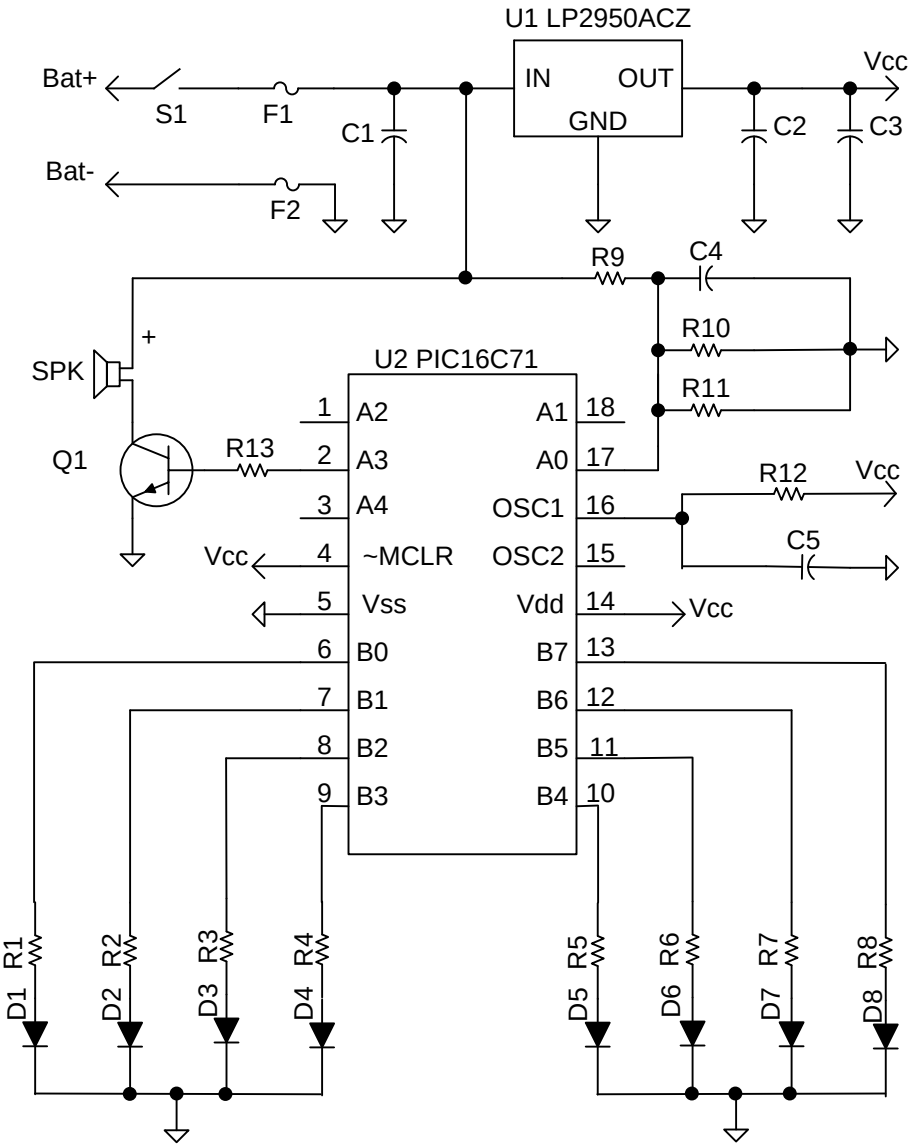


Notes: To enhance the accuracy of the divider, a dozen 1% resistors were tested, and three that matched to within a tenth of a percent were used. This creates a divider to within 0.13%. In the monitor's bar graph display, the first LED lights at 10.6 volts. the last one lights at 12.7 volts (About .26V per segment). When all LED go out or the battery voltage goes below 10.6 volts the alarm sounds with a pulse that is on and off with a 40% duty cycle. After turning the monitor on, if the battery is charged or above 10.6 volts the LED's stay on for approx. 45 sec., then the PIC goes to sleep and wakes up once every couple of seconds and samples the voltage ,but it does not display anything on the bar graph. Switch on and off to reboot and get a full display.

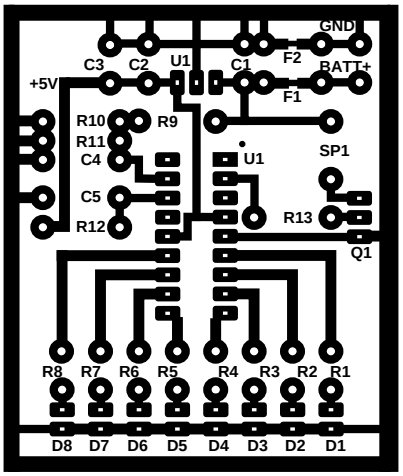
Materials List

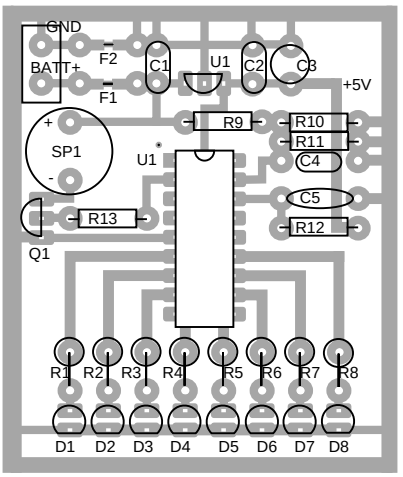
C1,C2,C4	0.01uF
C3	1uF electrolytic 10 V
C5	330 pF 5% CGO
D1-D8	LED
F1-F2	1 amp pico fuse(Keeps Resistance low)
R1-R8	127 ohm 1/8 watt 1% (100 to 300 ohm will work.)
R9-R12	30.1k 1/8 watt 1%(3 matched to 0.1%, See Notes)
R13	10k 1/8 watt 1%
S1	SPDT switch
SPK	Piezo Electric Buzzer RS273-074(RS)
U1	PIC16C71-041 MPU(Digi-Key)
U2	LP2950ACZ-5 Regulator (Digi-Key)
Q1	2N2222 Switching transistor

Original Article in January 1999 CQ Magazine page 36.

Date:	Revision/Addition/ Note	By:
Oct 15 2016	Initial Drawing. Redrawn in latest version of Visio. Thanks to Tom Kanode KA4HFP for his original Visio files.	GSC
Oct 15 2016	Original PIC 16C71, was a one time programmable part. Not recommended for new designs by Microchip. Not programmable with PIC Kit 2 or 3. Going to try a PIC 16F628 as a replacement at a later time.	GSC
Oct 15 2016	Do not substitute a 78L05 for the LP2950ACZ-5. Killed a charged battery if left on the device.	GSC
Oct 15 2016	Radio Shack buzzer 273-074 is still available if you can find an open store, otherwise order online.	

Drawn By:	Gerald Crenshaw WD4BIS	Date: Oct. 15, 2016	From the bench of: Amateur Radio Station WD4BIS	Page 1 of 1
Designed By:	Gerald Crenshaw WD4BIS	Date: Oct. 15, 2016	Title: Battery Monitor by WA0ZTI	Scale:
Checked By:	Janet Crenshaw WB9ZPH	Date: Oct. 15, 2016		





Date:	Revision/Addition/ Note	By:
Oct 15, 2016	Version 5 PWB. Initial Drawing. Redrawn in latest version of Visio. Thanks to Tom Kanode KA4HFP for his original Visio files.	GSC
Oct 15, 2016	Used printed fuses on this version. If they blow replace with Pico fuses. Took the power switch off of the board. Add externally if desired.	GSC
Oct 15, 2016	Placed DC input connections properly spaced for a JST XH connector. (JST connectors are standard RC model power.)	GSC

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