

Battery

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I am building my instrument with a battery of four NiMH cells.
(Order no. 32-1184 at Clas Ohlson)

Properties: AAA-cell (= R03, 10x44,5mm) 1,2V 550mAh

These cells can be charged either by the "Quick charge" procedure or by the standard charge procedure. "Quick charge" means 3,5h @ 185mA. The standard charge means 14h @ 55mA.

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Some minor changes must be made to the circuit in order to increase the charging current to 55 (50~70) mA:

** All diodes carrying the charge currents must be capable of a constant current of approximately 100 mA. (I only use BAX14 in the entire circuit, this one handles 500mA continuously..)

** LED5 needs a resistor of 33 ohm in parallel. This can be mounted on the solder-side of the PCB, between D8's anode and the cathodes of D11 and D12.

** R19 should be changed to 10 ohm.

** Make shure T4 is a BC328-16 (Philips) or better. This transistor must handle a continuous power of at least 0,8 watt.
Approx 10V x 75mA = 750mW.
(BC328-40 is not adequate, it handles only 0,6W and has another pinout)

The charging voltage should be from 12 to 18 volt. (not 10 to 30 as in the original design with low-capacity NiCd-cells)

The charging current will be from 50 to 70 mA. (14V --> 55mA)

BAX14:
40mA --> 700mV
60mA --> 725mV

LED:
2V @ 8,3mA

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The "LoBat" 4-volt-detector circuit works perfect with the component values originally used by the author.

I tested the circuit using a BC338-25 and a BZX55C3V3.

The trigger-voltage was 4,05 volt.
Base-voltage was 0,56V and voltage level at the zener-diode's cathode was 2,87V above ground.

At www.cadex.com there is a confirmation that 1 volt per cell is the normal discharge depth for both NiCd and NiMH batteries.

The discharging resistors R20 & R21 are simply used as a dummy load. I used two 0,6W-100ohm resistors.

Erik Grindheim, 24.03.2000