

## CC09D Etched Whale Handwheel Instructions

The etched sheets are in 0.2mm brass to achieve a fine level of detail without the need for extensive fettling. The wheels must be carefully cut from the sheet as pairs, folded back to back, and solder laminated to give the required thickness. The shafts should be made of 0.5mm straight brass wire, this is not supplied.

### Assembly of handwheel:

Fold the pair of chosen handwheels with the detail on the outer faces, and carefully line up. It is important to compress the completed fold with smooth faced pliers to eliminate a tendency to spring open. Grip and hold the two laminates firmly together using metal tweezers on one side. Apply liquid flux sparingly, using a small plastic ferruled brush, to the exposed edge of the wheel. Ensure that it is drawn into joint only and not on to the outer faces of the handwheel. Apply solder (145 or 188) sparingly to the edge of the handwheel with a 15 or 18W soldering iron. Capillary action will then draw the solder into the laminate. Rotate through 180 degrees and repeat so that the wheel is soldered around its full circumference. The cleanliness of the finished wheel is dependent on controlling the amount of flux and solder used.

### Creating the shaft for the handwheel:

Clean the end of a length of 0.5mm wire with a fine needle file to give a flat end, and pre-tin with solder. This allows quick solder fusing (with flux) from the back, without disturbing the laminate. This can be aided with a jig (not supplied) to hold the shaft vertical, using finger pressure, with the wheel face down on a flat surface (see diagram below – dimensions not critical, but the card cheeks must be set to align shaft vertically). This also allows a degree of control over the projection of the shaft through the central boss (To represent the securing nut). Place a piece of thin card under the wheels with a small hole for the shaft to project beyond the boss. The time taken to make a jig results in a more accurate and significantly faster assembly!!

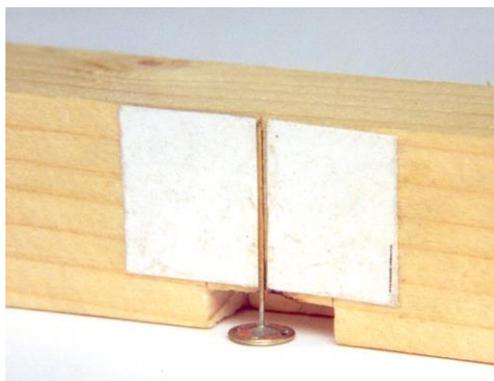
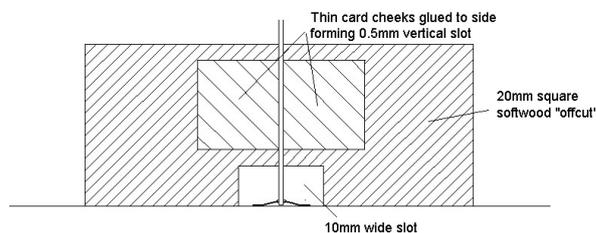


Note that when fitting the large wheels to their shafts, the protection disc on the centre of the large hopper wheel should be on the outer or top face. A photo of a completed wheel is shown.

A case of been there, done that!

### Finishing the handwheel assembly:

Clean up the outer edges (fine needle file) to remove the remains of the etched tags and cut the shaft to the required length. A "super" finish can be achieved by holding the wheel/shaft assembly in a mini-drill at low speed to polish and radius the outer edge of the wheel rim, using fine – medium (240-320 grit) Wet and dry. Finally clean off any flux residues in hot water. You should now be holding a miniature representation of the handwheel of your choice



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