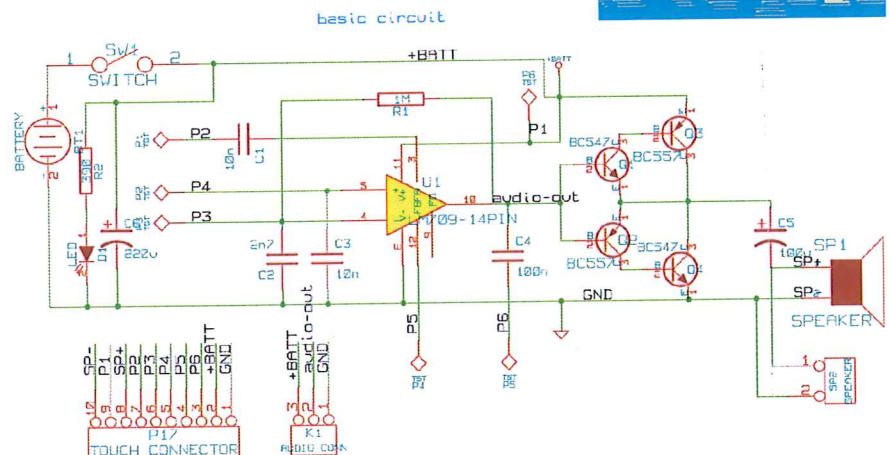


Crackle Guide



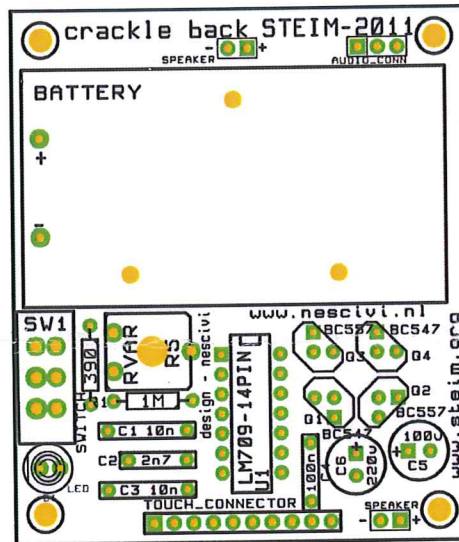
The basic crackle circuit is fairly simple. It is based on an amplifier chip that has a special frequency compensation input (the LM709). By changing the resistance between the "touchpoints" you change the frequencies that it creates.



Crackle Back

The basic components are:

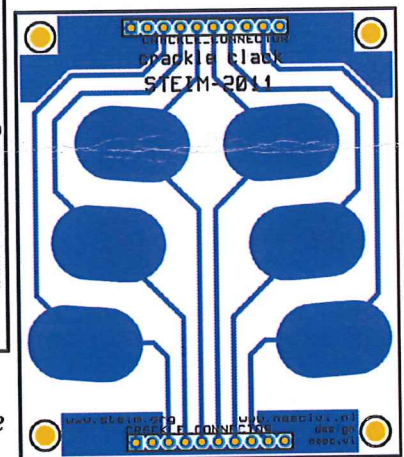
- a battery holder for a 9V battery
- an on/off switch (SW1)
- a capacitor of 2.7nF (C2)
- a capacitor of 100 nF (or 0.1 uF) (C4)
- two capacitors of 10 nF (C1, C3)
- a capacitor of 220 uF (has polarity!) (C6)
- a capacitor of 100 uF (has polarity!) (C5)
- a resistor of 1MOhm (R1)
- or a variable resistor of 10 MOhm (R5)
- a resistor of 390 Ohm (R2)
- two PNP transistors BC557 (Q2, Q3)
- two NPN transistors BC547 (Q1, Q4)
- a 14pin chip holder for the LM709 (U1)
- a LED
- some headers for the speaker
- a speaker and a red and black wire to connect it
- a touch connector (populated by a female header)



Start with the smallest component and solder them one by one onto the board.

Crackle Clack

If you want the more classical interface to your crackle board, you can hook up the Crackle Clack board!



Crackle Hack

The Crackle Hack board provides many options to attach various sensors, conductive materials or whatever you can come up with to the circuit.

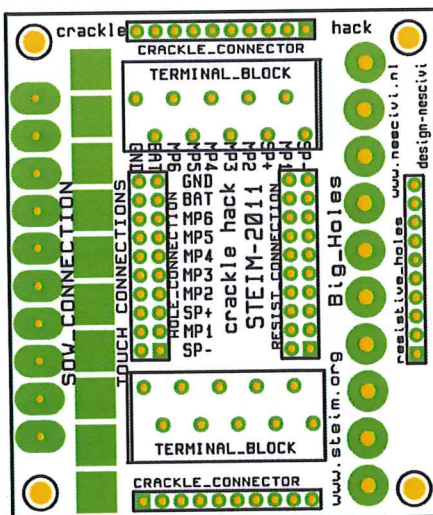
There are 10 signals coming out of the Crackle Back through the TOUCH CONNECTOR, and they come into the Crackle Hack through the CRACKLE CONNECTOR.

The signals are:

GND - BAT - touch 6 - touch 5 - touch 4 - touch 3 - touch 2 - SP+ - touch 1 (=BAT) - SP- (=GND)
the touch connectors are labeled MP on the board.

The Crackle Hack has different kind of connectors to hook up sensors (from left to right):

- sewing connector - for connecting conductive thread
- touch connector - for simple touching, or you can solder onto the pads
- hole connector - for a header to plug into, or to solder sensors to
- terminal blocks (the two green ones) - for plugging things in (useful for experimentation)
- resist connectors - the holes here are not connected to each other, so you can add an additional component here
- big holes - to connect big metal things (e.g. guitar strings), make sure you also have a resistor between the resist connectors in this row.
- resistive holes - to connect sensors. again you need resistors in this row.

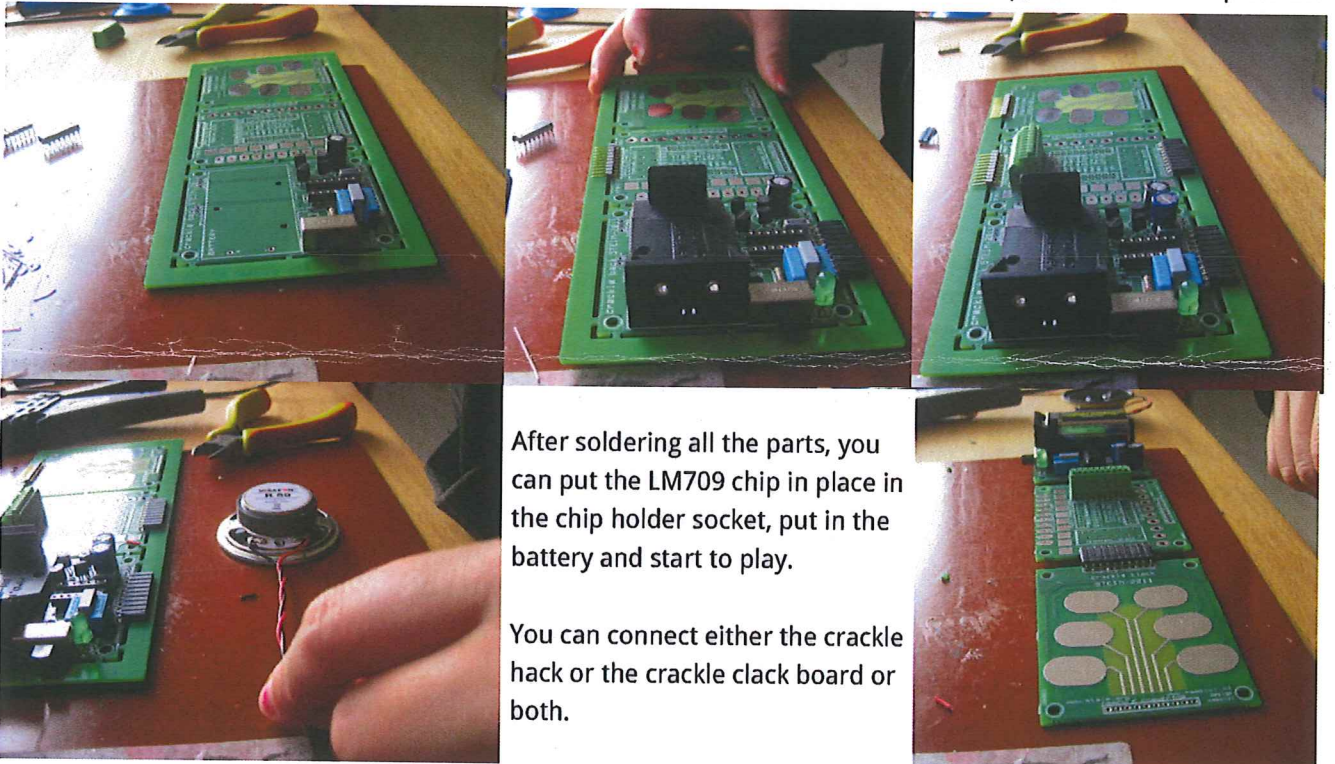


Crackle Guide



Building up the crackle board - start with the smallest components, and build the circuit up step by step.

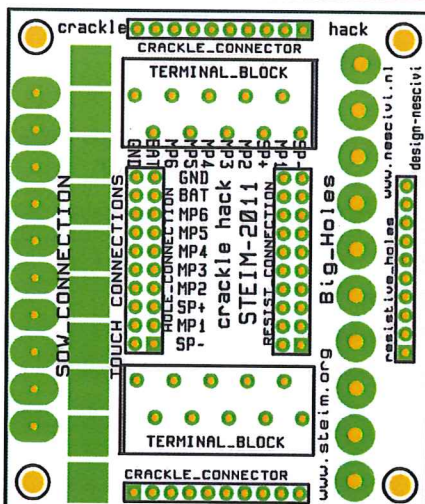
The female headers go at the bottom of the circuits, the male header on the top, as shown in the pictures.



After soldering all the parts, you can put the LM709 chip in place in the chip holder socket, put in the battery and start to play.

You can connect either the crackle hack or the crackle click board or both.

Hacking the crackle



For creating your own hacks, you can use the terminal blocks to make temporary connections with sensors between touch points. Just push the notch down and put in one leg of a sensor. Alternatively, on the outermost left side, you can use the pads to sew on textile sensors, using conductive thread; the touch pads right next to it allow you to just touch the circuit there, or use it as a big solder pad to make a connection with a sensor. The two rows of holes next to that can be used to solder on a two-row header to connect sensors, or a cable to another board you have soldered.

The two rows of holes on the right side, the resist connection serves a different purpose. The two holes next to each other on each row are not connected to each other. Instead, you can use these holes to connect a fixed resistor, and then connect for example a guitar string to one of the big holes. The extra resistor is needed to create a basic resistance between the touch points, when the guitar string is touched or connected to something else.