DIFFERENTIAL GPS[1]

Differential Global Positioning System (DGPS) is an enhancement Global Positioning System that uses a network of fixed ground based reference stations to broadcast the difference between the positions indicated by the satellite systems and the known fixed positions. These stations broadcast the difference between the measured satellite pseudoranges and actual (internally computed) pseudoranges, and receiver stations may correct their pseudoranges by the same amount. DGPS was especially useful when GPS was still degraded using "Selective Availability", because it could improve accuracy to 5–10 metres. The European DGPS network has been mainly developed by the Finnish and Swedish maritime administrations in order to improve safety in the archipelago between the two countries. The US Department of Transportation, in conjunction with the Federal Highway Administration, the Federal Railroad Administration and the National Geodetic Survey appointed the United States Coast Guard as the maintaining agency for the US Nationwide DGPS network. The centralized Command and Control unit is USCG Navigation Center, based in Alexandria, VA. The USCG has carried over it's NDGPS duties after the transition from the Department of Transportation to the Department of Homeland Security. There are 84 currently broadcasting NDGPS sites in the US network, with plans for up to 128 total sites to be online within the next 15 years.

[1] Adaptado de http://en.wikipedia.org/wiki/Differential_GPS

A reference station calculates differential corrections for its own location and time. Users may be up to 200 nautical miles (370 km) from the station, however, and some of the compensated errors vary with space: specifically, satellite ephemeris errors and those introduced by ionospeheric and tropospheric distortions. For this reason, the accuracy of DGPS decreases with distance from the reference station. The problem can be aggravated if the user and the station lack "intervisibility"—when they are unable to see the same satellites. The United States *Federal Radionavigation Plan* and the IALA *Recommendation on the Performance and Monitoring of DGNSS Services in the Band 283.5–325 kHz* cite the United States Department of Transportation's 1993 estimated error growth of 0.67 m per 100 km from the broadcast site but measurements of accuracy in Portugal suggest a degradation of just 0.22 m per 100 km.

References

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