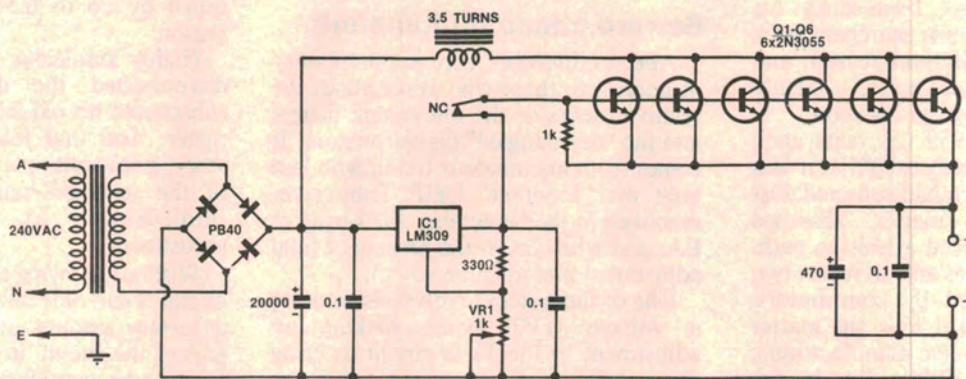


# Circuit & Design Ideas

Interesting circuit ideas from readers and technical literature. While this material has been checked as far as possible for feasibility, the circuits have not been built and tested by us. As a consequence, we cannot accept responsibility, enter into correspondence or provide constructional details.



## 13.8V power supply

A modified relay is used to provide overcurrent protection in this 13.8V 20A power supply circuit. When the relay trips, it disconnects the drive to the six 2N3055 output devices (Q1-Q6).

Drive current for the output devices is supplied by an LM309 five volt regulator and is nominally 650mA. Although the LM309 incorporates overcurrent protection, this does not operate below about 1.5A. This would correspond to a grossly excessive current in the output of the supply, so some other form of protection is required.

By wiring the relay coil in series with the supply output, the relay is able to

operate as a current sensing device. When the output of the supply is shorted, the relay operates and opens the circuit between the LM309 output and the bases of the series pass transistors. As soon as the transistors turn off, the relay releases and the short circuit current again flows through the load.

The relay thus operates and releases continuously until the short circuit is removed. Under these conditions, a short circuit current of about 12A is drawn from the supply.

In the original circuit, 3½ turns of wire sufficed for the relay coil. This figure will vary, depending on the relay used and the trip current. In any case, the original relay coil will have to be

replaced.

As a means of determining the ampere-turns required to operate the relay, a test winding of say 200 turns can be used. The original relay produced a figure of 70 ampere-turns. Once the figure has been deduced, it is a simple matter to substitute a coil of fewer turns, suitable for the anticipated overload current.

Editor's note: we suggest the inclusion of 0.1Ω/1W emitter resistors for the 2N3055s to ensure equal load sharing. Note also that the type of overcurrent protection offered by this circuit protects the supply rather than any load device.

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**\$12**

## Metronome with accented beat

