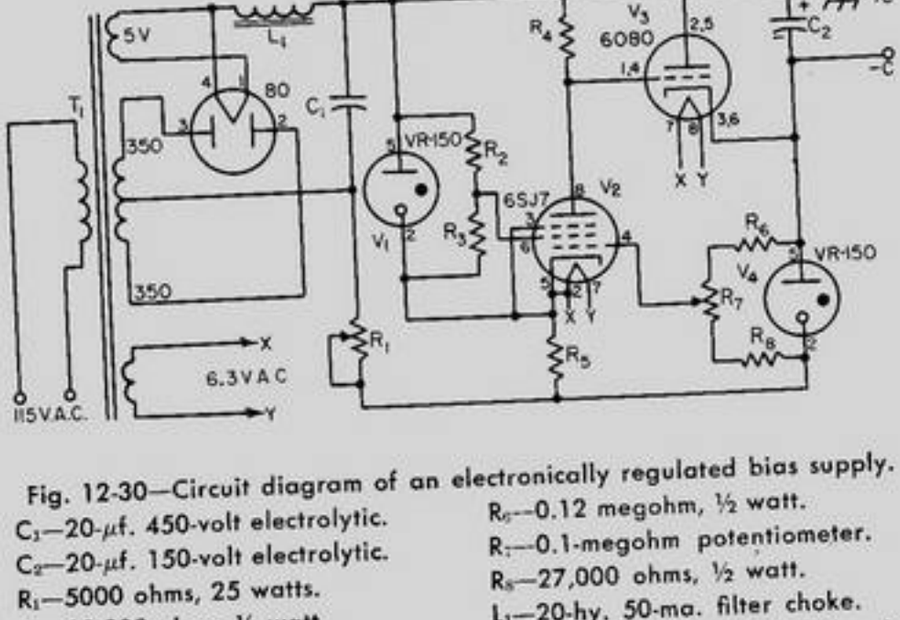

Fig. 12-30—Circuit diagram of an electronically regulated bias supply.

C_1—20-μf. 450-volt electrolytic.
C_2—20-μf. 150-volt electrolytic.
R_1—5000 ohms, 25 watts.
R_2—22,000 ohms, ½ watt.
R_3—68,000 ohms, ½ watt.
R_4—0.27 megohm, ½ watt.
R_5—3000 ohms, 5 watts.
R_6—0.12 megohm, ½ watt.
R_7—0.1-megohm potentiometer.
R_8—27,000 ohms, ½ watt.
L_1—20-hy. 50-ma. filter choke.
T_1—Power transformer: 350 volts r.m.s. each side of center 50 ma.; 5 volts, 2 amp.; 6.3 volts, 3 amp.

of 30 to 80 volts, and 100 ma. over the remainder of the range. If higher current-handling capacity is required, more 6080s can be connected in parallel with V_3. The regulation will hold to about 0.001 volt per milliampere of grid current. The regulator operates as follows: Since the voltage drop across V_3 and V_4 is in parallel with the voltage drop across V_1 and R_5, any change in voltage across V_3 will appear across R_5 because the voltage drops across both VR tubes remain constant. R_5 is a cathode biasing resistor for V_2, so any voltage change across it appears as a grid-voltage change on V_2. This change in grid voltage is amplified by V_2 and appears across R_4 which is connected to the plate of V_2 and the grids of V_3. This change in voltage swings the grids of V_3 more positive or negative, and thus varies the internal resistance of V_3, maintaining the voltage drop across V_3 practically constant.

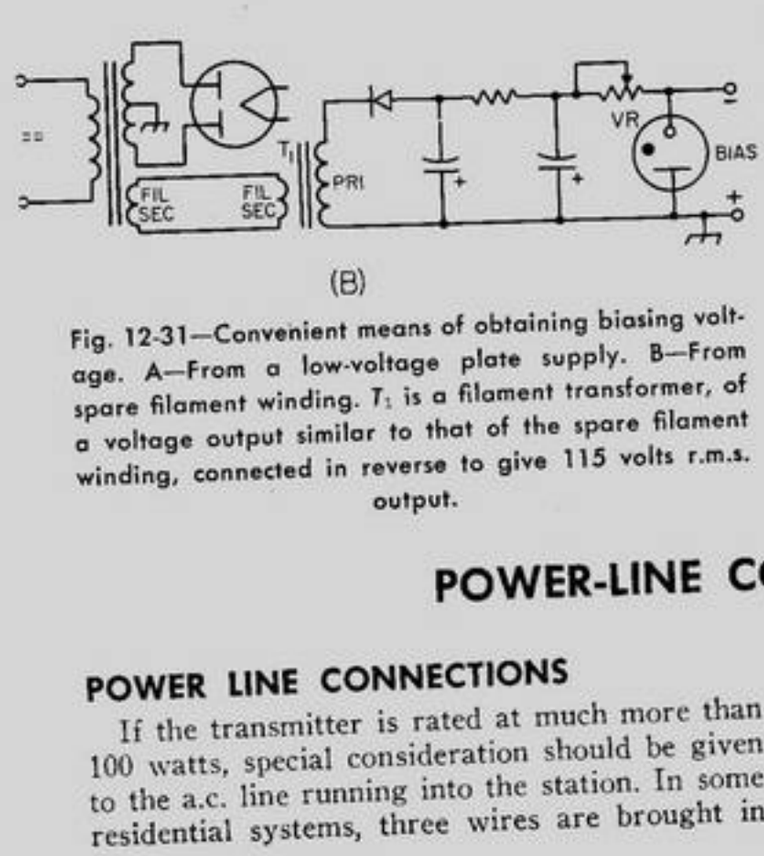

Fig. 12-31—Convenient means of obtaining biasing voltage. A—From a low-voltage plate supply. B—From spare filament winding. T_1 is a filament transformer, of a voltage output similar to that of the spare filament winding, connected in reverse to give 115 volts r.m.s. output.

Other Sources of Biasing Voltage

In some cases, it may be convenient to obtain the biasing voltage from a source other than a separate supply. A half-wave rectifier may be connected with reversed polarization to obtain biasing voltage from a low-voltage plate supply, as shown in Fig. 12-31A. In another arrangement, shown at B, a spare filament winding can be used to operate a filament transformer of similar voltage rating in reverse to obtain a voltage of about 130 from the winding that is customarily the primary. This will be sufficient to operate a VR75 or VR90 regulator tube.

A bias supply of any of the types discussed requires relatively little filtering, if the output-terminal peak voltage does not approach the operating-bias value, because the effect of the supply is entirely or largely "washed out" when grid current flows.

POWER-LINE CONSIDERATIONS

POWER LINE CONNECTIONS

If the transmitter is rated at much more than 100 watts, special consideration should be given to the a.c. line running into the station. In some residential systems, three wires are brought in from the outside to the distribution board, while in other systems there are only two wires. In the three-wire system, the third wire is the **neutral** which is grounded. The voltage between the other two wires normally is 230, while half of this voltage (115) appears between each of these