

# ADC-100 WINNER

## NiCd capacity meter

Usually, this capacity meter draws power from the NiCd battery under test. It discharges battery packs of from four to ten cells, a charger being connected after the test. As an example, a four-cell pack applies 3.5V to the circuit after allowing for current sensing and reverse polarity protection.

Latching comparator IC<sub>1</sub> starts the discharge when the start button is pressed, discharge ending when battery voltage falls to 1V/cell. In this case, the functions of output and hysteresis pins are reversed, since at low currents their threshold voltages differ by a few millivolts, the output being higher and preventing clean switching. Output current from the hysteresis pin is low and is amplified in Tr<sub>1</sub> and Tr<sub>2</sub>, the resulting switch being capable of supplying over 100mA.

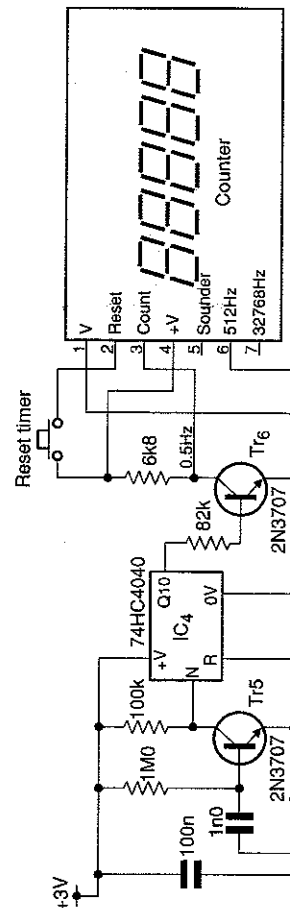
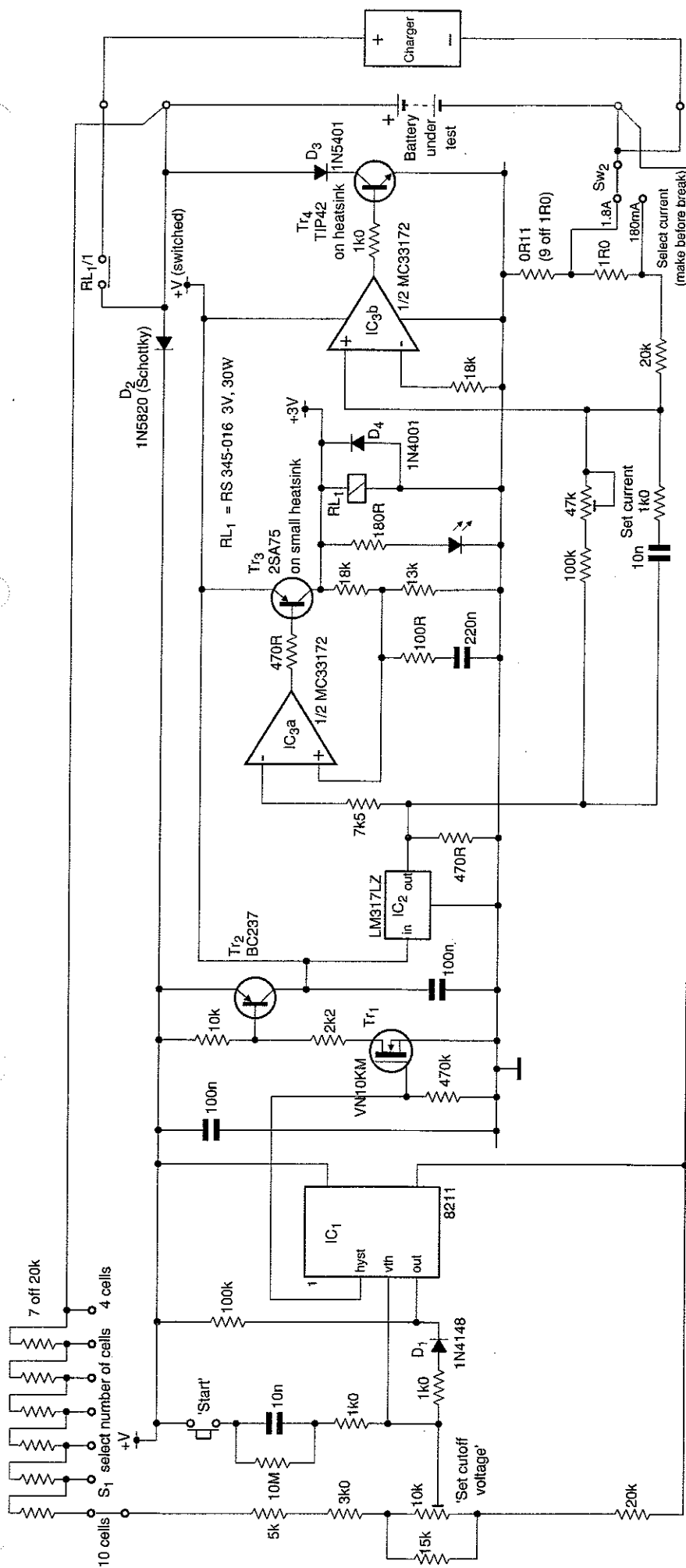
The discharge circuit is formed by IC<sub>3b</sub> and Tr<sub>4</sub> and is switchable to 180mA and 1.8A by S<sub>2</sub>. Very good power supply rejection in the MC33172 (IC<sub>3b</sub>) renders the discharge current largely immune to battery-voltage changes; the prototype's discharge current varies by less than 0.2% for a battery-voltage change of 4-25V.

To measure discharge time, the Maplin FS13P counter accepts its own 512Hz output, divided by the 4040 counter, to increment at two-second intervals while the battery is discharging. This is equivalent to 0.1 or 1mAh per count on the low and high current ranges. Power for the counter timer comes from IC<sub>3a</sub> and Tr<sub>3</sub>, which form a low dropout regulator to supply the relay.

Lower discharge currents may be used; PP9 batteries at 18mA can be handled, but the relay must be omitted. Higher currents or more cells will necessitate a heat sink for Tr<sub>4</sub>.

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*NiCd cell tester discharges batteries, timing the discharge to measure capacity and indicating the result digitally. Batteries are then recharged automatically.*