

# Instructions



## **065-0702-XX, 065-0717-XX, 050-3674-XX LCD/Touch Screen Replacement Kit TDS5000B Series Oscilloscopes**

**075-0837-01**

### **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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## **Contacting Tektronix**

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For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit [www.tektronix.com](http://www.tektronix.com) to find contacts in your area.

# Service Safety Summary

Only qualify 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

This replacement kit provides the direct replacement parts, software, and instructions for three separate LCD (liquid crystal display) \touch screen replacement kits:

- LCD for a standard instrument with no touch screen
- LCD and touch screen for an instrument with Option 18
- LCD only for an instrument with Option 18

All three replacement kits require new gamma settings (procedures are provided in this kit) and new touch screen software installed to ensure an optimum display with the new LCD.

This document supports Tektronix modification ECR 31268.

## Products

**TDS5000B Series** All Serial Numbers

## Kit Parts List

Kit number	Quantity	Part number	Description
065-0702-XX	1 ea	-----	Parts replacement kit for a standard instrument with no touch screen, TDS5000B Series, includes the following parts:
	1 ea	650-4586-XX	LCD assembly
	1 ea	075-0837-01	Kit Instructions: Display With Touch Screen, TDS5000 Series
065-0717-XX	1 ea	-----	Parts replacement kit for a instrument with Option 18: TDS5000B Series, includes the following parts:
	1 ea	650-4999-XX	LCD and touch screen assembly
	1 ea	020-2865-XX*	Accessory kit: Touch screen switcher tool CD V.1.0.0
	1 ea	075-0837-01	Kit Instructions: Display With Touch Screen, TDS5000 Series
050-3674-XX	1 ea	-----	Parts replacement kit for an instrument with Option 18, TDS5000B Series, includes the following parts:
	1 ea	650-4634-XX	LCD assembly with Adapter circuit board

## Kit Description

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<b>Kit number</b>	<b>Quantity</b>	<b>Part number</b>	<b>Description</b>
	1 ea	020-2865-XX*	Accessory kit: Touch screen switcher tool CD V.1.0.0
	1 ea	075-0837-01	Kit Instructions: Display With Touch Screen, TDS5000 Series

**NS Not Saleable**

\* The software installation procedure is provided in the CD booklet (071-2207-XX).

# Installation Instructions

This section contains the procedures needed to install the LCD\touch screen into the TDS5000B Series instruments. Use the appropriate procedures that pertain to your kit, LCD and/or touch screen.

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 Service Center or Tektronix Factory Service for installation assistance.

## Minimum Tool and Equipment List

The following tools are required 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
6	3/16 inch nut driver	Used to remove the rear panel nut posts	Standard tool
7	5/16 inch nut driver	Used to remove the rear panel nut posts	Standard tool

## Preparation



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**WARNING.** Before doing this or any other procedure in this manual, read the Safety Summary found at the beginning of this manual. Also, to prevent possible injury to service personnel or damage to the oscilloscope components, read Installation in Section 2, and Preventing ESD in this section.

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This subsection contains the following items:

- The preparatory information you need to properly do the procedures that follow.
- List of tools required to remove and disassemble all modules.
- Procedures for removal and reinstallation of the electrical and mechanical modules.
- A disassembly procedure for removal of all the major modules from the oscilloscope at one time and for reassembly of those modules into the oscilloscope.



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**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.

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**NOTE.** Read Equipment Required for a list of the tools needed to remove and install modules in this oscilloscope. See Table 1, page 5.  
Read the cleaning procedure before disassembling the oscilloscope for cleaning.

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**Equipment Required.** Most modules in the TDS5000 Digital Oscilloscope can be removed with a screwdriver handle mounted with a size T-15, Torx® screwdriver tip. Use this tool whenever a procedure step instructs you to remove or install a screw unless a different size screwdriver is specified in that step. All equipment required to remove and reinstall each module is listed in the first step of its procedure.



## Installation Procedures

The following procedures are found here, except for the touch screen procedure, and are listed in the order to be completed.

- Line Fuse, Line Cord, and Trim Removal
- Display Assembly Removal
- Gamma Settings
- Touch Screen Driver Switch Tool installation (in the CD booklet)

### Line Fuse, Line Cord, and Trim Removal

1. *Orient the oscilloscope:* Set the oscilloscope on the work surface with its rear facing you.
2. *Remove the line cord:* Pull the line cord away from the AC power connector.
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 Torxdrive screws that secure the front panel trim to the oscilloscope. See Figure 1, on page 8.
  - c. Grasp the trim ring by its 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 its 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.

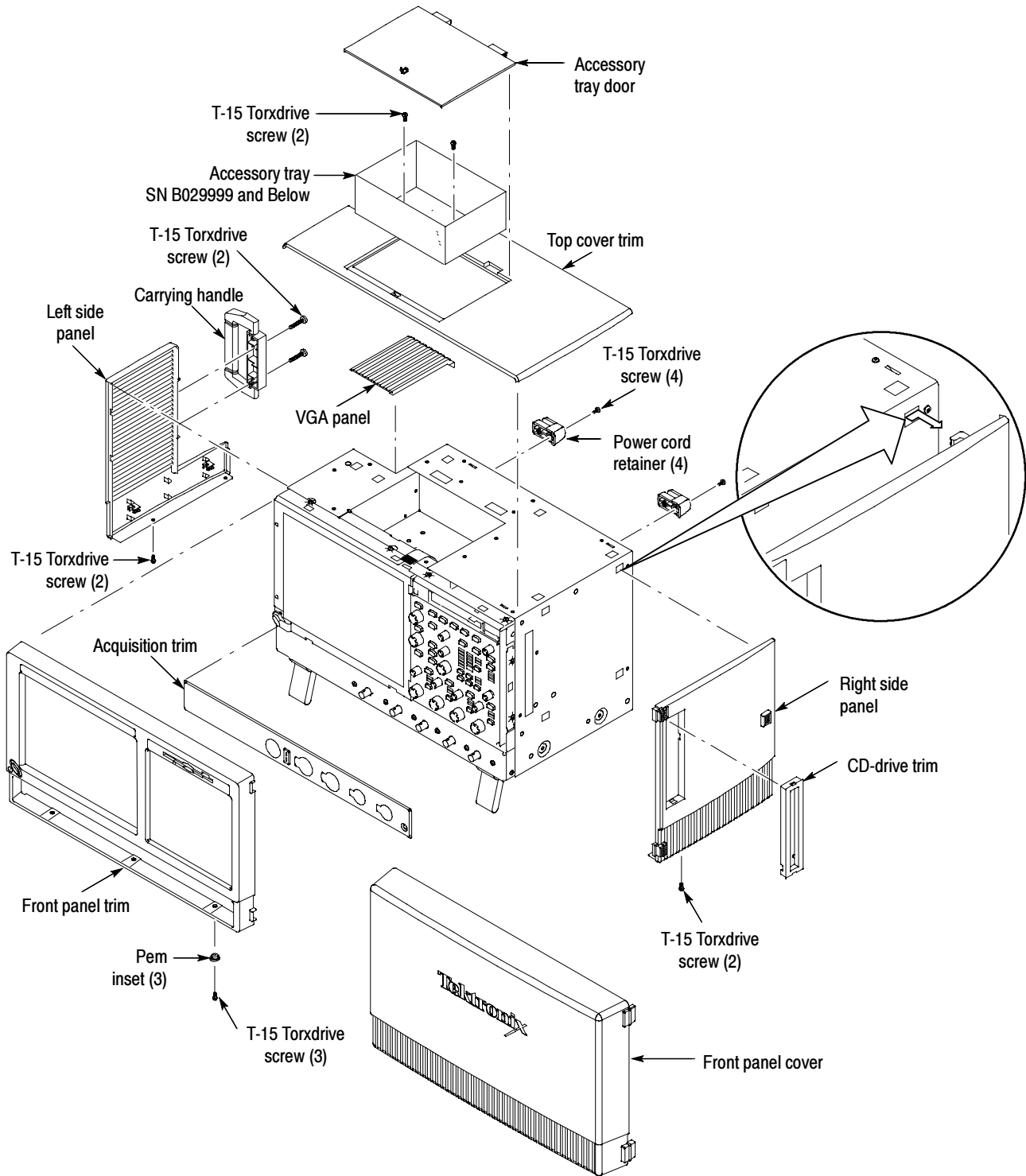
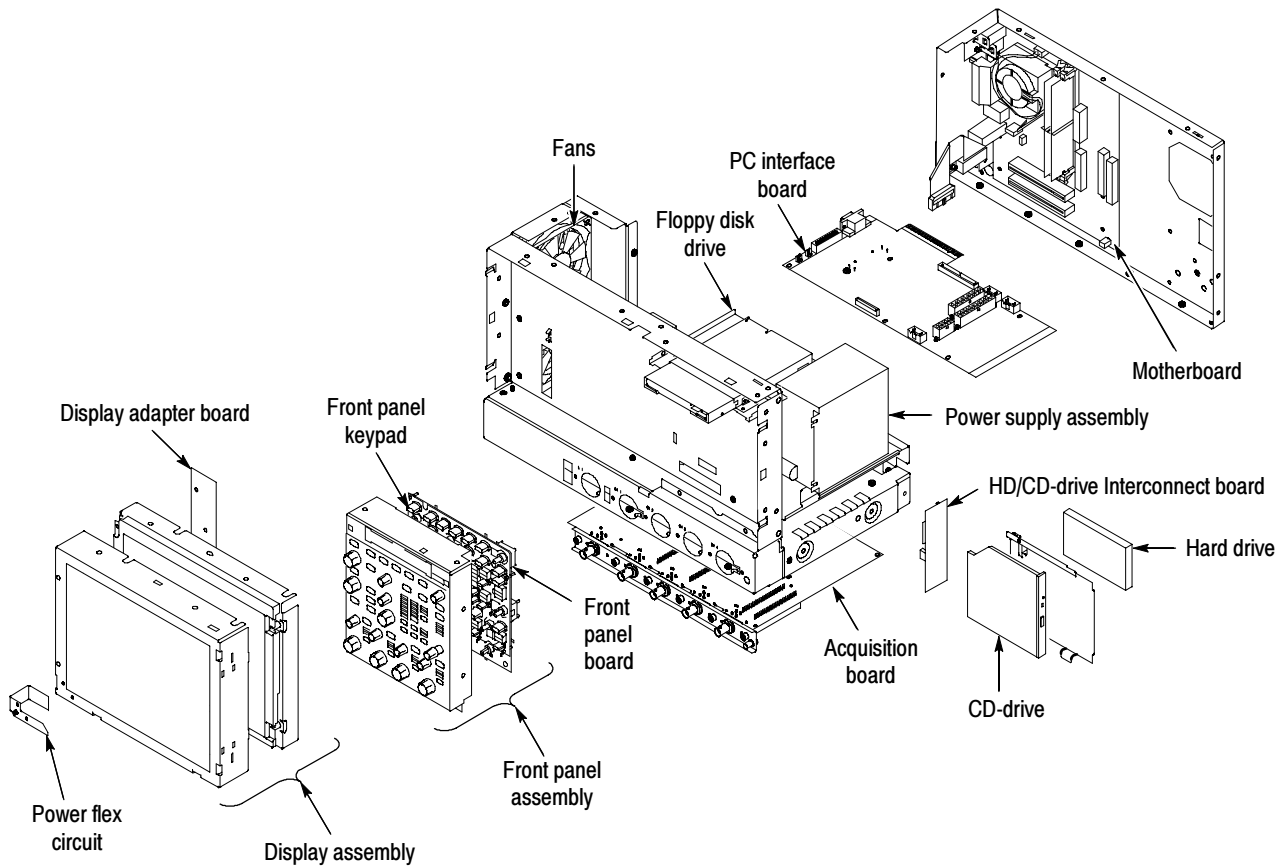


Figure 1: Trim removal



**Figure 2: Internal modules**

**Display Assembly Removal**

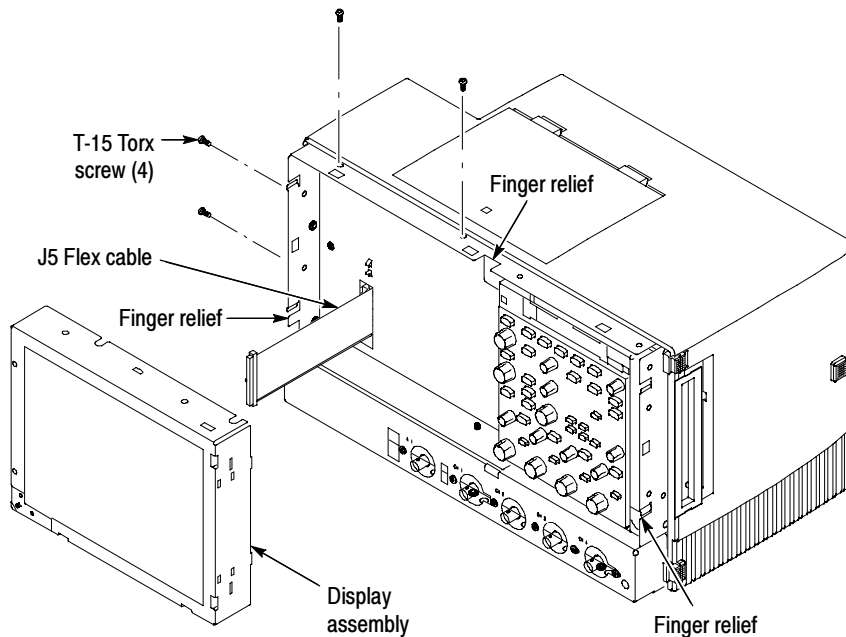
1. *Locate module to be removed:* Locate the Display assembly; see Figure 2.
2. *Orient the oscilloscope:* Set the oscilloscope on the work surface with its front panel facing you.



**CAUTION.** To avoid damage to the front panel Standby/On switch assembly, do not set the Display module assembly on a work surface. Sliding the oscilloscope over the edge of the work surface could break off the On/Standby switch assembly.

**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 removal**

**4. Remove and disconnect the following from the old display assembly:**

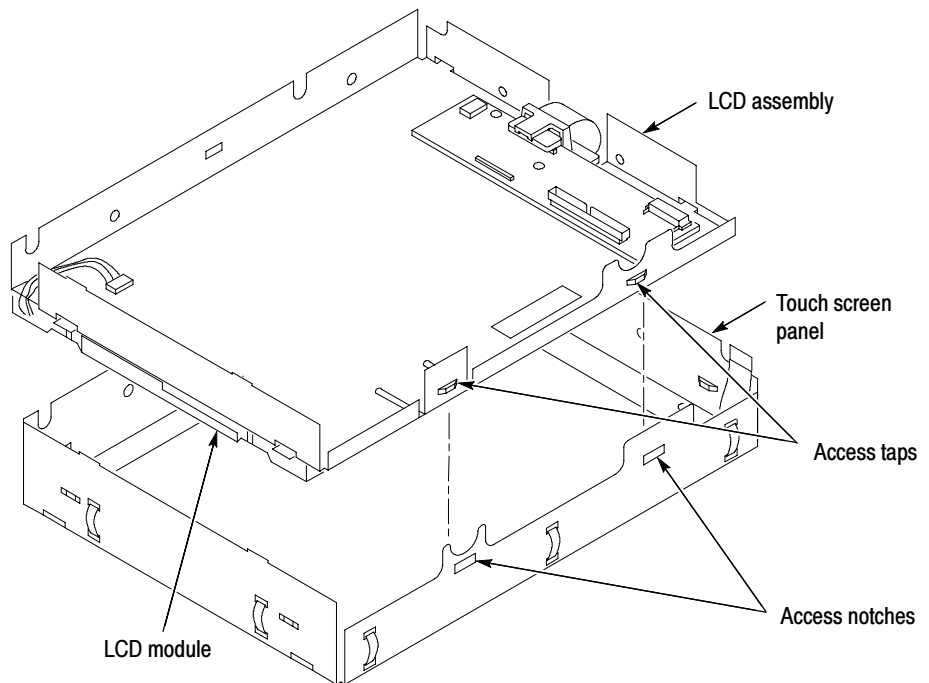
- a. Disconnect cables J1, J4 and J7 from the Display Adapter circuit board. See Figure 4, on page 11.
- b. Disconnect LCD light connector (S) from the Inverter circuit board.



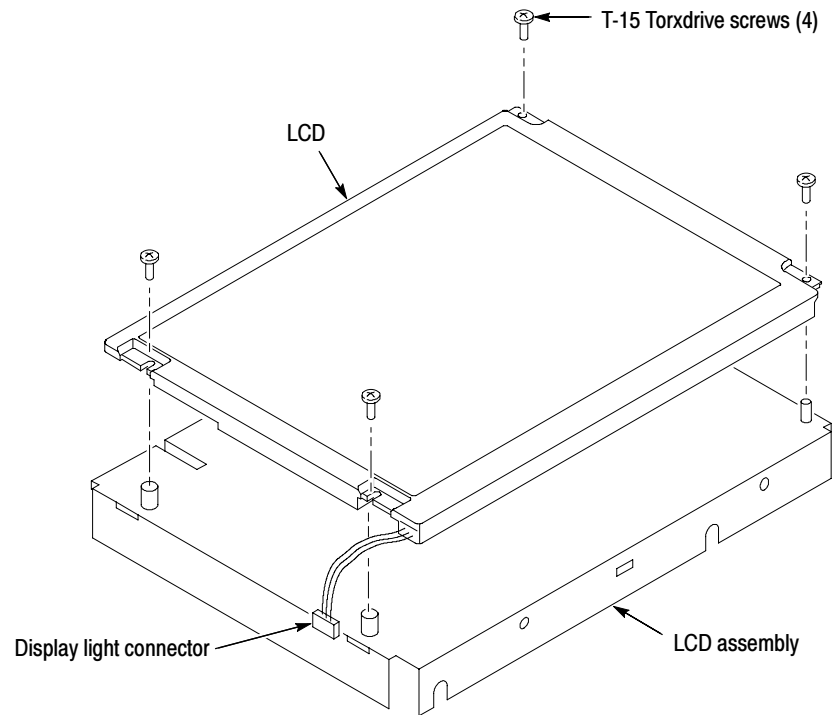


**CAUTION.** To prevent damage to the touch screen from scratches or cuts, make sure you take care not to contact the screen surface with any sharp tools.

- 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 Torxdrive 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**

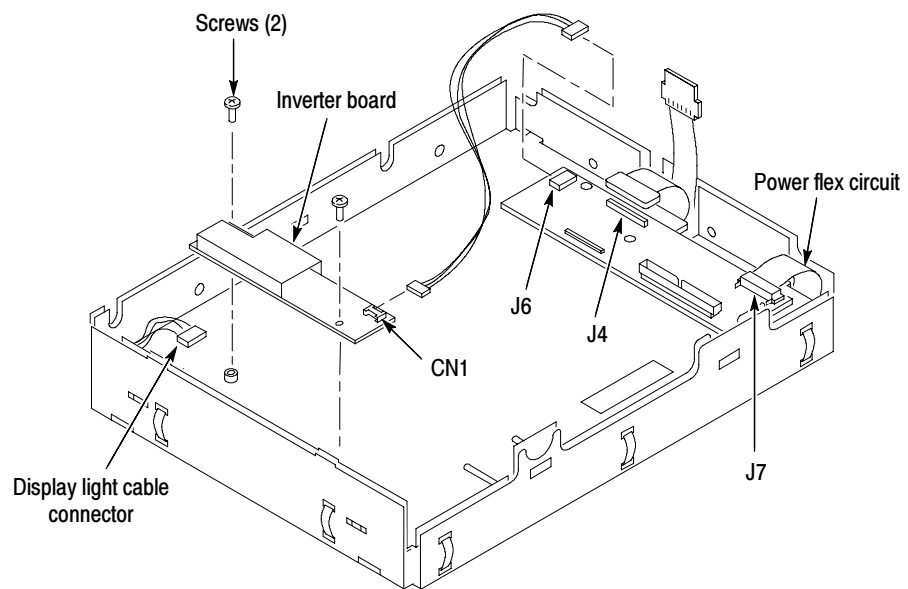
6. Install the new LCD assembly and touch screen panel by sliding them together until tabs snap into the notches. See Figure 6.
7. Install the old Inverter circuit board into the new LCD assembly using the two number 0 Phillips screws removed from the old display assembly.

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.

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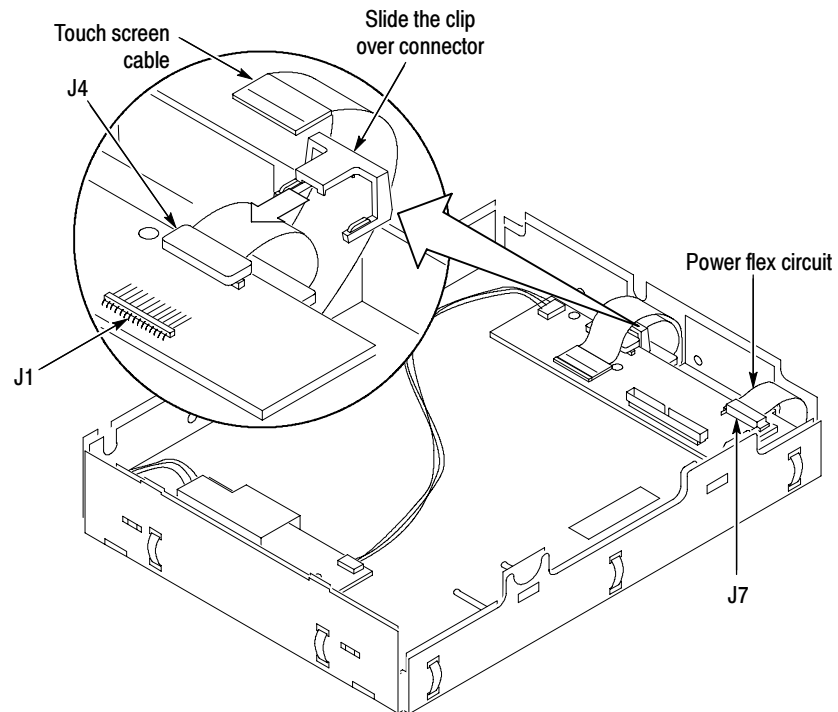
**NOTE.** The LCD and Inverter/Display connector housings have contacts visible on one side; make sure this side is facing up toward the installer when connecting the cable to both circuit boards.

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**Figure 7: Install the inverter circuit board**





**Figure 8: Cable clamp installation detail**

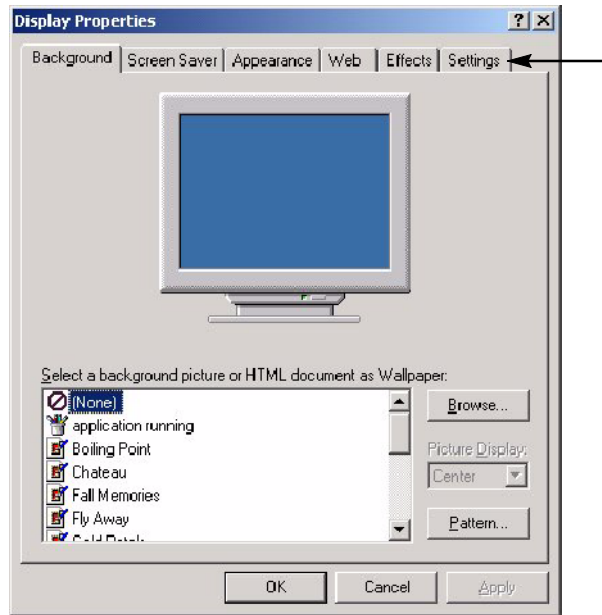
- 10.** Connect the display cable to J4 on the Display Adapter circuit board. Slide the cable clamp (provided in this kit) over the cable and under the Display Adapter circuit board to secure the cable to the connector. See Figure 8.
- 11.** Connect the touch screen cable to the J1 connector on the Display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

## Gamma Settings

Use the following gamma setting procedure to get the optimum display. Try both settings, Steps 8 and 12 on page 18, to determine what display looks best to you.

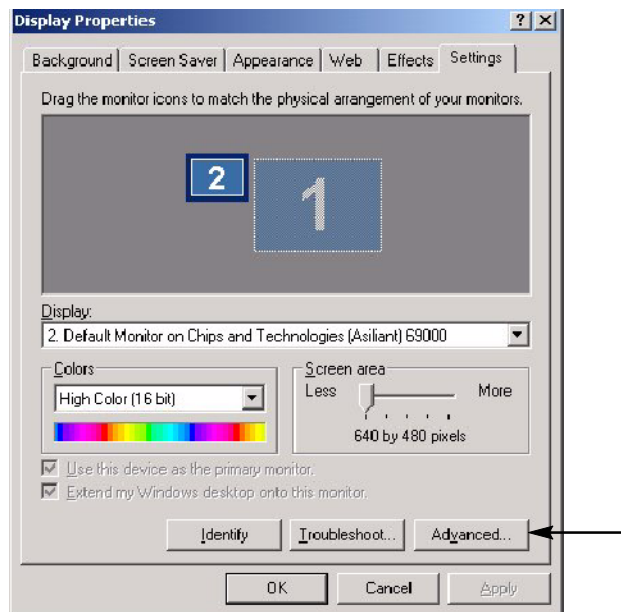
- 1.** Right click on the desktop.
- 2.** Click the Properties menu.

3. Click the Settings tab. See Figure 9.



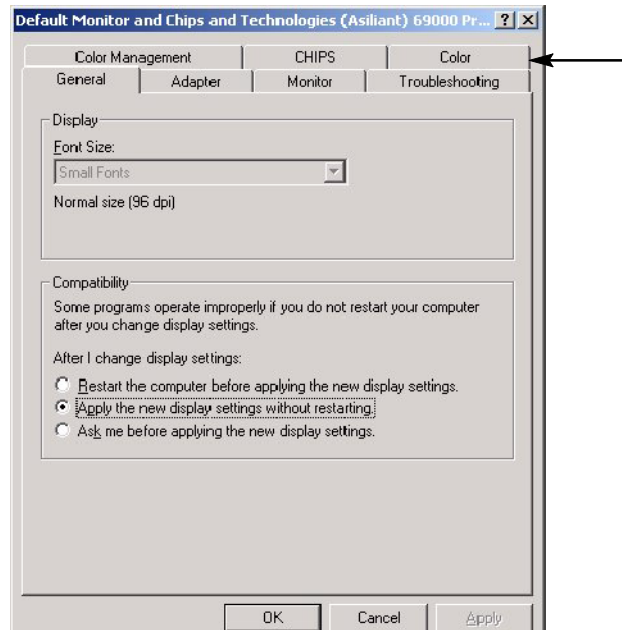
**Figure 9: Settings tab**

4. Click the Advance button. See Figure 10.



**Figure 10: Advance button**

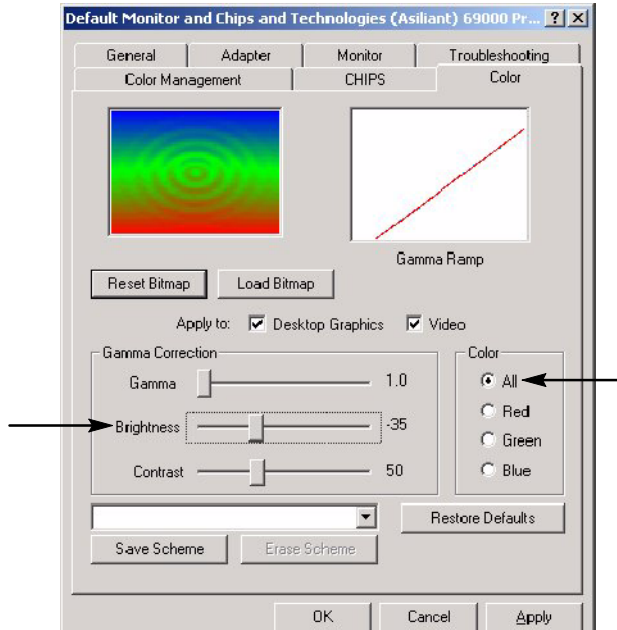
5. Click the Color tab. See Figure 11.



**Figure 11: Color tab**

6. Select the Desktop graphics and Video buttons. See Figure 12.

7. In the Color menu select All. See Figure 12.



**Figure 12: Brightness and button settings**

8. Slide the brightness bar to -35. All. See Figure 12.

9. Click OK.

10. Click OK on the Display menu.

11. Go to the Scope display to see 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.

### Touch Screen Set Up

For the touch screen set-up instructions, refer to the CD booklet that came with your Touch Screen Switcher Tool CD.

■ End of document ■