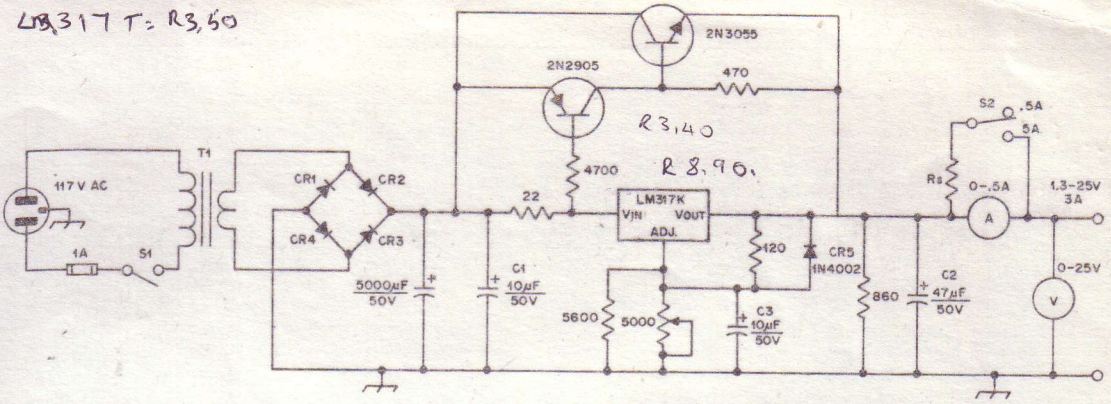


Fig. 2 — Schematic diagram of the complete power supply. All resistors are 1/2 watt composition. C1 through C3 are solid tantalum capacitors. T1 and CR1 through CR4 are discussed in the text. R1 is a panel-mounted linear-taper potentiometer. S1 and S2 are spst toggle switches. The meters are Calectro DI-916 and DI-923. If the pass transistors are not be used, the 22-ohm resistor between C1 and the regulator input to be omitted.

the load current, the transformer must supply a small amount of power to the regulator. The rectifier can be four individual diodes or an encapsulated bridge module. If individual diodes are used their rating should be at least 50 PRV and 1.5 amperes (3 A or more if pass transistors are used). An encapsulated bridge must have the same minimum ratings. A Radio Shack 276-1146 encapsulated bridge will be more than adequate.

The 2N3055 and the regulator will both require a heat sink which can be homemade. A suitable commercially made heat sink would be the Radio Shack 276-1360. Due to the different transformer and heat sink sizes the cabinet can be any type that the builder desires.

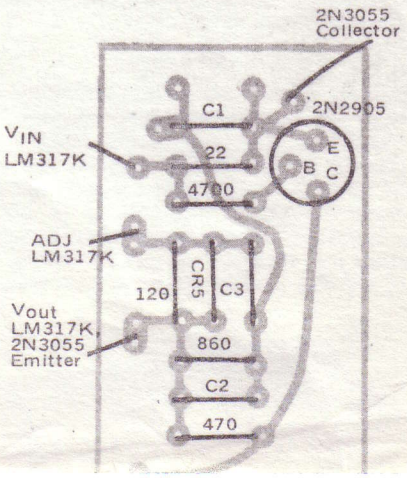
The template (Fig. 3) is the etching pattern for a pc board that will hold all the components external to the regulator. This pc board could be etched and then mounted above the regulator. If it is not desired to use a pc board, all the components can be mounted on terminal strips.

One point that should be noted is the proper wire size for the interconnecting wiring. The load regulation is a function of the resistance of the wiring. A value as small as 0.05 ohm can decrease the regulation by as much as a factor of eleven.

Adjustment and Operation

The value of the 5600-ohm resistor may be changed to suit the builder. Lowering its value will decrease the maximum output voltage available. No other adjustment is necessary for operation of this power supply.

although the output voltage may be adjusted with an externally mounted control within the range of 9 to 13 volts.

Circuit Description

The use of two transformers, rather than one, allows a certain degree of flexibility of operation, in that the supply may be used on either 117 or 235 volts ac with only minor differences in wiring. The dc voltage at point A is approximately 30. Q1 is used as a series pass transistor. Its function is to drop the voltage at point A of Fig. 1 to the desired 12-volt-output value, and maintain that voltage over wide variations in the output load current. U2 is an integrated-circuit voltage regulator which, with the aid of a few external components, is