product modification

050-0811-01

PC-24
M33402

Type 213

U335 REPLACEMENT

For TEKTRONIX® 213 DMM Oscilloscopes

Serial Numbers B010100 - B042749

Replacement of Trigger and Sweep Generator IC, U335, necessitates the addition of an 87pF capacitor, C338, to accommodate a change in the manufacturing process of the IC.

For instruments below serial number B010360, the variable holdoff circuit, Q335 and associated circuitry were removed to eliminate the need to select components when replacing the Trigger and Sweep Generator IC, U335.

NOTE: If the serial number of your instrument is above those listed, or if this kit has been installed, disregard the instructions and use the IC, pn 155-0048-01, as a direct replacement for U335.

8-1-78
Supersedes 8-24-76

PARTS INCLUDED IN PARTS REPLACEMENT KIT:

Ckt. No.	Quantity	Part Number	Description
U335	1 ea	155-0048-01	Integrated circuit, Trigger/Sweep
C338	1 ea	283-0251-00	Capacitor, cer., 87pF 5% 100V
	1 ea		Marker, identification

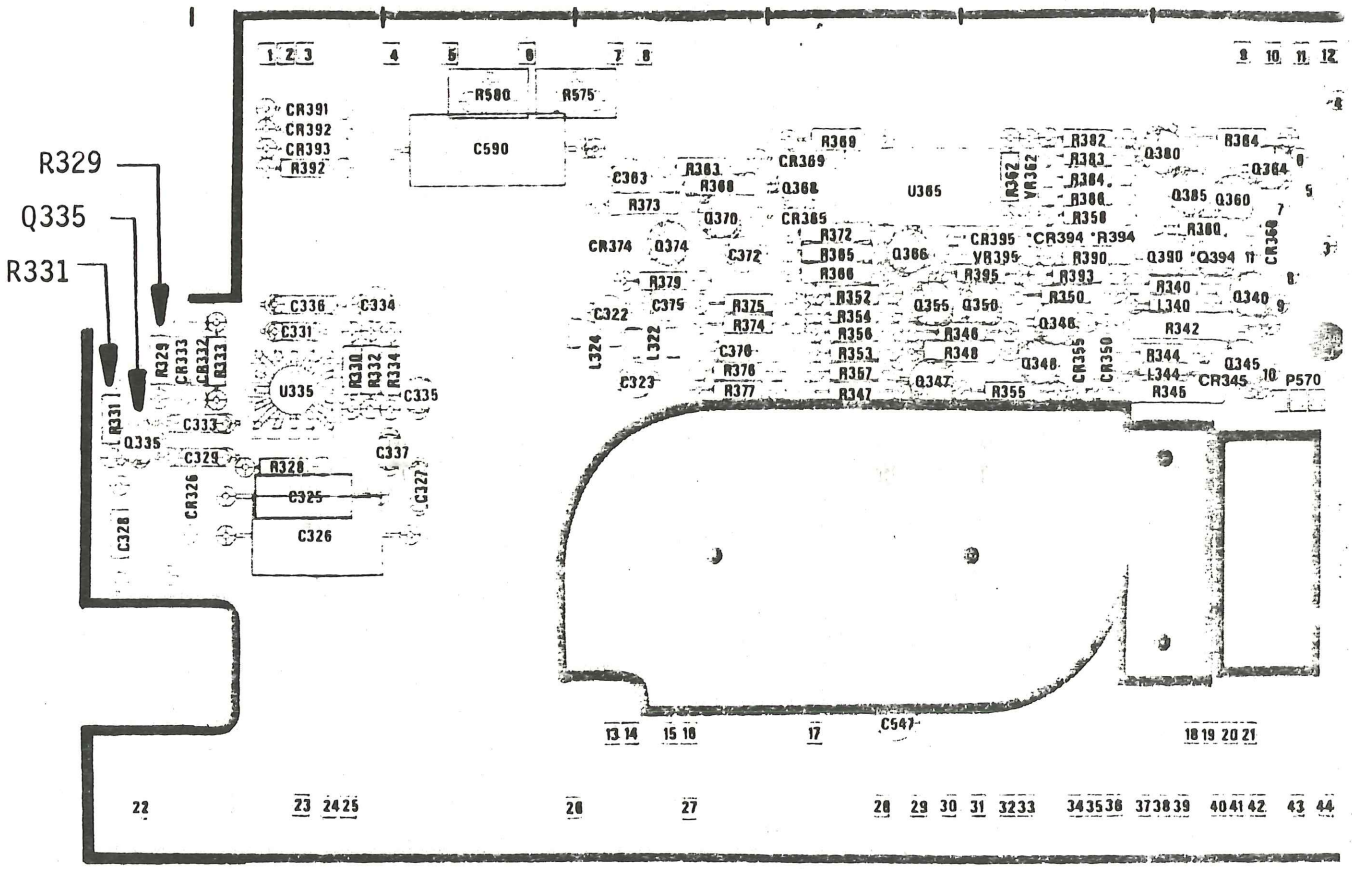

Figure 1. Component Side of Output Amplifier Circuit Board (A4).

INSTRUCTIONS:

WARNING

Before proceeding, position the POWER switch to OFF; then disconnect the instrument from the power source.

( ) 1. Place the instrument upside down on the work bench. Unwind both the power cord and the attached probe from the rear of the instrument.

NOTE: The circuit board-crt assembly is not fastened to the cabinet except by a close fit around the front of the crt. Be careful when removing the covers to avoid dropping the assembly.

( ) 2. Remove the four (4) screws from the bottom cover of the instrument and remove the bottom cover.

( ) 3. Disconnect the three (3) conductor battery lead from P444 on the Power Supply circuit board (A5).

( ) 4. Remove the battery retainer mounting screw and remove the battery retainer and batteries.

CAUTION

Do not set the batteries on a metal surface as the bottoms are at a one cell potential difference and one of the cells will be shorted and destroyed.

( ) 5. Remove the two (2) nuts and washers used to mount the Output Amplifier circuit board (A4) to the Line Converter Chassis.

( ) 6. Carefully lift the Output Amplifier circuit board straight up until the terminal pins disconnect from the respective terminal pin sockets.

NOTE: When removing the Output Amplifier circuit board, be careful NOT to disconnect the Power Supply circuit board from the A-D Converter circuit board.

( ) 7. Disconnect the three (3) conductor crt lead from the Output Amplifier circuit board and swing the circuit board up and toward the rear of the instrument until the circuit board rests on the working surface.

PERFORM STEP 8 IF THE SERIAL NUMBER OF YOUR INSTRUMENT IS BELOW B010360.

( ) 8. Remove Q335, R329 (a 47kΩ 0.25W resistor) and R331 (a 100kΩ 0.25W resistor).

( ) 9. Replace U335 with the IC from the kit.

( ) 10. Reassemble the Output Amplifier circuit board (A4) by performing steps 5 through 7 in reverse order.

NOTE: Be careful not to bend the terminal pins when installing the A4 circuit board and insure all the terminal pins enter their respective terminal pin sockets.

( ) 11. Reinstall the batteries and battery cover by performing steps 3 and 4 in reverse order.

( ) 12. Install C338, the 87pF capacitor from the kit, on the solder side of the Output Amplifier circuit board from ground to the junction of C325 and C326. Refer to Figure 2.

Refer to the Calibration section of your Instruction Manual and recalibrate as necessary.

( ) 13. Reassemble the instrument by performing steps 1 and 2 in reverse order.

( ) 14. For future reference, an identification marker has been included to indicate that this kit has been installed. After removing the protective backing, place the marker on a clean area on the bottom cover of your instrument.

For future reference, correct the Electrical Parts List in your Instruction Manual as shown in the kit Parts List and to show Q335, R329 and R331 as deleted. To reflect the addition of C338, the Output Amplifier circuit board also changed from pn 670-2228-02 to pn 670-2228-03.

JG:mr

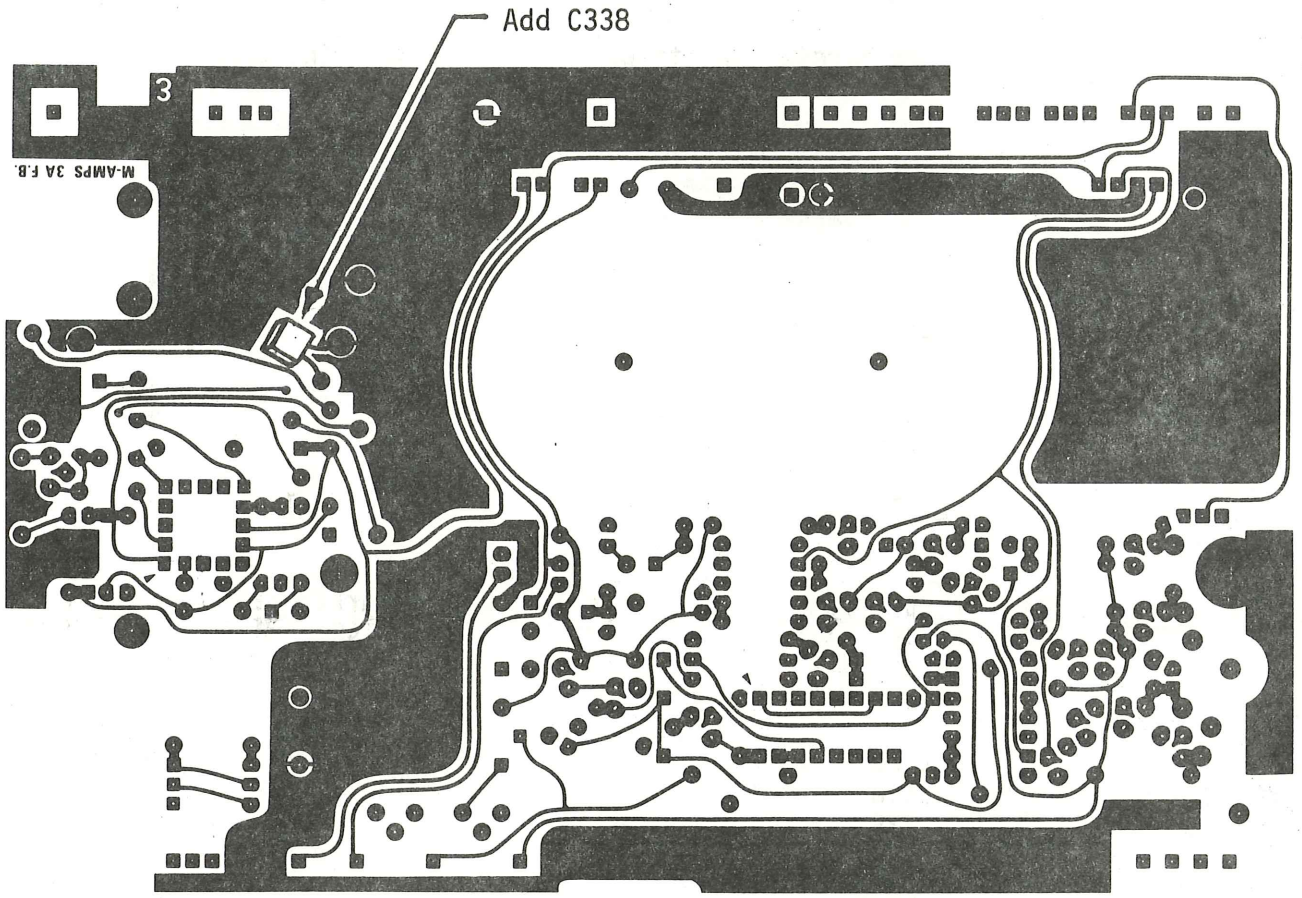

Figure 2. Solder Side of Output Amplifier Circuit Board (A4).