RSA5BUP (Options PFR, 50, PFR50)
RSA5100B Series Real-Time Signal Analyzers
Preamp and Precision Frequency Reference Upgrades

Instructions

Tektronix

Service safety summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* located in the *RSA5100B Series Real-Time Signal Analyzers Service Manual* 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 describes the installation of the following upgrade options:

■ Option PFR: Precision Frequency Reference for the RSA5100B Series

■ Option 50: Internal Preamp for the RSA5103B and RSA5106B

■ Option PFR50: Internal Preamp with the Precision Frequency Reference for the RSA5103B and RSA5106B

Products

RSA5103B. All serial numbers

RSA5106B. All serial numbers

RSA5115B. All serial numbers

RSA5126B. All serial numbers

Option 50 kit parts list

Quantity	Part number	Description
1 ea	071-2191-xx	MANUAL, TECH; SVCPT-UPG; TEKTRONIX SUPPLEMENTAL INFORMATION SHEET FOR THE PEOPLES REPUBLIC OF CHINA; CHINA ROHS
1 ea	075-1059-xx	INSTRUCTIONS, UPGRADE: RSA5BUP OPTIONS PFR, 50, PFR50
1 ea	850-0296-xx	MFG ASSY; RSA5BUP 50
1 ea	N/A	LABEL, MANUFACTURED; OPTION KEY UPGRADE LABEL 2.100 X 2.700, SAFETY CONTROLLED
1 ea	N/A	LABEL, MANUFACTURED; PRODUCT LABEL, SAFETY CONTROLLED

Option PFR kit parts list

Quantity	Part number	Description
1 ea	071-2191-xx	MANUAL, TECH; SVCPT-UPG; TEKTRONIX SUPPLEMENTAL INFORMATION SHEET FOR THE PEOPLES REPUBLIC OF CHINA; CHINA ROHS
1 ea	075-1059-xx	INSTRUCTIONS, UPGRADE: RSA5BUP OPTIONS PFR, 50, PFR50
1 ea	863-0956-xx	CKT BD; RSA5BUP PFR
1 ea	N/A	LABEL, MANUFACTURED; OPTION KEY UPGRADE LABEL 2.100 X 2.700, SAFETY CONTROLLED
1 ea	N/A	LABEL, MANUFACTURED; PRODUCT LABEL, SAFETY CONTROLLED

Option PFR50 kit parts list

Quantity	Part number	Description
1 ea	071-2191-xx	MANUAL, TECH; SVCPT-UPG; TEKTRONIX SUPPLEMENTAL INFORMATION SHEET FOR THE PEOPLES REPUBLIC OF CHINA; CHINA ROHS
1 ea	075-1059-xx	INSTRUCTIONS, UPGRADE: RSA5BUP OPTIONS PFR, 50, PFR50
1 ea	850-0296-xx	MFG ASSY; RSA5BUP 50
1 ea	863-0956-xx	CKT BD; RSA5BUP PFR

Quantity	Part number	Description
1 ea	N/A	LABEL, MANUFACTURED; OPTION KEY UPGRADE LABEL 2.100 X 2.700, SAFETY CONTROLLED
1 ea	N/A	LABEL, MANUFACTURED; PRODUCT LABEL, SAFETY CONTROLLED

Installation instructions

This section contains all procedures needed to install the required components.

Minimum tool and equipment list

The following tools are required to for installation of this kit. All tools are standard tools that are readily available.

Item	Name	Description
1	Screwdriver handle (magnetic)	Torque driver. Accepts 14 inch hex-head driver tips
2	No. 2 Phillips or Pozidriv tip	Phillips or Pozidriv-driver tip for number 2 size screw heads
3	T-15 TORX tip	TORX driver tip for T-15 size screw heads
4	T-20 TORX tip	TORX driver tip for T-20 size screw heads
5	5/16" hex wrench	Open end wrench to remove and install semi-rigid cables

These instructions are for qualified service personnel who are familiar with servicing the product. If you need further details for disassembling or reassembling the product, refer to the *RSA5100B Series Real-Time Signal Analyzers Service Manual*, Tektronix part number 077-0903-XX.

Remove covers

NOTE. Right-side or left-side references in these instructions assume you are viewing the instrument from the front panel.

⚠ *WARNING. To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power. Failure to do so can cause injury or death.*

1. Remove the power cord.

2. If it is installed, pull the front cover off the instrument.

3. Remove the two T-15 Torx-head screws that attach the plastic carrying handle to the side of the instrument. (It is not necessary to remove the black metal handles.) (See Figure 1.)

4. Remove four T15 Torx-head screws along each side that attach the top and bottom covers to the instrument, and two T20 screws near the front edge of the top cover (next to the folding handles).

5. Remove the top and bottom covers. Remove the top cover by pulling it straight back about 1 inch. Pull out on the sides of the top cover, flexing the sides slightly to clear the instrument chassis, and pull the top cover away from the instrument.

6. Turn the instrument over so it is resting on its top.

7. Remove the three T-15 Torx-head screws that attach the lower trim panel to the chassis, and lift the lower trim panel from the instrument.

8. Remove the 18 T15 Torx-head screws that attach the internal bottom cover to the chassis, and then lift the internal bottom cover away.

Top cover

T20 Torx
head screw (2)

T20 Torx
screw (2)

Carrying handle (1)

T-15 Torx drive
screw (2)

Screw (4)

Bottom cover

Screw (4)
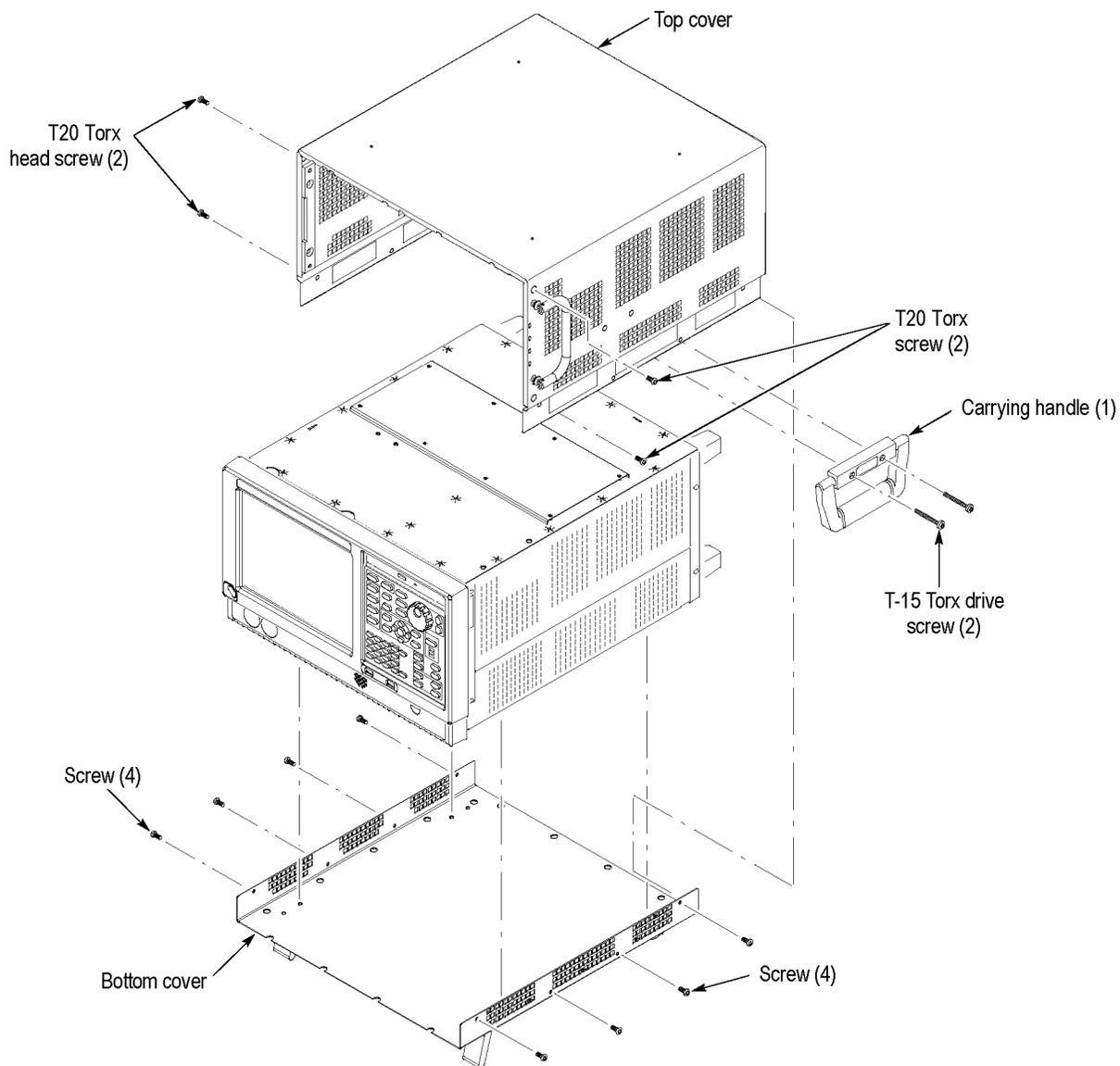
2880-001

Figure 1: Remove covers

Install Preamp option board (Options 50 and PFR50)

These options only apply to the RSA5103B and RSA5106B instruments.

1. Disconnect the semi-rigid cable connecting the ATT OUT connector to the 1ST CONV IN connector:
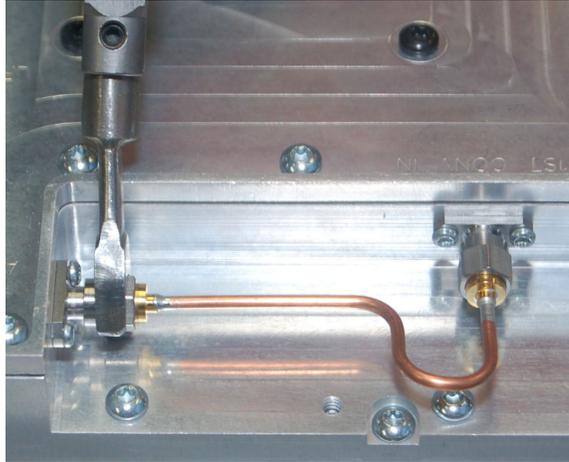
   a. Loosen the semi-rigid cable connecting to the ATT OUT connector. Do not pull the cable connector away from the ATT OUT connector.

   b. Loosen the semi–rigid cable connecting to the 1ST CONV IN connector completely. Rotate the semi-rigid cable upward. Now remove the semi-rigid cable from the ATT OUT connector.
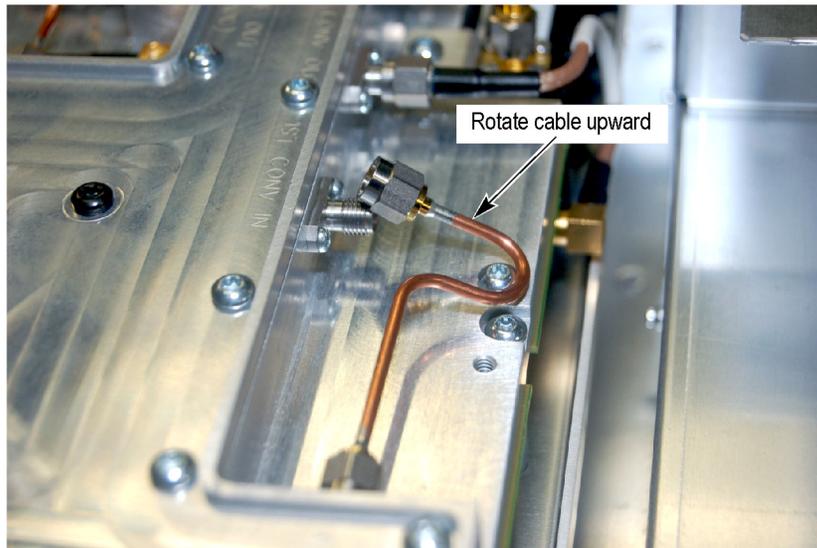
2. Remove the two screws from the chassis and set aside for later reuse.
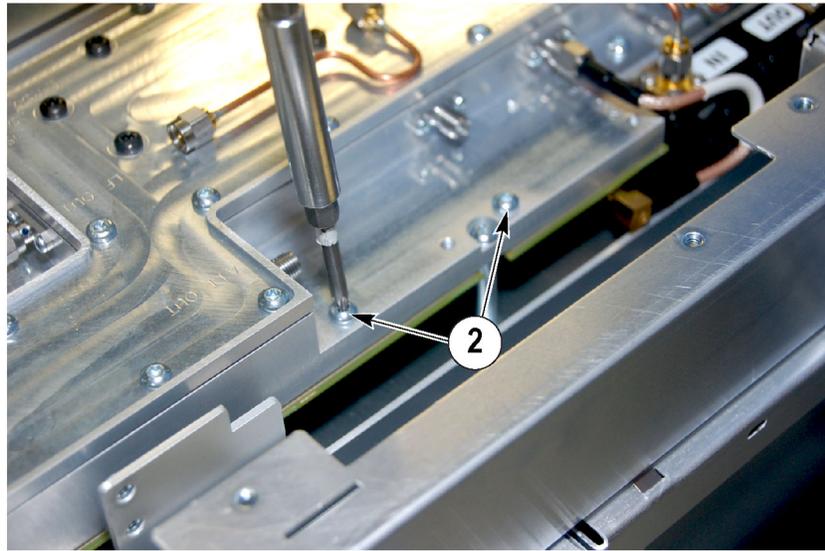
2872-002

3. Remove semi-rigid feed-through cable from preamp assembly before installing assembly. This allows access to the connectors below if needed.

Feed-through cable

a. Loosen one side (either side is okay) of the semi-rigid feed-through cable so the nut turns easily.

b. Loosen the nut on the opposite end of the semi-rigid feed-through cable.

c. Pull on one end of the semi-rigid feed-through cable straight out from the relay until the nut on the semi-rigid feed-through cable clears the connector on the relay.

d. Loosen the opposite end of the semi-rigid feed-through cable and remove the semi-rigid feed-through cable from the preamp assembly.

4. Set the preamp assembly on the 1st Converter. Align the semi-rigid cables with the ATT OUT and 1ST CONV IN connectors.

5. Use the two screws, previously set aside, to attach the preamp assembly to the 1st Converter. Do not tighten the screws yet.

6. Screw the nuts on the end of the semi-rigid cables on to the ATT OUT connector and 1ST CONV IN connector. Finger tighten the nut. If you encounter any difficulty securing the nut to the connector, loosen the nut from the connector and try connecting it again. It is critical that the alignment between the semi-rigid cable and the connector be kept as straight as possible to avoid possible calibration failure.

7. Tighten the screws securing the preamp assembly to the 1st Converter.

8. Torque the semi-rigid cable nut on the relay for the 1st Converter Out connection to 10 in-lbs. Do not over-torque the nut. Stop tightening the nut as soon as the torque wrench first "breaks".

⚠ *CAUTION.* *To avoid damaging the relay connector on the preamp assembly, be careful not to touch the connector on the relay with the torque wrench while tightening the nuts.*

Don't touch connector with wrench

1st Converter Out
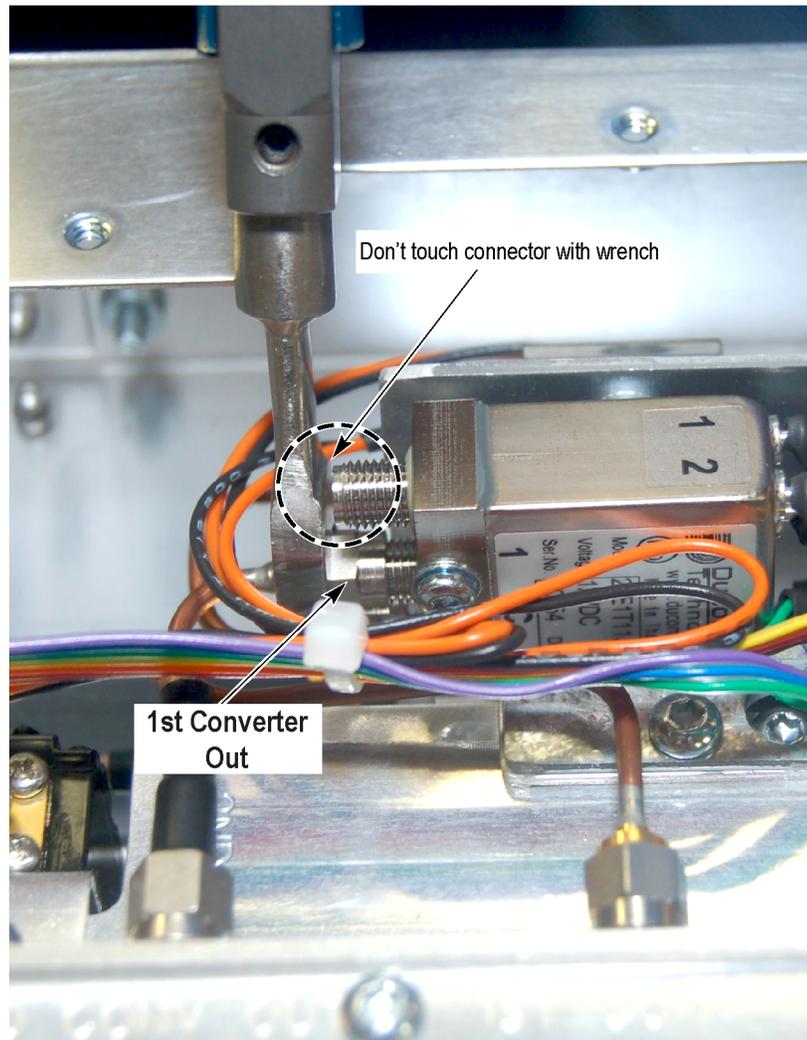
2872-005

9. Torque the nut on the connector below the relay for the ATT OUT connection to 10 in-lbs. Do not over-torque the nut. Stop tightening the nut as soon as the torque wrench first "breaks".

ATT Out

2872-006
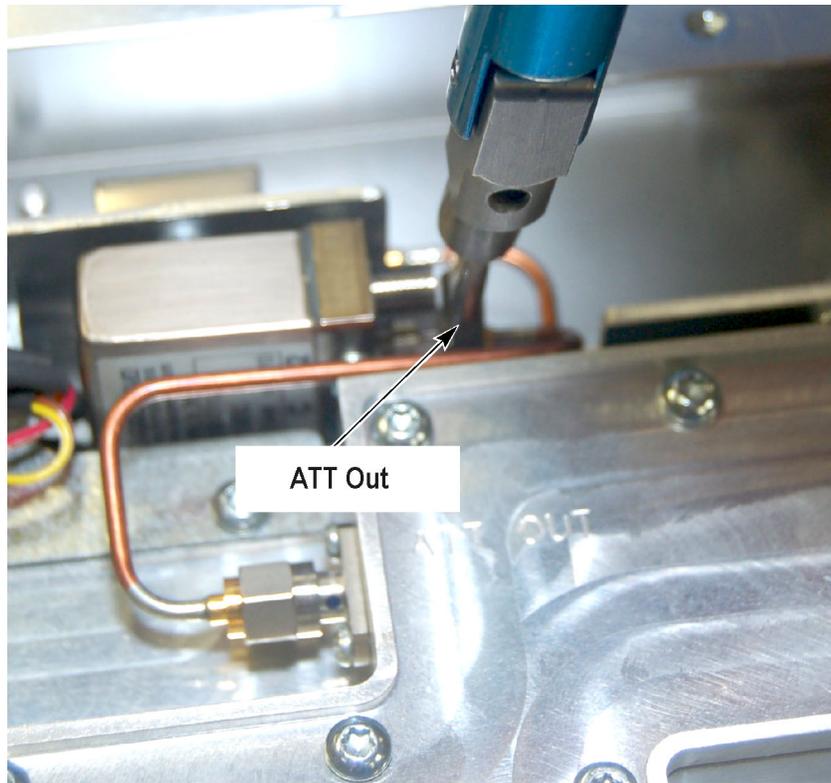
10. Torque the semi-rigid cable connections to the 1ST CONV IN and ATT OUT connectors on the instrument to 10 in-lbs. Do not over-torque the nuts.

11. Reattach the semi-rigid feed-through cable on one end of the preamp. Finger tighten the nut about half way.

12. Pull on the other end of the semi-rigid cable so that the nut on the end of the semi-rigid cable clears the connector on the relay (do not slide the nut over the connector). Align the nut on the semi-rigid cable with the connector on the relay and screw the nut on to the connector. Finger tighten the nut. The tension in the semi-rigid cable will relax.
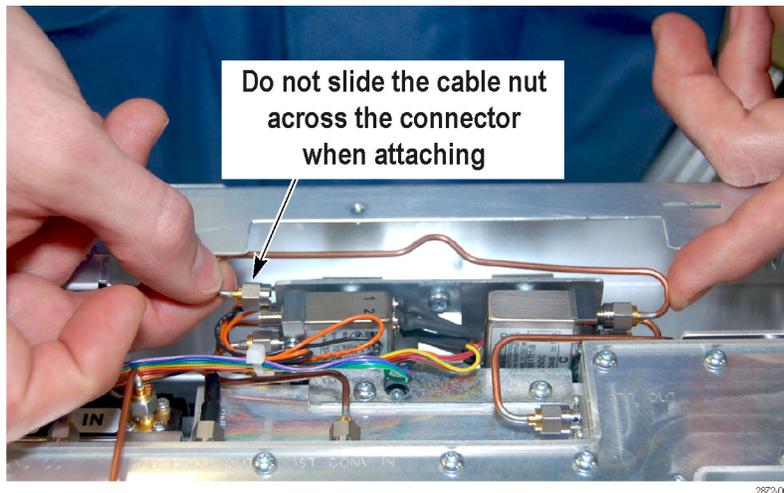
13. Holding the semi-rigid feed-through cable level with your fingers, torque the nuts on both ends of the semi-rigid cable to 10 in-lbs.
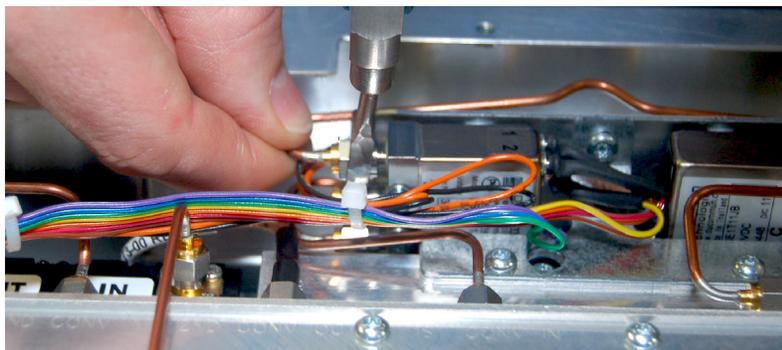
14. Feed the relay control cable under the semi-rigid cable as shown in the following figure.
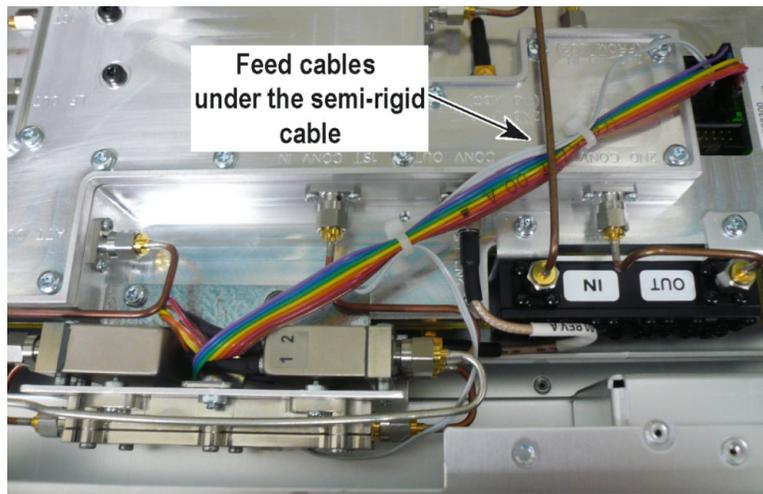
15. Insert the two wire cable into the power socket. Push the cable fully into the socket and listen for a click sound.

16. Insert the ribbon cable in the connector. Push the cable fully into the socket and listen for a click sound.

17. After inserting the cables into the sockets, pull up on the cables to be sure they do not disconnect.

18. Inspect the ribbon cables carefully for pins that are not fully inserted. If you find any pins visible above the plastic connector body, remove the connector, reinsert the pins into the connector body and reinsert the cable connector. Pull on the ribbon connector to be sure it is fully seated.
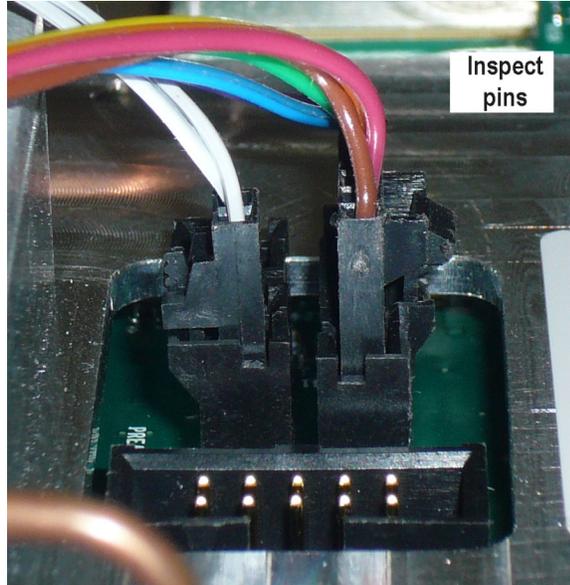
Install Precision Frequency Reference option board (Options PFR and PFR50)

1. Locate the 2nd LO/Reference oscillator board. The board is located near the rear of the instrument.
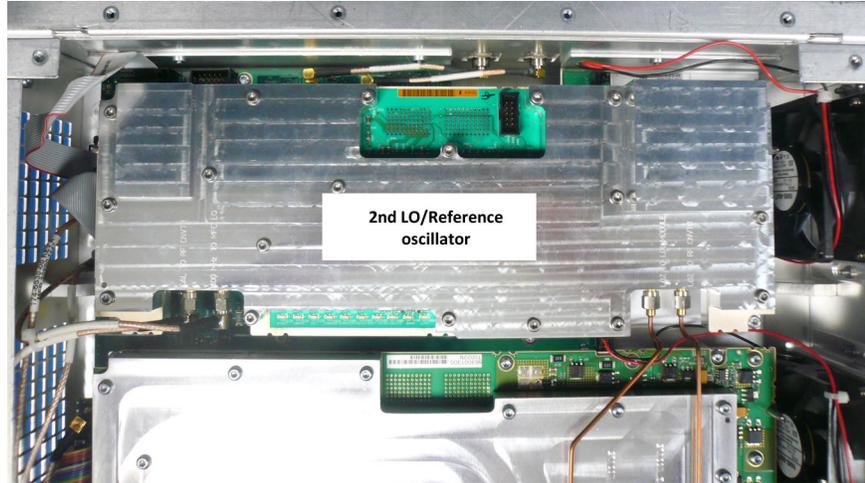
2. Disconnect the SMA cables from the CAL TO RF CNVTR and 400 MHz TO MFC LO connectors.

> RSA5103B and RSA5106B use a 50 ohm terminator in place of the SMA cable at this connector
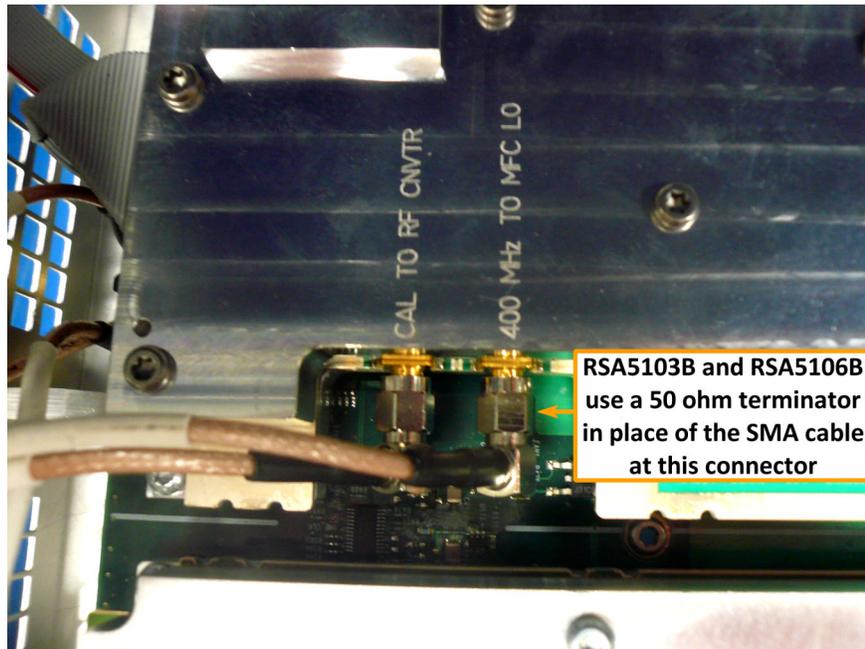
NOTE. *RSA5103B and RSA5106B instruments do not have an SMA cable connected to the 400 MHz TO MFC LO connector.*

In place is a 50 Ω terminator. Remove and save the terminator for reinstallation.

3. Disconnect the semi-ridged cables from the LO2 TO LO1 MODULE and LO2 TO RF CNVTR connectors.

⚠️ **CAUTION.** *Do not bend the semi-ridged cables.*

4. Remove the four T15 Torx-head screws (at each corner of the board) that secure the 2nd LO/Reference oscillator board to the chassis and remove the board.
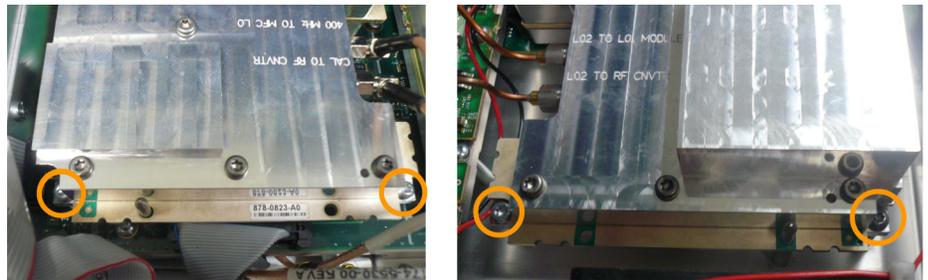
NOTE. *Make sure not to mix the standard board removed from the instrument with the option board contained in this kit. With the shields in place, they are very difficult to distinguish between the two.*

5. Install the PFR option board into the same location. Press down on the board to ensure the connector on the underside of the board is fully seated.

Push down here
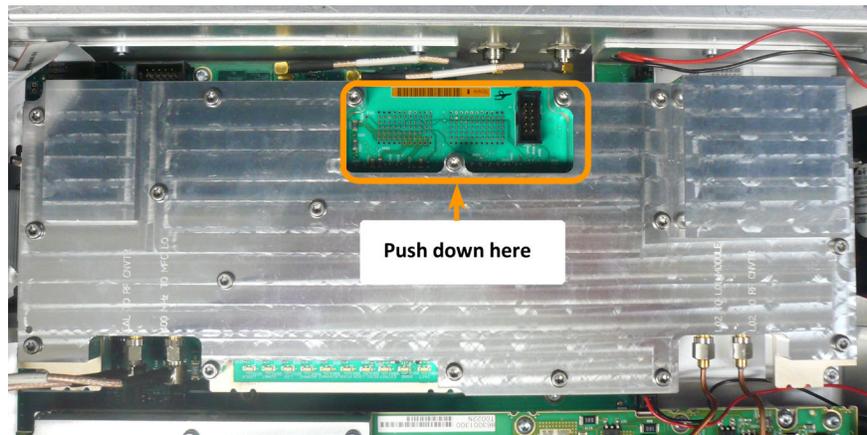
6. Secure the board using the four T15 Torx-head screws previous removed. Torque the screws to 10 in-lbs.

7. Reconnect the semi-ridged cables to the LO2 TO LO1 MODULE and LO2 TO RF CNVTR connectors. Torque the connections to 10 in-lbs. Do not over-torque the nuts.

8. Reconnect the SMA cables from the CAL TO RF CNVTR and 400 MHz TO MFC LO connectors. Torque the connections to 10 in-lbs. Do not over-torque the nuts.

NOTE. RSA5103B and RSA5106B instruments, place the 50 Ω terminator on the 400 MHz TO MFC LO connector.

Reinstall bottom shield and cosmetic covers

Reinstall the top and bottom cosmetic covers:

1. Place the bottom shield on the instrument, aligning the two protrusions on the shield with the two slots in the chassis.

2. Replace the 18 T-15 Torx-head screws that attach the bottom shield to the instrument. Torque these screws to 8 in-lbs.

3. Place the instrument on its rear feet, so the front panel is facing up and the top is toward you.

4. Place the top cover over the top of the instrument and slide it toward the front panel. Make sure that the top cover wraps around the flanges on the rear panel on all three sides.

5. Reinstall the four T20 Torx head screws (two on each side) near the front edge of the top cover (next to the folding handles) that attach the top cover to the instrument.

6. Rotate the instrument so the bottom faces you.

7. Place the bottom cover on the instrument, with the flip feet toward the front.

8. Align the four screw holes on each side in the top and bottom covers with the holes in the chassis, and install eight T15 screws, four on each side. Torque these screws to 8.0 in-lb.

9. Position the plastic carrying handle and its bracket on the right side of the instrument, and install the two T15 screws that attach it in place. Torque these screws to 8.0 in-lb.

Install option key

To activate your new option, you must enter a new option key.

1. Power on the instrument.

NOTE. When the application launches, it will display an error message indicating that the current option key does not support the new option hardware. Click OK to clear the error message.

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2. Select **Tools** > **Install Upgrades...** to start the upgrade installation process.

3. Click Continue from the Install Upgrades introduction screen.
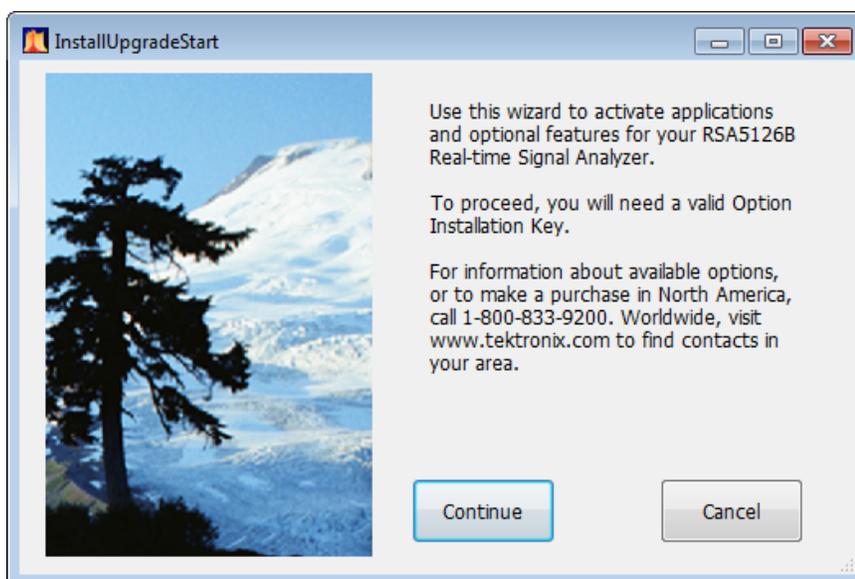
4. Enter the option key provided by Tektronix, and follow the on-screen instructions to install the option.
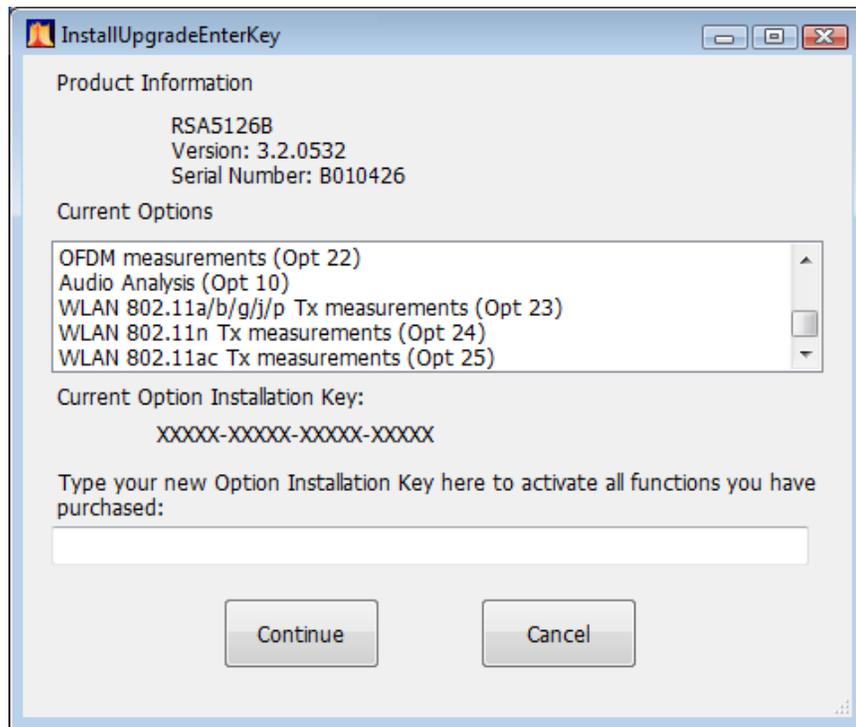
5. Power off the instrument, then power back on.

6. In the Help menu, select About Tektronix Real-Time Analyzer.

7. Verify the new option is listed.

Attach labels

Please attach all labels provided in this kit on the instrument's rear panel.

Attach the option key label   Place the new option key label over the existing label on the rear panel.

Attach the product/option label   Place the new product label over the existing label on the rear panel.

Recalibrate the instrument

The installation of the options in this kit requires that the instrument be recalibrated.

NOTE. Failure to perform a system calibration after installing this upgrade will result in a "Data from Uncalibrated Instrument" warning on the application display.

Verify instrument software version

Tektronix recommends to update to the latest available application software for your instrument.

1. Select **Help > About** to check the software version.

2. Use your Web browser to go to: www.tektronix.com/software.

3. Search for your instrument's model number and follow the link to the software.

4. If the installed software is older than that available, download the software.

5. Follow the instructions on the Web page to install the software.

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