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**BioAmp v1.5**

**Upside Down Labs**

**Apr 13, 2024**

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Small-size portable biopotential amplifier with a no code setup for non-invasive EMG recording!

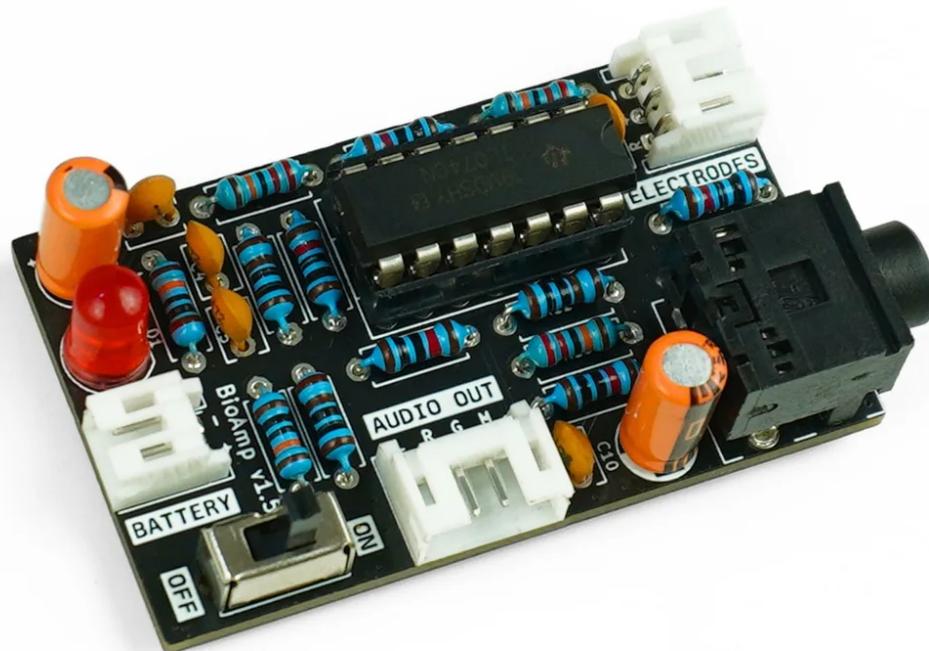
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**CHAPTER  
ONE**

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**OVERVIEW**

It is a small size portable biopotential amplifier with a no code setup to record and listen to your muscle signals (EMG) non invasively. The best part is that it doesn't require any microcontroller (like Arduino) to sample the signal. You just plug a 9V battery into the board, electrodes to the body, and an audio jack to a mobile/laptop, and you are ready to record signals from muscles (EMG) using audacity or Backyard Brain's spike recorder app.



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**CHAPTER  
TWO**

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**FEATURES & SPECIFICATIONS**

Minimum Input Voltage	7-9 V
Input Impedance	$10^7$ ohm
Fixed Gain	~200x
BioPotentials	EMG (Electromyography)
No. of channels	1
Electrodes	3 (Positive, Negative, and Reference)
Dimensions	5.0 x 3.0 cm
Open Source	Hardware + Software

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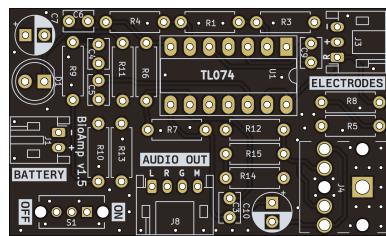
## CHAPTER THREE

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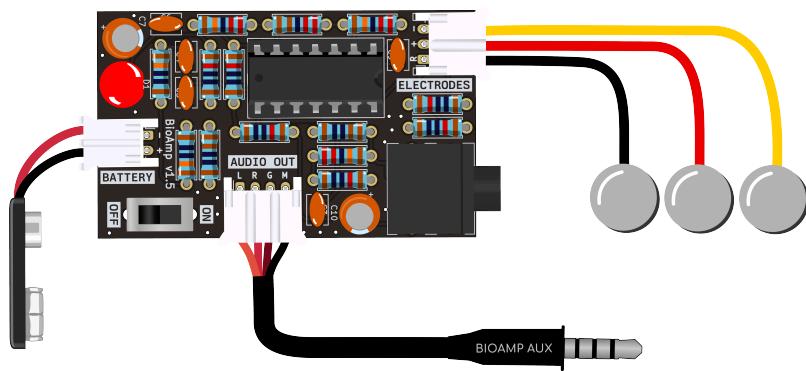
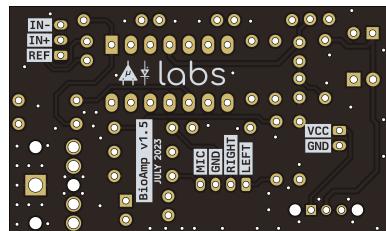
## HARDWARE

Images below shows a quick overview of the hardware design.

### PCB Front



### PCB Back



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## CHAPTER FOUR

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### ASSEMBLYING THE KIT

You can get your own Bioamp v1.5 bag of parts from [our store](#) or [Tindie](#) or the step by step guide below.

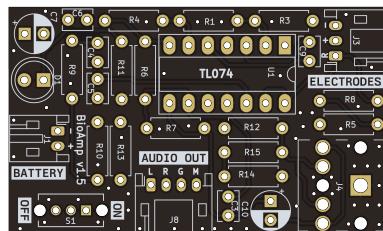


Fig. 1: Step 1 - Bare Board

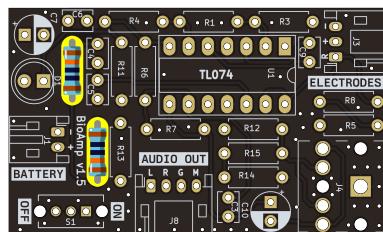


Fig. 2: Step 2 - 100K Resistors

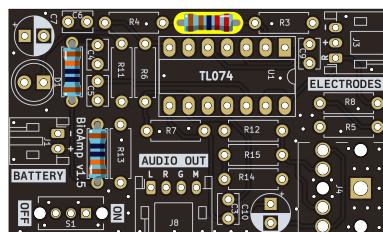


Fig. 3: Step 3 - 2.2K Resistor

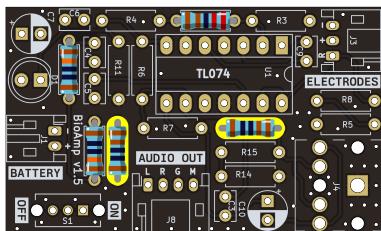


Fig. 4: Step 4 - 1K Resistors

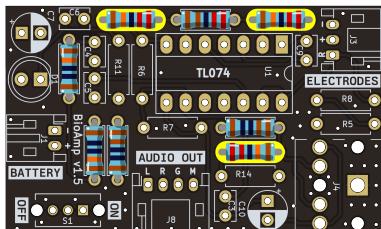


Fig. 5: Step 5 - 220K Resistors

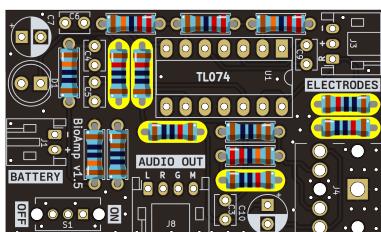


Fig. 6: Step 6 - 10K Resistors

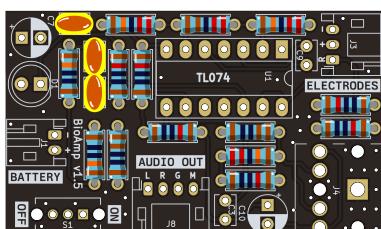


Fig. 7: Step 7 - 100nF Capacitors

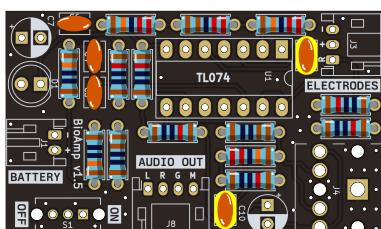


Fig. 8: Step 8 - 1nF Capacitors

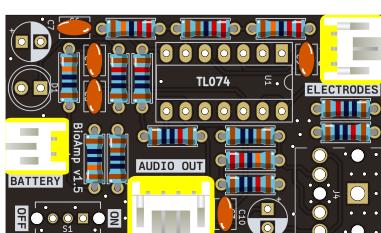


Fig. 9: Step 9 - JST PH Connectors

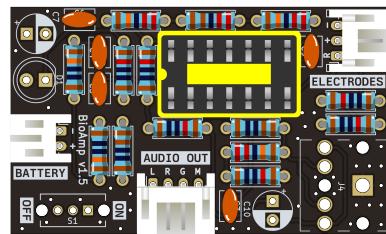


Fig. 10: Step 10 - IC Socket

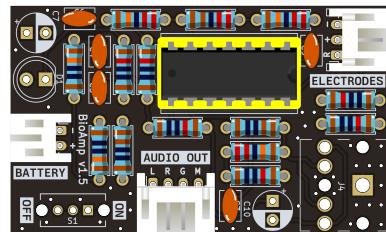


Fig. 11: Step 11 - IC

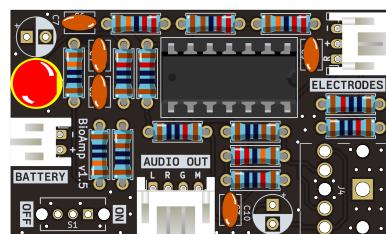


Fig. 12: Step 12 - Power LED

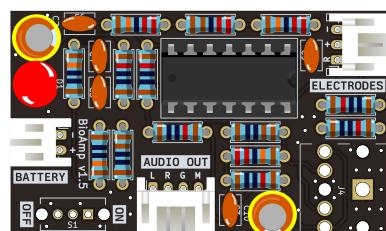


Fig. 13: Step 13 - 47uF Capacitors

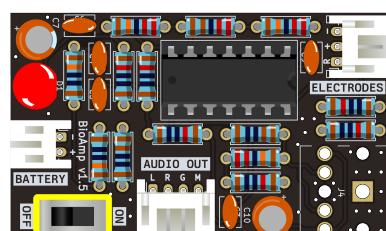


Fig. 14: Step 14 - Switch

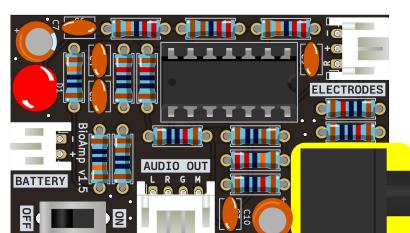


Fig. 15: Step 15 - Headphone jack

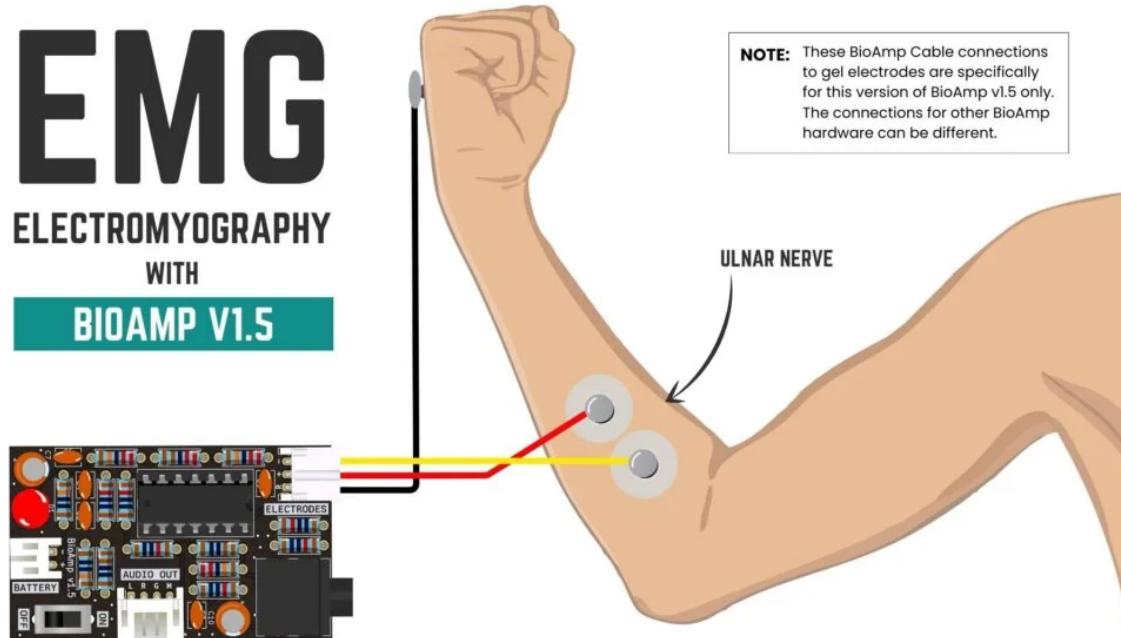
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CHAPTER  
FIVE

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## CONNECTIONS

To measure the EMG signals, just connect BioAmp Cable v3 with the hardware as shown in the image below, and get started.



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**CHAPTER  
SIX**

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**USING THE SENSOR**

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**CHAPTER  
SEVEN**

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**SOME PROJECT IDEAS**