



040-0826-00

M30407, M30911

#### GENERAL IMPROVEMENT

For TEKTRONIX® FG504 40MHz Function Generators

Serial Number B010100 - B030719

Modification Kit PN 040-0826-00 provides parts and instructions as follows:

- 1) The Sine Shaper Offset circuit sees variations in the power supply output as a change in adjustment of the Offset Control. To minimize this condition, the Sine Shaper Offset Control was changed from a voltage source to a current source.
- 2) To prevent overdissipation of the -25 volt power supply Q1760 was changed from a 151-0347-00 transistor on the front of the Main circuit board to a 151-0439-00 transistor on the back of the Main circuit board.
- 3) To further reduce the temperature on the front of the Main circuit board Q1660 was also relocated to the back of the Main circuit board.
- 4) Several components were added to the power supplies to prevent overdissipation at turn on and to protect the power supply transistors from being destroyed by current surges.

PARTS INCLUDED IN MODIFICATION KIT:

Ckt No.	Quantity	Part Number	Description
CR1712	2 ea	152-0141-02	DIODE, SILICON
CR1742			
Q1760	1 ea	151-0439-00	TRANSISTOR, NPN SI D40E7
Q215	1 ea	156-0484-00	INTEGRATED CIRCUIT FET, OPN1 AMP
R790	1 ea	311-1555-00	POTENTIOMETER, TRMR 100K 1/2W
R787	2 ea	315-0100-00	RESISTOR, COMP. 10 $\Omega$ 1/4W 5%
R793			
R1661	2 ea	315-0102-00	RESISTOR, COMP. 1k 1/4W 5%
R1761			
R983	2 ea	315-0103-00	RESISTOR, COMP. 10k 1/4W 5%
R1083			
R1746	2 ea	315-0302-00	RESISTOR, COMP. 3k 1/4W 5%
R1662	2 ea	315-0510-00	RESISTOR, COMP. 51 $\Omega$ 1/4W 5%
R1762			
R945	2 ea	321-0090-00	RESISTOR, PREC. 84.5 $\Omega$ 1/8W 1%
R1045			
R795	1 ea	321-0756-00	RESISTOR, PREC. 50k 1/8W 1%

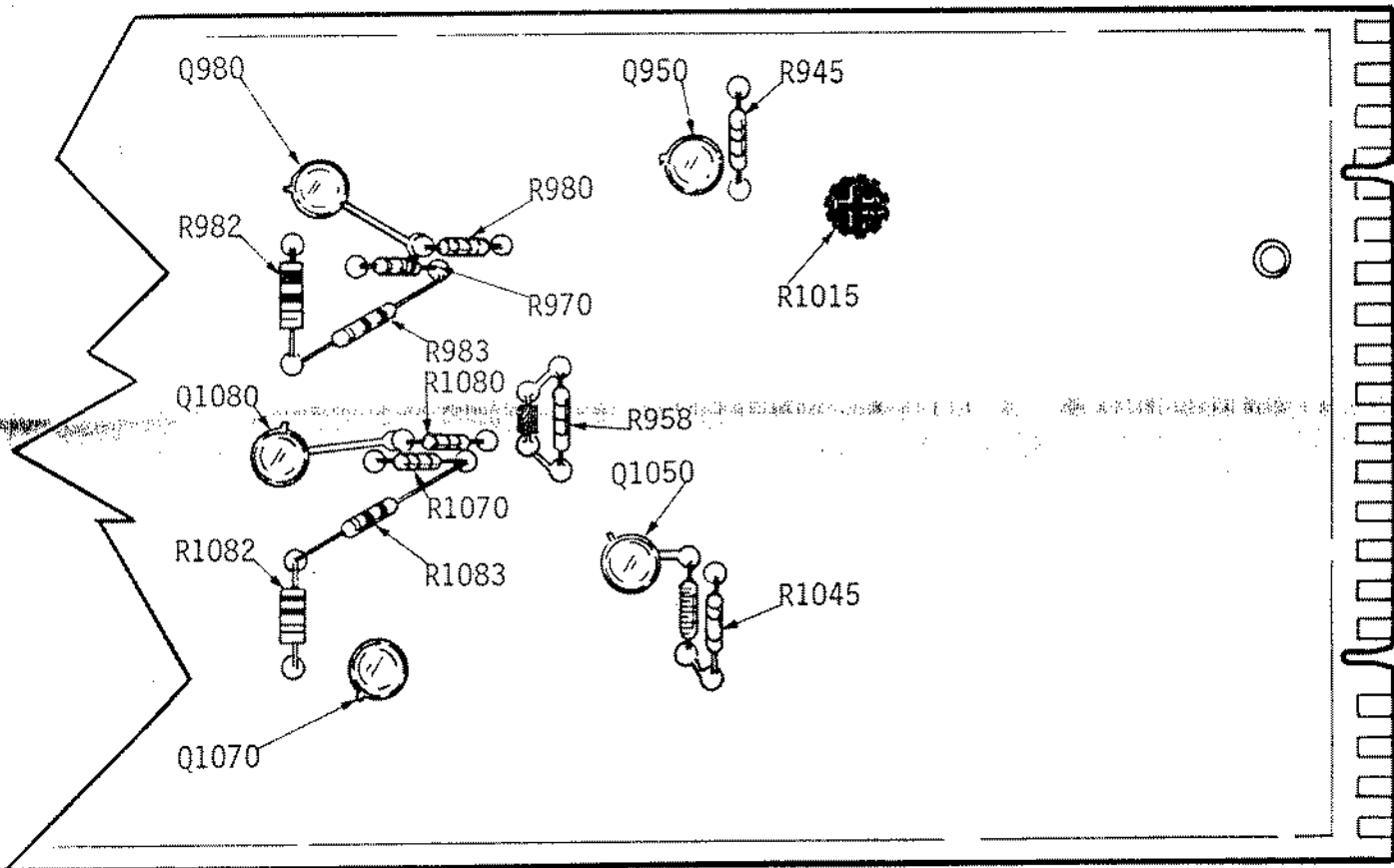


Fig. 1 Partial- Main Circuit Board

( ) 1. Remove the right and left side electrical shields.

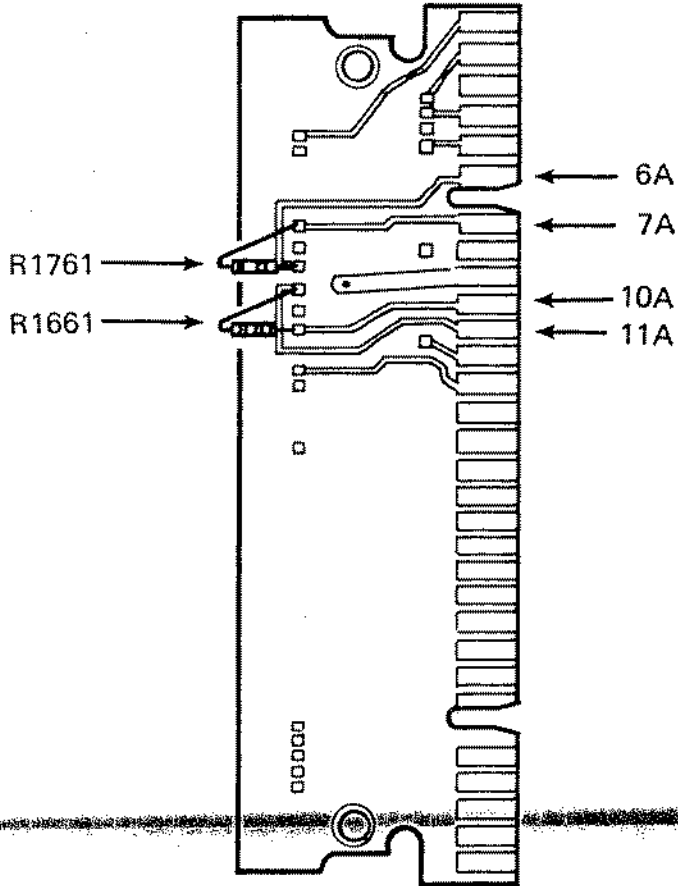
Make the following changes on the Main circuit board:

- ( ) 2. Replace Q1760, a 151-0347-00 transistor near CR1680, with the 151-0439-00 transistor, from the Kit, except mount the new transistor on the back of the Main circuit board and DO NOT solder the emitter lead to the circuit board.
- ( ) 3. Cut off both leads of the two  $51\Omega$  1/4W composition resistors to about 3/8 of an inch. Solder one lead of R1762,  $51\Omega$ , to the circuit board pad where the emitter of Q1760 was connected and solder the other lead of R1762 to the emitter of Q1760 teepee fashion above the circuit board.
- ( ) 4. In a similar manner relocate Q1660 from the front of the Main circuit board to the back of the circuit board and add R1662, the second  $51\Omega$  resistor, in series with the emitter of Q1660.

NOTE: It is much easier to install Q1660 on the back of the Main circuit board if you partially remove the rear panel.

- ( ) 5. Unsolder the collector lead of Q1742 from the Main circuit board. Cut off both leads of R1746, the  $3k$  1/4W composition resistor from the kit, and solder one lead to the circuit board pad where the collector of Q1742 was connected and solder the other lead of R1746 to the collector lead of Q1742 teepee fashion above the circuit board.
- ( ) 6. Temporarily remove the heat sinks from Q1070, Q1080, and Q980.
- ( ) 7. Install R983 and R1083, two  $10k$  1/4W composition resistors from the kit, as shown in Fig. 1 and reinstall heat sinks on Q980, Q1070 and Q1080.
- ( ) 8. Replace R945 and R1045, two  $78.7\Omega$  1/8W 1% precision resistors located as shown in Fig. 1, with the two  $84.5\Omega$  1/8W precision resistors from the kit.
- ( ) 9. Remove R958, a  $27k$  1/4W composition resistor as shown in Fig. 1. See Note in the Instruction Manual Modification Insert for selection procedure for R958.
- ( ) 10. Install CR1712, a 152-0141-02 diode from the kit, in parallel with CR1711 except connect the anode of CR1712 to the emitter of Q1710.
- ( ) 11. Install CR1742, a 152-0141-02 diode from the kit, in parallel with VR1740\*, on the back of the Main CB beneath C1682, except connect the cathode of CR1742 to ground.

\* Shown as CR1740 in some Manuals.



FLOATING CIRCUIT BOARD

FIG. 2

Instruments in the SN range 8010100 to 8020288 make the following change on the Loop circuit board:

- ( ) 12. Replace U215, a 156-0335-00 FET (operational amplifier) with the 156-0484-00 FET (operational amplifier) from the kit.

Make the following changes on the Function CB:

- ( ) 13. Remove R790, the 250 $\Omega$  circuit board mounted potentiometer just forward of P712, the single wire connector (with a white-orange wire).
- ( ) 14. Replace R793 and R787, two 2.7k 1/4W composition resistors near the right edge of the circuit board just forward of P712, with the two 10 $\Omega$  1/4W composition resistors from the kit.
- ( ) 15. Cut off one lead of R795, the 50k 1/8W precision resistor from the kit, to 1/4 inch and the other lead to about 1/2 inch. Solder the 1/4 inch lead to the circuit board pad where the center terminal (wiper) of R790 was connected.

Install R790 as follows:

- ( ) 16. Bend the center terminal of R790, the 100k potentiometer from the kit, out and up around the back of the pot. Solder the outer terminals of R790 to the circuit board pads and solder the long lead of R795 to the wiper of R790 teepee fashion above the circuit board.

Make the following changes on the Floating circuit board:

- ( ) 17. Install R1661 and R1761, two 1k 1/4W composition resistors from the kit, as shown in Fig. 2.