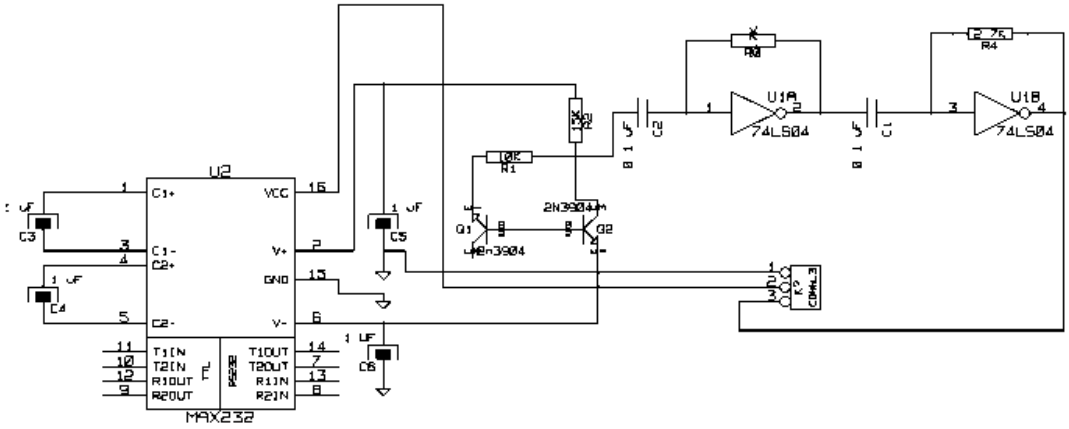
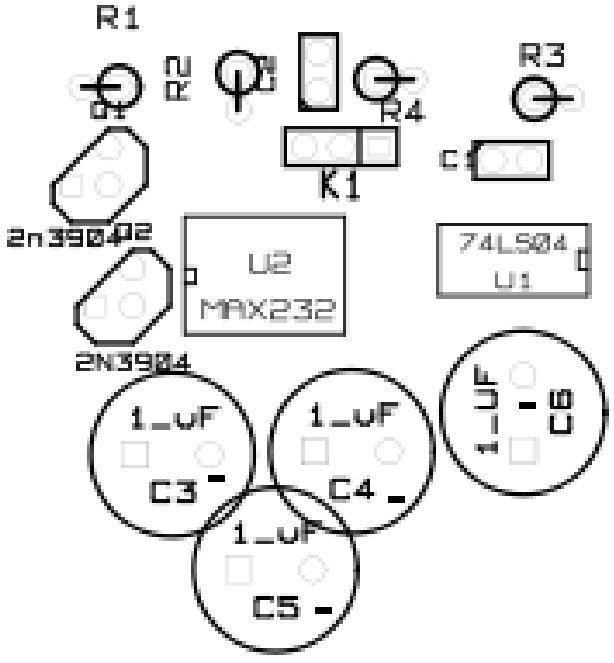
White noise kit:

Schematic:



Parts placement:



CAPACITORS:

C1	0.1 uF
C2	0.1 uF
C3	1 uF
C4	1 uF
C5	1 uF
C6	1 uF

CONNECTORS:

K1	CONN_3

TRANSISTORS:

Q1	2n3904
Q2	2N3904

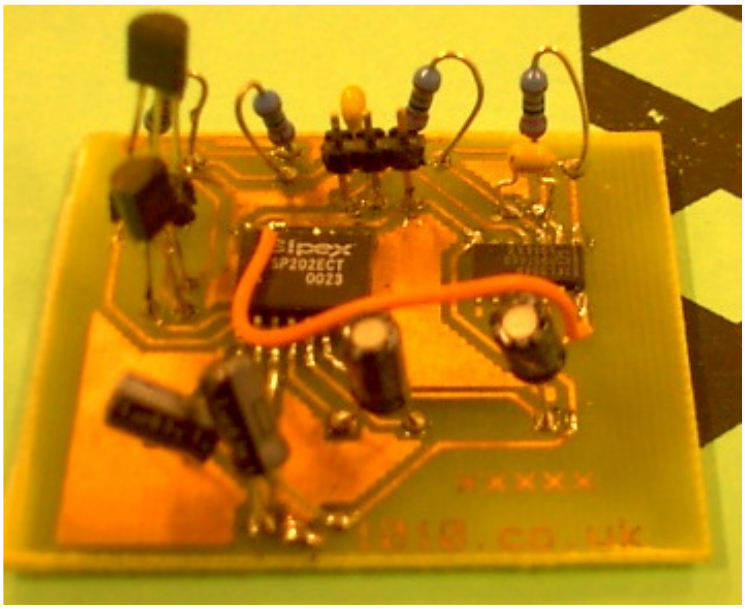
RESISTORS:

R1	10K
R2	15K
R3	2.7K
R4	2.7K

IC:

U1	74LS04
U2	MAX232

Image:



Description:

"This circuit uses avalanche noise in a reverse-biased PN junction, the emitter-base junction of the first transistor. The second transistor amplifies it. The first two ALS04 inverters are biased into a linear region where they act like op amps, and they amplify it further. The third inverter amplifies it some more..."

[Will Ware]

The RS232 IC is used to generate a 20V potential for the transistor. The white noise spectrum should be flat with no one frequency dominating. The circuit can be used, with a suitable microcontroller and interface for random number generation (RNG), as a signal source within EVP (Electronic Voice Phenomena) recordings, or for further audio processing.

Construction notes:

Clean the board (PCB) first with pure alcohol. Follow placement diagram with board facing and text right side up. Start by soldering all SMD/surface mount components first. Note that the 74LS04/14 IC is oriented upside-down in relation to the MAX232 chip and board. A wire jumper must be soldered between pin 16 of the MAX232 and pin 14 of the 74LS (see photo). Pay attention to polarity of capacitors (electrolytic), and orientation of the 2n3904 transistors (flat side facing you). Plus 9v from battery is connected to pin 2 of the jumper, GND(0v) to pin 3 and audio level output is pin 1 (first on the left). The white noise generator is best tested with a software spectrum analyser such as Baudline.

References:

Circuit diagram: http://1010.co.uk/images/noise.pdf [based after ones below]
PCB design:: http://1010.co.uk/images/noise-Component.pdf
Components: http://1010.co.uk/images/noise-all.pdf
http://www.hcrs.at/
http://www.cryogenius.com/hardware/rng/
http://www.ciphersbyritter.com/RES/NOISE.HTM
http://robseward.com/itp/adv_tech/random_generator/