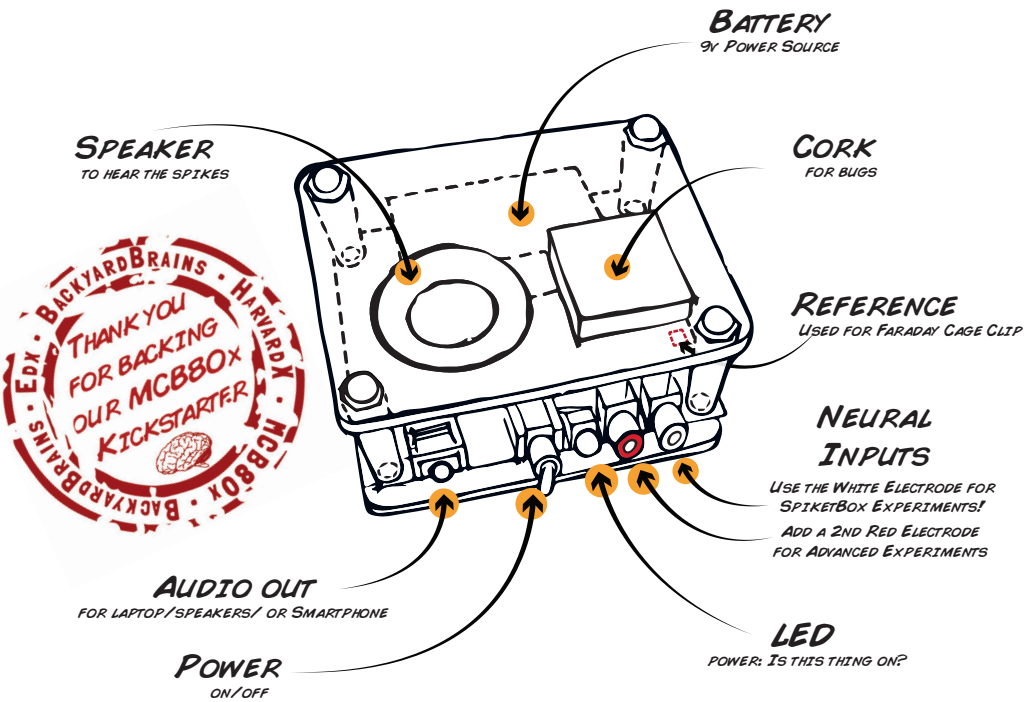
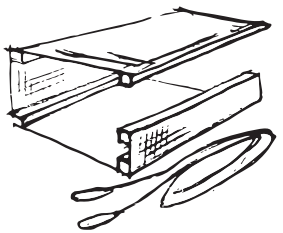
Welcome to the NeuroRevolution!

Congratulations! You are now a proud owner of the SpikerBox.



What's inside:

Faraday cage



Helps to get rid of noise while recording neural activity. Especially helpful when attempting to record from Earthworms! Wrap the cage around the SpikerBox, then use the alligator clips to connect the Faraday screen to the SpikerBox Reference. (See above for location)

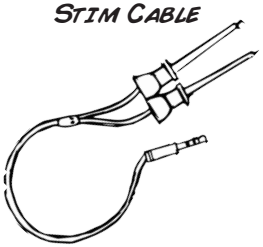
Laptop cable

Use this to connect SpikerBox to your laptop.

Smartphone cable

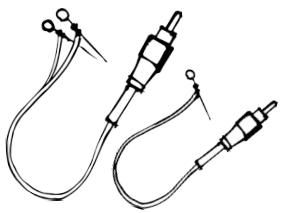
Use this to record spikes on your smartphone.

Stim Cable



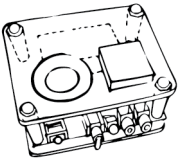
Plug into your music player, place hooks on the cockroach leg electrodes and watch it dance!

2Channel electrodes



Place pins into your insect to hear and record living neurons! The red is only needed when recording 2 channels.

Getting started with your

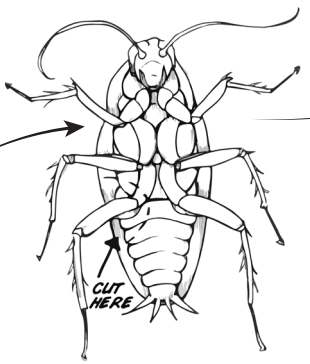


What can you do with 2-Channels? Good Question! You can record from multiple neural sources at the same time during your experiments, or our favorite, you can measure conduction velocity using earthworms. How fast do action potentials travel? Now you can find out!

Let's get started!

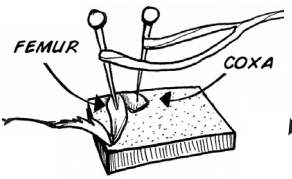
This is a great introductory experiment to get you started with spikes! By the end of this experiment, you will understand what neurons are, how they communicate, and how to record spikes using a SpikerBox!

Anesthetize the Cockroach. Put it in a jar of ice water. Wait a few minutes until it stops moving.

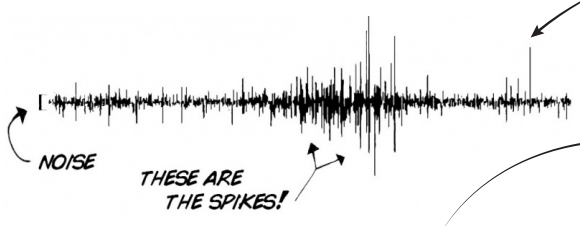


Neurosurgery! Remove the cockroach from ice, and cut off one of his legs near the body.

Place the leg on the cork of your SpikerBox, allowing a bit of the leg to overhang, like this.



And put the two electrodes into the coxa and femur. It doesn't matter which pins are where.

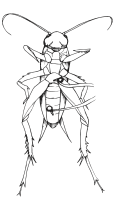


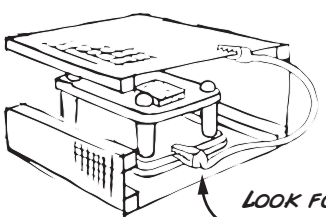
Turn your SpikerBox on! If you hear a popcorn sound, congratulations, you have just heard the spikes from your first neurons! Now let's see what the electrical discharge looks like. Plug in the cable from the SpikerBox into your smartphone (green cable) or into the microphone input of your computer (blue cable). Turn on our free "Backyard Brains" app (Android or iPhone) or, if on a laptop, our Backyard Brains PC app or Audacity.

Using your smartphone, Zoom in with your fingers, the spikes will look like this:

This is due to ion channels opening and closing in the neurons, causing a spike, or Action Potential.

Note: You can also do this experiment on crickets if you do not have access to cockroaches! These can easily be found at pet stores or your backyard!.





Too much noise? Put your SpikerBox into the Faraday cage!

Look for the small metal square to clip to!

You can do more advanced experiments using the second electrode and a laptop! For example: measure the speed of action potentials!