



Instructions

2220 F10/2220 F12

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INTRODUCTION

DESCRIPTION

The TEKTRONIX 2220/2230 F10 (IEEE 488 GPIB) and F12 (RS-232-C) Options instruction sheet provides information on installing the selected option module to the adapted instrument. The options operating information is found in the Operators Manual (supplied with the kit). Servicing information is found in the Service Manual. Installing either the F10 or F12 Option in accordance with the following instructions allows the instrument to meet electrical and environmental characteristics stated in the respective Operators Manual and Service Manual. Should you have questions or require advise about installation, contact your nearest Tektronix Service Representative.

WARNING

The battery used in 2230 F10/2230 F12 Option contains lithium. Do not expose to heat. Do not short terminals. See Service manual for complete instructions.

With the selected option and the instrument properly installed in the cabinet, verify that the instrument performance will meet the electrical characteristics stated in the respective Operators Manual and Service Manual.

The following items are provided with each option:

- ✓ 1 F10 or F12 Option
- ✓ 2 Integrated Circuits (ROMs)
- ✓ 2 Mounting screws, 4-40 X 0.25 pan-head torx screws
- ✓ 2 Mounting screws, 4-40 X 0.312 flat-head torx screws
- ✓ 1 Cable Assembly
- ✓ 1 Identification tag
- ✓ 1 Nutdriver, 3/16 inch
- ✓ 1 Nutdriver, 1/4 inch ^a
- ✓ 1 Torx tip, T-9
- ✓ 1 Torx tip, T-15
- ✓ 1 IC-Removal Tool

^a The 1/4 inch nutdriver is also used as a torx tip driver by inserting the torx bits into it.

For the instrument to operate correctly the ROMs firmware version number in the instrument and the installed Option must be identical. Replace the original ROMs with the new ROMs that are shipped with the option.

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INSTALLING F10/F12 OPTION

NOTE

Installation of either the F10 or F12 Option must be performed by qualified service personal.

To install either the F10 or F12 Option into the instrument, perform the following steps:

WARNING

To avoid electric shock, disconnect the instrument from the ac-power-input source before removing or replacing the cabinet.

- ✓ 1. Disconnect the power cord from the instrument.
- ✓ 2. Use T-15 Torx tip to remove the two screws from the rear panel (located on each side) and remove it from the instrument.
- ✓ 3. Use T-15 Torx tip to remove the screw from the right-rear side of the cabinet.
- ✓ 4. Use T-9 Torx tip to remove the screw from the bottom front of the cabinet.
- ✓ 5. Use T-9 Torx tip to remove the four screws from the X-Y Plotter side panel on the left rear side of the instrument. Then remove the side panel from the instrument.
- ✓ 6. Pull the front panel and instrument chassis forward and out of the cabinet.
- ✓ 7. Disconnect the following three connectors from the rear of the X-Y Plotter circuit board.
 - a. P4110, a two-wire connector.
 - b. P6423, a four-wire connector.
 - c. P9301, a five-wire connector.
- ✓ 8. Stand the instrument on its side (X-Y Plotter Assembly up), use a T-9 Torx tip to remove two screws from the

extreme edge of the bottom of the chassis frame underneath the delay line cable. Do not remove the two screws from the Main circuit board. See Figure 1 for the location of the two screws that secure the X-Y Plotter to the bottom of the chassis frame.

NOTE

Some early instruments did not have a ground clip install on the upper chassis frame.

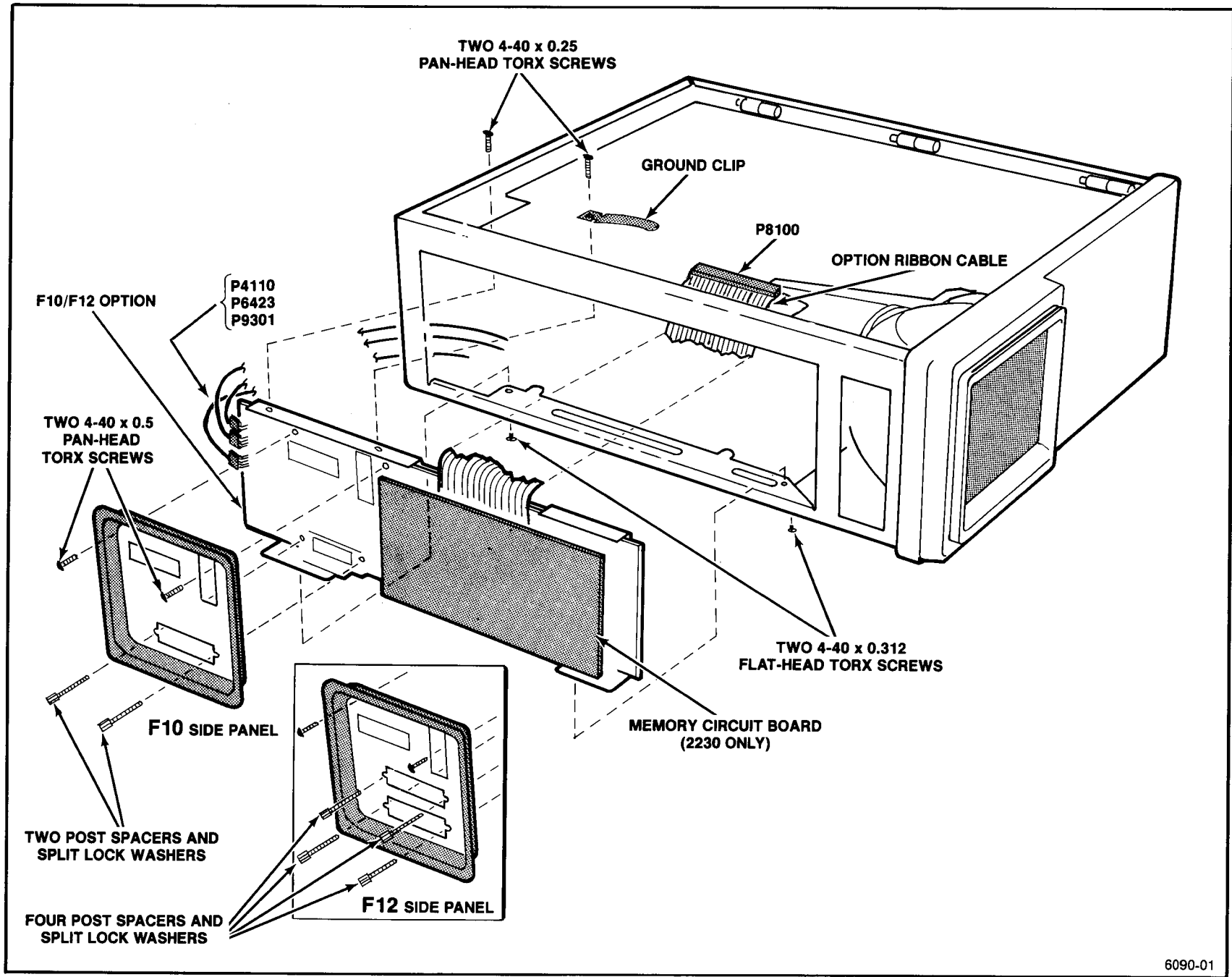
- ✓ 9. Lay the instrument down. Use a T-9 Torx tip to remove the two screws from the top of the chassis frame (located inside the two cutouts on the Storage circuit board). Note the position of the ground clip when removing the front screw from the chassis frame. See Figure 1 for the location of the ground clip and two screws that secures the X-Y Plotter to the top of the chassis frame.
- ✓ 10. Remove the X-Y Plotter Assembly from the instrument by sliding it out between the top and bottom chassis frame. Ensure that the ground clip remains in place.

NOTE

Proceed to step 12 if either the 2220 F10 or 2220 F12 Option is being installed. For 2230 instruments, proceed with step 11.

- ✓ 11. Connect two-wire connector P1152 (from the battery mounted on the rear the 2230 Option chassis) to J1152 on the Option Memory circuit board. Pins of J1152 are located inside the Option on the back of the Memory circuit board between the Option Ribbon cable and the spacer post as shown in Figure 2.
- ✓ 12. Place the option assembly next to the chassis frame in the correct orientation as shown in Figure 1 to install.
- ✓ 13. Move the Option assembly toward the front of the instrument until the ribbon cable can be inserted in the opening between the chassis frame and the Storage circuit board.

Figure 1. Installing the option into the instrument.



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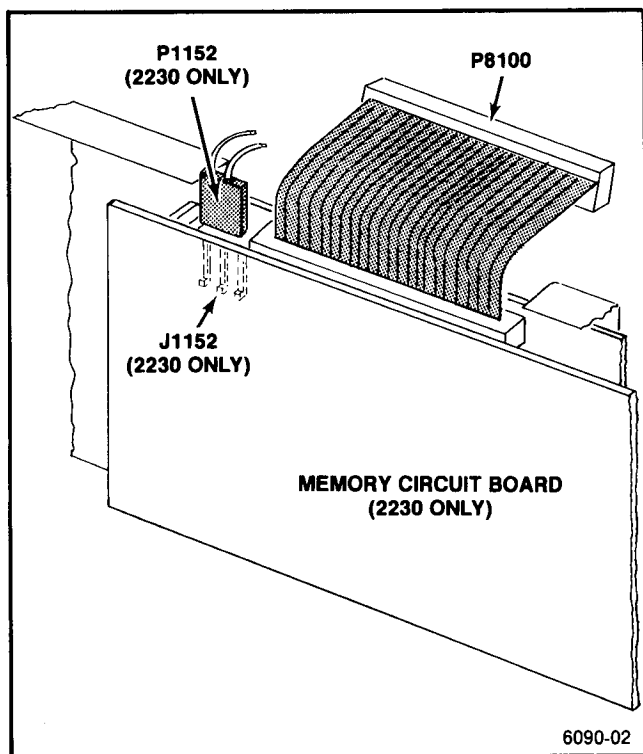


Figure 2. Location of battery connector on the Memory circuit board.

- ✓ 14. Slide the Option assembly back to permit the front to clear the chassis frame brace and push the front in. Slide the Option Assembly forward to permit the rear of the assembly to be move into place.
- ✓ 15. Reconnect the three connectors (removed in step 7) at the rear of the Option Assembly and move the rear of the assembly into place.
- ✓ 16. Align the top two mounting screw holes in the Option assembly with the holes in the chassis frame. Ensure that the hole in the ground clip remains aligned with the mounting screw hole in the chassis frame and in the position noted in step 9.
- ✓ 17. Use T-9 Torx tip to secure the Option and ground clip to the upper chassis frame with the two 4-4 X 0.25 pan-head screws supplied with the Option (see Figure 1). Do not tighten the upper screws until the lower screws are installed in step 18.
- ✓ 18. Secure Option to the lower chassis frame with the two 4-40 X 0.312 flat-head screws supplied with the Option using a T-9 Torx tip (see Figure 1). Tighten the two upper screws and the two lower screws to the chassis frame.

- ✓ 19. Connect the option ribbon cable plug (P8100) to J8100 on the Storage circuit board.

NOTE

The instrument chassis will not slide into the cabinet until the Option side panel is removed in the following steps.

- ✓ 20. Remove the pan-head torx screws (using T-9 Torx tip), post spacers (using 1/4-inch nutdriver for F10 and 3/16-inch nutdriver for F12) and washers from the Option side panel. See Figure 1 for locations of screws and post spacers of the Option side panel.
- ✓ 21. Remove the Option side panel from the instrument.
- ✓ 22. Move Jumper P9107 one pin over toward the center of the Storage circuit board as shown in Figure 3.

CAUTION

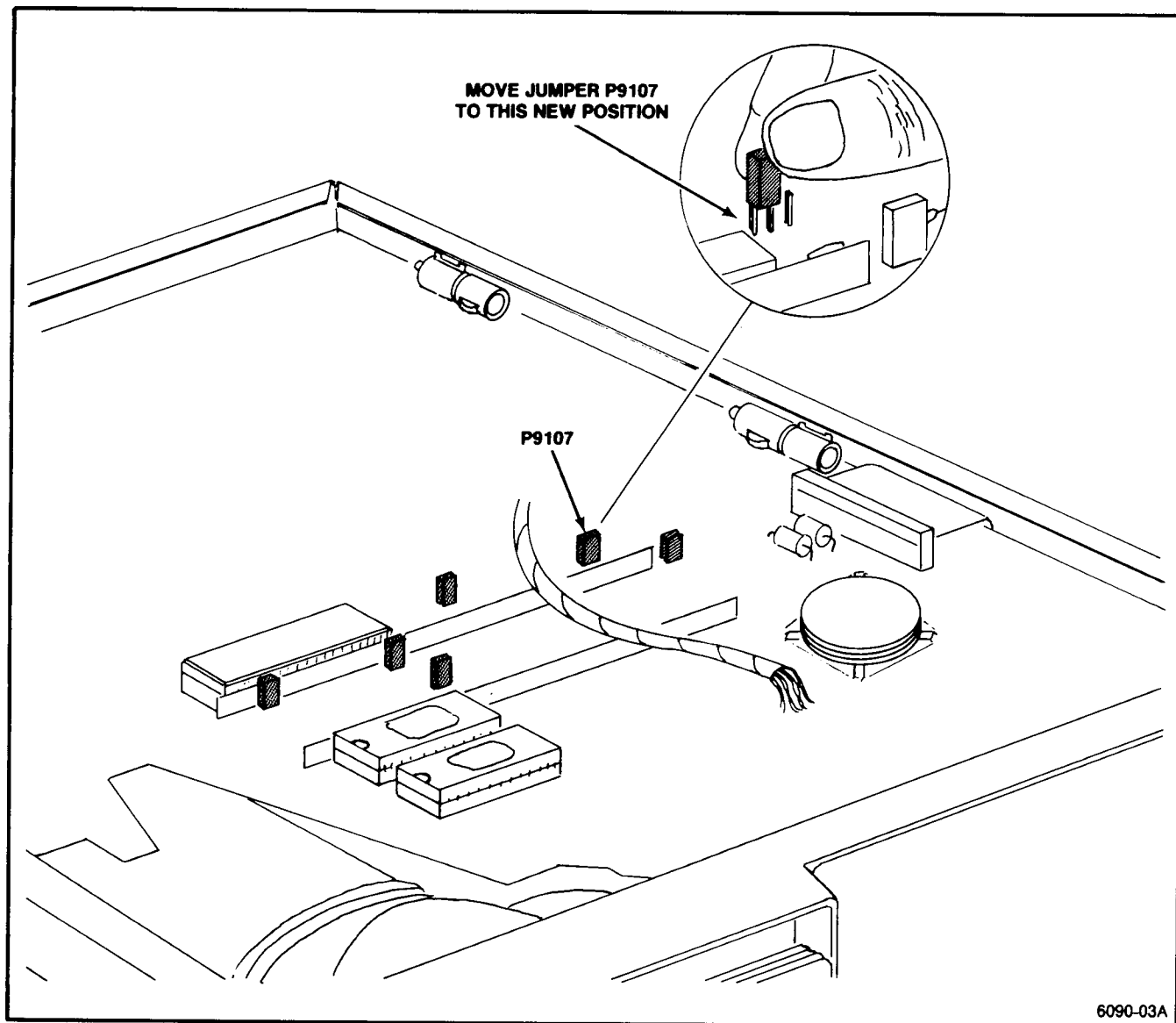
The removal and replacement of the ROMs should be performed only at a static-free work station. Discharge the static voltage from your body by wearing a grounded antistatic wrist strap while handling the ROMs. Never pick up the ROMs by their leads, always by their bodies.

- ✓ 23. Remove the two instrument ROMs (U9109 and U9110) from the Storage circuit board by using an IC-removal tool (supplied with the option). See Figure 4 for location and note the orientation of the index of the ROMs for replacement purposes.

CAUTION

The leads of the cable assembly and the replacement ROMs can be easily damaged when being installed. Use care to avoid bending or breaking the leads.

- ✓ 24. Install the cable assembly to the U9109 socket on the Storage circuit board as shown in Figure 4. Ensure that the lead from the cable assembly is toward the left side of the instrument (installed Option).
- ✓ 25. Connect either P1216 (F12 Option) or P1316 (F10 Option), a single wire connector, from the cable assembly to either J1216 (F12 Option) or J1316 (F10 Option) located near the upper-front edge of the circuit board on the Option as shown in Figure 4.



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Figure 3. Location of jumper P9107 on the Storage circuit board.

26. Install the two ROMs shipped with the Option into sockets U9109 and U9110 on the Storage circuit board noting the index of the two ROMs (See Figure 4). To determine where to install the two ROMs, compare the part number on the ROMs with the part number given in Table 1.

Table 1
ROMs Part Numbers

Instrument Type	IC Circuit Numbers	
	U9109	U9110
2220	160-3976-XX	160-3975-XX
2230	160-3633-XX	160-3532-XX

The installment of the Option into the instrument is now completed.

CAUTION

There is limited clearance for components and wiring harness on the Storage circuit board. To avoid damage when installing the cabinet, carefully guide the components and cable harness under the front lip of the cabinet when sliding the instrument chassis into the cabinet.

27. Slide the instrument chassis into the cabinet from the front until the cabinet is fully into the front-panel groove and the rear of the cabinet is flush with the rear of the chassis (removed in step 6).

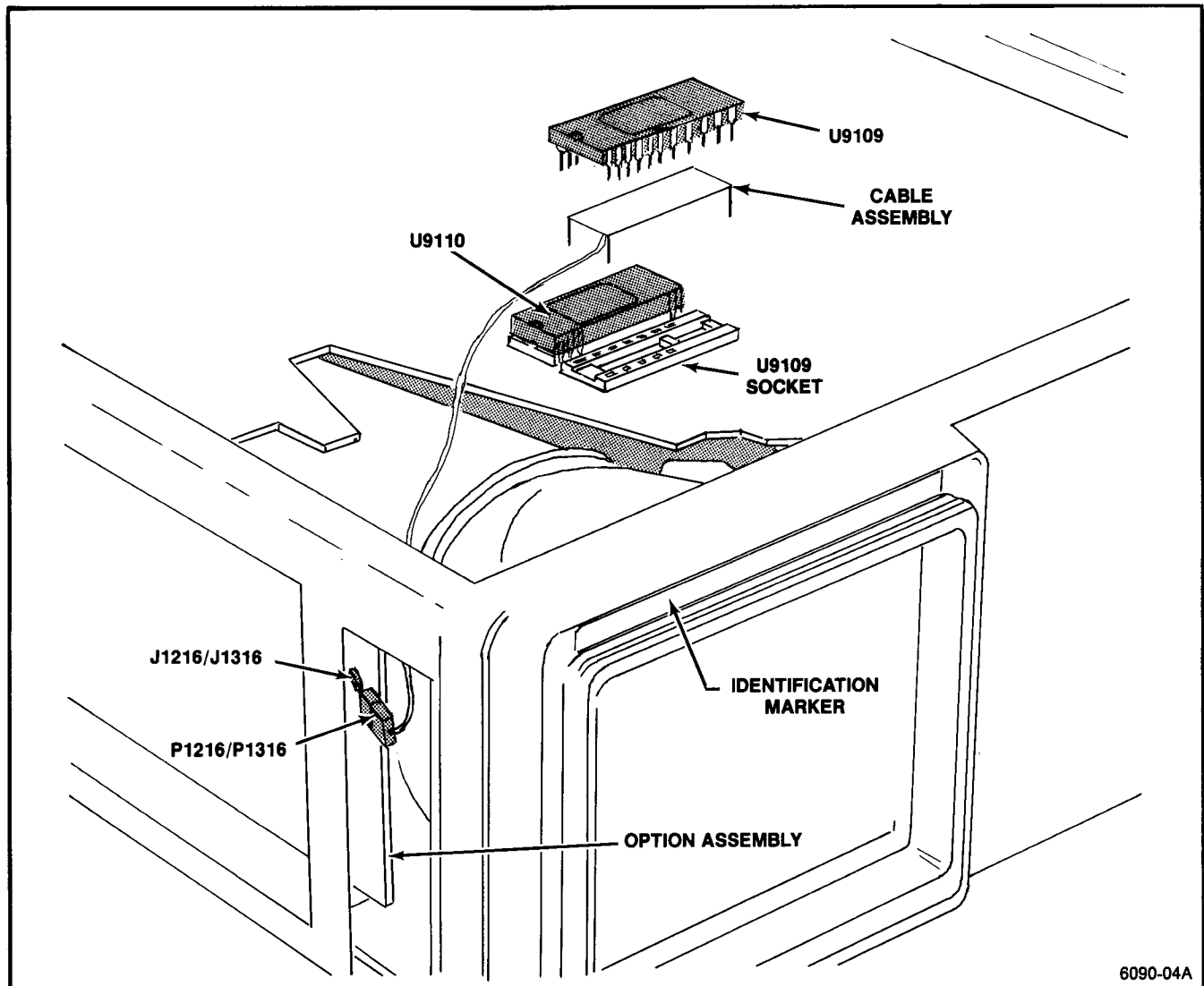


Figure 4. Locations of the ROMs, cable assembly, connector, and identification marker.

- ✓ 28. Reinstall two screws to the right-rear side and bottom of the cabinet (removed in steps 3 and 4).
- ✓ 29. Reinstall two screws securing the rear panel to the instrument (removed in step 2).
- ✓ 30. Reinstall the Option side panel and the hardware removed in steps 20 and 21.
- ✓ 31. Reconnect the power cord (removed in step 1).
- ✓ 32. Remove the instrument Identification Marker from above the crt frame (Figure 4). Use a small sharp pointed tool to lift up one corner of the Identification Marker and peel it away from the crt frame. Ensure that all the adhesive material is removed from the identification slot.
- ✓ 33. Remove the backing from the new Identification Tag (shipped with the F10/F12 Option) and install it in the identification slot.
- ✓ 34. Refer to the Option Information in either the Operators Manual or the Service Manual of the instrument to verify that either the F10 or F12 Option operates properly.