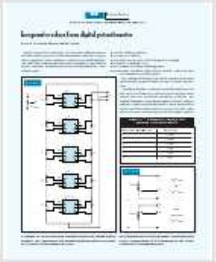
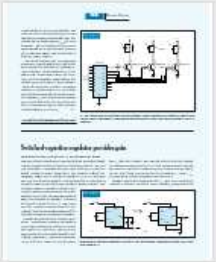
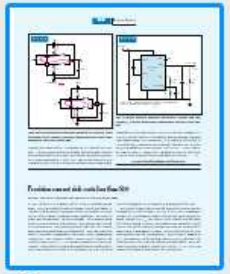

1


2


3

Precision current sink costs less than $20

CARLOS BARBERIS, BARTEK TECHNOLOGIES, HAVERHILL, MA

If you often need a simple active load (constant-current sink), you can benefit from the simple circuit in **Figure 1**. The need often arises to measure the life of a battery or other power device under constant-load conditions. The easy-to-build and inexpensive circuit in **Figure 1** is a handy addition to your arsenal of test fixtures. You can build the circuit for less than $20. The most expensive parts are the vernier knob and the multiturn potentiometer. You can build the active load into a miniature enclosure with banana-jack connectors. The vernier control allows you to directly set current from 1 mA to 1A by simply dialing the desired set current. Without the vernier and multiturn potentiometer, you could build the circuit for less than $10, but you then lose the advantage of a calibrated, stand-alone test box.

The circuit is a precision current sink with typical current regulation of better than 0.5% for a 3 to 40V compliance voltage. R_4 is a sensing resistor; its voltage drop servos the input voltage to IC_{1A}. The wiper of the vernier potentiometer sets the input voltage, discounting any amplifier offset errors. The offset could be as high as 2 mV in a run-of-the-mill LM10, translating to a 2-mA error between the set current and the current flowing in R_4. The reference amplifier, IC_{1B}, is a gain-of-5 stage that provides a 1.00V reference on the high side of the current-setting potentiometer. The voltage-to-current transfer function is thus 1A/1V. You can change the transfer function to fit your needs.