

Nicad battery charger

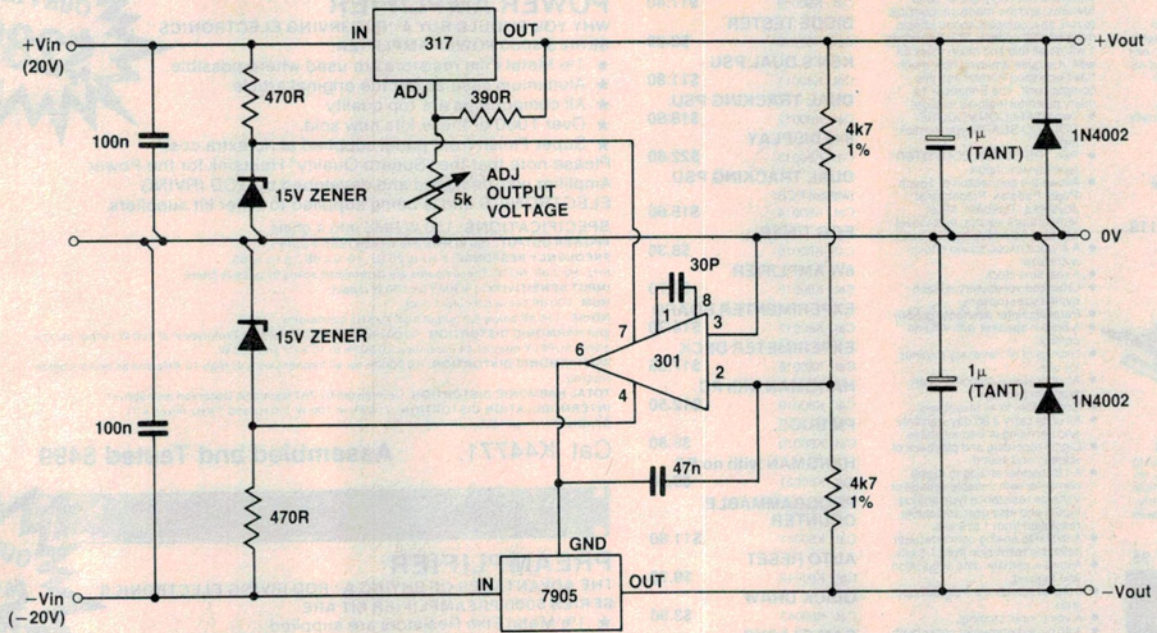
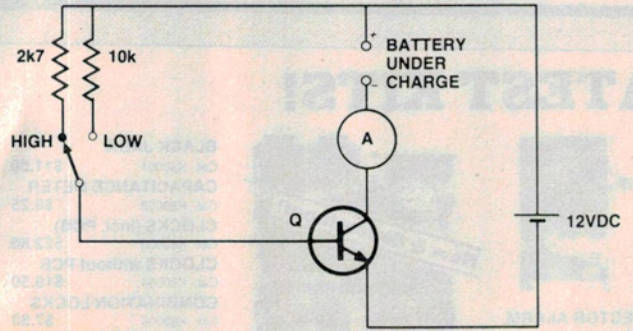
Noel Jackson of Wandin East sent us this Nicad charger. The switch selects a resistor to set the base current of the transistor, and the resulting collector current will charge the battery. Charging current will be reasonably constant irrespective of the number of cells in series being charged; up to 8 cells may be charged at the one time.

Once the circuit has been tested the ammeter could be omitted, or a multimeter switched to an appropriate current range could be plugged in

to the circuit.

The 12 volts dc could be provided by a plugpack, or by a suitable 240 volt transformer and rectifier.

In theory, the collector current will rise as the transistor's temperature increases, but this was not noticeable in the prototype. The transistor could be mounted on a heatsink if desired. Exact values for the resistors will depend on the transistor used and the required charging currents.



Dual tracking power supply

This circuit from H. Nancinovich, Gulgong NSW, is for a dual power supply. It is particularly suitable for powering op-amp circuits which usually require both positive and negative supply voltages. The circuit consists of a positive regulator which gives a positive output voltage variable from 1.2 V to approximately 16.6 V, and a negative regulator which tracks the positive output voltage to give a negative output voltage of equal magnitude. The positive regulator comprises a 317 (μ A317, LM317, etc.) IC which main-

tains a constant 1.2 V between its 'out' and 'adj' terminals. This voltage appears across a 390R resistor which, together with a 5k variable resistor, forms a voltage divider. The positive output voltage is equal to: $1.2 \text{ V} \times (1 + \frac{R}{390})$ where R is the value of the variable resistor in ohms. The negative regulator comprises a 7905 IC regulator and a 301 IC op-amp. The 7905 maintains a fixed -5 V between its 'out' and 'gnd' terminals. Its 'gnd' terminal is connected to the output (pin 6) of the op-amp. The latter compares the

voltage at the junction of two 4k7 resistors across the positive and negative output lines with that at the 0 V line and produces a proportional voltage at its output. The 7905 reflects this voltage (plus -5 V) into the negative output line. By negative feedback action, the voltage at the junction of the two 4k7 resistors is maintained equal to that at the 0 V line. Since these two resistors are equal, the negative output voltage is maintained equal and opposite to the positive output voltage.

The 1 μ tantalum capacitors

across the outputs and the 47n capacitor between pins 2 and 6 of the op-amp ensure stability, while the 1N4002 diodes across the outputs protect the regulators against possible reversal of the output voltages (as may sometimes happen when coupled with other power supplies, for example). Both the positive and negative regulators feature current and thermal limiting, which features are built into the 317 and 7905 ICs.