Additional NGC Alignments

Important Information on Subsequent Alignments after an Initial One- or Two-Star Alignment

If, in the course of an evening's viewing, you find that the accuracy of guiding to objects has decreased, you may re-align the telescope on an additional object to restore this accuracy. Such a situation is normally caused by inaccuracies in manufacturing of the telescope mount, affecting its orthogonality. A telescope is orthogonal when all three axes—Right Ascension, Declination and Optical—are perpendicular to each other. If not, a pointing error is introduced when moving the telescope from one portion of the sky to another. The NGC computer assumes a perfectly orthogonal mount for all calculations.

If your mount is very close to being orthogonal, you will probably never see such an error and should not need to make additional alignments. If, however, you wish to make an alignment subsequent to the initial on or two required, there are some guidelines, which should be followed as closely as possible. Please read this information carefully, as it is likely to be difficult to understand the first time through.

When making alignments, the NGC "sees" all such locations in terms of a fixed, earth-based reference. In other words, the altitude and azimuth of the position of the objects at the time of alignment determine their angular separation, and not their Right Ascension and Declination (a sky-based reference). Of course, if alignments are done near to each other in time, then the angular separation of the alignments is essentially equal to the separation of the objects. Note the distinction between the position of an alignment and the position of an object. Relative to the Earth, an object's position is changing with time, however the alignment position remains fixed.

If your initial alignment had a separation of 90°, your subsequent alignment might actually decrease this to something less than 90°, even if the Right Ascension and Declination of the object makes it appear to be much greater than 90° from the furthest object aligned on. Such an alignment would be more detrimental than beneficial.

In Figure 1 the observer has initially aligned on objects A and B. Several hours later object B is at the zenith (represented by B') and the observer wishes to align on object C'. Note that even though object C' is further from object A than is object B', the angular separation between A and C' is less than that of A and B. The NGC only remembers the last two alignment positions, so when a new alignment is performed, it must discard the previous alignment whose position is nearest that of the new alignment.

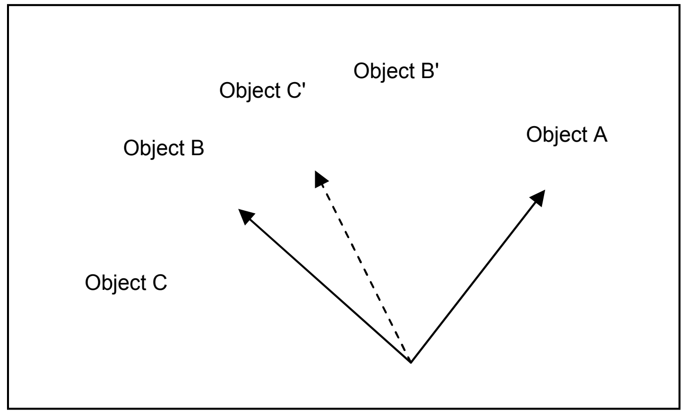

Figure 1

In our example, alignment position B is discarded, and the NGC is realigned on positions A and C'. This would result in an increased pointing accuracy in the proximity of object C' (which may be beneficial if you are staying in that area of the sky), but a likely decreased accuracy (from that experienced with the original alignment) in other areas of the sky.

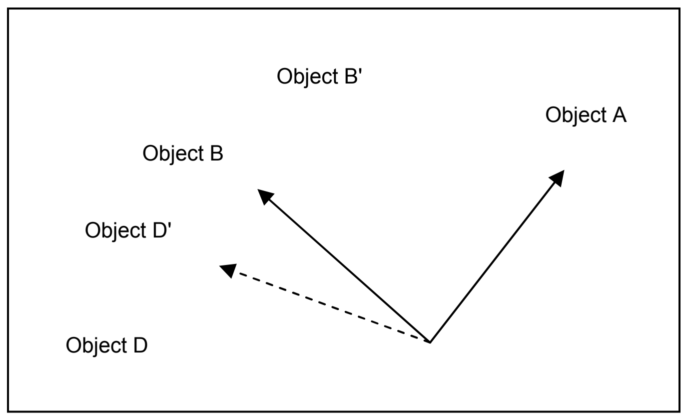

Figure 2

Figure 2 shows the correct subsequent alignment procedure. The observer first aligned on objects A and B, then several hours later made a third alignment on object D'. Note that the angular separation between object D' and the alignment position of object A is greater than that between positions A and B.

Once you understand the above information it will be easier to see that the most likely problems that subsequent alignments will cause are: 1) Too small of an angular separation and 2) Confusion about which alignments are kept and which are discarded. If all else fails, you may be better off doing a new initial alignment.

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