

## 'Facet Designer' Tip #5

When trying to relate the location of source spots on the sphere to 'bliki' on the gem, you can get fooled; it is easy to make wrong assumptions. A light source from one side of the sphere may not enter the gem from the same side or produce a light speck on the opposite side of the crown.

### CROSSOVER RAYS

Fig.1 shows examples of 'convergent' and 'divergent' rays, or 'crossing' and 'non-crossing' rays.

Ray A follows the common path of most 2-D rays in a round brilliant, which are bezel-to-table rays or table-to-bezel rays. Note that the entry and exit parts cross each other above the table. This crossover is not visible in such a close-up view of the gem, but they cross immediately above the gem in the big picture of Fig.2; they appear to come from the same spot on the gem, which is of insignificant size in this view – even smaller than shown.

This is why it is important to show both close-up view and observer-length view - both views are required for proper ray analysis.

Note that the 'bliki' seen by the viewer is on the left side of the gem, and the ray enters the right side of the gem but its source will appear on the left side of the sphere.

'Divergent' rays are standard for table-to-table rays but are uncommon for bezel-to-table rays in a diamond, shown as ray B in Fig.1 (note the abnormal main facet slopes).

In Fig.2 the sources of rays A and B, shown on the same side of the sphere axis, actually enter opposite sides of the gem. Sources A produce 'bliki' on the same side of the gem, while sources B produce 'bliki' on the opposite side of the gem. That is, sources side-by-side on the sphere may produce light specks on opposite sides of the gem surface.

### SIDE SOURCES

Fig.3 shows sources of rays entering below the girdle and exiting the table (3 internal reflections - to be discussed in Newsletter 09 as Garry Holloway's 'NoGo Zone').

Ray C enters the gem from a source that was 'downward' toward the sphere and appears as a spot below the 'equator' of the sphere, which is the same as the gem's girdle plane in the 'normal' view (Fig.1 of tutorial). See Fig.2 here.

Ray D, on the other hand, comes from a source that was 'upward' toward the sphere. It crosses the girdle plane near the gem and its source appears on the sphere ABOVE the equator!

## DECEPTIVE SOURCES

