

## Assembling Speaker pHAT

In this guide, you'll learn how to assemble your Speaker pHAT. Speaker pHAT combines an I2S DAC and mono amplifier, a tiny 8Ω 2W speaker, and a 10 LED bar graph that can be used as a VU meter to display volume levels.

Like our other pHATs, Speaker pHAT comes as a kit, so you'll have to assemble it yourself. Fortunately, it's really easy to assemble, and shouldn't take you more than 30 minutes. We'll show you just how to do that here.

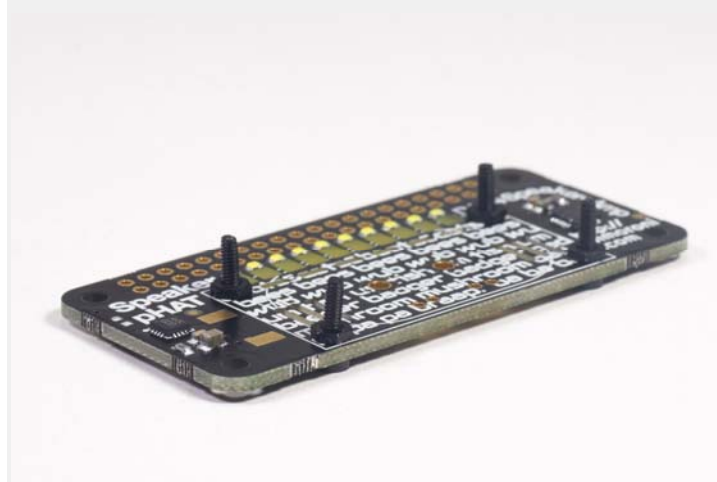
### Mounting the speaker

The speaker mounts on the underside of Speaker pHAT (the top is the side with the boom box artwork), and requires a couple of pieces of wire to be soldered from the two solder pads on the speaker to the two pads on the underside of the pHAT.

We'll mount the speaker with the nuts and bolts first. Push the four bolts through from the top of Speaker pHAT, using the inner set of four holes (the outer set are for mounting the pHAT).

**It's really important to use these spacer nuts. If the speaker isn't spaced slightly off the PCB, then the Mylar speaker cone will vibrate against the back of the PCB, degrading both the sound quality and the speaker itself.**

Use four of the nuts to secure the bolts on the underside of the pHAT; they'll act as spacers to space the speaker slightly away from the pHAT.



Now place the speaker on the bolts, ensuring that the solder pads are at the same side as the solder pads on the pHAT, and secure with the remaining four nuts.



The kit comes with a length of 24 AWG wire, and we'll use it to connect the two terminals of the speaker. Snip off a couple of pieces of the wire long enough to stretch from the terminals on the speaker to the solder pads on the pHAT.

First, solder the two pieces of wire to the terminals on the speaker. Make sure that you use a pair of tweezers preferably, or a small piece of tissue paper will do at a push, to hold the piece of wire and prevent you from burning yourself. The terminals on the speaker should already have a blob of solder on them, so all you should have to do is hold your soldering iron on the blob of solder until it melts, then place the piece of wire and remove your soldering iron, holding the wire in place until the solder cools.

Once you've soldered both ends to the speaker terminals, use your solder to put a couple of blobs of solder on the two pads on the pHAT. Now, bend the ends of the wires down to the pads and press and hold your soldering iron until the solder melts and attaches the wire. Add a little extra solder if necessary, and snip off any excess wire.



## Soldering the header

Speaker pHAT comes with a female 40 pin header that you'll need to solder to be able to use your Speaker pHAT with your Pi. We have a guide here that you can follow to learn how to solder headers to pHATs.

Or... you could use one of super-simple hammer headers if you're still not a pro-solderer or you're just a bit lazy.

