

# **FIELD TEST ACCURACY RESULTS OF THE DIFFERENTIAL NAVIGATION TECHNIQUE WITH NAVSTAR/GLOBAL POSITIONING SYSTEM**

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## **ABSTRACT**

The Global Positioning (GPS), which is being developed by the DoD to support the operational forces, is a navigation aid that provides the user with precise position, velocity, and time information anywhere within line-of-sight of four satellite transmitters. It also holds potential benefits for use by the civilian community and the DoD test and training ranges. The differential navigation technique consists of using measurements from reference user equipment at a precisely known location to provide correction data to improve the navigation solution of a user equipment at an unknown location. The correction data consist of errors in position estimates derived from reference receiver output using the known true location coordinates. These data are applied to the output of the user equipment (at the unknown location) to remove common-mode errors due mainly to ionospheric propagation delays and satellite clock and ephemeris errors. Data were collected for user-to-reference separation distances of from zero to 280 nmi at night. Accuracies achieved do not confirm predictions of a degradation in efficacy of differential corrections with increasing separation distance; however, local disturbances at either GPS receiver cause considerable dispersion in the data.