solution and intermediate to the solution. To use the resulting fix effectively as a measure of the quality of the GeoNav sensor subsystem data, the quality of a given fix solution must be measured. The GeoNav system does this with a unique, proprietary algorithm that estimates statistical variances north and east for the satellite fix. These estimates are not derived from a priori statistics of satellite fixes versus elevation angle but from only the incoming satellite data set. Figure 4 is a bull's-eye of satellite-fix distribution from a set of 100 fixes received in GSI's Dallas laboratory. These data were recorded with a minimum requirement of five short doppler segments on both sides of closest approach and with a maximum elevation angle of 75°.

The foregoing discussion covers the condition in which the satellite receiver is stationary. To obtain experimental data, a week of satellite observations were recorded on magnetic tape using a GeoNav system operating with the standard operating software. The resulting satellite fixes were tabulated, and known velocity and heading errors were introduced into the dead-reckoning or navigator's estimates. The satellite fixes were then recomputed and compared with the previously tabulated data and plotted. The resulting curves are those shown in Figures 5 and 6. It is noteworthy that the major component of satellite-fix error versus velocity error is that previously published in numerous journals. However, the smaller component of fix error shows a tendency to split, depending on the direction of satellite travel with respect to the observer, e.g., clockwise or counter-clockwise. These errors are as shown for 1 knot north in Figure 5 and 1 knot east in Figure 6 at latitude 32°N. These curves would converge to zero at the equator and be in reversed orientation in the southern hemisphere. In either