hemisphere, the magnitude of the error diverges as the pole is approached. In short, major satellite-fix errors are caused by dead-reckoning error, but the magnitude of these errors is such that they should be readily recognized. Hence, the problem reverts to one of identifying quality in a satellite-fix computation.

The previously described variances provided as part of the satellite-fix solution are independent of dead-reckoning error. To obtain a measure of the reliability of the variance computation, a set of satellite fixes was tabulated in the laboratory and each result and its variance estimates compared with the known antenna location. The curves shown in Figure 7 were obtained where the data were plotted as standard deviation versus satellite elevation angle. Figure 8 shows the same type of data recorded in the Far East while operating at approximately 40°S latitude. Figure 9 shows the difference between the variance estimate in the laboratory and the actual position error. This curve shows that the reliability of the variance estimate decreases at low elevation angles but that the estimate is reliable for satellites in the range 15° to 70°. Note that the error estimate tends to exceed the actual error, thereby avoiding an over-dependence on the satellite fix results. Hence, we have a reference with a reliable estimate of its accuracy which we can now use as a tool for verifying the quality of the velocity and azimuth measurement subsystems.

3. <u>Velocity/Heading Quality Control</u>

Velocity and azimuth subsystem performance can be evaluated by relating the position correction resulting from a satellite position fix to the distance between fixes. See Figure 10.