

SEATTLE FACETOR DESIGN May 1989

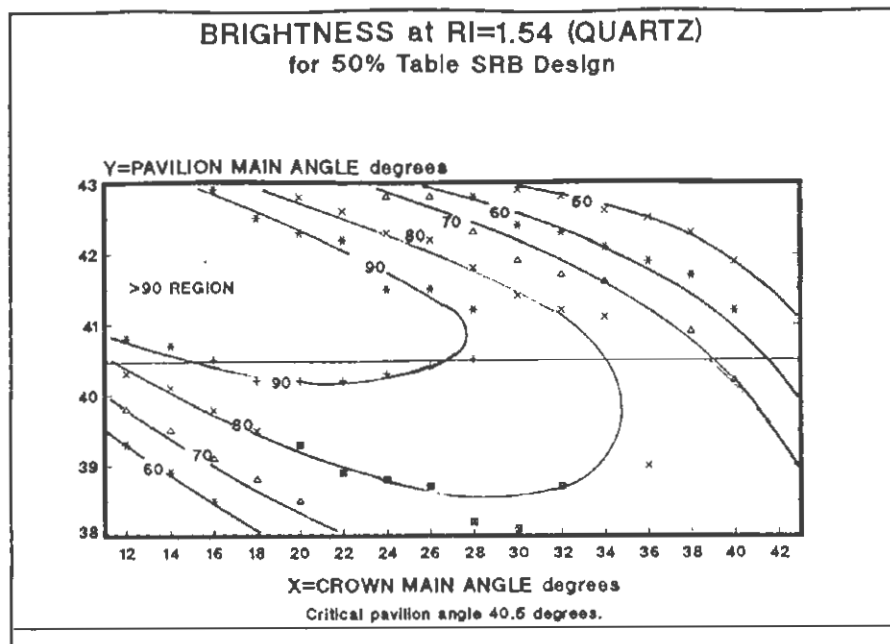


Figure 1 SUMMARY BRIGHTNESS DATA CHART FOR QUARTZ

BRIGHTNESS PLOTS TO DETERMINE CONDITIONS FOR BRIGHT GEMS
Robert Long & Norman Steele

Part 3

This article is a continuation of the SFD March and April 1989 discussion of the Brightness Plot Experiment with the Standard Round Brilliant design (SRB) using Raytracing and BRIGHTNESS PLOTS to search for optimum angle conditions. Table 1 lists the parameters for the whole experiment and Figures 1 thru 9 are some of the results for Quartz. These results should apply not only to the SRB Design itself, but also to most designs that depend on a symmetrical placement of facets about the design center.

Figure 1 is a chart summarizing the Quartz results. Crown main angles are shown on the horizontal (X-scale) axis, pavilion main angles on the vertical (Y-scale) axis, and corresponding Average Brightness in the form of "contour lines". Compared to charts

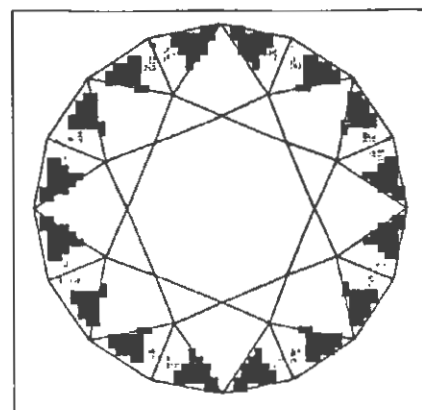


Figure 2 Brightness plot for a 41P/32C Quartz 50% Table SRB ..note bright center, but dark rim. Brightness Value 84

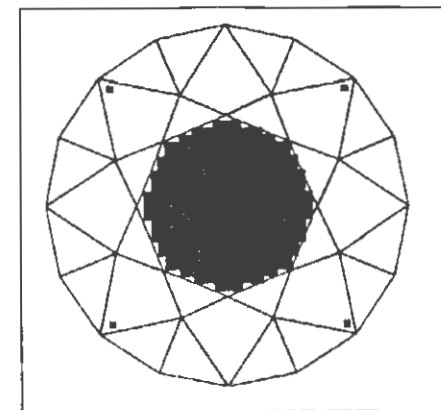


Figure 3 Brightness plot for a 39P/32C Quartz 50% Table SRB ...note center is not bright because critical angle has been exceeded, but relatively low crown angle gives a bright rim. Brightness Value 79

Table 1 EXPERIMENT PARAMETERS

Design:	Standard Round Brilliant	
Table Size		50% PP
Crown Main Angle		variable (6 - 42 degrees)
Pavilion Main Angle		variable (38 - 43 degrees)
Material:		
Quartz*		(RI 1.54)
Topaz		(RI 1.68)
Corundum		(RI 1.76)
Cubic Zirconia		(RI 2.15)
Diamond		(RI 2.42)

Note *:Materials featured in this article.