EMI suppression.

VMUPG Software Option Upgrades

These instructions are for adding any one or a combination of the following firmware option upgrades to the VM700T Video Measurement Set or the VM700A Video Measurement Set with the VMTB or VMTX Turbo upgrade installed. See page 8 for firmware option installation instructions.

These instructions support Tektronix modification M89159, for firmware upgrade to archive number 000815.

- VMUPG 1G 2T Echo and Rounding of Black and White Measurements
- VMUPG 3B Dual Standard (Option 01 NTSC and Option 11 PAL)
- VMUPG 20 Teletext Measurements
- VMUPG 21 Camera Measurements
- VMUPG 22 Video Wander Measurements
- VMUPG 30 Component Measurements
- VMUPG 42 Audio/Video Timing Measurements
(requires either Option 40 or Option 41)

Products. The VMUPG firmware option upgrades can be installed in the following products:

VM700T

VM700A with VMTB or VMTX installed

VMUPG Hardware Option Upgrades

These instructions are for adding any one or a combination of the following hardware option upgrades to the VM700T Video Measurement Set or the VM700A Video Measurement Set with the VMTB or VMTX Turbo upgrade installed.

**VMUPG 1S-
Option 1S Serial Digital
Interface**

This kit includes: SDI and an SDI Interface Panel circuit board with installation instructions and a short verification procedure. In addition, one SIMM is replaced on the Acquisition (A18) circuit board and one Boot ROM is replaced on the CPU board. See page 15 for installation instructions.

Products. The VMUPG 1S upgrade can be installed in the following products.

VM700T SN B020100 and Above

**VMUPG 2S-
Option 1S Serial Digital
Interface**

This kit includes: SDI, SDI Interface Panel and Acquisition (A18) circuit boards with installation instructions and a short verification procedure. See page 22 for installation instructions.

Products. The VMUPG 2S upgrade can be installed in the following products.

VM700T SN B019999 and Below

VM700A with VMTB or VMTX installed

**VMUPG 40-
Option 40 Audio
Measurements**

This kit includes: Audio Analog (A13) and Audio Processor (A12) circuit boards and the installation instructions with a short verification procedure. In addition, two mini-XLR connectors are provided to allow the user to adapt existing cabling to the connection method used for Option 40. Refer to the *VM700T Option 40/41/42 User Manual*, provided with this kit, for connector pin assignments. See page 36 for installation instructions.

Products. The VMUPG 40 upgrade can be installed in the following products.

VM700T

VM700A with VMTB or VMTX

**VMUPG 41-
Option 41 Six-Input Audio**

This kit includes: Six-Input Audio Analog (A17) and Audio Processor (A12) circuit boards. A 37-pin connector is provided to allow you to adapt existing cabling to the connection method used for Option 41. Refer to the *VM700T Option 40/41/42 User Manual*, provided with this kit, for connector pin assignments and installation instructions for the connector and ferrite EMI core. See page 39 installation instructions.

Products. The VMUPG 41 upgrade can be installed in the following products.

VM700T

VM700A with VMTB or VMTX

**VMUPG 48-
Option 48 GPIB Interface**

This kit includes a GPIB circuit board. See page 42 for installation instructions.

Products. The VMUPG 48 option upgrade can be installed in the following products.

VM700T
VM700A with VMTB or VMTX

**VMUPG 3D-
Option 40 to Option 41
Conversion**

This kit includes a 6-Input Selector circuit board to convert an installed Audio Option 40 with two input channels to Audio Option 41 operation with six input channels. These instructions provide the installation instructions and a short verification procedure. See page 44 for installation instructions.

A 37-pin connector is provided to allow you to adapt existing cabling to the connection method used for Option 41. Refer to the *VM700T Option 40/41/42 User Manual*, provided with this kit, for connector pin assignments and installation instructions for the connector and ferrite EMI core.

Products. The VMUPG 3D option upgrade can be installed in the following products.

VM700T Option 40
VM700A with VMTB or VMTX with Option 40

Installation Instructions

This section provides information on how to install software and hardware options to the VM700T Video Measurement Set or the VM700A Video Measurement Set with the VMTB or VMTX Turbo upgrade installed. This section covers the following topics:

- Installing firmware option upgrades page 8
- Installing hardware option upgrades:
 - VMUPG 1S page 15
 - VMUPG 2S page 22
 - VMUPG 40 page 36
 - VMUPG 41 page 39
 - VMUPG 48 page 42
 - VMUPG 3D page 44
- Installing the new option key page 47
- Verifying installation page 50

Firmware Option Upgrades

NOTE. *The option hardware must be installed first for those options to be checked in the Installation Verification procedure by the power-on diagnostics.*

This field-installable VMUPG Options Firmware upgrade kit adds the measurement capabilities of any options ordered as part of this installation, and upgrades the firmware to the most current version in compatible VM700T instruments. A user manual is included for any added option.

Kit Parts List

The following parts list is for the VMUPG firmware option upgrades.

Circuit/figure number	Quantity	Part number	Description
	1 EA	075-0294-07	INSTRUCTIONS: KIT OPTION UPGRADES; VMUPG
	1 EA	063-2913-04	FLOPPY DISK SET; DRIVER, VM700T SINGLE IMAGE
	1 EA	334-9282-XX	MARKER, IDENT REAR PANEL OPTION LABEL, 3.50 X 0.50, 0.10 POLY
	1 EA	-----	DATA SHEET; SOFTWARE KEY INFORMATION
			OPTION USER MANUALS
	1 EA	070-9648-XX*	MANUAL, TECH:USER, VM700T OPT 01 NTSC MEASUREMENTS (FOR OPTION 3B)
	1 EA	070-9649-XX*	MANUAL, TECH:USER, VM700T OPT 11 PAL MEASUREMENTS (FOR OPTION 3B)
	1 EA	070-9651-XX*	MANUAL, TECH:USER, VM700T OPT 1G 2T ECHO AND ROUNDING OF BLACK AND WHITE MEASUREMENTS
	1 EA	070-9652-XX*	MANUAL, TECH:USER, VM700T OPT 20 TELETEXT MEASUREMENTS
	1 EA	070-9900-XX*	MANUAL, TECH:USER, VM700T OPT 21 CAMERA MEASUREMENTS
	1 EA	071-0038-XX*	MANUAL, TECH:USER, VM700T OPT 22 VIDEO WANDER MEASUREMENTS
	1 EA	070-9654-XX*	MANUAL, TECH:USER, VM700T OPT 30 COMPONENT MEASUREMENTS
	1 EA	070-9656-XX*	MANUAL, TECH:USER, VM700T OPT 40/41/42 AUDIO OPTIONS

* Supplied with the ordered option.

NOTE. *The Laplink (174-3800-XX) is an optional accessory and not supplied with the kit. The Laplink must be ordered separately.*

When you receive your upgrade kit(s) for your VM700T, VM700A VMTB or VM700A VMTX Video Measurement set you will receive only one option key. The new option key is a unique alpha-numeric number that is used to activate the authorized options for a specific measurement set. It is based on the currently installed options plus the new option(s) being added or deleted for the upgrade. Previously installed option firmware is upgraded to the latest version compatible with the VM700T Video Measurement Set.

Continue with these instructions if you are installing one or more of the firmware only options that do not require additional hardware to be installed. If you are installing any of the hardware options (Option 1S, Option 40, Option 41, Option 48, or Option 3D) as part of this upgrade, follow the instructions provided with those option upgrade kits.

These instructions are for personnel familiar with the VM700T Video Measurement Set. For further assistance call your nearest Tektronix, Inc., Service Center or Tektronix Factory Service.

Install the Firmware Upgrade

The firmware upgrade is performed using the floppy disks supplied with this kit. The installation program on the floppy disks copies the firmware-upgrade software to your PC. You will upgrade your measurement set using the installed software on your PC hard drive. Complete instructions for performing the firmware upgrade are included in the installation program.

The minimum PC hardware and operating system requirements for performing the firmware upgrade are listed below:

Hardware requirements	Operating system requirements ¹
12 MB of free disk space on hard drive	MS/DOS (5.0 or later), Windows 3.1, or Windows 95/98
386 microprocessor or better	
3.5 in. floppy disk drive	
LapLink parallel cable (Tektronix part number 174-3800-00)	

¹ **The installation program will not run under Windows NT.**

Load the Firmware Upgrade Software

To load the firmware-upgrade software on your PC, perform the following procedure:

1. Insert the provided Program Disk into a floppy disk drive on your PC.

NOTE. *The installation program defaults to an installation source of drive A: and a destination of drive C:. You will be prompted by the installation program to verify or change the source and destination drives as required by your system.*

2. Install the upgrade software using one of the following command lines:
 - From Windows 3.1 or MS/DOS
run INSTALL.BAT
 - From Windows 95/98
run INSTALL.95
3. Follow the screen prompts to complete the loading of the software for the firmware upgrade.

Upgrade Your Measurement Set

Once you have installed the firmware-upgrade software on your PC, you can upgrade multiple VM700T or Turbo VM700A measurement sets without having to reload the floppy disks. To upgrade the firmware of a VM700T or Turbo VM700A measurement set from your PC, perform the following procedure:



CAUTION. To avoid loading incorrect firmware into your measurement set, be sure to use the correct firmware-image archive number for the instrument firmware you want to install. If you have installed multiple firmware images, you will have more than one firmware-image directory. If you load the wrong firmware, repeat the firmware upgrade using the correct firmware version.

The firmware-upgrade installation program creates a directory under the VM_UPGRD directory using the current firmware-image archive number loaded on the floppy disk set. The firmware-image number is based on a date using a format of year, month, and day. In most situations, you will want to load the latest version of the firmware into your measurement set.

NOTE. Do not perform this upgrade if your firmware image number is 030930 or higher.

1. If your firmware image number is lower than 030930, change the working directory on your PC to the following firmware-image directory:

`<destination drive>\VM_UPGRD\F_<archive number>`

For example, if you load the firmware-upgrade software to a destination drive of C:\ and your firmware archive number is 000815, then your command-line directory should look like the following:

`C:\VM_UPGRD\F_000815`

2. Connect the LapLink cable between the PC and the measurement set.

NOTE. To perform the firmware upgrade on multiple measurement sets, you will need to run the BURN.BAT program on each individual instrument.

3. Windows 3.1 or MS/DOS only. To perform the firmware upgrade, run BURN.BAT and follow the prompts.
4. Windows 95/98 only. To perform the firmware upgrade, run BURN.BAT from Windows Explorer and follow the prompts.

After Installing the Firmware. After installing the firmware upgrades go to *Install the New Option Key* refer to page 47.

Hardware Option Upgrades



CAUTION. *To prevent static discharge damage, service the measurement set only at an antistatic work station. Observe standard handling precautions for static-sensitive devices while installing this kit. Always wear a grounded wrist strap, grounded foot strap, and static resistant apparel while installing this kit.*

These instructions are for personnel familiar with servicing. If you need further details for disassembling or reassembling the measurement set, refer to the product service manual. For further assistance call your nearest Tektronix, Inc., Service Center or Tektronix Factory Service.

Tools Required

The following tools are required to install the option upgrades.

- Pozidriv screwdriver, P2
- Torx screwdriver, T20
- Soldering iron, 15W or less, fine tip or SMD soldering iron

Instrument Preparation

The following information prepares your instrument for hardware option upgrades.



WARNING. *Dangerous shock hazards may be exposed when the measurement set covers are removed. Before proceeding, ensure that both power switches are in the off position (see Figures 1 and 2), and then disconnect the measurement set from the power source.*

NOTE. *The following instructions are for general reference. Check your option upgrade section for specific cover panel removal instructions.*

Cover Panels. The four cover panels are positioned with slotted corner extrusions and fastened with screws to the instrument rear panel. Removing each cover panel requires removing its fastening screws on the rear panel and sliding the panel toward the rear of the instrument and out of the grooves in the chassis frame. Replacing each cover panel is the reverse of the removal procedure.

1. Remove the screws from the edge of the cover panels. See Figure 1.

NOTE. If the measurement set is rackmounted, note that the left and right side cover panels with slide tracks are not interchangeable. Mark the left and right sides for easier identification when reinstalling the rackmounted cabinet side panels.

2. Remove the cover panels by sliding them carefully to the rear of the measurement set and out of the chassis grooves as shown in Figure 1.
3. Set the cover panels aside.

Circuit Board Retainer Bar. Remove the Vertical bar on the left side of the measurement set.

4. Remove the circuit board retainer bar from the left side of the measurement set.

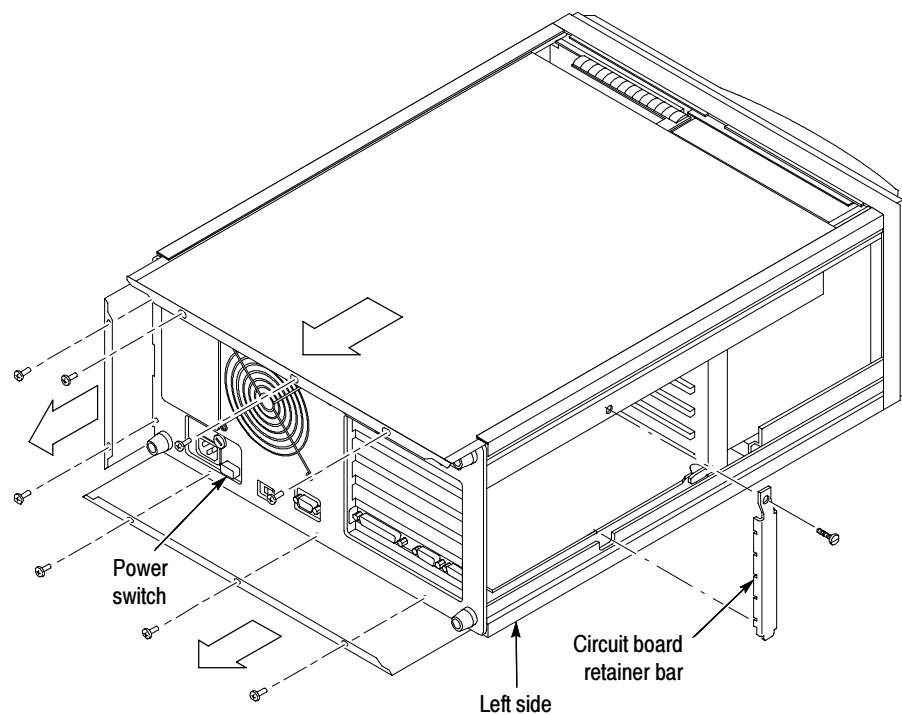


Figure 1: Cover panels and circuit board retainer bar removal

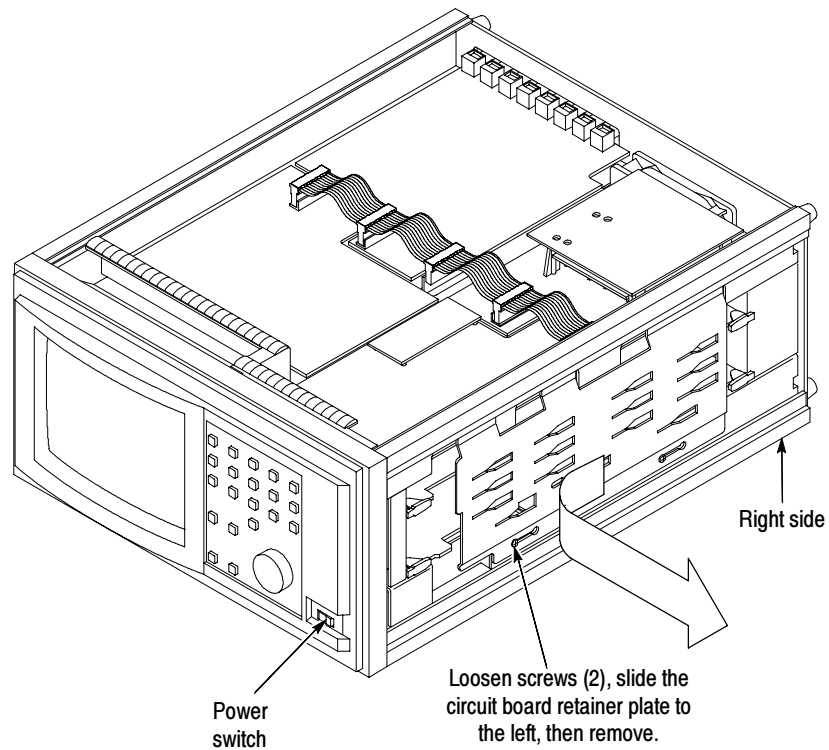


Figure 2: Right card cage retainer plate removal

Circuit Board Retainer Plate. Remove the circuit board retainer plate from the right side of the measurement set.

1. Position the measurement set so that you face the right side. (See Figure 1.)
2. Loosen (but do not remove) two screws on the front of the circuit board retainer plate as shown in Figure 2.
3. Remove the circuit board retainer plate by sliding it to the left until the screw heads clear the slots.
4. Set the circuit board retainer plate aside.

VMUPG 1S Upgrade

The VMUPG 1S upgrade contains instructions for the EMI and SDI installations.

Kit Parts List

The following parts list is for the VMUPG 1S Upgrade.

Circuit/figure number	Quantity	Part number	Description ¹
-----	1 EA	407-4585-00	BRACKET:EMI,0.062 THK,RIGHT SIDE FRT,ETCH&CLEAR CHROMATE;VM700T
-----	1 EA	119-5870-00	FILTER:EMI FAN,.050 AL,5052-H3X,4.7 X 4.7;VM700T
A22	1 EA	671-4136-02	CIRCUIT BD ASSY:SDI
A23	1 EA	672-1504-00	CIRCUIT BD ASSY:REAR PANEL INTERFACE
-----	1 EA	156-7874-00	IC,MEMORY:CMOS,SRAM;MODULE,1024K X 32,MODULE,15NS;EDI8F321 014B15MNC,SIMM 72
A5U14	1 EA	163-0782-02	IC,MEMORY:CMOS,EPROM;256K X 16,150NS BOOT ROM
-----	1 EA	337-4169-00	SHLD GSKT:ELE FINGER CLIP-ON,0.5L X 0.38W,BECU;VM700A
-----	1 EA	003-1757-00	EXTRACTION TOOL:CHIP CARRIER
-----	1 EA	174-3779-00	CA ASSY:SP,ELEC,AQ/CONTROLLER; 34, 32 AWG,2.6 L,RIBBON
-----	1 EA	004-2173-00	SHIPPING BOX: 20.0 X 12.0 X 3.5 W/CONVOLUTED FOAM,S/W
-----	1 EA	-----	STICKER (for changed Acquisition board)
-----	1 EA	071-0074-XX	MANUAL,TECH:USER MANUAL

¹ The installation program will not run under Windows NT.

Check List The following check list is for the VMUPG 1S Upgrade.

Table 1: Check list for VMUPG 1S upgrade

Installation		VM700T SN B030100 and above	VM700T SN B020100 - B029999
EMI	EMI right side bracket	-	X
	EMI fan filter	-	X
	Clip on I/O (A20) board	X	X
SDI	SDI (A23) Interface Panel	X	X
	SDI (A22) circuit board	X	X
	SIMM on Acquisition (A18) board	X	X
	Unsolder R32 from Acquisition (A18) board ¹	-	X
	Sticker on Acquisition (A18) board ¹	X	X
	Cable between SDI and Acquisition board	X	X
	Boot ROM (U14) on CPU (A5) board	X	X

¹ All ready installed on some boards.

VMUPG 1S - EMI

The VMUPG 1S - EMI installation instructions are provided below for specific measurement sets.

NOTE. The installation of EMI parts are required to maintain the VM700T measurement set EMC specification to CISPR 22B.

VM700T SN B030100 and Above. Your measurement set does not need an EMI installation. Continue to *VMUPG 1S - SDI* on page 17.

VM700T SN B020100 - B029999. Your measurement set needs three EMI parts installed:

- Right EMI bracket (refer to page 23)
- Clip on the I/O (A5) circuit board (refer to page 24)
- EMI fan filter (refer to page 33)

Then continue to the *VMUPG 1S - SDI* on page 17.

VMUPG 1S - SDI

The VMUPG 1S Upgrade consists of installing an SDI (A23) Interface Panel and circuit board, unsoldering a resistor, and placing a SIMM (Single In-Line Memory Module) on the existing Acquisition (A18) circuit board. A Boot ROM (U14) is installed on the CPU (A5) board.

SDI Panel. Install the SDI (A23) Interface Panel and position the SDI cables.

1. Remove and discard the blank panel from the measurement set rear panel.
2. Remove the right-side cover panel. Refer to *Cover Panels* on page 12.
3. Position the SDI (A23) Interface Panel at the rear of the measurement set. Slide all four cables through the second hole from the bottom on the rear panel as shown in Figure 3.

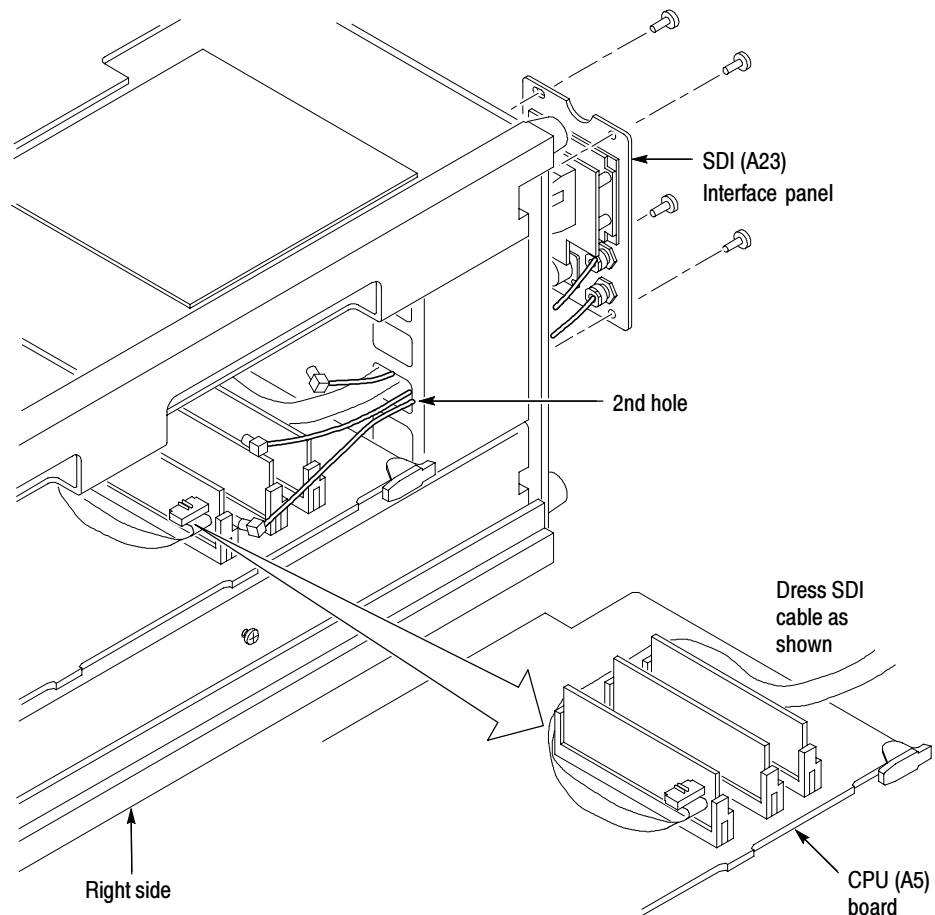


Figure 3: SDI panel and cable positioning

4. Slide the CPU (A5) circuit board halfway out of the measurement set.

5. Lay the SDI multicolored ribbon cable on the CPU (A5) circuit board as shown in Figure 3.
6. Reinstall the CPU (A5) circuit board.
7. Attach the SDI (A23) Interface Panel to the rear panel.

SDI Circuit Board. Install the SDI (A22) circuit board in the right side of the measurement set.

1. Position the measurement set so that you face the right side (see Figure 4).
2. Slide the SDI (A22) circuit board into the second slot from the top of the card cage, align the interboard connector pins, and press firmly to seat the board connector.
3. Plug in three coaxial cables into holder (J7, J8, J10) and one multicolored ribbon cable into holder (J5) as shown in Figure 4. Note the color and position of the three coaxial cables.

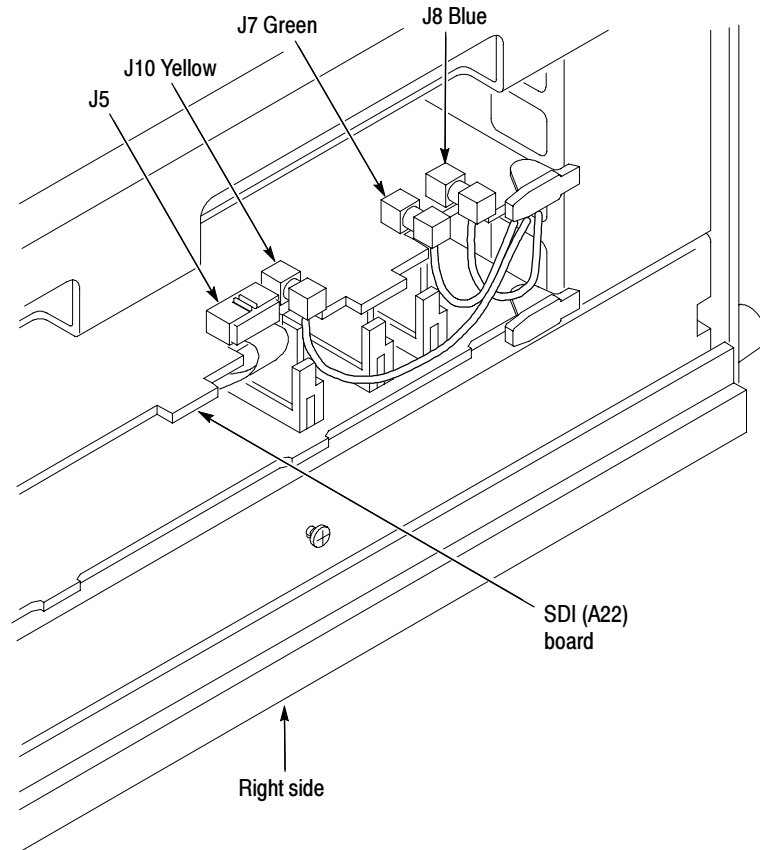


Figure 4: SDI circuit board location

Install the SIMM and Remove R32 (VM700T SN B020100 and B029999). Install the SIMM and remove R32 from the existing Acquisition circuit board (A18).

1. Disconnect four ribbon cables then remove the Acquisition (A18) circuit board from the card cage top slot.
 - a. Spread the cable ejector tabs to disconnect each cable from the board.
 - b. Use the board ejector tabs to release the circuit board from the interboard connector.
 - c. Remove the circuit board from the card cage.
2. Remove the existing SIMM by pressing the left metal tab, and then the right tab to release the SIMM from the board. Press the supplied SIMM into the board connection as shown in Figure 5.

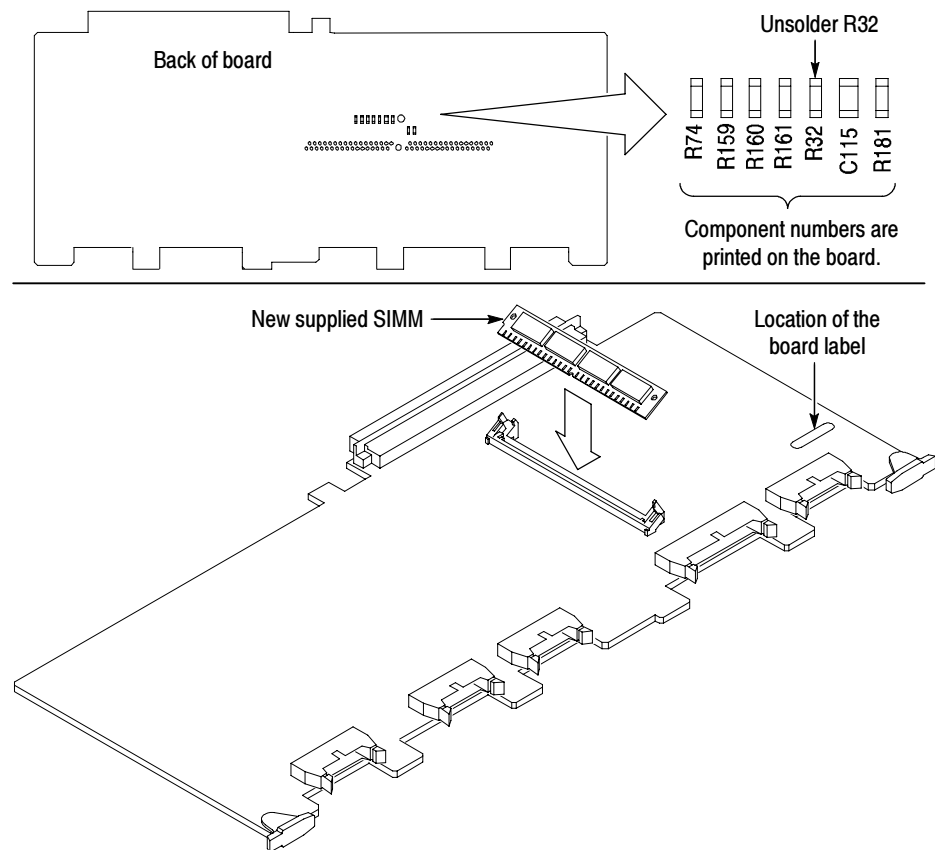


Figure 5: SIMM installation and R32 location (VM700T SN B020100 and B029999)

3. Attach the new board sticker to the Acquisition circuit board (A18)

4. Unsolder and remove R32 from the back of the existing Acquisition circuit board (A18) as shown in Figure 5.
5. Slide the Acquisition (A18) circuit board in the card cage top slot and press firmly to seat the interboard connector.
 - a. Press the four existing cables into the cable ejector tabs on the acquisition (A18) board, and then add the supplied fifth ribbon cable between the Acquisition (A18) circuit board and the SDI (A22) circuit board as shown in Figure 6.

Boot ROM. Install the supplied Boot ROM (U14) on the CPU (A5) circuit board.

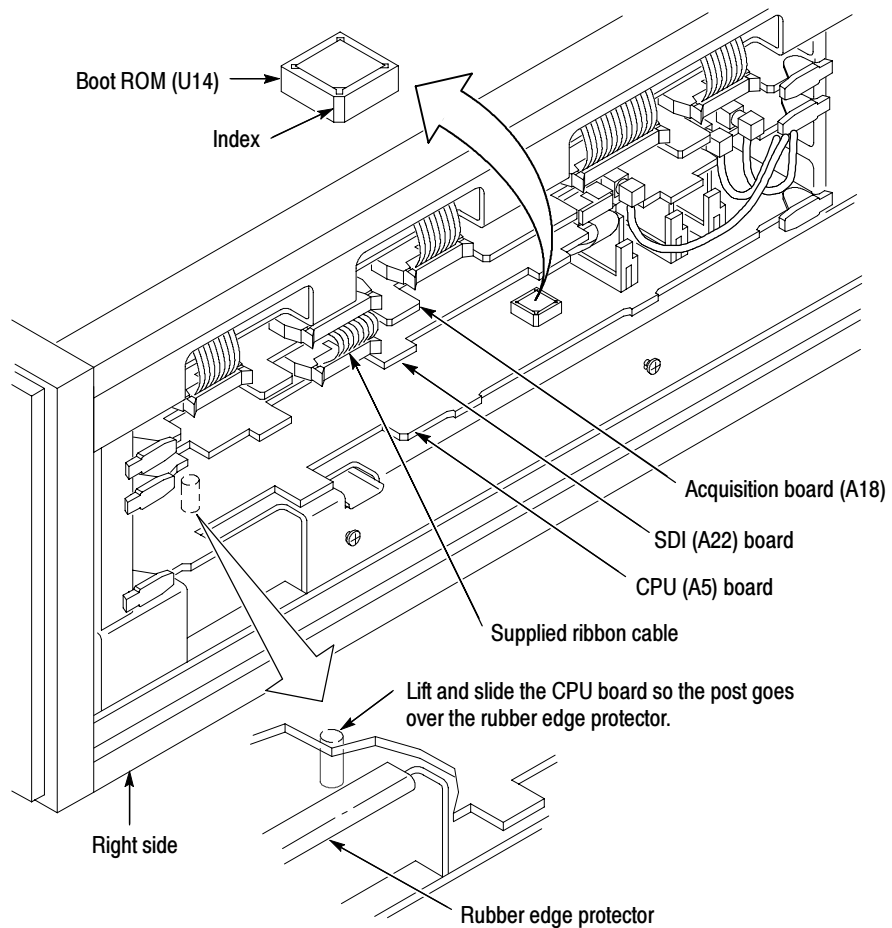


Figure 6: Acquisition board Installation



CAUTION. *To prevent damage, use the supplied extraction tool to remove the Boot ROM (U14) from the socket. When replacing the supplied Boot ROM (U14), orient the pins using the indexed corner on the Boot BOM to the printed outline on the board.*

1. Use the board ejector tabs to release the CPU (A5) circuit board.
2. Slide the CPU (A5) circuit board out until you can reach the Boot ROM (U14). You may need to lift the CPU (A5) circuit board over a board post located below the board.
3. Remove the existing Boot ROM (U14) using the supplied extraction tool, and replace it with the supplied Boot ROM (U14) on the CPU (A5) circuit board as shown in Figure 6. Note the index on the corner of the Boot ROM (U14).
4. Slide the CPU (A5) circuit board in the card cage, and press firmly to seat the interboard connector.
5. Reinstall the circuit board retainer plate to the right side of the measurement set (refer to page 14).

After VMUPG 1S Upgrade. Complete the installation of all hardware options, and then do the following steps.

1. Reinstall the removed cover panels as shown in Figure 1 on page 13.
2. Go to *Firmware Option Upgrades* on page 8.

VMUPG 2S

NOTE. Some EMI parts may already be installed if a VMTB/VMTX upgrade was installed after March of 1998.

Kit Parts List

The following parts list is for the VMUPG 2S upgrade.

Circuit/figure number	Quantity	Part number	Description
-----	1 EA	407-4585-00	BRACKET:EMI,0.062 THK,RIGHT SIDE FRT,ETCH&CLEAR CHROMATE;VM700T
-----	1 EA	348-1583-00	SHLD GSKT:ELE FINGER TYPE,W/ MAGNE-FIL,ADHESIVE,6L X 0.343,BECU,BRIGHT FINISH
-----	1 EA	337-4169-00	SHLD GSKT:ELE FINGER CLIP-ON,0.5L X 0.38W,BECU;VM700A
-----	2 EA	407-4586-00	BRACKET:EMI 0.62THK,AL 5052-H3X,ETC/CLEAR CHROMATE;VM700T
-----	1 EA	119-5870-00	FILTER:EMI FAN,.050 AL,5052-H3X,4.7 X 4.7;VM700T
-----	1 EA	276-0325-00	CORE:EM HALF,EMI SUPPRESS,IMPED 298 D MJT/85339
-----	2 EA	348-1618-00	SHLD GSKT,ELEK FINGER TYPE,4.4LX0.27W,BECU C17200,THO2 (HALF HARD),ZINC CHROMATE/CLEAR PL; I/O BRACKET,SAFETY CONTROLLED
A22	1 EA	671-4136-02	CIRCUIT BD ASSY:SDI
A23	1 EA	672-1504-00	CIRCUIT BD ASSY:REAR PANEL INTERFACE
A18	1 EA	671-4356-00	CIRCUIT BD ASSY:ACQUISITION
A5U14	1 EA	163-0782-02	IC,MEMORY:CMOS,EPROM;256K X 16,150NS BOOT ROM
-----	1 EA	174-3779-00	CA ASSY:SP,ELEC,AQ/CONTROLLER; 34, 32 AWG,2.6 L,RIBBON,(2X 17,HIGH DENSITY,RCPT) X (2 X 17,HIGH DENSITY,RCPT)
-----	1 EA	003-1757-00	TOOL:HAND CHIP CARRIER EXTRACTION TOOL PLCC SOCKET
-----	1 EA	004-2173-00	SHIPPING BOX:20.0 X 12.0 X 3.5 W/CONVOLUTED FOAM,S/W
-----	1 EA	071-0074-XX	MANUAL,TECH:USER MANUAL

Check List The following check list is for VMUPG 2S EMI and SDI installations.

Table 2: Check list for VMUPG 2S option upgrade

Installation		VM700T SN B019999 and below	VM700A VMTB/ VMTX with 119-4258-XX Power Supply	VM700A VMTB/ VMTX all other Power Supplies
EMI	Right side bracket	X	X	X
	Clip on I/O (A20) board	X	X	X
	Ferrite Bead on chassis panel	-	-	X
	Brackets (2) on CRT bracket	X	X	X
	Gasket on Power Supply	X	X	X
	Fan filter	X	X	X
	Rear panel brackets (2)	-	X	X
SDI	SDI (A23) Interface Panel	X	X	X
	SDI (A22) circuit board	X	X	X
	Acquisition (A18) board	X	X	X
	Cable between SDI and Acquisition board	X	X	X
	Boot ROM (U14) on CPU (A5) board	X	X	X

VMUPG 2S - EMI The EMI installation instructions are provided below.

NOTE. The installation of EMI parts is required to maintain the VM700T measurement set EMC specification to CISPR 22B.

Cover Panels and Circuit Board Retainers. Remove the right, left, top and bottom cover panels (see *Cover Panels* on page 12). Remove circuit board retainers (see *Circuit Board Retainer Bar* on page 13 and *Circuit Board Retainer Plate* on page 14).

Right Side EMI Bracket. Attach the EMI bracket to the right side of the measurement set.

1. Position the measurement set so that you face the right side (see Figure 7).
2. Remove the two screws nearest the front of the measurement set (See Figure 7).

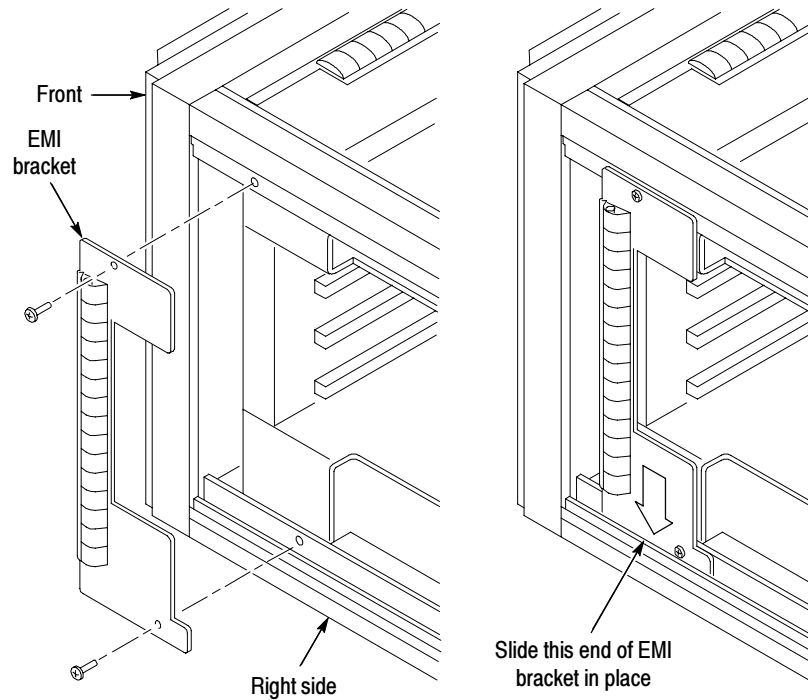


Figure 7: Right side EMI bracket installation

3. Position the bottom edge of the EMI bracket (see right side of Figure 7) inside the lower lip of the measurement set frame.
4. Align the EMI bracket to the screw holes in the measurement set. Attach and tighten the two screws as shown in Figure 7.

EMI Clip for CPU I/O Board. Adding an EMI clip to the CPU I/O (A20) circuit board.

1. Position the measurement set so that the left side faces you (see Figure 8).
2. Remove the screw holding the CPU I/O (A20) circuit board. The CPU I/O circuit board (A20) is located in the bottom slot of the card cage.
3. Pull the CPU I/O (A20) circuit board out, just exposing the rear panel connectors from the card cage.

4. Attach the EMI clip to the rear of the CPU I/O circuit board (A20) as shown in Figure 8.

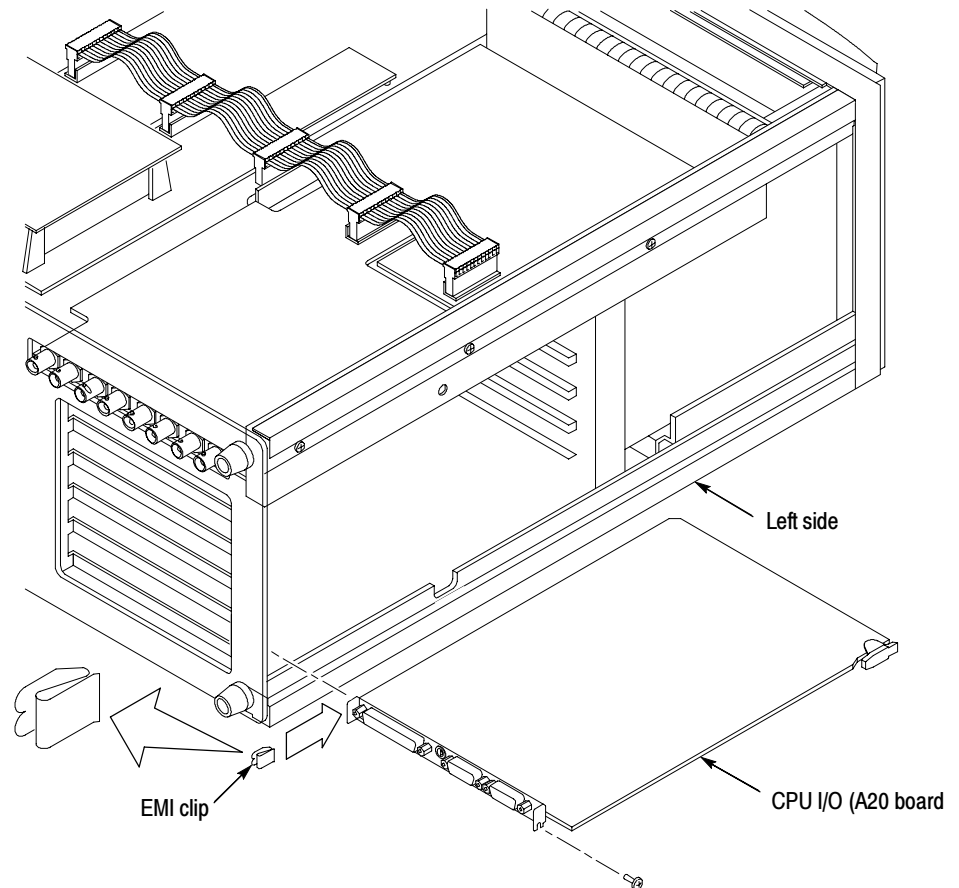


Figure 8: Location of the EMI clip on the CPU I/O board

5. Push the CPU I/O circuit board (A20) into the card cage. Attach and tighten the one screw.

NOTE. Check the part number on the bottom of your Power Supply. If the part number is 119-4258-XX, do not install the ferrite bead. Proceed to the next installation step EMI brackets and EMI gasket shield on page 27.

Clamp-on ferrite bead (Not for 119-4258-XX Power Supplies). Attach the clamp-on ferrite bead to the chassis panel.

1. Place the measurement set upside down so that you face the left side.

2. Slip the ribbon cable into the clamp-on ferrite bead and position the opening to face outward at an angle on the chassis panel as shown in Figure 9.

NOTE. Ensure that the ferrite bead is properly positioned before removing the paper backing in the following step. Once the ferrite bead is attached it cannot be removed.

3. Remove the paper backing from the clamp-on ferrite bead and attach to the chassis panel.

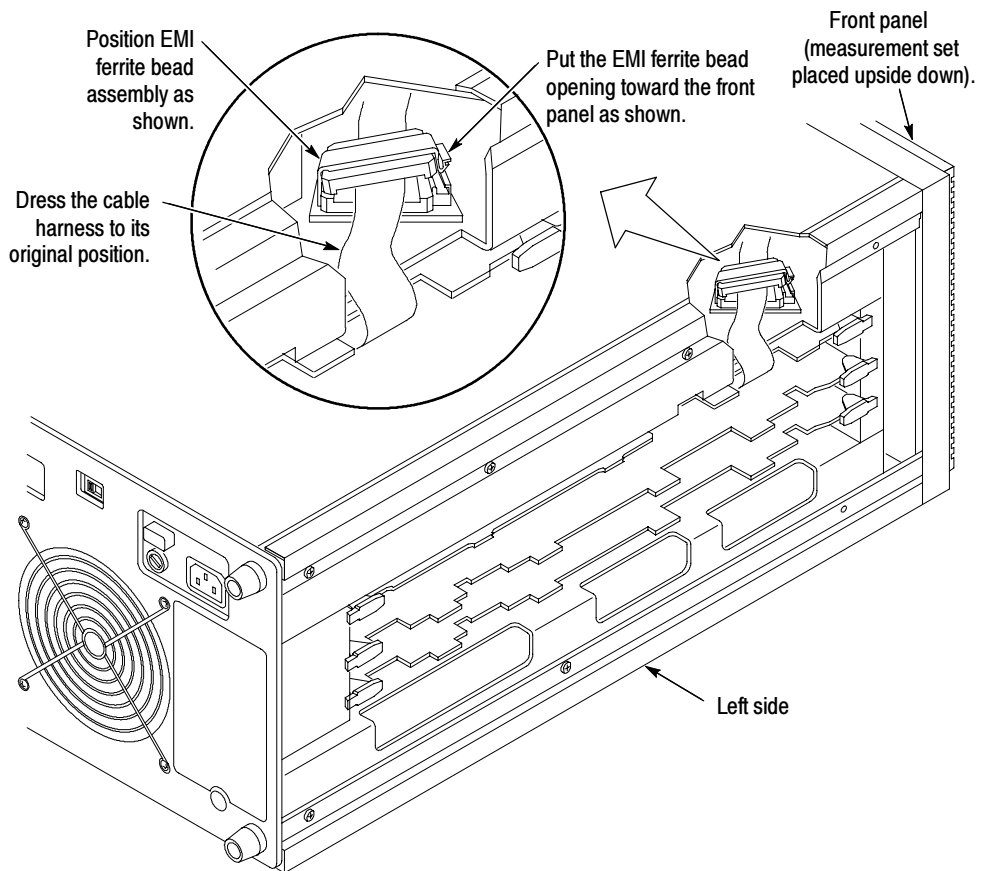


Figure 9: Clamp-on ferrite bead position (not for 119-4258-XX power supplies)

EMI Brackets and EMI Gasket Shield. Attach the two EMI brackets and EMI gasket shield to the bottom of the measurement set.

1. Position the measurement set on its left side with the bottom facing you and locate the CRT bracket as shown in Figure 10.

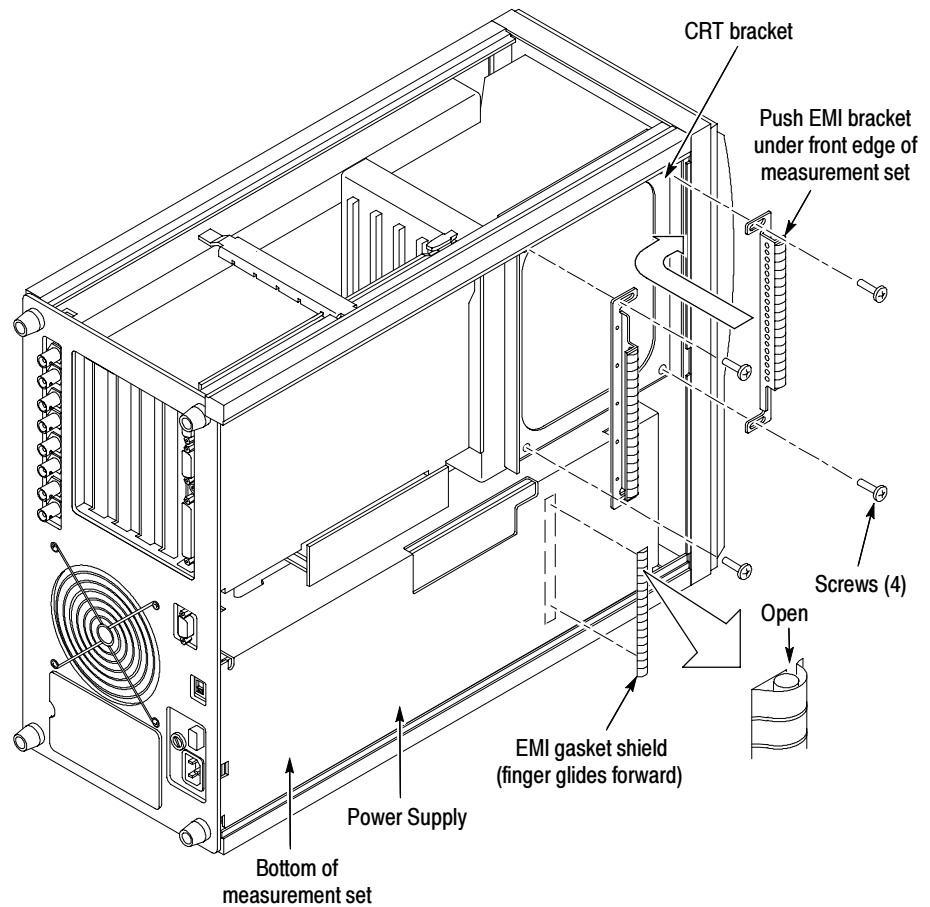


Figure 10: EMI Brackets and EMI gasket shield installation

2. Check that the two screws on the CRT bracket nearest the rear of the measurement set are tight.



CAUTION. Do not remove all four screws in the CRT bracket at the same time. The entire CRT assembly will fall inside the measurement set chassis if you do.

NOTE. Do not move the measurement set when performing the following steps.

3. Remove the first set of screws on the CRT bracket nearest the front of the instrument.
4. Align the first EMI bracket to the CRT bracket holes as shown in Figure 10. Push the EMI bracket forward and under the front edge of the measurement set as shown in Figure 10. Attach and tighten the two screws.
5. Remove the second set of screws on the CRT bracket nearest the rear of the instrument.
6. Align the second EMI bracket to the CRT bracket holes as shown in Figure 10. Attach and tighten the two screws.
7. Align the EMI gasket shield directly below the left EMI bracket as shown in Figure 10.
8. Reposition and attach the adhesive-backed EMI gasket shield with the copper fingers facing toward the front of the instrument as shown in Figure 10. Press firmly on the EMI gasket shield.




EMI Fan Filter only (VM700T - SN B029999 and Below). Go to *Install EMI Fan Filter (VM700T - SN B029999 and below)* on page 33 to install the supplied EMI fan filter.

EMI (rear) Gaskets and Fan Filter (VM700A with VMTB/VMTX). Follow the steps below unless noted otherwise.

NOTE. As you remove the rear-panel hardware, separate the different screw sizes and note the usage of each. Table 3 on page 29 also provides a description by item number (the circled number in the removal illustrations). Use a compartmented (divided) container to keep the different screw types separated. You will find this helpful when reinstalling the rear panel.

Table 3 shows the types and sizes of the screws used in the installation of the rear panel. In the removal illustrations, the circled numbers refer to the item numbers shown in Table 3.

Table 3: Screw sizes and types used in the rear-panel installation

Item		Screw type	Qty.
1		6-32 X 0.312 in Pozidriv with washer Tektronix Part Number 211-0658-00	12*
2		6-32 X 0.312 in Pozidriv Tektronix Part Number 211-0507-00	11*
3		6-32 X 0.250 in Pozidriv (not used in older measurement sets) Tektronix Part Number 211-0504-00	4*

* **Some measurement sets may have fewer screws.**

1. Position the measurement set so you face the rear panel.
2. Remove the screws as shown in Figure 11.

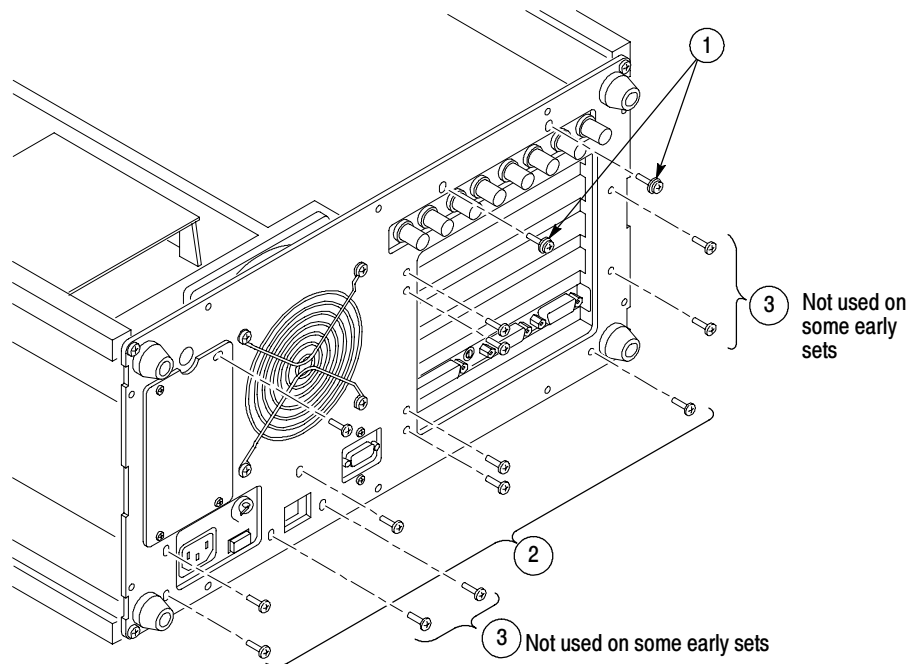


Figure 11: Rear panel screw removal (VM700A with VMTB/VMTX)

3. Loosen the four corner screws and pull the rear panel onto the screws, leaning the rear panel away just enough to slide the two EMI gaskets (shown in Figure 12) in place. Do not place excessive strain on the fan cable.
4. If necessary, you can remove the rear panel to provide access to install the EMI gaskets.

NOTE. Note the position of the two EMI gasket retainer clips (inside the rails) at each corner of the chassis (see the detail inset illustration in Figure 12). The retainer clips must be in place when the rear panel is reinstalled.

5. Attach the EMI gaskets behind the rear panel shown in Figure 12.

NOTE. The fingers on the EMI gaskets will face to the outside of the measurement set.

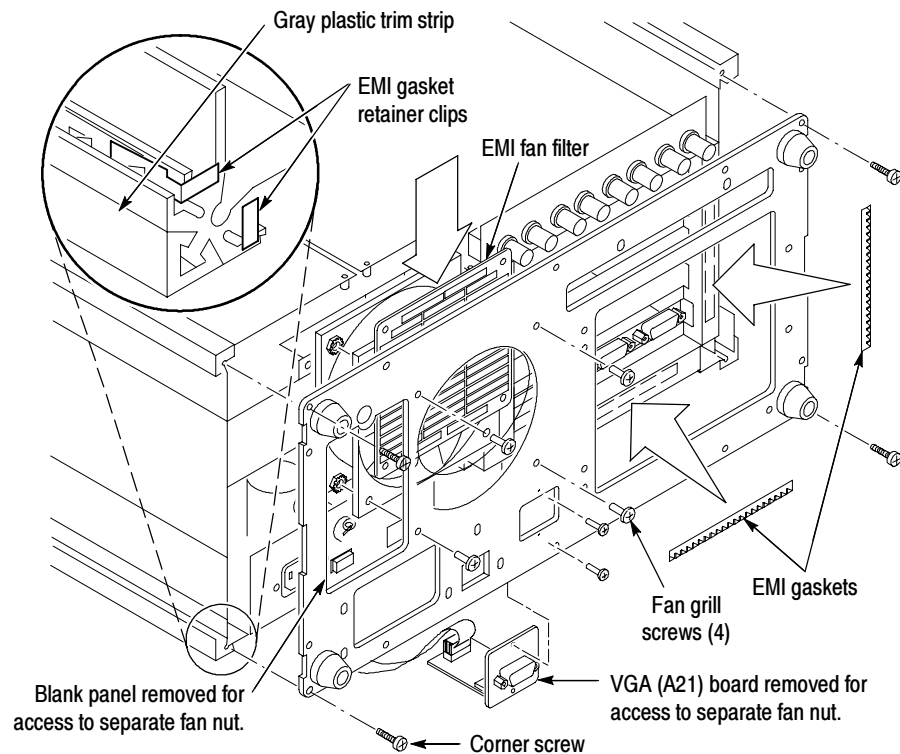


Figure 12: EMI gaskets and EMI fan filter installation (VM700A with VMTB/VMTX)

EMI Fan Filter (VM700A with VMTB/VMTX) with Separate Nuts. Determine if your measurement set uses separate assembly nuts or if it uses captive (press-mounted) nuts. See below for fan assembly with separate nuts or page 31 for *Fan Assembly with Captive Nuts*.

1. Mark the front and back orientation of the fan assembly. The correct air flow in the measurement set is front to back.



CAUTION. *Incorrect installation of the fan assembly will result in overheating and possible damage to the measurement set.*

2. Remove the screws from the VGA Connector circuit (A21) board to allow access to the lower right fan housing nut as shown in Figure 13.
3. Pull the VGA Connector circuit board (A21) away from the fan housing on the rear panel. Do not disconnect the VGA cables.
4. Remove the left blank panel and discard. This allows access to the lower left fan assembly nut as shown in Figure 13. Later, you will install the SDI (A23) Interface Panel in this position.
5. Holding the nuts on the inside of the fan housing remove the screws. Set the hardware aside. Discard the existing fan grill.
6. Slide the supplied EMI fan filter behind the rear panel and in front of the fan assembly and hold in place.
7. Align and begin tightening each of the four fan assembly screws into the rear panel, EMI fan filter, and fan assembly. Tighten all four screws.
8. Reinstall the mounting plate for the VGA circuit board (A21) on the inside of the rear panel, and attach the screws.

Fan Assembly with Captive Nuts. For fan assemblies with captive nuts, perform the following steps.

1. Remove the four screws that hold the existing fan grill to the rear panel. Discard the fan grill.
2. Slide the supplied EMI fan filter behind the rear panel and in front of the fan assembly and hold in place.
3. Align and begin threading each of the four fan assembly screws into the rear panel, EMI fan filter, and fan assembly. Tighten all four screws.

Reinstall Rear Panel. Reinstall the screws in the rear panel.

NOTE. Note the position of the two EMI gasket retainer clips at each corner of the chassis (see the detail inset illustration in Figure 12 on page 30). The clips must be in place when the new rear panel is installed. Replacement retainer clips are provided in the spare parts bag in case the originals are damaged or lost.

1. Align the four corner screws in the rear panel with the chassis corners and start threading the screws into the chassis rails. Check that the fan wires and VGA cable do not become pinched between the rear panel and the chassis.
2. Alternately tighten the four corner screws to evenly draw the rear panel toward the chassis. Leave these screws loose by about one turn until you install the other rear panel screws in the following steps.

NOTE. The trim strips on the chassis edges (see Figure 12) may slide back as you position the video measurement set on the work surface. This is especially true of the trim strips in contact with the work surface. Make sure each of the trim strips is fully forward as you tighten the corner screws of the rear panel.

3. Install the rear panel screws. Do not fully tighten these screws until all are in place. Use a small Pozidriv screwdriver to assist you in aligning the inside threaded holes with the rear-panel holes.

Refer to Table 3 on page 29 and the removal illustrations if you need assistance in determining the correct screws to install in each of the rear-panel screw holes.

After EMI installation

After the EMI installation is completed, continue to *VMUPG 2S - SDI* on page 34.

Install EMI Fan Filter (VM700T - SN B029999 & Below). Install the EMI Fan Filter. In addition, remove the VGA Connector Circuit board (A21) and left blank panel on the rear panel to reach the two lower fan assembly nuts.

1. Mark the front and back orientation of the fan assembly. The correct air flow in the measurement set is front to back.



CAUTION. *Incorrect installation of the fan assembly will result in overheating and possible damage to the measurement set.*

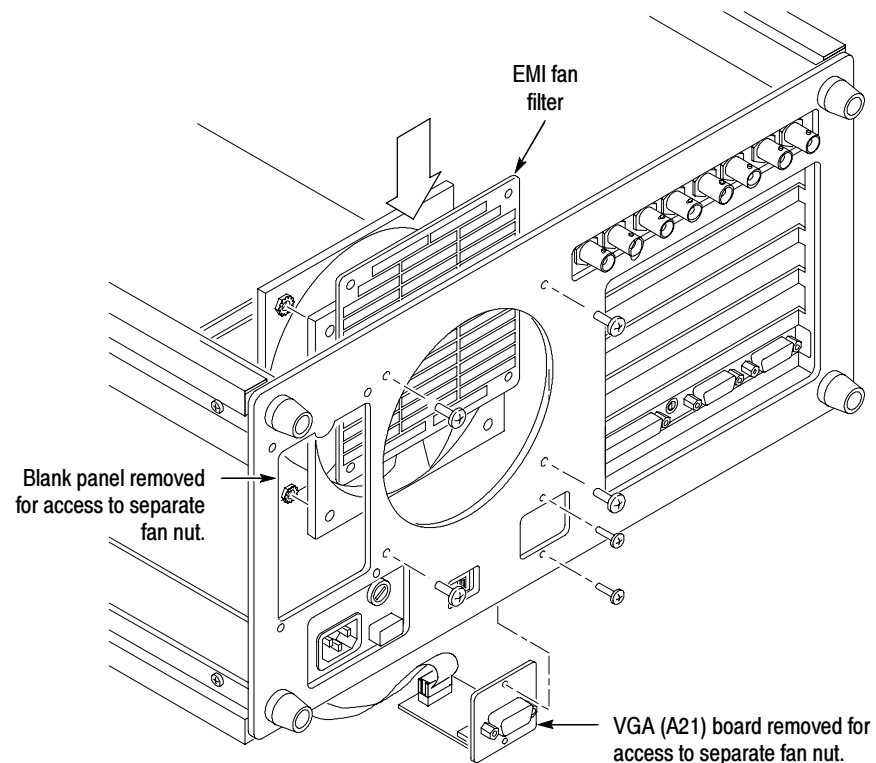


Figure 13: EMI Fan Filter location (VM700T - SN B029999 & below)

1. Remove the screws from the VGA Connector circuit (A21) board to allow access to the lower right fan housing nut as shown in Figure 13.
2. Pull the VGA Connector circuit board (A21) away from the fan housing on the rear panel. Do not disconnect the VGA cables.
3. Remove the left blank panel and discard. This allows access to the lower left fan assembly nut as shown in Figure 13. Later, you will install the SDI (A23) Interface Panel in this position.

4. Holding the nuts on the inside of the fan housing remove the screws. Set the hardware aside. Discard the existing fan grill.
5. Slide the supplied EMI fan filter behind the rear panel and in front of the fan assembly and hold in place.
6. Align and begin tightening each of the four fan assembly screws into the rear panel, EMI fan filter, and fan assembly. Tighten all four screws.
7. Reinstall the mounting plate for the VGA circuit board (A21) on the inside of the rear panel, and attach the screws.

After EMI installation Continue to *VMUPG 2S - SDI* below.

VMUPG 2S - SDI The SDI upgrade consists of installing an SDI (A23) Interface panel and SDI (A22) circuit board. The VMUPG 2S upgrade will require removing the existing Acquisition circuit board (A18) and installing a supplied Acquisition circuit board (A18).

SDI Panel and Circuit Board. Refer to *SDI Panel* on page 17 and *SDI Circuit Board* on page 18. Then continue to *Acquisition Circuit Board* below.

Acquisition Circuit Board. Remove the existing Acquisition (A18) circuit board and replace with the supplied Acquisition (A18) circuit board.

1. The Acquisition (A18) circuit board occupies the card cage top slot. To remove this board you must first disconnect four ribbon cables.
 - a. Spread the cable ejector tabs to disconnect each cable from the board.
 - b. Use the ejector tabs to release the circuit board from the interboard connector.
 - c. Remove the existing Acquisition (A18) circuit board from the card cage and discard.
2. Slide the supplied Acquisition (A18) circuit board in the card cage top slot and press firmly to seat the interboard connector.
 - a. Press the four existing cables into the cable ejector tabs on the acquisition (A18) board then add the fifth supplied ribbon cable between the Acquisition (A18) circuit board and the SDI (A22) circuit board.

Boot ROM. Install the supplied Boot ROM (U14) on the CPU (A5) circuit board.

3. Refer to *Boot ROM*, step 1, on page 20 for the Boot ROM procedure.
4. Reinstall the circuit board retainer plate to the right side of the measurement set (see Figure 2 page 14).

After VMUPG 2S Upgrade. Complete the installation of all hardware options, and then do the following steps.

1. Reinstall the removed cover panels as shown in Figure 1 on page 13.
2. Go to *Firmware Option Upgrades* on page 8.

VMUPG 40 - Option 40 Audio Measurements

These installation instructions add Option 40 to the VM700T Video Measurement Set or the VM700A Video Measurement Set with the VMTB or VMTX Turbo upgrade installed. The new option key (provided separately) activates all of options that were ordered as part of this upgrade. Previously installed option firmware is upgraded to the latest version compatible with the VM700T Video Measurement Set.



CAUTION. *To prevent static discharge damage, service the measurement set only at an anti-static work station. Observe standard handling precautions for static-sensitive devices while installing this kit. Always wear a grounded wrist strap, grounded foot strap, and static resistant apparel while installing this kit.*

These instructions are for personnel familiar with servicing. If you need further details for disassembling or reassembling the measurement set, refer to the product service manual. For further assistance call your nearest Tektronix, Inc., Service Center or Tektronix Factory Service.

Kit Parts List.

The following parts list is for the VMUPG 40 option upgrade.

Circuit/figure number	Quantity	Part number	Description
A12	1 EA	671-1787-05	CIRCUIT BD ASSY:AUDIO PROCESSOR
A13	1 EA	671-1788-05	CIRCUIT BD ASSY:AUDIO ANALOG
-----	2 EA	131-5272-00	CONN,CIR PLUG:AUDIO SLDR CUP,;MALE,STR,3 POS,0.413 DIA,W/PLZ,LATCHING,0.115 DIA MIN,22 AWG MAX CABLE
-----	1 EA	174-2359-01	CA ASSY,SP:26,28 AWG,1.375 L
-----	2 EA	174-2499-01	CA ASSY,SP,ELEC:3,22 AWG,36.0 L
-----	1 EA	070-9656-XX	MANUAL,TECH:USER,VM700T,OPT 40/41/42

Installation Install the Audio Analog and Audio Processor Circuit Board Assemblies.



WARNING. *Dangerous shock hazards may be exposed when the measurement set covers are removed. Before proceeding, ensure that both power switches are in the off position (see Figures 1 and 2), and then disconnect the measurement set from the power source.*

Cabinet Panel. Remove the left side cabinet panel (see Figure 14).

1. Remove the screws at the rear edge of the left side cover panel.
2. Remove the left side cover panel by sliding it carefully to the rear of the measurement set and out of the grooves in the chassis in the same manner as shown in Figure 1 on page 13 for the top cover panel.
3. Set the cover panel aside.

Audio Analog and Audio Processor Boards. Install the Audio Analog and Audio Processor Circuit Board Assemblies

1. Remove the upper two blank panels from the measurement set rear panel.
2. Remove the vertical circuit board retainer bar as shown in Figure 1 on page 13.
3. Install the Audio Analog circuit board in the top slot and the Audio Processor circuit board in the next slot as shown in Figure 1 on page 13.
4. Align the circuit board connector pins with the main interconnection board connector and press firmly to seat the circuit board connectors.
5. Plug in the short ribbon cable, provided in the kit, to interconnect the two circuit boards.
6. Install the circuit board retaining screws.

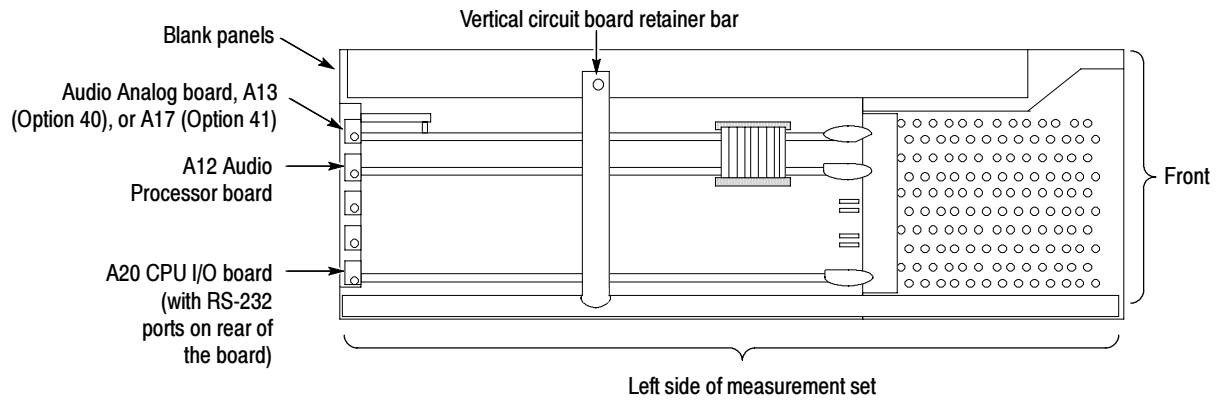


Figure 14: Locating the audio option boards in the left-side card cage

After Option 40 Upgrade. Complete the installation of all hardware options, and then do the following steps.

1. Replace the vertical circuit board retainer bar and screw.
2. Install the cover panel that was removed.
3. Go to *Firmware Option Upgrades* on page 8.

VMUPG 41 - Option 41 Six-Input Audio

These installation instructions add Option 41 to the VM700T Video Measurement Set or the VM700A Video Measurement Set with the VMTB or VMTX Turbo upgrade installed. The new option key (provided separately) activates all of the options that were ordered as part of this upgrade. Previously installed option firmware is upgraded to the latest version compatible with the VM700T Video Measurement Set.



CAUTION. To prevent static discharge damage, service the measurement set only at an antistatic work station. Observe standard handling precautions for static-sensitive devices while installing this kit. Always wear a grounded wrist strap, grounded foot strap, and static resistant apparel while installing this kit.

These instructions are for personnel familiar with servicing. If you need further details for disassembling or reassembling the measurement set, refer to the product service manual. For further assistance call your nearest Tektronix, Inc., Service Center or Tektronix Factory Service.

Kit Parts List

The following parts list is for the VMUPG 41 option upgrade.

Circuit/figure number	Quantity	Part number	Description
A12	1 EA	671-1787-05	CIRCUIT BD ASSY:AUDIO PROCESSOR
A17	1 EA	672-1348-06	CKT BD ASY:TRIPLE-INPUT AUDIO ANALOG
-----	1 EA	174-2359-01	CA ASSY, SP, ELEC:26-28AWG, 1.375 LONG
-----	1 EA	070-9656-XX	MANUAL,TECH:USER,VM700T,OPT 40/41/42
*	2 EA	276-0832-00	CORE,EM: FERRITE,EMI SUPPRESSOR,U SHAPED,IMP 159 OHM @ 25MHZ,245 OHM @ 100 MHZ,1.0 X 1.1 IN,0.51 HIGH
*	2 EA	346-0120-00	STRAP,TIEDOWN,E:5.5 L MIN,PLASTIC,WHITE
*	1 EA	131-0408-00	CONN,RCPT,ELEC:UHF,FEMALE,MODIFIED
*	2 EA	200-3947-00	COVER,CONN:CABLE END RFI/EMI SHIELDED COVER FOR 37 CONTACT,D-SUB, CABLE OD 0.255 TO 0.47,ZINC ALLOY BRIGHT NICKEL PLATE

* External connector parts. See the *VM700T Option 40/41/42 User Manual* for installation instructions.

Installation Install the Audio Analog and Audio Processor Circuit Board Assemblies.



WARNING. Dangerous shock hazards may be exposed when the measurement set covers are removed. Before proceeding, ensure that both power switches are in the off position (see Figures 1 and 2), and then disconnect the measurement set from the power source.

Cover Panel. Remove the left side cover panel.

1. Remove the screws at the rear edge of the left side cover panel.
2. Remove the left side cover panel by sliding it carefully to the rear of the instrument and out of the grooves in the chassis in the same manner as shown in Figure 1 on page 13 for the top cover panel.
3. Set the cover panel aside.

Audio Analog and Audio Processor Board. Install the Audio Analog and Audio Processor Circuit Board Assemblies

1. Remove the upper two blank panels from the instrument rear panel.
2. Install the Audio Analog circuit board in the top slot and the Audio Processor circuit board in the next slot as shown in Figure 15.

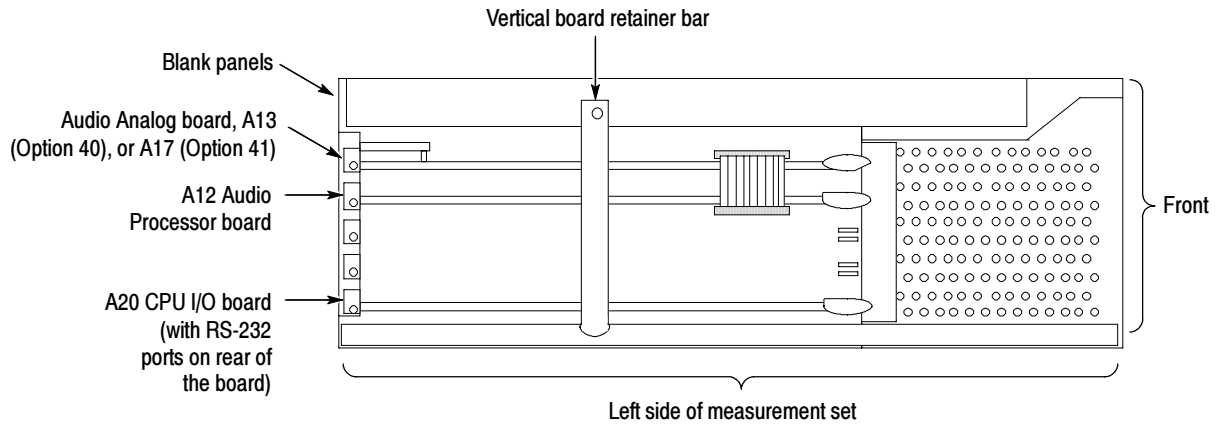


Figure 15: Locating the audio option boards in the left-side card cage

3. Align the circuit board connector pins with the main interconnection board connector and press firmly to seat the circuit board connectors.
4. Plug in the short ribbon cable, provided in the kit, to interconnect the two circuit boards.
5. Install the circuit board retaining screws.

After Option 41 Upgrade. Complete the installation of all hardware options, and then do the following steps.

1. Replace the vertical circuit board retainer bar and screw.
2. Install the cover panel that was removed.
3. Go to *Firmware Option Upgrades* on page 8.

VMUPG 48 - Option 48 GPIB interface

These installation instructions add Option 48 to the VM700T Video Measurement Set or the VM700A Video Measurement Set with the VMTB or VMTX Turbo upgrade installed. The new option key (provided separately) activates all of the options that were ordered as part of this upgrade. Previously installed option firmware is upgraded to the latest version compatible with the VM700T Video Measurement Set.



CAUTION. To prevent static discharge damage, service the measurement set only at an antistatic work station. Observe standard handling precautions for static-sensitive devices while installing this kit. Always wear a grounded wrist strap, grounded foot strap, and static resistant apparel while installing this kit.

These instructions are for personnel familiar with servicing. If you need further details for disassembling or reassembling the measurement set, refer to the product service manual. For further assistance call your nearest Tektronix, Inc., Service Center or Tektronix Factory Service.

Kit Parts List

The following parts list is for the VMUPG 48 option upgrade.

Circuit/figure number	Quantity	Part number	Description
A19	1 EA	671-2337-00	CKT BD ASSY:GPIB
-----	1 EA	070-9657-XX	MANUAL,TECH:PROGRAMMERS, OPT 48 GPIB

Installation

Install the GPIB Circuit Board Assembly



WARNING. Dangerous shock hazards may be exposed when the measurement set covers are removed. Before proceeding, ensure that both power switches are in the off position (see Figures 1 and 2), and then disconnect the measurement set from the power source.

Cover Panel. Remove the left side cabinet cover panel.

1. Remove the screws at the rear edge of the left side cover panel.
2. Remove the left side cover panel by sliding it carefully to the rear of the measurement set and out of the grooves in the chassis in the same manner as shown in Figure 1 on page 13 for the top cover panel.
3. Set the cover panel aside.

GPIB. Install the GPIB Circuit Board Assembly.

1. Remove the vertical circuit board retainer bar (see Figure 1 on page 13).
2. Remove the blank panel in the number three position (from the top) in the rear panel and install the GPIB circuit board assembly (A19) in that position as shown in Figure 16.

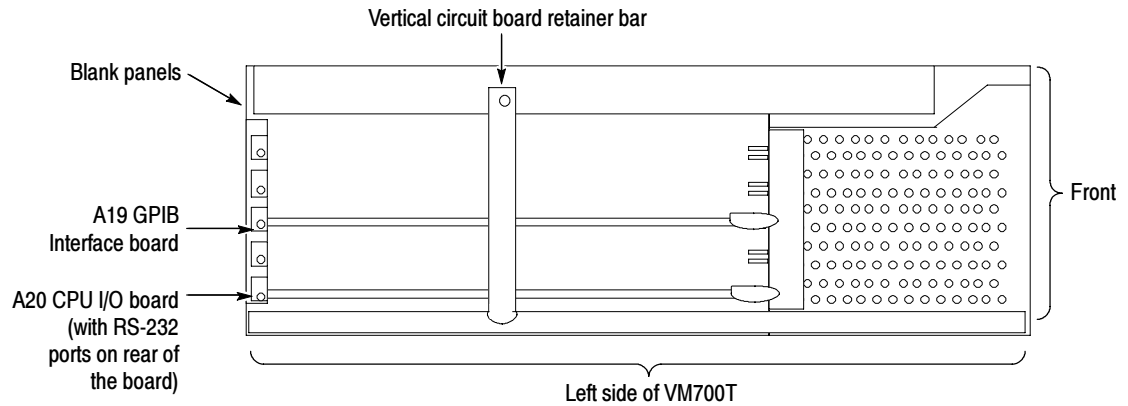


Figure 16: Locating the circuit boards in the left-side card cage

After Option 48 Upgrade. Complete the installation of all hardware options, and then do the following steps.

1. Replace the vertical circuit board retainer bar and screw.
2. Install the cover panel that was removed, and then go to *Firmware Option Upgrades* on page 8.

VMUPG 3D - Option 40 to Option 41 Conversion

These installations instructions convert an installed two-stereo-channel audio option (Option 40) to the six-channel audio option (Option 41) for VM700T Video Measurement or VM700A Video Measurement Set with the VMTB or VMTX Turbo upgrade installed. The new option key (provided separately) activates all of the options that were ordered as part of this upgrade. Previously installed option firmware is upgraded to the latest version compatible with the VM700T Video Measurement Set.



CAUTION. To prevent static discharge damage, service the measurement set only at an antistatic work station. Observe standard handling precautions for static-sensitive devices while installing this kit. Always wear a grounded wrist strap, grounded foot strap, and static resistant apparel while installing this kit.

These instructions are for personnel who are familiar with servicing. If you need further details for disassembling or reassembling the measurement set, refer to the product service manual. For further assistance call your nearest Tektronix, Inc., Service Center or Tektronix Factory Service.

Kit Parts List

The following parts list is for the VMUPG 3D option upgrade.

Circuit/figure number	Quantity	Part number	Description
A17A2	1 EA	671-2006-02	CIRCUIT BD ASSY:INPUT SELECTION
-----	2 EA	211-0244-00	SCR,ASSEM WSHR:4-40 X 0.312,PNH,STL,CD PL,POZ,MACHINE
-----	1 EA	386-6663-00	PANEL,CKT BD:AUDIO ANALOG
-----	2 EA	214-3903-01	SCREW, JACK:4-40 X0.132 EXT THD
-----	1 EA	070-9656-XX	MANUAL,TECH:USER,VM700T,OPT 40/41/42
*	2 EA	276-0832-00	CORE,EM: FERRITE,EMI SUPPRESSOR,U SHAPED,IMP 159 OHM @ 25MHZ,245 OHM @ 100 MHZ,1.0 X 1.1 IN,0.51 HIGH
*	2 EA	346-0120-00	STRAP,TIEDOWN,E:5.5 L MIN,PLASTIC, WHITE
*	1 EA	131-0408-00	CONN,RCPT,ELEC:UHF,FEMALE,MODIFIED
*	2 EA	200-3947-00	COVER,CONN:CABLE END RFI/EMI SHIELDED COVER FOR 37 CONTACT,D-SUB, CABLE OD 0.255 TO 0.47,ZINC ALLOY BRIGHT NICKEL PLATE

* External connector parts. See the *VM700T Option 40/41/42 User Manual* for installation instructions.

Installation Remove the Audio Analog (A13) Circuit Board Assembly.



WARNING. Dangerous shock hazards may be exposed when the measurement set covers are removed. Before proceeding, ensure that both power switches are in the off position (see Figures 1 and 2), and then disconnect the measurement set from the power source.

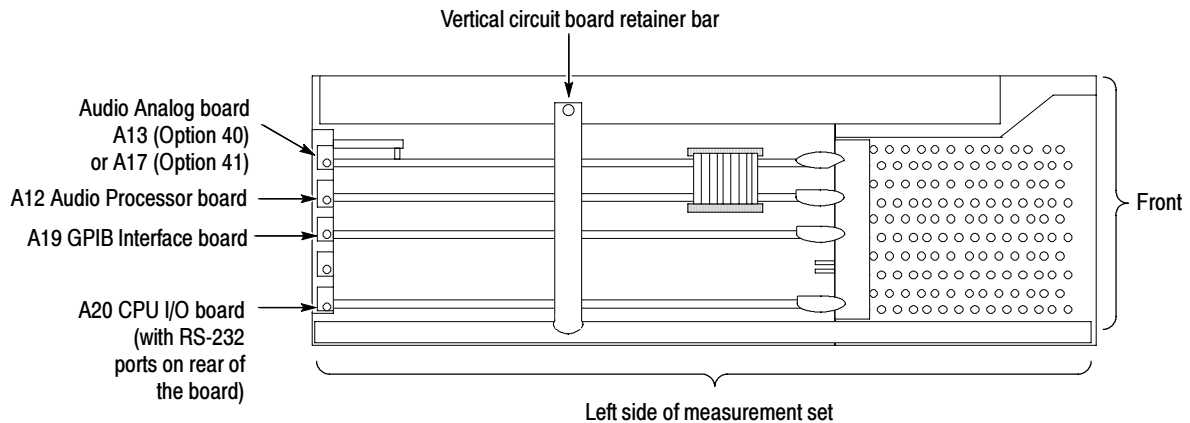


Figure 17: Locating the audio option boards in the left-side card cage

Cover panel. Remove the left side cabinet cover panel.

Audio Analog board. Remove the Audio Analog (A13) Circuit Board Assembly.

1. Remove the single screw holding each circuit board assembly to the measurement set frame.
2. Unplug multiconductor cabling between the top and second circuit board as shown in Figure 17.
3. Pull out on the circuit board ejector, and remove the A13 Audio Analog board from the measurement set.

Input Selector Board. Installation of the Input Selector (A17A2) board.

1. Make changes to the Audio Analog circuit board assembly (A13) as follows:
 - a. Remove and discard each of the bus conductors or coils attached between the two XLR connectors and the solder pads labeled J1-1, 2, 3 and J2-1, 2, 3.
 - b. Remove the circuit board panel and the XLR connector bracket from the Audio Analog circuit board. Save the panel hardware.

- c. Install the 6-Input Selector circuit board in the location as shown in Figure 18. Align the pins of J1 and J2 with the two connector housings labeled J17 and J18 on the Audio Analog circuit board. Note that the circuit board is installed component side down.

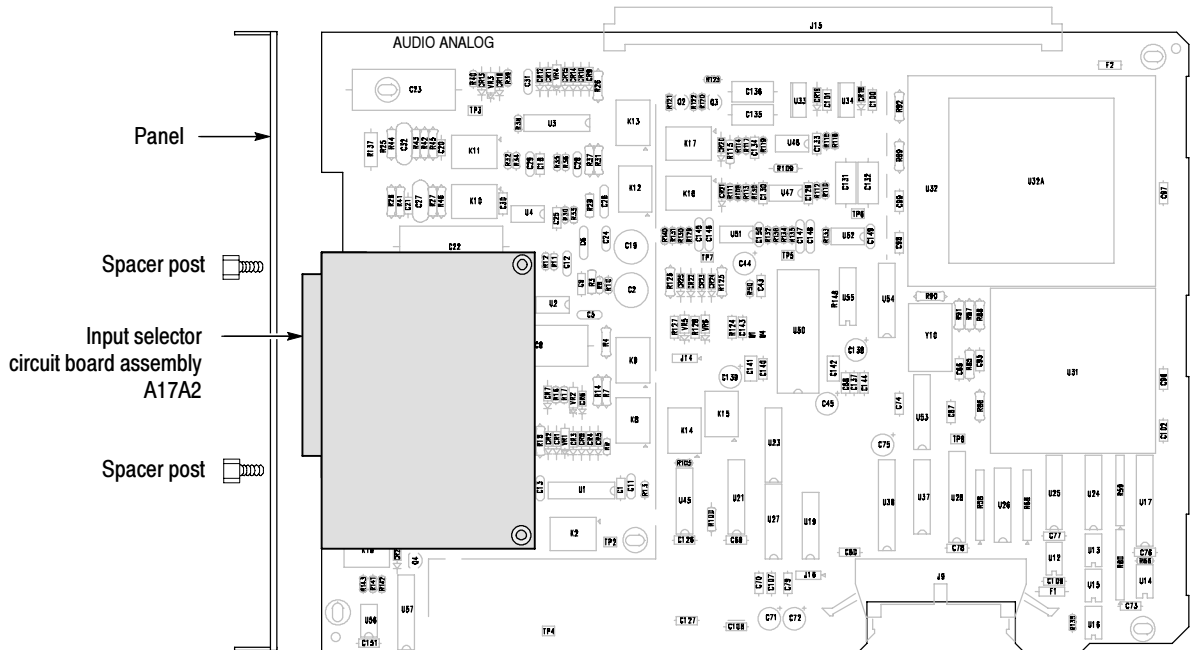


Figure 18: Audio Analog circuit board showing the location of the Input Selector circuit board (shaded)

- d. Install the two circuit board attaching screws.
 - e. Install the Audio Analog circuit board panel provided in the kit. Use the hardware removed in step 1b to attach the circuit board panel.
 - f. Install the two spacer posts with one lock washer each to attach the multiconductor connector and the circuit board panel.
2. Install the Audio Analog circuit board in the top slot. The Audio Processor circuit board is in the next slot down. Plug in the short ribbon cable to interconnect the two circuit boards.
 3. Install the circuit board retaining screws.

After Option 3D Upgrade. Complete the installation of all hardware options, and then do the following steps.

1. Replace the vertical circuit board retainer bar and screw.
2. Install the cover panel that was removed, and then go to *Firmware Option Upgrades* on page 8.

Install the New Option Key

After you complete the hardware installation, you must install the option authorization key for the upgrade. Use the following steps to install the new option key that activates the set of options for your upgrade. If you are installing more than one option for the upgrade, the new option key activates all the authorized options. The new option key you received with this upgrade is based on the previously installed option set plus all the new options you are adding.

1. Switch on the VM700T and wait for the system initialization to complete.
2. Press the Configure front panel button to display the menu as shown in Figure 19. A list of the currently activated options is displayed.
3. Touch the Option Key soft key. This will display the option key control menu (see Figure 20).
4. Touch the New Option Key edit field.
5. Type in the new option key provided in the upgrade kit using lower case letters. The hyphens in the option key are optional. Note the following information about typing in characters:
 - Typing always inserts characters at the cursor position. You can move the cursor left or right by turning the control knob.
 - To delete characters, move the cursor to the right of the character to be deleted; then press the Back Space key.

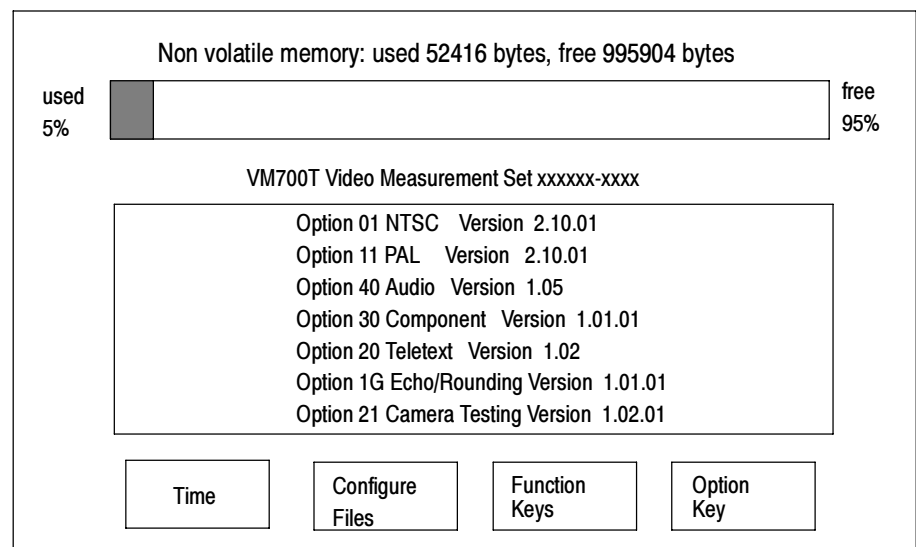


Figure 19: Typical main configure menu

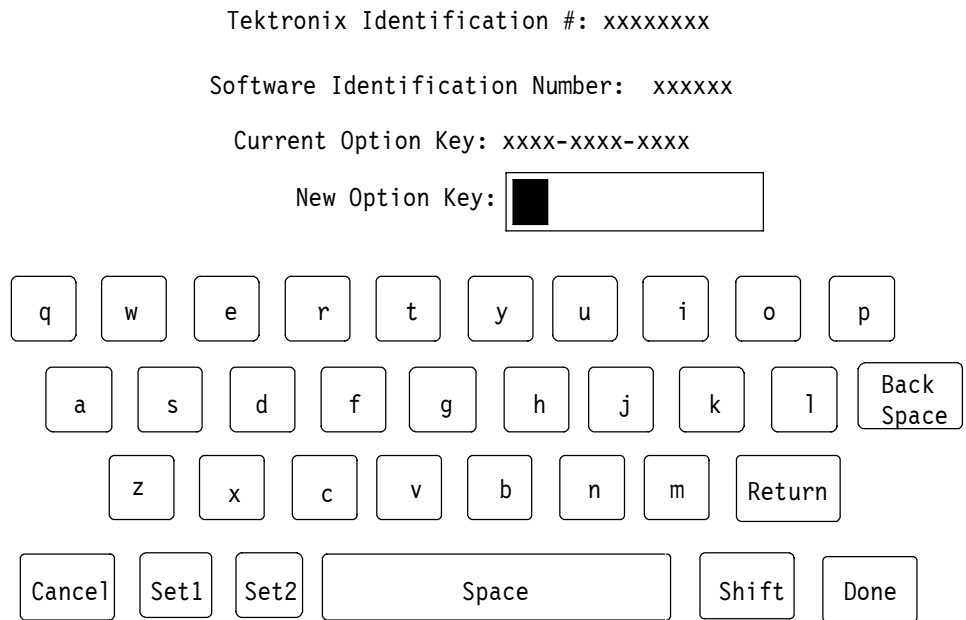


Figure 20: Option key control menu

6. When you have finished entering the new option key, touch the Done soft key. If you have entered a valid option key, a list of the options authorized by the option key is displayed. Go to step 8 if you have entered the option incorrectly.
 - a. Verify that this is the correct set of options ordered for the VM700T you are upgrading.
 - b. Mark the supplied Options label to match the options in the displayed list. You will affix the new Options label to the rear panel over the old one.

7. Touch the Continue soft key if the list of options is correct.

When you touch the Continue soft key, the VM700T Video measurement set reconfigures its firmware and file structure to the new option set. The default files have configuration lines added for the new options. When reconfiguring finishes, the VM700T runs the complete set of instrument diagnostics before the system is initialized.

8. If the list of options is not correct, press Cancel to prevent the new option configuration from taking place. The previous set of installed options is still valid, and the Current Option Key remains installed.
9. If you make a typing mistake or enter an invalid option key for your instrument, an error message appears in the display (see Figure 21). Follow the directions given in the message.

10. Verify that you have entered the new option key from the upgrade kit for the VM700T you are upgrading. You may have an incorrect option key for your instrument. If you need assistance, contact your local Tektronix representative or Tektronix Factory Service. You will need the Current Option Key (see line 3 in Figure 21 for its location) and a list of the current options plus any that are to be added by this upgrade.

Tektronix Identification #: xxxxxxxx

Software Identification Number:xxxxxx

Current Option Key: xxxx-xxxx-xxxx

New Option Key:

Error: New Option not valid for this instrument.
Please verify the Key and try again.
Touch the screen to continue.

Figure 21: Error message for invalid option key

After Installing the New Option Key. After installing the new option key continue to *Verify the installation* on page 50.

Verify the Installation

At power-on, all instrument diagnostics are bypassed for a quicker startup. Run all the diagnostic tests, including the audio diagnostics, as a verification procedure. Use the following procedure to force an Auto Reset.

Power On Check Out

1. Connect the power cord and press on the rear panel power switch (if it is off).
2. Hold down the Menu button and use the front panel STBY/ON switch to power on the instrument.

If the instrument displays the message “Diag NVRAM has been (RE) initialized”, press Select Line while continuing to hold the Menu button.

3. After the instrument beeps twice, release the Menu button. The VM700T displays the VM700T Startup Menu.
4. In the menu, use the control knob to select R ... INSTRUMENT RUN MODES, and press the Select Line button. A second diagnostic menu is then displayed.
5. In this menu, select A ... AUTO RESET, and press the Select Line button. This runs the full set of internal diagnostics. Check that all tests pass as they run.

If that a diagnostics failure is indicated, turn off the VM700T and disconnect the power cord. Verify that all the circuit boards are properly seated and that the connectors are installed properly. If a fault is still indicated when you run the diagnostics again, contact Tektronix Factory Service.

After the diagnostics complete, the upgraded VM700T should initialize in the Waveform mode.

All Hardware Options. All the diagnostic tests, including the GPIB diagnostics, should pass when the measurement set is powered on. In the event that a diagnostics failure is indicated, turn off the VM700T and disconnect the power cord. Verify that all the circuit boards are properly seated and that the connectors are installed properly. If a fault is still indicated when you run the diagnostics again, contact Tektronix Factory Service.

User-Selectable Diagnostics

With Option 40, 41, or 3D installed, the following two diagnostic routines are added:

- AudioProcessor ~ Diagnostic
- AudioAnalog ~ Diagnostic

With Option 1S installed, the following diagnostic routine is added:

- SDI ~ Diagnostic

With Option 48 installed, the following diagnostic routine is added:

- GPIB ~ Diagnostic

These added routines check the analog and digital circuitry of the newly installed options. After power-on and system initialization, the Option diagnostics are accessed through the MEASURE mode menu diagnostics selections.

You can select all the diagnostic tests to run in the Diagnostics Selection file so that the option is checked when running the high level diagnostics. When high level diagnostics are run in the power-on mode, only the major headings of the routines are given with a Pass or Fail statement. Running the interactive diagnostics tests shows all the tests and results of the testing.

Option 1S

Refer to the *VM700T Video Measurement Set Service Manual* for information regarding diagnostic operation.

Option 40

Refer to the *VM700T Video Measurement Set Service Manual* for information regarding diagnostic operation.

Option 41

Refer to the *VM700T Option 01 (NTSC) & Option 11 (PAL) User Manual* or the *VM700T Video Measurement Set Service Manual* for information regarding diagnostic operation.

Option 48

Refer to the *VM700T Option 48 GPIB Interface Programmer Manual* or the *VM700T Video Measurement Set Service Manual* for information regarding diagnostic operation.

**Optional Functional Check
Option 40, 41, and 3D**

Using a test signal generator that generates the 0.33 automatic test sequence, such as the Tektronix ASG 100, run the View Audio Auto Test given in the *VM700T Option 40/41/42 User Manual*, provided with these kits.

Attach Rear Panel Label

An Options label is provided for you to affix to the rear panel. This label, as shown in Figure 22, is used to identify the installed options of the measurement set after the upgrade. Mark the label to indicate the installed option set of the upgraded measurement set. Place it on the flat surface of the recessed area below the parallel printer port (see Figure 23).

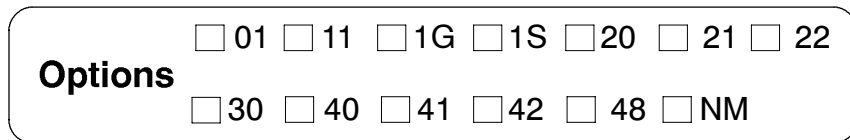


Figure 22: Option identification label

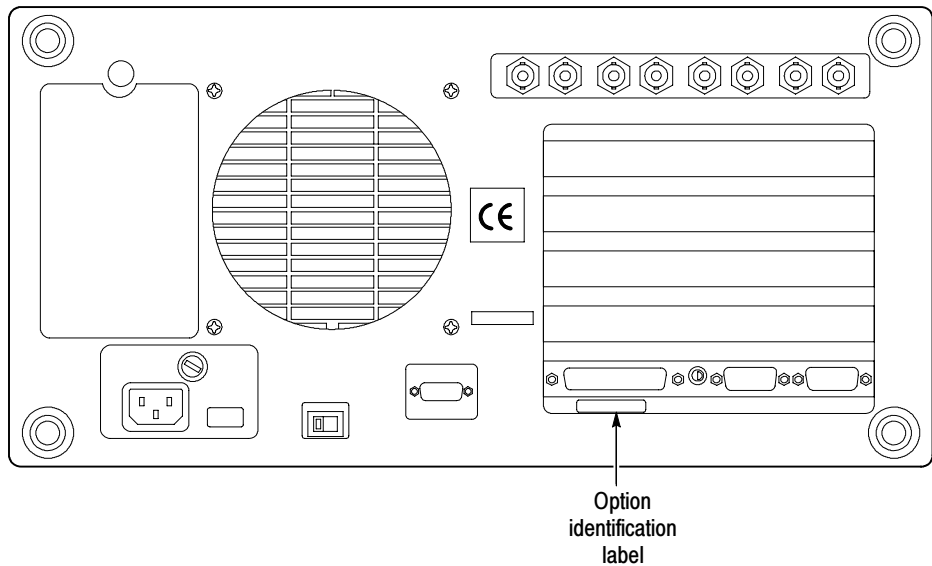


Figure 23: Measurement set rear panel showing the option label location

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