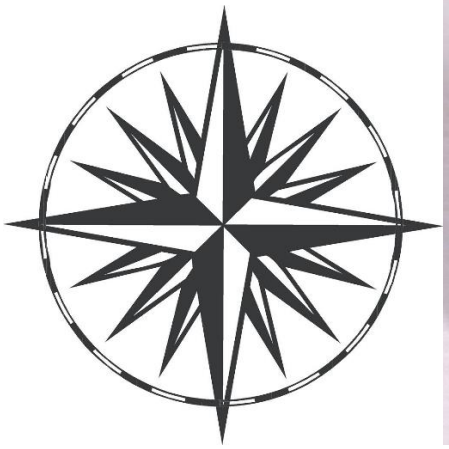

Nautical Star

Nautical Stars have become ubiquitous in many art forms since its inception among sea goers to depict the points on a compass. This Nautical Star cut is one I originated in the early 2000s to mimic the Nautical Star in a 3-d form cut into a gemstone. The following instructions describe in detail how to do this Nautical Star cut. The basic index settings align perfectly with the points of a compass; however, this cut is very flexible in many aspects such as proportional size, depth and overall shape. The pattern can be easily adapted to fit a full range of shapes whether symmetrical or asymmetrical. For this specific set of instructions, a simple modified square has been used. The pattern performs well in conventional, blocky pieces of rough as well as flat tabular rough since the v-grooving will provide the proper angles for reflection.

Preform and size gemstone using a 96-index gear. Figure 1,2,3 and 4.

Set angle at 45° and cut to a temporary center point using index settings, 12- 24- 36- 48- 60- 72- 84- 96.

Set angle at 90° and size stone by cutting on index settings, 02- 22- 26- 46- 50- 70- 74- 94. Figure A.

Set angle at 65° and level girdle by cutting on index settings, 02- 22- 26- 46- 50- 70- 74- 94. Figure B.

Set angle at 65° and cut to meet on index settings, 24- 48- 72- 96. Figure C.

Set angle at 90° and cut last girdle facet at index settings, 24- 48- 72- 96. Figure D.

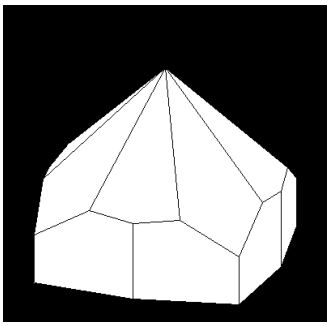

Figure 1.

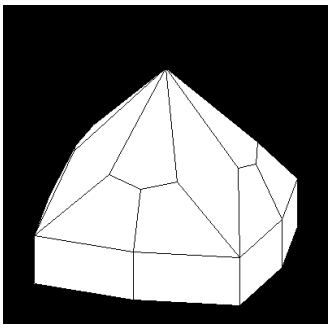

Figure 2.

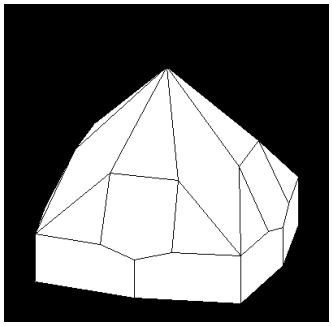

Figure 3.

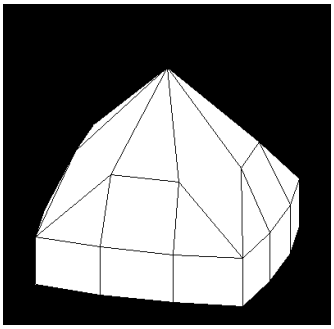

Figure 4.

The stone should look like (Figure 5.) prior to cutting the Nautical Star.

Transfer your mast to the Fantasy Machine and square it to the machine as best as possible. Position the spindle motor at 90° to the quill. Set the quill angle at 90° and adjust the height of the quill to the same center point as the spindle motor using a pointed dop mounted in the spindle. The pointed dop and temporary center point of the stone should meet. (Figure 6.) Remove the pointed dop from the spindle motor and secure a v-grooving wheel to cut the grooves. Position the mast as far toward the v-groove wheel as possible without actually touching the wheel. In operation the wheel will turn counter-clockwise as indicated by the arrow. (Figure 7.) Using the mast stabilizer or the preferred stop arm, fix the lateral movement of the quill in one place. Adjust the motor cross slide table (knob on the front of the Fantasy Machine) to align the lateral placement of the v-grooving cutter with the center point of the stone. (Figure 8.)

Figure 5.

Figure 6.

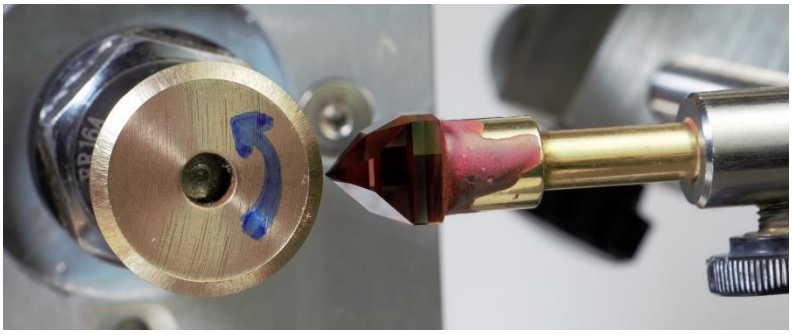

Figure 7.

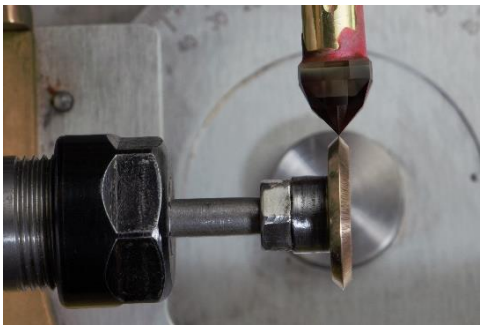

Figure 8.

With everything properly aligned, raise the quill and move the mast forward just enough to do a test cut to determine if you have alignment exactly where you need it. Turn the motor switch to CCW and set the speed control to number 4. Place a couple of drops of lubricant on the wheel and slowly lower the quill slowly allowing the wheel to cut at its own pace on index settings, 24- 48-72- 96. I use WD-40 and refresh as needed. The speed should not be so fast that the lubricant spins off the wheel. (Figure 9 & 10.) Each groove going out from the center should line up with its opposing groove. If you need to make adjustments, use the cross-slide knob on the front of the Fantasy Machine to make lateral adjustments until perfect alignment is achieved. After each adjustment, increase the depth of the cut slightly or you might not be able to see any difference. This might take several attempts to get the desired alignment.

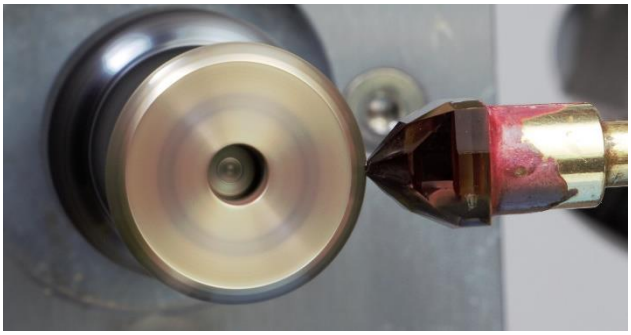

Figure 9.

Figure 10.

Once you are satisfied the alignment is accurate, you can begin cutting the grooves progressively deeper until you have cut to about 50% of the width of the overall stone. This is a judgment call and can vary relative to the rough you're cutting. With flat tabular material you might decide to extend the grooves to occupy a larger portion of the stone. Cut the grooves to depth on index settings, 12- 24- 36- 48- 60- 72- 84- 96. (Figure 11.) When you have this row of v-grooves cut you can set the dial indicator on the mast slide to zero. To make the primary points of the Nautical Star, increase the depth of cut by approximately .25 - .40mm and cut on index settings, 24- 48- 72- 96. (Figure 12) This is also a judgement call and will vary depending on rough and personal preference. As long as there is a difference between the secondary and primary points of the Nautical Star you should be able to see it develop.

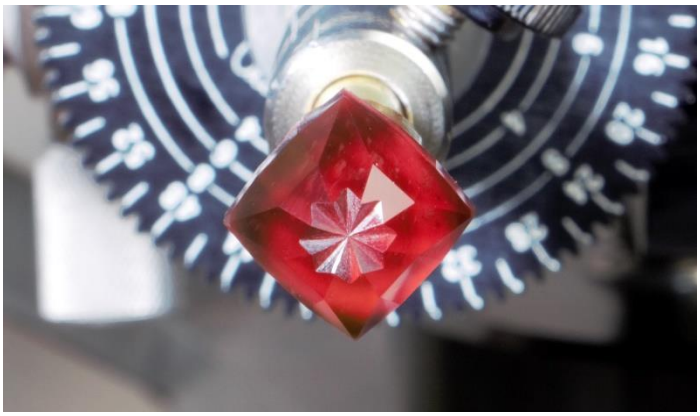

Figure 11.

Figure 12.

To make the smallest points of the Nautical Star, set the angle on the quill at 43°to 44°. Raise the mast so that the stone would be above the cutter. (Figure 13.) This step will involve using the mast slide plate to run the stone across the cutter using the knob on the right-hand side of the Fantasy Machine to move the mast forwards and back again in a machining type operation. (Figure 14.) I use a rubber band to secure the quill in position, holding it down and against the stop arm, which frees up my right hand to turn the knob to the right of the Fantasy Machine. Although the Fantasy Machine is equipped with an oscillation motor to accomplish this step, it's much easier to control the cut using the hand knob to move the mast while keeping the cutter stationary.

Since alignment might have shifted slightly in the process of adjusting the angle and moving the mast forward, it's advisable to make very small test cuts to determine accuracy. These small grooves should be lined up exactly at preform facet junctions making it easy to determine placement. Once alignment is achieved, slightly lower the mast in minute increments until you get the desired depth. Cut these points on index settings, 06- 18- 30- 42- 54- 66- 78- 90. Remember these are the smallest points of the Nautical Star so they should be in between the larger points and secondary points. (Figure 15.) As an option, on flat tabular material, this set of points can also be cut with the quill angle set at 90° and simply make this series of grooves shallower than the previous two steps.

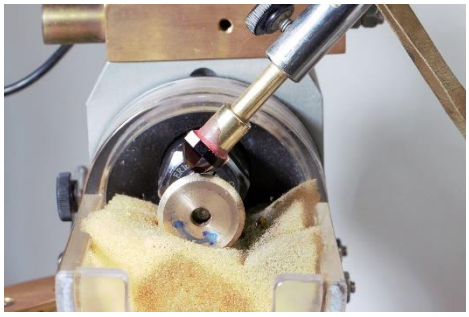

Figure 13.

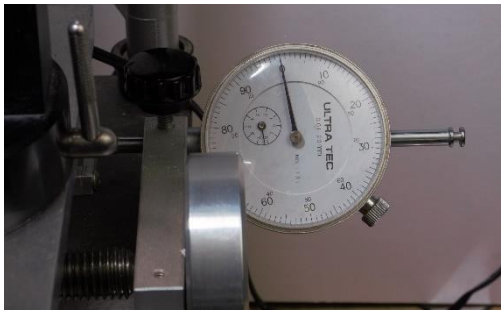

Figure 14.

Figure 15.

The points of the Nautical Star can be polished or left frosted by simply leaving the ground surface left after the v-grooving, depending on whether the desired look is more brilliance or visual imagery. To polish the grooves, use a medium stiffness bristle brush and diamond paste applied with a flex shaft or Dremel device. (Figure 16.) Start with 3000 grit to remove scratching and then 14k grit for a final finish. (Figure 17.)

Figure 16.

Figure 17.

Finish the pavilion by polishing the flat facets. Transfer the stone and cut the crown on the following settings.

1. Set quill angle at 42° and cut corners on index settings, 02- 22- 26- 46- 50- 70- 74- 94.

2. Set quill angle at 43° and cut on index settings 24- 48- 72- 96.

3. Set quill angle at 41° and cut on index settings 01- 23- 25- 47- 49- 71- 73- 95.

4. Set quill angle at 39° and cut on index settings 03- 21- 27- 45- 51- 69- 75- 93.

5. Set quill angle at 35° and cut on index settings 24- 48- 72- 96.

6. Set quill angle at 35° and cut on index settings 02- 22- 26- 46- 50- 70- 74- 94.

7. Cut table.

Nautical Star