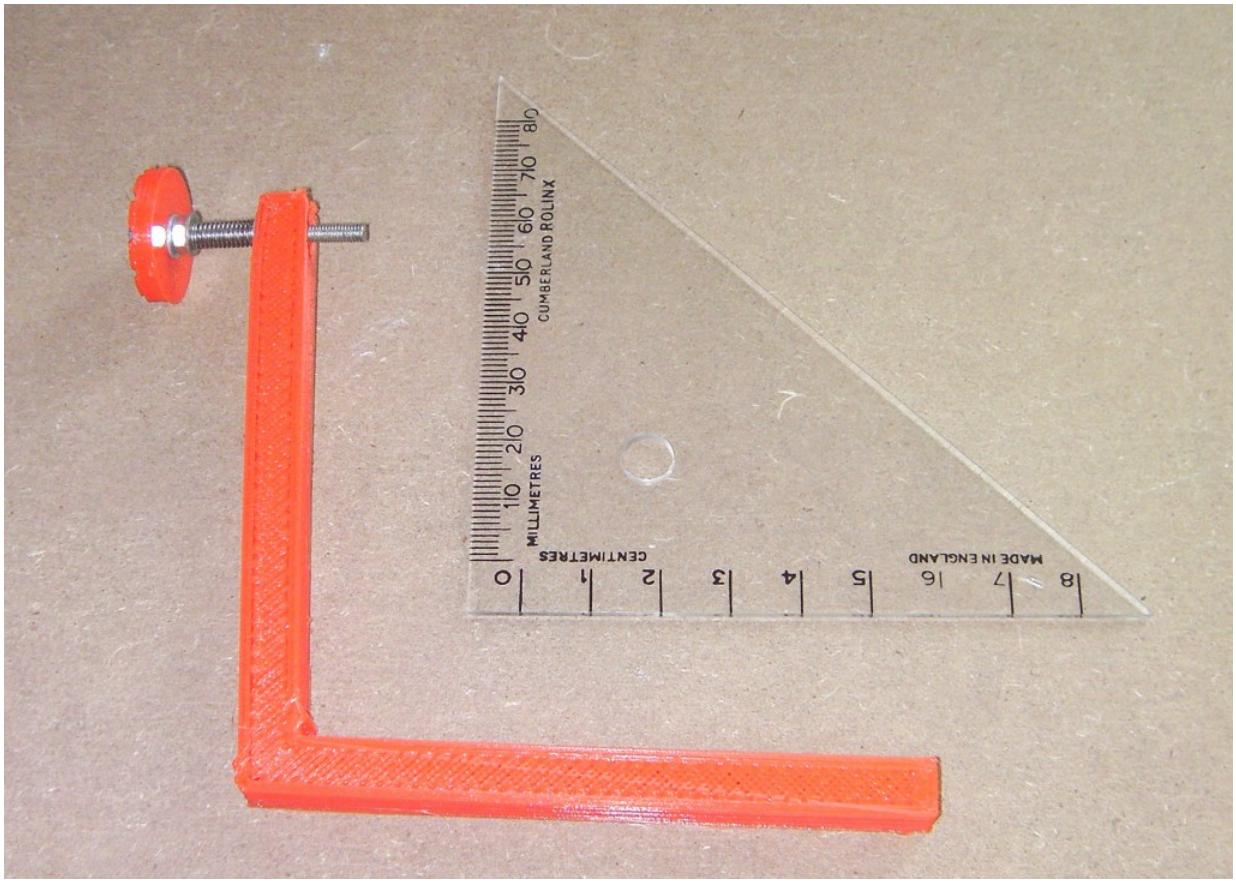
Setting the compensation from the printed test parts

Ormerod 2 allows you to compensate for the fact that its X, Y, and Z axes may not have been assembled at perfect right angles. This section tells you how to implement this.

First clean any extraneous wisps of filament or small lumps on the surface of the printed parts away. When you get used to printing these won't happen anyway, but this was your first print, and so it would be unreasonable to expect it to be perfect.



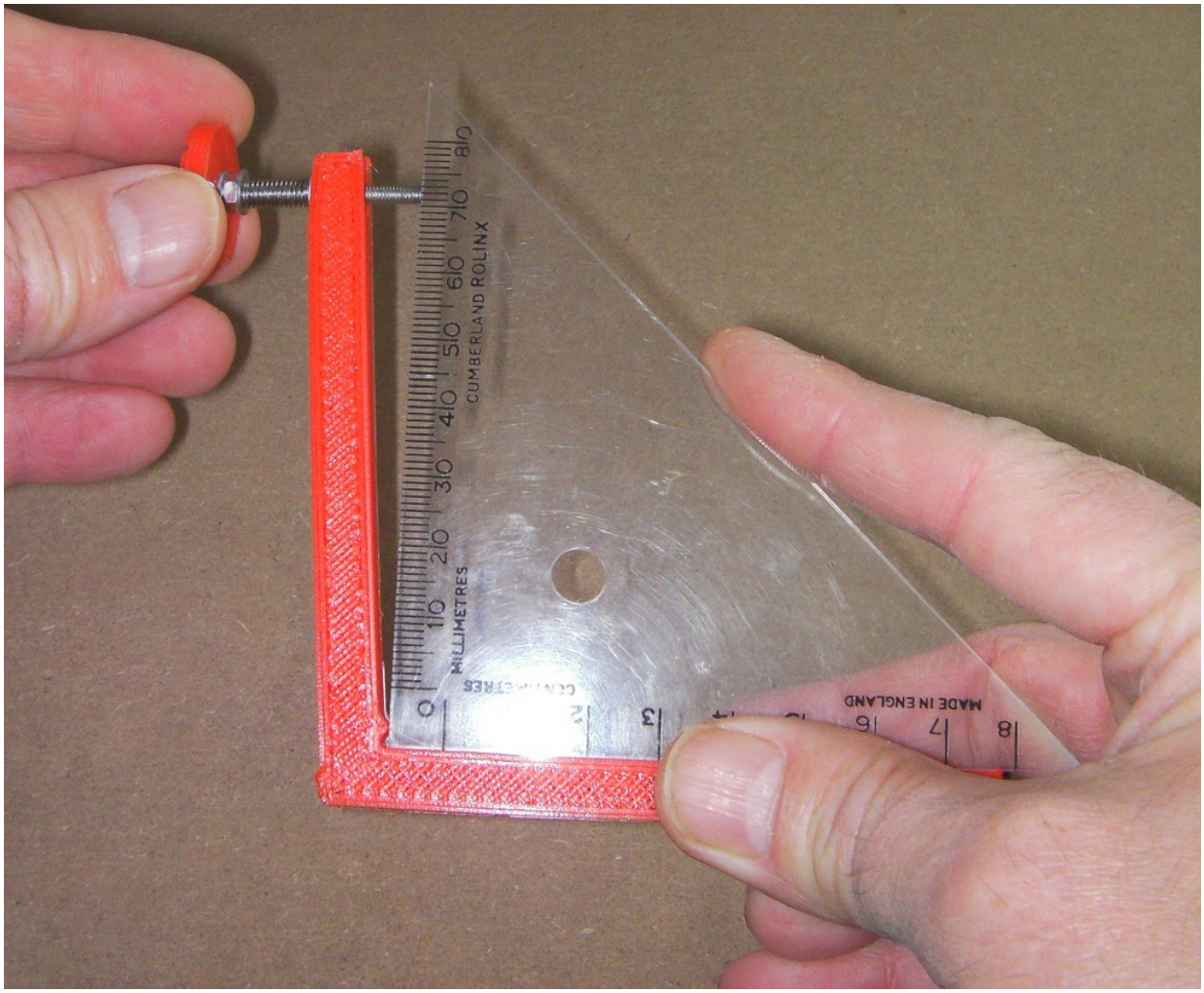
The thumbwheel in the test print has 10 radial indentations to allow you to count turns of it. The thread pitch of an M3 screw is 0.5mm, so each gradation is 0.05mm. Use a felt-tipped pen to mark one indentation so you can identify it as the wheel turns. Then assemble the gauge shown above.

> The M3x35 hex head screw and spring shown in the pictures for the axis compensation wheel are not supplied in the kit. You don't need a special screw; use any screw you have available. There should be a spare screw of each size in the kit. An M3x20mm cap head screw, or one of the crosshead screws that came out of the motor, should be long enough, is threaded all the way up it (so you can tighten the thumbwheel in place), and will do the job. The spring is a ball-point pen spring, but isn't necessary.

Start by using a short M3 screw to draw an M3 nut into the hexagonal cavity in the angled part. Put an M3 washer under the head of the screw. Take care as you tighten the screw that the flats on the nut are aligned with the hexagon of the cavity. You will feel the tightening force increase as the nut reaches the bottom of the cavity.

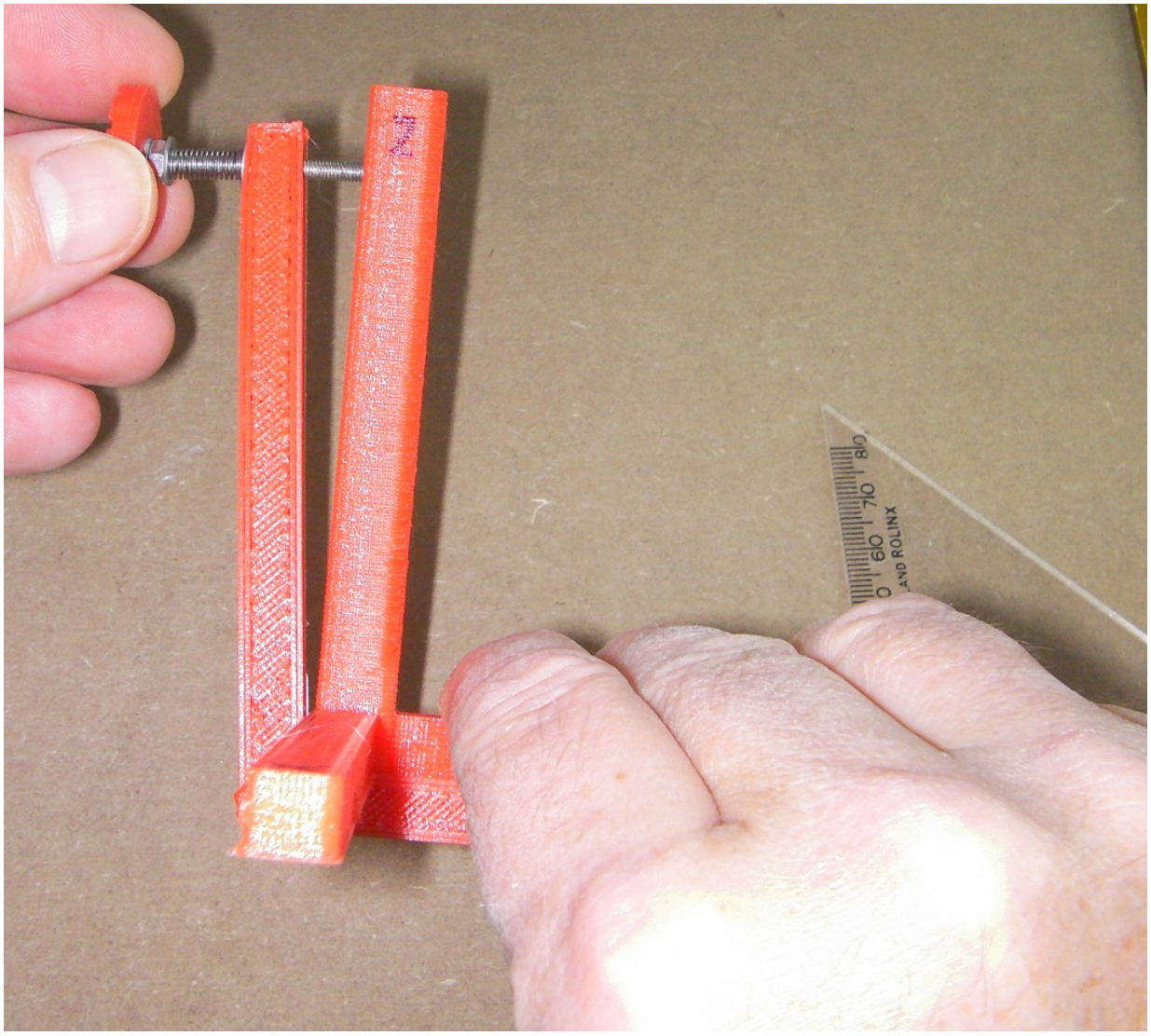
Then assemble the measuring screw. An M3 hex-headed screw fits in the cavity in the top of the thumbwheel, if you have one available. Secure it there with a nut with a washer under it on the other side of the wheel. Then put a washer, a spring, and another washer on the screw and screw it into the nut embedded in the cavity of the angled piece as shown above.

The order goes: M3 screw, thumbwheel, washer, nut, (washer, spring, washer, if available) angled piece, nut embedded in the angled piece.



Now use a set square to set the screw at just the right position for a right-angle, as shown above. Push the set square against the small projection near the angle. But don’t force things or push too hard. You don’t want to distort the pieces.

Note the position of the mark you made on the thumbwheel.



Now take the three-legged test piece that you printed. Hold it in the same place as the set square, and see how much (if at all) you have to turn the thumbwheel to just touch it. Note down the turns, and whether they were clockwise/inward/acute-angle/negative or anti-clockwise/outward/obtuse-angle/positive.

Suppose you need 1.3 clockwise turns. The pitch of an M3 thread is 0.5mm, so this means that the axis pair you have measured is -0.65mm away from a true right angle.

You can take several readings and average them – always more accurate. If you do, re-zero with the set square before each reading.

Measure all three pairs of axes: XY, YZ and XZ and write down the measurement for each.

Finally, measure the distance between the tip of the projection near the angled corner and the centre of the end of the screw. Let's call the distance *d* mm.