

HOWTO: Build your Xth Sense biophysical wearable sensor v2.0

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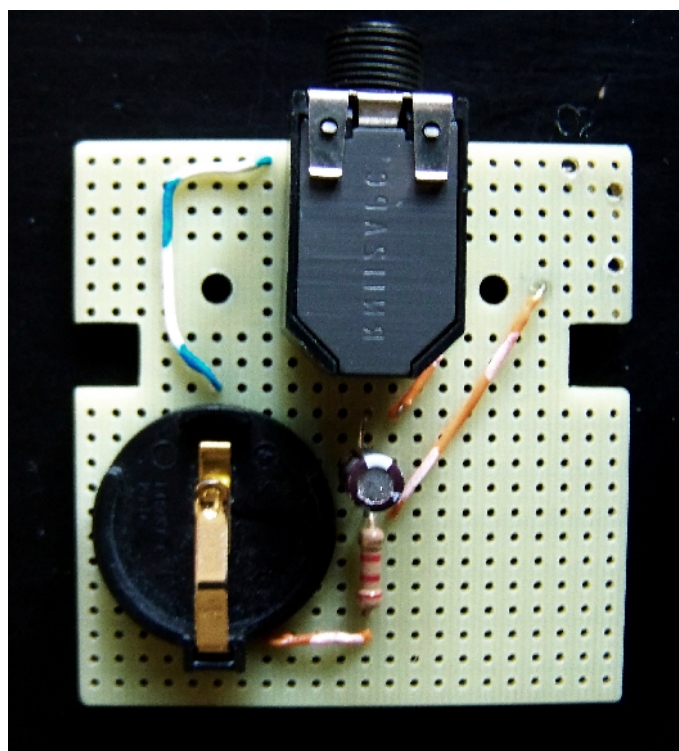
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Time required: from 1 up to 4 hours (depending on your skills and practice).

1. Make sure you have all parts and components (see Parts list), and the right tools. You'll need: a solder iron, solder, wirestripper, stranded wire, scissors, and a 3V coin battery.
2. Cut the matrix board in order to comfortably fit the box, but bear in mind the board has to be big enough to accommodate all the components.
3. Solder the circuit following carefully the schematics. You can solder everything except the flexible audio cable. We'll do this later on. See the suggested layout below.



4. If you need help understanding the schematics make sure to check the file titled “xth-sense_soldered-board.pdf”. It illustrates how to solder the components.
5. Using a suitable drill, make 2 holes in the plastic box.
One hole is needed for the flexible cable to reach the circuit inside the box; this can be done on the longer side of the box. Another hole is needed to fit the jack socket, thus it has to be bigger enough and well centered on the side of the box; this can be done on the shorter side of the box.

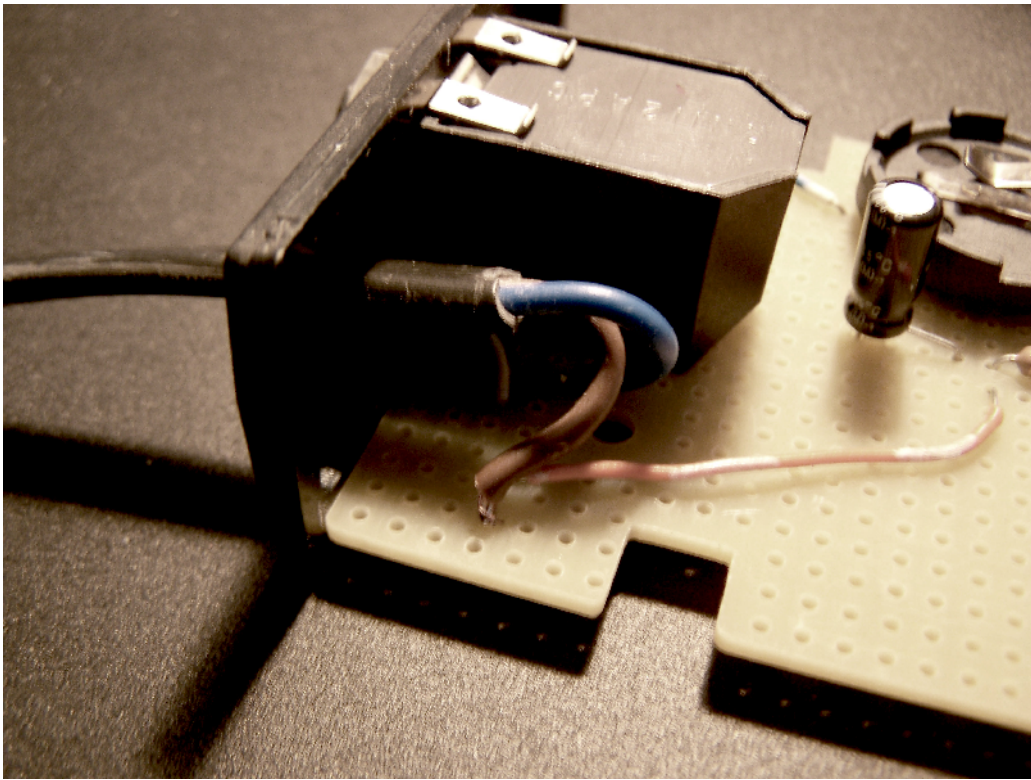
Always check the best location for the holes and the jack socket by inserting the circuit inside the box __BEFORE__ making the holes.

6. Cut a 1m long flexible cable (or longer, depending on which parts of the body you want to use).
7. Accommodate the flexible audio cable through the smaller hole on the box and solder the cable voltage and ground wires to the circuit according to the schematics.



8. Now position the circuit inside the box and fix the jack socket into its hole.
Make sure you can close the box!

Sometimes the jack socket might be slightly higher than the height of the box. If so, just cut away a small piece of the box cover so that you can close the box.



9. Prepare the velcro arm band.

Cut two velcro strips (one with the hooks and one with the loops) about 10/15cm long (this can be adjustable to the diameter you need).

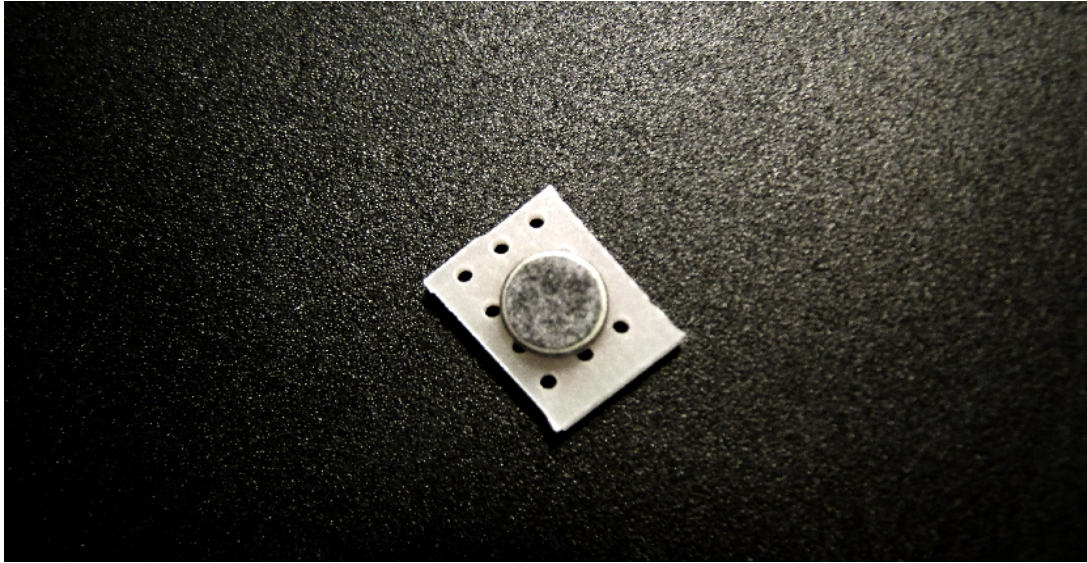
Sew them together, but REMEMBER NOT TO SEW a small part (about 3/4cm) of one of the sides of the arm band (at about 1/4 of the whole lenght of the arm band), AND cut out a small corner at one end of the arm band. You will need those holes to be able to embed the cable into the arm band.

10. When the arm band is ready, cut a small hole on the loop side of the arm band; the position of the hole should be at about 1/3 of the whole lenght of the arm band. We will use this hole to embed the microphone.

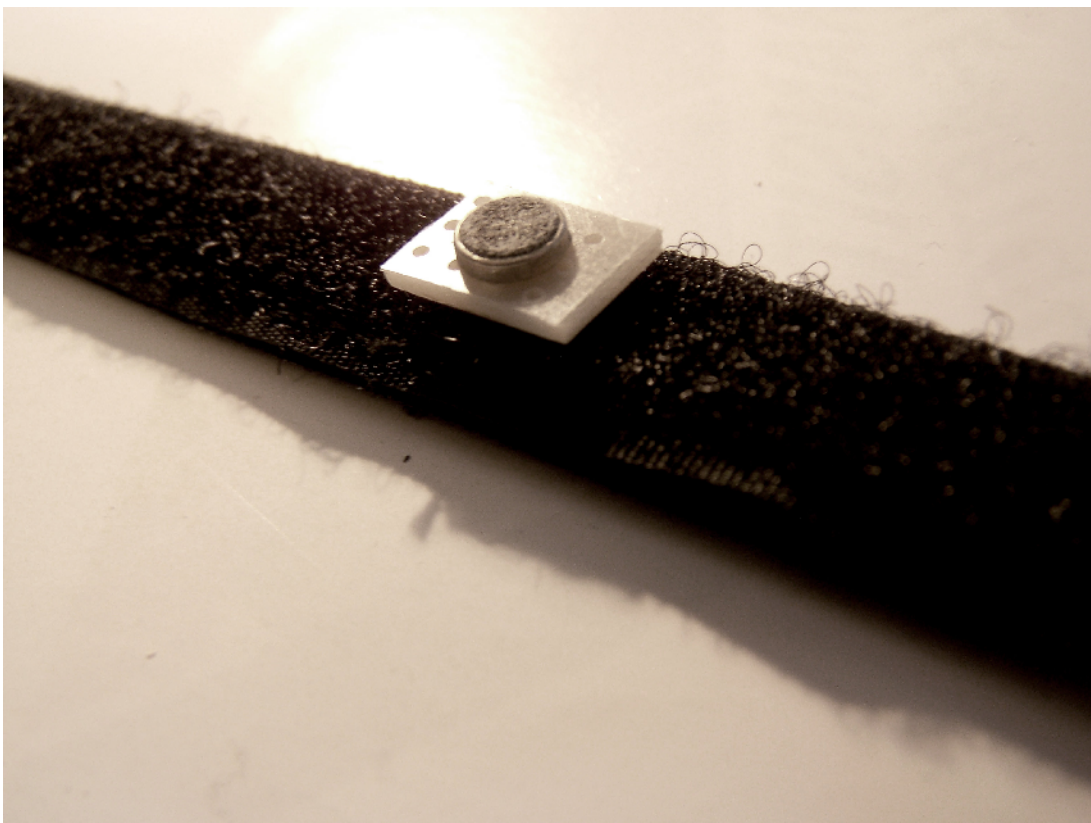


11. Take the free end of the audio cable, and insert it in between the two sides of the velcro arm band. Insert the cable from the corner of the arm band that has been cut (see picture above). Let the audio cable come out of the hole you cut into the arm band.

12. Cut a small piece of the matrix board (like 4x3 holes). Solder the microphone onto the yellow side of it. Turn the small piece of board on the other side, where the copper is, and solder the two wires of the audio cable to the microphone pins (don't mix up voltage and ground!). See the microphone specification sheet (included in this package).



13. Isolate each wire (voltage and ground) separately , by applying black tape on the solder iron.
14. Pull delicately the audio cable until the small piece of the board sits onto the velcro arm band.



15. You're almost done!!

Place the silicon case on the microphone, make sure that the microphone is as much static as possible. More the microphone is moving, less accurate the signal is. Be careful not to push the microphone too strongly. The hole in the silicon case is tight on purpose and it might need a little bit of fiddling to fit. Once inside, it won't move any more.

IMPORTANT: it is crucial that the microphone is located at the bottom of the silicon case.

If the mic is too high it will touch your skin, and this is bad because the mic does not work with skin-contact. If the mic is too low inside the silicon case, the muscle sound will be very quiet.

16. Insert the battery into its battery holder, close the box, you're done, have fun!!



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