

Instructions



TDS5BUP Option 18

TDS5000B Series

Display Touch Screen Upgrade Kit

075-0813-01

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* in the product service manual or the instruction 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, 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 and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

Kit Description

The following kit instructions describes the installation of the touch screen (Option 18) upgrade into your TDS5000B Series oscilloscope. This upgrade allows you to operate the oscilloscope using the touch screen.

This upgrade kit will require new gamma settings, procedures are provided in this kit, to ensure an optimum display with the new LCD.

Products

TDS5000B Series All Serial Numbers

Kit Parts List

Figure 1	Quantity	Part number	Description
1-1	1 ea	*	Touch screen display assembly: TDS5000B Series, includes the following parts:
	1 ea	119-6607-00	Touch screen display
	1 ea	259-0155-01	Flex circuit: switch
	2 ea	348-1701-00	Gasket: Display/touch panel, w/adhesive on one side, 9.4w X 7.1h X 0.062 thick, back
	2 ea	348-1700-00	Gasket: Display/touch panel, w/adhesive on both sides, 9.4w X 7.1h X 0.062 thick, front
	1 ea	407-4844-00	Bracket: Touch panel, 0.050 aluminum, front
	1 ea	407-4845-00	Bracket: Touch panel, 0.050 aluminum, back
	5 ea	131-6417-00	Contact, electrical: Grounding, 0.600 l X 0.250 w X 0.220 d, nickel plate
	1 ea	679-5244-00	Circuit bd: Display adapter, w/hardware TDS5000B Series
1-2	1 ea	119-6260-00	Circuit bd: Inverter, w/hardware, reuse board from the old display assembly
1-3	1 ea	174-3618-00	Cable assy: Connectors both ends, Display board to Inverter board, reuse cable from the old display assembly
1-4	1 ea	343-1676-00	Clamp: cable restraint, gray, PC/ABS
1-5	1 ea	333-4405-01	Front subpanel: 2 channel, with bezel, labels
1-5	1 ea	333-4411-01	Front subpanel: 4 channel, with bezel, labels
1-6	1 ea	260-2758-00	Switch: Keypad buttons, 2 channel
1-6	1 ea	260-2757-00	Switch: Keypad buttons, 4 channel

Figure 1	Quantity	Part number	Description
1-7	1 ea	075-0813-XX	Kit Instructions: Display With Touch Screen Upgrade Kit, TDS5000B Series

* - Not Saleable

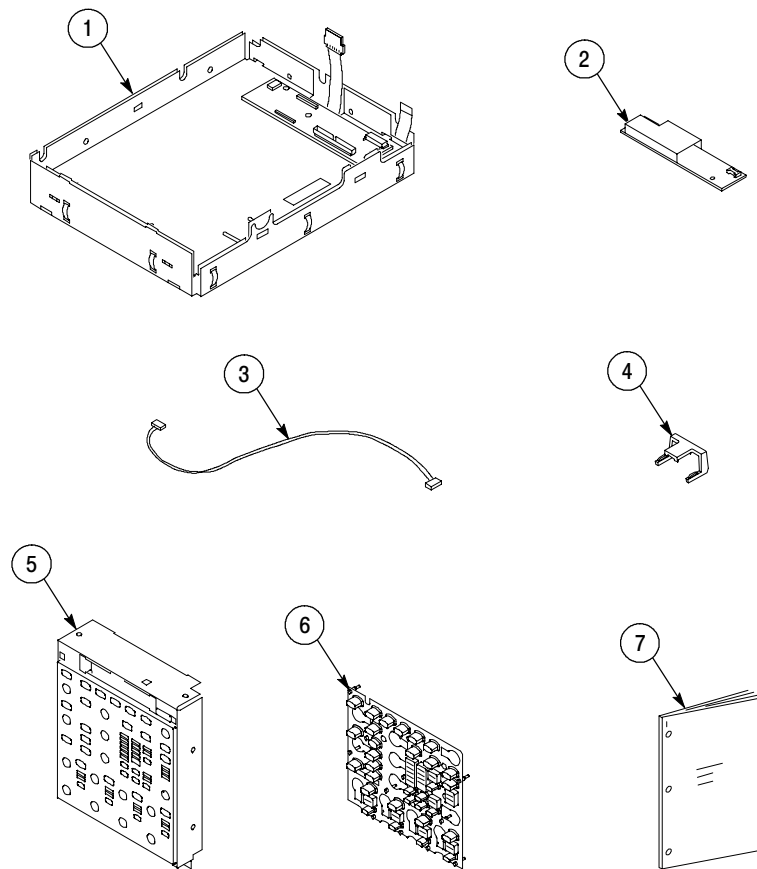


Figure 1: Display touch screen upgrade kit parts

Installation Instructions

This section contains all procedures needed to install the touch screen display into the TDS5000B Series instruments. This kit reuses the LCD, Inverter circuit board, and cable assembly connecting the Inverter to Display circuit board.

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 appropriate product manual. Contact your nearest Tektronix Service Center or Tektronix Factory Service for installation assistance.

Gamma setting procedures are on page 17.

Minimum Tool and Equipment List

Most modules in the TDS5000B Digital Oscilloscope can be removed with a screwdriver handle mounted with a size T-15, Torx-driver tip. Read Table 1 for a complete list of tools to perform this upgrade. All tools are standard tools that are readily available.

Table 1: Tools required for module removal

Item no.	Name	Description	General tool number
1	Screwdriver handle	Accepts Torx-driver bits	620-440
2	T-15 Torx-tip	Used for removing most oscilloscope screws. Torx-driver bit for T-15 size screw heads	640-247
3	1/8 inch flat-bladed screwdriver	Screwdriver for unlocking cable connectors	Standard tool
4	#0 Phillips screwdriver	Screwdriver for removing small Phillips screws, CD, floppy & hard drive	Standard tool
5	Angle-Tip Tweezers	Used to remove Front-Panel knobs	Standard tool

Preparation



WARNING. Before doing this or any other procedure in this manual, read the Safety Summary found at the beginning of this manual.

This subsection contains the following items:

- The preparatory information you need to properly do the procedures that follow.
- Procedures for removal and reinstallation of the necessary electrical and mechanical modules.



WARNING. Before doing any procedure in this subsection, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury or death.

Procedures for External Modules

The following procedures are found here and are listed in order presented.

- Line cord removal
- Trim (Front Panel) removal
- Display assembly removal
- Front Panel assembly removal

Line Cord and Trim

1. Pull the line cord away from the AC power connector.
2. Remove the Front-Panel cover, if necessary.
3. Remove the Front-Panel trim:
 - a. To prevent the power button from falling out of the Front-Panel trim, place a piece of tape over the button.
 - b. Remove the three T-15 Torx-drive screws that secure the Front-Panel trim to the oscilloscope. See Figure 2 on page 7.
 - c. Grasp the trim ring by the top edge and pull toward you to detach the three plastic snaps. (Alternatively, you can use a flat-bladed solder aid or other small prying tool to help you detach the snaps.)

- d. Grasp the trim ring by the side edges and slide it back and forth to release the snap in the middle of the trim ring. The snap is at the bottom “T” of the Front Panel above the channel 1 and 2 BNCs.
- e. Pull off the trim ring. As you do so, take care not to lose the 3 PEM inserts in the bottom of the trim ring.
- f. Remove the Acquisition trim.

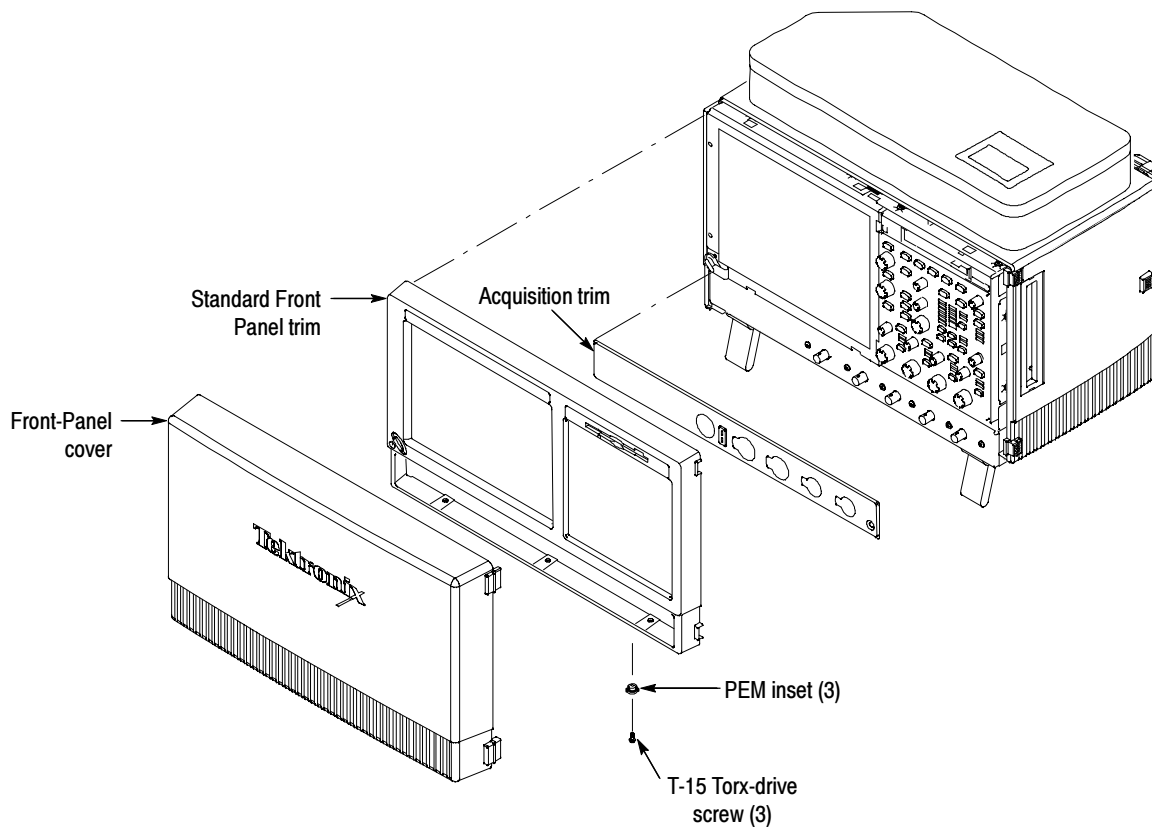


Figure 2: Trim removal

Display Assembly Removal

1. Locate the Display assembly, see Figure 3.
2. Orient the oscilloscope: Set the oscilloscope on the work surface with the Front Panel facing you.
3. Remove the Display assembly: See Figure 3.
 - a. Remove the four T-15 Torx-screws that secure the display assembly to the chassis.

- b. Grasp the display assembly at the finger reliefs located at the top-right and bottom-left corners of the display assembly and pull forward far enough to allow access to the flex cable connector.
- c. Disconnect J5 flex cable from the display assembly. Remove the display module assembly from the oscilloscope.
- d. Set the display assembly aside for later reassembly of the Inverter and Display circuit boards to the new display assembly with touch screen.

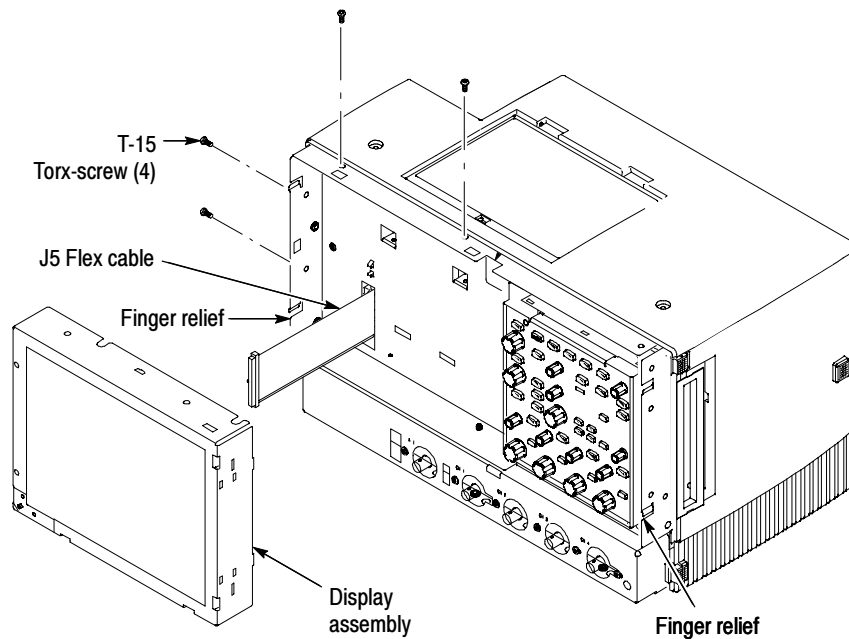


Figure 3: Display assembly removal

- 4. Remove and disconnect the following from the old display assembly:
 - a. Disconnect cables J1, J4 and J7 from the Display Adapter circuit board. See Figure 4 on page 9.
 - b. Disconnect LCD light connector (S) from the Inverter circuit board.
 - c. Disconnect the cable that connects between the Display Adapter (J6) to Inverter (CN1) circuit boards. Save the cable for later reassembly of the new display assembly.
 - d. Remove the two 0 Phillips screws that secure the Inverter circuit board to the display assembly. Save the Inverter board and Phillips screws for later reassembly onto the new display assembly.

5. Install the old LCD assembly to the new display assembly, using the four T-15 Torx-drive screws from the old display assembly.

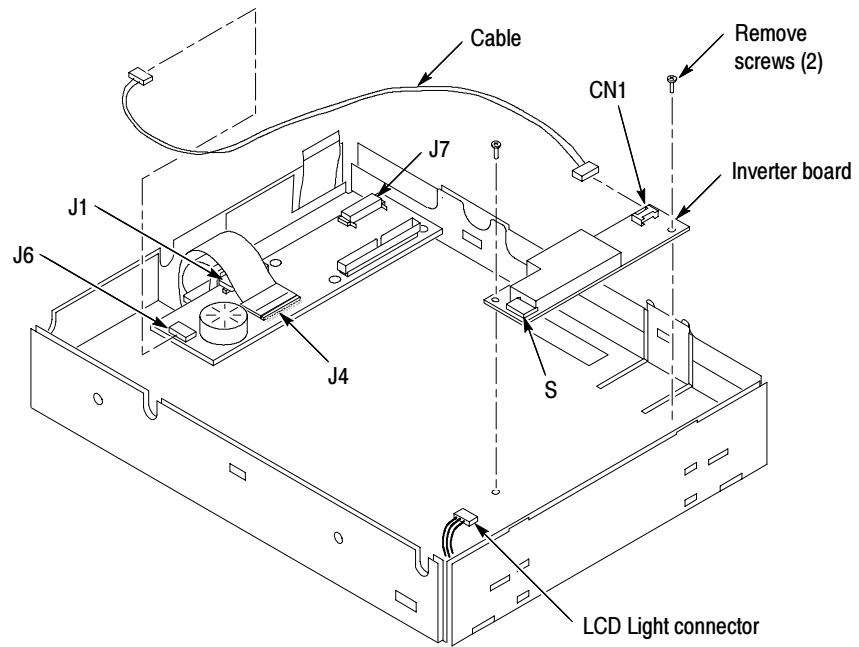


Figure 4: Remove Inverter circuit board



CAUTION. To prevent damage to the touch screen from scratches or cuts, make sure you take care not to contact the screen surface with any sharp tools.

- a. Separate the display assembly by carefully prying the (outer) touch screen panel assembly from the (inner) LCD assembly. Insert a flat-bladed screwdriver in the access notches to push out on the Touch panel assembly. See Figure 5.
- b. Remove the four T-15 Torx-drive screws that secure the old LCD to the old LCD assembly. See Figure 6 for T-15 screw locations.
- c. Install the old LCD into the new LCD assembly using the T-15 screws removed from the old LCD assembly.

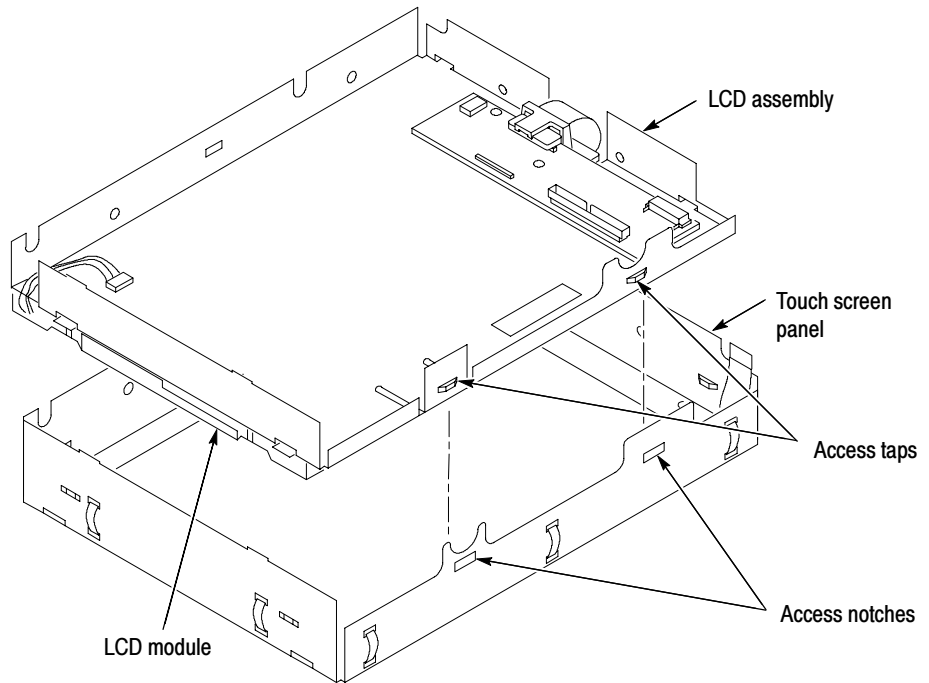


Figure 5: Remove/install the LCD assembly and touch screen panel

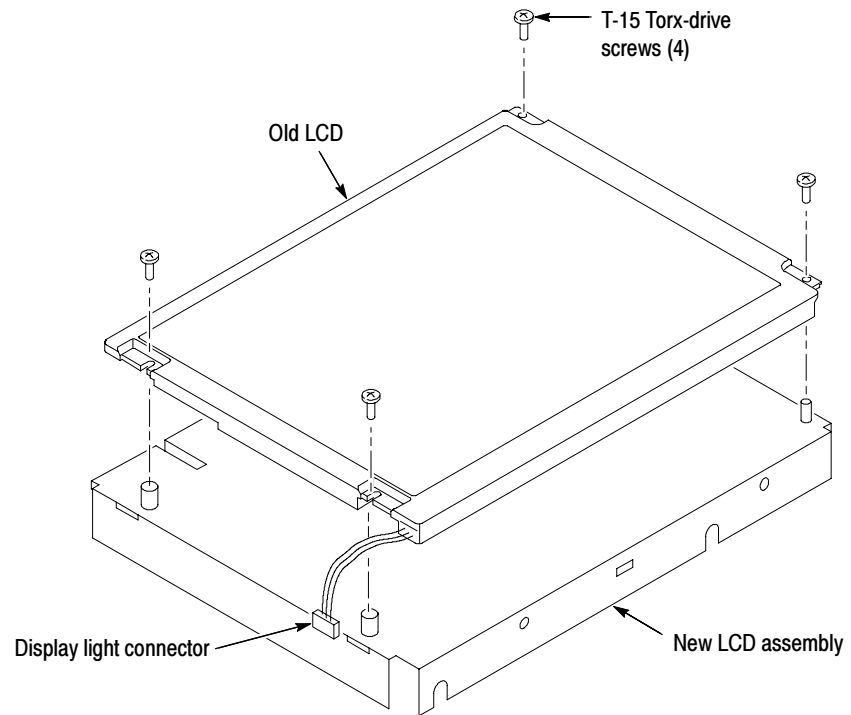


Figure 6: Install the old display to the new rear bracket assembly

6. Install the new LCD assembly and touch screen panel by sliding them together until tabs snap into the notches. See Figure 6.
7. Install the old Inverter circuit board into the new LCD assembly using the two 0 Phillips screws removed from the old display assembly.

8. Connect (CN1) to (J6) connectors to the Inverter/Display Adapter circuit boards. See Figure 7.
9. Connect LCD light connector (S) to the Inverter circuit board.

NOTE. The LCD and Inverter/Display connector housings have contacts visible on one side, make sure this side is facing up towards the installer when connecting the cable to both circuit boards.

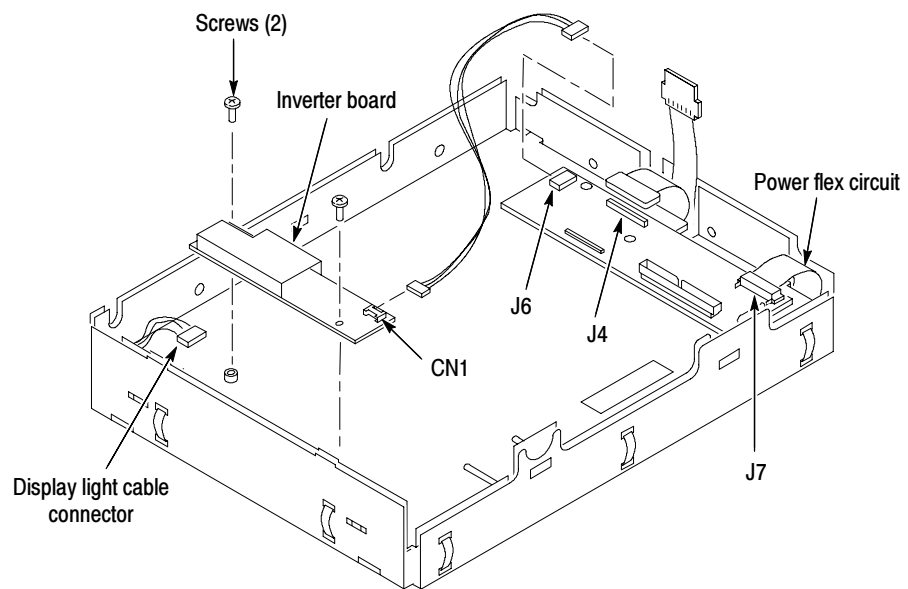


Figure 7: Install the Inverter circuit board

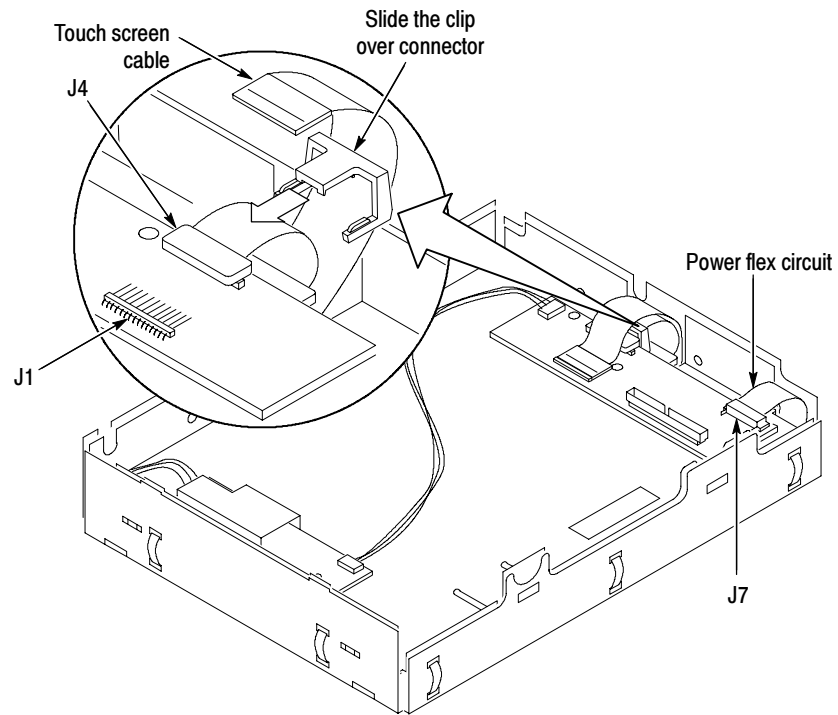


Figure 8: Cable clamp installation detail

- 10.** Connect the display cable to J4 on the Display Adapter circuit board. Slide the cable clamp (provided in this kit) over the cable and under the Display Adapter circuit board to secure the cable to the connector. See Figure 8.
- 11.** Connect touch screen cable to J1 connector on the Display Adapter circuit board.
- 12.** Do in reverse steps 1 through 3 on page 7, to reinstall the Display assembly into the instrument.

Front-Panel Assembly

1. Locate the module to be removed: Locate the Front-Panel assembly, see Figure 2 on page 7. The following procedure replaces the Front subpanel and keypad with the new touch screen button:
2. Remove the Front-Panel assembly, see Figure 9 on page 15.
3. Set the oscilloscope bottom side down on the work surface and face the Front Panel towards you.
 - a. Remove the six T-15 Torx-screws that secure the Front-Panel assembly to the front chassis.
 - b. Grasp the top of Front-Panel assembly and pull forward to allow access to the ribbon-cable connector on the Front-Panel board.



CAUTION. *To prevent damage to the touch screen from scratches or cuts, make sure you take care not to contact the screen surface with any sharp tools.*

- c. Use the $\frac{1}{8}$ inch flat-bladed screwdriver to carefully lift the J1 cable connector lock up to disconnect J1 flex cable from the display module assembly. See Figure 10 on page 15. Note the pin 1 index mark on the connector and the black stripe on the cable for later reassembly.
- d. Pull the Front-Panel assembly forward and remove from the oscilloscope.

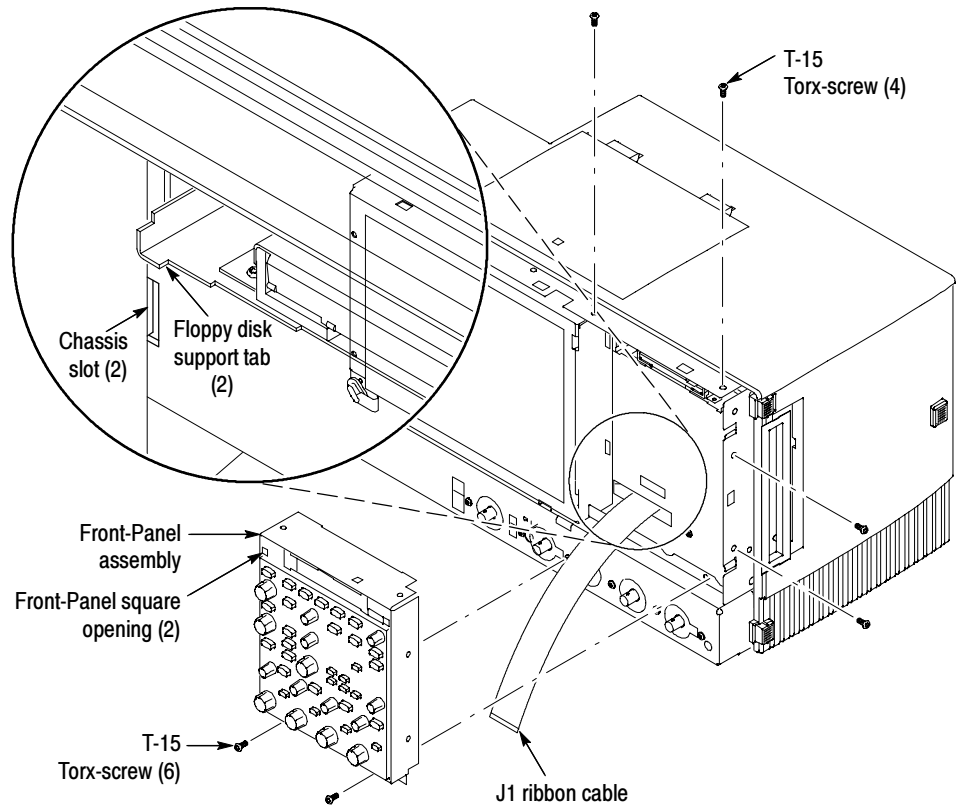


Figure 9: Front-Panel assembly removal

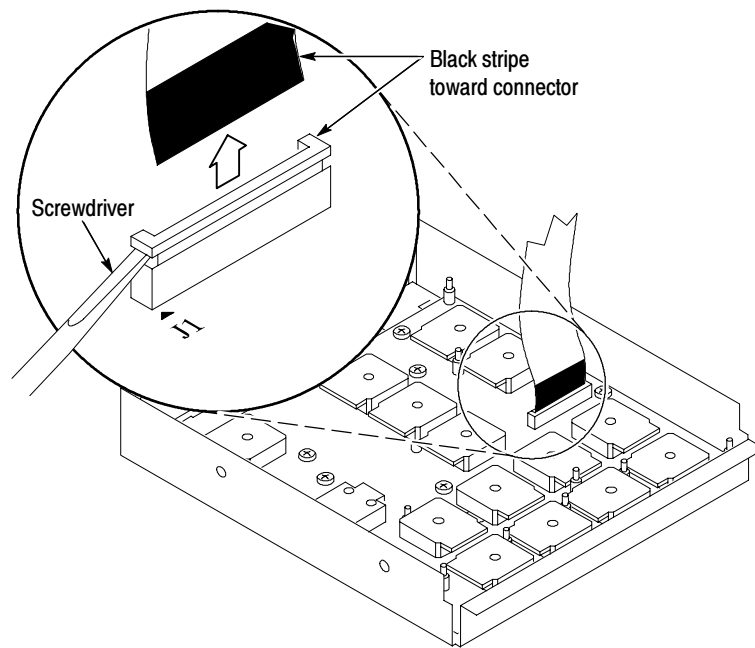


Figure 10: J1 flex cable connector removal

Front-Panel Board

1. Remove the Front-Panel board: See Figure 11.
 - a. Remove the eight T-15 Torx-screws that secure the Front-Panel board to the front subpanel assembly.
 - b. Pry the board up off the alignment studs. Place a flat-bladed screwdriver in the pry-point access holes to pry the board up from the assembly.
 - c. Remove the board from the assembly. Set the board aside for later reassembly. Discard the old front subpanel.

Front-Panel Keypad

1. Remove the Front-Panel keypad: See Figure 11.
2. Pull on each of the keypad support guides to separate the keypad from the board. Use a pair of tweezers or equivalent tool to pull the twelve keypad support guides.
3. Remove the keypad from the Front-Panel board. Discard the keypad.

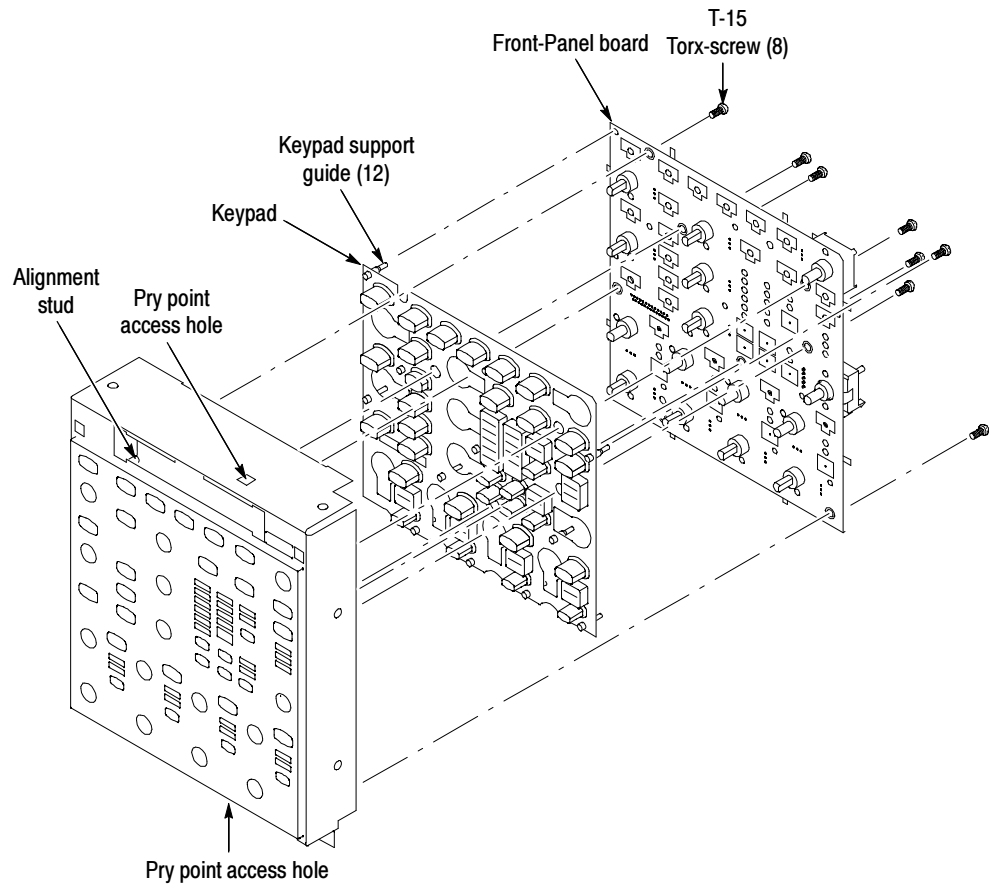


Figure 11: Front subpanel board and keypad removal



CAUTION. *When removing or installing the keypad, make sure you do not touch the switch contacts with your fingers. The oils in your fingers will degrade or damage the switch contacts. To help prevent damage to the keypad use cotton gloves when removing or installing the keyboard pad.*

4. Install the new keypad, old Front-Panel board, new front subpanel, and then install the Front-Panel assembly back into the instrument. Reverse step 3 on page 16 through step 1 on page 14. See the following instructions:
 - a. Make sure the keypad is aligned properly on the Front-Panel board.
 - b. Make sure the ribbon cable is routed without being pinched between the chassis and Front-Panel when installing the Front-Panel into the chassis.
 - c. Insert the two floppy disk support tabs into the Front Panel square openings. Both left Front-Panel tabs must go into the chassis slots. See Figure 9 on page 15.
5. Reinstall the Front-Panel trim, line fuse, and line cord. Reverse steps 1 through 3 on page 6.

Gamma Settings

Use the following gamma setting procedure to get the optimum display. Try both settings, Steps 8 and 12 on page 20, to determine what display looks best to you.

1. Right click on the desktop.
2. Click the Properties menu.

3. Click the Settings tab. See Figure 12.

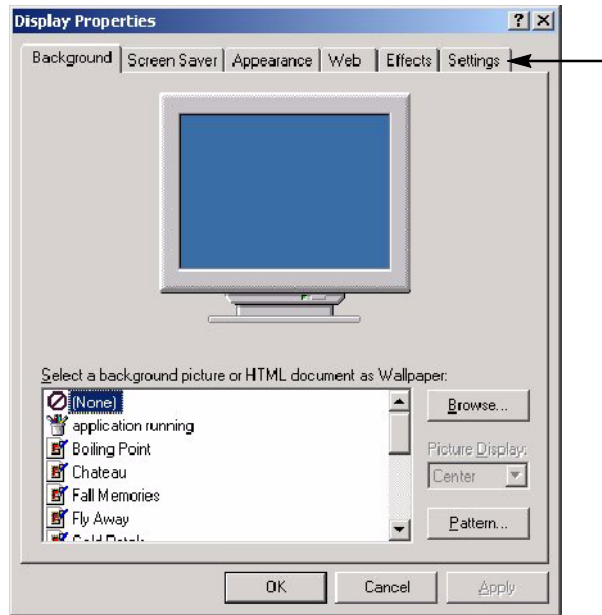


Figure 12: Settings tab

4. Click the Advance button. See Figure 13.

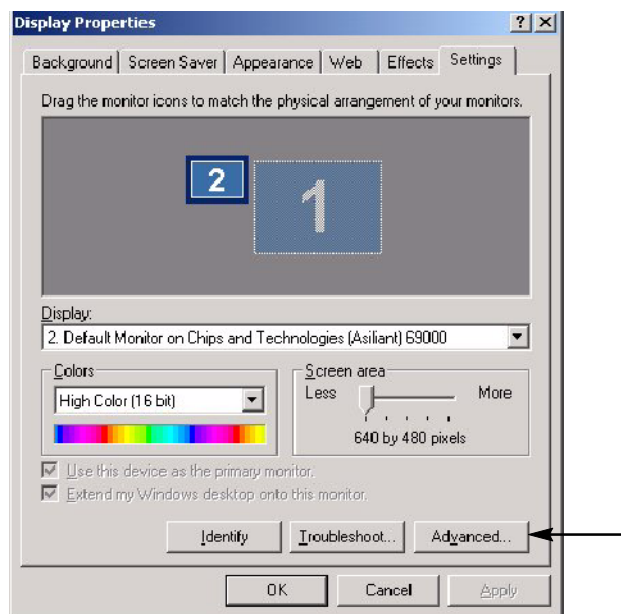


Figure 13: Advance button

5. Click the Color tab. See Figure 14.

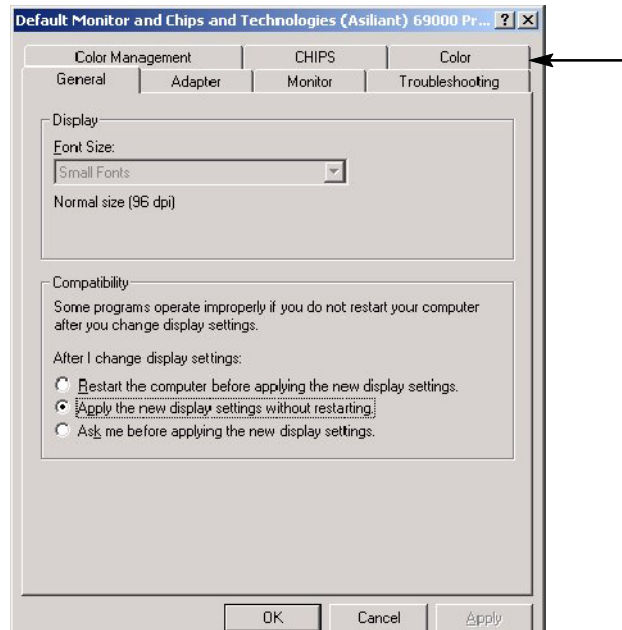


Figure 14: Color tab

6. Select the Desktop graphics and Video buttons. See Figure 15.

7. In the Color menu select All. See Figure 15.

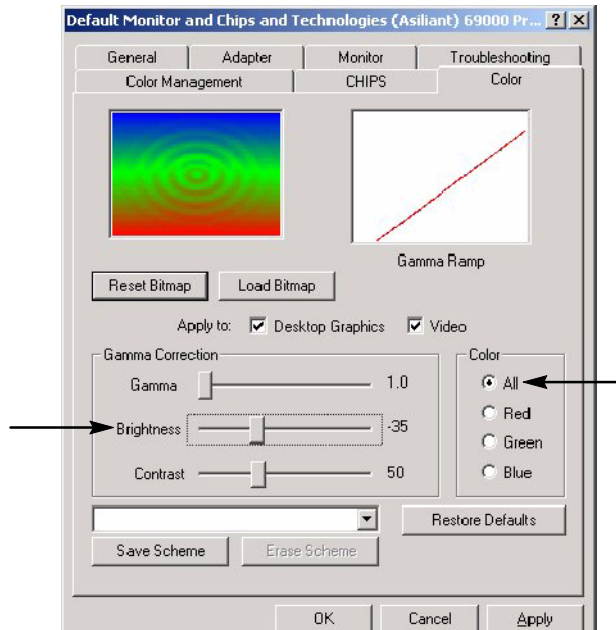


Figure 15: Brightness and button settings

8. Slide the brightness bar to -35. All. See Figure 15.

9. Click OK.

10. Click OK on the Display menu.

11. Go to the Scope display to verify how the display looks.

12. Repeat Steps 1 through 11, except set the slide the brightness bar to -40 in step 8.

13. Set the gamma setting that looks best to you, -35 or -40.

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