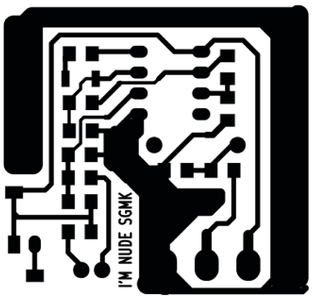
diy makeaway

Krac[illegible]auen mit der Schweizerischen Gesellschaft für Mechatronische Kunst

I'm Nude - Ionization chamber for Monitoring NUclear DEsasters 15.00

is a simple & cheap DIY gadget to detect radioactivity in small samples.
It is NOT a professional, calibrated measurement device like Geiger counters,
but nevertheless a quite sensitive radiation indicator.



Functional Description

An empty peanut can with a wire electrode makes a simple ionization chamber. When air inside the chamber gets ionized by radiation, very small currents flow into the wire electrode and generate a small voltage in R3 which is amplified in electrometer amplifier U1b. This controls pitch of sound generator U1a which drives a small piezo speaker.

Assembly

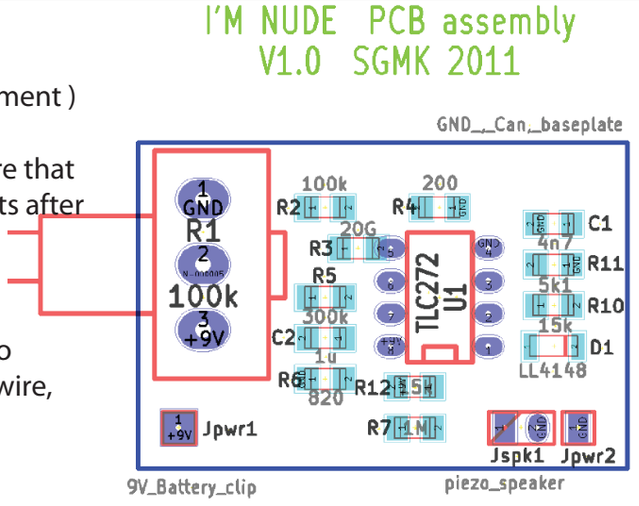


1 Drill a 6mm centre hole in bottom up standing peanut can.
2 Follow PCB assembly drawing to solder all SMD parts except R3.
3 Bend U1 pins in "pseudo SMD style" an solder it in.
4 Solder R3 from PCB straight to the floating pin 5 of U1.
5 Solder wire electrode to pin5 of U1.

6 Put PCB with electrode in centre of drill hole and fix with hot glue.
7 Solder blank wire from +9V PCB track to can.
8 Solder potentiometer R1 as shown in picture : 3 pins on PCB and extra wire from GND trace to R1 metal case.
9 Solder speaker with blank wires to PCB .
10 Solder black battery clip wire to GND track of PCB and red wire to the can.

How to detect radioactivity

1 Put I'M NUDE open side down on the metal base plate (which is a shield against external electric fields during measurement)
2 Turn potentiometer R1 left until the sound just disappears.
3 Stand back 1m to avoid body electric fields effects and make sure that there is still no sound (wait 5 secs for stabilisation: sound artifacts after touching I'M NUDE are normal)
4 Remove I'M NUDE and put a small sample (e.g. thorium doped welding wire) on the base plate.
5 Put I'M NUDE back over the sample. Can must have full contact to base plate. The sample must not touch the chambers electrode wire, but it may touch the can inside.
6 Stand back again and listen !!
If you hear "random sound bursts", your sample is radioactive !



More info on www. mechatronicart.ch/diymakeaway