MULTI-MEGA-PHONE

Agente Costura
WITH
Federica Teti!

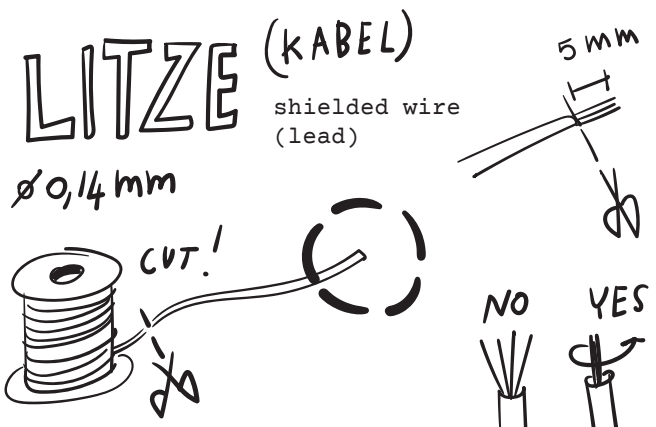
MATERIAL:

3 potentiometers 100Kohm
3 widerstand 100kohm
1 kondensator 10uF
1 kondensator 220uF
1 IC LM 386
1 IC halter
1 Lautsprecher
3 Klinken-Buchse (6,35mm)
1 Kippschalter
1 batterie clip

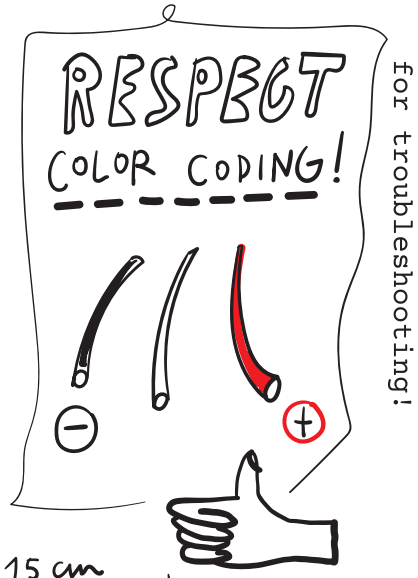
1 lochrasterplatine

0,14mm Litze verschiedene Farben

MIKRO:
piezo
Mikrofonkabel
klinken-Stecker (6,35mm)

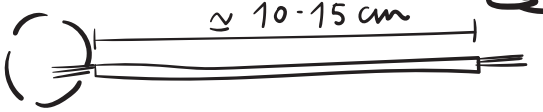


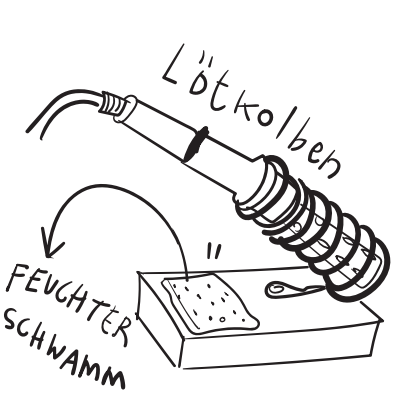
Cut 3 leads of each color of about 10cm (depending on the housing).

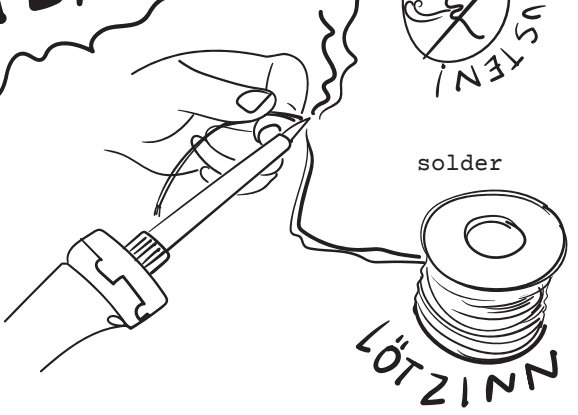


It will make life easier for troubleshooting!

Remove shield at the tip and TWIST!



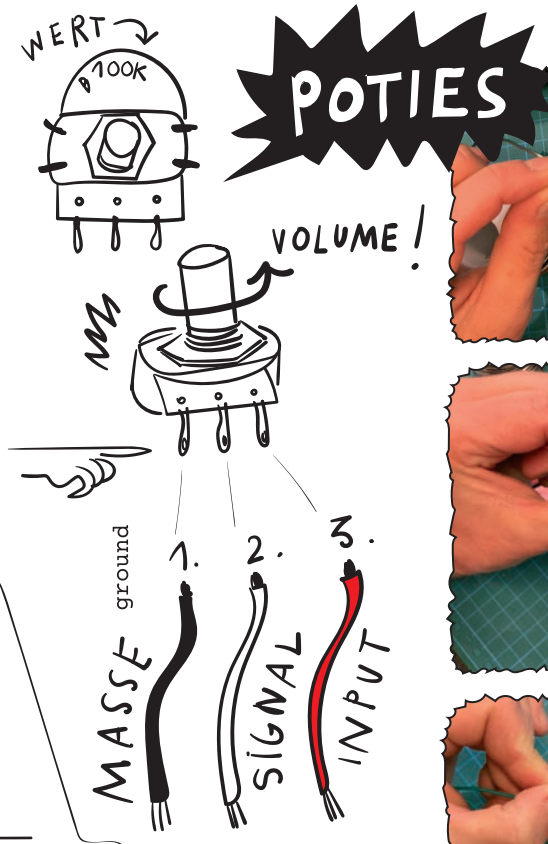


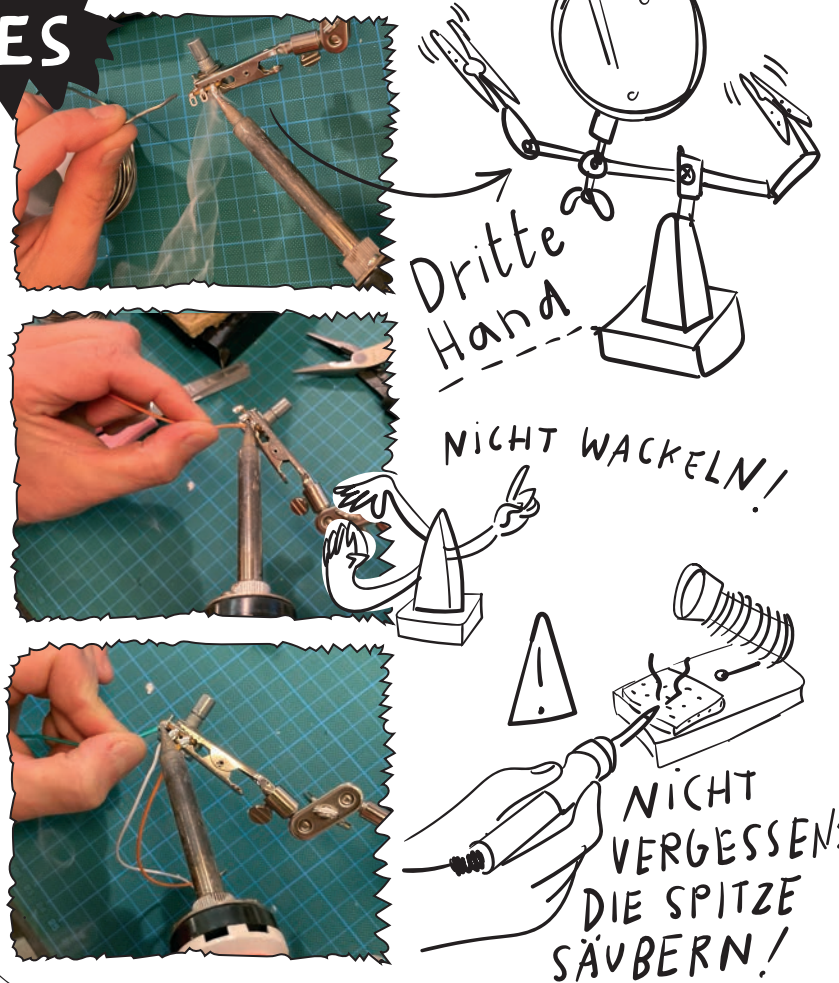


Apply heat to the metal (a few seconds) then apply solder.
Tinning means coating the leads and connection points before soldering them together:
this makes stronger connections!

A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider.

Tin the poties then join the leads to each terminal following the color code.

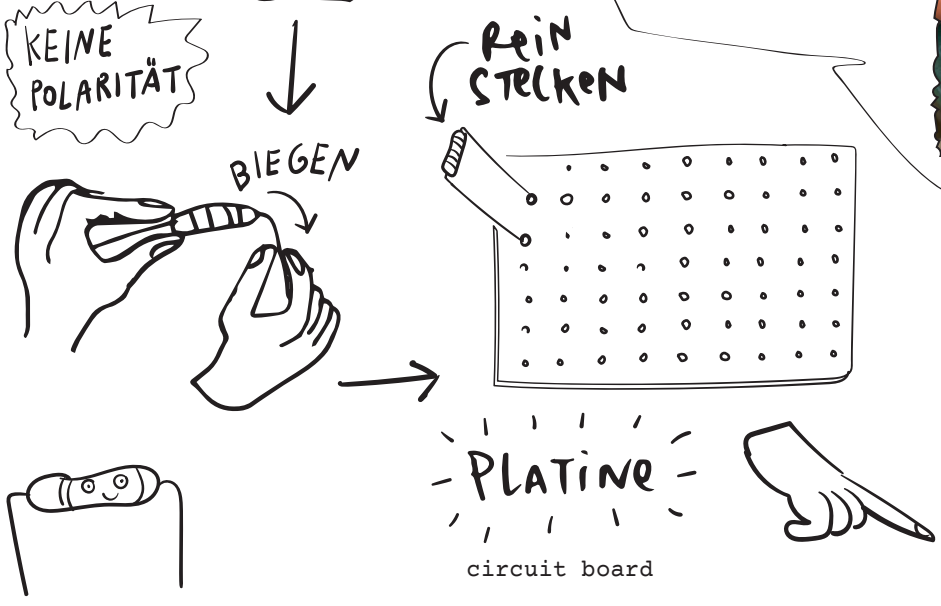




resistor

WIDERSTAND

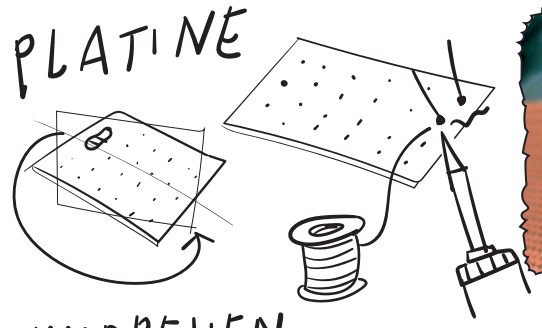
100kΩ = WIE DIE POTIES

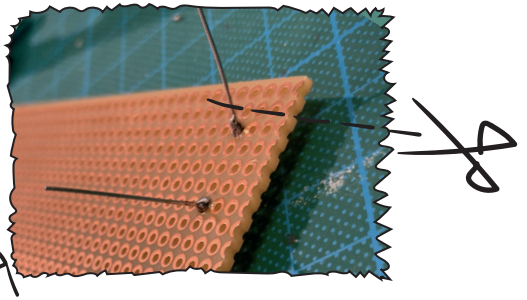


A resistor is a passive electrical component that limits electrical current to a specific value.

The cicuit board we are using has single copper holes, we have to make all the connections.

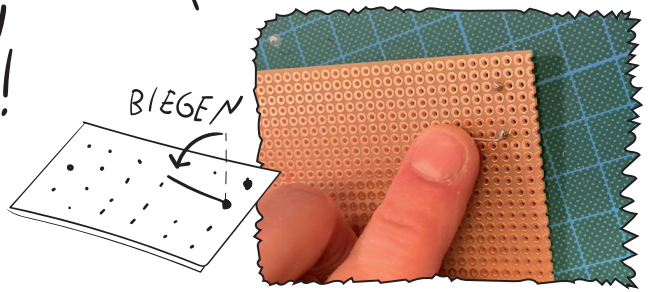
Always place components on the top (plastic) and solder on the bottom (copper)!





Turn the board and solder.
Heat the metal first then apply solder.
Solder joints should look like small shiny blobs.
Cut the top leg and keep it for later.
Bend the bottom leg, it will be a bridge between resistors.

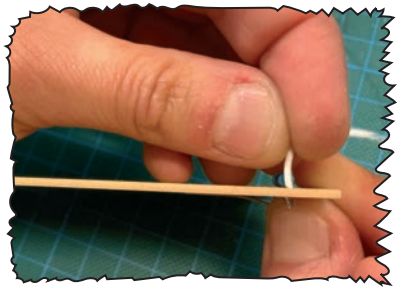
UMDREHEN & LÖTEN!



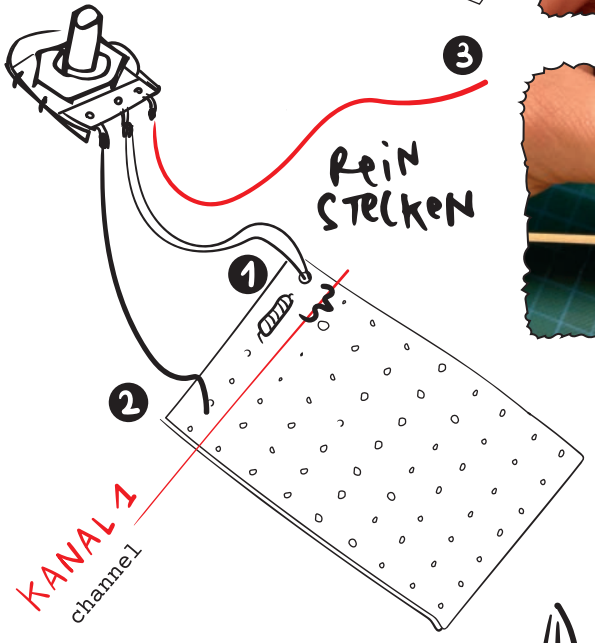
Channel 1:

1 Thread the lead into the hole until the shield and solder in place.

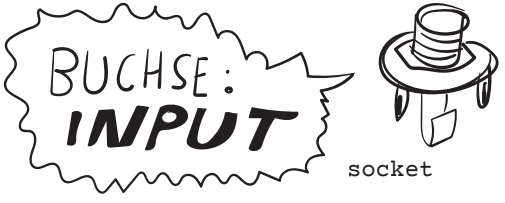
Join white lead from the poti with the top resistor leg by soldering the two joints together.

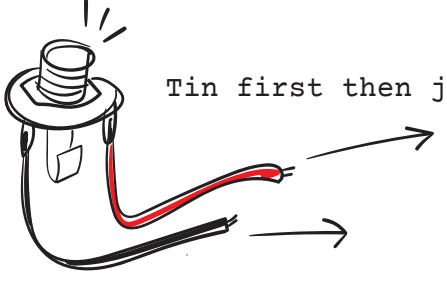


2 Solder the ground (black) lead a few holes down on the board. This is the beginning of a ground path!

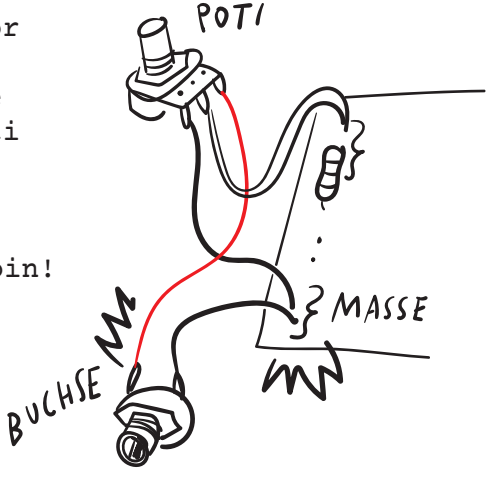


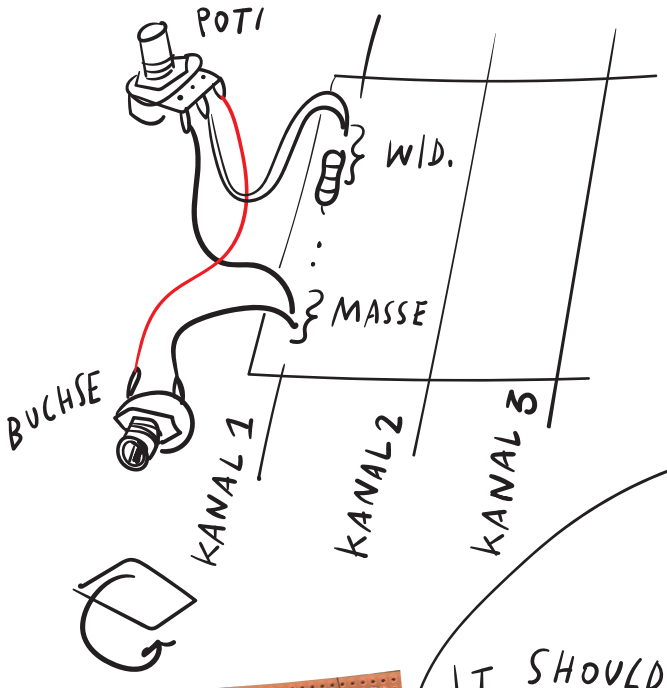
3 The socket is the connector for the microphone (input).
Check the socket polarity (see -->Mikro) and connect + to poti and - to ground!

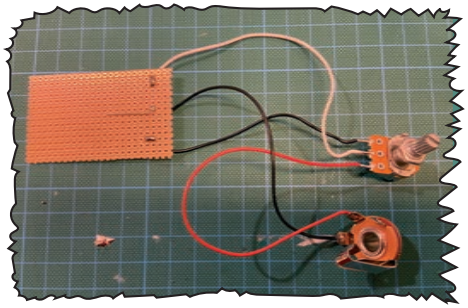


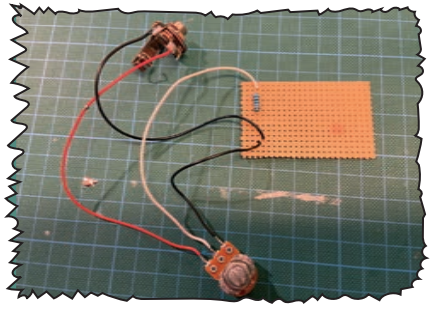


Tin first then join!





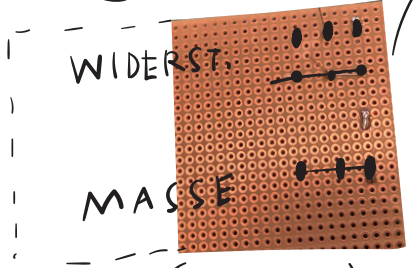




Do the same for channel 2 and 3!

Connect the bent legs of the three resistors.

Use the cut out resistors legs to connect all ground joints.

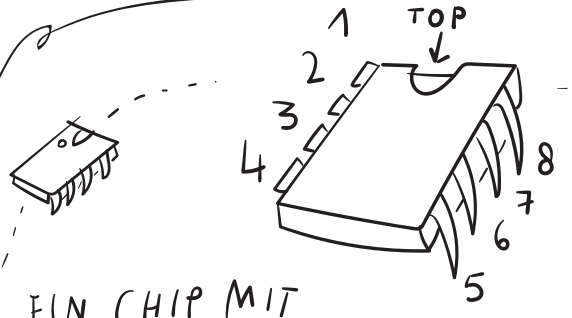


(BOTTOM)

IT SHOULD LOOK LIKE THIS!

IC

EIN CHIP MIT 8 PINS (BEINCHEN)

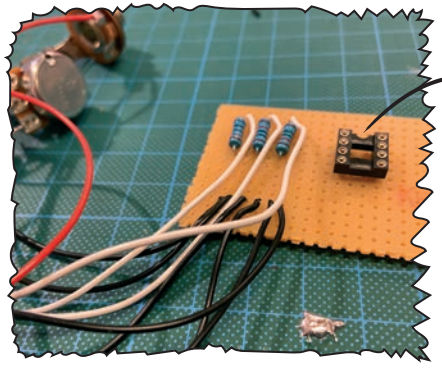


The LM386 is an operational amplifier! Each pin has a specific function in the circuit.

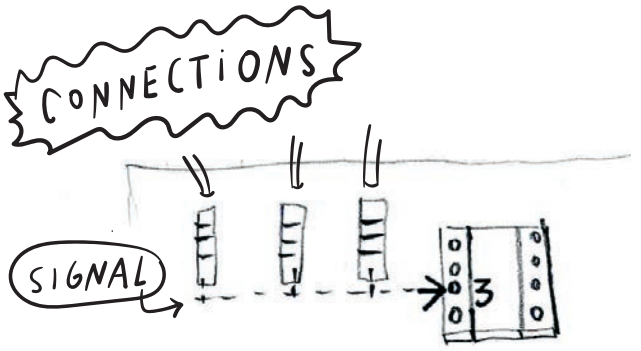
If the chip is placed upsidedown it may burn...

INTEGRATED CIRCUITS

An integrated circuit is a set of electronic circuits on one small flat piece (or "chip") of semiconductor material. ICs have revolutionized electronics!

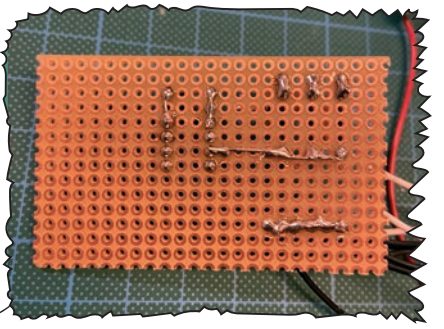


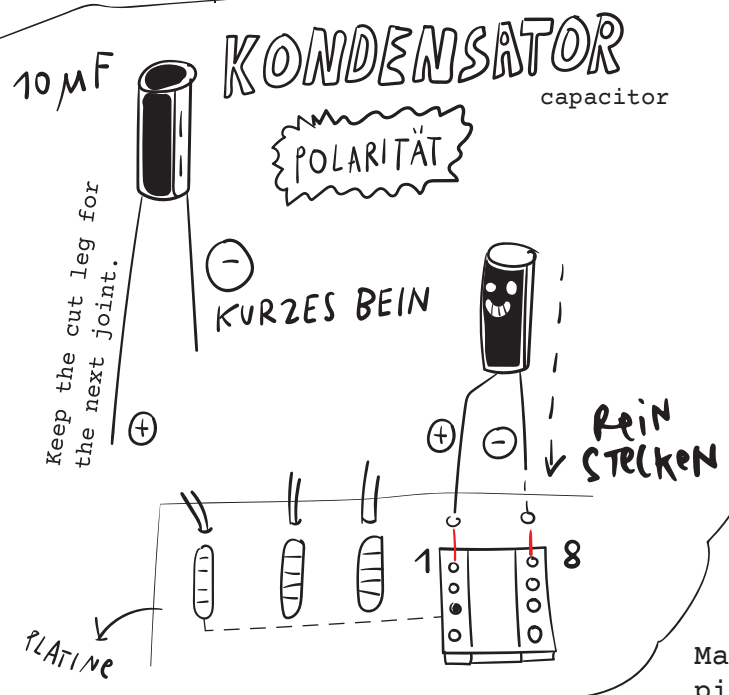
This is an IC holder. It also has a marker at the top! Place it on the board so pin 3 is aligned with resistors.



Solder each pin to board and make sure they do not connect to each other. From now on all joints will be very close to each other. Be precise!

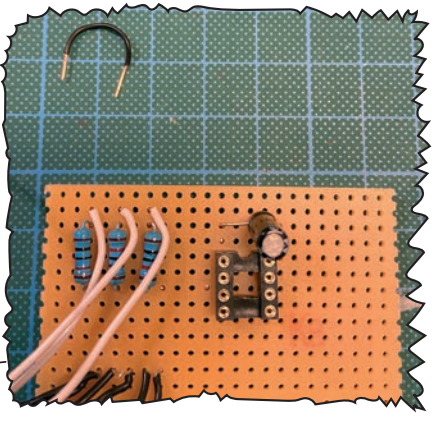
Connect the row of resistors to pin 3.

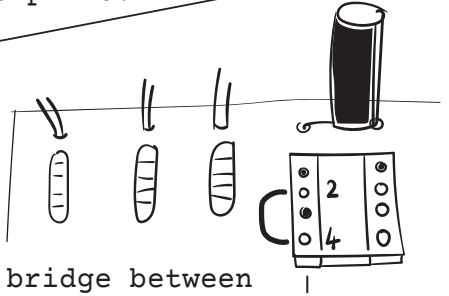




Electrolytic capacitors function as tiny batteries. They are polarized. The polarity is also marked on the component housing.

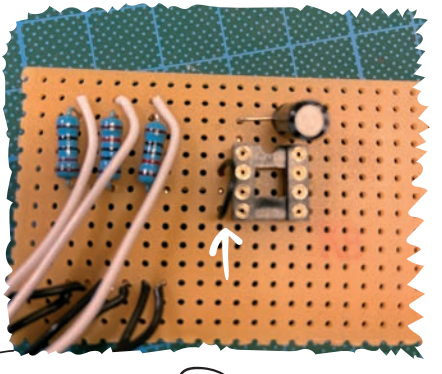
Insert 10uF capacitor all the way.
Connect:
+ to pin 1
- to pin 8!

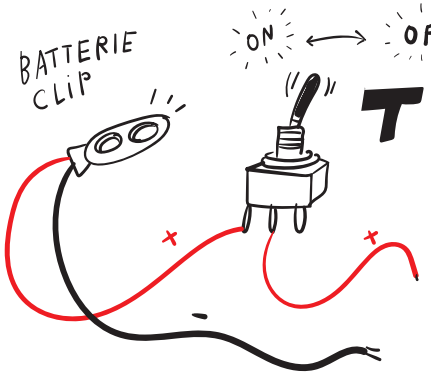




Make a bridge between pin 2 and 4 and connect them to ground.

Masse

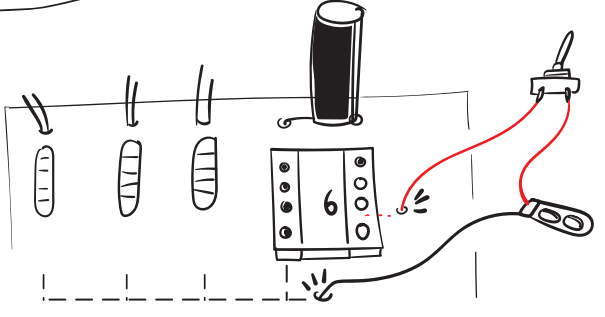




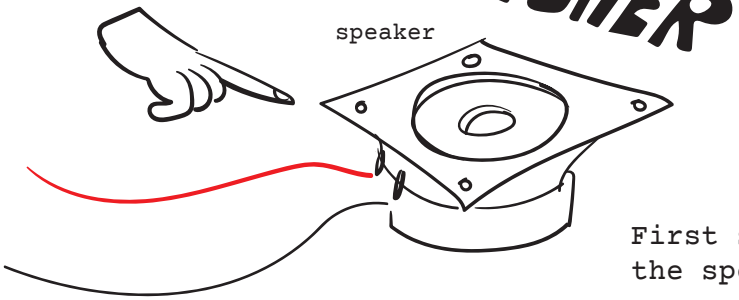
TILT SWITCH

A tilt switch has on and off function.

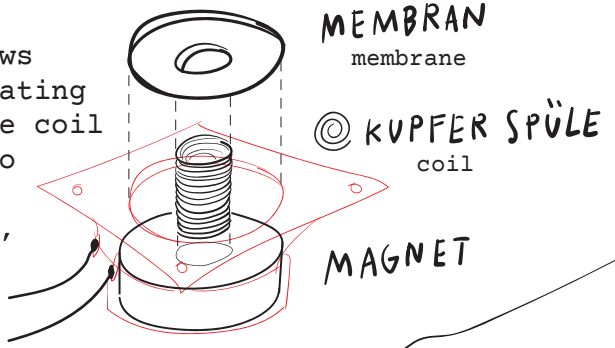
Solder battery clip and tilt switch together.
Connect + to pin 6 and - to ground.



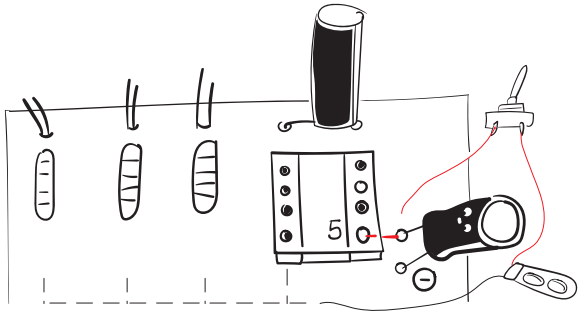
LAUTSPRECHER



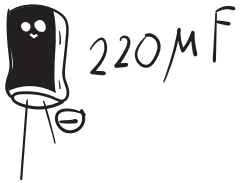
How a speaker works: electric current flows through the coil creating a magnetic field, the coil moves the membran to create sound waves. A mic works the same, but backwards!

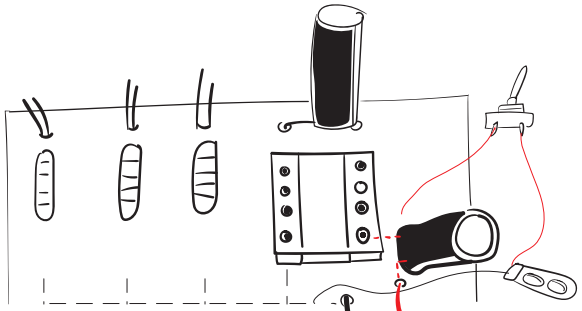


First solder leads to the speaker.

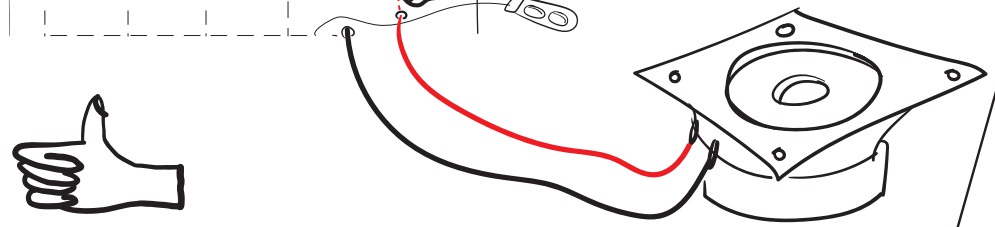


Connect 220uF capacitor:
+ to pin 5
- will connect with speaker.

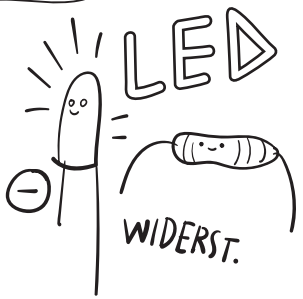


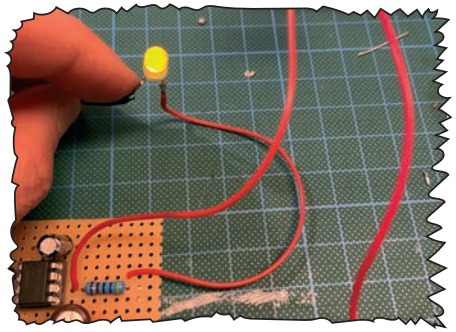


Connect speaker:
+ with capacitor
- with ground.

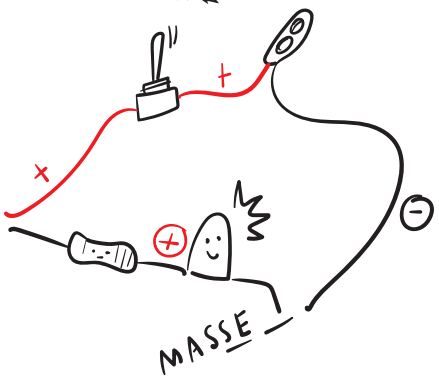


You can also add an LED, to show when circuit is on. The LED is polarized, and always needs a resistor.



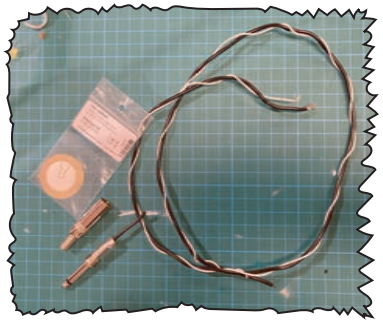


Connect as the diagram shows, to tilt switch and to ground.



Mikro

microphone

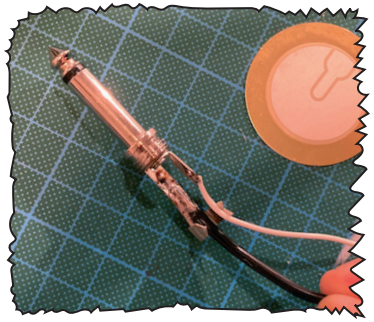


shaft tip

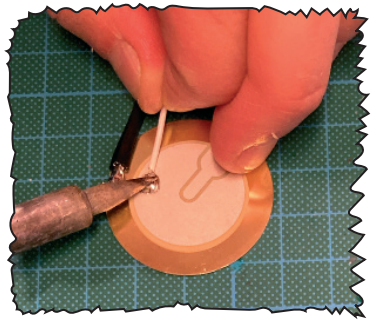
KLINKE

jack plug

Use a mono jack plug. This is a connector for audio signal.

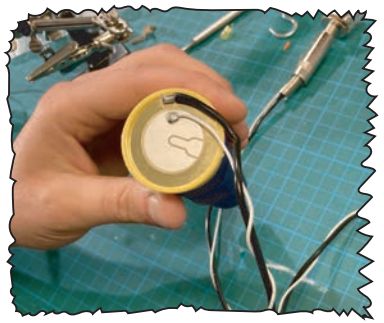


Follow the drawing to connect leads correctly according to polarity.

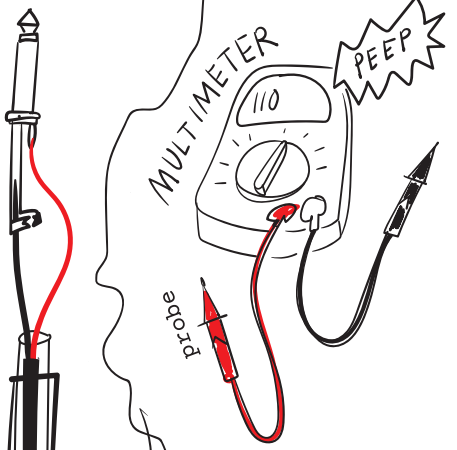


PIEZO

A piezo is a contact mic, it has a brass and a ceramic plate. It picks up vibration, and usually not our voice...



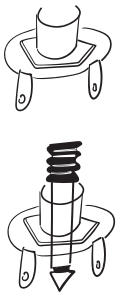
Unless you put the mic inside a cone! For example the Overlock thread cone!



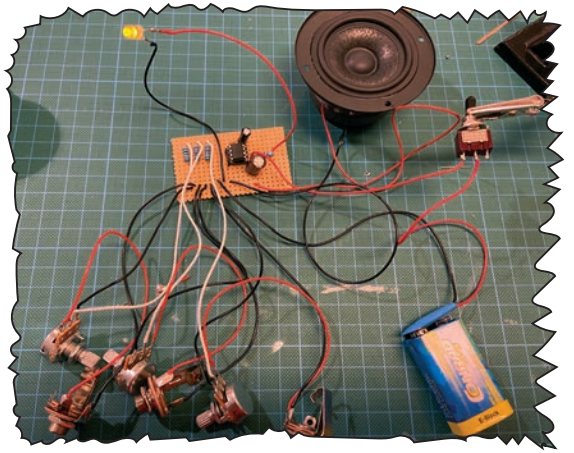
How to find out polarity?

Use the multimeter! Plug jack into socket. To find + touch one probe to jack tip, the other to socket terminals: If it beeps its +!

To find - touch jack shaft and socket terminals: If it beeps its -!



SOUND CHECK



Place chip, check if its the right way!
Plug mic.
Connect 9v battery.
Tilt switch on!!!

CASE

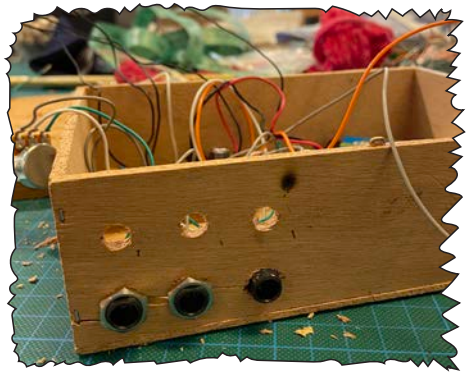
A case is good protection for your device! Look for cigar boxes, Plastic containers, a bag... anything that isn't metal works.

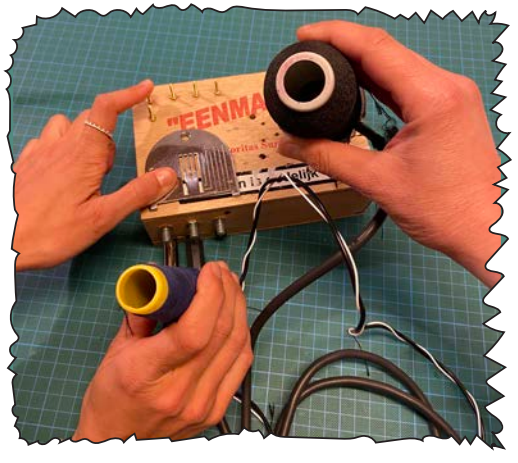
Measure to make sure everything fits in the case: leave room between the poties and jack sockets, they cannot touch each other! Shorten any leads if they are too long.

Hot glue the tilt switch onto the circuit board to secure it once the switch is placed in the case.

Mark the holes for poties, sockets, switch and LED and make holes with screwdriver.

Unscrew the nuts on poties and jacks, place them inside the case and screw them tight from the outside!

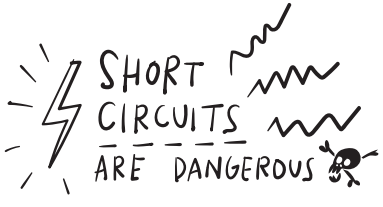




TURNING YOUR MULTI-MEGA-PHONE INTO A NOISE BOX:

Touch the back of your circuit board with two fingers: at certain connections you hear some squeaks and noises. This is because our bodies conduct electricity, and actually you are making a short circuit on the board with fun results!

Extend these points with some shielded wire to anything conductive: screws, metals… to check conductivity use the multimeter: if it beeps its conductive!



Working with short circuits as noise generators is a fun experiment but should only be played with battery operated devices!

MAKE NOISE with your friends!!!