STARFIRE™

- Global Satellite Based Augmentation System (GSBAS)
- Real-time Five Centimeter Global Accuracy
- Worldwide Coverage
- No Base Station Needed
- Fully Redundant, Global, Geo-Stationary Satellite Coverage

POSITIONED BY
STARFIRE

NAVCOM
A John Deere Company

www.navcomtech.com

THE POWER TO DO IT ALL

The StarFire Network is the world's first Global Satellite Based Augmentation System (GSBAS) capable of real-time five centimeter accuracy. Performance is no longer a function of your distance from a reference station, so you have the freedom to use StarFire anywhere in the world.

REAL-TIME GLOBAL ACCURACY

- Less than 5 cm one-sigma per horizontal axis (10 cm vertical) using NavCom algorithms and receivers
- No local base station / radio comm. link required
- Global availability

METHODOLOGY

The StarFire Network is a major advance from earlier ground based augmentation systems because it considers each of the GNSS satellite signal error sources independently. GNSS satellite orbit and clock corrections are calculated from a global tracking network of dual frequency receivers. These corrections are transmitted via geo-stationary satellite links direct to StarFire receivers, resulting in minimal data latency and worldwide operation with a minimum 10° look angle to the geostationary satellites. All StarFire receivers use a multi frequency GNSS receiver that measures the ionospheric delay for each satellite. Tropospheric zenith delays are calculated from a multi-state time and position model aided by redundant satellite observables.

RELIABILITY

- 99.999% availability[1]
- Extensive monitoring through internal checks
- Real-time monitoring of global positioning results
- Redundancy throughout all segments of the system

Redundant data links, geographically separated processing hubs and dual satellite uplink equipment ensure continuous reliable positioning. The system is inherently robust with the ability to calculate a full set of corrections even if multiple reference stations were to become unavailable.

StarFire Over IP delivery allows user to receive StarFire corrections over the internet, which is ideal for environments where StarFire satellite delivery might be unavailable, such as deep urban canyons or very high latitude locations.

APPLICATIONS

StarFire receivers are available as fully integrated units or modular systems. Applications that can benefit from StarFire performance, accuracy and availability include:

- Land Survey
- Offshore Positioning
- Precision Agriculture
- Aerial Photogrammetry and LIDAR
- GIS and Asset Mapping
- Machine Control
- Unmanned Vehicles
- Government & Military

SYSTEM INTEGRITY

A global network of multi frequency GNSS receivers provide raw data every second via reliable redundant data links to two network processing centers located in California, (S.W., USA) and Illinois, (N.E., USA). These receivers are tied to the latest realization of the International Terrestrial Reference Frame (ITRF) coordinate system. StarFire's primary time reference is coupled to the International Atomic Time standard.

The network is a fully automated continuously self-monitoring system overseen around the clock by StarFire Network operators. The GSBAS correction algorithms were independently developed by NavCom. Orbit and clock corrections from both processing centers are distributed via dedicated circuits with multiple communication backups to three geostationary satellite uplink stations. An independent network of StarFire user equipment continuously monitors system accuracy to ensure maximum reliability.
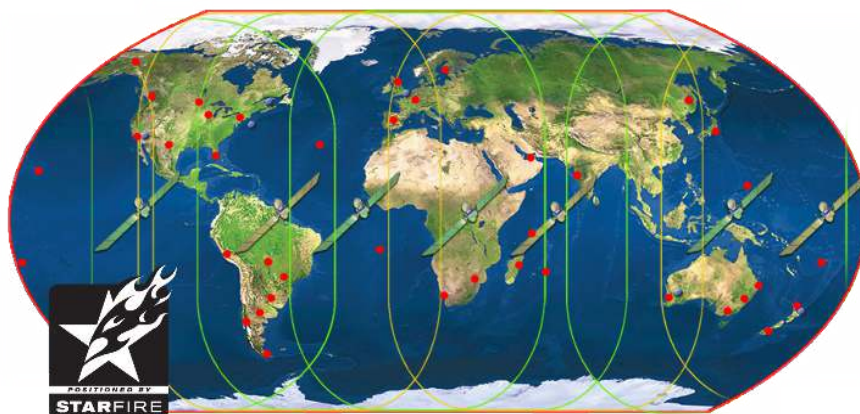
PERFORMANCE

Using any of NavCom's StarFire GNSS receivers provides better than 5 cm horizontal and 10 cm vertical accuracy (1 sigma).

Unlike DGPS positions that are relative to the reference station location, StarFire produces absolute, ITRF positions anywhere, any time. StarFire accuracy is independent of the distance to the nearest reference station.

[1] Performance dependent on location, satellite geometry, atmospheric conditions and GNSS corrections

StarFire Network Coverage Area

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