'Facet Designer' - Newsletter 02

OPTICS and BEAUTY

RADIAL PATTERN

This gem has the following proportion data:

Symmetry = 5   **Index Gear Teeth = 80**

CROWN:	Row	Split	Shift	Position	Slope
break	1	4		0.81	----
main	2	0	-	0.38	----
star	3	0	8	1.00	----
PAVILION					
break	1	4	-	0.25	----
main	2	0	-	0.10	----

Fig.1 shows the crown. This pretty pattern is formed by choosing **Position** = 0.81, 0.38: the stars form a perfect pentagram. The mains are 1:1 kites. The table is 31%. to tips.

The pavilion (not shown) has break facets with **Position** = 0.25, which gives approximately 75% break depth

Girdle Thickness is set at 0.031 (does not affect pattern).

A pretty pattern is all that some folks strive for, but it may not produce an optically attractive gem. Let's find out.

ADJUSTING SLOPES

We chose corundum (sapphire/ruby) and used the red/blue hemisphere for analysis. The object is to get maximum red, minimum blue, and we achieve it almost perfectly in Fig.2.

Facet slopes are adjusted easily by varying **Max.Slope**, whereby face-on patterns, such as Fig.1, are not affected. You can do this by pressing the up/down buttons (black arrow), but for faster results, just type-in whole numbers (red arrow) until you find one you like best, then fine-tune with the buttons.

Doing the crown first, the results looked good at **Max.Slope** = 39.00 (break facets), for which the crown mains became 23.00 and the stars became 14.73. Then the pavilion looked good at **Max.Slope** = 42.00, for which the mains were 38.84.

Tilt the stone slowly to see how soon a 'window' appears.

GENERAL LIGHT SOURCES (interest only)

Fig.3 shows the pattern from the standard tri-color light sphere (30° red, 60° green) = virtually no horizon light (blue). The reds and greens are pure – no blending – quite unusual.

EFFECT OF THE VIEWER'S HEAD

Fig.4 shows the effect of the viewer's head, using the **LightMap** sphere (blue arrow); the back is black and the front is white. **Head radius** = 10° and the body is not turned on.

The dark black areas (red arrow) are from the sources seen within the black circle of the viewer's head (purple arrow). With '**const**' front light you see nothing else; it was changed to '**cos**' (black arrow) so that oblique light sources are gray (green arrow); these are the same as the green areas in Fig.3.

RESULT

When we tilted the gem in Fig.2 and saw a 'window', we might have abandoned the design, but **Animation** shows this to be a very attractive gem with great dynamic contrast. This shows that beauty cannot be predicted by logic and numbers.

In this example, sapphire looks better than diamond!

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Fig.1

Fig.2

Fig.3

Fig.4