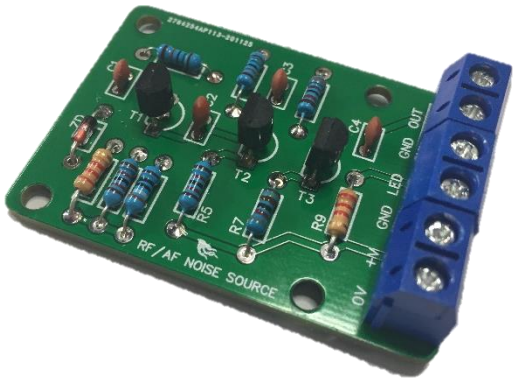
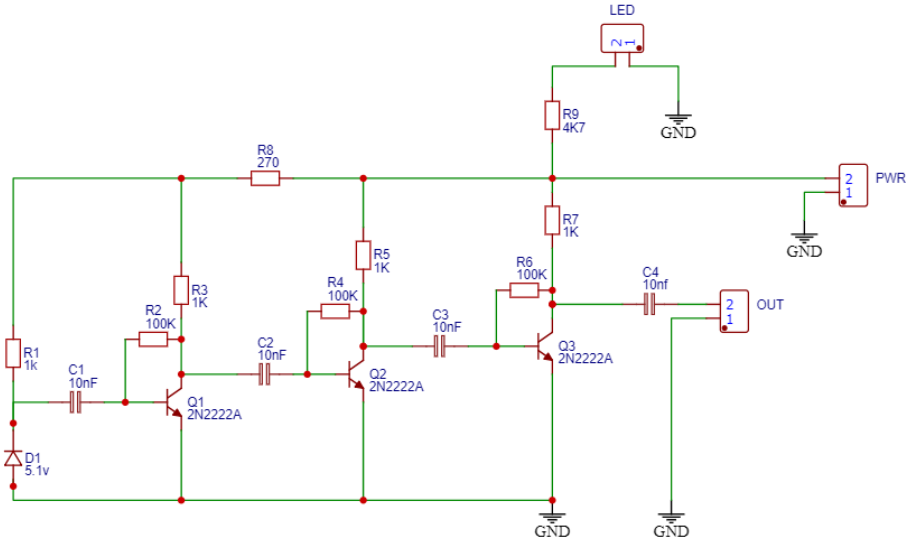
Wideband RF Noise Source



This Kit is designed to help with setting up Receivers filters and audio projects. It will produce strong white noise signals. Starting at audio frequencies right the way into the VHF spectrum. It is not a calibrated test instrument but uses the well know 'Noisy Diode' method of noise production that is amplified by 3 stages to produce a strong signal.

A very simple low cost project that should be in the tool box of anyone that builds receivers or audio filters/amplifiers.

Let's see the circuit



Parts List

R1, R3, R5, and R7	1K ¼ watt resistor
R2, R4, and R6	100K 1/4watt resistor
R8	270 ohm ¼ watt resistor
R9	4K7 ¼ watt resistor
C1, C2, C3, and C4	10nF disk capacitor (Marked 103)
D1	6.2v or 6.7v Zener diode (either is fine)
LED	5mm Red LED

3 x 2 way Terminal blocks
RF Noise Source PCB
3 x 2N2222 Transistors

The Kit is very easy to build and many of you will just steam ahead and build it without reading any more, ok if that's you fine, there is nothing unusual about the kit.

If you do follow instructions let's get started.

First let's fit the resistors,

Start with the 1K resistors R1, R3, R5, R7 they can be fitted either way round, I have provided a colour resistor chart so you can use that if you're not sure which resistors are 1K. Fit them and after soldering trim the leads flush with the PCB.

Now fit the 100K resistors R2, R4, R6 again they can be fitted either way round.

Just two left now, fit R8 which is a 270 Ohm resistor, then move on to fit R9 which is the 4K7 resistor, in case you're interested this resistors value can be changed if you wish, it controls the brightness of the LED. Do not fit one lower than 1K, we don't want to burn out the LED.

Now fit the small disk capacitors, C1 to C4. They are All the same value and be fitted either way round.

OK stop and check your work, look for solder bridges or dry/missed joints.

Now we are moving onto the active devices, these MUST be fitted the right way round, let's start with the Zener diode (D1) . This is the device that produces the noise. If you lose this do not substitute it for a standard diode, it must be a Zener type around 6 to 7 volts.

Look at this diode and you will see one side as a black band. Look at the PCB layout and you will see that the image on the board for the diode shows a band on one end. The black band MUST be at that end. Fit the diode right down on the board and solder and trim the wire ends.

Now we will fit the transistors, these amplify the noise one after another to get us the nice strong signal we want.

All the transistor are a general purpose NPN type, I have used the well know and easy to get 2N2222(A), these will operate upto 250Mhz so are ideal for this application.

The transistors must be fitted the correct way and to help with this the PCB shows the outline of the transistors, just fit them to match the silk screen layout, do not try and push them flush to the PCB the are intended to be sat about 5mm off the PCB, this distance isn't critical.

Now stop again and double check your work, the pads for the transistors are close to each other, make sure you have no solder blobs shorting any out.

The last parts to fit are the three 2 way terminal blocks, they should be fitted flush to the board with the screw terminals on the edge of the board.

That's it you're done, now you can fit the module in box or use it as is, upto you.

The module needs 9 to 12v power, I use a PP3 9v battery on mine and that provides plenty of noise right upto 2m (145Mhz).

If you wish you can fit the LED for a power on indication. The LED will only work one way. Look at the LED and you will see it has one long lead, this lead must be wired to the middle block and the terminal marked as LED, the other lead should be wired to the same block but the terminal marked GND.

An example of use of this noise source. Connect the output of a radio to computer, like you would for using a data mode. Run software like FLdigi or anything that provides a waterfall type display, with the noise source connected to the antenna socket of the radio you will see a strong signal right the way across the waterfall, adjust the receivers bandwidth and you will see the difference in the waterfall, you can use this to measure the bandwidth of the radios filter, or you could also use it to peak the receiver sensitivity and even a more novel use, connect the output to a small audio amplifier, you will now have a white noise source that you could use to help you sleep. Many people find it helps, especially people with tinnitus can find this type of noise soothing.

This is just a simple AF/RF Noise source and you will find that the higher the frequency you use it with the lower the amplitude of the noise but it will provide useful noise up well into the VHF bands. Have fun building the kit and I hope you find it useful.

Any problems please contact me

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