We have in the past shown only the "ISO" model Brightness Plots because we consider it to be a limiting case -- - - no design can do better than it does under "ISO" conditions which accommodate all possible input ray directions. However, since the "SPOT" model complies with the requests we have had to make the Brightness Diagrams "look like real stones" we will be doing more "SPOT" diagrams in the future.

The "Sirius for Garnet" design (45.032 in SFD August 90) generated the greatest amount of unfavorable comments we have had. After cutting the stone in dark red garnet (also blue spinel) both Piet Van Zanten and Alexandre Wolkonsky felt the stone was not as bright as they had hoped it would be. Since this design checks out well with the "ISO" Brightness Plot , there ensued much correspondence and head shaking to see why. Here is an excerpt from Van Zantens letter:

"Why did this not show earlier with other cuts? Well, the reason might be that with the SFD proposal the apex facets can only show light when the incident ray is at a high angle with the symmetry axis. Then it is clear that in iso light this will work, but not in directed lamp light as long as the lamp is above the stone. For cuts with flat tables, the rays coming from the table mostly will have entered also near to the vertical. In the SFD Sirius for Garnet cut, with a near flat table, the pavilion angles are too small to reflect such rays."

In any case, if we use the "SPOT" model instead of "ISO" and repeat the evaluation indicated in the SFD Aug 90 the basic conclusions that the PAVILION ANGLES affect brightness more than the CROWN ANGLES and that we can use much thinner crowns than has been the previous practice remain unchanged. However, the 38 degree pavilion/ 15 degree crown that was recommended does seem to be too low. The optimum for garnet is more like 41 degree pavilion/25 degree crown., which is not too far from the 41 degree pavilion/28 degree crown we found with Quartz and the Standard Round Brilliant.

The three sets of BRIGHTNESS Plots (Fig 4 , 5,and 6) illustrate some general facets about the pattern types, "ISO" and "SPOT" using Sirius for Garnet as the example. We always expect the "ISO" plot to be brighter and more tolerant of ray distribution problems in the center of the design, but within the limitations of black/white reproduction and limited gray scale rendition the "SPOT" model looks more like the real stone.

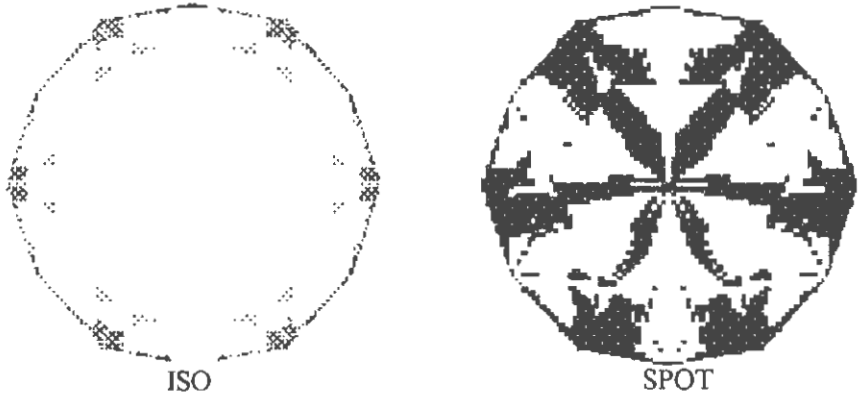

Figure 4 BRIGHTNESS Plots design 45.032 with P=41/C=25

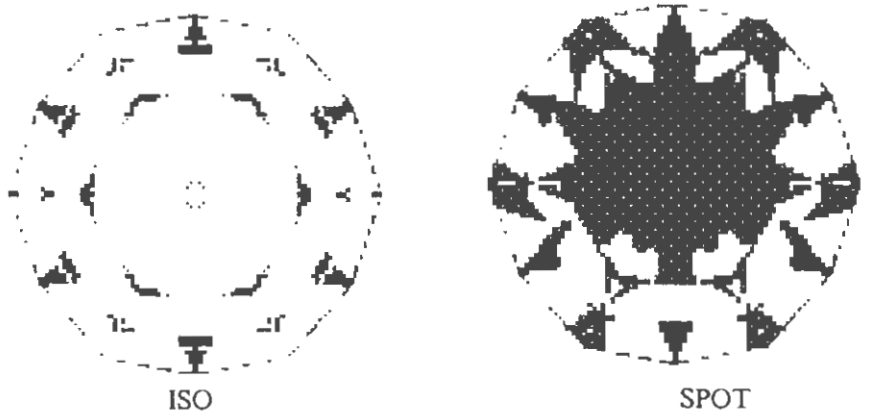

Figure 5 BRIGHTNESS Plots for design 45.032 with P=38/C=15

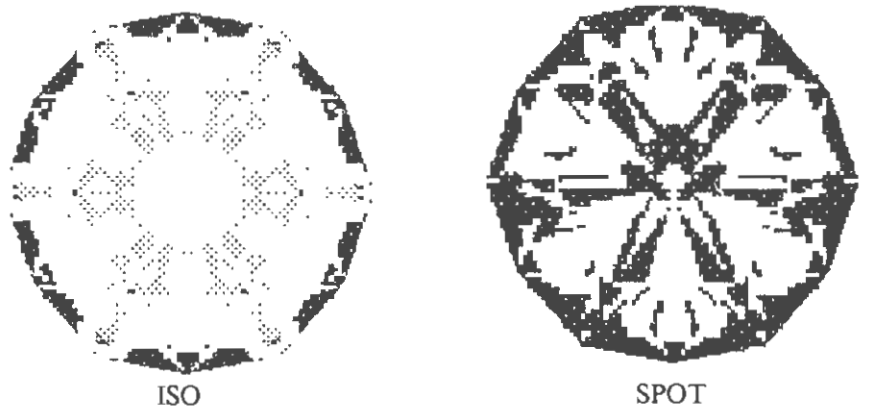

Figure 6 BRIGHTNESS Plots for A. Wolkonsky's recommended angles for the SIRIUS cut