

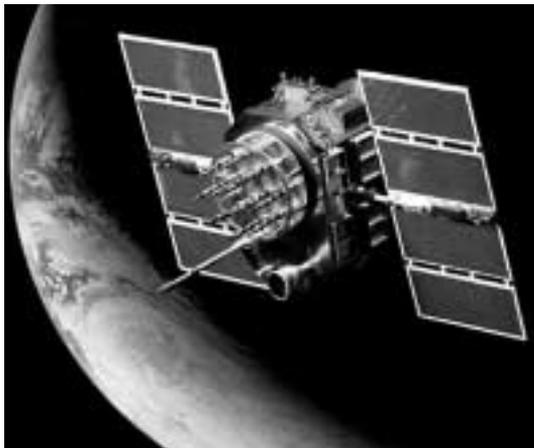
# NAVSTAR GPS

## "Where Am I? Are We There Yet?"

ASPJ STAFF\*



For centuries, military commanders and travelers have wanted to know their location, objective, and—perhaps more commonly—whether they had yet arrived. The answers to their questions became clearer and more precise in the 1960s with the deployment of the Navy Navigation Satellite System, also



known as the Transit System, developed at Johns Hopkins University. Transit proved invaluable to military planners and operators, but demands for greater accuracy set the stage for the Navigation Satellite Timing and Ranging (NAVSTAR) Global Positioning System (GPS). Still in the experimental phase in 1990–91, the system nevertheless proved its worth when it helped coalition forces find their way through Iraq's vast, faceless desert during Operation Desert Storm.

NAVSTAR GPS is a dual-use system consisting of a constellation of 24 satellites, plus spares, orbiting at an altitude of approximately 12,600 miles. Initially built by Rockwell and declared fully operational in April 1995, the radio-based system's ability to pinpoint objectives accurately enables military planners to use weapons such as the Joint Direct Attack Munition in highly lethal attacks that produce devastating effects.

Civilian use of NAVSTAR GPS has grown significantly in the decade since it became operational. At first, the military intentionally degraded the system's signal for all non-US military/allied users, restricting its accuracy to 100 meters. In 2000, however, the government permitted capable civilian systems to obtain accuracies of three meters or less, thus opening NAVSTAR GPS to use by law-enforcement personnel, outdoor enthusiasts, travelers, and traditional maritime/aviation civilian counterparts. New applications that capitalize on the technology continue to appear on the market. Some current and future military/civilian applications of NAVSTAR GPS include the following:

- Indoor-outdoor personnel-location/lost-child systems.
- Antisubmarine warfare.
- Nationwide joint operations with civilian emergency responders in the homeland-security environment by virtue of the common grid (Military Grid Reference System/US National Grid).
- Determination of current and remote position by special-forces forward observers.
- Delivery of Joint Direct Attack Munitions and Joint Standoff Weapons.
- Updating and improvement of maps for military/community planning and the placement/location/relocation of utilities.
- Mine/minefield location.
- Precision, all-weather navigation of military/commercial ships, vehicles, and aircraft.
- Pedestrian navigation.
- Remote control of unmanned land vehicles.
- Weather sensors for weather forecasting and sea-state determination.
- Unmanned aerial vehicles such as Global Hawk.

### To Learn More . . .

*GPS World.* On-line. Internet. Available from <http://www.gpsworld.com/gpsworld>.

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Spires, David N., et al. *Beyond Horizons: A Half Century of Air Force Space Leadership*. Rev. ed. Maxwell AFB, Ala.: Air Force Space Command in association with Air University Press, 1998.

\*The information presented here is adapted from material available in various USAF NAVSTAR GPS fact sheets and from Michael Russell Rip and James M. Hasik's *The Precision Revolution: GPS and the Future of Aerial Warfare* (Annapolis: Naval Institute Press, 2002).