

Step 1:

1. Get a 40x40mm mini fan from CPC. Using scissors remove the part of the sticker covering the contacts. (Figure 1)
2. Using a soldering iron – remove the wires currently connected to the fan. (Figure 2)



Figure 1



Figure 2



Figure 3

Step 2:

1. Use a standard 5mm twist drill bit to enlarge the bottom right corner hole – this is to allow the USB cable to pass through. (Figure 3)

Step 3:

1. Take one of your USB Type A to A cables from CPC and hold both ends in one hand. Using your other hand pull the cable taut and cut the wire in middle using side cutters or scissors. (Figure 4)
2. Use a cable stripper or Stanley knife to remove approx. 30mm of sheathing revealing a foil layer of sheathing. (Figure 5)
3. Cut away the thin layer of foil and unsheathed strands of wire.
4. You will then have 4 wires: a red and a black cable as well as two others (usually green & white). You only need the black and red wires so use side cutters to cut these remove these 2 spare wires. (Figure 6)
5. Once again using wire strippers or your nails, remove approx. 10mm of sheathing from both wires and twist the braids. To get a flat end use side cutters to cut the end to length. (Figure 7)



Figure 4



Figure 5



Figure 6

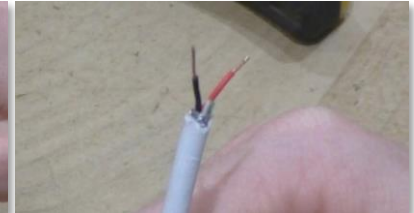


Figure 7

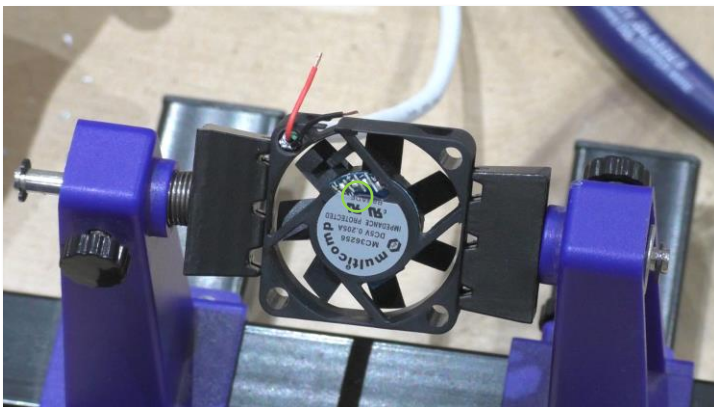


Figure 8

Step 4:

1. Use a clamp or a PCB holder to hold the fan in preparation for soldering.
2. Pass the USB cable through the hole you drilled earlier.
3. Get the black cable and hold it onto the -ve terminal using an insulator (e.g. lolly-pop stick). (Figure 8)
4. Solder the cable onto the terminal ensuring not to use too much solder which will flow over the other terminals.
5. Repeat the process for the red cable onto the +ve terminal. (Figure 8)

Step 5:

1. Drop a few spots of standard superglue (ideally not 2-part activated) down the sides of the white cable sheathing.
2. Push the cable back and forth through the hole a couple of times to spread the glue and form a good joint.
3. Whilst that is drying, mix some epoxy glue (I used Araldite) to cover the soldered joints and the top of the white sheathing (in the hole). (Figure 9)
4. Allow the epoxy to dry for approx. 1 day or overnight - this should be in a well-ventilated area.

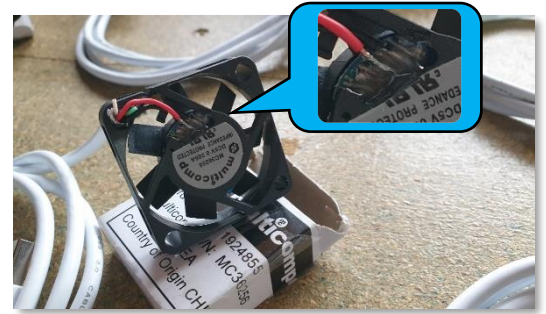


Figure 9

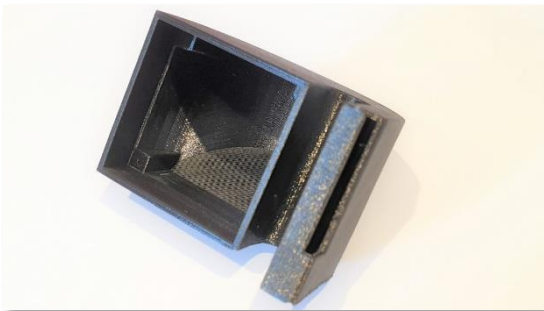


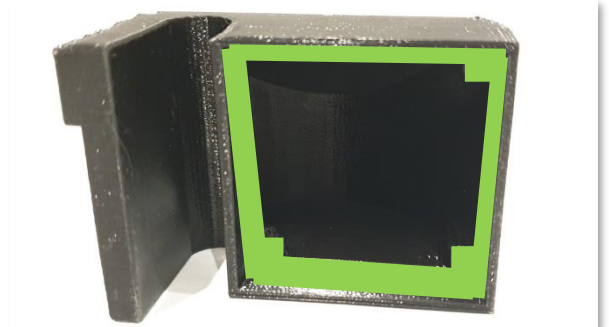
Figure 10

Step 6:

1. Download the fan housing .STL 3D Printer file (CAD.CoolingFans.co.uk)
2. Print this file with the 45° plane on the printer bed – this should not require scaffolding/support material

Step 7:

1. Mix a small amount of epoxy glue.
2. Apply epoxy on the fan housing square edges and square flats inside the housing (green sections) to secure the fan.
3. Push the fan into the 3D printed housing ensuring the cable goes into the corner of the housing with no corner boss.



Step 8:

1. Use some medium density foam (can also be purchased from CPC) to line the shorter side of the fan ducting.
2. Using scissors cut a slight chamfer on the front edge to allow it to easily slide over the visor frame.
3. Now cut a 5mm clearance slot in the centre of the foam to allow space for any clips visors may have.
4. Use an adhesive (e.g. superglue) to stick the foam to the fan housing.
4. Finally, we suggest providing each fan with a length of wide elastic approx. 300mm long to hook from the fan housing over the user's head in order to distribute the load effectively.
5. Repeat this process and celebrate the good work you're doing 😊