

NavtechGPS Acronyms and Glossary of GNSS Terms

NavtechGPS® created this glossary of GPS and GNSS-related acronyms and terms for your convenience and personal use. We encourage you to link to this reference. You may individually distribute this, *provided* it is distributed in its entirety with the copyright information included for editorial use only with proper accreditation to NavtechGPS®. This file, or any portion of this file, may not be altered, sold or used for advertising, advertorial, promotional or other commercial activity.

NavtechGPS® and the NavtechGPS® logo are trademarks of NavtechGPS, Inc., registered in the United States and in other countries. All other trademarks used in this work are property of their respective owners and NavtechGPS® makes no claim with respect to them.

1D, 1-D	One-dimensional
2d, 2D, 2-D	Two-dimensional
2 DRMS, 2drms	Two-dimensional (or distance) root mean square; analogous to a 2D 2-standard deviation statistic. 2DRMS represents a 2-dimensional ellipse containing 95% (or greater) of the independent, uncorrelated position points in a measurement distribution. It may also represent the 2D, 2σ accuracy of a navigation system.
3D, 3-D	Three dimensional
A	
AAIM	Aircraft Autonomous Integrity Monitoring
ABAS	Airborne-Based Augmentation System
Absolute Positioning	Positioning mode in which a position is identified with respect to a well-defined coordinate system, commonly a geocentric system (i.e., a system whose point of origin coincides with the center of mass of the earth).
A/C	Aircraft
Accuracy (in GPS)	The degree of conformance between the estimated or measured position, velocity, and/or time of a GPS receiver determination and its true position, time and/or velocity using an accepted standard. Radio navigation accuracy is usually presented as a statistical measure of error and can be characterized as follows:
	Predictable Accuracy. The accuracy of a radio navigation system's position solution with respect to the geodetic, or the most accurately known, position information. Both the navigation system position solution and the reference information must be based upon or converted to the same measurement datum.
	Repeatable Accuracy. The accuracy with which a user of a navigation system can return to a position. The position is one whose coordinates have been measured at a previous time with the same navigation system.
	Relative Accuracy. The accuracy with which a user can determine position relative to that of another user of the same navigation system at the same time. For real time applications, this normally requires the use of a data link between both user systems.
ACSM	American Congress of Surveying & Mapping
ACU	Antenna Control Unit
A/D	Analogue/Digital, or Analogue to Digital (converter)
ADC	Analogue to Digital Converter
ADF	Automatic Direction Finder
ADI	Altitude Direction Indicator
ADR	Accumulated Delta Range
ADS	Automatic Dependent Surveillance
AE	Antenna Electronics
AEEC	Airlines Electronic Engineering Committee
AEP	Architecture Evolution Plan
AES	Aerospace and Electronics Systems Society

AFB	Air Force Base
AFCRL	Air Force Cambridge Research Laboratory (now Phillips Laboratory)
AFGD	Air Force Geophysics Directorate (was AFCRL)
AFI	Automatic Fault Indication
AFS	Air Force Station
AFSCF	Air Force Satellite Control Facility
A/G	Air to Ground
AGD	Australian Geodetic Datum
AGL	Above Ground Level
A-GPS	Assisted GPS
AHRS	Attitude and Heading Reference System
AIMS	Airspace Information Management System
AJ	Anti-Jamming
AKM	Apogee Kick Motor (See “Apogee”)
Allan Deviation	A method to characterize clocks. Others are Modified Allan, Hadamard Variance and Théo1, ThéoH
Almanac	A data file for a given constellation that contains coarse orbit information for all satellites. At times, the almanac is considered to also include clock corrections and atmospheric delay parameters but these are provided in separate sub-frames of the GPS data message. The almanac is transmitted by GPS satellites to facilitate rapid satellite acquisition by GPS receivers. 12.5 minutes is required to load an almanac on a new receiver.
Almanac Data	A set of parameters similar to the more precise ephemeris data, used for approximating the GPS satellite orbits.
Ambiguity or carrier cycle ambiguity	The number (N) of whole carrier signal wave lengths(cycles) between a GPS satellite and a GPS receiver or a defined part of the path. This is important in the use of relative carrier phase measurement techniques.
Analog or Analogue	A type of transmission characterized by variable values representing information, contrasted with the typical binary characteristics of digital data. A clock with moving hands is an analog device, whereas a clock with electronically displayed numbers is a digital device. Modern computers are invariably digital, but when they communicate over telephone lines, their signals normally must be converted to analog form using a modem (a modulator/ demodulator). The analog signal is converted back to a digital form before being delivered to the destination computer.
Anti-spoofing	Anti-spoofing (A-S) in GPS is the process whereby the P-codes used in the precise positioning service (PPS) are encrypted. The resulting encrypted codes are known as the Y-code. The Y-codes can be used only by receivers with decryption capability. This mode of operation provides protection to equipped GPS user equipment from signal spoofing, or the transmission of signals replicating the true GPS signals, by adversaries and others. The use of these signals can cause hazardous and misleading information to GPS users unless anti-spoofing methods, such as signal encryption, are employed.
Anywhere Fix (GPS)	The ability of a GPS receiver to start position calculations without being given an approximate location and time.
AoA	Analysis of Alternatives
AoA	Angle of Attack
AOL	Airborne Optical Laser
AOPA	Aircraft Owners and Pilots Association
APL	Airport pseudolites
Apogee (GPS)	The point in the elliptical orbit of a satellite that is the greatest distance from the center of the earth.
Application Software	These programs accomplish the specialized tasks of the user, while operating system software allows the computer to functionally operate as designed. A computer-aided dispatch system is application software, as are word processing and graphics programs.
APT	Asia Pacific Telecommunity
ARCS	Automatic Route Control System
ARINC	Aeronautical Radio, Inc.
ARNS	Aeronautical Radionavigation Service (a band in the radio spectrum)

ARP	Antenna Reference Point
ARTCC	Air Route Traffic Control Center (FAA facility)
ARTEMIS	Advanced Relay Technology Mission (GEO navigation satellite)
A-S	Anti-spoof (also see "Spoofing")
ASAT	Anti-satellite
ASCII	American Standard Code for Information Interchange
ASIC	Application Specific Integrated Circuit
Assisted GPS	Techniques that integrate GPS/comm, especially wireless.
ASOS	Automated Surface Observing System
A&T	Acquisition and Technology
ATC	Air Traffic Control
ATCRBS	Air Traffic Control Radar Beacon System
ATE	Automatic Test Equipment
ATM	Air Traffic Management
Atomic Clock	Any of a variety of highly stable, precise and accurate timekeeping devices that are based typically on the state transition behavior of particular elements, such as cesium, hydrogen and rubidium in their gaseous phase.
ATON	Autonomous Navigation
Atmosphere	The layers of various densities of gases enveloping the earth, starting with those furthest out: Exosphere (part of the ionosphere) Thermosphere (part of the ionosphere) Mesosphere Stratosphere Troposphere
Attenuation	Reduction in the strength or amplitude of a signal.
Automatic Vehicle Location, AVL	A type of system to track or automatically locate a vehicle.
Availability	The percentage of time over a defined interval that the services of a navigation system can be used within a particular coverage area while meeting specific user requirements. Signal availability is the percentage of time that navigational signals transmitted from external sources are available for use and meet specific operational performance requirements.
AVCS	Attitude and Velocity Control System
AVL	Automatic Vehicle Location
AVLN	Automatic Vehicle Location and Navigation
AWOS	Automated Weather Observing System
Azimuth	The horizontal angle clockwise from north to the location of the satellite in the sky
B	
Bandwidth	The range of frequencies included in a radio signal, usually specified as greater than a given power level (such as a half power level, or -3dB.) It is expressed in Hertz (Hz) with the relative power level at band extremes normally specified.
BaroVNAV	Barometric Vertical Navigation
Baseline	A baseline consists of the three dimensional vector between a pair of GPS stations. Also, the vector distance between two points.
Base Station (GPS)	A base station is a GPS receiver at a known position specifically established to collect differential correction data for other GPS receivers in a given region. Base station data is used to calculate the errors relative to its known position which are provided to other users. The "relative difference" between the base station's known position and the position calculated from GPS satellite signals become the basis for the corrections provided to other GPS receivers. Corrections can be transmitted in real-time, or used during later post-processing. A base station is also called a reference station.
BBS	Computer Bulletin Board Service
BCD	Binary Coded Decimal

BeiDou	The name of the satellite navigation system created by People's Republic of China, named after the constellation of stars used to locate the North Star. See also Compass below, which is not an acronym, but the English translation of Beidou, most often spelled BeiDou.
BER	Bit Error Rate
BIH	Bureau International de L'Heure
BIPM	International Bureau of Weights and Measures (Bureau de Poids et Mesures).
Bit	A binary 1 or 0 or one of the two states possible in a binary digital sequence.
Block I, II, IIR, IIF Satellites or Spacecraft (S/C)	The various generations of GPS satellites: Block I spacecraft (S/C) were developmental satellites that began launch in February, 1978; Block II and IIA S/C are operational spacecraft used to populate the 24 operational slots in the NAVSTAR baseline constellation; Block IIR and IIR-M S/C are replenishment satellites; and Block IIF S/C are the follow-on generation of GPS S/C.
BOC	Binary Offset Carrier
bps	Bits Per Second
BPSK	Bi-Phase Shift Keying
BTS	Bureau of Transportation Statistics
C	
C31	Command, Control, Communications and Intelligence
CAA	Civil Aviation Authority (UK)
C/A-Code	Coarse/Acquisition-Code: the GPS code which is freely available to civilian users, modulated on the L1 carrier at a frequency of 1.023 MHz
CAD	Computer Aided Design
Cadastral	Definition of cadastral in US English - (of a map or survey) showing the extent, value, and ownership of land, especially for taxation. Ref.: The Oxford Dictionary
CADC	Central Air Data computer
CAF	Cross Ambiguity Function
Carrier	The fundamental unmodulated RF signal. A radio signal having frequency and amplitude that may be varied from a reference value by modulation.
Carrier-Aided Tracking	A signal processing technique that uses certain characteristics of the GPS carrier signal (especially its Doppler shift) to provide a low noise signal for aiding the pseudorandom codes.
Carrier Frequency	Continuous electromagnetic radiation of constant amplitude and frequency emitted by a radio transmitter
Carrier Phase Measurement	Relating to the relative phase difference measurement between two or more GPS carrier signals.
Cartesian/Geocentric Coordinates	A system of defining position which has its origin at the center of the earth with the x- and y-axes in the plane of the equator. Typically, the x-axis passes through the meridian of Greenwich, and the z-axis coincided with the agreed upon value for the earth's axis of rotation.
CC	Convolutional Coding
CDDIS	Crustal Dynamics Data Information System
CDMA	See Code Division Multiple Access
CDU	Control Display Unit
CE50	Circular Error containing 50 percent probability
CE90	Circular Error containing 90 percent probability
CEP	Circular Error Probable
CEPT	European Conference of Posts & Telecommunications
Cesium Clock (Cs Clock)	An atomic clock based on the atomic transitions in gaseous cesium. Cesium Beam Automatic Standard Clock)
Channel	A channel of a GPS receiver consists of the signal and operations on the signal from a single GPS satellite.
Chip	The period or interval of time to transmit either a "0" or a "1" in a binary sequence. An integrated circuit.
Chipping rate	The bit rate, or rate at which binary digits are produced. Expressed as chips per second (cps). For example, the C/A-code chipping rate is 1.023 Mcps.
CGIC	Civil GPS Information Center (at the NAVCEN, Alexandria VA)
CGIS	Civil GPS Information Service

CGM	Common GPS Module
CIGNET	Cooperative International GPS Network
CGSIC	Civil GPS Service Interface Committee
Circular Error Probable - CEP	In a circular normal distribution, the radius of the circle that contains 50 percent of all the random samples in a 2-D region.
CIS	Conventional Inertial System
CL	Civil Long Code (as on L2C). This code is data free.
Clock bias	The difference between the GPS receiver clock's time and GPS time as established by the control segment.
Clock Offset	The difference in the time reading between two clocks.
cm	Centimeter
CM	Civil Moderate-Length Code (as on L2C). This code carries the navigation data.
CMOS	Complementary Metal Oxide Semiconductor
CNAV	Civil NAVigation message (as on L5 and L2C)
C/No	Carrier Energy to Noise Density Ratio
CNS	Communications, Navigation and Surveillance
Coarse/Acquisition-Code	The coarse/acquisition-code is modulated onto the GPS L1 signal. This code is a sequence of 1,023 pseudorandom binary bits modulated on the GPS carrier at a chipping rate of 1.023 Mcps, resulting in a code repetition period of 1 millisecond. The code was selected to provide good acquisition properties. Also known as the "civil code since it is the only GPS signal generally used by the civil community."
Code Division Multiple Access, CDMA	A method of frequency reuse whereby many radios use the same frequency but each one has a unique code. GPS uses CDMA techniques with Gold codes to obtain excellent cross-correlation properties.
Code Phase GPS	GPS measurements based on the pseudo random code [C/A or P(Y)] as opposed to the use of the carrier of the signal.
Comm	Communications
Compass	Not an acronym, but the English translation of BeiDou, which literally means the Northern Dipper and refers to the constellation of stars used to locate the North Star. BeiDou (oftentimes spelled Beidou) is the name of the satellite navigation system created by People's Republic of China.
Continuous Tracking Receiver	A receiver design which includes four or more channels to simultaneously track four or more satellites.
Control Point	A point at which coordinates have been assigned that are of an agreed upon confidence level.
Control Segment	A world-wide network of GPS monitor and control stations responsible for maintaining the accuracy of satellite positions, clocks, and health.
CONUS	Continental United States (48 states, not including Hawaii or Alaska)
Coordinate System	One of a number of systems used to represent positions in space. Examples are latitude/longitude/altitude and state plane coordinates.
CORS	Continuously Operating Reference Station
Cos	Cosine
COTS	Commercial Off-the-Shelf
CRPA	Controlled Radiation (reception) Patterned Antenna
CPFF	Cost Plus Fixed Fee
CPM	See Carrier Phase Measurement
Cps	Chips per second
CRT	Cathode Ray Tube
Cs	Cesium
CS, C/S	Control Segment
CSOC	Consolidated Space Operations Center (at Schriever AFB, Colorado Springs, CO)
CW	Continuous Wave
Cycle Slip	A discontinuity in the measured carrier phase usually resulting from a temporary loss-of-lock in the carrier tracking loop of a GPS receiver.

D	
DAC	Digital to Analog Converter
DAS	Distributed Antenna Systems
DARPA	Defense Advanced Research Projects Agency
Data Message (GPS)	A message included in the GPS signal which reports the observed satellite's ephemeris, or predicted path, clock corrections and health. Includes almanac data that provides approximate information on the paths of other satellites and other status information.
Datum	A datum is a horizontal or vertical reference system for making survey measurements and computations. Horizontal datums are frequently ellipsoids. Improving technology has led to more precise values for the geographic points over time; to use recently collected data in conjunction with preexisting data, it is necessary to match datum and coordinate systems between the data sets. Some examples of datums are NAD-27 and WGS-84 (North American Datum 1927, World Geodetic System, 1984.
Db	Decibel
DBm, dBm	Decibels Relative to a milliwatt
DBw, dBw	Decibels Relative to a Watt
Deg	Degree
DGPS	Differential GPS
Differential GPS Positioning, DGPS	A technique used to improve positioning or navigation accuracy by canceling the common components of positioning error between a known location and a remote location. This is accomplished in near real-time by the transmission of a differential correction to the remote receiver by the use of a data link.
Digital	Generally, information is expressed, stored and transmitted by either analog or digital means. In a digital form, this information is seen as information in a binary (or n-ary) sequence.
Dilution of Precision - DOP	The multiplicative factor that relates ranging errors to position errors caused by the geometry of the user and the set of satellites in view at the time. Standard terms for the GPS application are: GDOP: Geometric (3 position coordinates plus clock offset in the solution) PDOP: Position (3 coordinates) HDOP: Horizontal (2 horizontal coordinates) VDOP: Vertical (height only) TDOP: Time (clock offset only) RDOP: Relative (normalized to 60 seconds). The lower the # the better.
Distance Root Mean Square - drms	The root-mean-square value of the distances from the true position in a collection of measurements. As typically used in GPS positioning, 2 drms is the radius of a circle that contains 95 percent of a large set of independent measurements. Also see 2 DRMS.
Dithering	The deliberate introduction of digital noise. This is the process the DoD used to add inaccuracy to GPS signals to induce Selective Availability.
DL	Data link
DLL	Delay-Locked Loop
DMA	Defense Mapping Agency (then NIMA and now NGS)
DME	Distance Measuring Equipment
DOC	U.S. Department of Commerce
DoD, DOD	U.S. Department of Defense
DOI	U.S. Department of the Interior
DOJ	U.S. Department of Justice
DOP	See Dilution of Precision
Doppler-Aiding	A signal processing strategy that uses measured Doppler shift data to help the receiver smoothly track the GPS signal, providing a more precise measurement of velocity and position.
Doppler Shift	The apparent change in the frequency of a signal caused by the relative motion between the transmitter and receiver. Example: sound heard when a train passes your ears.
DoT, DOT	U.S. Department of Transportation
DPR, dPR	Differential pseudorange
DPRC	Differential pseudorange correction
DR	Delta Range or Dead Reckoning, Deduced Reckoning

DRAIM	Differential RAIM
DRMS	See Distance Root Mean Square Also see 2DRMS
DRS	Dead Reckoning System
DSARC	Defense Systems Acquisition Review Committee
DTC	Dry Term Correction (in troposphere)
DT&E	Development, Test and Evaluation
D/U	Desired-to Undesired Ratio (normally expressed in dB)
E	
ECEF	Earth-Centered, Earth-Fixed Coordinate System. A Cartesian coordinate system where the x-direction is in the direction of the intersection of the prime meridian (Greenwich Longitude) with the equator. The z-axis is the agreed upon direction of the Earth's spin, or the earth's geographic polar, axis. The y-axis is in the direction of advance of a right-handed screw when the x-axis is rotated in the direction of the z-axis. The position vectors rotate with the earth and all positions in this reference frame are relative to the rotating earth (e.g., the fixed Latitude and Longitude) coordinate system.
Eb/No	Energy-per-bit divided by noise spectral density (normally expressed in dB)
EC	European Commission
Eccentricity	The ratio of the distance between foci of the ellipse to the major axis distance. Or, the ratio of the distance from the center of an ellipse to a foci divided by the semi-major axis distance.
ECDIS	Electronic Chart Display & Information System
ECEF	Earth-centered, Earth-fixed
ED	European Datum
EDM	Electronic Distance Measurement
EFIS	Electronic Flight Instrument System
EGNOS	European Geostationary Navigation Overlay System
EIRP	Effective Instantaneous Radiated Power
Elevation	The height above a reference point or the distance measured normal to a reference frame. For example, altitude is frequently considered as the height above mean sea level, or the vertical distance above the geoid.
Elevation Angle	An angle measured above and relative to the horizon.
Elevation Mask Angle	Usually a user definable angle (in degrees) below which data measurements from a satellite will not be used. The mask angle value is typically set to avoid excessive degradation of the signal from the effects of the ionosphere, troposphere and multipath.
ELINT	Electronic Intelligence
eLORAN	Enhanced Long-Range Navigation, a regional, two dimensional form of navigation which relies on signals from ground based antennas.
Ellipsoid	In geodesy, a mathematical figure formed by revolving an ellipse about its minor axis. It is often used interchangeably with spheroid. Two quantities define an ellipsoid, the length of the semi-major axis (a) and the flattening, $f = (a - b)/a$, where b is the length of the semi-minor axis. Prolate and triaxial ellipsoids are usually described as such.
Ellipsoid	A solid figure for which all plane sections through one axis are ellipses and through the other are ellipses or circles.
Ellipsoid Height	The measure of vertical distance above the ellipsoid. Not the same as elevation above sea level.
ELVs	Expendable Launch Vehicles
EM	Electromagnetic
EMC	Electromagnetic Compatibility
EMCON	Emission Control
EMD	Engineering Manufacturing Development
EMI	Electromagnetic Interference
EMP	Electromagnetic Pulse
EOL	End of Life
Ephemeris	The predictions of current satellite positions transmitted to the user in the data message. A list of accurate positions or locations of a celestial object as a function of time. Available as "broadcast ephemeris" or as post-processed "precise ephemeris."

Ephemeris Parameters	A set of parameters used in defining the orbit of a celestial body or of a satellite
Epoch	The initial or recurring start time for a process.
EPS	Electrical Power System
ERP	Effective Radiated Power
Error Budget	A breakdown or listing of statistical errors for various contributors, which, when combined together, make up the total expected error for a process.
ESA	European Space Agency (headquartered in Noordwijk, The Netherlands)
ESGN	Electrically Suspended Gyro Navigator
ETA	Estimated Time of Arrival
ETRF	European Terrestrial Reference Frame
EU	European Union
EUROCAE	European Organization for Civil Aviation Equipment Standardization
EW	Electronic Warfare
F	
FAA	U.S. Federal Aviation Administration (part of the Department of Transportation)
FANS	Future Air Navigation Systems (prior activity of ICAO)
Fast-Multiplexing Channel (GPS receiver)	see Fast-switching channel
Fast-Switching Channel (GPS receiver)	A single channel receiver that rapidly samples the pseudoranges of a number of GPS satellites. "Fast" usually means that the switching time is sufficiently fast (typically 2 to 5 milliseconds) to recover the data message.
FBM	Fleet Ballistic Missile
FCC	U.S. Federal Communications Commission
FCC	Fire Control Computer (JPO version)
FDE	Fault Detection and Exclusion
FDI	Fault Detection and Isolation
FEC	Forward Error Correction Coding
FHWA	Federal Highway Administration
FIG	Federation Internationale des Geometres
Figure of Merit (FOM)	An indication of the navigational quality of a military receiver, represented by a digit between 0 and 9.
FGCC	Federal Geodetic Control Committee
FLL	Frequency-Locked Loop
FMI	Flexible Modular Interface
Frequency Band	A particular range of frequencies in a region of the electromagnetic spectrum.
Frequency Spectrum	A range of frequencies associated with a signal. Also, the distribution of signal amplitudes as a function of frequency of the constituent signal.
FRA	Federal Railroad Administration
FRP	Federal Radionavigation Plan, published by the DoT. Available online.
FRPA-GP	Fixed Radiation Pattern Antenna - Ground Plane
FSK	Frequency Shift Keying
FTA	Federal Transit Administration
FY	Fiscal Year
G	
GAAS	Gallium Arsenide Semiconductor
GAGAN	GPS Aided Geo Augmented Navigation system. GAGAN is the SBAS implementation by the Indian government.
Galileo	A navigation satellite system under development and implementation by the European Commission of the European Union, the European Space Agency and European industry. The Galileo system is planned for initial operation by 2008 and, although autonomous, is expected to be used primarily with GPS.
GATM	Global Air Traffic Management (Air Force)

GBAS	Ground-Based Augmentation Services
GDM	General Development Model
GDOP	See Dilution of Precision
GEO	Geostationary Earth Orbit
Geodesy	The science related to the determination of the size and shape of the Earth, the location of points on the Earth, its gravity field, the properties of its interior and the time variations of these.
Geodetic Datum	A mathematical model designed to best fit part or all of the geoid. It is defined by an ellipsoid and the relationship between the ellipsoid and a point (or points) on the topographic surface established as the origin of the datum.
Geodetic Surveys	Global surveys done to establish control networks (comprised of reference or control points) as a basis for accurate land mapping.
Geoid	The particular equipotential surface that coincides with mean sea level and that may be imagined to extend through the continents. This surface is everywhere perpendicular to the force of gravity.
Geoid Height or Geoidal Height	The height above the geoid is often called elevation above mean sea level.
GES	Ground Earth Station
GHz Gigahertz	One billion Hz. 10×10^9 Hz.
GIS	Geographic Information System
GLONASS	Global Orbiting Navigation Satellite System of the Russian Federation. The Russian Federation's equivalent to the American NAVSTAR GPS. GLONASS was designed to provide worldwide coverage. The GLONASS design has three orbital planes containing eight satellites each. The constellation has had only 8-12 S/C for the past several years (c.2004) and is not currently providing worldwide service.
GMT	Greenwich Mean Time. The time at zero degrees latitude in Greenwich, England
GNSS	Global Navigation Satellite System. A collective name for all of the satellite navigation systems that have been deployed by various countries. The term includes GPS, GLONASS, Galileo, BeiDou and other space-based and ground-based segments to support global navigation, position determination and related measurements.
GPS	Global Positioning System. A U.S. DOD-sponsored and operated constellation of satellites orbiting the earth in 6 orbital planes at a nominal altitude of 10,898 nautical miles (or 20,190 km). GPS satellites transmit signals that allow the accurate passive determination of GPS receiver (antenna) locations. Receivers can be located at fixed locations, moving on the earth's surface, in the earth's atmosphere, or in low-Earth orbit. GPS is used in air, land, sea and space navigation as well as in mapping, surveying and other applications where precise positioning is necessary. The GPS civil signal is provided free to all properly equipped users on or near the earth who have a view (in general) of at least four satellites.
GPS ICD-200	The GPS Interface Control Document (ICD) is a U.S. government document that contains the technical description of the elements of the GPS signal and the interface between the satellites and the user.
GRS	Geodetic Reference System
H	
Handover Word, HOW Word	The second 30-bit word in the GPS data message subframes that provide GPS time data. It provides at six second (subframe) intervals the exact time for a particular spacecraft's transmission from the start of the current week, i.e., from midnight GPS time of the previous Saturday night. This is used for timing, including synchronization information for the acquisition of the P(Y)-code signal.
Hardware	The physical components of a system. It is also frequently considered as the physical part of a system that uses instructions to accomplish a task or operation. Reference is often made to computer "hardware" and "software". In this context, "hardware" consists of the computer (case, motherboard, drives, memory, etc.), input and output devices and other peripheral equipment.
HD	High Dynamic
HDOP	See Dilution of Precision
HDUE	High Dynamic User Equipment
Hertz, Hz	One cycle per second
HF	High Frequency

HOL	High Order Language (for computer programming)
HOW	See Handover Word
HPA	High Power Amplifier
Hrs, hrs	Hours
HSI	Horizontal situation indicator
HV	Host Vehicle
Hz	Hertz
I	
IAG	International Association of Geodesy
IALA	International Association of Aids to Navigation and Lighthouse Authorities
ICAO	International Civil Aviation Organization
ICS	Initial Control System
ICD	Interface Control Document
IEC	International Electro-Technical Commission
IEEE	Institute of Electrical and Electronics Engineers
IERS	International Earth Rotation Service
IF	Intermediate Frequency
IFF	Identification Friend or Foe
IFR	Instrument Flight Rules
IFRB	International Frequency Review Board
IGEB	Interagency GPS Executive Board
IGS	International GNSS Service
IGSO	Inclined Geosynchronous Orbits
I-Level	Intermediate Level
ILA	International LORAN Association
ILS	Instrument Landing System
IMO	International Maritime Organization
IMUs	Inertial Measurement Units
INMARSAT	International Maritime Satellite Consortium, Ltd.
INS	Inertial Navigation System
Integrity	The ability of a system to provide timely warnings to users when the system should not be used for navigation.
Intelsat	International Telecommunications Satellite Organization
Interface	A shared boundary that exists between various systems or programs. An interface is also frequently considered as the equipment or device that facilitates the interoperation of two or more systems, or system components.
I/O	Input/Output
IOC	Initial Operational Capability
ION	The Institute of Navigation (specifically, the U.S. Institute of Navigation). (www.ion.org)
IONDS	Integrated Operational Nuclear Detection System
Ionosphere (iono)	The band of charged particles between the stratosphere and the exosphere at an altitude of 50 to 250 miles above the earth's surface which represent a non-homogeneous and dispersive medium for radio signals. The free electrons in the ionosphere refract radio waves resulting in delays and direction of arrival effects on signals traversing the ionosphere.
Ionospheric Delay	A wave propagating through the ionosphere experiences delay. Ionospheric phase delay depends on the electron content of the signal path through the ionosphere and relates to the carrier signals. Group delay also depends on in the electron content and relates to the delays in the signal modulation (code) components. The phase and group delay are of the same magnitude but opposite in sign.
Ionospheric Refraction	The change in the propagation velocity and direction of a signal as it passes through the ionosphere.
IOT&E	Initial Operational Test and Evaluation
IP	Instrumentation Port or Internet Protocol

IR	Infra-red
IRNSS	Indian Regional Navigational Satellite System. IRNSS is the regional satellite navigation being developed by the Indian government.
IRU	Inertial Reference Units
ISL	Inter-Satellite Link
ISU	International System of Units
ITRF	International Terrestrial Reference Frame
ITU	International Telecommunications Union
IVHS	Intelligent Vehicle Highway System
J	
Jammer Detector	Inadvertent and deliberate GPS/GNSS signal jamming has become a considerable problem. Locating the source of the GPS signal jamming can be critical. Chronos Technology makes a number of handheld jammer detectors. The CTL3520 can detect the signal jamming and locate the jammer source.
Jamming	The interference with the reception of a desired signal typically by an intentional or unintentional signal or noise.
JCS	Joint Chiefs of Staff
JGPSC	Japan GPS Council
JPALS	Joint Precision Approach and Landing System
JPO	Joint Program Office (as in GPS JPO, El Segundo, California)
J/S	Jamming/Signal (or Jamming to Signal) ratio
JSC	Joint Spectrum Center Also, the NASA Johnson Space Center in Houston, TX.
JTIDS	Joint Tactical Information Distribution System
K	
Kalman Filter	A method for processing data to provide an optimal future estimate based upon multiple time-sequenced statistical measurements. Kalman filters typically employ numerical methods to provide an estimate for a time-varying signal in the presence of noise.
Kg	Kilogram
KHz, kHz	Kilohertz
Kinematic Surveying	Surveying that involves the rapid movement of the rover system relative to the stable reference or base station.
Km, km	Kilometer
L	
L1 Signal	The primary L-band signal transmitted by each GPS satellite is centered at 1575.42 MHz. The L1 broadcast is modulated with the C/A and P(Y)-codes and with the navigation message. Future plans call for a new military signal (the M-code). This band is 24 MHz wide as authorized by the ITU.
L2 Signal	The secondary L-band signal is centered at 1227.60 MHz. The L2 signal carries the P(Y)-codes and the navigation message data and future plans call for a second civil signal (the C-code) and a new military signal (the M-code). This band is 24 MHz wide as authorized by the ITU.
L5 Signal	GPS 3 rd civil frequency, centered at 1176.45 MHz. This band is 24 MHz wide as authorized by the 2000 ITU WRC.
LAAS	Local Area Augmentation System
LabSat®	LabSat® is a low-cost GPS / GNSS simulator (with a GLONASS and BeiDou option) for recording and replaying real GPS RF data. This allows the user to test almost any GPS device with real-world signals, from the workbench. NavtechGPS was the first U.S. company to demonstrate LabSat 3 . The LabSat 3 Wideband is capable of recording bandwidth of 56 MHz across all constellations to capture the following signals: GPS: L1 / L2 / L5; GLONASS: L1 / L2 / L3; BeiDou: B1 / B2 / B3; QZSS: L1 / L2 / L3; Galileo: E1 / E1a / E5a / E5b / E6; SBAS and IRNSS. Both can record with or without a PC.
LAN	Longitude of the Ascending Node in orbital mechanics. Defines the Earth longitude at which an inclined orbit satellite crosses the equatorial plane in its motion from the Southern Hemisphere to the Northern Hemisphere. Also used for Local Area Network

L-band	The radio frequency band extending from about 1 to 2 GHz (1000 – 2000 MHz). The GPS carrier frequencies (1575.42 MHz for L1 and 1227.6 MHz for L2) are in the L-band.
LCD	Liquid Crystal Display
LD	Low Dynamic
LED	Light Emitting Diode
LEO	Low Earth Orbit
LEP	Linear Error Probable
LF	Low Frequency
LNAV/VNAV	Lateral and Vertical Navigation
LO	Local Oscillator
LOP	Line of Position
LORAN	Long Range Navigation System
LOS	Line of Sight
Low SNR GPS	Low Signal-to-Noise Ratio GPS. Systems employing data aiding, integration and other techniques to obtain operation in poor signal areas, or in high noise areas, or both.
LRIP	Low Rate Initial Production
LRU	Line Replaceable Unit
M	
M	Meter(s) or Mega (1,000,000)
m	Meter(s) or milli (0.001)
μ Micro	Micro, one millionth
MAGR	Miniaturized Aviation GPS Receiver
MAGNAV	Magnetic anomaly navigation, a method of navigation which relies on the detection on anomalies in the magnetic field of the earth. MAGNAV is used in airborne applications but becomes less reliable at higher altitudes.
MAP	Maximum A Posteriori (as in MAP detector)
MARAD	Maritime Administration
Master Control Station, MCS	A computer processing and communications facility that gathers measurements from the Monitor Stations and uses this data to determine orbital elements, clock correction and related factors for the GPS satellites. (Located at Schriever AFB, Colorado Springs, CO)
MATLAB®	An powerful engineering mathematics software tool from MathWorks®
Mb	Megabit
MB	MegaByte or millibar
mBar	millibar
Mbps	Megabits per second
M-code	The military code on modernized GPS satellites. Uses BOC modulation.
MCMT	Mean Corrective Maintenance Time
Mcps	Megachips per second (Millions of chips per second)
MCS	See Master Control Station
MD	Medium dynamic
MDT	Mobile Data Terminal. A device, typically installed in a vehicle consisting of a small screen, a keyboard or other operator interface, and various amounts of memory and processing capabilities.
MEDLL	Multipath Estimating Delay Locked Loop
MEMS	microelectromechanical systems
MEO	Medium Earth Orbit
MF	Matched Filter
MGUE	Military GPS User Equipment
MHz	Megahertz. One million cycles per second
Microsecond	One millionth of a second. Sometimes written as μsec.
MIDS	Multifunction Information Distribution System
Millisecond	One thousandth of a second

MLS	Microwave Landing System
MLV	Medium Launch Vehicle (e.g. Delta II)
mm	Millimeter(s)
M max CT	Maximum Maintenance Corrective Time
MMD	Mean Mission Duration
MMLS	Mobile MLS
M mean CT	Maintenance Mean Corrective Time
Monitor Stations (GPS)	The worldwide group of stations used in the GPS control segment to track the satellites and obtain data on their clocks, orbital parameters and other information. Data collected at monitor stations are linked to a master control station where corrections are calculated. This correction data is uploaded to the satellites and provided to other parts of the system as needed.
MMR	Multi-Mode Receiver
MOA	Memorandum of Agreement
MOPS	Minimum Operational Performance Standards
MOU	Memorandum of Understanding (The term is used to refer to a document that generally precedes a formal legal agreement.)
MP	Manpack
MPS, mps	Meters per second
Mrad, mRad	Milliradian (0,001 radian)
M/S, mps	Meters per second
Ms, ms, msec	Millisecond
MSAS	Multi-functional Satellite Augmentation System
MSL	Mean Sea Level
MSS	Mobile Satellite Service
MTBF	Mean Time Between Failures
MTBM	Mean Time Between Maintenance (operations)
MVUE	Man/Vehicular User Equipment
Multichannel Receiver	A receiver containing multiple channels, each of which can track one satellite continuously, so that navigation solutions are derived from the set of simultaneous measurements of pseudoranges and range rates.
Multipath	Errors caused by the reflection or refraction of a signal that has reached the receiver antenna by two or more different paths. It is usually caused by one path being reflected from nearby structures or other reflective surfaces.
Multiplexing Channel	A single receiver channel that is designed to track more than one satellite signal by using a rapid sequencing process. See Fast Multiplexing Receiver.
N	
NAD-27	North American Datum of 1927. Obsolete horizontal datum of North America. NAD 27 depends upon an early approximation of the shape of the earth, known as the Clarke Spheroid of 1866, designed to fit only the shape of the conterminous United States, and utilizing a specific Earth surface coordinate pair as its center of reference.
NAD-83	The current North American Datum, 1983. NAD 83 relies on the more precise Geodetic Reference System of 1980 (GRS-80).
Nanosecond, nanosecond	One billionth of a second. 10 exp -9 seconds. The distance light travels in 1 foot.
NANU	Notice Advisory to Navigation Users
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NAV	The legacy NAVigation message (as on the C/A and P(Y) codes).
Nav	Navigation
NAVD-88	North American Vertical Datum of 1988. Effort underway by the National Geodetic Survey (NGS) to readjust the North American Vertical Datum. The NAVD 88 readjustment, when completed, will remove distortions from the continent-wide vertical geodetic (height) reference system.

Nav Message, Nav Data Message, Data Message, NAV-msg.	Navigation Message or Data Message. The navigation message broadcast by each GPS satellite at 50 bps on the L1 and/or L2 signals. This message contains data on system time, clock correction parameters, ionospheric delay model parameters, and the vehicle's ephemeris and health. The information is used to process GPS signals to give user time, position, velocity and the capabilities of the spacecraft.
NAVSTAR	One of the names given to the U.S. GPS satellite constellation. NAVSTAR is an acronym for NAVigation Satellite Timing and Ranging. The term NAVSTAR also has been used to designate specific spacecraft in the GPS constellation.
NAVWAR	Navigation Warfare
NBS	National Bureau of Standards (now NIST- National Institute of Standards and Technology))
NCA	National Command Authority
NCO	Number controlled oscillator. Also, Non Commissioned Officer
NDGPS	Nationwide Differential GPS
NDB	Non-Directional Radio Beacon
NDS	Navigation Development Satellite
NET	Not Earlier Than
NGS	National Geodetic Survey – (precursors were DMA and then NIMA)
NHTSA	National Highway Traffic Safety Administration
NIMA	National Imagery and Mapping Agency (was DMA, Defense Mapping Agency)
NIST	National Institute of Standards and Technology
Nm, nm	Nautical miles
NMEA	National Marine Electronics Association
n.mi., nm	Nautical mile
NNSS	Navy Navigation Satellite System (Transit)
NOAA	National Oceanic and Atmospheric Administration
NOSC	Naval Ocean Systems Center
NOTAM, Notam	Notice to Airmen
NPA	Non-precision Approach
NRC	National Research Council of the National Academies of Science and Engineering
NRL	Naval Research Laboratory
NSA	National Security Agency
Nsec, ns	See Nanosecond (10 exp –9 seconds)
NTDS	Naval Tactical Data System
NTIA	National Telecommunications and Information Administration
NTDS	Navy Tactical Data System
NTS	Navigation Technology Satellite
NUDET	Nuclear detection system. An auxiliary payload on the GPS spacecraft.
O	
Observation Period (GPS Survey)	The period of time over which GPS data is collected. In the survey field, it indicates the period during which data is simultaneously collected by two or more receivers.
OBS	Omni Bearing Select
OCC	Operational Control Center
OCS	Operational Control Segment or Operational Control System
0 dBi	0 decibels isotropic (unity gain) – the gain of an idealized omni-directional antenna
OEM	Original equipment manufacturer
OMB	Office of Management and Budget
OmniStar®	OmniSTAR® provides space-based GNSS correction services that can improve the accuracy of a GNSS receiver for precise positioning applications
Orbit	The path followed by a satellite or celestial body as it moves through space around a central force field.
OSD	Office of the Secretary of Defense

P	
P-channel	Precision code channel
PCM	Pulse code modulation
P-code	See Precise Code
PDD	Presidential Decision Directive (as in removal of S/A)
PDF	Probability Density Function
PDOP - Position Dilution of Precision (x, y, z)	A geometric dependent term expressing the relationship between the errors in user position and the errors in the ranging measurements to the satellites. PDOP is a function of the geometric configuration of satellites from which signals are derived for position (see DOP). PDOP typical values range between 2 and 4. They vary continuously since the satellites are continuously in motion providing a changing geometry.
PDOP Mask	Usually a user-definable upper limit for the PDOP that will be tolerated during collection of a dataset. If PDOP becomes greater than the pre-set limit, GPS data collection will be suspended or the data will be notated until the PDOP decreases below the limit.
Perigee	The point in the orbit of a satellite that is closest to the center of the earth.
Phase Lock	The technique where the phase of an oscillator signal is made to follow closely the phase of a reference signal. The receiver first compares the phases of the two signals, and then uses the resulting phase difference signal to adjust a reference oscillator.
PL	See Pseudolite
PLGR	Precise Lightweight GPS Receiver or P-code Lightweight GPS Receiver
PLL	Phase-locked Loop
PLRS	Position Location and Reporting System
PN, PRN	Pseudo Noise (see pseudo random noise, PRN)
Point Positioning	A geographic position produced from one receiver in a standalone (or autonomous) mode.
Point Solution	An instantaneous position solution that uses current pseudo-range measurements from four or more satellites.
Position	The latitude, longitude, and altitude of a point or other designation for a point using three independent coordinates. An estimate of error is often associated with a position.
Post-Processed Differential GPS	Differential GPS operation in a post-processed mode employs data collection and computational techniques that do not require the base and rover receivers to have a data link connecting them. Each receiver independently records data. This data is later processed with data from other receivers taken during the same time period. The set of satellites used in later processing must be common to all receivers collecting data. Differential correction post processing software is used to combine and process the data collected.
Power Spectral Density	The power content of a signal relative to the signal's frequency
Ppm, ppm	Parts Per Million
PPS	See Precise Positioning Service
PR	Pseudorange
PRC	Pseudorange Corrections
PRE	Pseudorange Error
Precise (or Precision) Code (P-Code)	The GPS precise, or precision code, is authorized primarily for military use. It consists of a very long sequence of pseudo-random binary bits that are bi-phase modulated on the GPS carriers at a chipping rate of 10.23 Mcps. These repeat about every 267 days. One-week segments of this code are assigned to the GPS spacecraft forming codes that have a one-week period.
Precise Positioning Service (PPS)	The most capable level of military dynamic positioning accuracy provided by GPS, typically using the P(Y)-codes in the dual-frequency mode. PPS is also frequently used in the single frequency mode (such as with the PLGR).
PRN	Pseudorandom noise (modulation)
Pseudodelay	The delay between the transmission of the signal from a satellite and receipt by the receiver plus the difference between receiver and system time.
Pseudolite (shortened form of pseudo-satellite)	A ground-based transmitter that broadcasts a signal similar to that of a GPS satellite. Pseudolites are typically used to improve geometric solutions in a local area. The data portion of the signal may also contain differential corrections and other information (such as integrity) that can be used by receivers.

Pseudorandom Code, PRN code, PN code	A signal consisting of a sequence of binary bits that have random noise-like properties but which, in fact, have a well-defined deterministic sequence pattern.
Pseudorandom Noise Codes	A sequence of digital 1's and 0's that appear to be randomly distributed and have noise-like properties but are, in fact, generated with reproducible properties. An important characteristic of PRN codes is a low autocorrelation value for all delays except when the codes coincide. Each GPS satellite transmits unique C/A and P(Y)-code pseudorandom-noise codes.
Pseudorange	A distance measurement between a satellite and a receiver (antenna), based on the correlation of a satellite-transmitted code and the local receiver's reference (replica) code.
PSK	Phase Shift Key
PTTI	Precise Time and Time Interval
PVT	Position, Velocity and Time
P/Y Code	Precision-code or / Encrypted P-code
Q	
QPSK	Quadrature Phase Shift Keying
QZSS	Quazi-Zenith Satellite System. The satellite system authorized by Japan.
R	
RAAN	Right Ascension of the Ascending Node
RAIM	Receiver Autonomous Integrity Monitoring
RAJPO	Range Applications Joint Program Office (now RISPO)
Radionavigation	The determination of position, or of information relating to position and navigation by means of the propagation properties of radio waves. GPS is a method of radionavigation.
Range	A distance between two points, such as between a satellite and a GPS receiver.
Range Rate	The rate of change in the distance (range) between a satellite and receiver or other range measurement. The range to a satellite continually changes due to satellite and observer motion. Range rate is determined by measurement of the Doppler shift of the satellite carrier signal.
R&D	Research and development
Rb	Rubidium. An element used in some types of atomic standard clocks.
Rcvr, Rec.	Receiver
RDF	Radio Direction Finder
RDSS	Radio Determination Satellite Service
Real-Time Differential GPS	A position improvement process whereby a GPS receiver receives real-time correction data from another source in order to remove the effects of bias errors. One way to obtain correction data is by the use of a GPS receiver located at a known position (typically known as a base station). The GPS receiver at the known position computes, formats, and transmits corrections usually through a data link with each new GPS observation. The rover unit receives the GPS corrections and applies the corrections to its current observations. Other sources of correction data include satellite-based systems such as OMNISTAR, StarFire, CORS stations, etc.
Relative Navigation	A technique for determining position in which one or both of the position points may be moving. A data link is used to provide error data to the moving vehicles to improve real-time navigation.
Relative Positioning	The process of determining the relative difference in position between two locations. In the case of GPS, by placing a receiver over each site and making simultaneous measurements observing the same set of satellites at the same time. This technique allows the receiver to cancel errors that are common to both receivers, such as satellite clock and ephemeris errors, propagation delays, etc.
Reliability	The probability of performing a specified function without failure under given conditions for a specified period of time.
RF	Radio Frequency
RINEX	Receiver INdependent EXchange format. A set of standard definitions and formats that permits interchangeable use of GPS data from dissimilar GPS receiver models or post processing software. The format includes definitions for time, phase, range and other parameters.
RISPO	Range Instrumentation System Program Office
RLG	Ring Laser Gyroscope (type of INS)
RMS, rms	Root Mean square
RNAV	Area Navigation
RNPC	Required Navigation Performance Capability

Rover	Any mobile DGPS receiver used during a data collection session. The receiver's position can be computed relative to one or more stationary (reference) GPS receivers.
RPV	Remotely piloted Vehicle
RSPA	Research and Special Programs Administration of DoT
RSS, rss	Root Sum Square
RT	Remote Terminal
RTCA	Radio Technical Commission for Aeronautics (Now RTCA, Inc.) Sets technical standards for avionics equipment.
RTCM	Radio Technical Commission for Maritime Services. Special Committee 104 of RTCM has established and periodically updates the data message format for the transmission and use of differential GPS broadcasts over data links to provide real-time and other corrections to GPS computed positions.
RTK	Real-Time Kinematic (positioning using phase measurements)
Rubidium Clock, Rubidium Atomic Clock	A stable and precise atomic clock based on the atomic transitions associated with gaseous rubidium.
S	
SA	See Selective Availability
SAASM	Selective Availability Anti-spoofing Module: A SAASM GPS Receiver allows decryption of precision GPS coordinates and allows satellite authentication, over-the-air rekeying, and contingency recovery.
SAC	Strategic Air Command
SAMSO	Space and Missile Systems Organization
Satellite Configuration	The arrangement or state of the satellite constellation at a specific time, relative to a specific user or set of users. Occasionally used interchangeably with satellite constellation.
Satellite Constellation	The arrangement in space of a set of satellites. In the case of GPS, the fully operational constellation is currently composed of six orbital planes, each containing four or more satellites. GLONASS has three orbital planes which, when fully occupied, contain eight satellites each. Galileo tentatively plans to have three inclined orbits and one geostationary orbit and a total of 30 satellites.
Satellite Elevation Mask	A user definable elevation mask in degrees above the horizon in which spacecraft signals are not used by a GPS receiver. SVs at an elevation angle below the mask angle may be tracked, but data from them will not be used to compute positions. SVs near the horizon have larger error effects due to atmospheric and multipath conditions.
satnav	Satellite navigation, navigation which depends on information provided by a satellite.
S-band	A microwave frequency band (in the 2-4 GHz region)
SBAS	Satellite-Based Augmentation System
SC, S/C	Spacecraft
SC-155	RTCA Special Committee on the Future CNS
SC-159	RTCA Special Committee on MOPS and MASPS for GNSS
SCAT-1	Special Category-1 Approach and Landing system
SCF	Satellite Control Facility
SDCM	System of Differential Correction and Monitoring
SDOF, SDF	Single Degree of Freedom
Selective Availability, SA	A DOD technique for distorting (or dithering) the GPS spacecraft time base and thereby corrupting the pseudorange and range rate measurements available to civil users. The purpose of this was to degrade the GPS navigation accuracy available to the civil community to a level of about 100 meters (2drms) in position. SA was set to zero on 1 May 2000 by Executive Order and there are commitments from the government that it will not be reinstated in the future.
SESC	Satellite and Environmental Service Center
SEP	See Spherical Error Probable
SFAP	Space-Frequency Adaptive Processing
SI	International System of Units
Sigma, σ	Standard Deviation
SISRE	Signal in Space Ranging Error

SGLS	Space-Ground Link, S-band system
SLAM	Standoff Land Attack Missile
SLGR	Small Lightweight GPS Receiver
SNR	Signal-to-Noise Ratio. The measure of the signal power to the noise power, normally expressed in decibels. A higher number is desirable.
Space Segment (GPS)	The portion of the GPS system that is located in space. This includes the GPS satellites and any ancillary spacecraft that provide GPS augmentation data (i.e., differential corrections, integrity messages, etc.)
Spread Spectrum (GPS)	The received GPS signal is a wide-bandwidth spread spectrum signal at a very low power level (-160 to -166 dBW). The L-band signals are modulated with high-rate (1.023 and 10.23 Mcps) PRN codes. This spreads the signal energy over a much wider bandwidth than the signal information bandwidth.
Spherical Error Probable	The radius of a sphere within which there is a 50 percent probability of locating a point (or being located). SEP is the three-dimensional analogue of the two dimensional CEP.
Spheroid	A solid figure generated by rotating an ellipse about either axis.
SPS	See Standard Positioning Service
Spoofing (GPS)	The misleading of the user's GPS navigation determination by the use of signals that replicate GPS signals but are timed differently. In most cases, a receiver is unaware it is being spoofed.
Squaring-Type Channel	A GPS receiver channel that multiplies the received signal by itself to obtain a second harmonic of the signal. This signal does not contain the code modulation. Used in "codeless" receiver equipment.
STAP	Space-Time Adaptive Processing
Standard Deviation (Sigma)	A measure of the dispersion of random errors about the mean value. If a large number of independent, or uncorrelated measurements or observations of the same process are made, the standard deviation is the square root of the sum of the squares of the deviations from the mean value of all the measurements divided by the number of observations less one.
Standard Positioning Service, SPS (for GPS)	The GPS service available to the civil community and used for certain applications by the military Precise Positioning Service (PPS) user. It basically consists of the C/A-codes on L1. On a temporary basis, civil users have been authorized the use of "codeless" techniques, involving the P(Y)-codes at L2 and L1 to establish two frequency ionospheric correction data, primarily for aviation users in the WAAS program.
SPS Accuracy (GPS)	The normal civil positioning accuracy obtained by using the GPS C/A-code at the L1 frequency. Under selective availability conditions, guaranteed to be no worse than 100 meters 95 percent of the time (2 drms). Since SA was set to zero in May, 2000, SPS accuracy has been typically at the 5-10 meter level on a 2drms basis.
SSC	Spectral Separation Coefficients
Static Positioning	Position determination accomplished with a stationary receiver. This allows the use of various averaging and differential techniques.
STOL	Short Take-Off and Landing
STS	Space Transportation System
SUNS	Small Unit Navigation System
SV, S/V	Space Vehicle or Satellite Vehicle
SVN	Space Vehicle Number (or Satellite Vehicle Number)
SWaP/SWaP-C	Size, weight, and power (and cost)
T	
TAC	Tactical Air Command
TACAN	TACTical Air Navigation system
TAI	See International Atomic Time
TBA	To Be Announced
TBD	To Be Determined
TD	Tokyo Datum
TDOF, TDF	Two Degrees of Freedom
TDOP	Time Dilution of Precision
TDRSS	Tracking and Data Relay Satellite System

TEC	Total Electron Content
TJP	Tolerable Jamming Power
ToR	Time of Reception
ToT	Time of transmission
TPC	Turbo Product Code
Tropospheric Correction	The correction applied to the range measurements to account for tropospheric delay.
TT&C	Tracking, Telemetry and Control
TFFF	Time to First fix
TTSF	Time to Subsequent Fix
U	
UA, UAV Unmanned Aircraft	Unmanned Aerial Vehicle
UDRE	User Differential Ranging Error
UE	User Equipment
UEE	User Equipment Error
UERE	User Equivalent Range Error
UHF	Ultra-High Frequency
UMTA	Urban Mass Transit Administration
Universal Time Coordinated (UTC)	An international, highly accurate and stable uniform atomic time system kept very close to Universal Time corrected for seasonal variations in the earth's rotation rate (UT2). Maintained by the U.S. Naval Observatory in Washington, D.C. GPS time is directly relatable to UTC by accounting for the leap seconds since midnight January 4, 1980, currently at 13 (c. 2004).
URE	User Range Error
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USGIS	U.S. GPS Industry Council
USGS	U.S. Geological Survey
USMC	U.S. Marine Corps
USN	U.S. Navy
USNO	U.S. Naval Observatory
User Segment	The portion of the GPS that can be directly interfaced by the user (e.g., GPS receivers). The controls and displays, including the GPS receiver, by which a receiver conveys GPS system information to the user.
UT	Universal Time
UTC	Universal Time Coordinated
URA	See User Range Accuracy.
User Interface	The hardware and operating software by which a receiver operator executes procedures on equipment (such as a GPS receiver) and the means by which the equipment conveys information to the person using it, i.e., the controls and displays.
User Range Accuracy	The contribution to the range-measurement error from related error sources
UT	Universal Time
UTC	See Universal Time Coordinated
UV	Ultraviolet
V	
VAFB	Vandenberg Air Force Base
VDOP	Vertical Dilution of Precision. See Dilution of Precision
VFR	Visual Flight Rules
VHF	Very High Frequency
VHSIC	Very High Speed Integrated Circuit
VLSIC	Very Large Scale Integrated Circuit

VLBI	Very Long Baseline Interferometry
VLF	Very Low Frequency
VLSI	Very Large Scale Integration
VOR	VHF omni-range navigation system
VPA	Vehicle Power Adapter
VTs	Vessel Traffic Services
W	
WAAS	Wide Area Augmentation System
WARC	World Administrative Radio Conference
WADGPS	Wide Area Differential GPS
WDOP	Weighted Dilution of Precision
WGS-72, 84	World Geodetic systems (1972 and 1984)
World Geodetic System (WGS)	A consistent set of parameters describing the size and shape of the Earth-derived from: the positions of a network of points with respect to the center of mass of the Earth; transformations from major geodetic datums; and the gravity potential of the Earth.
WGS-84 (World Geodetic System 1984)	The mathematical ellipsoid used as a reference datum for GPS since January 1987.
w.r.t., wrt	with respect to
WWDGPS	World Wide Differential GPS
Y	
Y-code	The encrypted version of the P-code.
YPG	Yuma Proving Ground

NavtechGPS is a woman-owned small business with more than 30 years of experience in GPS and precise positioning technology and GNSS training and education. As a reseller of hundreds of GPS-related [products](#), NavtechGPS delivers innovative solutions for military, commercial and research COTS (commercial-off-the-shelf) integration projects. NavtechGPS has been a critical team member on hundreds of complex projects and has helped its partners win competitive programs. Our deep technical understanding and practical experience results in solutions to meet your technical, budget and scheduling requirements. Our [projects](#) have included work on unmanned air (UAS/UAVs) vehicles, unmanned ground/maritime vehicles; precise attitude/heading system applications, reconnaissance for geolocation applications, precise recovery/docking systems, LiDAR systems, mobile surveillance vehicles, and PNT (position, navigation and timing) applications.

NavtechGPS is also a world leader in GPS/GNSS training with comprehensive list of [courses](#) taught by world-class [instructors](#). We offer on-site, customized GNSS technical training at your location and at choice locations in the United States. Please [contact us](#) for more information about our products, services and technical GPS and GNSS training (1-703-256-8900, 1-800-628-0885).

Edited 4/18/18