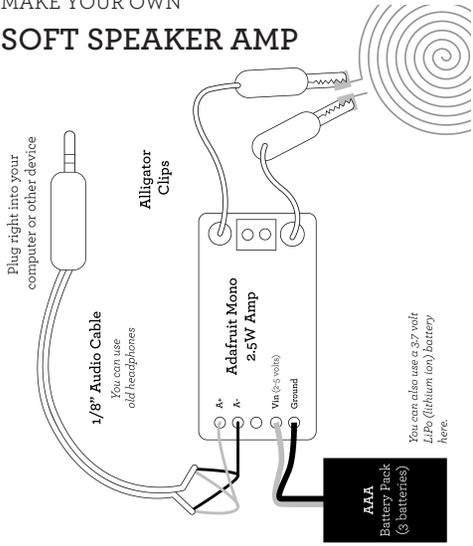


MAKE YOUR OWN SOFT SPEAKER AMP



CONNECTING HEADPHONE WIRES

- Strip the wires on both cords
- Solder the ground wires (usually copper) together
- Solder the signal wires* (usually different colors) together.

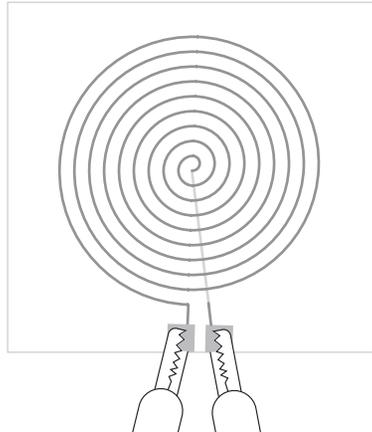
* If the wires have enamel on them, you can hold a lighter to it or run a soldering iron over it on a wooden surface slowly until the solder sticks.

FABRIC SPEAKERS

Spark Workshop

May 22, 2018

liza stark // thesoftcircuitteer.net



FABRIC SPEAKERS

PROPERTIES

There are a few variables you have to consider when making a fabric or paper speaker:

1) COIL TIGHTNESS

The tighter the coil, the louder. (It will be since it will have a stronger magnetic field.)



2) MATERIAL

You can hear noise because the sound waves vibrate off the material. How stiff or thick the material is effects the loudness.



3) MAGNET SIZE

The larger the magnet, the louder the volume. You can combine many small magnets or just get a big one BUT be careful - neodymium magnets are **very strong**.



4) MAGNET PLACEMENT

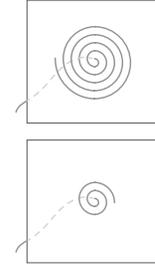
The volume will be louder the closer the magnet is to the center of the coil.



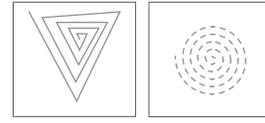
FABRIC SPEAKER

HOW TO MAKE IT

- 1) Draw a coil on your fabric. It can be any shape you like.
- 2) Thread your needle with one strand of conductive thread. You can run wax over the end to get it through the hole.
- 3) Tie a knot 5-6 inches from the end.
- 4) Come up through the center of the piece of fabric.
- 5) Stitch around the coil, making sure the conductive thread lines do not touch each other. (See inside)
- 6) Make sure the extra 5-6 inches of thread does not get sewn into the coil! We need to keep them separate.



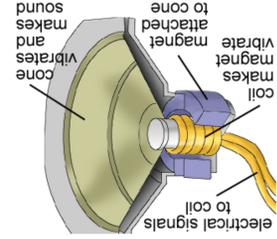
You can use any shape or stitch



SPEAKERS

HOW IT WORKS

Have you ever broken open a speaker? This is what a speaker looks like on the inside:

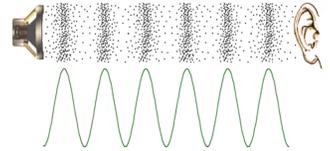


GOOD VIBRATIONS WHAT IS SOUND?



Sound is a type of energy made when something vibrates.

If you hit a drum (or any other object), the air particles around it vibrate. The air carries this energy in all directions in the form of sound waves.



When these waves of vibrating particles reach your ears, it causes the hair in your ears to vibrate, which your brain reads as sound. Sound waves keep going until the energy dissipates or it is absorbed by another object.

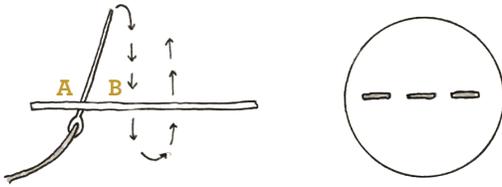
coil.

When the audio signal is connected to either end of your electromagnet (the coil), a fluctuating magnetic field forms around the membrane to the magnet. It vibrates, repelling and attracting the waves that we can hear.

The membrane moves the air around it, translating electrical frequencies into audible waves that we can hear.

STITCH 1

RUNNING STITCH

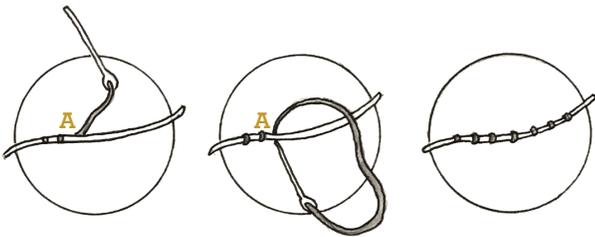


This is the most basic stitch - you just go over and under the fabric. It's great for sewing quick traces with conductive thread.

With your needle on the back side of the fabric, bring your needle up through point A and pull the thread through. Put your needle through point B a short distance away from point A. Repeat.

STITCH 3

COUCH STITCH

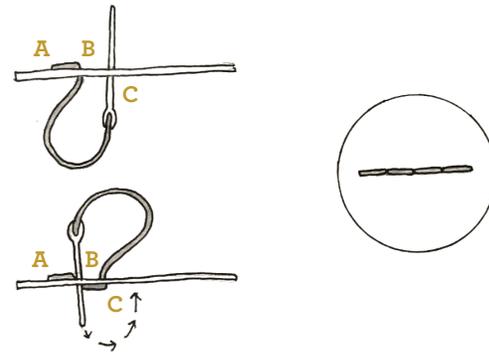


Couching is a great stitch for conductive thread because you don't have to sew with it. The conductive thread lies on top while you sew around it to create any design you like.

With your needle on the back side of the fabric, bring your needle up through point A and pull the thread through. Go over the conductive thread and place your needle back down through point A (or as close as you can get.). Repeat.

STITCH 2

BACK STITCH

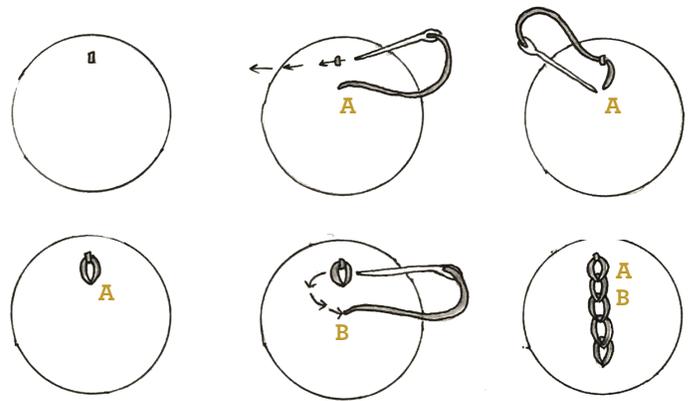


The back stitch creates the effect of a single line.

Bring your needle up through point A and down through point B. Next, bring your needle up through point C and pull the thread through. Now, put your needle *back through* point B and pull your thread through. Repeat.

STITCH 4

CHAIN STITCH



The chain stitch is a little tricky at first, but once you get the hang of it, it's easy and a beautiful decorative stitch.

Create a small stitch where you want to start. With your needle on the back side of the fabric, bring your needle up through point A and pull the thread through. Insert your needle through the small stitch and pull. Insert your needle back into point A. Next, come up through point B. Insert your needle underneath the threads of the first chain and pull the thread through. Insert your needle back through point B. Repeat.

EMBROIDERY 101

These are four basic embroidery stitches you can use with regular or conductive thread.