

Creator's booklet

 **CircuitMess**
JAY-D

Meet Jay-D

Jay-D is a DJ mixtable you build & code yourself.



HOW IT WORKS?



1 Assemble your DJ mixtable



2 Play and mix music



3 Code new apps and functions



4 Become a DJ superstar!

What is CircuitMess?



CircuitMess started in 2016 when Albert (our CEO) was 17 years old.

Albert loved tinkering with electronics and one of his first projects was a DIY game console.

People really liked the idea so he decided to launch it on **Kickstarter** where it raised \$100,745!

After that, **CircuitMess** was born. We are a small and fast-growing team of tech lovers who wish to share our love of creating new technology with the rest of the world!

Behind the name

“Circuit” is a reference to electronic circuits. “Mess” is what best describes our workplace. Combine the two and you get CircuitMess!

You can do it!

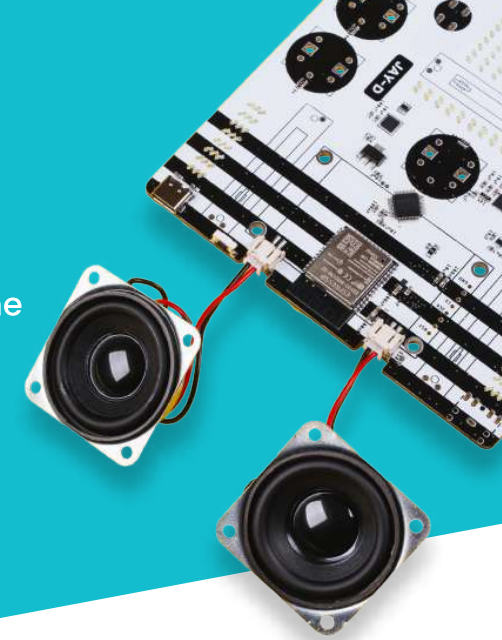


All of our kits are designed, manufactured, and packed in Croatia!

Our mission

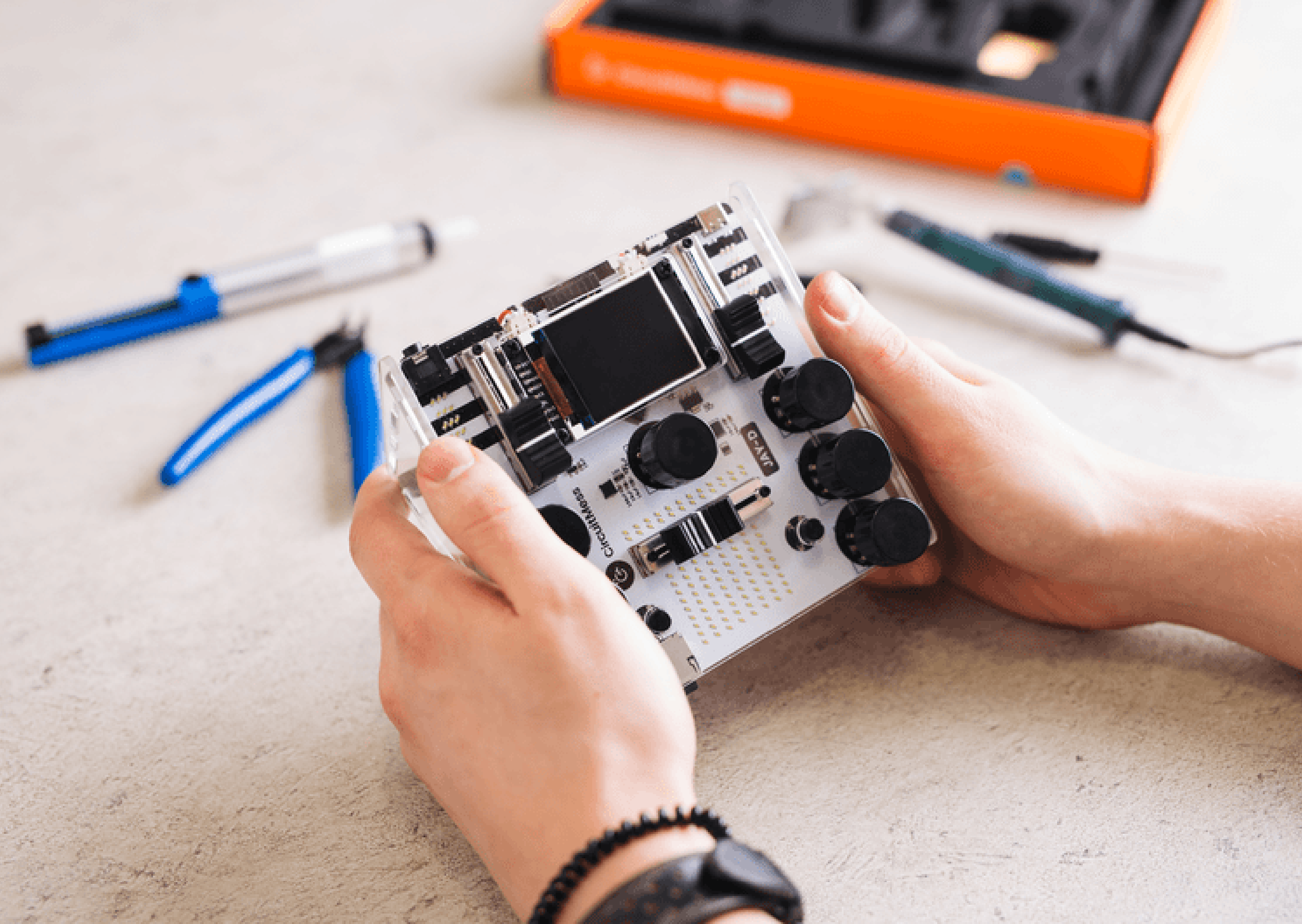
Everybody knows how important technology is, but less than 1% of the population knows

HOW TO MAKE new technology.



We're here to change that! With our kits, we want to inspire people to be **CREATORS**, instead of just consumers.

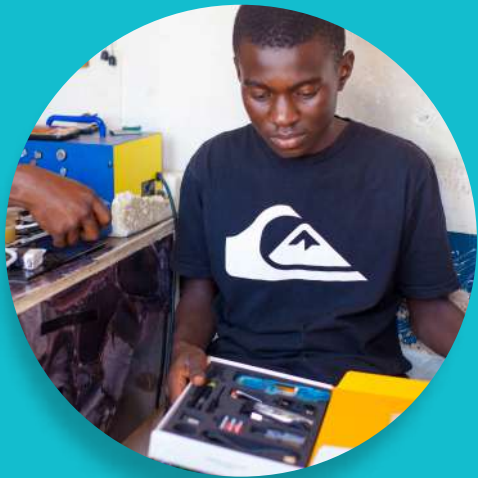




Shiny Gloves Club

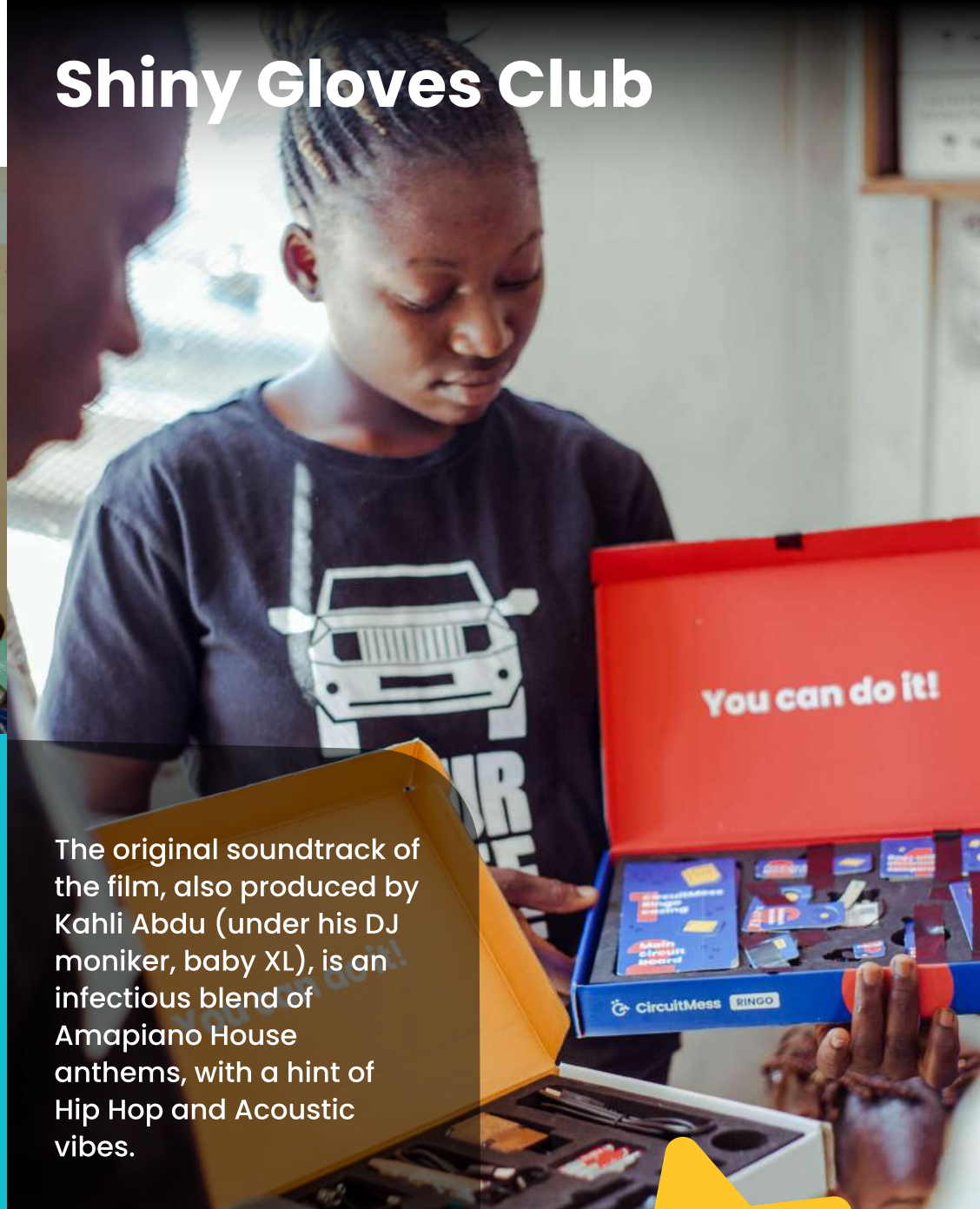


We have partnered with **Shiny Gloves Club** on this project - a non-profit organization founded by Kahli Abdu committed to providing **free education** to children in impoverished communities in Africa.



Kahli Abdu's Young Michael short film - shot in Miango village in Jos, Nigeria - is about a poor, but gifted boy who will use his extraordinary gifts to lift his single mother and sister out of poverty. The film was written and produced by Kahli Abdu and is directed by JENOM.

Shiny Gloves Club



The original soundtrack of the film, also produced by Kahli Abdu (under his DJ moniker, baby XL), is an infectious blend of Amapiano House anthems, with a hint of Hip Hop and Acoustic vibes.



On your Jay-D, besides free sample music, you will also find 4 awesome and exclusive new tracks.

The collection of groovy African tunes features rising African talent and global rock stars **MGMT.**

What is a DJ mixtable?



Mixers are an essential piece of equipment for a DJ. These mysterious little electronic boxes make music magic happen.

They are used to **control**, **mix** and **manipulate** tracks. With them, you can create different sounds & sound effects to make unique music.

Fun fact:

DJ is an abbreviation for “**disc jockey**” - a person who plays recorded music for an audience. The word “disc” comes from the vinyl gramophone records used before all of the fancy electronics that we have nowadays were invented.

The term “jockey” means the operator of a machine. This term was coined in 1935 by an American radio commentator **Walter Winchell**.



Walter Winchell

1943

World's first DJ dance party was launched. The DJ was **Jimmy Savile**, and he played jazz records.



What's inside the box?

- 1 Main circuit board
- 2 Display board
- 3 Acrylic casing
- 4 A bag of small components
- 5 Two 5W speakers
- 6 Custom-made plastic knobs
- 7 USB-C cable for charging and programming
- 8 4GB Micro SD card with preloaded beats




What will you learn?

1  How to **solder** and assemble your very own DJ mixtable

What components are needed for **digital sound production**

3  What are **sound waves**

How can they be produced using computers and various electronic components

5  What is DAC, and how you can control it for simultaneous playback of multiple sound files

How a DJ mixtable works

7  How to code custom light shows for your Jay-D mixtable

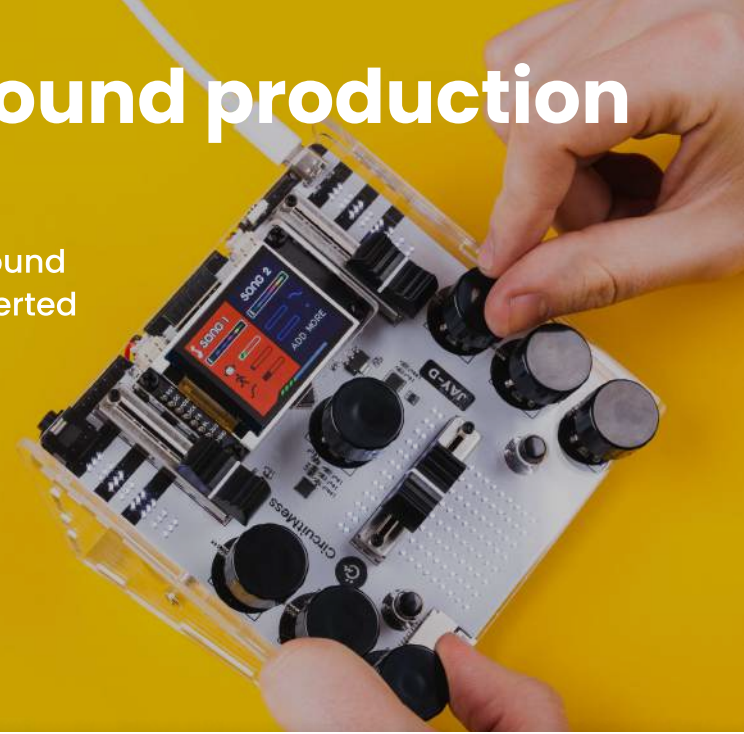
How to become a DJ superstar!

8 

Digital sound production

Digital audio is a representation of sound recorded in or converted into digital form.

In digital audio, the audio signal's sound wave is typically encoded as a sequence of numbers.



Digital audio systems usually need to handle the following tasks:



Compression - the audio signal is compressed to save storage and bandwidth. Jay-D handles this with its dual-core processor called the ESP32.



Storage - digital audio needs to be stored somewhere. Jay-d has a Micro SD card where the songs are stored in a digital format.



Processing - Digital audio needs to be processed, synced, and sometimes converted in order to be played correctly. Jay-D processes digital audio using its dual-core processor.

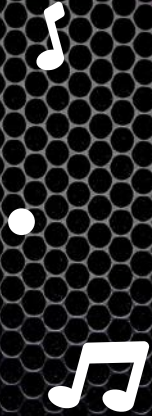


Data transmission - this is usually done by various communication channels in digital audio systems such as computer buses, copper wires, and sometimes optical fibers.

Speakers

A speaker is a device that converts electrical signals into **sound**.

More technically, a speaker changes an electrical audio signal into sound pressure waves.



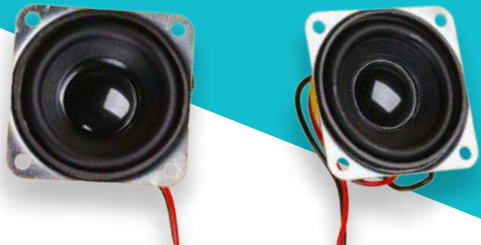
Speakers usually have two things written on them:

Wattage (i.e., 5W) - this marks how much **power** the speaker can handle. More specifically, the number of Watts indicates how much power a speaker can be burdened with under certain circumstances before it breaks.

W



Impedance (i.e., 8 ohms) - this represents how difficult the speaker is to power. The lower the impedance, the more efficiently it allows the electric signal, which is basically the music, to pass through the speaker. Impedance is measured in ohms.

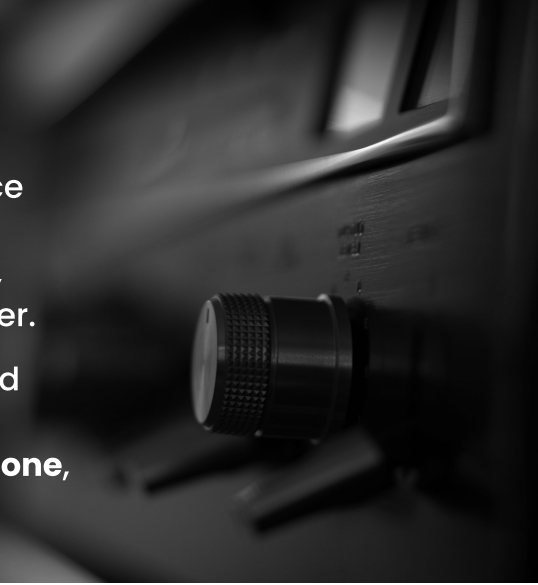


Jay-D's speakers are rated for **5 Watts** of power and **4 ohms** of impedance.

Amplifiers

An electronic **amplifier** is a device that increases the level or amplitude of an electrical signal, making the resulting sound louder.

Every device that produces sound has some kind of an amplifier, including your **laptop**, **mobile phone**, or the **TV** in your living room.

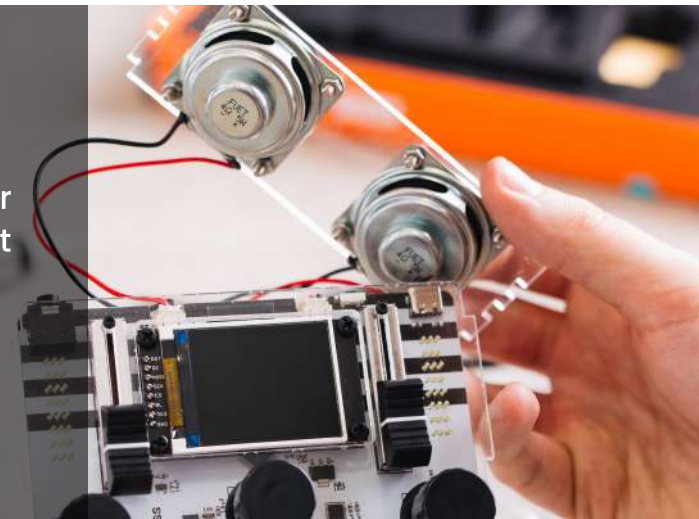


DID YOU KNOW?

Not all amplifiers are made out of microchips! An acoustic amplifier is the part of a musical instrument that vibrates in response to the instrument's initial vibration, causing the surrounding air to move more efficiently and making the sound louder. Some examples of an acoustic amplifier include the body of an acoustic guitar, a drum's shell, and the piano's wooden soundboard.

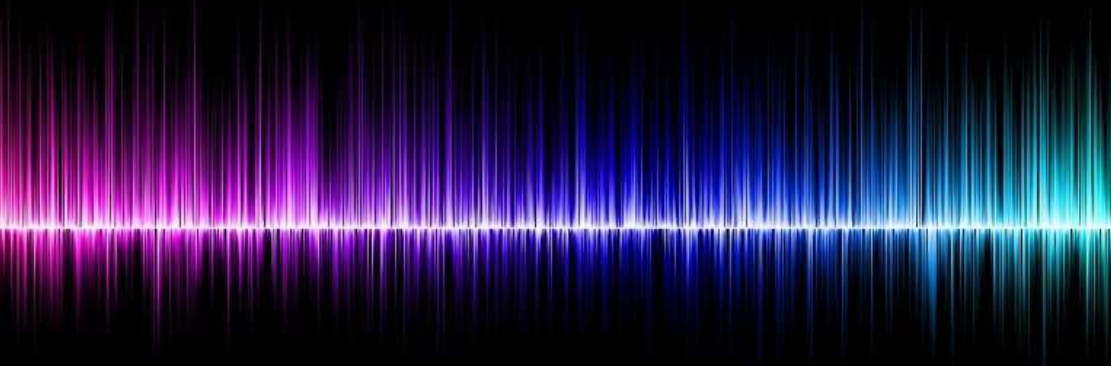


Jay-D's acrylic casing acts as an acoustic **amplifier**. You can try playing sounds on your Jay-D with and without the casing attached, and you'll see that the sound is **louder** when you attach the plastic casing.



Soundwaves

Sound wave is a wave caused by a **vibration** that results in slight air pressure variations, which we hear as **sound**.



Sound waves move by vibrating objects, and these objects vibrate other surrounding objects, carrying the sound along. Sound can move through the air, water, or solids as long as there are particles to bounce off.

Believe it or not, there is **no sound** in outer space because there are no molecules there. Here on Earth, fortunately, we have air molecules that vibrate to our ears.

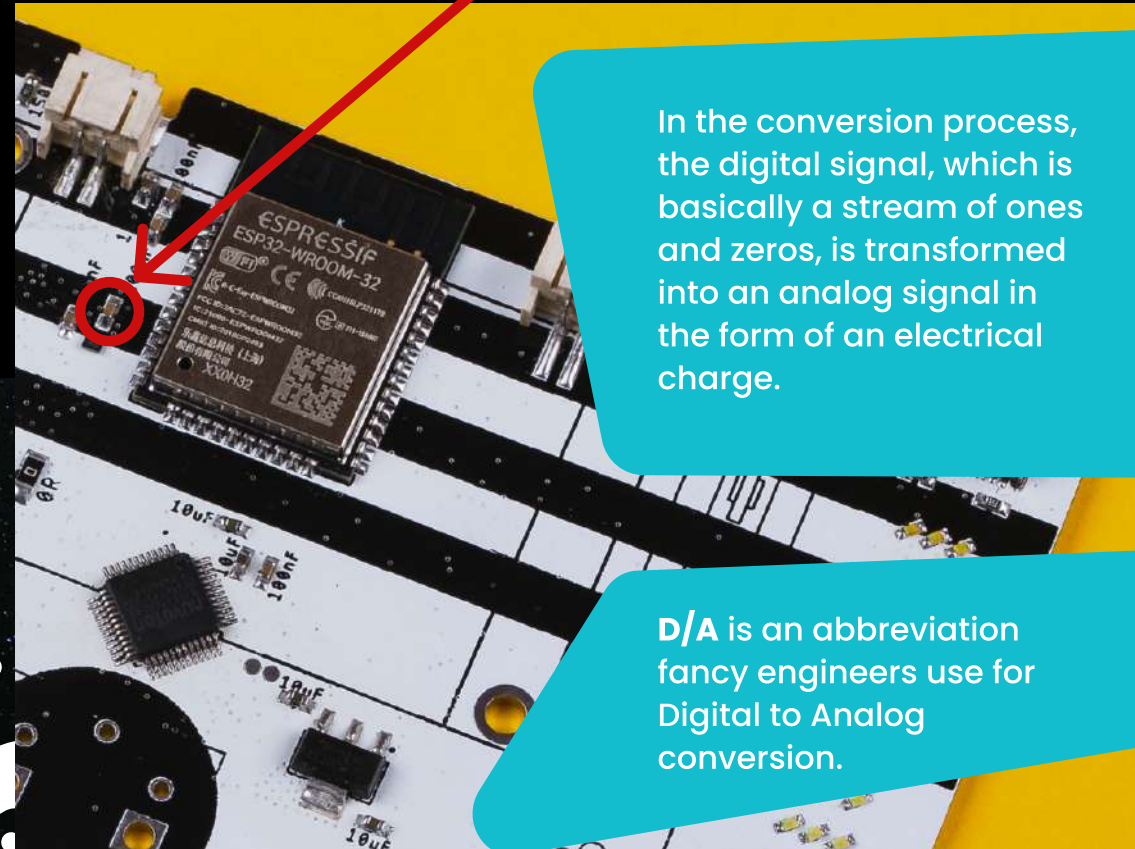
Fun fact



DAC

Digital-to-Analog Converter – (usually called “DAC”) is an electronic circuit that takes **digital data** and transforms it into an **analog audio signal**. Afterward, it sends that analog signal to an amplifier.

When you hear digital recordings, you’re actually listening to an analog signal converted from digital by a DAC. Jay-D has a DAC chip called “**TFA9882**”. This chip has an amplifier built-in.



In the conversion process, the digital signal, which is basically a stream of ones and zeros, is transformed into an analog signal in the form of an electrical charge.

D/A is an abbreviation fancy engineers use for Digital to Analog conversion.

Safety first!

Before you start with the assembly, pay attention to the following safety measures:



1 Handling a soldering iron and a screwdriver is **not recommended for children under the age of 9!**



2 Keep Jay-D away from young children! This product contains small components that are dangerous for children under the age of 3.



3 If you are a minor, assemble Jay-D strictly with the help of an adult.

Jay-D is not a toy for toddlers.

Closely follow all the instructions you received in this kit and those found on our online pages so that no one gets hurt.

If you have never used a soldering iron or a screwdriver, **carefully follow the assembly instructions** on our website and, if necessary, ask someone more experienced or older than you to help you.

If you are having problems with our kit, contact our customer support via email at contact@circuitmess.com.

Happy soldering!

To build your Jay-D, go to:

circuitmess.com/build



CircuitMess

JAY-D



 CircuitMess

