

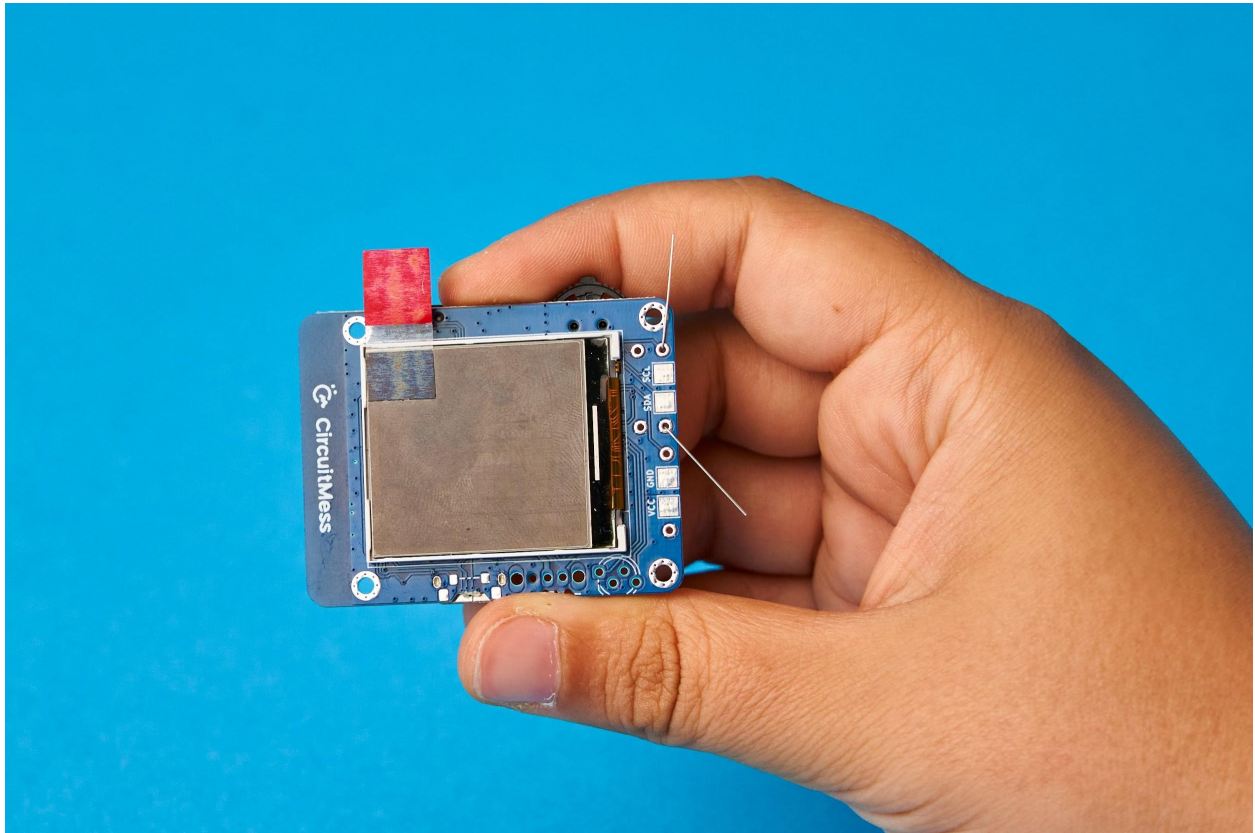
Let's learn something about the components you've got!

1. Circuit board

The **blue square-shaped thingy** you've gotten in your kit is called a circuit board.

Professionals call this a **printed circuit board** or **PCB**.

A PCB is a laminated sandwich structure of conductive and insulating layers.



What does it do?

Your circuit board has two functions:

- It holds all the electronic components in place.
- It provides electrical connections between the electronic components.

Because of the circuit board, all electronic components can work together as a team.

What are those tiny lines on my circuit board?

They allow electrical charges to flow between components. This way, electronic components are powered, and they can do clever stuff using electricity.

What is my circuit board made of?

Circuit boards are usually made out of fiberglass-reinforced epoxy-laminated sheets.

These are also referred to as “**FR4**” sheets.

The FR4 sheets are used as the insulating non-conductive material, and copper is used as a conductive material.

If material is **conductive**, it conducts electricity; electrical charge can flow through that material easily.

FR4 and copper are both sandwiched together in thin sheets, and that’s how you get a circuit board.

Where are PCBs used?

They’re used everywhere!

In your phone, in your laptop, in your refrigerator, air conditioner. Basically, every electronic device you use has a unique printed circuit board that makes it work.

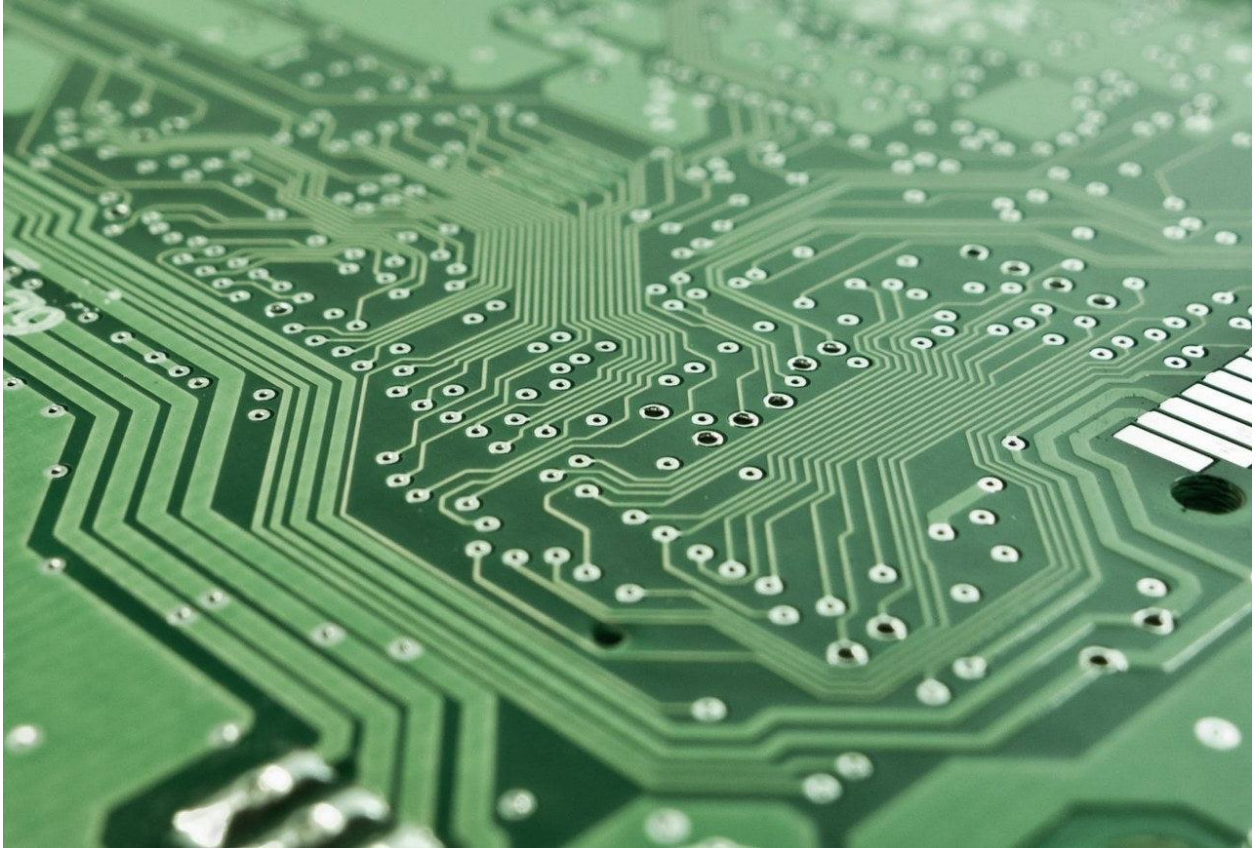
Did you know?

A PCB is one of the most important inventions of the last 100 years.

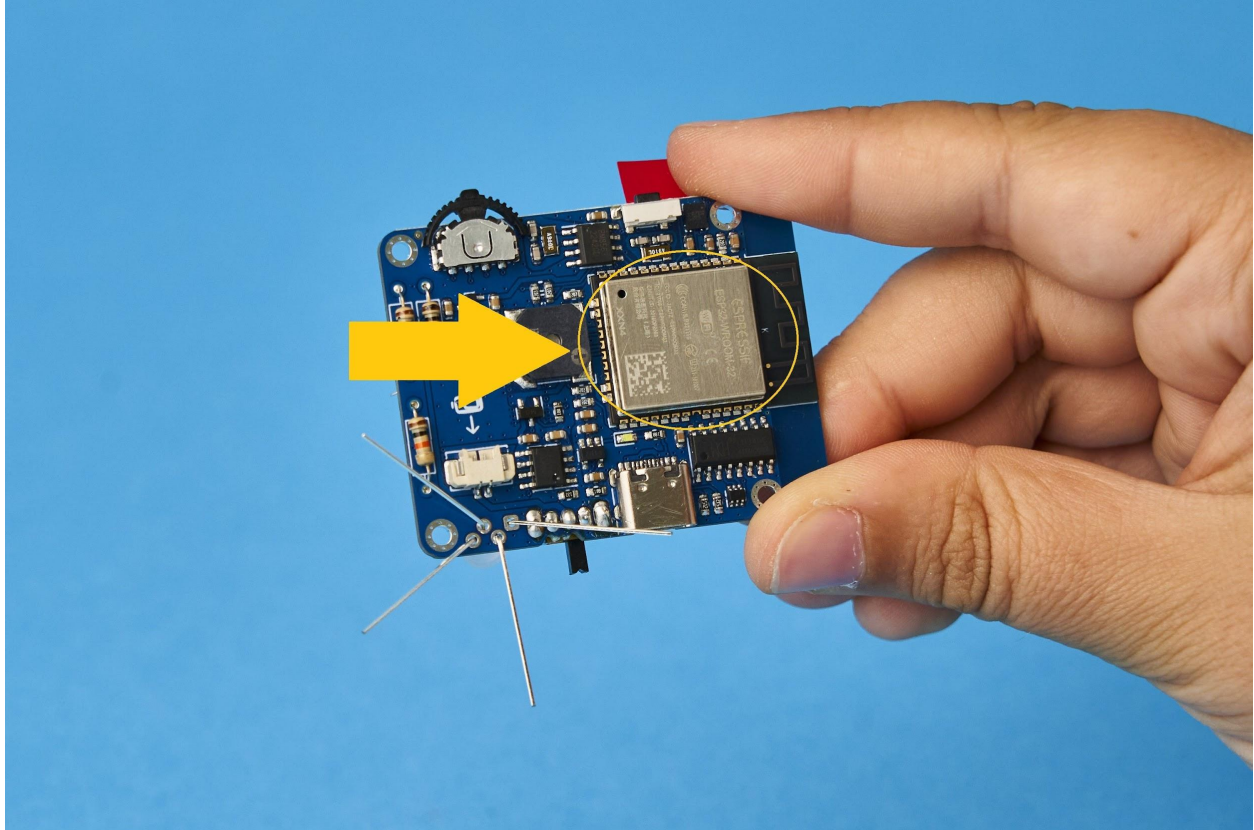
Space travel wouldn’t be possible without them.

PCBs were invented by **Paul Eisler**.

He invented it in the 1930s, but the predecessors of modern-day PCBs have been around since the age of gramophones and vacuum tube radios, just in a somewhat different form.



2. ESP-WROOM-32



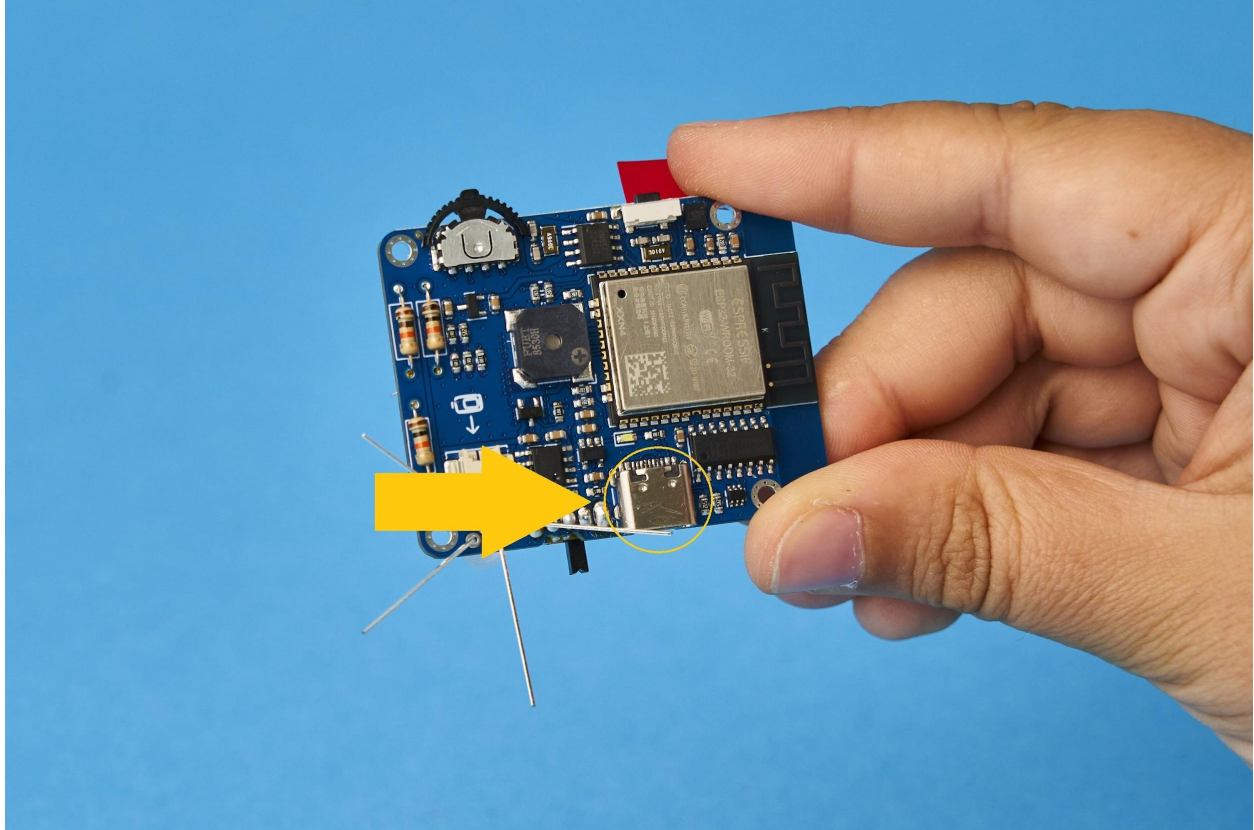
This microcontroller runs everything, and you could say that this is **Clockstar's brain**. ESP-WROOM-32 is a powerful module mainly used for sound encoding and streaming music. It is reasonably priced considering all its abilities.

Apart from being famous for sound encoding, ESP-WROOM-32 also controls button, display, gyroscope, and everything else.

Due to its complexity and sensitivity, this module is already connected to Clockstar's main board.

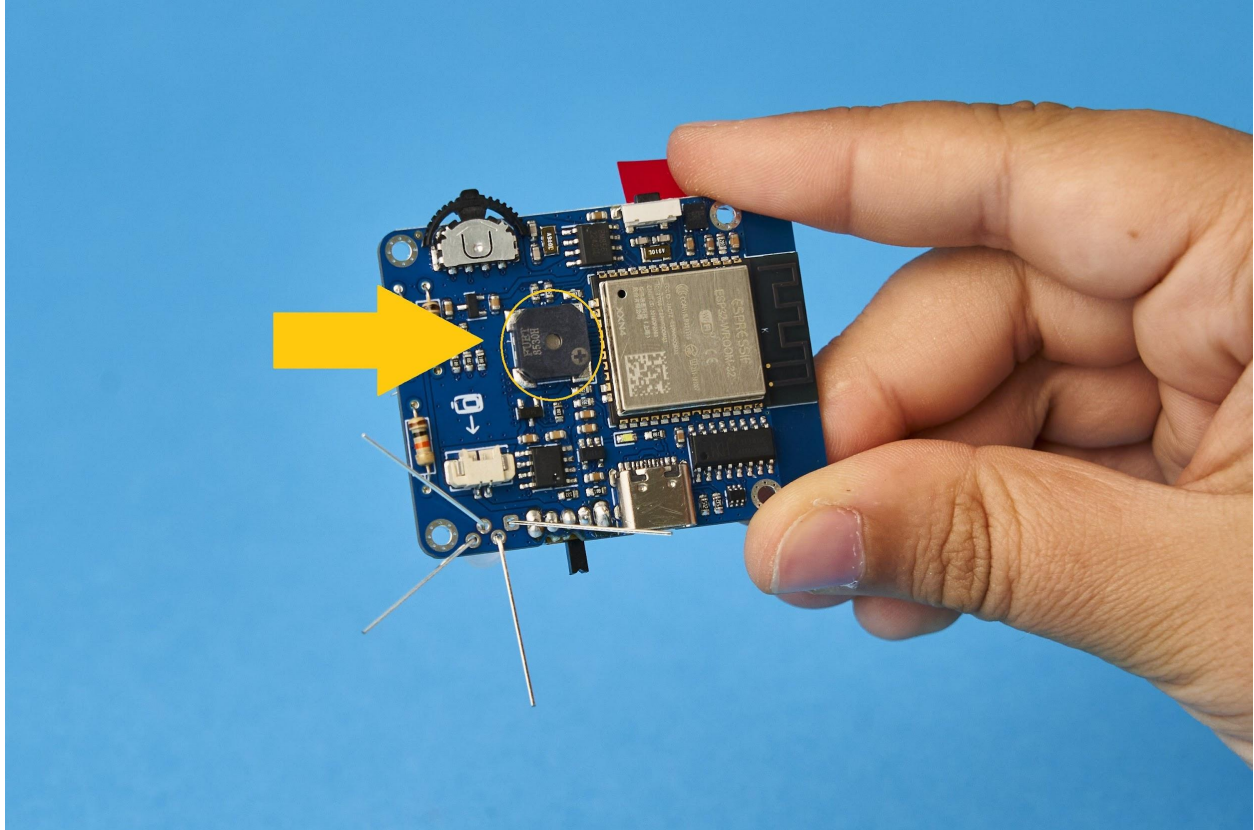
- [ESP-WROOM-32 data sheet](#)

3. USB-C connector



This connector is used to **connect Clockstar to the computer and charge its battery**. Once you connect it to your PC, you'll be able to program it in CircuitBlocks - a graphical programming interface that helps newbies get into embedded programming.

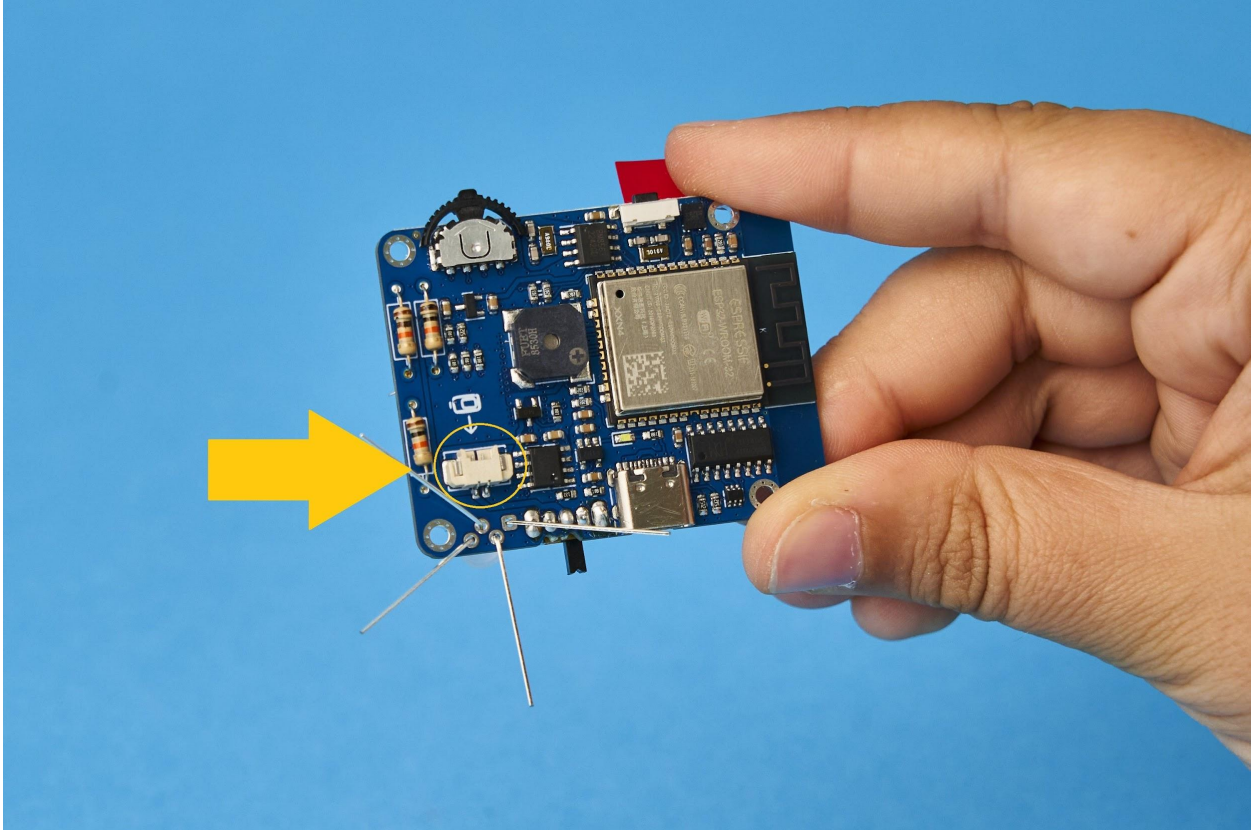
4. Buzzer



A buzzer is an **audio signaling device**, which may be mechanical, electromechanical, or piezoelectric.

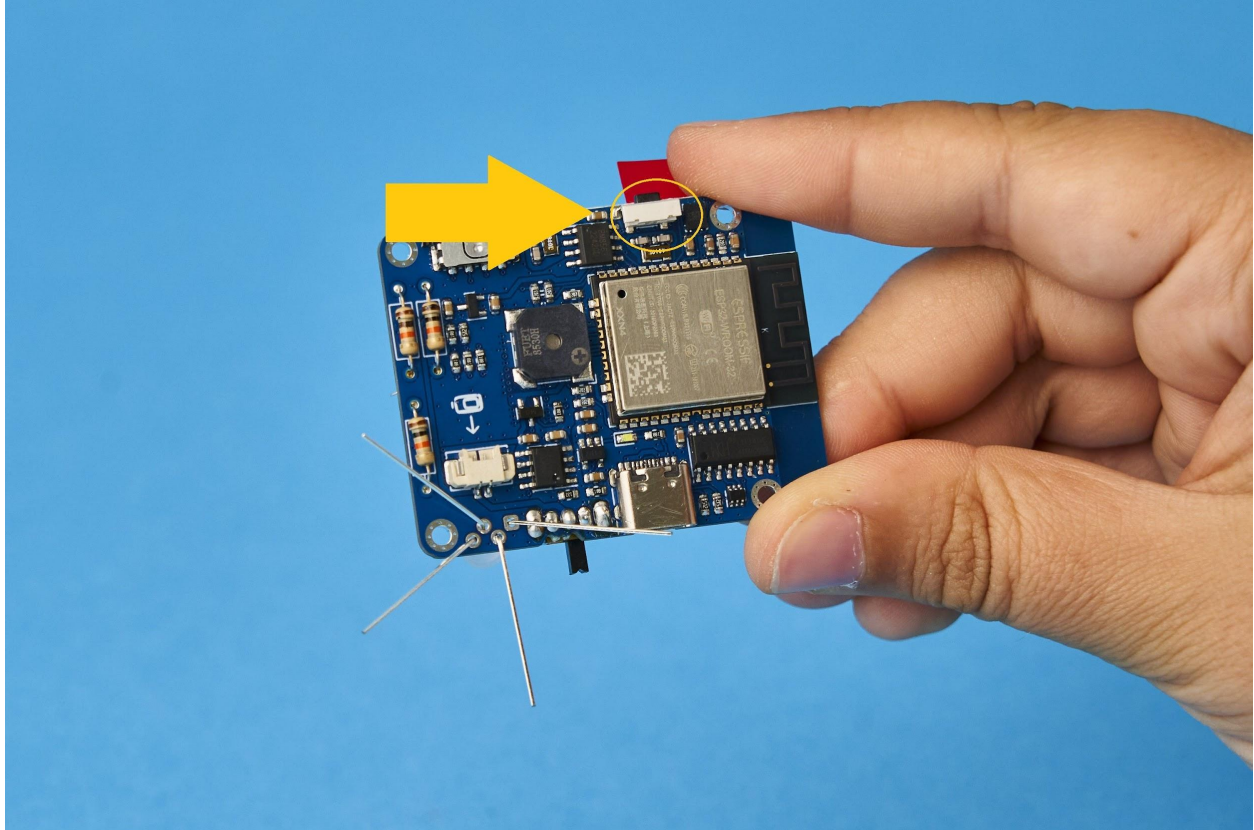
The main function of the buzzer is to **convert the signal from audio to sound**; typically, they are used in alarm devices, timers, etc.

5. JST-2P connector



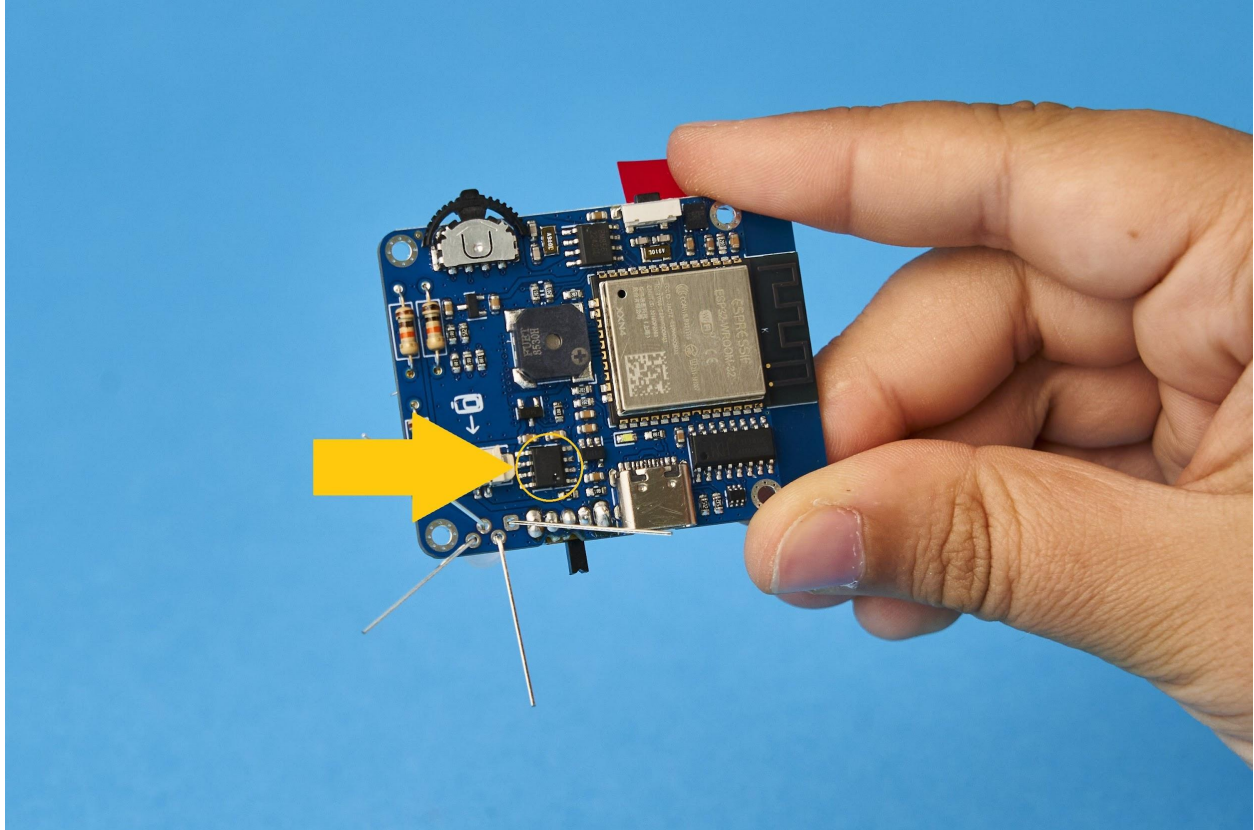
This connector is used for **manually connecting the battery** to the main board.

6. Reset button



This one's pretty self-explanatory - the reset button is used **for resetting the whole device**. You can find this useful in case something gets frozen (which is hopefully never).

7. Voltage regulator

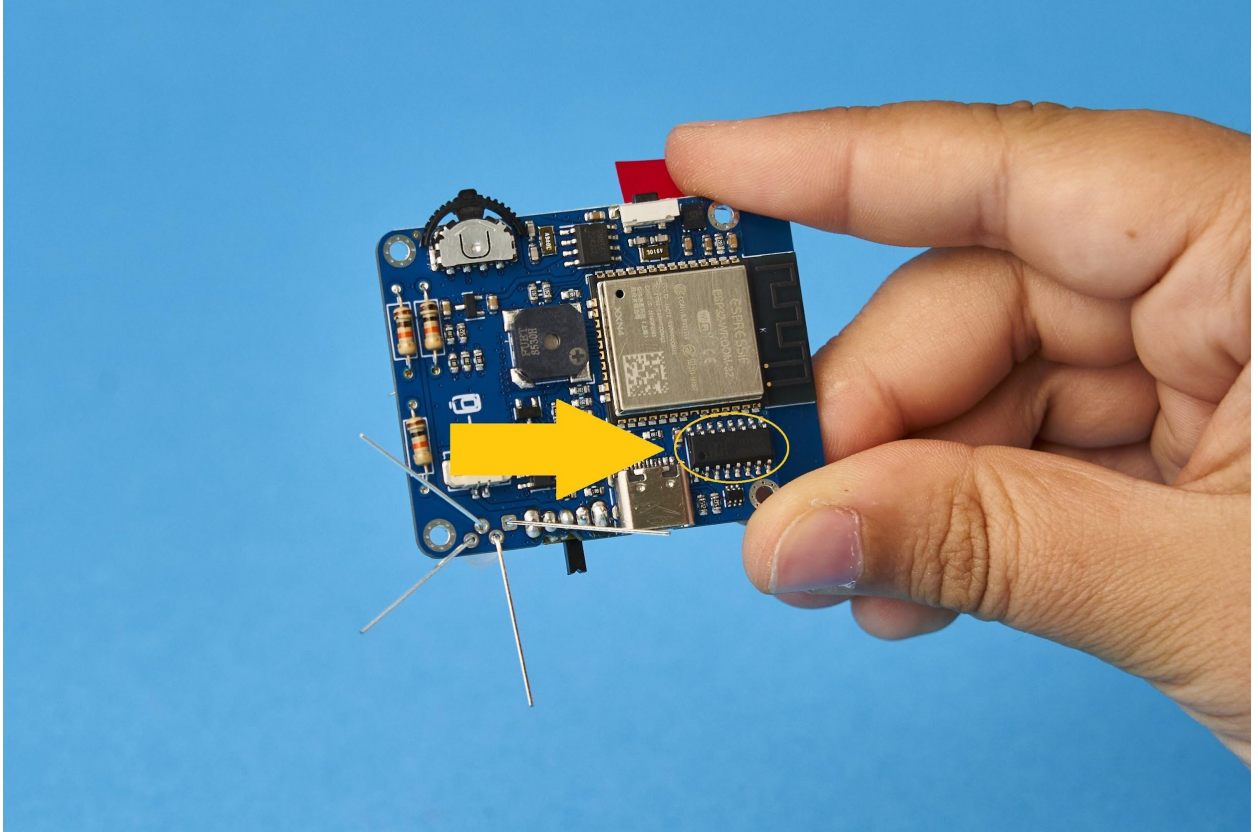


This is the regulators that **keep the voltage stable**.

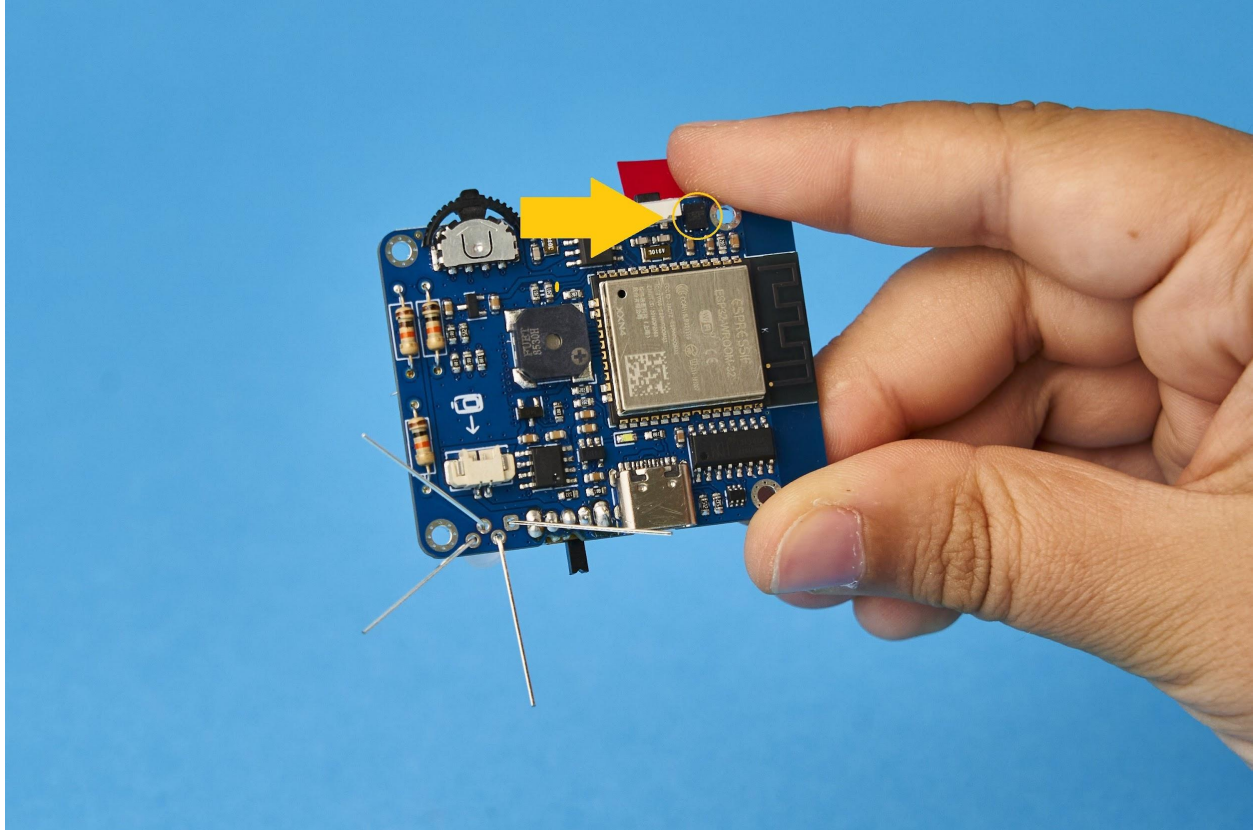
This regulator is extremely important since not every electrical component operates at the same voltage.

8. Chip CH340C

Clockstar can **communicate with your computer** over USB, thanks to this little guy!



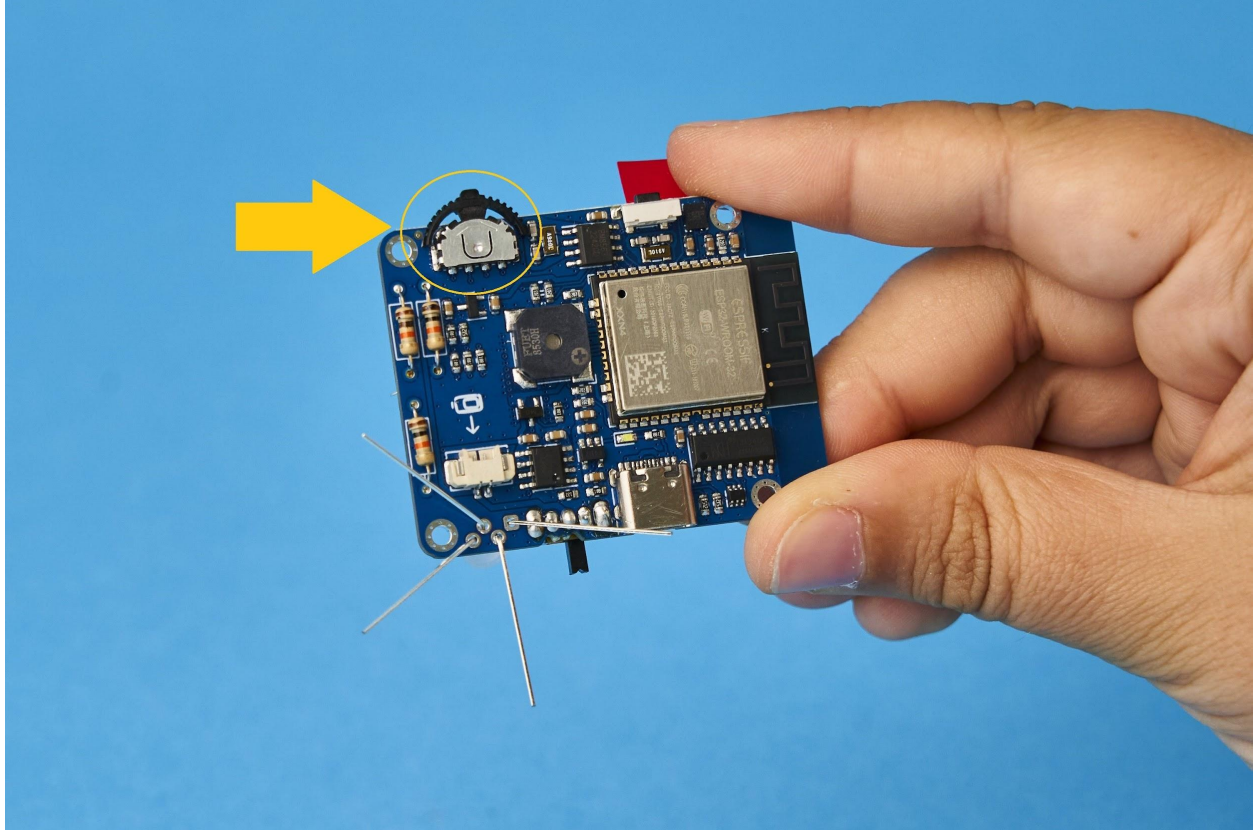
9. Gyroscope



Gyroscopes are here to help us **stay on track and keep things spinning smoothly.**

To put it in simple terms, they work just like the wheels on a bike that keep us from falling over when we pick up the speed.

10. Button



This button will help you navigate through your Clockstar and choose the action you want it to do!