Bluetooth Speaker Kit - Teacher Notes

Thank you for purchasing this Bluetooth Speaker kit. Below is some information on each of the components and tips on how to get the most out of your kit. Watch this video for an example of how to put together a speaker.

Components

Speakers

The two speakers are high quality, 40mm 4ohm 5W drivers. The optimal cutout size is 39mm.
They connect to the yellow and blue wires provided.

Passive Radiator

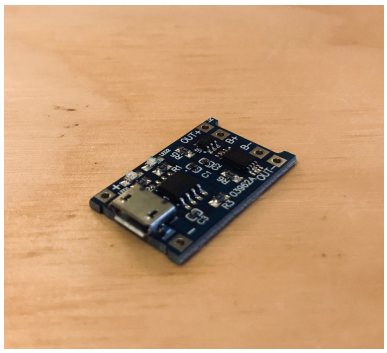
The passive radiator acts like a “subwoofer”. It provides the low end bass from the vibrations of the speaker drivers. Most small portable Bluetooth speakers have them.

Bluetooth Amplifier

The Bluetooth Amplifier connects to bluetooth devices, such as your phone or computer. It also sends the audio to the speakers. It is very simple to connect - the wires just plug in. The audio signal can sometimes distort depending on the loudness of the music playing. If this happens just turn the volume down on your device.

Switch

This 12mm on/off latching push button switch has a rubber grommet keep the cutout airtight and is made from stainless steel. The cutout for the switch is a 12mm hole.



Battery Charger

The battery charger module connects directly to the battery holder wires and also to the switch and then onto the amplifier. It charges the 3.7v lithium ion battery provided via a micro USB cable connected to a powered USB port.

Battery and Holder

The battery provided is a 3.7v lithium ion battery that is charged by the battery charger via USB. The battery holder provides a safe way for students to connect the wires and makes the battery easily replaceable in the future.

Cables

The cables provided are a micro USB cable and the three connection wires which clip into the amplifier.

Packaging

The cardboard packaging is specially designed not only to protect your components from getting damaged in transit but also to serve as a place for students to keep their work safe while working on their project.

All of the packaging is fully recyclable (apart from outer wrapping) to minimise waste.

Tips

- Speaker cutout size is best at 39mm.
- Passive radiator cutout size is best as a 70mm x 35mm rectangle with a 17mm fillet on each corner.
- Make sure the enclosure that you have designed is fully airtight. Silicon works best but it is messy. If your speaker lacks bass then there is probably air leakage somewhere.
- Test the circuit and bluetooth connectivity before gluing or sealing. If nothing turns on, check the battery as it may not be charged or isn't touching the pins in the battery holder.

- The battery charger's USB socket needs to be accessible from the outside of the enclosure. The best cut out is a 9mm x 3mm rectangle. You will need to router or cut the material for the module to reach the USB socket. Check out the video.
- If you have access to a laser cutter, I recommend using it to cut out the enclosure parts.
- When designing the box enclosure, I recommend not exceeding a size of 200x60x60 or 720cm^3 with a material thickness of around 5mm. But experiment to see what sounds best for your design.

Links to help support student learning

- https://youtu.be/dF52ra42uMw
- https://en.wikipedia.org/wiki/Passive_radiator_(speaker)
- https://www.scientificamerican.com/article/experts-how-does-bluetooth-work/
- https://en.wikipedia.org/wiki/Wireless_speaker
- https://electronics.howstuffworks.com/gadgets/audio-music/wireless-speakers.htm

If you have any questions please don't hesitate to contact me.
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