

Battery Voltage Monitor
Andy Palm N1KSN

This is a circuit taken directly from the website of Steve Weber KD1JV. All I did was make minor changes to the schematic. It is intended for use with a nominally 12 volt lead-acid type battery (e.g., gel cell, AGM).

The LM358 dual opamp is used as two comparitors. A 5v reference voltage is provided by 78L05 regulator. The two resistive dividers made up of R1-R3 and R2-R4 allow a comparison of a fraction of the battery voltage to the 5v reference.

When the battery voltage is over 11.5v the output of U1b is high and the green part of the bicolor LED is lit. When the battery voltage is below 11.9v the red part is lit by U1a. Thus, the LED is green when the voltage is over 11.9v, red when below 11.5v, and yellow (red and green both on) when between 11.9 and 11.5v.

These cutoff voltages were chosen so that the LED is green when operation of a rig from the battery will be reliable and red when the battery is nearly discharged. (The discharge curve of a lead-acid based battery drops off rather sharply when you get much below 11.5 volts.)

The original KD1JV circuit has the resistive dividers made up of two fixed resistors with a trim pot in between, the opamp connection going to the pot's wiper. This allows a precise setting of the cutoffs. I chose to use 1% tolerance resistors instead because I had some. You may need to use two or more actual resistors in series or parallel for some of the resistor values.

I built my circuit "ugly style" on a small piece of single-sided, unetched circuit board, but any building style should work well enough as no radio frequencies are involved.