



050-2678-00

M71065

AT117 OR AT127 REPLACEMENT

For the following TEKTRONIX® Portable Oscilloscopes:

2245	Serial Numbers	B010100 - UP
2245A	Serial Numbers	B010100 - B025412
2246	Serial Numbers	B040100 - UP
2246A	Serial Numbers	B010100 - B021681
2246 MOD A	Serial Numbers	B100100 - B114266
2246 1Y	Serial Numbers	B700100 - B711094
2247A	Serial Numbers	B010100 - B022642

A new attenuator network, pn 307-2135-03, replaces all previous versions of the attenuator network used for AT117 or AT127. The new network provides a variable resistor which allows manufacturing to minimize 5V/div aberrations while maintaining bandwidth at 50mV/div. For field replacement, the variable resistor adjustment should be set to the center of its range.

CAUTION

STATIC SENSITIVE DEVICES

Static discharge can damage any semiconductor component in this instrument. Static voltages of 1kV to 30kV are common in unprotected environments.

TO AVOID DAMAGE, OBSERVE THE FOLLOWING:

1. Minimize handling of static-sensitive components.
2. Transport and store static-sensitive components or assemblies in their original containers, on a metal rail, or on conductive foam. Label any package that contains static-sensitive assemblies or components.
3. Discharge the static voltage from your body by wearing a wrist-strap while handling these components. Servicing static-sensitive assemblies or components should be performed only at a static-free work station by qualified service personnel.
4. Nothing capable of generating or holding a static charge should be allowed on the work station surface.
5. Keep the component leads shorted together whenever possible.
6. Pick up components by the body, never by the leads.
7. Do not slide the components over any surface.
8. Avoid handling components in areas that have a floor or work-surface covering capable of retaining a static-charge.
9. Use a soldering iron that is connected to earth ground.
10. Use only approved, anti-static type, desoldering tools.

KIT PARTS LIST:

Ckt. No.	Quantity	Part Number	Description
AT117 or AT127	1 ea	307-2135-03	Resistor Network: Attenuator
	1 ea	---- ----	Label: 050-kit

INSTALLATION INSTRUCTIONS:

WARNING

Dangerous shock hazards may be exposed when the instrument cabinet is removed. Before proceeding, ensure the POWER switch is in the OFF position, then disconnect the instrument from the power source. Disassembly should only be attempted by qualified service personnel.

- () 1. Unplug the power cord from its rear-panel connector.
- () 2. Install the protective front cover over the front panel and set the instrument face down on a clean, flat surface.
- () 3. Remove the torx-head screw from the right side near the rear of the cabinet.
- () 4. Remove the four torx-head screws used to secure the plastic rear cover and set the cover aside.
- () 5. Slide the cabinet housing up and off the instrument. Set the instrument down flat on the work surface.

WARNING

Potentially dangerous voltages exist at several points throughout this instrument. If it is operated with the cabinet removed, do not touch exposed connections or components. Before replacing parts or cleaning, disconnect the ac power source from the instrument and verify that the line-rectifier filter capacitors have discharged. Also, check the low voltages at the power supply/main board interface connector (J1204). If any of the supply-voltage or line-voltage filter capacitors remain charged for more than 20 seconds, discharge them to ground through a 1k Ω , 5 or 6 watt resistor.

- () 6. Unplug the ribbon cable from J2501 which is located in the front-right corner of the Processor circuit board.
- () 7. Unplug the ribbon cable from J2105 which is located in the upper-left corner of the Potentiometer circuit board.

- () 8. Remove the front protective cover. Use a 1/16-inch hexagonal wrench to loosen the setscrews securing the CH1 and CH2 VOLTS/DIV VAR knobs and the SEC/DIV VAR knob; remove the knobs.
- () 9. Remove all the remaining front panel knobs that are located to the right of the crt. Grasp the knobs firmly and pull straight out from the front panel.
- () 10. Unclip the high voltage connector from the front of the power supply housing. Remove the plastic retaining clip from the housing (it is pressed in). Move the high voltage connector to the top of the power supply housing to make room for removing the Potentiometer/Switch board assembly.
- () 11. Pull out on the four captive plastic snap fasteners on the back of the Switch circuit board that hold the Switch board to the front panel. (Do not release the fasteners securing the Potentiometer circuit board to the Switch circuit board.) Use long-nose pliers, if necessary, to reach the fasteners.
- () 12. Move the Potentiometer/Switch circuit board assembly back away from the front panel and lift it out of the instrument.
- () 13. Turn the instrument bottom side up.
- () 14. Remove the five screws securing the bottom attenuator shield; remove the shield.
- () 15. Remove the screw securing the top attenuator shield to the Main circuit board. Turn the instrument over and remove the top attenuator shield. (The shield mounts between the Potentiometer/Switch assembly and the Main circuit board.)

CAUTION

When soldering on circuit boards, use only a 15W (600° maximum) soldering iron. A higher wattage soldering iron can cause etched circuit conductors to separate from the board base material. Never allow the solder extractor tip to remain in one place on the board for more than three seconds.

When unsoldering multipin components, especially microcircuits, do not heat adjacent pins consecutively. Apply heat to the pins at alternate sides and ends as solder is removed. Allow the circuit board to cool before proceeding to the next pin.

Use only an antistatic, vacuum-type solder extractor approved by a Tektronix, Inc., Service Center (such as a Soldapullit[®] AS196). Solder wick, heat blocks, and spring-actuated or squeeze-bulb solder suckers must not be used.

- () 16. Replace the defective attenuator network, AT117 or AT127, with the new network included in this kit. Ensure the variable resistor adjustment on the new attenuator network is set to the center of its range.

NOTE

Due to limited availability in the field of test equipment to measure 5V/div aberrations, the variable resistor on the new attenuator network should be set to the center of its range. The variable resistor is the adjustment on the attenuator network that is located nearest the front of the instrument.

- () 17. Partially reassemble the instrument by performing the reverse of the procedure in steps 6 through 15. Temporarily reconnect the power cord to the instrument to perform the following step.
- () 18. Refer to the Performance Check Procedure (Section 4) and the Adjustment Procedure (Section 5) in the Service Manual and make any necessary checks and adjustments. Especially check the vertical adjustments.
- () 19. Install the cabinet housing by performing the reverse of the procedure described in steps 1 through 5.
- () 20. Remove the protective backing from the 050-kit label, included in this kit, and place the label on a clean, flat surface of the rear panel near the serial number tag. The label indicates this kit has been installed.
- () 21. For future reference, update the Replaceable Electrical Parts list in the service manual with the information provided in the parts list of this kit.

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