Instructions

Tektronix

040-1710-00 and 040-1711-00
Product Hardware Upgrade
SPG600 & SPG300 Sync Pulse Generators

075-0868-00

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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075086800

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Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* in the product service manual or the user manual.

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, disconnect the mains power by means of the power cord or, if provided, the power switch.

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 provides parts and instructions to replace and add the following parts on the SPG300 and SPG600 sync pulse generators to reduce operating sound of the fan:

- Replace a fan guard
- Add spacers between the fan and fan guard
- Replace nine SMD resistors on the Main board

This document supports Tektronix modification: ECO 1656.

Products

SPG300	J300164 and below, J300166-J300168, and J300171
SPG600	J300183 and below, and J300185-J300194

Minimum Tool and Equipment List

Required tools and equipment	Description
Screwdriver handle (magnetic)	Accepts Phillips-driver bits
#1 Phillips tip	Phillips-driver tip for #1 size screw heads
#2 Phillips tip	Phillips-driver tip for #2 size screw heads
Nut driver 5 mm	----------
Soldering iron	----------
Desoldering pump or desoldering braid	----------
Tweezers	----------

Kit Parts List

Circuit/figure number	Quantity	Part number	Description
040-1710-00 (SPG300)			
R174,R175, R222,R224, R231,R233, R239,R240, R242	9 ea	321-5620-00	RES, FXD, FILM: 43.2OHM, 0.1%, 62.5mW
-----	1 ea	200-4943-00	FAN GUARD
-----	2 ea	211-A235-00	SCREW, MACHINE: M3X50mm L
-----	2 ea	129-1615-00	SPACER, POST
-----	1 ea	334-1377-50	MARKER, IDENT: MARKED 040-1710-00
-----	1 ea	NS	MARKER, IDENT: MARKED 671-5777-01
-----	1 ea	075-0868-XX	MANUAL, TECH, INSTRUCTIONS: SPG600 & SPG300 UPGRADE KIT
040-1711-00 (SPG600)			
R530,R531, R532,R533, R534,R535, R536,R537, R538	9 ea	321-5620-00	RES, FXD, FILM: 43.2OHM, 0.1%, 62.5mW
-----	1 ea	200-4943-00	FAN GUARD
-----	2 ea	211-A235-00	SCREW, MACHINE: M3X50mm L
-----	2 ea	129-1615-00	SPACER, POST
-----	1 ea	334-1377-50	MARKER, IDENT: MARKED 040-1711-00
-----	1 ea	NS	MARKER, IDENT: MARKED 671-5773-01
-----	1 ea	075-0868-XX	MANUAL, TECH, INSTRUCTIONS: SPG600 & SPG300 UPGRADE KIT

NS-Not Saleable

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 *SPG600 & SPG300 Sync Pulse Generators Service Manual* (Tektronix part number 071-1342-XX).

WARNING. *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.*

These installation instructions consist of three main processes for each product (SPG600 or SPG300):

- Replacing a fan guard and adding spacers between the fan and fan guard
- Replacing nine resistors on the Main board
- Verifying instrument performance after the kit components are installed

Replacing a Fan Guard and Adding spacers (SPG600)

Perform the following procedure to replace a fan guard and add spacers between the fan and fan guard:

Removing the Top Cover

1. Disconnect all external cables and the power cord from the SPG600 rear panel.
2. Use a screw driver with a #2 Phillips tip to remove the sixteen screws securing the top cover to the chassis and remove the cover. See Figure 1.

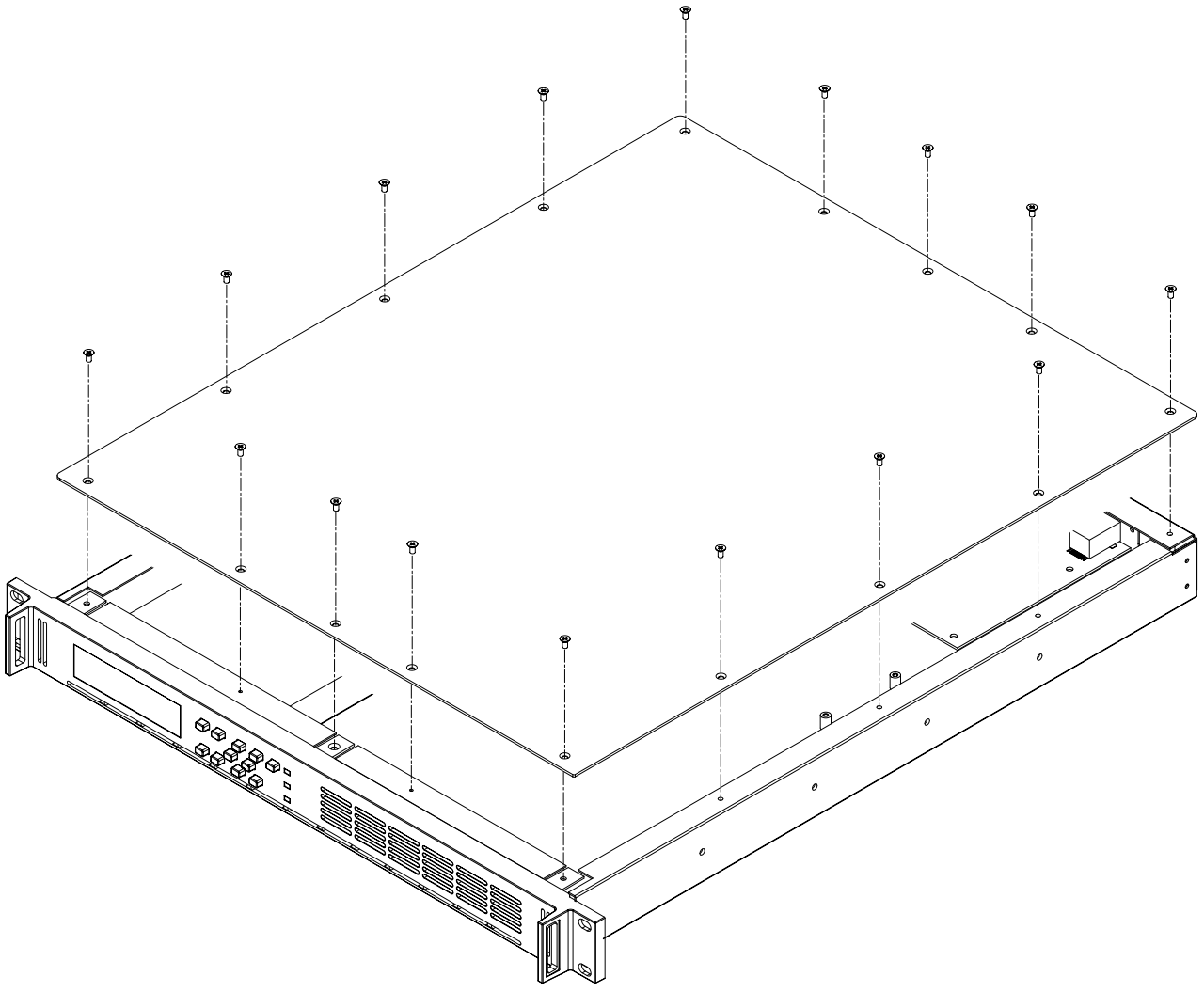

Figure 1: Removing the top cover

Removing the Power Supply Shield with the Fan

3. Unplug the fan's power cable from J5 on the A10 Main board
4. Unplug the cable from J900 on the A10 Main board.
5. Unplug the cable from CN1 on the power supply.
6. Use a screwdriver with a #2 Phillips tip to remove the four screws securing the power supply shield. See Figure 2.
7. Lift the shield with the fan up and away from the chassis.

Removing the Fan and Fan Guard

8. Use a screw driver with a #2 Phillips tip to remove the two screws securing the fan and fan guard to the power supply shield. See Figure 2.

9. Lift the fan and fan guard up and away from the shield.

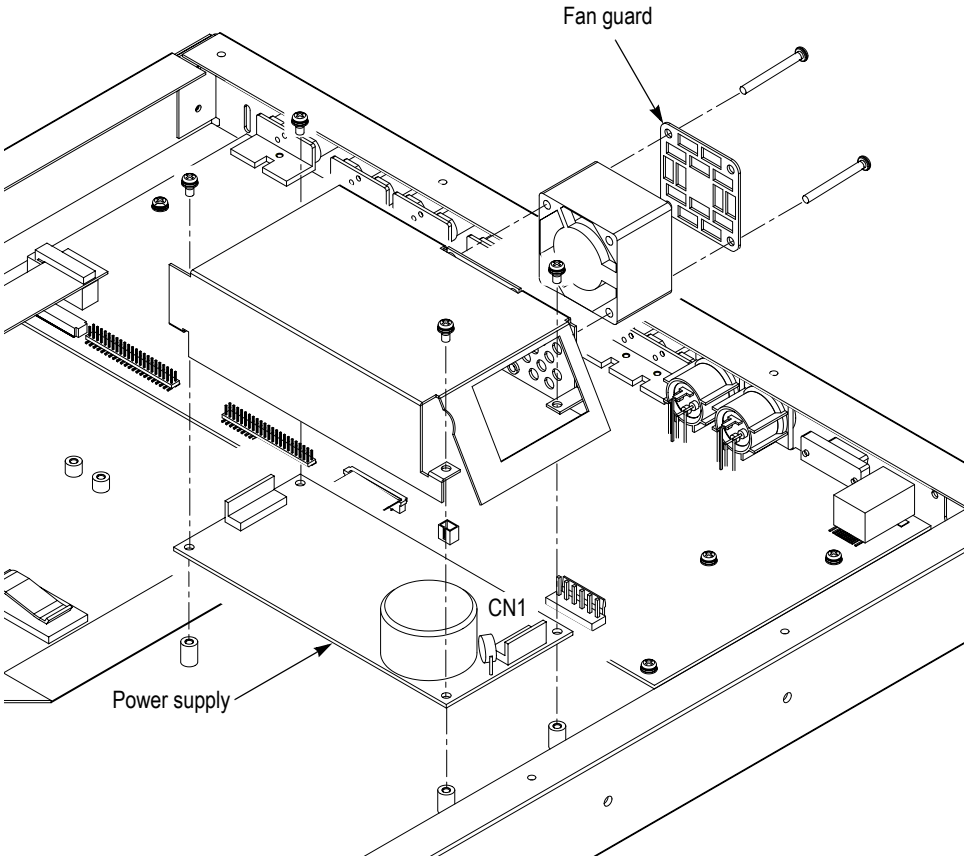

Figure 2: Removing the fan and fan guard

Installing the Replacement Fan Guard and Spacers

10. Position the replacement fan guard and two spacers provided in the kit as shown in Figure 3.

11. Secure the fan guard and spacers to the power supply shield using two screws provided in the kit. See Figure 3.

12. Secure the bottom of the fan to the power supply shield using one of the screws removed in step 8. See Figure 3.

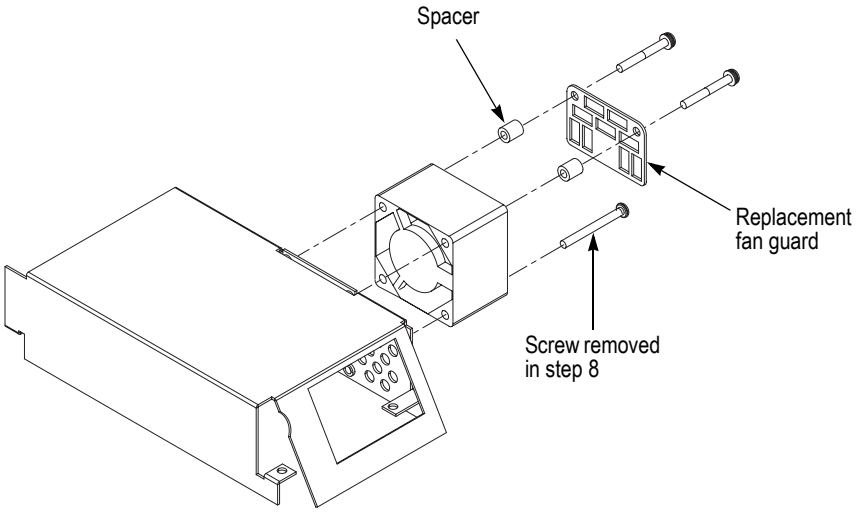

Figure 3: Installing the replacement fan guard and spacers

Replacing Nine Resistors on the A10 Main Board (SPG600)

Perform the following procedure to replace resistors R530, R531, R532, R533, R534, R535, R536, R537, and R538 on the A10 Main board:

Removing the A30 Analog Board (Option 02 Only)

1. Use a screwdriver with #1 Phillips tip to remove the two screws securing the A30 Analog board to the rear of the chassis. See Figure 4.
2. Use a screwdriver with #2 Phillips tip to remove the two screws securing the A30 Analog board to the bottom of the chassis. See Figure 4.
3. Unplug the flat cable from J600 on the A10 Main board.
4. Lift the board up and away from the chassis, and then place it on a static free surface.

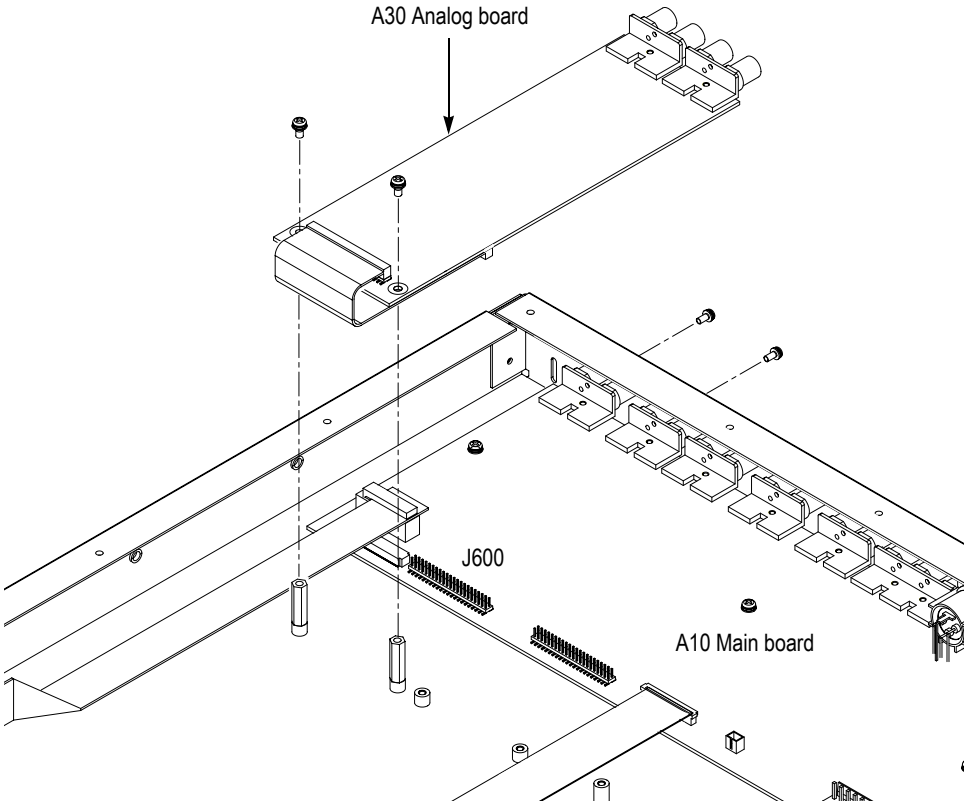

Figure 4: Removing the A30 Analog board

Removing the A40 SDI Board (Option 03 Only)

5. Use a screwdriver with #1 Phillips tip to remove the two screws securing the A40 SDI board to the rear of the chassis. See Figure 5.
6. Use a screwdriver with #2 Phillips tip to remove the two screws securing the A40 SDI board to the bottom of the chassis. See Figure 5.
7. Unplug the flat cable from J610 on the A10 Main board.
8. Lift the board up and away from the chassis, and then place it on a static free surface.

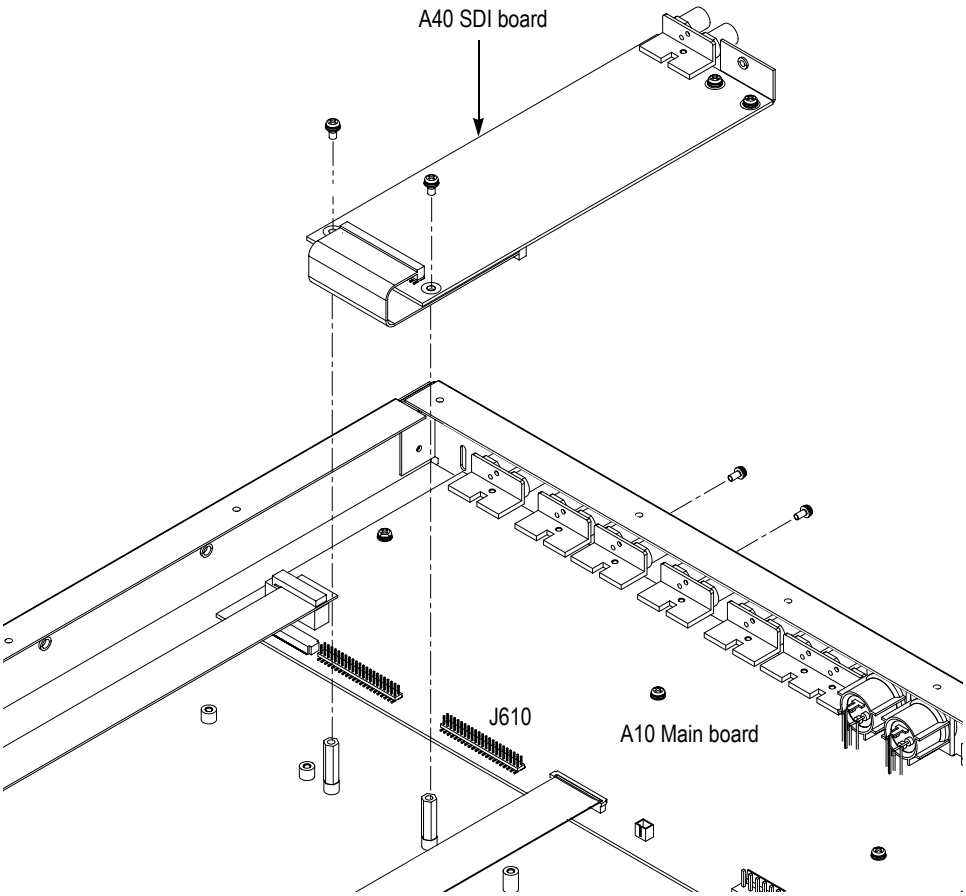

Figure 5: Removing the A40 SDI board

Removing the A10 Main Board

9. Unplug these cables:

- The cable from the LCD module at J000.
- The cable from the A20 Front-panel board at J010.

10. Use a screw driver with a #1 Phillips tip to remove the eleven screws securing the A10 Main board to the rear of the chassis. See Figure 6.

11. Use a 5 mm size nut driver to remove the two Hex-headed mounting posts securing the GPI connector to the chassis. See Figure 6.

12. Use a screw driver with a #2 Phillips tip to remove the six screws securing the A10 Main board to the bottom of the chassis. See Figure 6.

13. Lift the board up and away from the chassis, and then place it on a static free surface.

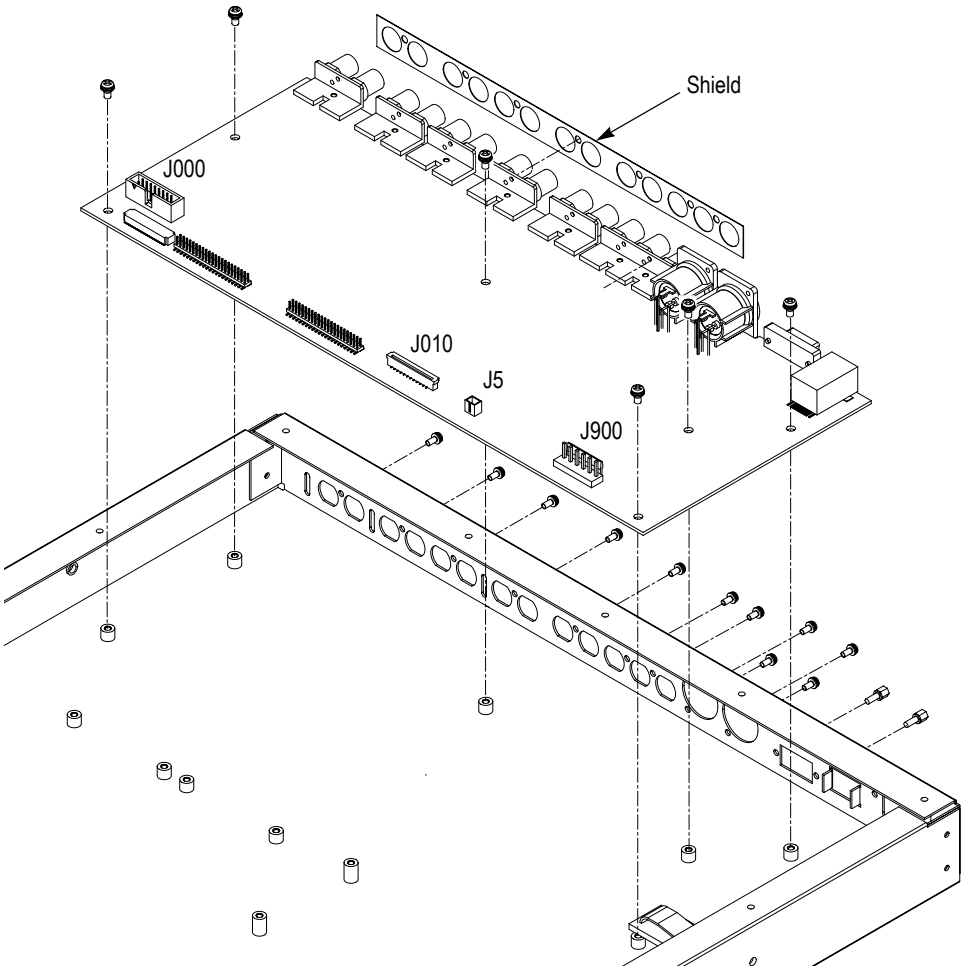

Figure 6: Removing the A10 Main board

Replacing the Resistors

14. Locate R530, R531, R532, R533, R534, R535, R536, R537, and R538 on the reverse side of the A10 Main board. See Figure 7.

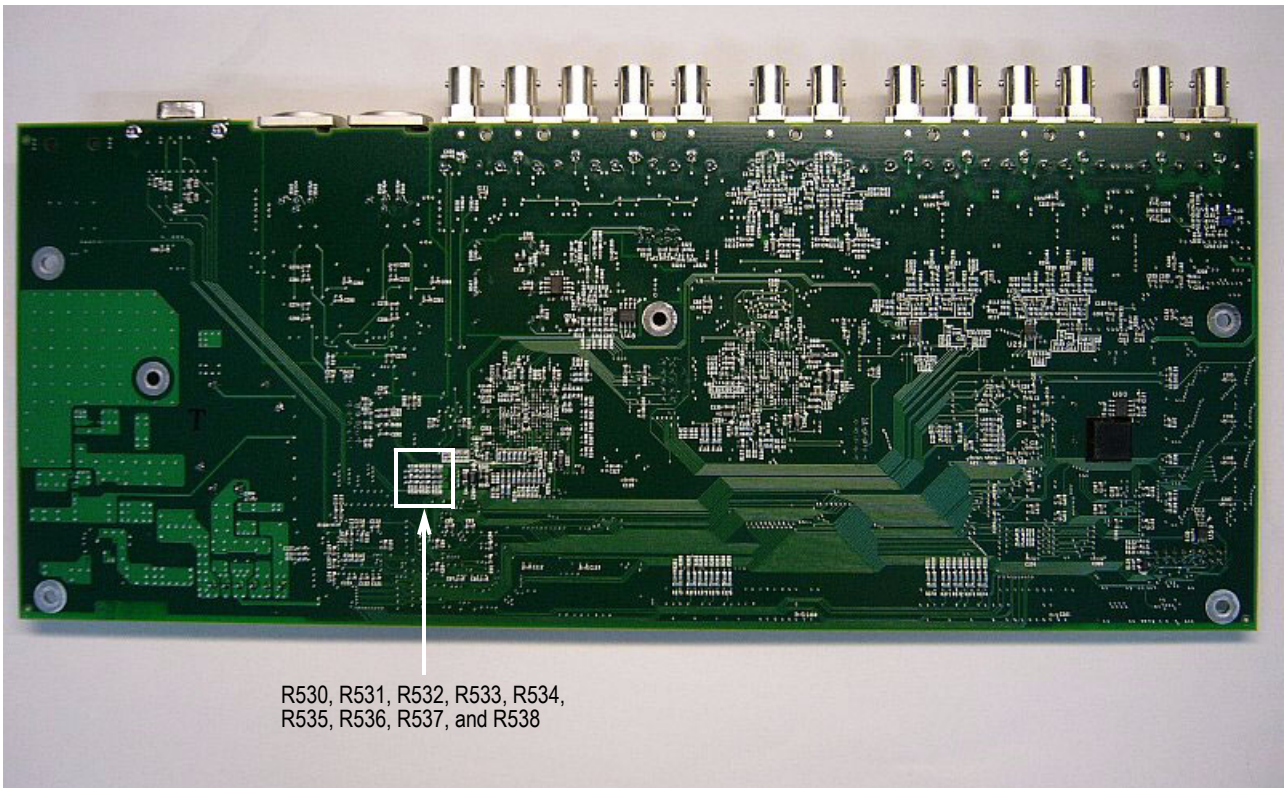

Figure 7: A10 Main board view (reverse side), showing location of the resistors

15. Unsolder R530, R531, R532, R533, R534, R535, R536, R537, and R538 from the circuit board.

16. Install the resistors provided in the kit.

17. Remove the protective backing from the label marked 671-5773-01 and apply it on the existing part number label.

Installing the A10 Main Board

18. Use a screwdriver with a #2 Phillips tip to install the six screws securing the A10 Main board to the bottom of the chassis.

19. Use a screwdriver with a #1 Phillips tip to install the eleven screws securing the A10 Main board to the rear of the chassis.

20. Use a 5 mm size nut driver to install the two Hex-headed mounting posts securing the GPI connector to the chassis.

21. Reconnect these cables:
    - The cable from the LCD module at J000.
    - The cable from the A20 Front-panel board at J010.

Installing the A40 SDI Board (Option 03 Only)

22. Reconnect the cable to J610 on the A10 Main board.
23. Use a screwdriver with #2 Phillips tip to install the two screws securing the A40 SDI board to the bottom of the chassis.
24. Use a screwdriver with #1 Phillips tip to install the two screws securing the A40 SDI board to the rear of the chassis.

Installing the A30 Analog board (Option 02 Only)

25. Reconnect the cable to J600 on the A10 Main board.
26. Use a screwdriver with #2 Phillips tip to install the two screws securing the A30 Analog board to the bottom of the chassis.
27. Use a screwdriver with #1 Phillips tip to install the two screws securing the A30 Analog board to the rear of the chassis.

Installing the Power Supply and the Shield

28. Use a screwdriver with a #2 Phillips tip to install the four screws securing the power supply and the shield to the chassis.
29. Reconnect the fan's power cable to J5 on the A10 Main board
30. Reconnect the cable to J900 on the A10 Main board.
31. Reconnect the cable to CN1 on the power supply.

Installing the Top Cover

32. Use a screwdriver with a #2 Phillips tip to install the sixteen screws securing the top cover to the chassis.
33. Remove the protective backing from the label marked 040-1711-00 and apply it to the right side of the instrument.

Replacing a Fan Guard and Adding spacers (SPG300)

Perform the following procedure to replace a fan guard and add spacers between the fan and fan guard:

Removing the Top Cover

1. Disconnect all external cables and the power cord from the SPG600 rear panel.
2. Use a screw driver with a #2 Phillips tip to remove the thirteen screws securing the top cover to the chassis and remove the cover. See Figure 8.

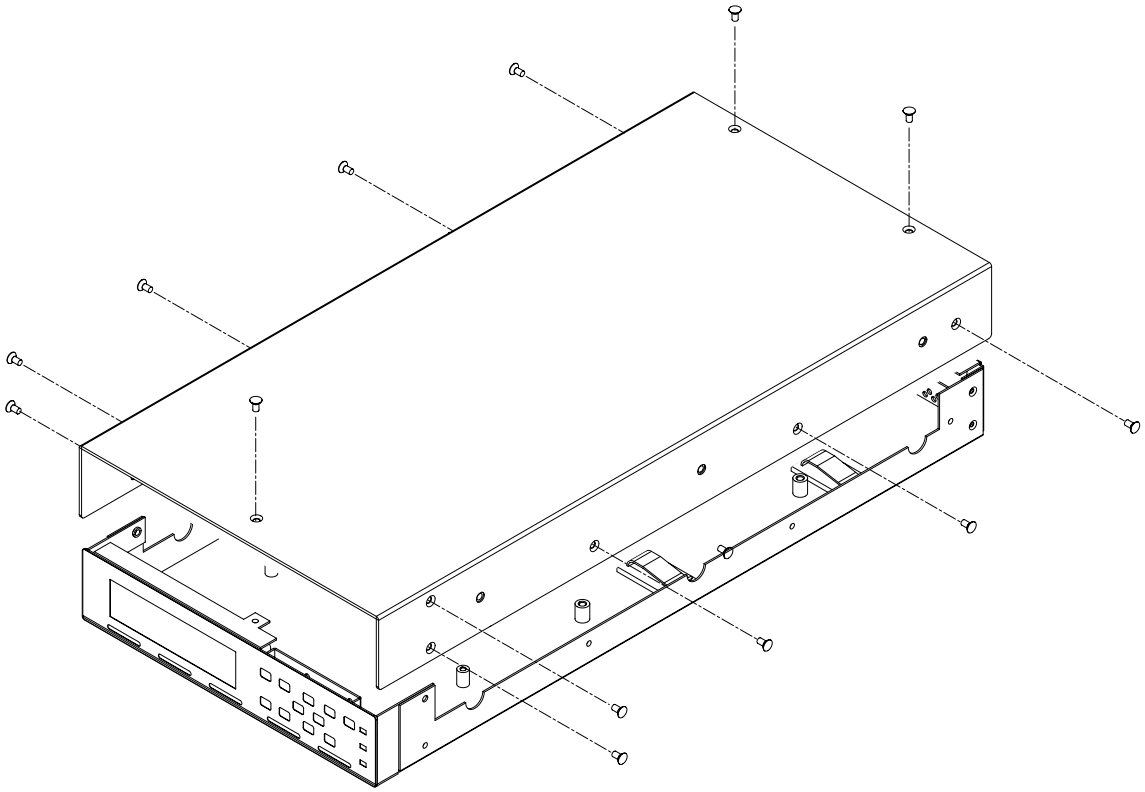

Figure 8: Removing the top cover

Removing the Power Supply Shield with the Fan

3. Unplug the fan's power cable from J3 on the A50 Main board
4. Unplug the cable from J900 on the A50 Main board.
5. Unplug the cable from CN1 on the power supply.
6. Use a screwdriver with a #2 Phillips tip to remove the four screws securing the power supply shield. See Figure 9.
7. Lift the shield with the fan up and away from the chassis.

Removing the Fan and Fan Guard

8. Use a screw driver with a #2 Phillips tip to remove the two screws securing the fan and fan guard to the power supply shield. See Figure 9.
9. Lift the fan and fan guard up and away from the shield.

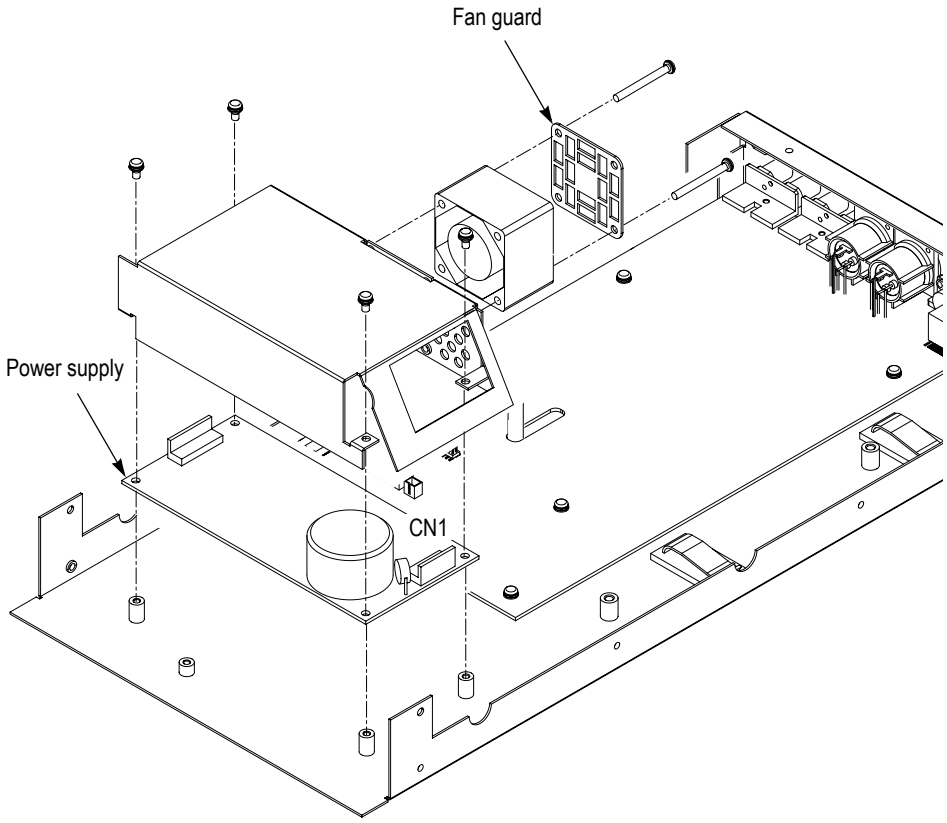

Figure 9: Removing the fan and fan guard

Installing the Replacement Fan Guard and Spacers

10. Position the replacement fan guard and two spacers provided in the kit as shown in Figure 10.
11. Secure the fan guard and spacers to the power supply shield using the two screws provided in the kit. See Figure 10.
12. Secure the bottom of the fan to the power supply shield using one of the screws removed in step 8. See Figure 10.

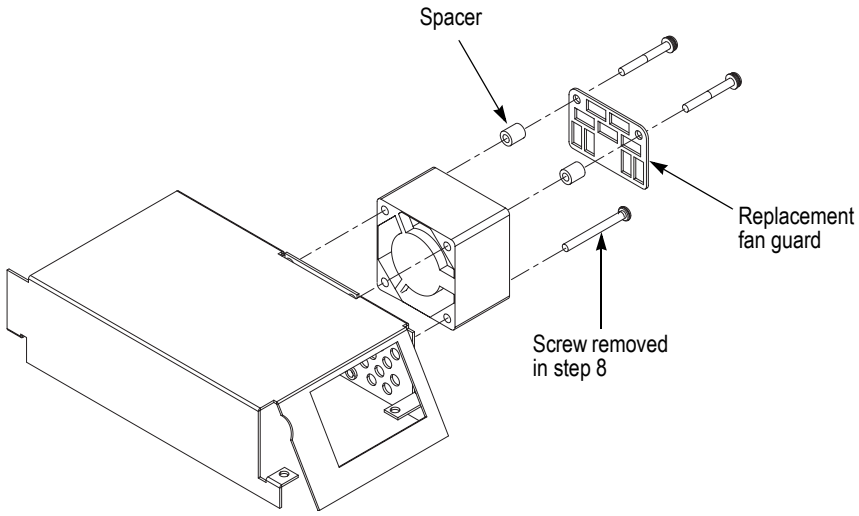

Figure 10: Installing the replacement fan guard and spacers

Replacing Nine Resistors on the A50 Main Board (SPG300)

Perform the following procedure to replace resistors R174, R175, R222, R224, R231, R233, R239, R240, and R242 on the A50 Main board:

Removing the A60 Analog Board

1. Use a screwdriver with #1 Phillips tip to remove the two screws securing the A60 Analog board to the rear of the chassis. See Figure 11.
2. Use a screwdriver with #2 Phillips tip to remove the two screws securing the A60 Analog board to the bottom of the chassis. See Figure 11.
3. Unplug the flat cable from J600 on the A50 Main board.
4. Lift the board up and away from the chassis, and then place it on a static free surface.

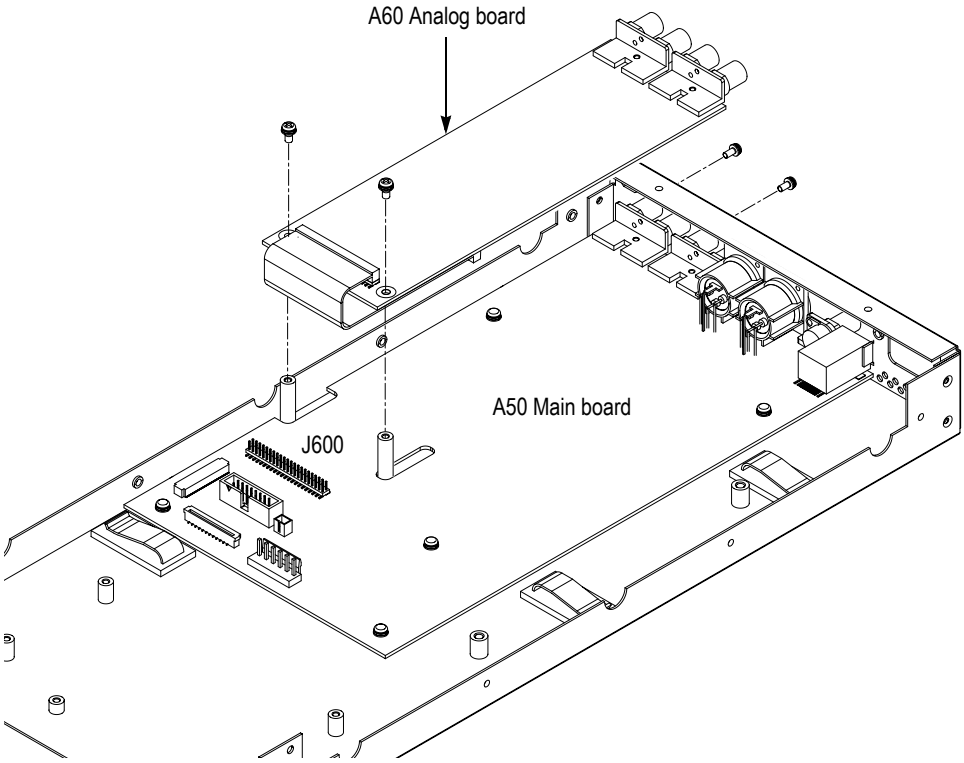

Figure 11: Removing the A60 Analog board

Removing the A50 Main Board

5. Unplug these cables:
   - The cable from the LCD module at J000.
   - The cable from the A20 Front-panel board at J010.
   - The cable from the GPI connector at J100.
6. Use a screw driver with a #1 Phillips tip to remove the seven screws securing the A50 Main board to the rear of the chassis. See Figure 12.
7. Use a screw driver with a #2 Phillips tip to remove the five screws securing the A50 Main board to the bottom of the chassis. See Figure 12.
8. Lift the board up and away from the chassis, and then place it on a static free surface.

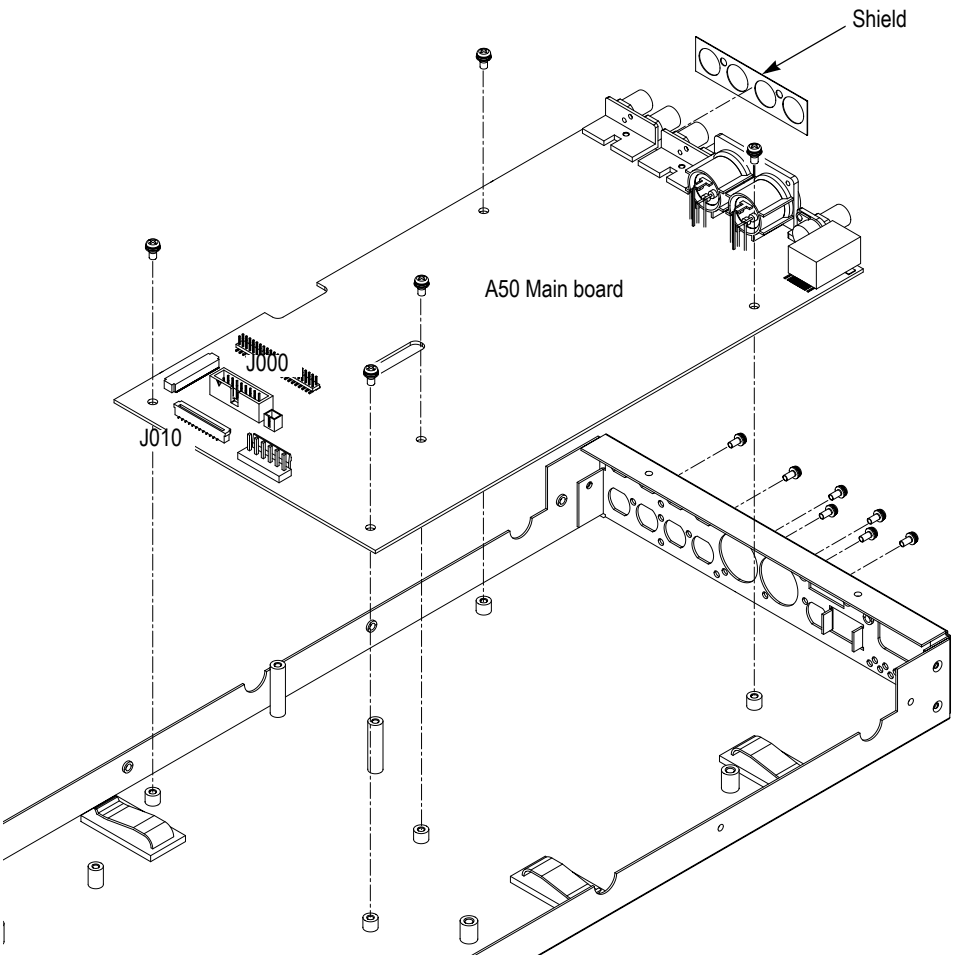

Figure 12: Removing the A50 Main board

Replacing the Resistors

9. Locate R174, R175, R222, R224, R231, R233, R239, R240, and R242 on the the A50 Main board. See Figure 13.

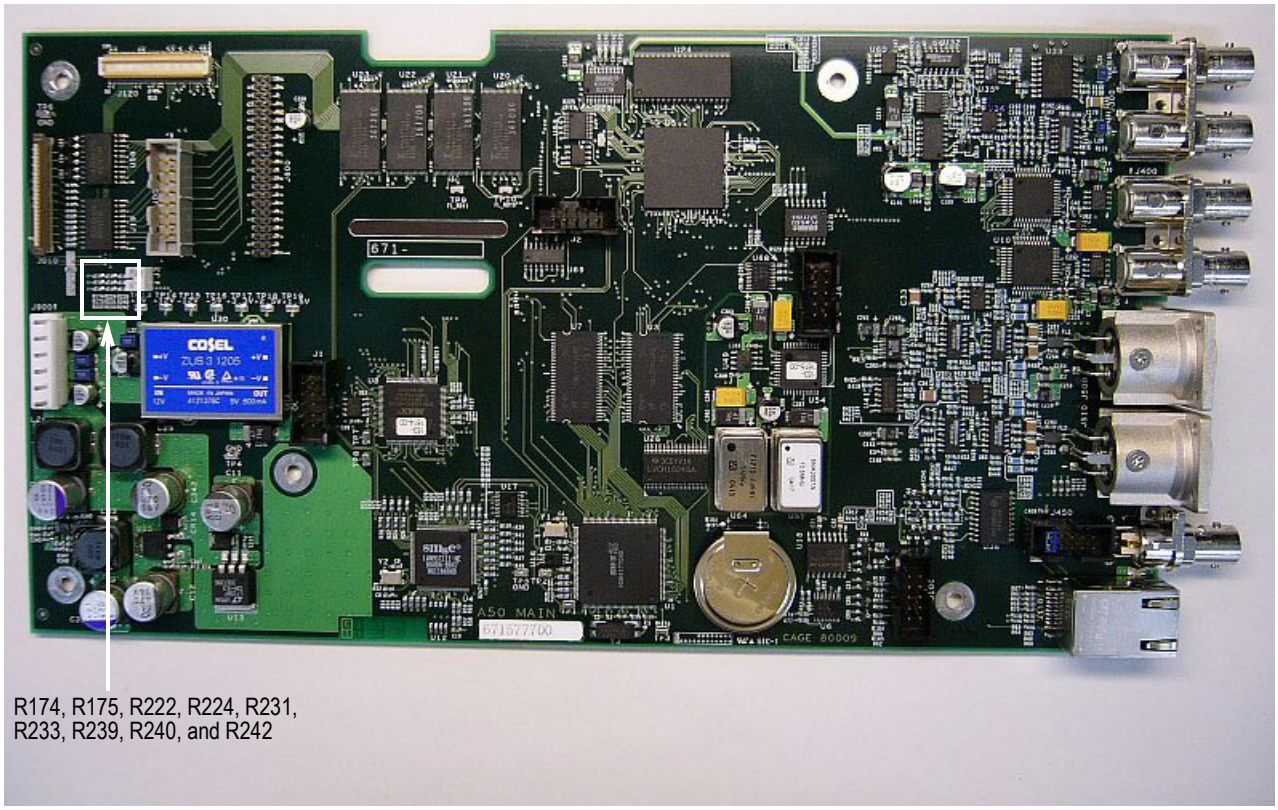

Figure 13: A50 Main board view, showing location of the resistors

10. Unsolder R174, R175, R222, R224, R231, R233, R239, R240, and R242 from the circuit board.
11. Install the resistors provided in the kit.
12. Remove the protective backing from the label marked 671-5777-01 and apply it on the existing serial number label.

Installing the A50 Main Board

13. Use a screwdriver with a #2 Phillips tip to install the five screws securing the A50 Main board to the bottom of the chassis.
14. Use a screwdriver with a #1 Phillips tip to install the seven screws securing the A50 Main board to the rear of the chassis.
15. Reconnect these cables:
    - The cable from the LCD module at J000.
    - The cable from the A20 Front-panel board at J010.
    - The cable from the GPI connector at J100

Installing the A60 Analog board

16. Reconnect the cable to J600 on the A50 Main board.
17. Use a screwdriver with #2 Phillips tip to install the two screws securing the A60 Analog board to the bottom of the chassis.
18. Use a screwdriver with #1 Phillips tip to install the two screws securing the A60 Analog board to the rear of the chassis.

Installing the Power Supply and the Shield

19. Use a screwdriver with a #2 Phillips tip to install the four screws securing the power supply and the shield to the chassis.
20. Reconnect the fan's power cable to J3 on the A50 Main board
21. Reconnect the cable to J900 on the A50 Main board.
22. Reconnect the cable to CN1 on the power supply.

Installing the Top Cover

23. Use a screwdriver with a #1 Phillips tip to install the thirteen screws securing the top cover to the chassis.
24. Remove the protective backing from the label marked 040-1710-00 and apply it to the bottom of the instrument.

Performing Functional Check

After you have installed the components in this kit, perform the functional check procedure for the sync pulse generator as described in the *SPG600 & SPG300 Sync Pulse Generators User Manual* (Tektronix part number 071-1340-XX).

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