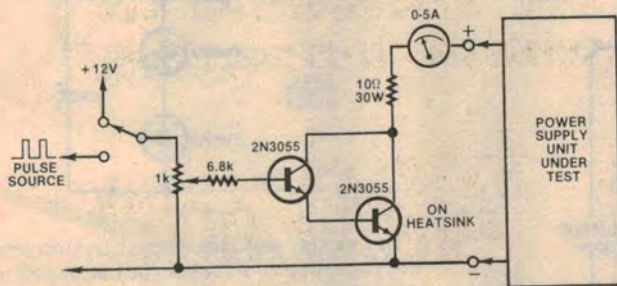


Active DC load



Choose an ammeter with full scale deflection a little larger than the desired load current.

When designing and testing DC power supplies, suitable high power resistors and rheostats to serve as test loads are often unavailable. To overcome this problem a simple circuit comprising two low-cost transistors, a low power potentiometer and a couple of resistors may be brought into service. Additionally, the set-up may be used for investigating the transient performance of the supply – a facility not possible with passive loads.

Referring to the accompanying diagram, it will be seen that a $1\text{k}\Omega$ potentiometer is connected across a 12-volt source. The moving arm is wired via a $6.8\text{k}\Omega$ series resistor to a two-stage current amplifier, connected as a Darlington pair. The output of the power supply is coupled to the collector of the second stage via an ammeter and

a 10Ω 30 watt resistor. This resistor limits the peak current through the transistor.

The 2N3055 transistors used in the prototype each had an H_{fe} of approximately 40. Thus to pass a current of, say, 2 amps through the second transistor an input current of approximately 1.25mA was required. Not only can a power supply be "loaded" with ease, but also, a pulse generator may be substituted for the 12 volt source, enabling transient tests to be conducted. Use an oscilloscope to observe the resultant transient response.

Note that it is necessary to mount the second transistor on a substantial heatsink to dissipate the power.

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