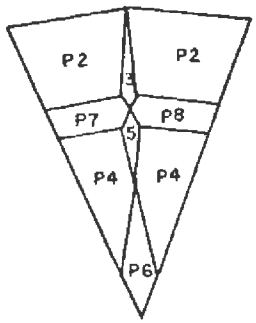

Figure 1 No Cheater

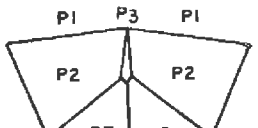

Figure 2 Cheater 3.75 degrees
(One full tooth)

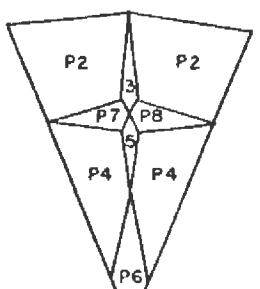

Figure 3 Cheater 0.75 degrees
(0.2 of one tooth)

To calibrate my "cheater", I first cut an octagonal step cut with two rows of facets at the same index settings. Then I recut one of the rows with the index gear set 1 tooth different and the amount of cheater correction needed to put the facet back in line with the first set was recorded. After averaging the eight measurements, I made a table with this average adjustment divided into 10 parts. Now whenever I need to use the cheater, I first calculate the amount of adjustment needed in terms of fractional "gear teeth" and then translate this to actual cheater adjustment I have in my calibration table.

Figure one shows the principal segment of the "LUPUS" design as it would appear if the indexing for P7 = P8= P2 = P4 (no cheater adjustment). If we did not overcut...a simple step would result...it would look like a band extending around the stone parallel to the girdle.

Figure 2 shows the effect if we adjust P7 1 full tooth toward the centerline and P8 1 full tooth in the opposite direction. This would be a cheater adjustment of 3.75 degrees (since we are using a 96 index gear). Way too much if we want the "star" to have reasonable proportions.

Figure 3 shows the effect of adjusting P7 and P8 about 0.2 part of one gear tooth (0.2 x 3.75 = 0.75 degrees). This is about what we want. Any more cheater adjustment than this will tend to be more like Figure 2. Any less cheater adjustment will not permit the facets to meet in the center when they also meet at the tip of the "wings". If your "cheater" is not calibrated, these facets can be cut by trial and error. Since it is obvious that the setting is a little to the left of the P2 facet on the right; and a little to the right of the P2 facet on the left. Small cheater adjustments should be made in these directions, alternately on one side and then on the other until the correct setting is found. Then the rest of the facets can be cut and polished using the empirically determined cheater adjustment.

Note in this design the elevation angle for P7 and P8 controls the symmetry of the star "wings". The intersection of facets P2 and P4 is a level line (since both have the same bearings). To be exactly symmetrical with this line when viewed in the plan view the P7 (P8) should be:

$$\text{Tan}^{-1}\ (P7) = 1/2\ (\text{Tan}\ (P2) + \text{Tan}\ (P4))$$

or $\text{Tan}\ (P7) = (\text{Tan}\ 46.0 + \text{Tan}\ 41.0)/2$ $\qquad P7 = 43.6$ degrees

In the LUPUS design Mr Kendall used an angle P7 = P8 = 42.9 degrees consequently the arms of the stars are not parallel to the level line at the girdle. It is strictly a matter of taste whether you think this is good or bad. The point is if you want to control the "droop" of the stars, it done by controlling the elevation angle of P7 and P8.