

# 'Facet Designer' - Newsletter 02

## OPTICS and BEAUTY

### RADIAL PATTERN

This gem has the following proportion data:

|          |     | <i>Symmetry = 5</i> |       | <i>Index Gear Teeth = 80</i> |       |
|----------|-----|---------------------|-------|------------------------------|-------|
| 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!

BLH

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