or 8 minutes of time, so this difference must be divided in half when computing motion of the body for 4 minutes of time.

For ease of plotting, all azimuths can be converted to grid. To convert, use the longitude of the assumed position to determine convergence, because the Zn is for the assumed position, not the DR position. On polar charts, convergence is equal to longitude.

In computing motion of the observer, it is imperative that you use the difference between grid azimuth and grid track, or Zn and true track, since this computation is based on relative bearing (RB). Zn minus grid course does not give RB.

Since low altitudes and low temperatures are normal in polar regions, refer to the refraction correction table and use the temperature correction factor for all observations.

In polar regions, Coriolis corrections reach maximum values and should be carefully computed.

Poles as Assumed Positions

Within approximately 2° of the pole, it is possible to use the pole as the assumed position. With this method, no tabulated celestial computation is necessary and the position may be determined by use of the Air Almanac alone.

At either of the poles of the earth, the zenith and the elevated poles are coincident or the plane of the horizon is coincident with the plane of the equator. Vertical circles coincide with the meridians and parallels of latitude coincide with Dec circles. Therefore, the altitude of the body is equal to its Dec and the azimuth is equal to its hour angle.

To plot any LOP, an intercept and the azimuth of the body are needed. In this solution, the elevated pole is the assumed position. The azimuth is plotted as the GHA of the body or the longitude of the subpoint. The intercept is found by comparing the Dec of the body, as taken from the Air Almanac, with the observed altitude of the body. To summarize, the pole is the assumed position, the Dec is the Hc, and the GHA equals the azimuth.

For ease of plotting, convert the GHA of the body to grid azimuth by adding or subtracting 180° when using the North Pole as the assumed position. When at the South Pole, 360° – GHA of the body equals grid azimuth. The result allows the use of the grid lines for plotting the LOPs. When using grid azimuth for plotting, apply Coriolis to the assumed position (in this case, the pole). Precession or nutation corrections are not necessary since current SHA and Dec are used. Motion of the observer tables may also be used in precomputation, since grid azimuth relative to grid course may be determined. Motion of the body is zero at the poles.

Note the exact GMT of the celestial observation. From the Air Almanac, extract the proper Dec and GHA. Plot the azimuth. Compare Ho and Hc to obtain the intercept. When the observed altitude (Ho) is greater than the Dec (Hc), it is necessary to go from the pole toward the celestial body along the azimuth. If the observed altitude is less than the Dec, as is the case with the sun in *Figure 12-15,* it is necessary to go from the pole away from the body along the azimuth. Draw the LOPs perpendicular to the azimuth line in the usual manner. Do not be concerned about large intercepts; they have no bearing on the accuracy of this type of fix. Observations on well-separated bearings give a fix that is as good close to the pole as it is anywhere else.
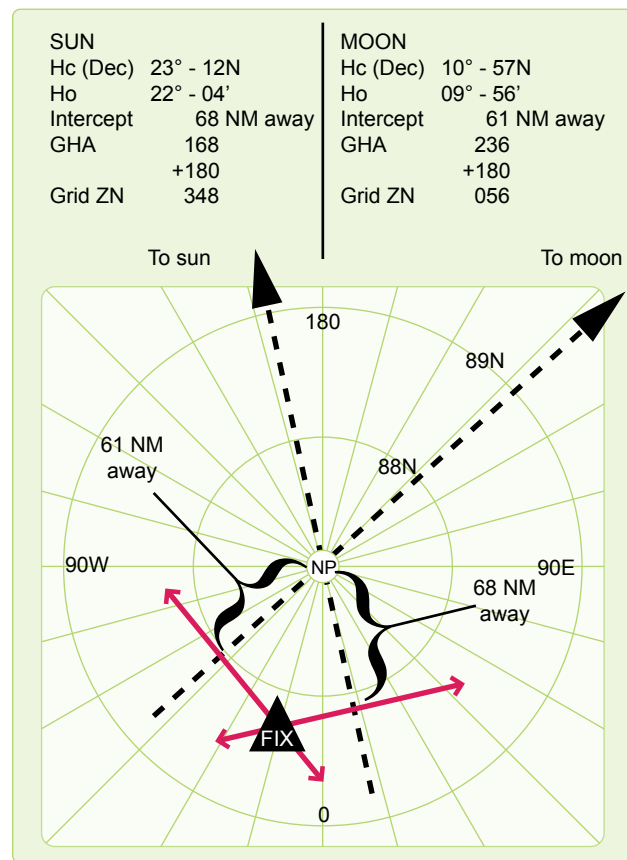

SUN			MOON		
Hc (Dec)	23° - 12N		Hc (Dec)	10° - 57N	
Ho	22° - 04'		Ho	09° - 56'	
Intercept		68 NM away	Intercept		61 NM away
GHA	168		GHA	236	
	+180			+180	
Grid ZN	348		Grid ZN	056	

Figure 12-15. *Using pole as assumed position.*

Adjusting Assumed Position

Adjusting Assumed Position for Off-Time Shot

There are times when the observer does not start the shot at the prescribed time for various reasons. For example, the observer may struggle to find the body due to cloud cover. If a shot is taken off time, you can use the FEAST (Fast EAST) rule: a shot taken too fast or too early has the assumed position moved 15' of longitude east for each minute early to compensate for body motion. *[Figure 12-16]* Apply the