



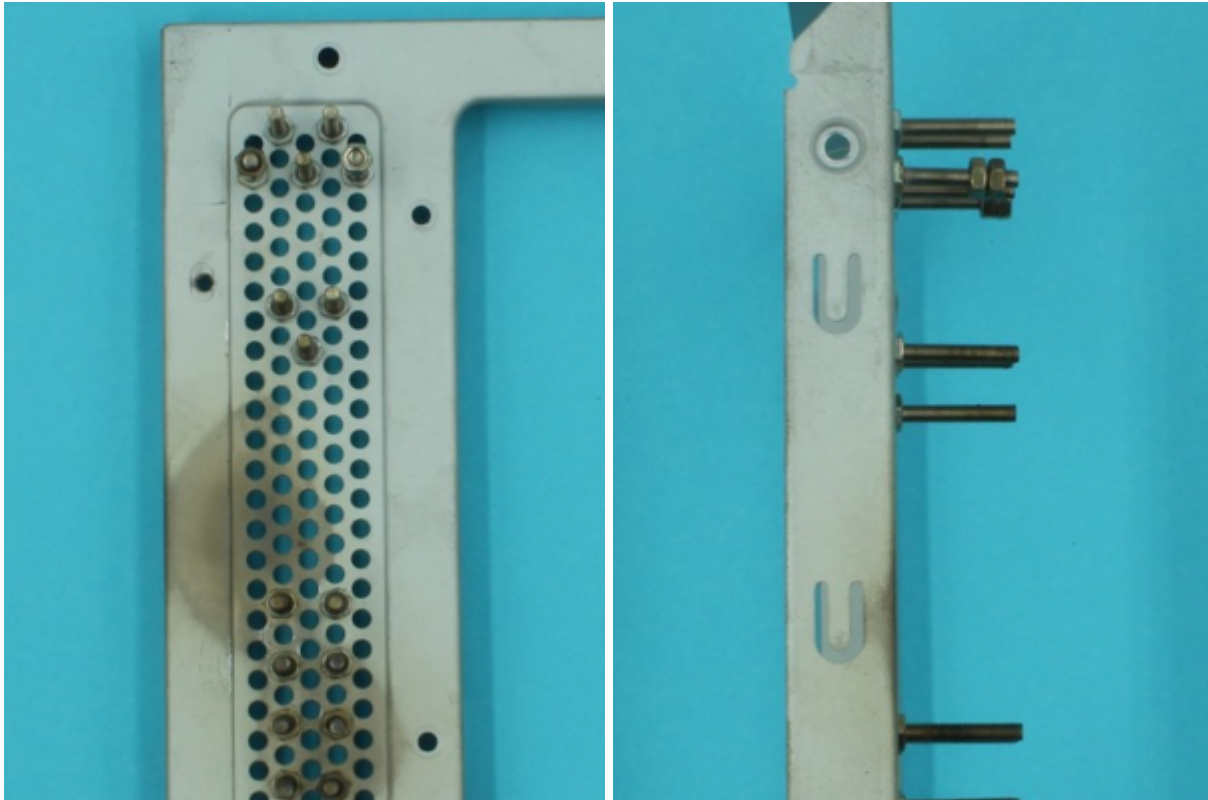
Pre-Production

SLQ Wiki Fabrication Lab 2024/04/29 04:08

Pre-Production

TRAINING THE MEMORY WIRE

Training the wire to a particular shape requires building a jig that can withstand heating to cherry red in an open flame. Typically, metal grids or blocks with threaded supports are used. In this case, a recycled computer case with a ventilation grill was used, because the arrangement of holes gave the greatest variety of available attachment points, and the holes were 3mm diameter, which matched the hardware available.



Each retainer post consists of a 3mm machine screw held in place with a nut. Attachment points for the wire are made by attaching two more nuts to the top of the screw. The wire is inserted between the two nuts, and held there while the top nut is tightened to jam it in place as shown below.

Before beginning, it is important to make sure the length of the wire is appropriate for the design. If a prototype of the design is made, the distance between the two attachment points after full extension (ie: before memory activation to cause the desired effect) can be measured: add a cm to either end for attachment, and this is the length of wire required.



Now the memory wire is constrained in the shape required, proceed to the heating.

Hold one end of the wire construction over an open flame until it starts to glow red, and slowly move the wire along through the flame in one direction, keeping the glow going. Do this a couple of times from end to end to be sure. Uncontrolled heating like this will give a variable (but probably high) transition temperature to the construction, but the heating during operation should be sufficient for this not to matter.

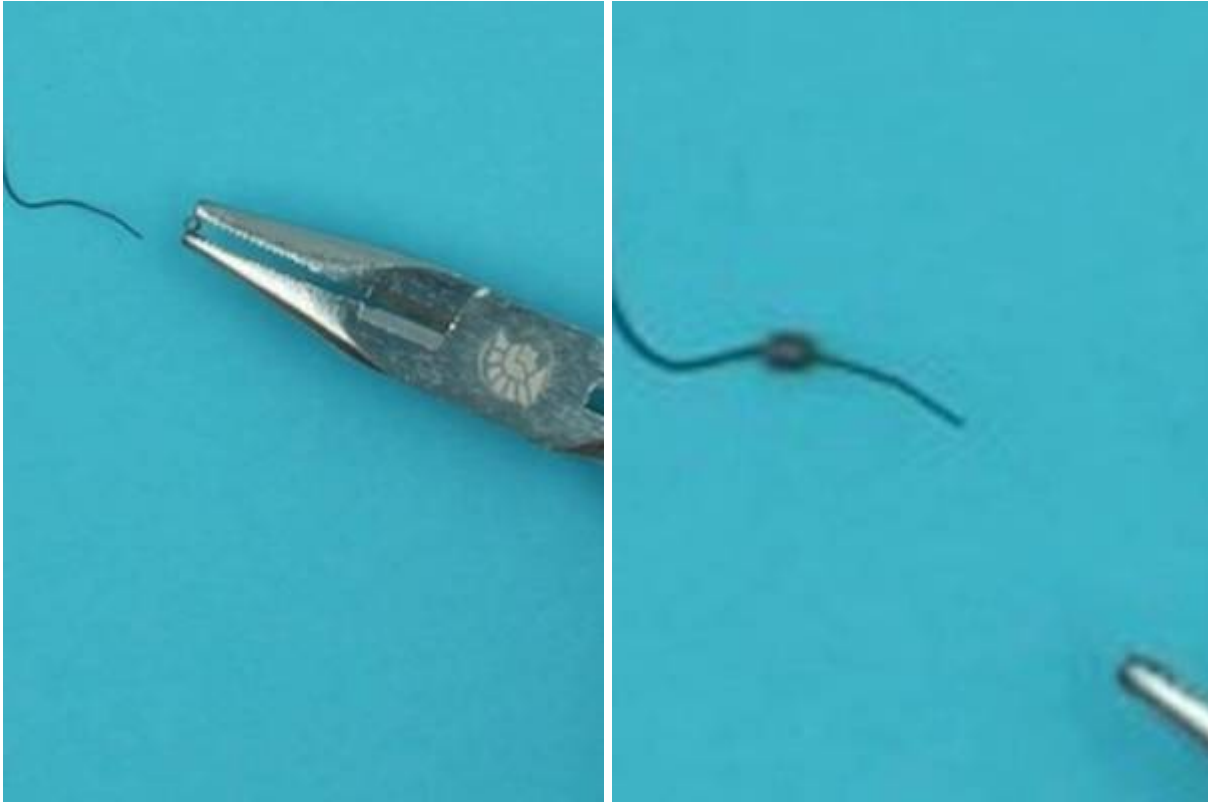
Cool quickly by quenching in water if possible, or else allow to cool in air. After a few minutes (when the jig as well as the wire has cooled down), loosen the retaining nuts, and remove the trained wire - it should stay in the shape set.



ATTACHING THE CONNECTING WIRE

Heating the memory wire will be achieved by passing a current through it, and this means there

needs to be a way to connect the ends to the terminals of a battery. A suitable length of very fine copper wire can be physically attached to each end of the memory wire shape to allow this. The connector used is a copper jewellery crimp (0.5mm dia).

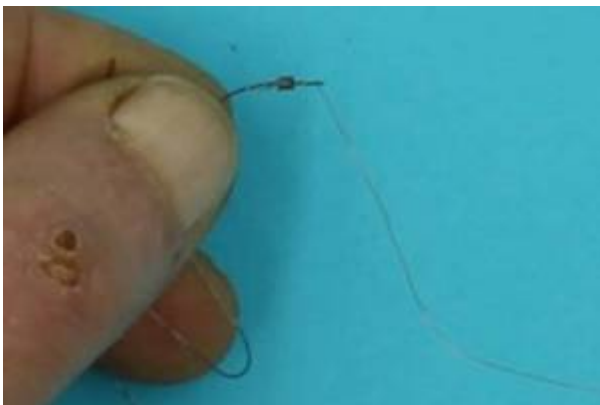


Slide the crimp along the wire so that the end is exposed, and wrap the end of a length of fine copper wire around it. You might need to bend the end of the copper wire over to lie along the memory wire to achieve the next step.

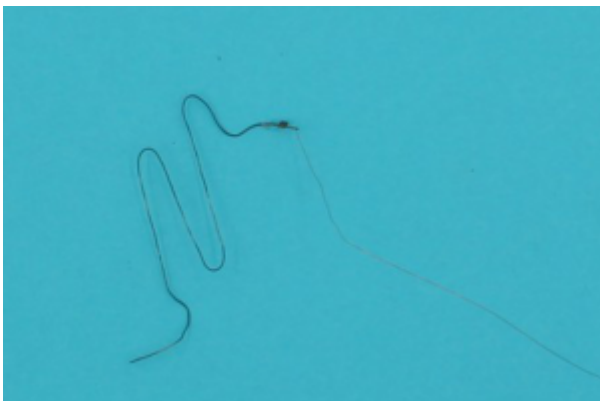




Slide the crimp along over the top of the wound copper, and crush it closed using pliers. Give the copper wire a gentle tug to make sure the crimp is holding it in place securely.



You can now do the same to the other end of the memory wire, and it will be ready for use in the construction of your project.



NOTE: At this stage it is important to retain the trained shape of the memory wire so that it can be inserted correctly into the design. This example will change from straight to the concertina shape shown, but the change only happens along one plane, and this has to match the required movement of the piece attached.