SQUARE ONE
SEATING, LIGHTING, OBSERVATION & MAGNIFICATION

by Jim Gemmell

This is the second article in a series of article reprints intended for those members new to faceting who are looking for the more elementary knowledge of the art.

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Faceting a gemstone can be both fascinating and tedious and some of the tedium can be alleviated by being able to sit comfortably at the right height under appropriate lighting in order to make the necessary observations.

SEATING

If you are going to sit for long periods at a faceting machine, then it is essential that you have a comfortable chair with a good backrest, which can be positioned so that you are at the right height for your machine.

If your stone cannot be removed from the machine then your viewing positions are restricted and the positioning of the eye is more important, a good rule of thumb is that with the mast height set to cut a facet at 45 degrees and the stone raised to or near perpendicular, the eye should be just above the level of the stone.

If the height of your chair is not adjustable, then you have to look at modifying the machine table. The best type of chair is an office swivel chair with no arms that has either a manual or gas operated height adjustment.

OBSERVATIONS.

To observe a gemstone you need light to transmit the image, the eye to receive it and the brain to interpret it. The eye is a receiver which receives wavelengths of visible light and passed to the brain which converts them to an image for analysis and action.

In faceting, the problem lies in not being able to understand what you see and act upon it. But like many other techniques, you become more proficient with practice.

MAGNIFICATION.

For inspection and critical assessment of a stone you will need to magnify the image, and for this you will need a 10x hand lens or loupe. The loupe is used as an extension to the eye and held as close to the eye as possible and the stone viewed from about an inch away from the loupe, the focal length of the loupe.

You need to buy a well corrected loupe of good quality. If you can, try various loupes. If you have good vision without spectacles try the 18mm loupes. If your eyes are not what they used to be, you might be better with a 21mm loupe.

Check for, colour fringes (chromatic aberration) by holding it up to a strong light. Use millimetre graph paper to check for distortion (spherical aberration). You should see a magnified square i.e. straight lines. It takes some practice to become proficient and the loupe needs to be held very steady to obtain a focus.

A lesser magnification can be used in the earlier stages of cutting and many cutters use the binocular magnifier on the head when you have the advantage of having both hands free.

The Optivisor is a very good magnifier of this type. It is very comfortable and well made. The visor acts as an eye shade and prevents a lot of glare, a problem that gets worse with age. There is a choice of six lens plates of magnification between 1.5x and 3.5x and an extension loupe which gives a further 2.5x. No. 5 lens plates (2.5x) in conjunction with a loupe gives a magnification of 6.5x.

LIGHTING.

Suitable lighting is essential to good cutting and opinions on the subject are many and varied. If your machine has an accurate location and the stone can be removed from the quill or you have a machine with a "floating head" such as a Raytech-shaw or Imahachi, then the stone can be positioned under a single light source to obtain the necessary light transmissions to make the observations. A 60w-240v or 40w-LV halogen light would be all that is required.

If your stone cannot be removed from the machine, then your viewing positions are restricted and to compensate you will need more than one light source. One can only generalise and it is up to the new cutter to experiment to suit his or her own needs.

Try the three lights, one fixed as a machine light, preferably of the angle-poise type and two portable lights which can be moved about to find the best position. Have one positioned above and behind with the light coming over your shoulder and the other behind the stone so that the light is transmitted through the stone.

Keep the light source as small as possible and use low powered lamps. Try concentrating the beam, 20v Halogen lights run cool and can be masked,

Try switching the lights on and off and using various combinations to see their different effects of illumination. LV High Intensity lights work very well positioned behind the stone but are rather expensive.

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