



050-2390-00

M66311

U320 OR U420 REPLACEMENT

For the following TEKTRONIX® instruments:

2432 Serial Numbers B010100 - BXXXXXX*
2432M Serial Numbers B010100 - BXXXXXX*

Vertical preamplifier hybrid microcircuit, pn 165-2235-02, replaces hybrid preamplifier microcircuit, pn 165-2235-00 or pn 153-2235-01, for use as U320 or U420. Replacement of either U320 or U420 requires replacement of both microcircuits. The new microcircuits provide improved performance at low temperatures.

NOTE

If the instrument serial number is greater than those listed above or if this kit has been installed previously, disregard the instructions and use vertical preamplifier hybrid microcircuit, pn 165-2235-02, as a direct replacement for U320 or U420.

* Ending serial number not available at this printing.

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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. Number	Quantity	Part Number	Description
U 320	2 ea	165-2235-02	Microcircuit, hybrid, low noise, vert preamp
U 420	1 ea	--- ---- --	Label, 050- kit

INSTRUCTIONS:**WARNING**

Dangerous shock hazards may be exposed when the instrument covers are removed. Before proceeding, ensure the mainframe 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. Disconnect the power cord from any ac power source.
- () 2. Disconnect the power cord from its receptacle at the instrument rear panel.
- () 3. Grasp the power cord plug (female end), rotate the power cord retainer 1/4 turn, and pull it to remove the cord from the rear panel.
- () 4. Grasp the handle hubs (at right and left side of the instrument) and pull outward. Rotate the hubs to position the front of the handle away from the front of the instrument.
- () 5. Install the protective front cover over the front panel. Push on the cover to lock the side tabs around the front panel trim band.
- () 6. Set the instrument so it rests on the front cover.
- () 7. Remove the two screws inside each of the rear feet at the instrument back panel.

WARNING

Dangerous potentials exist at several points throughout this instrument. If it is operated with the cabinet removed, do not touch exposed connections or components. Some transistors may have elevated case voltages. Disconnect the ac power source from the instrument and verify that the line-rectifier filter capacitors have discharged before cleaning the instrument or replacing parts (see label on the Low Voltage Power Supply cover).

- () 8. Grasp the handle hubs (at right and left sides of the instrument) and pull outward. While holding the hubs outward, pull straight up from the rear of the cabinet to remove the cabinet from the instrument.

WARNING

The line-rectifier capacitors normally retain a charge for several minutes after the instrument is powered off and can remain charged for a longer period if a bleeder resistor fails or other power supply problems occurs. Before beginning any cleaning or work on the internal circuitry of the instrument, discharge the capacitors by connecting a shorting strap in series with a 1k Ω , 5 watt resistor across the capacitors. Connect one end of the shorting strap/resistor combination to the upper-most terminal of S1020 (the terminal connected through a wire to W310). Connect the other end to pin 11 of T117 (the pin protruding from the side of the transformer, near its right-rear corner). Measure across those two connections with a voltmeter to ensure the capacitors are discharged.

- () 9. Set the instrument on a flat, smooth surface with the bottom side up and the front panel facing forward.
- () 10. Replace the CH 1 vertical preamplifier, U420, as follows:
 - () a. Remove the two screws securing the preamp shield to U420's heat sink and remove the shield.
 - () b. Unsolder the assembly consisting of diode CR411, capacitor C1005, and resistor R1005 from the lead of U420 protruding through the hole in the heat sink.
 - () c. Remove the two post spacers and two nuts securing the heat sink of U420.
 - () d. Remove the heat sink/hybrid assembly and replace it with one of the hybrid assemblies from the kit.
 - () e. Ensure the hybrid assembly is properly seated in its socket, then complete its installation by performing the reverse of the procedure in sections a through c of this step.
- () 11. Replace the CH 2 vertical preamplifier, U320, as follows:
 - () a. Remove the two screws securing the preamp shield to U320's heat sink and remove the shield.
 - () b. Unsolder the assembly consisting of diode CR311, capacitor C1006, and resistor R1006 from the lead of U320 protruding through the hole in the heat sink.

- () c. Remove the two post spacers and two nuts securing the heat sink of U320.
- () d. Remove the heat sink/hybrid assembly and replace it with the remaining hybrid assembly from the kit.
- () e. Ensure the hybrid assembly is properly seated in its socket, then complete its installation by performing the reverse of the procedure in sections a through c of this step.
- () 12. Refer to the Performance Check and Adjustment Procedure sections in the Service Manual and make any necessary checks and adjustments.
- () 13. Reassemble the instrument by performing the reverse of the procedure in steps 1 through 9.
- () 14. Remove the protective backing from the 050-kit label and place it on a clean, dry area of the rear panel.
- () 15. For future reference, update the Electrical Parts List in the service manual with the information contained in the Kit Parts List on page 3 of these instructions.

