# History:

* 10/25 created

# Goal:

Accurately align the G-Code that is in the laser’s coordinate system to Carousel workpiece on the laser table.

# Challenge:

The laser is manually aligned using eyesight. Laser goggles must be used which makes seeing the features on the Carousel difficult. Using three different outer corners of the masked pads we are getting about 0.2 to 0.5mm errors in the alignment. This isn’t good enough.

# New Plan:

1. Shift to using tooling holes for the alignment with targets instead of features that are covered by resin.
2. Use holes in the tooling pin so the laser beam disappears when aligned. Use black PLA printed with as fine resolution as possible. Paint the top white. Burn a hole in the top with the laser. It is important the top of the surface be at the same level as the pads.
3. Because the tooling pins will have some positional error, use four points to increase the accuracy by allowing more least mean square correction. Also number and orient the pins so they are consistently inserted.
4. It is likely some correction factor will be needed for the set of tooling pins but if those same pins are used the correction should be constant.

## Which four tooling holes?

the Use the tooling holes with dowel pins. Put a hole in the center so the laser disappears when it hits the hole.

Holes are 0.19” in diameter.

Create a dowel that fits in the hole and the top is at the same level as the pads.

3D print a dowel. Coat the surface with white. Burn a hole in the white with the laser so it disappears when the laser aligns.