

## CUTTING DIRECTIONS FOR THE EIGHT-SIDED BRILLIANT

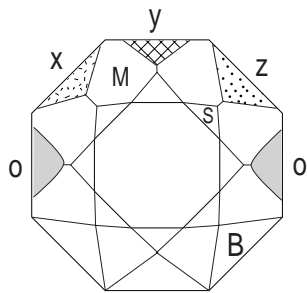


Figure 6.  
Placing the break facets

### STEP 4: The Last Row of Crown Facets

The final step is the closing of the crown with the break facets (B). Cutting is done on a fine lap, indexing on the settings of step 3. The correct angle must be found by trial, and should be between  $10^\circ$  and  $20^\circ$  greater than the crown angle. A break facet must be wide enough at the base to touch the adjacent break facets at the lower tip of the mains, while also just touching the lower tip of the star facets.

To accomplish this, make a trial cut on a wet, motionless lap, at  $15^\circ$ , the median of the suggested angles. When the facet is about half way to the star facet, it should be easy to see if it is moving too fast in either direction. This is shown in Figure 6. Two uncut facets

are labeled o. A break facet that is too steep is shown at x. This break will not touch the star when the base reaches the facets at it's sides. The angle in this situation must be decreased slightly. An opposite situation is shown at y. The break will touch the star before it is wide enough at the base. The angle will need to be increased to correct this situation. The correct break angle is shown at z. A slight amount of further cutting will bring it into place.

Change the angle no more than a degree for each trial cut. A new index setting should be used for each trial cut until you find the proper angle. Once this angle is found, any unsuccessful trial cuts must be carefully recut after the other breaks are in place. Do not try to cheat these facets into place. Recutting must be done carefully; much material has already been cut away. After all breaks are in place, recut them slightly with an extra fine lap.

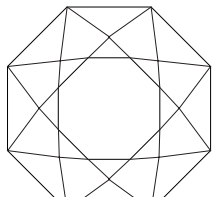


Figure 7.  
The finished crown

The crown should now resemble Figure 7, and is ready to polish. Use the same dry wiping method for each facet row as was done for the pavilion and table. Polish the breaks first (the angle should still be set from cutting). Next polish the star facets and then the main facets.

When the crown is completely polished, the gem can be removed from the dop stick. Directions for removal are in the fume hood.

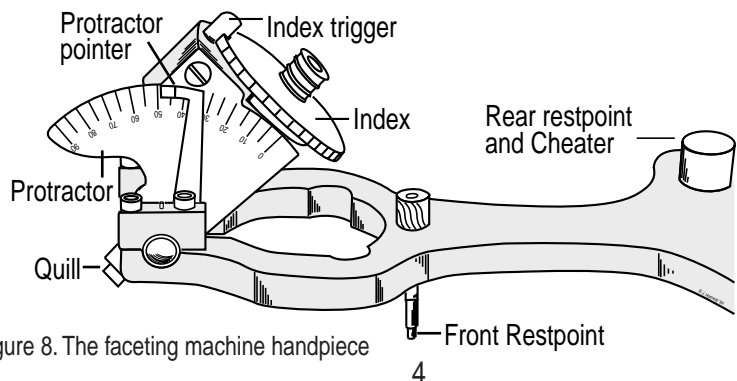


Figure 8. The faceting machine handpiece

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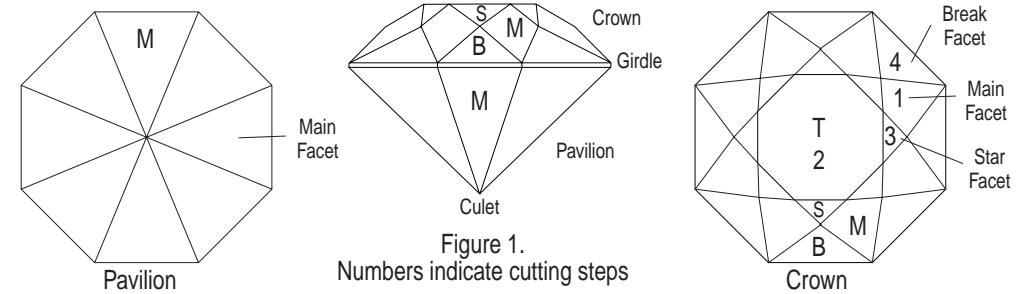


Figure 1.  
Numbers indicate cutting steps

### CUTTING THE PAVILION

Insert the dop stick into the handpiece (Fig. 8). Be sure the pin on the dop stick drops deep into the notch in the quill. Lock the dop stick in place by tightening the small set screw with the small hexagonal wrench. Place a medium lap on the faceting machine and tighten the center bolt by hand.

### STEP 1: The Pavilion Main Facets

Place the index latch in the largest number (ID setting of 32 index). Set the protractor for the culet angle ( $43^\circ$  for quartz; remember this angle!). Start with the handpiece resting on all three restpoints and the stone not touching the lap. Turn the machine on. Now, slowly lower the platform until cutting begins. When the stone is no longer being cut, lower the platform a little more until cutting begins again. Continue this process until the facet looks like #32 in Figure 2A; it extends well into the girdle. Examine the facet frequently to determine cutting progress. When you are through, the handpiece must rest on all three restpoints, and the stone should just barely touch the lap. Turn the index to setting 8 and, without adjusting the platform, cut the next facet until it no longer cuts. Repeat this for index settings 16 and 24. The pavilion should now look like Figure 2A. The four facets must meet at a perfect cross at the culet. If one is short, turn to it and recut it without changing the platform. If one facet is not well into the girdle, lower the platform very slightly and cut until it is correct. Recut the remaining three to match, without changing the height of the platform.

When the first four facets are in place add the next four on settings 4-12-20-28, again without adjusting the platform, (the platform should be at the same height as it was for the first four facets).

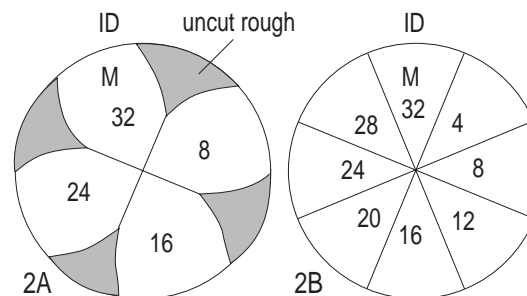


Figure 2. The Eight-sided Brilliant pavilion main facets. Numbers are index settings.

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When all eight mains are cut, change to a fine lap and recut each facet slightly to remove the medium lap scratches. Do this by lowering the platform slightly until a facet begins to cut, and cut until it doesn't cut anymore. Examine the facet to see if the entire facet has been recut; if not lower it a little more and cut until it no longer cuts. Recut the remaining seven facets the same way, but without changing the height of the platform. Repeat the same recutting procedure with an extra fine lap. When finished, all facets must meet perfectly at the culet (Fig. 2B).