

COMMERCIAL OSCILLOSCOPES AND RELATED EQUIPMENT

HICKOK MODEL 195

FREQUENCY RESPONSE

Vertical Amplifier 10 cps to 50 kc
Horizontal Amplifier 10 cps to 50 kc

DEFLECTION FACTORS

Vertical-Deflection Plates 0.05 rms volts/inch
Vertical Amplifier 15 rms volts/inch
Horizontal Amplifier 0.3 rms volts/inch
Horizontal-Deflection Plates 30 rms volts/inch

LINE RATING 105-125 volts, 50-70 cps

TUBE COMPLEMENT

Type	Function
6SJ7 (V1)	Horizontal Amplifier
884 (V2)	Sweep Circuit Oscillator
6AC7 (V3)	Vertical Amplifier
6X5GT (V4)	Low-Voltage Rectifier
5Y3GT (V5)	High-Voltage Rectifier
5UP1	Cathode-Ray Tube

The schematic circuit diagram of Model 195 is shown in Fig. 22-32. One feature of this otherwise conventional instrument is the use of a phasing control, *R3*, to apply a voltage derived from the *V4* plate circuit to *C8* through the *S1* horizontal selector switch. *C11*, *C9*, *R8*, *R4*, *C6*, and *R3* make up the phasing network. There is a voltage division of the 350-volt, 60-cycle signal, between *C11* and *C9*. The signal voltage across *C9* is applied to *R12* through *S1*, *C8*, and *R8*. *R3* affects the amplitude and phase by changing the circuit impedance.

HICKOK MODEL 195B

FREQUENCY RESPONSE

Vertical Amplifier 30 cps to 1,000 kc
Horizontal Amplifier 10 cps to 50 kc
Sweep Circuit 10 cps to 25 kc

DEFLECTION FACTORS

Vertical Amplifier 0.03 rms volts/inch
Vertical-Deflection Plates 15 rms volts/inch
Horizontal Amplifier 0.3 rms volts/inch
Horizontal-Deflection Plates 30 rms volts/inch

LINE RATING 105-125 volts, 50-70 cps

TUBE COMPLEMENT

Type	Function
6SJ7 (V1)	Horizontal Amplifier
884 (V2)	Sweep Circuit Oscillator
6SN7 (V3)	Vertical Cathode-Follower Input Amplifier
6AC7 (V4)	Vertical Amplifier
6X5GT (V5)	Low-Voltage Rectifier
5Y3GT (V6)	High-Voltage Rectifier
5UP1	Cathode-Ray Tube

The schematic circuit diagram of Model 195B is shown in Fig. 22-33. This oscilloscope provides for external Z-axis or intensity grid modulation of the cathode-ray tube. A signal may be fed to pin 2 of the cathode-ray tube through *C31* and *S5*, using either external or internal modulation. The horizontal sweep and remaining circuits are very much like those of Hickok Model 195. However, the phasing control and filter circuits are a little different. Two filters, *C32* and *C33*, are used instead of four filters. The phasing voltage is derived from the transformer primary rather than from the high-voltage secondary.

HICKOK MODEL 305

FREQUENCY RESPONSE

Vertical Amplifier 30 cps to 1 Mc
Horizontal Amplifier 10 cps to 50 kc
Sweep Circuit 10 cps to 25 kc
F.M. Oscillator 0-30 kc, and 0-450 kc

LINE RATING 115 volts, 60 cps

The tube complement and tube functions of Model 305 are given in the schematic diagram, Fig. 22-34. This oscilloscope is similar to Hickok Model RFO-5. It should be noted, however, that Model RFO-5 uses 1,000 kc and 23 Mc for the r-f oscillator, while Model 305 uses 1,000 kc and 50 Mc. The use of the *V6* cathode-follower also permits the employment of a low-impedance vertical gain control *R50* of 10,000 ohms in place of the high-impedance control *R114* in Model RFO-5. The low-impedance control has less frequency discrimination and is, therefore, an improvement. The signal tracer jack *J1* is in the low-impedance cathode circuit of *V5*, rather than in the high *Z*-plate circuit of *V103* in the RFO-5. A connection to it, therefore, is a less critical matter. High-frequency compensation in the form of *L2* and *L3* is used to give a wide-band characteristic in the vertical-amplifier stage.

HICKOK MODEL 505A

FREQUENCY RESPONSE

Vertical Amplifier 30 cps to 1 Mc
Horizontal Amplifier 10 cps to 50 kc
Sweep Circuit 10 cps to 25 kc

DEFLECTION FACTORS

Vertical Amplifier 0.08 rms volts/inch
Vertical-Deflection Plates 15 rms volts/inch
Horizontal Amplifier 0.13 rms volts/inch
Horizontal-Deflection Plates 30 rms volts/inch

LINE RATING 105-125 volts, 50-70 cps

The tube complement and its functions for Model 505A are shown in the schematic circuit diagram, Fig. 22-35. Model 505A is very similar to the 305 electrically.

JACKSON MODEL CRO-1

FREQUENCY RESPONSE

Vertical Amplifier—Wideband 20 cps to 4½ Mc
Vertical Amplifier—High Sensitivity 20 cps to 100 kc
Horizontal Amplifier 20 cps to 150 kc
Sweep Circuit 20 cps to 50 kc

DEFLECTION FACTORS

Vertical Amplifier—Wideband 0.25 rms volts/inch
Vertical Amplifier—High Sensitivity 0.018 rms volts/inch
Vertical-Deflection Plates 12 rms volts/inch
Horizontal Amplifier 0.55 rms volts/inch
Horizontal-Deflection Plates 15 rms volts/inch

LINE RATING 100-125 volts, 50-60 cps

TUBE COMPLEMENT

Type	Function
5Y3 (V1, V2)	Rectifiers
6J6 (V3, V4, V5)	Amplifiers
6J6 (V6)	Sweep Oscillator
6C4 (V7, V8)	Cathode Followers
5UP1 (V9)	Cathode-Ray Tube

The schematic circuit diagram for Model CRO-1 is shown in Fig 22-36. The vertical amplifiers are operated in a high-gain circuit to provide a sensitivity of 0.018 volts per inch in the *high-sensitivity* position. They are switched to video-type amplifiers in the *wideband* position and provide 0.25 volts per inch sensitivity with a frequency response within 1.5 db to 4.5 Mc. Intensity modulation may be applied to the grid of the cathode-ray tube at 60 cps internally, or an external voltage may be applied to a binding post on the front panel.

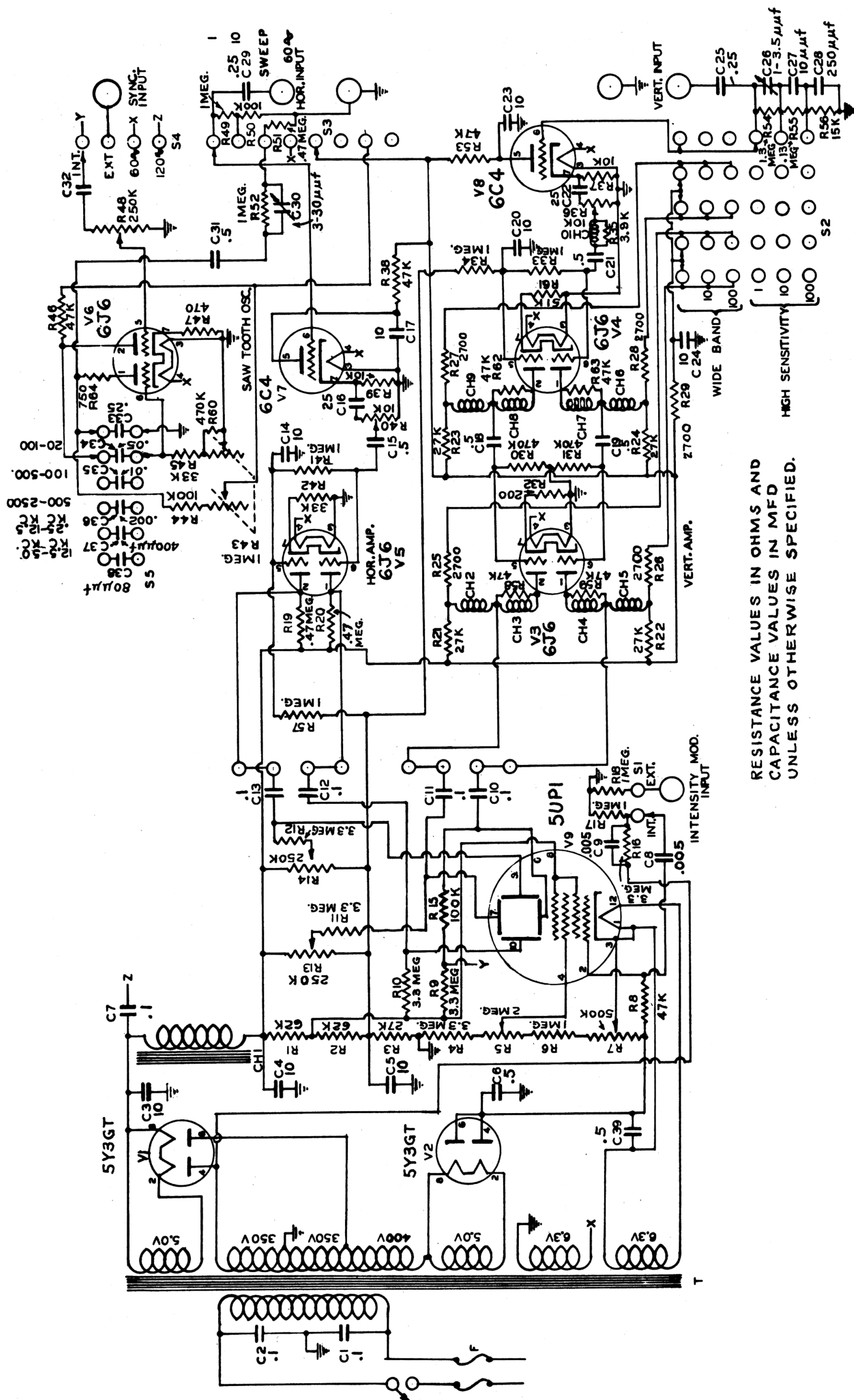


Fig. 22-36.—Schematic of Jackson Model CRO-1.

Courtesy Jackson Elec. Inst. Co.