BRILLIANCE IN TILT Continued from page 3

In SEATTLE FACETOR DESIGN (and in personal communications) we have often asked for comments about use of BRIGHTNESS PLOTS to evaluate facet designs. We know that in *our experience* they are very useful tools, but we never know whether others agree or disagree unless they tell us so. Recently Alexander Wolkonsky (the French Connection) sent us the results of an experiment he conducted to determine possible standards for evaluating brightness in gems. In previous communications to him, Bob Long had stressed that in order for our model of Brightness Plots by Raytracing to be pertinent it would be necessary to exclude all light ORIGINATING FROM THE PAVILION SIDE OF THE STONE. So Wolkonsky devised a holder for the stone that did exactly that.

Figure 4 is sketch of the device which consists of a wooden block painted a dull black and drilled so that an adjustable prong type holder can be fitted in the block. A set screw is provided so the mounted stone can be adjusted up and down to located the stone's girdle just at the edge of the block. This permits light to enter and exit thru the crown, but effectively blocks light that either exits thru the pavilion or would have entered thru the pavilion. Several of these blocks can be clamped together so that several stones can be compared side by side against a neutral dark background.

By adjusting such variables as camera distance, angle of incident light, camera angle, and types of light, Mr Wolkonsky experimented with two standard round brilliant stones and recorded the results on 35mm slides which he kindly sent to us along with two of the modified holders. This practical demonstration agrees with our computer generated BRIGHTNESS PLOTS i.e. the stone closest to our recommended anlges was indeed the brightnest. (These slides were shown by Mr Wolkonsky to the AUSTRALIAN FACETOR'S GUILD NATIONAL SEMINAR at Warwick, QLD, Australia in 1989)

The connection of Mr Wolkonsky's experiments to Love's article about effects of "tilt" on apparent brightness, is the variation of camera angle (directly equivalent to tilting the stone). Since a camera angle perpendicular to the table of the stone would either require putting the camera behind the light source or tolerating a shadow on the stone, one of Mr Wolkonsky's recommendations is to standardize on a *15 degree tilt* for the stone relative to the camera and have a daylight equivalent fluorescent light source at 0 degree tilt. This is somewhat like the head shadow (10 degree) assumption that others (e.g. Harding) have suggested.

Our computer simulation of BRIGHTNESS PLOTS includes possible adjustments for "tilt", but we have not reported results in print very often because although absolute value of brightness changes, the relative comparison between different designs is seldom affected. Nevertheless, we often actually run a series of BRIGHTNESS PLOTS at difference degrees of tilt (e.g. 5, 10, 15, 20, 25 degrees) when evaluating a new design (at least new to us). In SFD we normally only show the 0 degree tilt version, because we have more comparison data in that form and generally the 0 degree tilt yields the highest brightness value We feel when one looks at a real gem it will almost automatically be "tilted" relative to the light source to show its most favorable appearance. For the usual "flat table" design it will likely be close to the face up position.

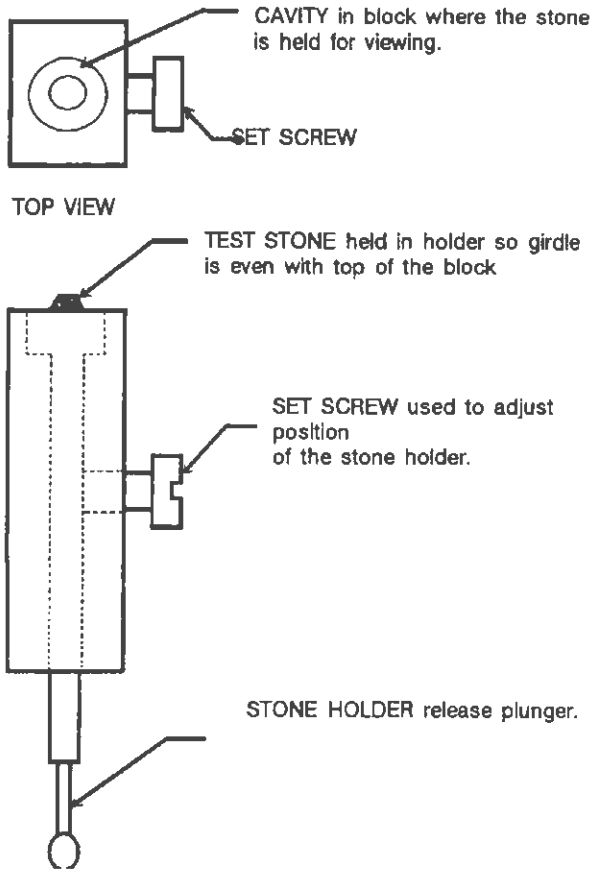

Figure 4 Features of Wolkonsky's modified stone holder which eliminates back reflections.