Instructions

Tektronix

050-2925-05 and above (Standard)
050-3119-04 and above (Option 74)
A14 Replacement
(Display Module Subassembly w/Touch Panel)
VM700T

075-0899-00

www.tektronix.com

075089900

Contacting Tektronix

Tektronix, Inc.
14200 SW Karl Braun Drive
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Beaverton, OR 97077
USA

For product information, sales, service, and technical support:
- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.

General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Ground the Product. This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

Kit Description

The Display Module Subassembly/Touch Panel in this kit replaces an earlier Display Module Subassembly/Touch Panel which is no longer available. The replacement assembly requires changing a capacitor on the Front Panel circuit board and several other changes. These changes will ensure instrument specifications can be met for all variations in the characteristics of the replacement Touch Panel.

This document supports Tektronix modification: 76529, TDS-338, 85579, 87971 and ECO1087.

Products

VM700T   B010100 - B052129

Minimum Tool and Equipment List

Required tools and equipment	Part number
Flat-blade screwdriver,	3/16 or 1/4 inch blade
Combination wrench or nut driver	3/16 inch
Socket wrench	1/4 inch socket
Pozidriv screwdriver	1X, 2X

Kit Parts List

Circuit/figure number	Quantity	Part number	Description
A14	1 EA	065-0640-xx	DISPLAY MODULE; W/TOUCHPANEL, VM700A (STANDARD ONLY)
A14	1 EA	065-0682-xx	DISPLAY MODULE; W/TOUCHPANEL, VM700A (OPTION 74 ONLY)
	1 EA	065-0724-xx	TOUCHSCREEN CONTROLLER BD REPL KIT; 119-6934-xx W/PACKAGING
A10A1C340	1 EA	283-0645-xx	CAP, FXD, MICA DI:790PF, 1%, 300V

Circuit/figure number	Quantity	Part number	Description
A5U14	1 EA	163-0782-xx	IC, MEMORY, COMPATIBLE WITH ELO TOUCH PANEL ASSY
	4 EA	129-1602-xx	SPACER, POST
	1 EA	174-4947-xx	POWER CABLE
	1 EA	174-4948-xx	RS232 CABLE
	4 EA	211-0503-xx	SCREW, MACHINE; 6–32 X 0.188, PNH, STL CD PL, POZ
	1 EA	407-5001-xx	BRACKET; CONTROLLER BOARD
	1 EA	614-1008-xx	FRONT PANEL BEZEL ASSY
	1 EA	063-2913-xx	SOFTWARE PKG; FIRMWARE UPGRADE,ARCHIVE 030930,FLOPPY DISKS,SET OF 6
	1 EA	075-0899–00	KIT INSTRUCTION; A14 REPLACEMENT, 050-2925-xx AND 050-3119-xx

Installation Instructions

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

⚠️ **CAUTION.** *To prevent static discharge damage, service the product only in a static-free environment. 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.*

NOTE. *Instrument upgrades and repairs should only be attempted by qualified service personnel. If you need further assistance, call your local Tektronix representative.*

⚠️ **CAUTION.** *Many components in this instrument are susceptible to static-discharge damage. Service the instrument only in a static-free environment while observing standard handling precautions for static-sensitive devices. Always wear grounded wrist and foot straps.*

Cabinet Removal

1. Remove the top and bottom cabinets from the instrument. Refer to Figure 1.

2. Remove the left and right side cabinets. The side cabinets are removed in the same manner as the top cabinet.

3. Position the instrument as shown in Figure 2.
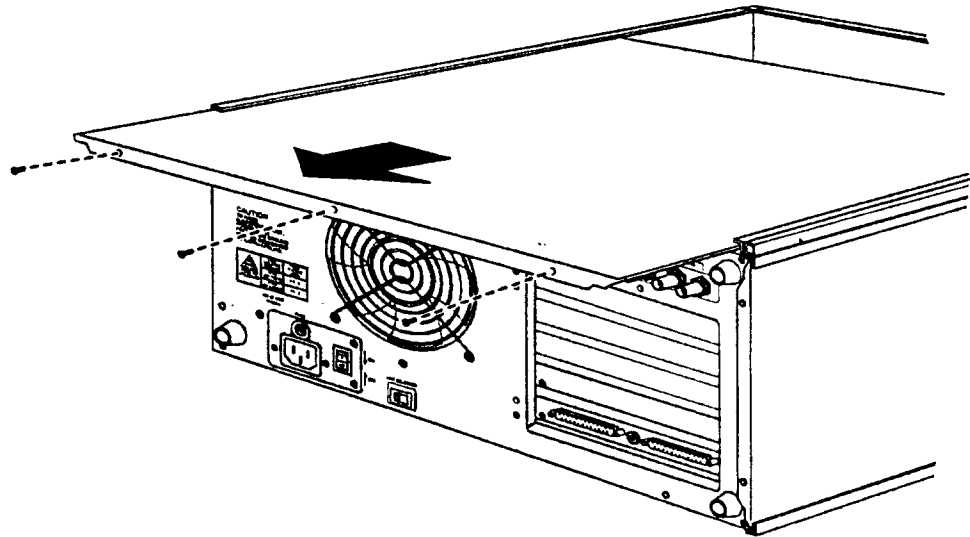
Figure 1: Rear view of the VM700A showing top cabinet removal

Display Subassembly Removal

1. Remove the four screws that attach the display subassembly to the instrument chassis. Black arrows in Figure 2 show the screw locations.

2. Remove the bezel attaching screw in the location indicated by the larger arrow in Figure 2. (The screw is located behind the front panel.) Do not remove the other three bezel attaching screws at this time.

3. Position the instrument to rest on the bottom.

4. Remove the remaining three bezel attaching screws. The three screws are located near the outer edge of the bezel, midway between each corner.
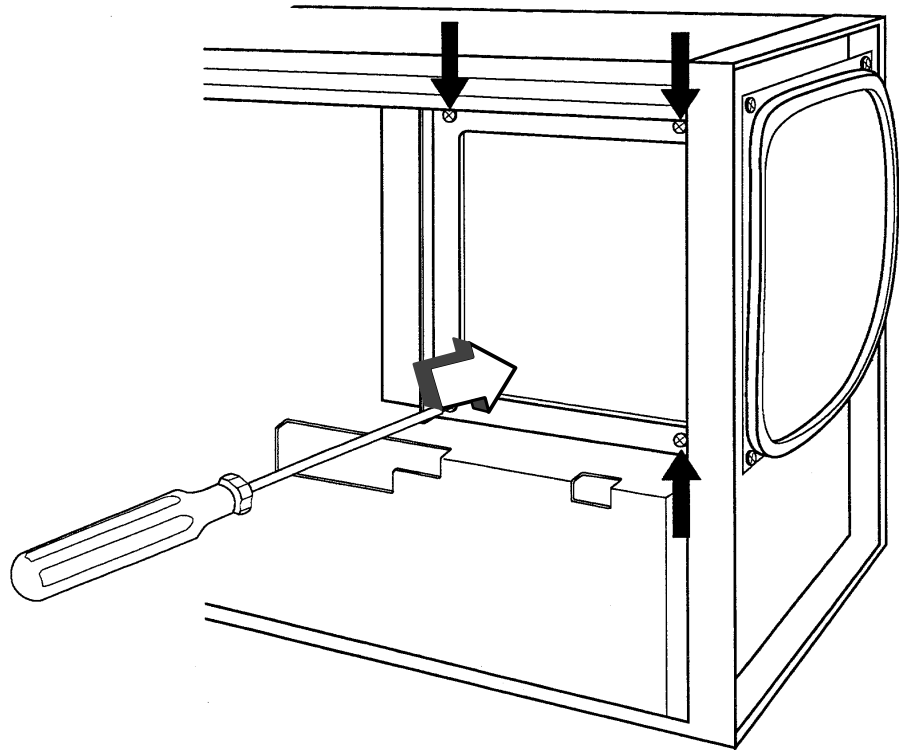
Figure 2: Bottom view showing monitor attaching screws and approximate location of bezel attaching screw

5. Carefully lift off the bezel. As the bezel is separated from the front of the instrument, disconnect the POWER connector from the On/Off circuit board. Note the orientation of the connector. Pin one is indicated with a dot on the connector housing.

   a. From the circuit side of the STBY/ON switch, remove the two nuts holding the switch assembly to the bezel. See Figure 3.

   b. Separate the switch and its front plate from the bezel.

   c. Discard the bezel; you will replace it with the new one provided in the kit.

Key board
bracket
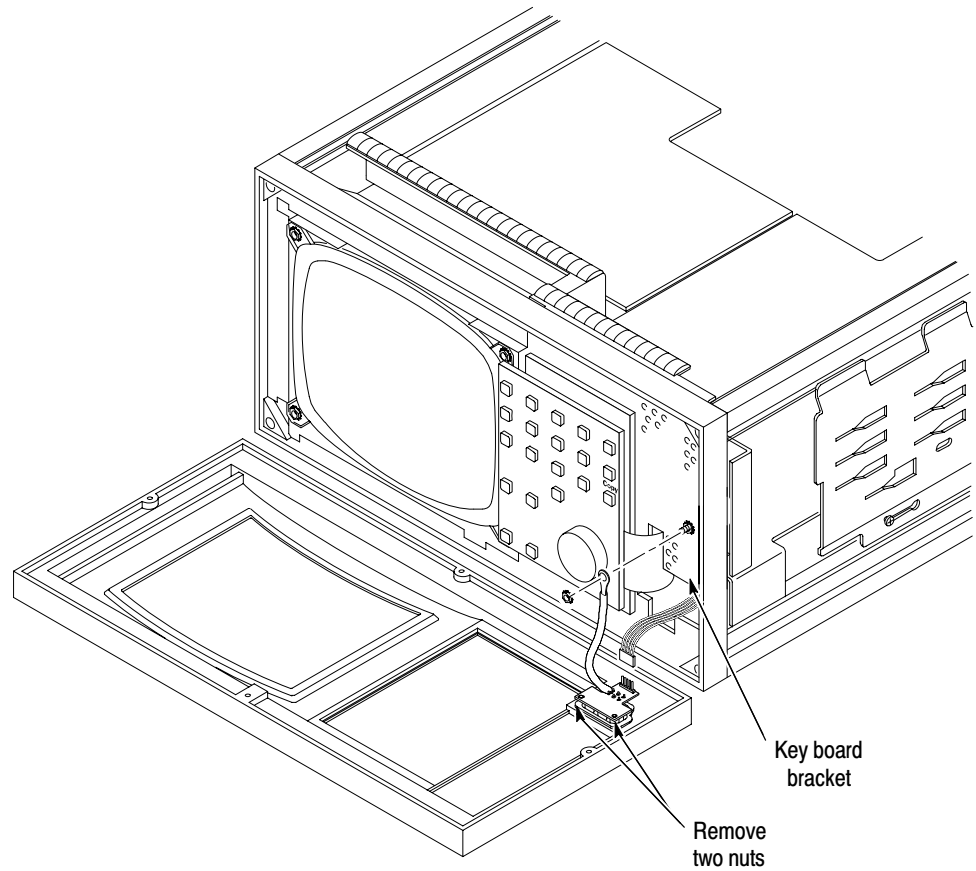
Remove
two nuts

Figure 3: Disconnecting the STBY/ON switch

**Remove the Card Cage
Retainer**

6. Remove the Card Cage Retainer from the right side by following these steps:

   a. Loosen, but do not remove, the two screws on the front of the card cage
   retainer (see Figure 4).

Loosen screws (2).
Slide the retainer to the left,
and then remove the retainer.

Figure 4: Loosening the screws on the right card cage retainer

    b. Slide the retainer carefully to the left until the screw heads clear the slots, and then remove the retainer to expose the CPU board for removal.

    c. Disconnect the interconnection cable at J9 on the CPU board.

7. Remove the screws attaching the Key board bracket to the cabinet frame. See Figure 5.

8. Lift out the Front Panel/Key board assembly.

Figure 5: Removing the retaining screws from the Keypad board

9. Unplug the Touch Panel connector at J933 (on the Front Panel circuit board) and remove the ground wire from beneath the circuit board attaching screw. Refer to Figure 6 for component locations.
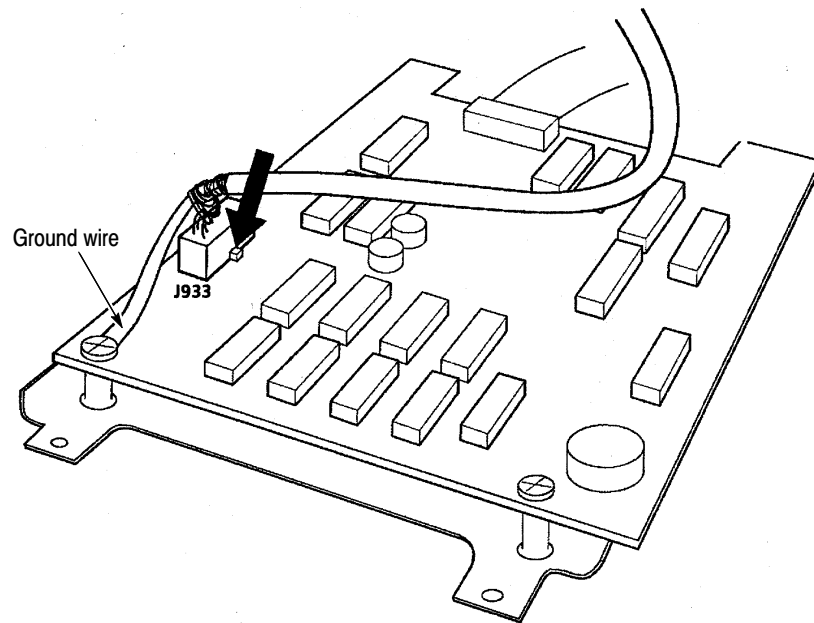
Figure 6: Front Panel circuit board assembly (VM700 shown) showing cabling and proper alignment of multi-pin connector

10. VM700A - Remove the EMI shield from the front border of the CRT chassis. Refer to Figure 16 on page 23 for location.

11. Remove the display subassembly. As the assembly is removed, unplug the multi-conductor cable from the rear of the module.

Modular Subassembly Installation

1. Install the new display subassembly in the chassis; at the same time, plug in the multi-conductor cable.

2. VM700A - Install the EMI shield removed earlier.

Front Panel Circuit Board Change

1. Replace C340 with the 790 pF capacitor provided in the kit.

Figure 7: Front Panel circuit board showing location of C340

Assemble Keypad and Keypad Controller

2. Install the new power cable (Tektronix part number 179-4947-xx) onto the back of the Keypad board (Tektronix part number 679-3620-xx) as follows:

    a. Remove the solder from the hole near fuse F890 that is marked +5V and solder the red wire from the new power cable into this hole. See Figure 8.
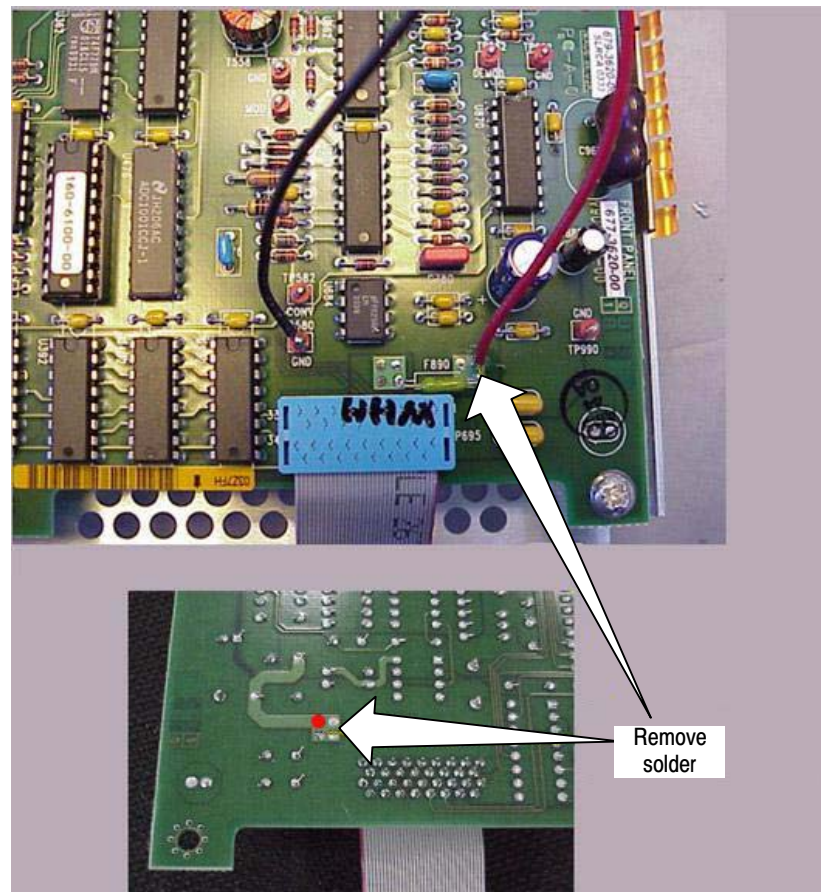
Figure 8: Solder Power cable to Keypad board

    b. Wrap and solder the black wire from the new power cable to TP580 (ground terminal).

3. Install the new Touch Panel Controller board assembly (Tektronix part number 119-6934-xx) to the Keypad board assembly as follows:

a. Remove four screws from the Keypad board (see Figure 9) and install the four standoffs (Tektronix part number 129-1602-xx) into the holes. Torque the standoffs to 8 in−lbs, using a 1/4 inch socket.
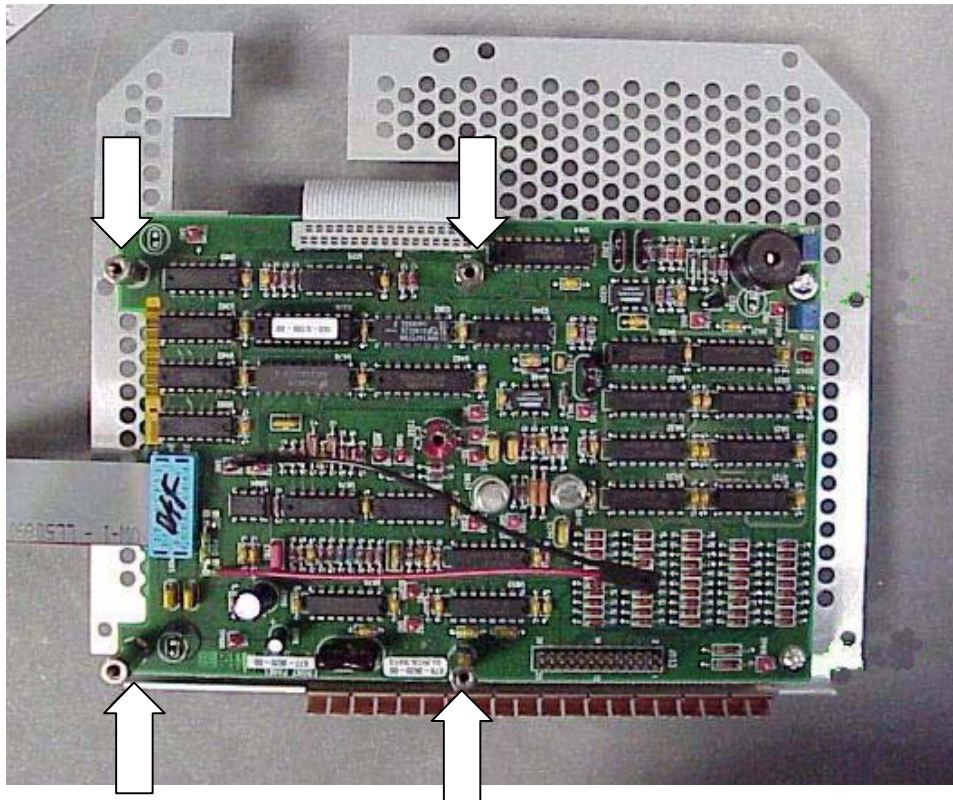
Figure 9: Standoff locations

b. Secure the Touch Panel Controller board to the bracket (Tektronix part number 407-5001-xx), using the four screws (Tektronix part number 211-0503-xx). See Figure 10.
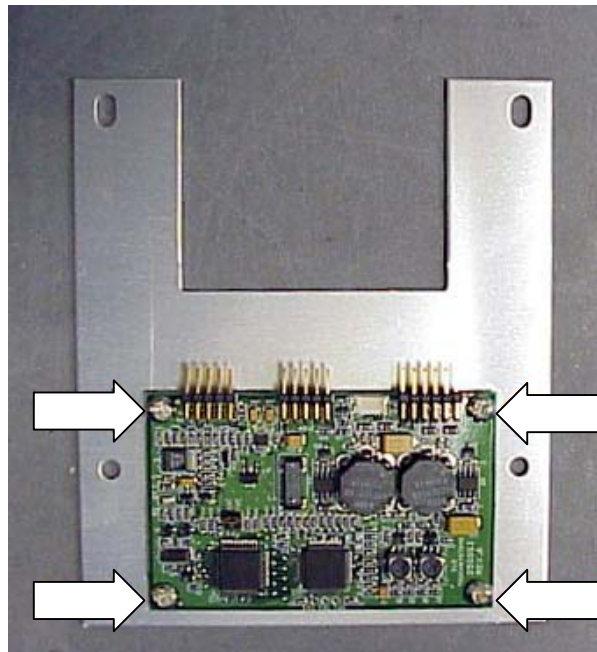
Figure 10: Installing the Touch Panel Controller board to the bracket

⚠️ **CAUTION.** *Install the cables as instructed. If cables are installed incorrectly, the instrument may be damaged.*

    c. Install the non-keyed end of the new RS232 cable (Tektronix part number 174-4948-xx) to the P2 connector on the Touch Panel Controller board. The cable connects to the top row of pins on the connector, with the yellow wire to the outside. See Figure 11.
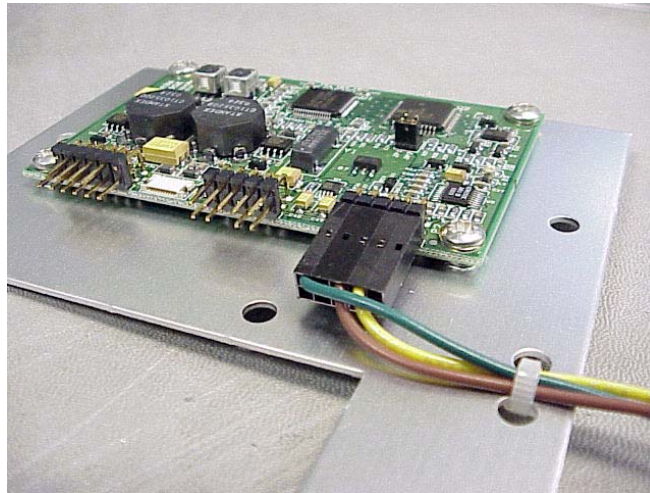
Figure 11: Connecting the RS232 cable to the Touch Panel Controller board

    d. Install the 2–pin connector of the new power supply cable (Tektronix part number 179-4047-xx) to connector P1 on the Touch Panel Controller board. Place the black wire closest to the bracket, and the red wire in the upper position, above the black wire. See Figure 12.
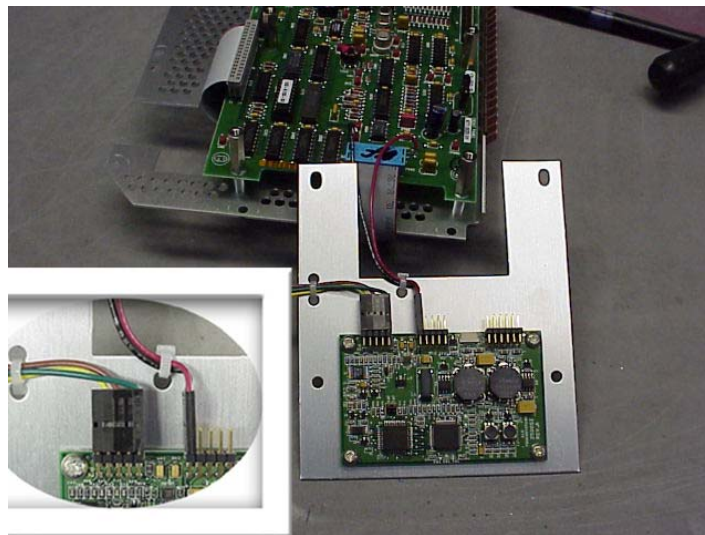
Figure 12: Connecting the power supply cable to the Touch Panel Controller board

    e. Fasten the two cables to the bracket using cable ties as shown in Figure 12. Cut off the end of the cable ties.

f. Position the Touch Panel Controller board and bracket assembly on the standoffs on the Keypad board (see Figure 13).

g. Secure the bracket to the standoffs using the four screws (Tektronix part number 211-0510-xx). Torque to 8 in-lbs.
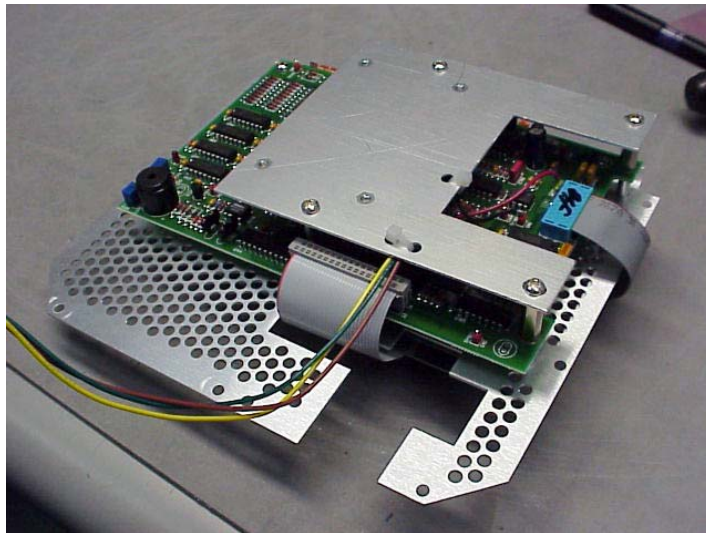
Figure 13: Attaching the Touch Panel Controller assembly to the Keypad board
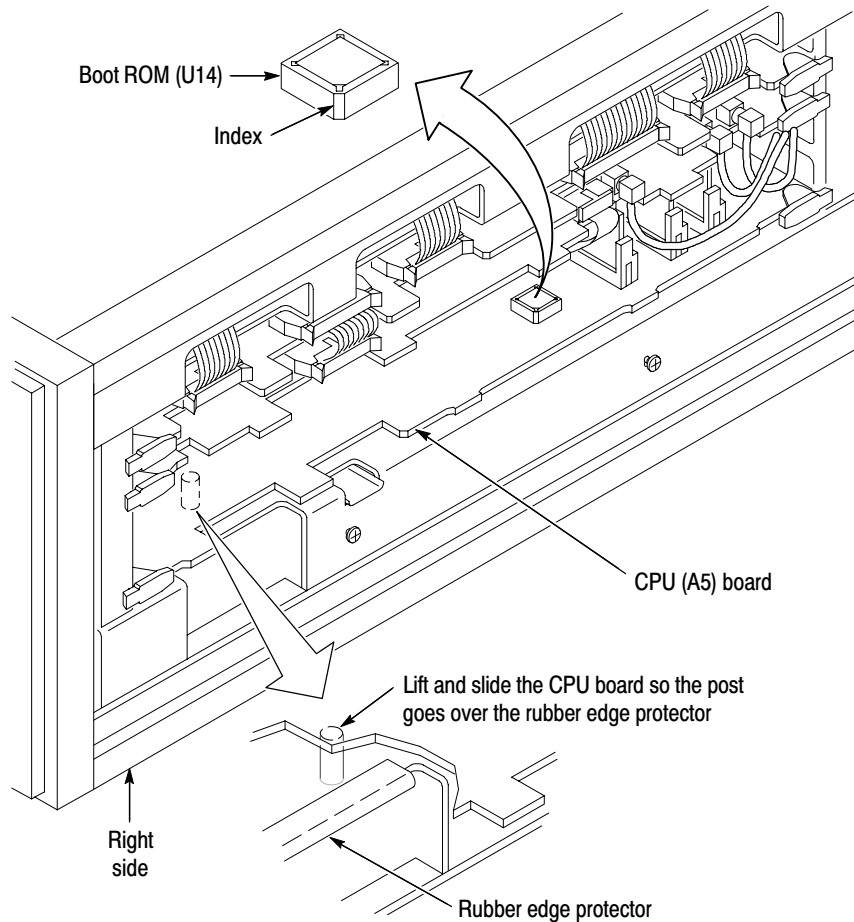
Replace the Boot ROM (A5U14)

4. Install the supplied Boot ROM (A5U14) on the CPU (A5) circuit board as follows:

⚠ *CAUTION. To prevent damage, use an 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.*

a. Use the board ejector tabs to release the CPU (A5) circuit board.

b. Slide the CPU (A5) circuit board out until you can reach the Boot ROM (A5U14). You may need to lift the CPU (A5) circuit board over a board post located below the board (see Figure 14).

c. Remove the existing Boot ROM (A5U14) using an extraction tool, and replace it with the supplied Boot ROM (A5U14) on the CPU (A5) circuit board as shown in Figure 14. Note the index on the corner of the Boot ROM (A5U14).

Figure 14: Replacing the Boot ROM

     d. Slide the CPU (A5) circuit board into the card cage, and press firmly to seat the interboard connector.

Replace the Keypad Board Assembly

5. Replace the Keypad board assembly as follows:

     a. Attach the touch panel cable to J933 on the Keypad board assembly. The key on the plug should be towards the shield. Make sure to route the cable outside of the standoffs. See Figure 15 on page 19.

     b. Route the new RS232 cable alongside the flat ribbon cable that connects the Keyboard assembly to J9 on the CPU board. Connect the keyed end of the RS232 cable to J5 on the CPU board.
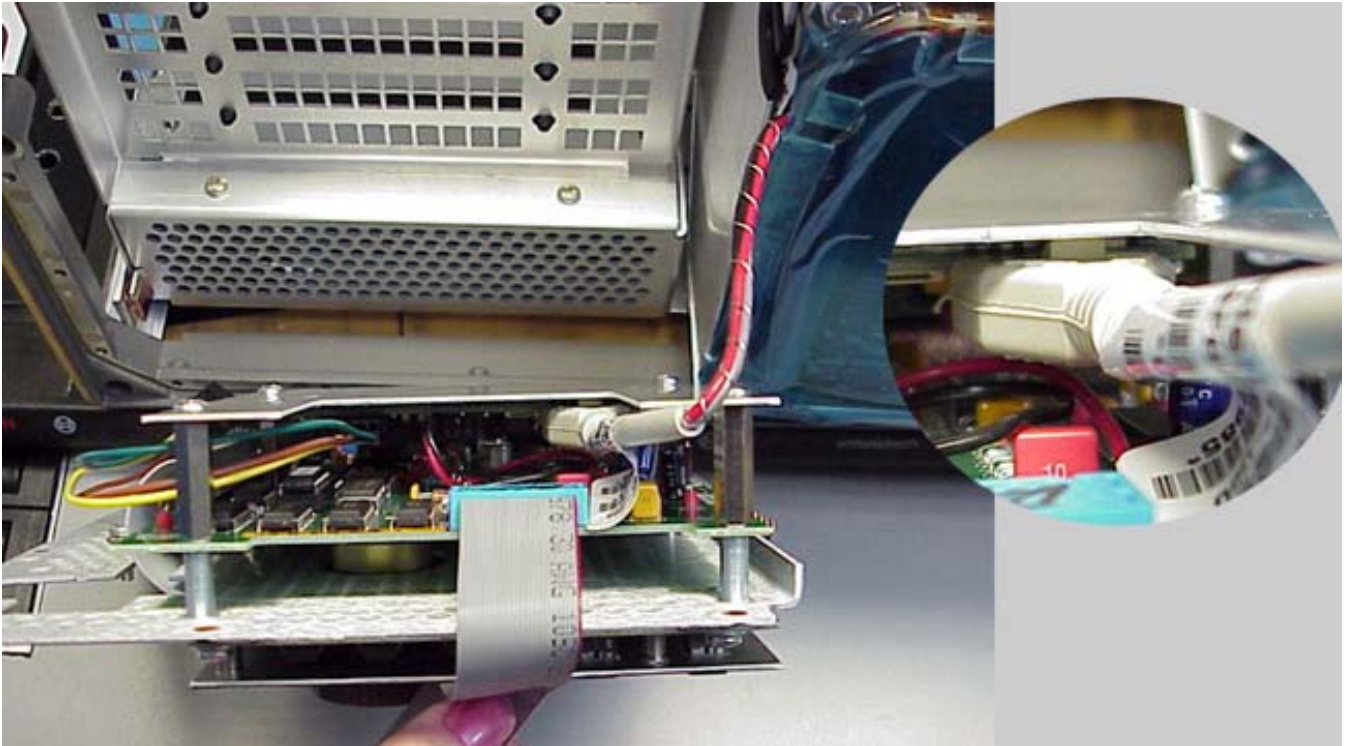
Figure 15: Installing the Keypad board assembly (bottom)

    c. Install the Keypad board assembly on the instrument. Make sure that the Touch Screen cable is free from interference with the chassis.

    d. Install and tighten the flat-head screws that hold the Keypad board assembly bracket to the instrument front frame. (See Figure 5 on page 10.)

    e. Replace the right-side card cage retainer. (See Figure 4 on page 9.)

Replace the CRT Bezel   **6.** Install the new CRT bezel (included in the kit) as follows:

    a. Install the STBY/ON switch (that you removed from the old bezel) into the new bezel.

    b. Position the new CRT bezel near the instrument front panel.

    c. Connect the 5-connector cable from the instrument to the STBY/ON switch in the new CRT bezel.

    d. Connect the ground strap ring from the STBY/ON switch to the keyboard bracket. (See Figure 3 on page 8.) Reinstall and tighten the nut that holds the ground strap ring in place.

A14 Replacement   **19**

  e. Place the bezel on the front frame.

NOTE. *Use care in tightening the bezel retaining screws. The threaded bezel inserts can be stripped from the bezel if the screws are over-tightened.*

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  f. Reinstall and tighten the four screws that hold the bezel to the front frame.

Replace the Card Cage Retainer

7. Replace the card cage retainer by following these steps:

  a. Connect the interconnection cable at J9 on the CPU board.

  b. Place the card cage retainer onto the two screws, and slide it to the right (see Figure 4 on page 9).

  c. Tighten the two screws on the front of the card cage retainer.

Replace the Cover Panels

8. Replace the top and bottom panels, and the left and right side panels by guiding them into the chassis grooves, sliding them all the way to the front of the instrument, and installing the screws.

Upgrade Firmware

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-xx)	

[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.

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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.

1. 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.

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.

Verify Operation

1. After installing a new touch panel, perform the following procedures, which are provided in the *VM700T Video Measurement Set Service Manual:*

   ■ Adjustment procedure steps pertaining to the touch panel

   ■ Performance Verification procedure

NOTE. *Panel calibration values vary greatly depending on the version of touch panel that is installed in your instrument. Sample values shown in the service manual are typical of older touch panels; your results can vary significantly.*
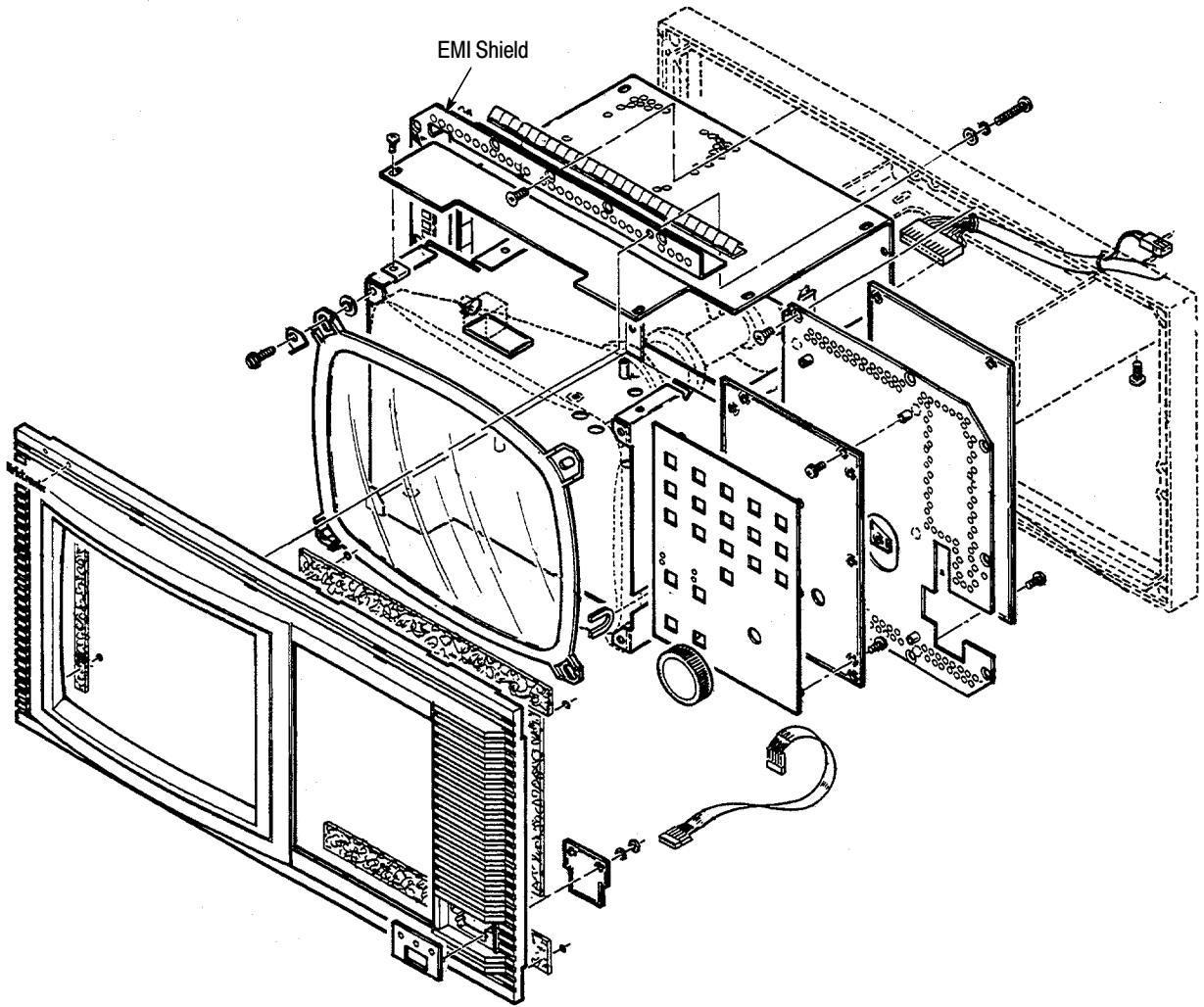
EMI Shield

Figure 16: Partial VM700/A exploded view

■■   **End of document**   ■■