Episode 13, Layout Tools

French Curves

1) The French curves are an easy cutout so plan on making several sizes. Use the supplied DXF files and enlarge them in your drawing software.
2) Begin making the French curves by using a pocket cut to remove the material in the interior regions.
3) Use some small pieces of wood and screws to secure the plastic to the spoil board through the interior areas that were just cut out. This will allow you to not use tabs and avoid having to clean them up.
4) Last, use a profile toolpath to cut out the perimeter of each of the French curves.

Circle Templates and Protractor

1) The circle templates have numbers indicating the diameter of each tracing arc, so the first step is to engrave the numbers. I used a 60 degree V-bit. You may need to experiment with depth of cut, spindle speed, and rate of cut to find the best combination for the material that you're using.
2) Set up and run a pocket cut toolpath to remove the material in the tracing arcs.
3) Use some small pieces of wood and screws to secure the plastic to the spoil board through the interior spaces just cut out to avoid having to use tabs.
4) A profile toolpath finishes the job by cutting out the template from the parent material.

Trammels

1) Set up a 60 degree V-bit and run a toolpath to create the numbers on the trammels.
2) To create all the many holes that house a pencil point in the trammels I used a drilling toolpath. A drilling toolpath has the advantage over a pocket cutting toolpath in that the router bit retracts fully after each successive cut.
3) Last, set up a profile cut with tabs to cut out the overall shape of the trammels – the holes in the trammel are too small for all but #4 screws.

Compass

1) There are two legs to the compass – one with a steel point and one that can hold a pencil. Let's start by cutting out the leg with the steel point. The leg is a simple profile with tabs that includes the ¼" bolt hole at the top. While not covered in the video you may choose to cut a very shallow pocket around the bolt hole in each leg. Doing so will cause the legs to join at the outer edge of the top of the legs creating the best mechanical advantage for the legs to hold firm and not slip while in use.

2) After cutting out the leg with the steel point drill the hole for the point. I used a 1/8” piece of steel drill rod for the point. After grinding the point use a drop of CA glue to hold it in place.
3) The pencil leg of the compass begins cutting a shallow channel to cradle the pencil, a hole for the screw eye, and a slot for the bottom of the screw eye. Use a 1/8” bit for these pocket cuts.
4) Next, cut out the pocket around the bolt hole and a profile cut with tabs to finish the pencil leg.
5) Assemble the compass with a ¼”-20 carriage bolt, washer and wingnut or knob. The pencil is held in place with a 10-24 eye bolt, washer, and wingnut. The interior of the eyebolt needs to be 5/16” in diameter for a pencil to pass through.