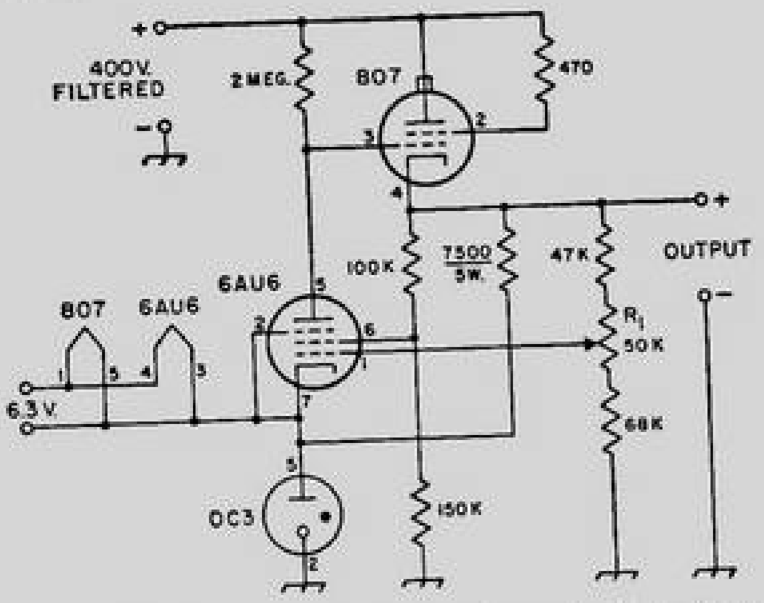

Fig. 12-22—Electronic voltage-regulator circuit. Resistors are ½ watt unless specified otherwise.

by the loads on both taps should not exceed 30 to 35 ma. Regulation of the order of 1 per cent can be obtained with these regulator circuits.

The capacitance in shunt with a VR tube should be limited to 0.1 μf. or less. Larger values may cause the tube drop to oscillate between the operating and starting voltages.

A single VR tube may also be used to regulate the voltage to a load current of almost any value so long as the *variation* in the current does not exceed 30 to 35 ma. If, for example, the average load current is 100 ma., a VR tube may be used to hold the voltage constant provided the current does not fall below 85 ma. or rise above 115 ma. In this case, the resistance should be calculated to drop the voltage to the VR-tube rating at the maximum load current to be expected plus 5 ma. Under constant load, effects of line-voltage changes may be eliminated by basing the resistance on load current plus 15 ma.

Electronic Voltage Regulation

Several circuits have been developed for regulating the voltage output of a power supply electronically. While more complicated than the VR-tube circuits, they will handle higher voltages currents and the output voltage may be varied continuously over a wide range. In the circuit of Fig. 12-22, the 0C3 regulator tube supplies a reference of approximately +105 volts for the 6AU6 control tube. When the load connected across the output terminals increases, the output voltage tends to decrease. This makes the voltage on the control grid of the 6AU6 less positive, causing the tube to draw less current through the 2-megohm plate resistor. As a consequence the grid voltage on the 807 series regulator becomes more positive and the voltage drop across the 807 decreases, compensating for the reduction in output voltage. With the values shown, adjustment of R_1 will give a regulated output from 150 to 250 volts, at up to 60 or 70 ma. A 6L6-GB can be substituted for the type 807; the available output current can be increased by adding tubes in parallel with the series regulator tube. When this is done, 100-ohm resistors should be wired to each control grid and plate terminal, to reduce the chances for parasitic oscillations.

Another similar regulator circuit is shown in Fig. 12-23. The principal difference is that screen-grid regulator tubes are used. The fact that a screen-grid tube is relatively insensitive to changes in plate voltage makes it possible to ob-

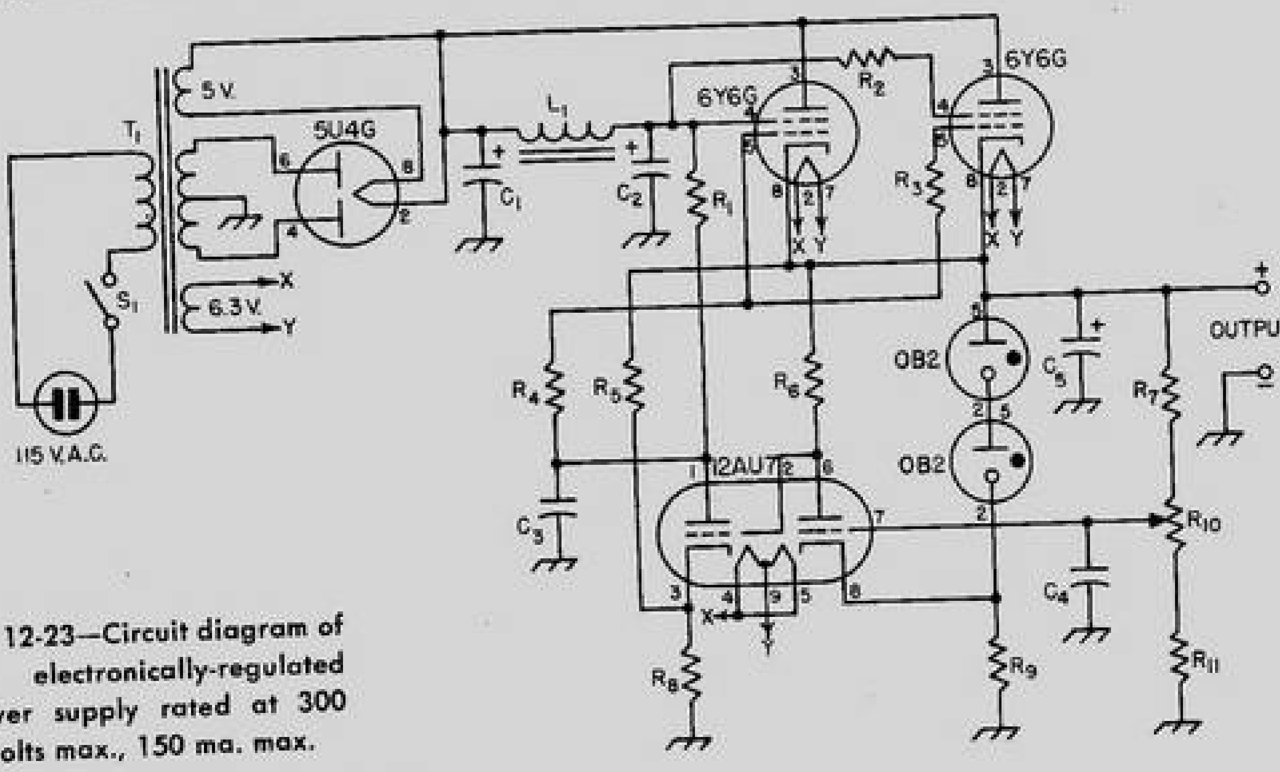

Fig. 12-23—Circuit diagram of an electronically-regulated power supply rated at 300 volts max., 150 ma. max.

C_1, C_2, C_5—16-μf. 600-volt electrolytic.
C_3—0.015-μf. paper.
C_4—0.1-μf. paper.
R_1—0.3 megohm, ½ watt.
R_2, R_3—100 ohms, ½ watt.
R_4—510 ohms, ½ watt.
R_5, R_8—30,000 ohms, 2 watts.
R_6—0.24 megohm, ½ watt.
R_7—0.15 megohm, ½ watt.
R_9—9100 ohms, 1 watt.
R_{10}—0.1-megohm potentiometer.
R_{11}—43,000 ohms, ½ watt.
L_1—8-hy., 40-ma. filter choke.
S_1—S.p.s.t. toggle.
T_1—Power transformer: 375-375 volts r.m.s., 160 ma. 6.3 volts, 3 amps.; 5 volts, 3 amps. (Thor. 22R33).