NAVSTAR GLOBAL POSITIONING SYSTEM:
A SATELLITE BASED MICROWAVE NAVIGATION SYSTEM

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A B S T R A C T

The NAVSTAR Global Positioning System is a satellite-based navigation system that will provide extremely accurate three-dimensional position fixes and timing information to properly equipped users anywhere on or near the earth. User positioning requires the determination of the times of transit for satellite generated signals to reach the user. Satellite positions and other necessary system information are transmitted to the satellites for modulation onto the navigation signal.

By 1977, six satellites will be deployed to permit demonstration and evaluation tests. The system will then be expanded into an operational 24-satellite system.

This paper reviews the design concept and system performance characteristics for GPS. Emphasis will be placed on the nature and role of the satellite-to-ground L-band link including: the design constraints leading to the frequencies and bandwidths selected; the dual frequency technique for ionospheric calibration; the GPS signal structure and its role in signal acquisition, user navigation, and providing resistance to electronic countermeasures.