

RAY TRACING EXPERIMENT with ROUND BRILLIANT

This section is a continuation of Seattle Facetor Design March 1988. The figures on the right represent "Brightness Plots" for four different view angle versions of the Round Brilliant having "Quartz" parameters. In these plots dark areas (indicated by * or S) represent possible exit points in the crown grid pattern that did not receive an exit ray i.e. exited thru the pavilion (or girdle or became trapped).

	DESIGN PARAMETERS			
Design (SRB)	A-1	A-2	A-3	A-4
Crown Main	37.0	37.0	37.0	37.0
Pavilion Main	43.0	43.0	43.0	43.0
Refractive Index	1.54	1.54	1.54	1.54
Table Size (% width)	60.0	60.0	60.0	60.0
View Angle	0.0	5.0	10.0	20.0

These Figures contrast the effect of View Angle on a stone that is optimized more for 1.54 (roughly equivalent to tipping the stone relative to the light source, but looking directly at the crown). If brightness patterns did not change as view angle is varied it would indicate the design is insensitive to view angle with material. However, this is not the case for Quartz R.I. 1.54. Even a little tipping has a drastic effect on the brightness pattern. As view angle is increased dark areas show in the Table area whereas at 0.0 degree view angle it is clear.

Recall in the Seattle Facetor Design March 1988 issue we showed this same design with a 1.0 degree view angle. Even this extremely small deviation from perpendicular (0.0 viewing) showed a dark region due to leakage of light thru the pavilion main facets. Here at 5, 10, and 20 degree view angles the effect is more pronounced and in the higher angles actually leads to light loss thru the break and star facets as well.

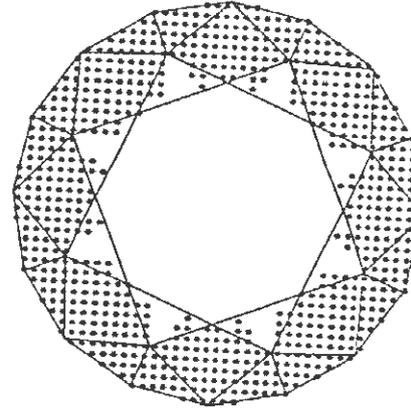


Figure A-1 View Angle 0.0

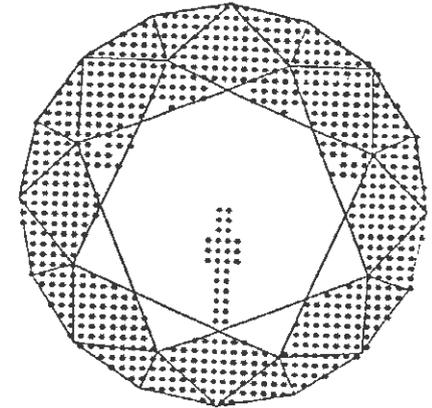


Figure A-2 View Angle 5.0

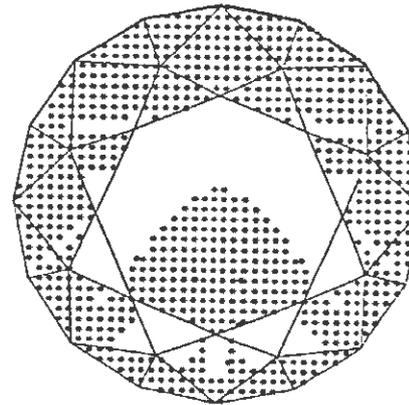


Figure A-3 View Angle 10.0

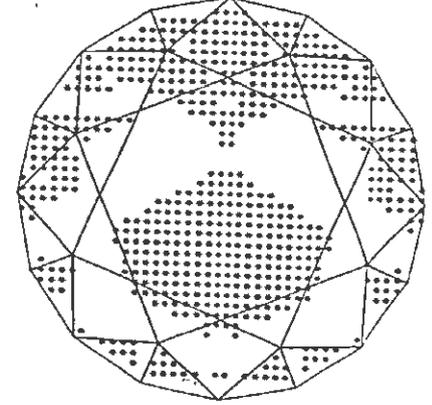


Figure A-4 View Angle 20.0