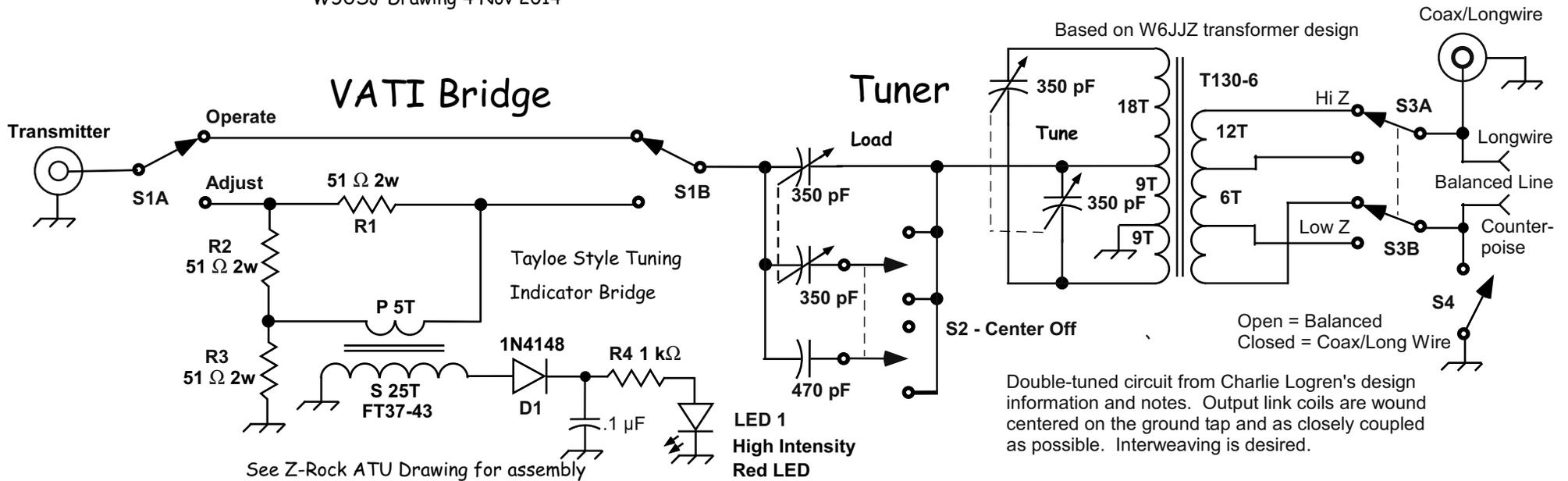


Z-Rock ATU Schematic

W5USJ Drawing 4 Nov 2014



See Z-Rock ATU Drawing for assembly

Switch S1 in Adjust position

The tuning indicator bridge is switched into adjust position. Adjusting the tuner changes the RF voltage at point A. (Possible slight change at R2/R3 junction.)

An unmatched load (antenna) unbalances the bridge. A voltage difference is developed high enough for the 1:5 step-up transformer T1 to illuminate the LED.

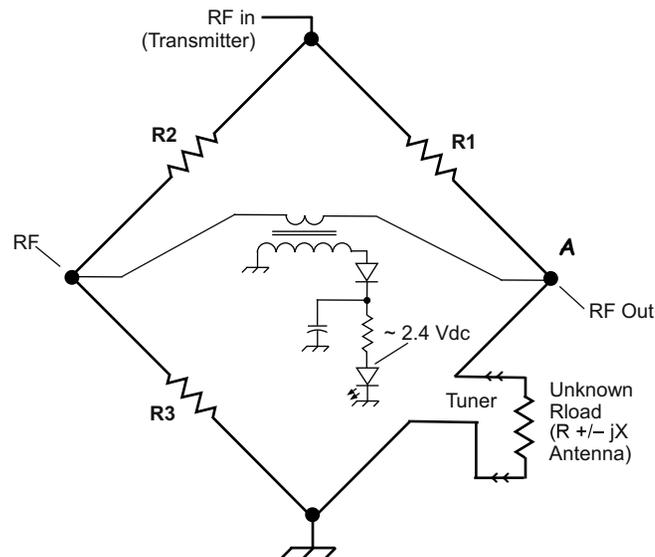
As a match is achieved, the equivalent R load comes closer to the value of the resistors. When the unknown $R \pm jX$ load is \sim equal to the values of resistors R1, R2 and R3, the voltage across the bridge is balanced and the LED goes out or nearly out. This is the matched load condition.

The RF voltage at the junction of R2 and R3 will be nearly constant. The RF voltage at point A will change with adjustment of the tuner controls. The DC voltage at the junction of the 1N34 and 1k resistor should change from several volts to about 1.5 volt or less when the LED goes out.

At this point, the VSWR will be at its lowest value.

Use a Hi-Z RF probe to measure the RF voltages.

Useful Illumination to 50 mW or Less



Equivalent Circuit, Classic Wheatstone/Maxwell Bridge