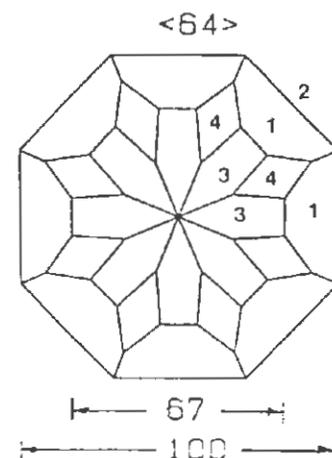
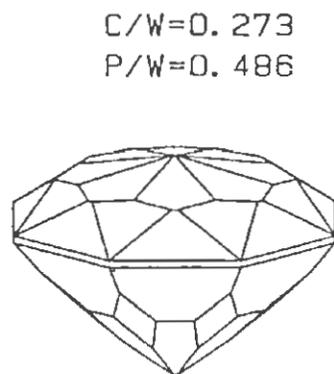
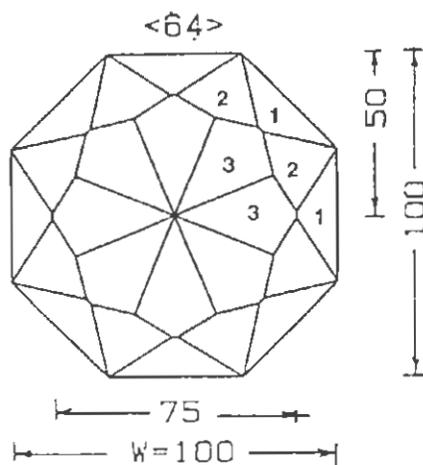


Figure 10 Brightness Plot for design 21.143  
Brightness Value 89 (Corundum)



## 21.143 APEX OCTAGON

64 INDEX

1.00 L/W  
0.273 C/W

56 FACETS  
0.486 P/W

Reference: Original design by Sammy Fangrath

### CROWN CUTTING INSTRUCTIONS

STEP/ANGLE	BEARING INDEX	REMARKS
C1 45.9	64-56-48-40-32-24-16- 8	Level girdle
C2 34.0	60-52-44-36-28-20-12- 4	Meet P1-P1-girdle
C3 11.3	64-56-48-40-32-24-16- 8	Meet P2-P1-P2

Angles are for CORUNDUM.

This design is an example of how Brightness Plots can be used to optimize angles. First attempt, intended for sapphire, used 43P/42C, but only gave average brightness 67 at RI=1.76 Using Tangent-Ratio transformation to keep the design looking the same in plan view, various pavilion mains combinations (39,41,43 degrees) were tested with crown mains (24,34,42 degrees) by preparing Brightness Plots. Highest average brightness found was the combination 39P/34C which gave an 89 with bright areas scattered all the way out to the girdle. (39P/24C gave similar results with both Quartz and Cubic Zirconia).

### PAVILION CUTTING INSTRUCTIONS

STEP/ANGLE	BEARING INDEX	REMARKS
P1 52.2	64-56-48-40-32-24-16- 8	Cut ECED
P2 90.0	64-56-48-40-32-24-16- 8	Level girdle
P3 39.0	64-56-48-40-32-24-16- 8	P1/P1 edge 0.280W
P4 42.0	60-52-44-36-28-20-12- 4	P1/P1 edge 0.134W

Size of facet P4 is indeterminate, however to reproduce the diagram as shown and the optical performance noted, final dimension of P1/P1 edge must be 0.134W measured from the girdle meetpoint to meepoint (P1-P3-P4). At the end of step P3 this same edge was longer (0.280W), but cutting P4 reduces its length. Having to make direct measurements is the price we have to pay to make indeterminate designs determinate. Note: : To "cut ECED" means to cut all facets in the group at the same mast height setting or height above the lap. ECED stands for Equal Center to Edge Distance. P1 and P2 could be interchanged in the cutting sequence, however there is less strain on the faceting equipment when one cuts at an angle (like the 52.2 angle of P1) instead of directly on the 90 degree girdle. If there is enough extra material the P1 facets will come to a temporary center point (TCP), whereas the P2 facets never can meet at a point because they are parallel to the centerline of the quill shaft.