

RF Noise Bridge for LF, MF, & HF

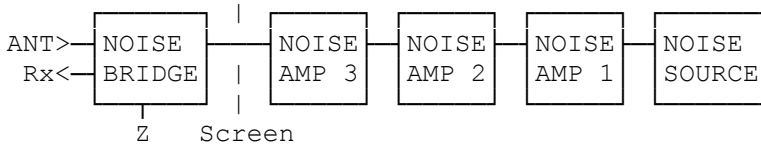
By G8MNY

(Updated Sep 09)

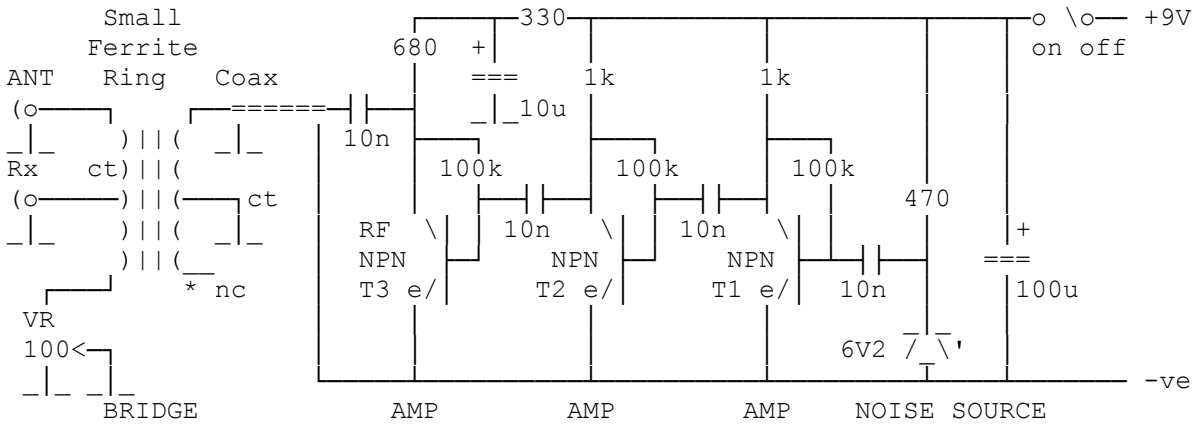
(8 Bit ASCII Graphics use code page 437 or 850)

Revisited from an old 2nd hand project.

SCHEMATIC



CIRCUIT

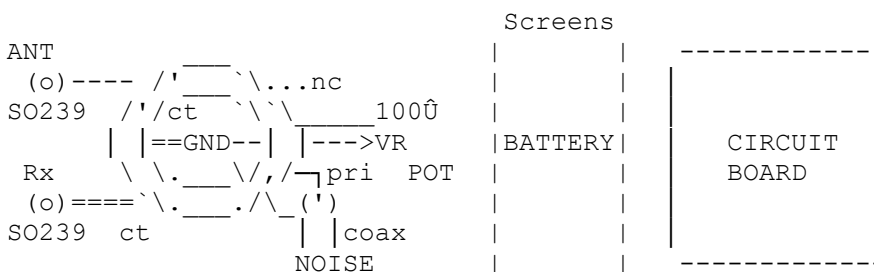


THE CIRCUIT

The noise from the zener (use the noisiest U have) is amplified by the 3 RF amp stages using RF transistors, this provides about 1V peak of noise (as seen on a scope). The 3 transistors are any good small signal RF NPN types e.g. BF series. Layout is not too critical, but small is normally best for RF. Feed the transformer with a coax lead to keep the noise well screened from the Rx port.

THE TRANSFORMER

This is the heart of the bridge, a well made one with give good nulled match from 100kHz - 50MHz. The transformer windings, layout of the carbon track 100Ω VR & connections are ALL critical, if a good 50Ω non inductive measurement is going to be any good over all HF bands.



Wind the 4x 4 turns on thin enamelled copper wire in parallel flatly (no twisting) around a 1-2cm dia ferrite ring. Identify the 4 wires to form the 2 centre taps ct. & clean off the enamel, twist the ct pairs together & solder.

Note the unused connection (nc) provides 180° out of phase noise to cancel the crosstalk from the primary winding, leave this end a few cm long so it can be moved around for precision nulling.

Place a piece of tin can (or drill in earth tags on die cast box.) under the closely located output sockets & transformer & up to the VR 100Ω centre slider, this all helps provide a low ground Z. Keep all connection leads as short as possible.

TESTING & CALIBRATION

- 1/ With a Scope or Rx check the RF noise increases down the amps.
- 2/ Using a digital ohm meter measure & make a temporary scale (on paper) for RV e.g. stop, 0, 20, 30, 40, 50, 60, 70, 75, 80, 100, stop.
- 3/ With No ANT or a Shorted ANT, there should be lots of noise on the Rx port.
- 4/ With a good 50Ω dummy load the noise should null out around the 50Ω mark, check this on all bands. If it varies try moving the nc wire end to equalise the crosstalk to the Rx port on the highest bands. Nulls of 40dB should be possible on most bands!
- 5/ Modify the scale to precisely agree with the RF impedance matching point.

IN USE

You can use with Rx to match any aerial with a suitable ATU.
It can be used as a noise source for checking filters & Traps etc.

With a spectrum analyser the multiple resonances of any aerial system will be seen. As a noise source the spectrum response of any filters can be measured.

Why don't U send an interesting bul?

73 de John G8MNY @ GB7CIP