Navigation Acronyms, Abbreviations and Definitions
NAVIGATION
ACRONYMS, ABBREVIATIONS
AND DEFINITIONS

Please pass any amendments or additions to dwb@rin.org.uk

‘

minute (= 1°/60)

0G to 5G
0G, 1G, 2G, 3G, 4G & 5G generations of mobile phone technology

2dRMS
twice distance root-mean-square

Twice the root-mean-square of the radial distances from the true position to the observed positions obtained from a number of trials. Should contain 95% of observed positions.

2SOPS
2nd Space Operations Sqn (of 50th Space Wing, USAF)

Exercise command and control of GPS satellite constellation.

3DMA
three-dimensional mapping aiding

3DNC
three-dimensional digital navigational chart

3GPP
3rd Generation Partnership Project (of telecoms standard dev orgs)

a
atto (SI unit multiplier of 10¹⁸)

A-band
NATO radar band 0-250 MHz = > 1.2 m

A-CDM
Airport Collaborative Decision Making (air traffic management tool)

A-GPS
Assisted GPS

A-S
anti-spoofing

A-SMGCS
Advanced Surface Movement Guidance & Control System

A/A
air-to-air

A/D
(a/d) aerodrome

analogue-to-digital

A/J
anti-jamming

A1A
CW telegraphy (eg morse code) keying the transmitted signal

A2A
CW telegraphy (eg morse code) keying the modulation only

A4A
Airlines for America (industry trade organisation for US airlines)

AAA
airport avoidance area

AAAF
Association Aéronautique et Astronautique de France

AAC
Army Air Corps

AAD
assigned altitude deviation

aae
above aerodrome elevation

AAF
Army Air Field (US)

AAI
angle of approach indicator

angle of attack indicator

AAIB
Air Accidents Investigation Branch (UK DfT)

AAIM
aircraft autonomous integrity monitoring

aal
above aerodrome level
AAPS  Automated Aid Positioning System (US)
AAWA  Advanced Autonomous Waterborne Applications
ab initio  ‘from the beginning’ (elementary training)
ABC  adjacent band compatibility (eg GNSS with ground-based system)
autonomous basis of coordinates
abm  abeam (at 90° to track)
ABN  aerodrome beacon
ABP  active bus priority (traffic lights)
Association of British Ports
London based private company owning several UK ports.
ABS  Automatic Blink System (Loran-C integrity channel)
absolute accuracy  (geodetic or geographic accuracy)
The accuracy of a position with respect to the geographic or geodetic coordinates of the earth (IMO).
ac  aircraft
AC  altocumulus cloud
Analysis Centre (IGS)
Admiralty Chart
AC(YPS) Act  Activity Centres (Young Persons’ Safety) Act 1995 (UK)
ACARS  Aircraft Communications Addressing and Reporting System (ARINC)
Civil air data link for air-to-ground business and ATS messages.
ACAS  Airborne Collision Avoidance System
Acc  altocumulus castellanus cloud
ACC  adaptive cruise control
area control centre (ATC)
accuracy  The degree of conformance between the estimated or measured parameter of a craft at a given time and its true parameter at that time (IMO).
ACDS  Aeronautical Charts and Data Section (CAA)
ACEM  Agence de Coopération pour l’Europe de la Mer (= ECMA)
ACF  auto correlation function
ACI  Airports Council International (eg ACI-Europe)
ACK  acknowledge(ment)
ACN  Active Control Network (UK OS)
Airspace Co-ordination Notice
ACP  Airspace Change Proposal (CAA)
ACR  aerodrome control radar
ACRUDA  Assessment and Certification RUles for Digital Architectures (EU)
ACTD  advanced concept technology demo
ACZ  aerodrome control zone
AD  air data
Airworthiness Directive
Issued by airworthiness authority to correct a defect found after certification.
Mandatory.

**ADA**
advisory area (ATC)

**ADAM**
Airport Datum Management Program (US)

**ADAS**
Advanced Driver Assistance System(s)

**ADC**
aerodrome control(ler)

**ADD**
average delay per delayed flight (air traffic flow management)

**Address Point**
An OS gazetteer of postal addresses referenced to the Nat Grid

**ADEOS**
ADVanced Earth Observation Satellite (Japan)

**ADEXP**
ATS Data Exchange Protocol (EATMP)

**ADF**
automatic direction find(er)(ing)

**ADI**
attitude director indicator

**ADIRS**
air data and inertial reference system

**ADM**
average delay per movement (air traffic flow management)

**ADMAP**
Antarctic Digital Magnetic Anomaly Project

**ADNM**
Admiralty Digital Notice to Mariners

**ADONIS**
EU project to make cycling and walking safer

**ADPCM**
adaptive differential pulse code modulation

**ADR**
accident data recorder

**ADRIS**
advisory route (ATC)

**ADS**
automatic dead reckoning

**ADRIS**
automatic DR indicating system

**ADS**
Automatic Dependent Surveillance

**ADS-B**
Automatic Dependent Surveillance - Broadcast

**ADS-C**
Automatic Dependent Surveillance - Contract

**ADSL**
Asymmetric Digital Subscriber Line

For access to the Web using normal phone lines at speeds between 512 and 2,000 kbps.

**ADSP**
Automatic Dependent Surveillance Panel (of ICAO)

**ADVANCE**
Advanced Driver & Vehicle Advisory Navigation Concept (US)

**AE**
antenna electronics

**a_e**
Earth’s equatorial radius (typically $6.378 \times 10^6$ m)

**AEA**
Association of European Airlines

**AEEC**
Airlines Electronic Engineering Committee (US)

**AEI**
air experience instructor

**Aena**
Spanish ATSP

**AEP**
Architecture Evolution Plan (GPS)

**AESIG**
Asociacion Espanola de Sistems de Informacion Geografica y Territo

**AFB**
Air Force Base (US)
AFC  automatic frequency control (eg in radar)
AFCS  automatic flight control system
AFI  assistant flying instructor
automatic fault indication
AFIGEO  Association français pour l'Information Géographique
AFIS  airfield flight information service (info but not control)
AFIT  (US) Air Force Institute of Technology
AfOL  Association for Outdoor Learning (UK)
AFRL  Air Force Research Laboratory (USAF)
AFS  Air Force Station (US)
atomic frequency standard
AFSS  automated flight service station
AFTN  Aeronautical Fixed Telecommunication Network
AGI  Association for Geographic Information (UK)
agl  above ground level
AGO  automatic geophysical observatory
AGORA  Implementation of Global Location Referencing Approach
AGU  American Geophysical Union
AHMS  Aeronautical Message Handling System (to replace AFTN in 2000+)
AHRS  attitude (&) heading reference system
AHS  Advanced Cruise-Assist Highway Systems (Japanese concept)
automated highway system
AHWG  ad-hoc working group
AI  Accuracy and Integrity (Galileo Service)
artificial intelligence
attitude indicator
AIAA  area of intense aerial activity
AIB  Accident Investigation Board
AIC  Aeronautical Information Circular
Automotive Information Centre (MIRA)
AIDU  Aeronautical Information Documents Unit
AIG  Association international de géodésie (IAG)
AIM  Aeronautical Information Management (eg NOTAMs etc)
AIN  Arab Institute of Navigation
AION  Australian Institute of Navigation
AIP  Aeronautical Information Publication
AIPCN  Association Internationale de Navigation (also PIANC)
AIRPROX  UK term for ‘airmiss’
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS</td>
<td>Aeronautical Information Service</td>
</tr>
<tr>
<td>AIV</td>
<td>all in view</td>
</tr>
<tr>
<td>AIZ</td>
<td>aerodrome information zone</td>
</tr>
<tr>
<td>AJAS</td>
<td>anti-jam antenna system (eg for GNSS)</td>
</tr>
<tr>
<td>AL</td>
<td>alert limit/level</td>
</tr>
<tr>
<td>ALA</td>
<td>approach and landing accidents</td>
</tr>
<tr>
<td>ALAR</td>
<td>Approach and Landing Accident Reduction (eg FSF WG)</td>
</tr>
<tr>
<td>ALARP</td>
<td>as low as reasonably practicable (of risk in using a system)</td>
</tr>
<tr>
<td>ALFENS</td>
<td>Automated Low Flying Enquiry &amp; Notification System</td>
</tr>
<tr>
<td>ALL</td>
<td>Admiralty List of Lights</td>
</tr>
<tr>
<td><strong>along-track error</strong></td>
<td>A position error in the direction of the intended track (IMO).</td>
</tr>
<tr>
<td>ALPA</td>
<td>Air Line Pilots Association (US)</td>
</tr>
<tr>
<td>ALPR</td>
<td>automatic licence-plate recognition</td>
</tr>
<tr>
<td>ALRS</td>
<td>Admiralty List of Radio Signals</td>
</tr>
<tr>
<td>ALS</td>
<td>aerodrome lighting system</td>
</tr>
<tr>
<td>AM</td>
<td>amplitude modulation</td>
</tr>
<tr>
<td>AM/FM Europe</td>
<td>Automated Mapping/Facilities Management - European Division</td>
</tr>
<tr>
<td>AM/FM It</td>
<td>Automated Mapping/Facilities Management - Italy</td>
</tr>
<tr>
<td>AMAS</td>
<td>Autonomous Mobility Appliqué System (Lockheed for US Army)</td>
</tr>
<tr>
<td>AMASS</td>
<td>Airport Movement Area Safety System (FAA) (software package)</td>
</tr>
<tr>
<td><strong>ambiguity</strong></td>
<td>The condition obtained when one set of measurements derived from a navigation system defines more than one point, direction, LOP or surface of position (IMO).</td>
</tr>
<tr>
<td>AMCP</td>
<td>Aeronautical Mobile Communication Panel (of ICAO)</td>
</tr>
<tr>
<td>AMCS</td>
<td>Alternate Master Control Station (GPS) - Vandenberg AFB</td>
</tr>
<tr>
<td>AME</td>
<td>authorised medical examiner (for aviation licences)</td>
</tr>
<tr>
<td>AMI-C</td>
<td>Automotive Multimedia Interface Collaboration (telematics standard)</td>
</tr>
<tr>
<td>AMLCD</td>
<td>active matrix liquid crystal display</td>
</tr>
<tr>
<td>amsl</td>
<td>above mean sea level</td>
</tr>
<tr>
<td>AMSS</td>
<td>Aeronautical Mobile Satellite Service</td>
</tr>
<tr>
<td>AMTICS</td>
<td>Advanced Mobile Traffic Information System (Japan)</td>
</tr>
<tr>
<td>AMVER</td>
<td>Automated Mutual-Assistance VEssel Rescue System</td>
</tr>
<tr>
<td>ANA</td>
<td>area navigation approach</td>
</tr>
<tr>
<td>ANC</td>
<td>Air Navigation Commission (ICAO)</td>
</tr>
<tr>
<td>ANO</td>
<td>Air Navigation Order</td>
</tr>
<tr>
<td><strong>ANPR</strong></td>
<td>Automatic number plate recognition</td>
</tr>
<tr>
<td><strong>ANR</strong></td>
<td>active noise reduction</td>
</tr>
</tbody>
</table>
ANS  automatic navigation system
ANSI  American National Standards Institute
ANSP  air navigation service provider
ANT  antenna
AOA  Airport Operators Association
      angle of arrival
AOB  angle of bank
AOC  Advanced Operational Capability
      aerodrome/airport obstruction chart
      aeronautical operational control (US military)
      Air Operator’s Certificate
      aircraft operations centre
      airline operations communications
      auxiliary output chip
AOPA  Aircraft Owners and Pilots Association
AOR  Atlantic Ocean Region (-E or -W) (eg of Inmarsat satellites)
      AOR-W 54W, AOR-E 15.5W
AP  air position
      Air Publication (RAF) (AP3456 covers navigation)
      assumed position (estimated pos’n for astronomical sight reduction)
      autopilot
APC  approach control(ler) (ATC)
API  air position indicator
      application program interface
APL  airport pseudolite
APNT  alternative position, navigation & timing
APOLO  Advanced POsition LOcator (train location system using GNSS)
APPG  All-Party Parliamentary Group on General Aviation (UK)
APR  approach control radar
APU  auxiliary power unit
APV-I  Approach with Vertical Guidance - 1 (to runway)
      Requires accuracies (95%) of 220 m H, 20 m V. HAL 556 m, VAL 50 m. Time to alert 10 s.
APV-II  Approach with Vertical Guidance - 2 (to runway)
      Requires accuracies (95%) of 16 m H, 8 m V. HAL 40 m, VAL 20 m. Time to alert 6 s.
AR  augmented reality
ARA  airspace restricted area
ARAIM  advanced receiver autonomous integrity monitoring
ARB  Airworthiness Requirements Board (CAA)
ARCC  Aeronautical Rescue Co-ordination Centre
Associated Rescue Co-ordination Centre
Centre nominated by national SAR agency to which CES normally routes distress calls.

ARCS
Admiralty Raster Chart Service

ARINC
Aeronautical Radio Inc (now just called 'ARINC')
US avionics standards-setting body whose standards are accepted world-wide.

ARN
ATS Route Network

ARNS
Aeronautical RadioNavigation Service (of allocated spectrum bands)

ARP
aerodrome reference point

ARPA
automatic radar plotting aid

ARPU
annual revenue per user (of eg a telematics service)

ARS
air route surveillance radar

ARTCC
air route traffic control centre

ARTEMIS
Advanced Relay and TEchnology MISSION satellite (ESA)

ARTES
Advanced Research in TElecommunications Systems
ESA initiatives. Element 9 involves development work for GNSS.

ARTIST
Austrian Radionav Tech & Integrated Sat Nav Servs & Products T’bed

As
altostratus cloud

ASAB
Association of Animal Behaviour

ASAF
All Source Adaptive Fusion (US Northrop air nav software)

ASAS
Airborne Separation Assurance System

ASCII
American Standard Code for Information Interchange
Comprises letters, digits and special characters each represented by 8 bits or 1 byte.

ASDE
airport surface detection equipment (radar) (can feed AMASS)

ASE
altimetry system error

ASECAP
Association Européenne de Concessionnaires d’Autoroutes et d’Ouvrages à Péage

ASF
additional secondary phase factor (Loran-C)

Air Safety Foundation (of the US AOPA)

ASI
Agenzia Spaziale Italiana (Italian National Space Agency)
airspeed indicator

ASIC
application-specific integrated circuit

ASMI
airfield surface movement indicator

ASMS
advanced satellite mobile system (future comms)

ASOS
automatic surface observation station/service

ASP
application service provider

ASQF
Application Specific Qualification Facility (EGNOS - Torrejon)

ASR
airport/airfield surveillance radar
alimeter setting region
aviation safety report

ASR-WSP
airport surveillance radar - weather systems processor (FAA)

ASRS
Aviation Safety Reporting System (NASA)
Under EC 5th Framework RTD Programme.

**Angular distance between the plane of the celestial equator and the point’s plumb line.**

**Angle between the plane of the prime meridian and the plane of the point’s celestial meridian.**

<table>
<thead>
<tr>
<th>ASV</th>
<th>Advanced Safety Vehicle (Japanese concept)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATA</td>
<td>actual time of arrival</td>
</tr>
<tr>
<td>ATAG</td>
<td>Air Transport Association (US)</td>
</tr>
<tr>
<td>ATGA</td>
<td>automatic tracking aid</td>
</tr>
<tr>
<td>ATAG</td>
<td>Air Transport Action Group</td>
</tr>
<tr>
<td>ATGA</td>
<td>Industry lobby gp, 80 members funded by IATA, Boeing and Airbus.</td>
</tr>
<tr>
<td>ATC</td>
<td>air traffic control</td>
</tr>
<tr>
<td>ATCA</td>
<td>ancillary terrestrial component (ground comms towers)</td>
</tr>
<tr>
<td>ATCC</td>
<td>air traffic control assigned airspace</td>
</tr>
<tr>
<td>ATCO</td>
<td>air traffic control centre</td>
</tr>
<tr>
<td>ATCRBS</td>
<td>air traffic control radar unit</td>
</tr>
<tr>
<td>ATD</td>
<td>actual time of departure</td>
</tr>
<tr>
<td>ATE</td>
<td>along track error</td>
</tr>
<tr>
<td>ATFM</td>
<td>automatic test equipment</td>
</tr>
<tr>
<td>ATIS</td>
<td>air traffic flow management</td>
</tr>
<tr>
<td>ATIS</td>
<td>advanced traveller information system</td>
</tr>
<tr>
<td>ATIS</td>
<td>automatic terminal information station/service</td>
</tr>
<tr>
<td>ATIS</td>
<td>Continuous broadcast of routine non-control aerodrome information.</td>
</tr>
<tr>
<td>ATL</td>
<td>Air Traffic Licensing Board</td>
</tr>
<tr>
<td>ATM</td>
<td>aerodrome traffic monitor</td>
</tr>
<tr>
<td>ATM</td>
<td>air traffic management</td>
</tr>
<tr>
<td>Atmosphere</td>
<td>Shell round earth extending to height of 350 km</td>
</tr>
<tr>
<td>ATM</td>
<td>Comprises troposphere, stratosphere, mesosphere, thermosphere and ionosphere.</td>
</tr>
<tr>
<td>ATMSP</td>
<td>Air Traffic Management Service Provider</td>
</tr>
<tr>
<td>ATMS</td>
<td>eg: AENA - Spain, ANA - Portugal, DFS - Germany, DGAC - France, ENAV - Italy, NATS - UK.</td>
</tr>
<tr>
<td>ATMWG</td>
<td>Air Traffic Management Working Group (IATA)</td>
</tr>
<tr>
<td>ATN</td>
<td>Aeronautical Telecommunications Network</td>
</tr>
<tr>
<td>ATNS</td>
<td>Air Traffic Navigation Service (South Africa)</td>
</tr>
<tr>
<td>ATOL</td>
<td>Association of Tour Operators and Leaders</td>
</tr>
<tr>
<td>ATON</td>
<td>(ATON) aid to navigation</td>
</tr>
<tr>
<td>ATOP</td>
<td>Advanced Technologies and Oceanic Procedures (FAA)</td>
</tr>
<tr>
<td>ATP</td>
<td>Allied Tactical Publication (NATO)</td>
</tr>
<tr>
<td>ATP</td>
<td>Automatic Train Protection (UK signalling safeguard)</td>
</tr>
<tr>
<td>ATPL</td>
<td>Air Transport Pilot’s Licence</td>
</tr>
</tbody>
</table>
A standard size for avionics boxes. All 10 ins high, full ATR 10 ins wide, half ATR 5 ins wide etc.

Air Transport Racking (ARINC)

Air traffic service

Aircrew Training System (USAF)

Air traffic services outside controlled airspace

Air Traffic System Provider

Air traffic service unit

Admiralty Tide Tables

advanced transport telematics

advanced transport telematics system

aerodrome traffic zone

Usually 2 or 2.5 NM radius up to 2,000ft aal.

astronomical unit

augmentation

Any technique of providing enhancement in order to provide improved navigation performance to the user (IMO).

AUGUR

A predictive GPS receiver autonomous integrity monitoring system

EUROCONTROL.

all-up mass (aircraft)

autonomous underwater vehicle

all-up weight (aircraft)

autonomous vehicle

availability

The percentage of time that an aid, or system of aids, is performing a required function under stated conditions (IMO).

automatic vehicle classification

automatic vehicle guidance

aviation gasoline (for piston aircraft)

automatic vehicle identification

Added Value Information Dissemination (EU project)

automatic vehicle location

automatic vehicle location system

automatic vehicle monitoring

audio, video, navigation (in-car systems)

aviation turbine fuel (kerosine) (for jets/turbops)

Advanced Weather and Reporting Enhancements

Tool being from NASA to present better weather info for GA pilots.

Automated Weather Distribution System

aural warning generator

Aviation Weather Network (US)

Allied Worldwide Navigational Information System

Classified NATO navigational warning system.

all-weather operations
| **AWOP** | All-Weather Operations Panel (ICAO) |
| **AWOS** | Automated Weather Observing System |
| **AWP** | automated weather processor |
| **AWPR** | automatic waypoint reporting |
| **AWR** | airborne weather radar |
| **AWS** | Automatic Warning System (UK railways) |
| **Awy** | airway |
| **az** | azimuth |
| **B-band** | NATO radar band 250-500 MHz = 1.2-0.6 m |
| **B-GAN** | Broadband Global Area Network |
| **B-RNAV** | basic area navigation |
| **B-WAN** | Black Wide Area Network (OCX) |
| **BA** | British Admiralty |
| **BA** | British Airways |
| **BAA** | British Airports Authority |
| **BaaS** | Backend as a Service (for web and mobile app developers) |
| **BABS** | Blind Approach Beacon System (1941) |
| **BAFEGIS** | Baltic Ferry Guidance and Information System |
| **BALPA** | British Air Line Pilots Association |
| **BANET** | Baltic & N Sea ECDIS Test-Bed |
| **BATA** | British Air Transport Association (became ‘Airlines UK’ Nov 2016) |
| **BAUA** | Business Aircraft Users Association (UK) |
| **baud** | rate of transfer of binary messages |
| | \[1 \text{ baud} = 1 \text{ bit per second for most purposes.}\] |
| **BB** | Brown Box (Europort pilot portable radio navigation system) |
| **BBAC** | British Balloon and Airship Club |
| **BBP** | beam bend potential (ILS) |
| **BC** | patches (met) |
| **BCAR** | British Civil Air Requirements |
| **BCD** | binary code decimal |
| **bcn** | beacon |
| **BCR** | bow crossing range |
| **BCS** | British Cartographic Society |
| **BCT** | bow crossing time |
| **BCU** | British Canoe Union |
| **BDIS** | Bus Departure Information System |
| **BDS** | BeiDou Navigation Satellite System (China) |
| **BECMG** | becoming (met) |
| **BEDMAP** | Antarctic Bedrock Mapping Project |
| **BeiDou** | Chinese GNSS (Chinese Bǐdǒu means ‘Northern Dipper’)


BER  bit error rate
BEST  Beginning-to-End for Simulation and Training
      NATS ATC simulation system for NERC.
BFO  beat frequency oscillator
BGA  British Gliding Association
BHAB British Helicopter Advisory Board
BHPA British Hang Gliding and Paragliding Association
BIC  brain-inspired computing (eg robotics)
BIGF British Isles GPS (archive) Facility (NERC)
BIH  Bureau International de L’Heure
BIMCO Baltic and International Maritime Council
BINA British Isles/North America (eg ERS)
BIPM Bureau International des Poids et Measures
bit  binary digit
      A single unit of binary data.
BIT  built-in test
BKN  broken cloud (5 to 7 oktas)
BL   blowing (met)
BLE  Bluetooth Low Energy
Block Batch of GPS satellites made to a common standard

Bluetooth Specification for wireless comms between terminals & peripherals
      Basic is up to 10 metres using 2.4 GHz at 720 kbps.
BMAA British Microlight Aircraft Association
BMC  British Moutaineering Council
BMIF British Marine Industries Federation Ltd
Bn   beacon
BNSC British National Space Centre
BOD  bearing origin to destination
bORN bursting olfactory receptor neurons (animal navigation)
BOW  basic operating weight (everything except payload)
BPA  British Parachute Association
BPEO Best Practicable Environmental Option
BPEV battery powered electric vehicle
BPR  Brinnenvaart Politie Reglement (Dutch derivative of CEVNI)
bps  bits per second
BPSK bipolar/binary phase shift-keying
BR   mist (met)
brg  bearing
| **BRNAV**  | basic area navigation     |
| **BS**     | British Standard          |
| **broadband services** |                        |
| **BSH**    | Bundesamt für Seeschifffahrt und Hydrographie (German HO) |
| **BSI**    | British Standards Institution   |
| **BSI/EN/ISO** | tri-numbered standard (British/European/International) |
| **BST**    | British Summer Time (from last Sun Mar to last Sun Oct) |
| **BT**     | British Telecom           |
| **BTS**    | Bureau of Transportation Statistics (US)  |
| **BWB**    | British Waterways Board   |
| **BWC**    | bearing and distance to waypoint (great circle) |
| **BWPA**   | British Women Pilots' Association |
| **BWR**    | bearing and distance to waypoint (rhum line) |
| **BWW**    | bearing waypoint to waypoint |
| **BYOD**   | bring your own device     |
| **byte**   | binary word (often of 8 bits) |
| **c**      | centi (SI unit multiplier of \(10^{-2}\)) |
| **speed of light in vacuo** | \((2.997\, 924\, 590 \times 10^8 \text{ m s}^{-1})\) |
| **C**      | °Celsius                   |
| **C of A** | Certificate of Airworthiness (issued by CAA in UK) |
| **C-band** | NATO radar band 0.5-1 GHz = 60-30 cm |
| **Old radar band 4-8 GHz = 7.5-3.75 cm** | (ITU assigned 5.250-5.925 MHz). |
| **C/A**    | Coarse Acquisition code (of GPS) |
| **Family of PRN codes, one of 32 allocated to each satellite. Each code has 1,023 chips sent at 1.023 Mbps, repeating every ms.** |
| **C/No**   | carrier-to-noise power density |
| **Ratio of power level of a signal carrier to the noise power in a 1 Hz bandwidth.** |
| **C/NOFS** | Communication/Navigation Outage Forecasting System (USAF) |
| **c/s**    | callsign                  |
| **C&V**    | corrections and verification (WAAS software) |
| **C3CEN**  | Command, Control and Communications Engineering Centre (USCG) |
| **C4ISR**  | Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance. |
| **CAA**    | Cargo Airlines Association (US) |
| **Civil Aviation Authority (UK)** |                        |
| **CAAC**   | Civil Aviation Administration of China |
| **CAATS**  | Canadian Automated Air Traffic System |
| **cable**  | 1/10th nautical mile ~ 185.2 m |
| **CABSINET** | Cellular Access to Broadband Services and Interactive Television |
| **CAD**    | computer-aided design     |
computer-aided dispatch (system)

CADC  central air data computer
CAE  computer-aided engineering
CAEP  Committee on Aviation Environmental Protection (ICAO)
CAGR  compound annual growth rate
CAIM  craft autonomous integrity monitoring
CAIV  cost as an independent variable
CALF  Chart Amendment - Low Flying
CAM  computer-aided manufacture
CAMUS  an in-vehicle data bus
CAN  controller area network (in-vehicle data bus)
CANP  Civil Aviation Notification Procedure (for low-level flying)
CANSO  Civil Air Navigation Services Organisation
CAO  Co-ordinating Agency Office (NELS)
CAP  central alerting post

Civil Aviation Publication

CAPA  Coalition of Airline Pilots’ Associations (US)
Capstone  FANS ADS-B system implemented in Alaska from early 2001
CARAD  Civil Aerospace Research and Development (Programme) (UK)
CARAT  CNS Appl’n for Intern’l & Regional Airp’ts App, Lndg & Dep Traffic
CARDME  Concerted Action on Road Demand Management in Europe
CARIN  Car Information and Navigation System (car nav system from Philips)
CARPILOT  An autonomous in-car navigation system (DR and map-matching, NL)
CAS  calibrated/corrected airspeed

IAS corrected for air density and compressibility.

Controlled Access Service (of Galileo - for registered users only)
controlled airspace

CASST  Commercial Aviation Safety Strategy Team (FAA)
CAT  clear-air turbulence
commercial air traffic

Scheduled/non-scheduled passenger flights in airliners and helicopters.
Cargo flights.

CAT I  Category (of ILS service)

Precision runway approach to height above touchdown of not less than 200 ft and RVR
not less than 2,400 ft (with touchdown & centreline lights 1,800 ft (AB or C) or 2,000
ft (D)). Requires accuracies (95%) of 16 m H, 4-6 m V. HAL 40 m, VAL 10-15 m.
Time to alert 6 s.

CAT II  Category (of ILS service)

Precision runway approach to height above touchdown of not less than 100 ft and RVR
not less than 1,200 ft. Requires accuracies (95%) of
6 m H, 1 m V. Time to alert 1 s.
CAT III  Category (of ILS service)

Precision runway approach - no decision height minimum and RVR not less than: A 700 ft, B 150 ft, C no minimum. Requires accuracies (95%) of 6 m H, 1 m V. Time to alert 1 s.

CATIV  Conceptual Analysis for Transportation on Rivers (EU)

CAV  connected and autonomous vehicle

CAVOK  ‘cav-okay’ - ceiling and visibility OK

Basic visibility at least 10km and no cloud below 5,000ft.

CAVU  ceiling and visibility unlimited

Cloudless or scattered cloud and visibility over 10km.

CB  compass bearing (angular distance from CN to the object)

Cb  cumulonimbus cloud

CBM  conventional buoy marking

CBT  computer-based training

CC  chronometer correction

The amount that must be added algebraically to the chronometer time to obtain UT.

Compass course

Intended direction of movement (of the ship), defined by the angle between compass north and the fore-and-aft line (of the ship), expressed in angular units from compass north (000º).

CCD  charge coupled device

computer control device (eg trackball, touch pad, joystick)

CCG  Canadian Coast Guard

CCIR  International Radio Consultative Committee (of ITU)

Now called ITU-R.

CCITT  International Consultative Ctee on Telephony and Telegraphy (ITU)

Now called ITU-T.

CCS  complex conjugate symmetric (often refers to signal filters)

CCTF  Consultative Committee for Time and Frequency

CCW  coded continuous-wave

CD  chart datum

compact disk

CD-R  compact disk - recordable

CD-ROM  compact disk - read-only memory

CD-RW  compact disk - re-writable

CDI  course deviation indicator

CDLC  cellular data link control

CDMA  code division multiple access

CDR  critical design review

CDTI  cockpit display (of) traffic information (in ADS-B)

CDU  computer display unit

control and display unit
total compass error correction
   Sum of Var and Dev. Angle between TN and CN, from TN eastwards named E (+), westwards named W (-).

Conférence Européenne de l'Aviation Civile (= ECAC)

Central European Air Traffic Services (based in Vienna from 2006)

Central European GPS Reference Network
   Initially 31 sites in 11 countries, over 60 sites in 2000. Gives accuracy of 2-4 mm horizontal and 4-8 mm vertical.

Central European Initiative (Scientific programme with 17 nations)

circle of the celestial sphere formed by the intersection of the celestial sphere and a plane through the centre of the earth and perpendicular to the zenith-nadir line.

network cell identification (cellphone positioning)
   Accuracy of 250 m - 10 km.

Comité Européen de Normalisation
   European standards body for IT.

Comité Européen de Normalisation Electrotechnique
   European Committee for Electrotechnical Standardisation. Central Secretariat based in Brussels.

Centre for Earth Observations/Joint Research Centre

Committee for Environmental Protection

Conference of European Postal Telecommunications Administrations

Community of European Railways

Comité Européen des responsables de la cartographie officielle

Comms Electronics Research, Development and Engineering Center
   US Army Materiel Command.

Central European Region Geodynamics Project (CEI)
   Phase 1 concluded 1998 led to CEGRN. CERGOP-2 from 2000.

coast earth station (same as LES operationally)

Certification Policies, Procedures & Requirements
   For satellite-based navigation and landing systems and corresponding research activities.

Centre for Exploitation of Science and Technology

Central European Terrestrial Reference Frame

Centre d'Essais en Vol (French national flight test centre)

Code Européen de Voie de la Navigation Intérieur
   The rules for inland waters of mainland Europe.

constant false alarm rate (eg in radar)

chief flying instructor

controlled flight into terrain

Central Flow Management Unit

Code of Federal Regulations (US)

Coastguard
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGAS</td>
<td>Coast Guard Air Station (US)</td>
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<tr>
<td>CGPM</td>
<td>General Conference of Weights and Measures</td>
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<tr>
<td>CGS</td>
<td>Civil GPS Service</td>
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<tr>
<td>CGSIC</td>
<td>Civil GPS Service Interface Committee</td>
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<tr>
<td>Ch</td>
<td>Channel</td>
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<tr>
<td>CH</td>
<td>compass heading</td>
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<tr>
<td>Actual direction in which the longitudinal axis (of the ship) is pointed, defined by the angle between compass north and the fore-and-aft line (of the ship), expressed in angular units from compass north (000°).</td>
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<tr>
<td>CHA</td>
<td>Competent Harbour Authority</td>
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<tr>
<td>Chayka</td>
<td>Russian Loran-C system</td>
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<tr>
<td>chip</td>
<td>binary element or digit that conveys no information</td>
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<tr>
<td>CHIRP</td>
<td>Confidential Human Factors Incident Reporting Procedure</td>
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<td>CHS</td>
<td>Canadian Hydrographic Service</td>
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<tr>
<td>Ci</td>
<td>cirrus cloud</td>
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<tr>
<td>CIC</td>
<td>cave instructor certificate</td>
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<tr>
<td>CICADA</td>
<td>close-in covert autonomous disposable aircraft (US military)</td>
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<tr>
<td>CIGTF</td>
<td>Central Inertial and GPS Test Facility (USAF Holloman AFB)</td>
</tr>
<tr>
<td>CIKR</td>
<td>critical infrastructure and key resource (sectors)</td>
</tr>
<tr>
<td>CIL</td>
<td>Commissioners of Irish Lights</td>
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<td>CIN</td>
<td>China Institute of Navigation</td>
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<tr>
<td>CIR</td>
<td>cockpit image recorder</td>
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<tr>
<td>Corotation interaction region (of Sun geomagnetic activity)</td>
<td></td>
</tr>
<tr>
<td>CIRM</td>
<td>Comité International Radio Maritime</td>
</tr>
<tr>
<td>CIS</td>
<td>Commonwealth of Independent States</td>
</tr>
<tr>
<td>CISC</td>
<td>complex instruction set computer</td>
</tr>
<tr>
<td>CIWG</td>
<td>Communication Infrastructure Working Group (IATA)</td>
</tr>
<tr>
<td>CLAS</td>
<td>Centimeter Level Augmentation Service (QZSS)</td>
</tr>
<tr>
<td>CLCS</td>
<td>Commission on the Outer Limits of the Continental Shelf (UN)</td>
</tr>
<tr>
<td>cld</td>
<td>cloud</td>
</tr>
<tr>
<td>CLGE</td>
<td>Comité de liaison des géomètres Européens</td>
</tr>
<tr>
<td>Council of European Geodetic Surveyors.</td>
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</tr>
<tr>
<td>CMA</td>
<td>Central Monitoring Agency (NATS)</td>
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<tr>
<td>CMATZ</td>
<td>combined military air traffic zones</td>
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<tr>
<td>CMCU</td>
<td>Clock Monitoring and Control Unit (Galileo)</td>
</tr>
<tr>
<td>CME</td>
<td>coronal mass ejection (from sun)</td>
</tr>
<tr>
<td>CMG</td>
<td>course made good (rhumb line direction between 2 fixes)</td>
</tr>
<tr>
<td>CMIC</td>
<td>Civil Military Interface Standing Committee (EUROCONTROL)</td>
</tr>
<tr>
<td>CMOS</td>
<td>complementary metal oxide semiconductor</td>
</tr>
<tr>
<td>CMR</td>
<td>civil marine radar</td>
</tr>
<tr>
<td>CMU</td>
<td>communications management unit</td>
</tr>
</tbody>
</table>
CMYK  Cyan, Magenta, Yellow and black (colour system for printing)
CN  compass north
Northerly direction of the needle or zero-index of a magnetic compass.
CNC  computer numerically controlled
CNES  Centre Nationale d'Etudes Spatiales (French National Space Agency)
CNI  critical national infrastructure(s) eg GNSS etc
CNIG  Centro Nacional de Informacao Geografica (Portugal)
CNIS  Channel Navigation Information Service
CNS  celestial navigation system (eg star tracker)
communications, navigation and surveillance
CNSS  Compass Navigation Satellite System (Chinese BeiDou)
COA  course of advance (course to make good)
Direction from the (ship's) last fix to next estimated position, expressed in angular units from true north.
COBA  cost-benefit analysis
CODA  Central Office of Delay Analysis (EUROCONTROL)
COG  course over the ground
Direction of (the ship's) movement relative to the earth, measured on board (the ship).
COGR  continuously operating GPS receiver
COLREGs  International Regulations for Preventing Collisions at Sea (IRPCS)
COMEDS  CONUS Meteorological Distribution System
COMESA  Common Market for Eastern and Southern Africa
21 African states. Initiatives include adoption of an 'open skies' policy and a joint CNS/ATM system (by late 2002).
CoMP  coordinated multipoint (eg 4G handset comms with 2 sites)
COMPASS  COMbined Positioning Alternative Signalling System (UK future rail)
COMSAR  Sub-Ctee on Radiocommunications and Search and Rescue (IMO)
confidence interval  The numerical range within which an unknown is estimated to be with a given probability.
confidence level  The percentage of confidence that a given statement is correct or that a stated interval includes an unknown.
confidence limits  The extremes of confidence interval.
CONOPS  Concept of Operations (US)
continuity  The ability of a system to function within specified performance limits without interruption during a specified period (IMO).
CONUS  Continental United States
CONVERGE  Completed (2000) EU project on deployment of ITS
Conversion angle  Angular difference between rhumb line and great circle between two points.
CoP  Conformity of Production (assessment of client under VCA)
Copernicus  EU space infrastructure programme (was GMES)
correction  The best estimate that can be made of the difference between the true and the measured value of a parameter. The sign is such that a correction is to be added to an observed reading is taken as positive.
CORS continuously operating reference station (DGPS)
COS continuity of service
COSPAS-SARSAT Cosmicheskaya Sistyema Poiska Avarynych Sudov - SAR Sat-aided Trkg
Satellite-aided SAR system based on low altitude near polar orbit satellites designed to
locate distress beacons on 121.5 and 406 MHz.
COST COoperation in the field of Scientific & Technical research
Cooperation between 17 European countries: Austria, Belgium, Czech Rep, Denmark,
Finland, France, Germany, Greece, Hungary, Italy, Ireland, Netherlands, Slovakia, Spain,
Sweden, Switzerland & UK.
COTS commercial off-the-shelf (equipment)
coverage The surface area or space volume in which signals are adequate to permit the user to
determine position to a specified level of performance (after IMO).
COZDIS Coastal and Oceanic Zones Display and Information System
CP Cooperative Positioning (inter-vehicle) system
CPA closest point of approach
CPDLC controller-pilot data link communications
CPDLC Build 1 is based on VDL Mode 2.
CPE customer premises equipment
CPF Central Processing Facility (EGNOS, MSAS)
CPFPS Central Processing Facility Processing Set (EGNOS)
CPGS cassette preparation ground station (flight planning)
CPL commercial pilot’s licence
current performance level
CPLD complex programmable logic device
CPM Conference Preparatory Meeting (ITU)
CPR carrier-phase range
CPU central processing unit
CPV carrier-phase velocity
CRADA Co-operative Research and Development Agreement (US)
CRC cyclic redundancy code
CRCO Central Route Charges Office (EUROCONTROL)
Responsible for the collection of aviation navigation charges.
CRLB Cramér-Rao lower bound
For carrier-phase ranging & carrier-frequency velocity measurements.
CRM crew resource management (has also been known as ‘cockpit’ RM)
cross-track error Position error perpendicular to the intended track.
CRP compulsory reporting point
CRPA controlled radiation/reception pattern antenna
CRS CIGTF Reference System (USAF)
coast radio station
course (heading)
Angle measured in horizontal plane from a reference direction, counted clockwise from
000° through 360°, written as a 3 digit number.
ATC automation tools - TMA, FAST and DA.

The intended direction of movement (of a ship), defined by the angle between the meridian through its position and the fore-and-aft line (of the ship), expressed in angular units from true north (000º).

Direction of the ship’s movement through the water, defined by the angle between the meridian through its position and the direction of the ship’s movement through the water, expressed in angular units from true north (000º).

cumulus cloud
Chart User’s Advisory Panel (of HO)
closed user group
constant velocity update
proprietary positioning system using GSM phones
commercial vehicle operator
cockpit voice recorder
continuous-wave
Canadian WAAS
Conspicuity Working Group (CAA)
collision warning system
Conference of Yacht Cruising Clubs (main UK clubs)
Czech Republic Institute of Navigation
deci (SI unit multiplier of 10⁻¹)
\textbf{D-band} \quad \text{NATO radar band 1-2 GHz} = 30-15 \text{ cm}

\textbf{d.lat} \quad \text{difference of latitude}

\textit{Shorter arc of any meridian between the parallels of 2 places.}

\textbf{d.lon} \quad \text{difference of longitude}

\textit{The shorter arc of a parallel between the meridians of 2 places.}

\textbf{D&D} \quad \text{Distress and Diversion (UK ATC facility)}

\textbf{D2B} \quad \text{International multimedia networking protocol for use within vehicles}

\textbf{D3} \quad \text{DAGR Distributed Device (US military)}

\textbf{da} \quad \text{deca (SI unit multiplier of} \, 10^{1})

\textbf{DA} \quad \text{Descent Advisor (ATC management tool, US)}

\textbf{DAB} \quad \text{digital audio broadcast(ing)}

\textbf{DAC} \quad \text{digital-to-analogue converter}

\textbf{DADI} \quad \text{datalinking of aircraft-derived information}

\textbf{DAGR} \quad \text{Defense Advanced GPS Receiver (US)}

\textbf{DAISY} \quad \text{Digital Automatic Identification System}

\textbf{DAL} \quad \text{design assurance level}

\textbf{DAP} \quad \text{downlinked aircraft parameter (SSR Mode S)}

\textbf{DARC} \quad \text{data radio channel}

\textbf{DARPA} \quad \text{Defense Advanced Research Projects Agency (US)}

\textbf{DARS} \quad \text{Digital Audio Radio Service (satellite broadcast)}

\textbf{Datatrak} \quad \text{proprietary navigation system (Siemens UK)}

\textit{Was a coherent LF DTMA nav system giving an accuracy about 1.5 times better than raw GPS, post-SA. Transmitters \sim 120 \text{ km apart.}}

\textbf{dB} \quad \text{decibel}

\textit{Power ratio in dB} = 10 \log \text{(power ratio)}.

\textit{Voltage or current ratio in dB} = 20 \log \text{(voltage or current ratio)}.

\textbf{dBi} \quad \text{decibels, isotropic}

\textbf{dBW} \quad \text{decibel watts}

\textit{Power level relative to 1 \text{ watt.}}

\textbf{DCDB} \quad \text{Data Centre on Digital Bathymetry}

\textbf{DCE} \quad \text{data circuit-terminating equipment}

\textbf{DCPC} \quad \text{direct controller/pilot communications}

\textbf{DCPS} \quad \text{differentially corrected positioning service}

\textbf{DCT} \quad \text{direct}

\textbf{DD} \quad \text{double-difference (method of GNSS fixing)}

\textbf{DDGI} \quad \text{German umbrella organisation for geoinformation}

\textbf{DDM} \quad \text{difference in depth of modulation}

\textbf{DDV} \quad \text{Design, Development and In-Orbit Validation (phase of Galileo)}

\textit{\sim 2001-2005.}

\textbf{DE&S} \quad \text{Defence Equipment and Support (part of UK MOD)}

\textbf{dead ahead} \quad \text{direction ahead of a (ship's) fore-and-aft line}

\textbf{Dec} \quad \text{declination}
Decca
  hyperbolic LF navigation system
  In UK funded by THLS until 31 Mar 00.

DECT
  Digital European Cordless Telecommunications
  Short range speech or data system. TDMA on 1.88-1.90 GHz.

deg
  degrees

DEKF
  desensitised extended Kalman filter

DEM
  digital elevation model/map

Demeter
  Digital Electronic Mapping of European Territory
  Covers data standards for road networks for nav systems.

Dep
  departure
  Distance between 2 meridians at any given parallel of latitude, expressed in nautical miles.

DERA
  Defence Evaluation and Research Agency (UK)
  On 1 Apr 01 split into New DERA and the Defence Science and Technology (DST) Lab.
  New DERA becomes ‘QinetiQ’ on 2 Jul 01.

DES
  Data Encryption Standard

Dest
  destination

DETR
  Department of the Environment, Transport and the Regions (UK)
  Ceased in Jun 01 - most became DTLR.

Dev
  deviation
  Angle between MN and CN, from MN eastwards named E (+), westwards named W (-).

DFDR
  digital flight data recorder

DFGS
  digital flight guidance system

DFMC
  dual frequency, multi-constellation (2nd generation SBAS)

DFS
  Deutsche Flugsicherung (German ATSP)

DFTI
  distance from touchdown indicator

DG
  degaussing
  directional gyro

Director-General

D_g
  distance between 2 points on a great circle (orthodromic distance)

DG Range
  degaussing range

DG TREN
  Director General TRansport and ENergy (EC - was DG VII)

DGAC
  Direction Général a l’Aviation Civile (French CAA)

DGLONASS
  Differential GLONASS

DGNS
  doppler/GPS navigation set

DGNSS
  Differential GNSS

DGON
  Deutsche Gesellschaft für Ortung und Navigation e.V.
  German Institute of Navigation.

DGPS
  (or D-GPS) Differential GPS

DGT
  digital GPS translator (of TGRS)
DH  
decision height (of landing aircraft)  
Height above runway at which pilot must have runway approach lights in sight or initiate the missed-approach procedure.

DHS  
Department of Homeland Security (US)

DI  
direction indicator

differential system  
An augmentation system whereby radionavigation signals are monitored at a known position and the corrections so determined are transmitted to users in the coverage area.

DIN  
Deutsches Institut für Normung e.V. (German standards body)

DIRECTS  
Demo of Interop’ Road user End-to-end Charging & Telematics Sys

DIS  
Driver Information System

DISPATCH  
GSA Project (2015)  
Development of end-to-end prototype capable of testing the security aspects of Galileo PRS service provision.

dist  
distance

DIT  
Department for International Trade (UK)

DIW  
dead in water

DL  
datalink

DL  
distance between 2 points on a rhumb line (loxodromic distance)

DLL  
delay locked loop

DLoran  
Differential Loran

DLR  
Deutsches Zentrum fur Luft-und Raum-Fahrt  
German National Space Agency.

DLT  
digital linear tape

DMA  
Defense Mapping Agency (US)(now NIMA)

DME  
distance measuring equipment

DMP  
difference of meridional parts

DMR  
distance measuring radio

DMS  
dimethyl sulphide  
Produced by phytoplankton in response to zooplankton grazing - its odour attracts some birds, enabling them to navigate to food-rich sources.

DNA-STNA  
French ATSP

DNS  
Decca Navigator System (withdrawn in UK 31 March 2000)

Domain Name System (internet)

DOA  
direction of arrival

DOC  
Department of Commerce (US)

DoD  
Department of Defense (US)

DOF  
degrees-of-freedom (eg platform 6DOF)

DOP  
dilution of precision  
A dimensionless number that accounts for the contribution of relative satellite geometry to errors in position determination.

DORIS  
Doppler Orbitography and Radiopositioning by Satellite

DoS  
denial of service (such as GNSS)
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT</td>
<td>Department of Transportation (US)</td>
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<tr>
<td>DP</td>
<td>dew-point</td>
</tr>
<tr>
<td>DPS</td>
<td>dynamic positioning system</td>
</tr>
<tr>
<td>DQ</td>
<td>data quality</td>
</tr>
<tr>
<td>DQM</td>
<td>data quality monitoring</td>
</tr>
<tr>
<td>DR</td>
<td>dead (deduced) reckoning</td>
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<tr>
<td>DR cor</td>
<td>corrected DR position</td>
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<tr>
<td>DRFM</td>
<td>digital radio frequency memory</td>
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<tr>
<td>DRG</td>
<td>digital route guidance</td>
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<tr>
<td>DRI</td>
<td>driver restriction information (eg info on blocked roads)</td>
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<tr>
<td>Drift angle</td>
<td>Angular difference between: (Sea) course of advance and course through water; (Air) heading and track.</td>
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<tr>
<td>DRISL</td>
<td>Data Relay Inter-Satellite Links (part of WSN)</td>
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<tr>
<td>DRIVE</td>
<td>Dedicated Road Infrastructure for Vehicle Safety in Europe (EU)</td>
</tr>
<tr>
<td>DRL</td>
<td>data relay link (eg between satellite and ground)</td>
</tr>
<tr>
<td>dRMS</td>
<td>distance root-mean-square</td>
</tr>
<tr>
<td>DRS</td>
<td>dead reckoning system</td>
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<tr>
<td>DS</td>
<td>duststorm (met)</td>
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<tr>
<td>DSAC</td>
<td>Deep Space Atomic Clock (NASA)</td>
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<tr>
<td>DSB</td>
<td>double sideband</td>
</tr>
<tr>
<td>DSC</td>
<td>digital selective calling (GMDSS)</td>
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<tr>
<td>DSCOVR</td>
<td>dynamically supported craft</td>
</tr>
<tr>
<td>DSSS</td>
<td>Deep Space Climate Observatory (NOAA satellite, Jul 16)</td>
</tr>
<tr>
<td>DSI</td>
<td>detailed spectrum investigation</td>
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<tr>
<td>DSN</td>
<td>Deep Space Network</td>
</tr>
<tr>
<td>DSP</td>
<td>digital signal process(ing)(or)</td>
</tr>
<tr>
<td>DSRC</td>
<td>dedicated short-range communication (system)</td>
</tr>
<tr>
<td>DSRR</td>
<td>Digital Short-Range Radio</td>
</tr>
<tr>
<td>DSSS</td>
<td>Direct connection between hand-portables over short distances. Typically use 880-890 and 933-935 MHz.</td>
</tr>
<tr>
<td>DST</td>
<td>daylight saving time</td>
</tr>
<tr>
<td>Dstl</td>
<td>Defence Science and Technology Laboratory (UK - ex-DERA)</td>
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<tr>
<td>DSTO</td>
<td>Defence Science and Technology Organisation (Australia)</td>
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<tr>
<td>DT</td>
<td>decision trees (statistics algorithm)</td>
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<tr>
<td>DT&amp;E</td>
<td>Development Test and Evaluation</td>
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<tr>
<td>DTE</td>
<td>data terminal equipment</td>
</tr>
</tbody>
</table>
DTED  digital terrain elevation data
DTEO  Defence Test and Evaluation Organisation (Division of DERA)
DTG   distance to go
DTI   Department of Trade and Industry (UK)
DTLR  Department for Transport, Local Government & the Regions (UK)
       Formed from DETR in Jun 01.
DTM   digital terrain model
DTOA  difference in time of arrival (of events in 2 signals)
DTS   Digital Terrain System
       Predictive GPWS for military ac.
DU    dust (met)
DUA   dedicated user area (ATC)
duplex use of separate radio channels for transmission and reception
DUTI  value of predicted difference between UTC and UT1
DVB   digital video broadcast(ing)
DVD   digital versatile disc
       Initially stood for ‘digital video disc’. Holds up to 17 Gigabytes.
DVI   direct voice input (eg cockpit)
DVL   doppler velocity log
DVOR  doppler VOR
DVP   Development Verification Platform (EGNOS)
DWT   deadweight tonnage
DZ    drizzle (met)
       dropping zone (parachutes)
E-911 Enhanced 911 (includes automatic location, US)
E-band NATO radar band 2-3 GHz = 15-10 cm
E-field electric-field (eg of aerial)
E-GNSS European Global Navigation Satellite System
E-OTD  enhanced observed time diff (gives 100m position fm cellphone)
EADI  electronic attitude director indicator
EAN   European Aviation Network (WiFi for aviation - Inmarsat/Deutsche)
EASA  European Aviation Safety Authority (EU)
EAT   estimated (or expected) approach time
EATCHIP European ATC Harmonisation and Integration Prog (EUROCONTROL)
EATMP  European Air Traffic Management Programme (EUROCONTROL)
EATMS  European Air Traffic Management System
       Under EUROCONTROL’s ATM2000 initiative.
eAtoN electronic aid to navigation
EBCDIC extended binary-coded decimal interchange code (8-bit)
EBL   electronic bearing line (radar)
EBM   electronic bearing marker
EBU  European Broadcasting Union
      66 member states in Europe and Mediterranean area plus 51 associate member states.

EC    European Commission

ECA   European Common Frequency Allocation Table

ECAC  European Civil Aviation Conference (Fr = CEAC, 44 states)

ECAM  electronic centralised aircraft monitor

ECASBA EU Association of Shipbrokers and Agents

ECC   electronic chart centre

ECCAIRS European Central Repository (of air accident data)

ECDIS electronic chart display and information system
      Hardware and software that can display ENC data.

ECEF  earth-centred earth-fixed

ECI   earth-centred inertial (reference frame)

ECINS electronic charting and integrated navigation system

ECOMM European Conference on Mobility Management (EU) (eg ECOMM ‘97)

ECOTTRIS European Collaboration on Transition Training for Improved Safety
      EC air transport (ATM) safety project to ensure that the human element is adequately
      trained for technical innovations, especially the ‘glass cockpit’.

ECP   Engineering Change Proposal

ECPINS Electronic Chart Precise Integrated Navigation System (US)

ECS   electronic chart system

ECSA  European Community Shipowners’ Association

ED    European Datum
      Most commonly used is ED-50 (of 1950). This uses a non-geocentric geoid to express
      latitude & longitude within Europe.

EDA   European Defence Agency (based in Brussels)

EDC   early display configuration

EDGE  Enhanced Data-rate for GSM Evolution

EDI   electronic data interchange

EDM   electronic distance measurement

EDPG  European Data Producers’ Group

EDU   electronic display unit

EEA   European Environment Agency

EEE   electrical, electronic and electromechanical (parts)

EEG   electroencephalograph(ic) (to record electrical brain activity)

EEIG  European Economic Interest Group (for ERTMS)

EELV  Evolved Expandable Launch Vehicle (USAF - covers GPS launches)

EET   estimated elapsed time

EETES EGNOS End-to-End Simulator

EFB   electronic flight bag
EFC  electronic fee collection (includes ERP, ETC, RUC etc)
EFCS electronic flight control system
EFIS  electronic flight instrument system
EGATS European Guild of Air Traffic Services
EGC  enhanced group calling
EGI  embedded GPS/INS
EGII European Geographic Information Infrastructure
EGIS European Conference on GIS
EGNOS European Geostationary Navigation Overlay Service
   Space-based augmentation system for GPS, GLONASS (& Galileo)
EGPWS Enhanced Ground Proximity Warning System
EGR  embedded GPS receiver
eGRC  Enterprise Governance Risk Compliance
EGS  European Geophysical Society (Katlenberg-Lindau, Germany)
EGNSS Secretariat (to the ETG)
EHF  extremely high frequency (30-300 GHz)
EHSI  electronic horizontal situation indicator
EICAS engine-indication and crew-alerting system (air)
EIDS European Integrity Determination System
EIFS Advanced Integrated Fare System (Motorola smart card system)
EIRP  effective isotropic radiated power (usually in dBW)
EISCAT European Incoherent Scatter Scientific Association
EIV  errors in variables
EKF  extended Kalman filter
ELBA Emergency Location Beacon, Aircraft (ELT)
ELD  electronic logging device
ELT  emergency location transmitter
   Transmitter fixed to aircraft which transmits on emergency frequencies on impact or immersion.
ELTIS European Local Transport Information Service (EU)
EM  electromagnetic
   engineering model
EMC  electromagnetic compatibility
EMCA European Maritime Core Area
EMCON emission control
Emf  electromotive force
EMI  electromagnetic interference
EMP  electromagnetic pulse
EMPA European Maritime Pilot’s Association
EMRF  European Maritime Radionavigation Forum
   Independent body formed December 1999 from the European GNSS Maritime Advisory Forum.
EN  Européén Normalisation (European Standard)
ENAC  Italian CAA
ENAV  Ente Nazionale di Assistenza al Volo (Italian ATSP)
ENC  electronic navigational chart
   Data is held as vectors and can be selectively displayed. When produced to IHO/IMO standard S57 Ed 3 the data is legally equivalent to a paper chart for vessels subject to SOLAS regulations.
ENCASIA  European Network of Safety Investigation Authorities (inc AAIB)
ENT  EGNOS Network Time
ENU  East-North-Up (system of defining coordinates)
ENVISAT  Environmental Satellite (ERS follow-on)
EO  Earth observation
electro-optics
EOG  EGNOS Operators’ Group
   Alliance between ATS providers of France, Germany, Italy, Spain and UK which are contributing to the EGNOS project.
EOIG  EGNOS Operator and Infrastructure Group
   Consortium of EU aviation administrations.
EOP  Earth Orientation Parameters (of ITRF)
EOR  electric orbit raising (of satellites)
   end-of-record (often 9999)
EOSI  Earth Observation Science Initiative (NERC)
EOTD  estimated observed time difference (cellphone location technique)
   Could give accuracy of <100 m.
EOW  end-of-week
   In GPS occurs approx midnight each Sat/Sun. Week no. defined by 10-bit word and hence rolls-over to zero after each 1,024 weeks from 6 Jan 80. First roll-over was 22 Aug 99.
EP  estimated position (most probable position)
   Most probable position obtained by adding to the last fix course (track) and speed, considering all estimated influence. (After ISO)
EO  European Parliament
EPA  electronic plotting aid
EPFS  electronic position-fixing system
EPIRB  Emergency Position-Indicating Radio Beacon
EPNdB  effective perceived noise decibel
EPOMM  European Platform on Mobility Management (EU)
EPROM  erasable programmable read-only memory
EPS  Encapsulated Postscript (graphic file format)
   EUMETSAT Polar System
EPSRC  Engineering and Physical Sciences Research Council (UK)
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPSRC</td>
<td>Engineering and Physical Sciences Research Council (UK)</td>
</tr>
<tr>
<td>EPVS</td>
<td>electronic plotting video symbols (maritime)</td>
</tr>
<tr>
<td>EQM</td>
<td>electrical qualification model</td>
</tr>
<tr>
<td>Equator</td>
<td>primary great circle of the earth</td>
</tr>
<tr>
<td>ERA</td>
<td>Emergency Road Assistance (GLONASS facility) European Regions Airline Association</td>
</tr>
<tr>
<td>ERBL</td>
<td>electronic range and bearing line (radar)</td>
</tr>
<tr>
<td>ERC</td>
<td>en-route chart European Radiocommunications Committee</td>
</tr>
<tr>
<td>ERD</td>
<td>estimated range deviation</td>
</tr>
<tr>
<td>ERDM</td>
<td>equation restore difference method (eg for DGPS)</td>
</tr>
<tr>
<td>ERF</td>
<td>European Union Road Federation (part of IRF)</td>
</tr>
<tr>
<td>ERNP</td>
<td>European Radionavigation Plan</td>
</tr>
<tr>
<td>ERO</td>
<td>European Radiocommunications Office (of the ERC, Copenhagen) Based in Copenhagen.</td>
</tr>
<tr>
<td>EROPS</td>
<td>extended range operations (aircraft)</td>
</tr>
<tr>
<td>ERP</td>
<td>effective radiated power The product of power and gain of a transmitting aerial in a particular direction. electronic road pricing (a form of EFC)</td>
</tr>
<tr>
<td>ERRI</td>
<td>European Rail Research Institute (based in Utrecht, NL)</td>
</tr>
<tr>
<td>ERRV</td>
<td>Emergency Response and Rescue Vessel</td>
</tr>
<tr>
<td>ERRVA</td>
<td>Emergency Response and Rescue Vessel Association Was the SSOA until May 2000.</td>
</tr>
<tr>
<td>ERS</td>
<td>En Route Supplement (for aircrew) European Remote Sensing satellite</td>
</tr>
<tr>
<td>ERTMS</td>
<td>European Rail Traffic Management System (EU) ETCS + GSM-R + ETML + HERO.</td>
</tr>
<tr>
<td>ES</td>
<td>environmental surveillance</td>
</tr>
<tr>
<td>ESA</td>
<td>electronic sub-assembly European Space Agency</td>
</tr>
<tr>
<td>ESARR</td>
<td>EUROCONTROL Safety Regulation Requirement</td>
</tr>
<tr>
<td>ESCAPE</td>
<td>European Safety Critical Applications Positioning Engine (GSA)</td>
</tr>
<tr>
<td>ESD</td>
<td>electro-static discharge</td>
</tr>
<tr>
<td>ESGN</td>
<td>electrically-suspended gyro navigator</td>
</tr>
<tr>
<td>ESNP</td>
<td>European Satellite Navigation Programme (ETG)</td>
</tr>
<tr>
<td>ESOC</td>
<td>European Space Operations Centre (Darmstadt, Germany)</td>
</tr>
<tr>
<td>ESP</td>
<td>extended service programme (eg for older aircraft)</td>
</tr>
<tr>
<td>ESPO</td>
<td>European Sea Ports Organisation</td>
</tr>
<tr>
<td>ESTB</td>
<td>EGNOS System Test Bed</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<td>--------------</td>
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</tr>
<tr>
<td>ESV</td>
<td>earth station (located on a) vessel (for maritime comms)</td>
</tr>
<tr>
<td>ETA</td>
<td>estimated time of arrival</td>
</tr>
<tr>
<td>ETACS</td>
<td>Extended Total Access Communication System (cellphone standard)</td>
</tr>
<tr>
<td>ETC</td>
<td>electronic toll collection (a form of EFC)</td>
</tr>
</tbody>
</table>
| ETCS         | European Train Control System (part of ERTMS)  
  *Internationally Interoperable signalling and safety system.* |
| ETD          | estimated time of departure |
| ETE          | estimated time en route |
| ETG          | European Tripartite Group  
  *A cooperation between EC, ESA and EUROCONTROL to develop EGNOS and perform preliminary work on GNSS-2.* |
| ETML         | European Traffic Management Layer (part of ERTMS) |
| ETOPS        | extended-range twin-engine operations |
| ETRF         | European Terrestrial Reference Frame  
  *Almost identical to WGS-84, but accommodates European continental drift.* |
| ETRO         | estimated time to return of operations (eg of GPS satellite) |
| ETS          | European Telecommunications Standard |
| ETSI         | European Telecommunications Standards Institute |
| EU           | European Union |
| EUFRANET     | European Freight Railway Network (EU) |
| EUGIN        | European Group of Institutes of Navigation  
  *Institutes (2001): Austria, France, Germany, Italy, Netherlands, Nordic, Spain, Switzerland, UK.* |
| EUMETSAT     | European satellite carrying several meteorological instruments |
| EUR          | European Region (of ICAO) |
| EUREF        | European Reference Frame (eg ED-50) |
| EUREKA       | Coordinated EU R&D programme for collaboration between industries |
| EUROBALISE   | *Use of magnetic transponders (balises) for comms between track and train. Part of ETCS.* |
| EUROCAE      | European Organisation for Civil Aviation Electronics |
| EUROCONTROL  | European Organisation for the Safety of Air Navigation  
| Eurofix      | Datalink system whereby GNSS differential and integrity data was transmitted by LORAN-C and Chayka. |
| EUROGI       | European Umbrella Organisation for Geographic Information |
| EUROLOOP     | semi-continuous transmission system for trains (part of ETCS) |
| Europrice    | EC DG VII (TREN) project for deployment of road pricing in Europe  
  *Linked to Intercept Project.* |
| EURORADIO    | Based on GSM-R, will replace optical train signalling (part of ETCS) |
| EUROSCOPE    | Efficient Urban Transport Ops Services Co-op of Port Cities in Eur  
  *Development of ROMANSE and SCOPE.* |
| EUT          | equipment under test |
**EUTP**  European Transfer Point (for intermodal transport)(EU)

**EV**  electric vehicle

**EVA**  autonomous route guidance system from Robert Bosch

**EVS**  enhanced vision system

**EW**  electronic warfare

**EWAAS**  End-State WAAS

*Final stage of WAAS, capable of supporting navigation and CAT I precision approach.*

**EWAN**  EGNOS Wide Area Network

**EXCOM**  National Executive Committee on Space-Based PNT (US)

**EXM**  executive monitoring (GBAS processing)

**f**  Earth’s flattening (typically 1/298)

femto (SI unit multiplier of $10^{-15}$)

frequency

farad (capacitance)

**F-band**  NATO radar band 3-4 GHz = 10-7.5 cm

**F**  °Fahrenheit

**FAA**  Federal Aviation Administration (US)

Flight Air Arm (RN)

**FAB**  fast adaptable bandwidth (of loop filter for tracking GPS signals)

**FADEC**  full-authority digital engine control

**FAF**  final approach fix

**FAI**  Fédération Aéronautique Internationale

*Body for verification of aeronautical record attempts and sporting activities.*

**failure**  The unintended termination of the ability of a system, or part of a system, to perform its required function.

**failure rate**  The average number of failures of a system, or part of a system, per unit time.

**FANG**  Flight Management System Air Traffic Management Next Generation

**FANS**  Future Air Navigation System (ICAO)

**FANS-1/A**  air-to-ground datalink (ICAO)

**FAR**  Federal Aviation Regulation (US)

**FAS**  final approach segment (eg of GNSS landing system)

Future Airspace Strategy (UK CAA)

**FAST**  Final Approach Sequencing Tool (for air traffic)(US)

**FASTESt**  *Facilitating Smart Card Technology for Electronic Ticketing & Seamless Travel*

**FASVIG**  Future Airspace Strategy VFR Implementation Group (CAA)

**FBW**  fly-by-wire (aircraft)

**FC**  funnel cloud (met)

**FCC**  Federal Communications Commission (US)

flight control computer

**FCD**  floating car data (from ‘probe’ vehicles that can create mapping data)
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCEV</td>
<td>fuel cell electric vehicle</td>
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<tr>
<td>FCL</td>
<td>flight crew licensing</td>
</tr>
<tr>
<td>FCS</td>
<td>Federation of Communications Services (UK)</td>
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<tr>
<td>FCS-MPC</td>
<td>finite control set model predictive control (eg for autonomous vehs)</td>
</tr>
<tr>
<td>Fcst</td>
<td>forecast</td>
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<tr>
<td>FD</td>
<td>flight director</td>
</tr>
<tr>
<td>FDA</td>
<td>flight data analysis (FDR data to monitor quality of operations)</td>
</tr>
<tr>
<td>FDD</td>
<td>frequency division duplex (eg wireless telecom network)</td>
</tr>
<tr>
<td>FDE</td>
<td>fault detection and exclusion</td>
</tr>
<tr>
<td>FDI</td>
<td>fault/failure detection and isolation</td>
</tr>
<tr>
<td>FDMA</td>
<td>frequency division multiple access</td>
</tr>
<tr>
<td>FDPS</td>
<td>flight data processing system</td>
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<tr>
<td>FDR</td>
<td>flight data recorder</td>
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<tr>
<td>FEC</td>
<td>forward error correction</td>
</tr>
<tr>
<td>FEI</td>
<td>Federation of Electronics Industries (UK)</td>
</tr>
<tr>
<td>FEM</td>
<td>front-end module</td>
</tr>
<tr>
<td>FERNs</td>
<td>Far East RadioNavigation System (Loran-C and Chayka system)</td>
</tr>
<tr>
<td>FET</td>
<td>field effect transistor</td>
</tr>
<tr>
<td>FEW</td>
<td>few clouds (1-2 oktas)</td>
</tr>
<tr>
<td>FFL</td>
<td>fixed and flashing light</td>
</tr>
<tr>
<td>FFSK</td>
<td>fast frequency-shift keying</td>
</tr>
<tr>
<td>FFT</td>
<td>Fast Fourier Transform</td>
</tr>
<tr>
<td>FG</td>
<td>fog (met)</td>
</tr>
<tr>
<td>FGDC</td>
<td>Federal Geographic Data Committee (US)</td>
</tr>
<tr>
<td>FGMU</td>
<td>Frequency Generation and Modulation Unit (Galileo)</td>
</tr>
<tr>
<td>FHWA</td>
<td>Federal Highway Administration (US)</td>
</tr>
<tr>
<td>FIC</td>
<td>Flight Information Centre</td>
</tr>
<tr>
<td>FID</td>
<td>Field Identifying Number (for farming, created in UK in 1995)</td>
</tr>
</tbody>
</table>
| FIG | Fédération Internationale des Géomètres  
*International Federation of Surveyors.* |
| FIR | Flight Information Region |
| Firewire | Computer connection at up to 400 Mbps (IEEE-1394) |
| FIS | Field Identification System (of farming maps) |
| FISO | Flight Information Service Officer |
| fix | A position established by processing information from a number of navigation observations. Determined without reference to any other former position. |
| fix interval | Maximum time between fixes. |
| fix rate | The number of fixes per unit time. |
flight level

Altitude expressed in hundreds of ft, with ISA pressure setting of 1013.2mb set on altimeter.

FLAS Flight Level Allocation Scheme
FLIP Flight Information Publication
FLIR forward-looking infrared
FLL frequency-locked loop
FLP fused location provider (geofencing)
flt flight
FM flight model
FM frequency modulation from (met)
FMC flight management computer
FMEA failure mode and effects analysis
FMECA failure mode, effects and criticality analysis
FMG Frequency Management Group (ICAO)
FMOD fuzzy model
FMS fleet management system
FMX flight management system
FNPT flight and navigation procedure trainer
FNS flight navigation system
FOC flag of convenience

Full Operational Capability

For GPS defined as 24 Block II/IIIA satellites operating in assigned orbits, tested for military functionality and meeting military requirements (17 Jul 95). For Galileo from 2020?

FOG fibre-optic gyro
FOM figure of merit
FOQA Flight Operations Quality Assurance (programme)
FP Framework Programme (EU)
FPD flat panel display
FPGA field-programmable gate array
FPS flight progress strip (ATC)
FPU floating point unit (maths co-processor to speed up arithmetic tasks)
FRA Federal Railroad Administration (US)
FRAME GSA Project (2014)

Provision of processes and tools to support GSA activities related to the definition of new Galileo PRS use cases.

FRER Free Route Experim’tal Encounter Resolution (EUROCONTROL Prog)
FRP Federal Radionavigation Plan (usually produced each even year, US)
FRPA fixed radiation/reception pattern antenna
FRPA-GP FRPA ground plane
true replies uncorrelated in time (SSR garbling problem)

FS fixed service (transmitter) (ITU)

Fs fractostratus cloud

FSA Formal Safety Assessment (shipping)

FSD full-scale development

FSDPS flight service data processing system

FSF Flight Safety Foundation (US)

FSK frequency-shift keying

FSS fixed satellite services

frequency-selective surface (for rf selection in nav/com systems)

FST fuzzy set theory

FTA fault tree analysis

Federal Transit Administration (US)

FTD flight training device

FTE flight technical error

FTP File Transfer Protocol (Internet)

FU smoke (met)

FZ freezing (met)

G giga (SI unit multiplier of 10^9)

G-band NATO radar band 4-6 GHz = 7.5-5 cm

G-STAR GPS Spacial Temporal Anti-jam Receiver

G/S groundspeed

GA general aviation

Executive, company, private and flying club aircraft. Gliders, sport aviation, airships/balloons & aerial work.

ground antenna

GAAC General Aviation Awareness Council (UK)

GaAs gallium arsenide

GAFLEX Galileo Flight Experiment (Germany-Russia industrial team)


GAGAN GPS Aided GEO Augmented Navigation (Indian SBAS)

GAGE GPS at Geostationary Transfer Orbit Experiment


GAINS General Aviation Improved Navigation and Surveillance (SESAR proj)

Gal unit of acceleration of 1 cm/s^2 used in gravimetry (also mGal/μGal)

GALA GALileo overall Architecture definition (EC contract ~2000)

GALILEAN GALileo Applications Network

EU-funded thematic network on GNSS applications.
Proposed on 10 Feb 99 as a PPP with industry contributing up to half of €3 billion cost over 10 years.

In 2014 became the Honourable Company of Air Pilots incorporating Air Navigators.

GATS Forum created an open standard for transferring traffic info, emergency call, breakdown, dynamic navigation and general info using GPS and GSM.

The intersection of a sphere on the earth and a plane through its centre.

Intended direction of movement (of the ship), defined by the angle between gyro north and the fore-and-aft line (of the ship), expressed in angular units from gyro north (000º).

The European standard used to describe and transfer road networks and road-related data for the mapping industry.
gyro error correction
Correction of gyro heading error (inc speed error) of a gyro compass. Angle between TN and GN, from TN: E (+) or W (-).

GEBCO General Bathymetric Chart of the Ocean (IHO project)

GEC groundtrack equatorial crossing
Equatorial angle from the prime meridian to the location that a groundtrack intersects the equator when crossing from the southern to northern hemisphere.

GEMINUS Galileo European Multimodal Integrated Navigation User System
EC study to define Galileo services. Nov 99 - Dec 00.

GENESIS Galileo European Network of Experts to Support the Eur commISSion
Network to support EC in Galileo matters. Nov 99 - Nov 03.

GEO geosynchronous equatorial orbit
Satellite height of ~35,786 km in equatorial plane.

Geocentric lat Angle at the centre of of the reference ellipsoid between the celestial equator and the radius vector to a point on the ellipsoid.

Geocentric lon Angle between the plane of the geocentric prime meridian and the plane of a point’s geocentric meridian.

Geodetic accuracy The accuracy of a position with respect to the geodetic coordinates of the earth (IMO).

Geodetic datum A set of parameters specifying the reference coordinate system used for geodetic control in the calculation of coordinates of points on the earth (ISO).

Geodetic lat Angular distance between the plane of the geodetic equator and the normal to a point on the earth ellipsoid.

Geodetic lon Angular distance between the plane of the geodetic prime meridian and the plane of a point’s geodetic meridian.

Geographic accuracy The accuracy of a position with respect to the geographic coordinates of the earth (IMO).

GERTS Galileo Enhanced Robust Time Server

GES ground earth station

GFLOPS 1 billion floating point operations per second

GH gyro heading
Actual direction in which the longitudinal axis (of the ship) is pointed, defined by the angle between gyro north and the fore-and-aft line (of the ship), expressed in angular units from gyro north (000º).

GHA Greenwich Hour Angle

GHz gigahertz (1,000,000,000 cycles per second)

GIA Glacial Isostatic Adjustment

GIAC GPS Interagency Advisory Council (USA)

GIANT Geodetic Infrastructure for Antarctica

GIC GNSS/Ground Integrity Channel

GIF Graphics Interchange Format (used on Web)

GIGO garbage in, garbage out

GIM global ionospheric map (for TEC determination)

GIP Government Industry Partnership (US) (=PPP)

GIS geographic information (geoinformatic) system
GISIC  Geographical Information Systems International Group
GISIS  Global Integrated Shipping Information System (IMO)
GISM  GPS Scintillation Model
GISPE  Geographic Information Service Providers in Europe
GISS  Galileo Interim (management) Support Structure
GITA  GPS Interference Testing Approval
GIVE  Geographical Information Vendors Europe
gird ionospheric vertical error (eg in WAAS)
GLAN  geographic longitude of the ascending node
      Equatorial angle from the prime meridian to the ascending node.
GLAs  British & Irish General Lighthouse Authorities
GLF  General Lighthouse Fund
GLONASS  GLObal NAvigation Satellite System
        Russian Globalnaya Navigatsionnaya Sputnikovaya Sistema
GLONASS-M  Second generation GLONASS system
GLORIA  GNSS & Loran-C in Road & Rail Applications (EC)
GLS  GPS Landing System
      Generic term with limits of 350ft cloudbase and 1 nautical mile vis.
GMC  ground movement controller (ATC)
GMDSS  Global Maritime Distress & Safety System (see Sea Areas)
GMES  Global Monitoring for Environment and Security
      Flagship EU space program, became ‘Copernicus’.
GML  Geography Markup Language
GMS  Ground Monitor Station (MSAS)
GMSK  gaussian minimum shift keying
      Typically allows 8 kbps to be transmitted over a 12.5 kHz channel.
GMSP  Global Multimission Service Platform (USA)
      Could represent 8 satellites giving both higher-power GPS and comms. The 8 could
      replace the same number of current GPS sats at about the time of introduction of GPS
      III.
GMT  Greenwich Mean Time
      May be regarded as the general equivalent of UT1.
GMU  GPS-based monitoring unit
      US system for checking aircraft navigation performance.
GN  grid north
      Northerly direction indicated by the gyro-compass 000° index.
gnd  ground
GNE  gross navigational error
GNSS  Global Navigation Satellite System(s) (generic name for all systems)
GNSS/CN  Global Navigation Satellite System/Cellular Network
GNSS/GSM  Global Navigation Satellite System/Global System for Mobile Comms
GNSSSP  Global Navigation Satellite Systems Panel (ICAO)
GOCE  Gravity Field and Steady State Ocean Circulation Explorer (ESA)
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goes</strong></td>
<td>Geostationary Operational Environmental Satellite</td>
</tr>
<tr>
<td><strong>GOV</strong></td>
<td>GNSS-I Operational Validation (EUROCONTROL)</td>
</tr>
<tr>
<td><strong>GP</strong></td>
<td>general purpose</td>
</tr>
<tr>
<td><strong>GP&amp;C</strong></td>
<td>global position &amp; communication</td>
</tr>
<tr>
<td><strong>GPIP</strong></td>
<td>glidepath intercept point (of landing aircraft)</td>
</tr>
<tr>
<td><strong>GPMS</strong></td>
<td>GPS Performance Monitoring System (UK NATS)</td>
</tr>
<tr>
<td><strong>GPRS</strong></td>
<td>General Packet Radio Service (GSM-based protocol)</td>
</tr>
<tr>
<td><strong>GPS</strong></td>
<td>Global Positioning System (NAVSTAR)</td>
</tr>
<tr>
<td><strong>GPS III</strong></td>
<td>Next generation GPS</td>
</tr>
<tr>
<td><strong>GPS Time</strong></td>
<td>Time to which GPS signals are referred</td>
</tr>
<tr>
<td><strong>GPS Week</strong></td>
<td>Modulo 1,024 number of elapsed GPS weeks</td>
</tr>
<tr>
<td><strong>GPS-RO</strong></td>
<td>GPS radio occultation (for weather forecasting)</td>
</tr>
<tr>
<td><strong>GPS/GSM</strong></td>
<td>Global Positioning System/GSM System for Mobile Communication</td>
</tr>
<tr>
<td><strong>GPsS</strong></td>
<td>Global Positioning and Timing Service</td>
</tr>
<tr>
<td><strong>GPU</strong></td>
<td>graphics processing unit</td>
</tr>
<tr>
<td><strong>GPWS</strong></td>
<td>Ground Proximity Warning System</td>
</tr>
<tr>
<td><strong>GR</strong></td>
<td>hail &gt;5 mm (met)</td>
</tr>
<tr>
<td><strong>GRACE</strong></td>
<td>Generalised Rules for Advanced Constellation Evaluation</td>
</tr>
<tr>
<td><strong>GRADU</strong></td>
<td>Gravity Recovery and Climate Experiment (NASA)</td>
</tr>
<tr>
<td><strong>GRAM</strong></td>
<td>gradual (met reports)</td>
</tr>
<tr>
<td><strong>GRAPE</strong></td>
<td>GPS Routine for Attitude Parameter Estimation</td>
</tr>
<tr>
<td><strong>GRAS</strong></td>
<td>Software package for processing GPS signals.</td>
</tr>
<tr>
<td><strong>GRICAS</strong></td>
<td>GPS Receiver for Atmospheric Sounding</td>
</tr>
<tr>
<td><strong>GRC</strong></td>
<td>Ground-based Regional Augmentation System (eg Australia)</td>
</tr>
<tr>
<td><strong>GRC</strong></td>
<td>Galileo Reference Centre (in The Netherlands)</td>
</tr>
<tr>
<td><strong>GRI</strong></td>
<td>Group Repetition Interval (Loran-C)</td>
</tr>
<tr>
<td><strong>GRICAS</strong></td>
<td>Galileo Search-And-Rescue Return-Link Implementation for a better Civil Aviation Safety system</td>
</tr>
<tr>
<td><strong>GRINGO</strong></td>
<td>GPS RINEX Generator (IESSG)</td>
</tr>
<tr>
<td><strong>GRM</strong></td>
<td>GPS receiver module</td>
</tr>
<tr>
<td><strong>gross error</strong></td>
<td>Or ‘outlier’ is error other than random or systematic error. Often large and, by definition, unpredictable (After IMO).</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>GRT</td>
<td>gross registered tonnage</td>
</tr>
<tr>
<td>GS</td>
<td>glideslope</td>
</tr>
<tr>
<td>GSA</td>
<td>European Global Navigation Satellite Systems Agency (Prague)</td>
</tr>
<tr>
<td>GSC</td>
<td>GNSS Service Centre (run by GSA)</td>
</tr>
<tr>
<td>GSDI</td>
<td>Global Spacial Data Infrastructure</td>
</tr>
<tr>
<td>GSE</td>
<td>ground support equipment</td>
</tr>
<tr>
<td>GSM</td>
<td>Groupe Speciale Mobile or Global System for Mobile (communications)</td>
</tr>
<tr>
<td>GSM-R</td>
<td>GSM-Railway (part of ERTMS)</td>
</tr>
<tr>
<td>GSMC</td>
<td>Galileo Security Monitoring Centre (manages PRS)</td>
</tr>
<tr>
<td>GSO</td>
<td>geo-synchronous orbit</td>
</tr>
<tr>
<td>GSOp</td>
<td>Galileo Service Operator (Spaceopal GmbH)</td>
</tr>
<tr>
<td>GSSB</td>
<td>Galileo System Security Board</td>
</tr>
<tr>
<td>GSSF</td>
<td>Galileo System Simulation Facility (ESA)</td>
</tr>
<tr>
<td>GST</td>
<td>Galileo System Time (synched with UTC on 22 Aug 99)</td>
</tr>
<tr>
<td>GSTARS</td>
<td>Ground Safety Tracking and Reporting System (for airfields)</td>
</tr>
<tr>
<td>GSTB</td>
<td>Galileo System Test Bed</td>
</tr>
<tr>
<td>GT</td>
<td>gross tonnage</td>
</tr>
<tr>
<td></td>
<td>ground track (intended path of ship’s movement over ground)</td>
</tr>
<tr>
<td>GTO</td>
<td>geosynchronous transfer orbit</td>
</tr>
<tr>
<td>GTP</td>
<td>GPS translator processor (of TGRS)</td>
</tr>
<tr>
<td>GTR</td>
<td>Group Time Reference (Loran-C)</td>
</tr>
<tr>
<td>GTRF</td>
<td>Galileo Terrestrial Reference Frame (based on ITRF96)</td>
</tr>
<tr>
<td>GTS</td>
<td>Global Telecommunications System</td>
</tr>
<tr>
<td>GUI</td>
<td>graphical user interface</td>
</tr>
<tr>
<td>GUST</td>
<td>Galileo User Support Transport</td>
</tr>
<tr>
<td></td>
<td><em>EC project for Galileo receivers.</em></td>
</tr>
<tr>
<td>GWGGTI</td>
<td>GalileoSat WG on the Galileo Time Interface</td>
</tr>
<tr>
<td>h</td>
<td>hecto (SI unit multiplier of 10^2)</td>
</tr>
<tr>
<td>H</td>
<td>henry (inductance in Wb/A)</td>
</tr>
<tr>
<td>H-band</td>
<td>NATO radar band 6-8 GHz = 5-3.75 cm</td>
</tr>
<tr>
<td>H-field</td>
<td>magnetic-field (eg of aerial)</td>
</tr>
<tr>
<td>H24</td>
<td>continuous round-the-clock operation</td>
</tr>
<tr>
<td>HA</td>
<td>high accuracy (eg service)</td>
</tr>
<tr>
<td></td>
<td>Highways Agency (established by UK Government in 1994)</td>
</tr>
<tr>
<td>HAL</td>
<td>horizontal alert limit/level (eg for WAAS precision approach etc)</td>
</tr>
<tr>
<td>HAPS</td>
<td>high altitude pseudo-satellite (often helium-filled &amp; semi-rigid)</td>
</tr>
<tr>
<td>HAT</td>
<td>height above terrain</td>
</tr>
<tr>
<td>HAV</td>
<td>hybrid air vehicle (part aircraft, part airship)</td>
</tr>
<tr>
<td>Acronym</td>
<td>Definition</td>
</tr>
<tr>
<td>---------</td>
<td>------------</td>
</tr>
<tr>
<td>HBT</td>
<td>heterojunction bipolar transistor</td>
</tr>
<tr>
<td>HCMM</td>
<td>The Honourable Company of Master Mariners</td>
</tr>
<tr>
<td>HCS</td>
<td>heading control system</td>
</tr>
<tr>
<td>HD</td>
<td>head direction (used in animal navigation)</td>
</tr>
<tr>
<td>HDC</td>
<td>Hydrographic Data Centre (UK)</td>
</tr>
<tr>
<td>HDG</td>
<td>heading (course)</td>
</tr>
<tr>
<td>HDLC</td>
<td>high-level data link control/communication</td>
</tr>
<tr>
<td>HDOP</td>
<td>horizontal dilution of precision</td>
</tr>
<tr>
<td>HeliNet</td>
<td>Proposed netw’k of unmanned solar-powered stratospheric platforms</td>
</tr>
<tr>
<td>HEMS</td>
<td>Helicopter Emergency Medical Service</td>
</tr>
<tr>
<td>HEO</td>
<td>highly-elliptical orbit (typically 1,500-40,000 km)</td>
</tr>
<tr>
<td>HEROES</td>
<td>Harmonisation of European Rail Rules for Operating ERTMS (EU)</td>
</tr>
<tr>
<td>HEV</td>
<td>hybrid electric vehicle</td>
</tr>
<tr>
<td>HF</td>
<td>high frequency (3-30 MHz) (decametric waves)</td>
</tr>
<tr>
<td>HFDL</td>
<td>high frequency datalink</td>
</tr>
<tr>
<td>Hg</td>
<td>Refers to inches of mercury for atmospheric pressure</td>
</tr>
<tr>
<td></td>
<td>ISA 1013.2 mB or hPa = 29.92 ins Hg.</td>
</tr>
<tr>
<td>HGS</td>
<td>head-up guidance system</td>
</tr>
<tr>
<td>HI</td>
<td>High Integrity (Galileo service)</td>
</tr>
<tr>
<td>HIAL</td>
<td>high intensity approach lighting</td>
</tr>
<tr>
<td>HIPS</td>
<td>Highly-Interactive Problem Solver (EUROCONTROL)</td>
</tr>
<tr>
<td></td>
<td>Software for real-time air traffic management.</td>
</tr>
<tr>
<td>HIRL</td>
<td>high intensity runway lighting</td>
</tr>
<tr>
<td>HISL</td>
<td>high-intensity strobe light</td>
</tr>
<tr>
<td>HL</td>
<td>heading line (radar)</td>
</tr>
<tr>
<td>HLD</td>
<td>high level definition</td>
</tr>
<tr>
<td>HLG</td>
<td>High Level Group</td>
</tr>
<tr>
<td>HLS</td>
<td>helicopter landing site</td>
</tr>
<tr>
<td>HMAC</td>
<td>hydrogen maser atomic clock</td>
</tr>
<tr>
<td>HMD</td>
<td>helmet-mounted display</td>
</tr>
<tr>
<td>HF</td>
<td>hypomagnetic field</td>
</tr>
<tr>
<td>HMI</td>
<td>hazardously misleading information</td>
</tr>
<tr>
<td></td>
<td>human-machine interface</td>
</tr>
<tr>
<td>HMR</td>
<td>helicopter main route</td>
</tr>
<tr>
<td>HMU</td>
<td>health monitoring unit</td>
</tr>
</tbody>
</table>
height-monitoring unit
  *Ground-based unit for very accurately checking on aircraft height.*

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HNSE</td>
<td>horizontal navigation system error</td>
</tr>
<tr>
<td>HOB</td>
<td>Hydrographic Office Board (UK)</td>
</tr>
<tr>
<td>HoE</td>
<td>height of eye</td>
</tr>
<tr>
<td>HOTAS</td>
<td>hands on throttle and stick (ergonomic cockpit technology)</td>
</tr>
<tr>
<td>HOW</td>
<td>hand-over word</td>
</tr>
<tr>
<td>hPa</td>
<td>hectopascal</td>
</tr>
<tr>
<td></td>
<td><em>Supersedes the millibar. 1 mB = 100 pascals = 1 hPa.</em></td>
</tr>
<tr>
<td>HPA</td>
<td>high power amplifier</td>
</tr>
<tr>
<td>HPC</td>
<td>high-performance computing</td>
</tr>
<tr>
<td>HPEC</td>
<td>high-performance embedded comput(ing)</td>
</tr>
<tr>
<td>HPL</td>
<td>high-precision location (often GNSS augmentation using RTK)</td>
</tr>
<tr>
<td>HPZ</td>
<td>helicopter protected zone</td>
</tr>
<tr>
<td>hr</td>
<td>hour</td>
</tr>
<tr>
<td>HSB</td>
<td>hue, saturation, brightness (system of specifying monitor colours)</td>
</tr>
<tr>
<td>HSC</td>
<td>high speed craft</td>
</tr>
<tr>
<td>HSI</td>
<td>horizontal situation indicator</td>
</tr>
<tr>
<td>HSS</td>
<td>high-speed stream (of solar wind)</td>
</tr>
<tr>
<td>HSSC</td>
<td>Hydrographic Services and Standards Committee (IHB)</td>
</tr>
<tr>
<td>HSSWS</td>
<td>high speed solar wind stream</td>
</tr>
<tr>
<td>HTML</td>
<td>HyperText Mark-up Language (for Web pages)</td>
</tr>
<tr>
<td>HTTP</td>
<td>HyperText Transfer Protocol</td>
</tr>
<tr>
<td>HTZ</td>
<td>helicopter traffic zone</td>
</tr>
<tr>
<td>HUD</td>
<td>head-up display</td>
</tr>
<tr>
<td>HUMS</td>
<td>health and usage monitoring systems (IoT)</td>
</tr>
<tr>
<td>HUNE</td>
<td>horizontal component of the user navigation error</td>
</tr>
<tr>
<td>HUNGAGI</td>
<td>Hungarian Association for Geo-information</td>
</tr>
<tr>
<td>HV</td>
<td>host vehicle</td>
</tr>
<tr>
<td>HW</td>
<td>high water</td>
</tr>
<tr>
<td>HZ</td>
<td>haze (met)</td>
</tr>
<tr>
<td>Hz</td>
<td>Hertz (cycles per second)</td>
</tr>
<tr>
<td>I-4</td>
<td>Inmarsat 4th generation GEO satellites</td>
</tr>
<tr>
<td>I-4 F1</td>
<td>F1 143.5E, F2 63.5E, F3 98.4W.</td>
</tr>
<tr>
<td>I-band</td>
<td>NATO radar band 8-10 GHz = 3.75-3 cm</td>
</tr>
<tr>
<td>I-Level</td>
<td>intermediate level</td>
</tr>
<tr>
<td>I-NMF</td>
<td>Integrity Network Management Facility (Galileo)</td>
</tr>
<tr>
<td>I²S</td>
<td>integrated information system</td>
</tr>
<tr>
<td>IA</td>
<td>intelligent awareness</td>
</tr>
</tbody>
</table>
IAA  Irish Aviation Authority
IACA  International Air Carriers Association (of non-scheduled airlines)
IACS  International Association of Classification Societies (London)
IADC  International Association of Dredging Companies
IAEA  International Atomic Energy Agency
IAG  International Association of Geodesy
IAIN  International Association of Institutes of Navigation
       33 institutes & associated members. www.iainav.org
IALA  International Association of Lighthouse Authorities
       Full title ‘International Association of Marine Aids to Navigation and Lighthouse Authorities’. 80 national lighthouse authorities + associate and industrial members. UK represented by TH & NLB. Formed 1957.
IAMF  International Aeronautical Monetary Fund (ICAO)
       For implementation of CNS/ATM in poorer countries.
IANT  Instituto Argentino de Navegacion
IAOPA  International Aircraft Owners and Pilots Association (73 bodies ‘18)
IAP  instrument approach procedure
IAS  indicated airspeed
IASA  International Aviation Safety Assessment (FAA programme)
IATA  International Air Transport Association
IAU  International Astronomical Union
IBAN  Internet-Based Augmentation System (a WAAS using www)
IBC Code  International Bulk Carriers’ Code
       Includes equipment in ships carrying dangerous chemicals in bulk.
IBCU  inboard computer unit
IBLS  Integrity Beacon Landing System (using pseudolite)
IBn  identification beacon
IBS  integrated bridge system
IC  ice crystals (met)
ICAA  Iceland Civil Aviation Administration
ICAM  Integrated Coastal Area Management
ICAO  International Civil Aviation Organisation (192 states, HQ Montréal)
ICAO (EUR/NAT)  ICAO (European & North Atlantic Region)
ICC  integrated control system
       International Certificate of Competence
ICCL  International Council of Cruise Lines
ICD  interface control document
ICF  initial contact frequency (ATC)
       Integrity Control Facility (Galileo)
ICNS  integrated communication, navigation and surveillance
ICOMIA  International Council of Marine Industry Associations
ICS    initial control system
         Institute of Chartered Shipbrokers
         International Chamber of Shipping (London-based)
         International Commission on Shipping
ICT    information and communication technologies
ICZM   Integrated Coastal Zone Management (UK)
ID     identification
IDDN   Integrity Data Dissemination Network (Galileo)
IDE    integrated development environment
IDM    improved data modem
IDP    information data processing
IDS    integrated display system
         integrity determination system
         interference detection system
IEC    International Electrotechnical Commission
         Based in Geneva. Sets standards for electrotechnical devices. IEC 61108-1 (1996-06) applies to GPS.
IEEE   Institute of Electrical Engineers (UK)
IEEE   Institute of Electrical and Electronic Engineers (US)
IERS   International Earth Rotation and Reference Systems Service
         HQ Paris.
IESSG  Institute of Engineering Surveying and Space Geodesy
         At the University of Nottingham.
IETT   Institute of European Trade and Technology
IF     inertial frame
         instrument flying
         intermediate frequency
IFCS   integrated flight control system
IfEN   Institute of Geodesy and Navigation (Univ FAF Munich, Germany)
IFF    Identification Friend or Foe (system)
IFN    Institut Français de Navigation
IFR    instrument flight rules
IFSMA  International Federation of Shipmasters' Associations
IGC Code International Gas Carriers' Code
         Includes equipment in ships carrying liquified gases in bulk.
IGEB   Interagency GPS Executive Board (US co-chairs DoD & DOT)
IGEX   International GLONASS Experiment
IGS    instrument guidance system
         International GPS Service
IGSAGS  Integrated Global Surveillance and Guidance System
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGSO</td>
<td>Inclined geosynchronous orbit. Satellite height of 36,000 km inclined to equatorial plane.</td>
</tr>
<tr>
<td>IHB</td>
<td>International Hydrographic Bureau</td>
</tr>
<tr>
<td>IHPT</td>
<td>Portugese Navy Hydrographic Institute</td>
</tr>
<tr>
<td>IIAR</td>
<td>Instantaneous integer ambiguity resolution</td>
</tr>
<tr>
<td>IIM</td>
<td>Instituto Idrografico della Marina (Italian Hydrographic Office)</td>
</tr>
<tr>
<td>IIN</td>
<td>Italian Institute of Navigation</td>
</tr>
<tr>
<td>IISC</td>
<td>International Information Sub-Committee (of CGSIC)</td>
</tr>
<tr>
<td>IKD</td>
<td>In-kind delivery. Contribution to a project in-kind rather than by direct funding.</td>
</tr>
<tr>
<td>ILA</td>
<td>International Loran Association</td>
</tr>
<tr>
<td>ILAMA</td>
<td>International Life-saving Appliances Manufacturers’ Association</td>
</tr>
<tr>
<td>ILF</td>
<td>International Lifeboat Federation</td>
</tr>
<tr>
<td>ILO</td>
<td>International Labour Organisation (deals with marine crewing issues)</td>
</tr>
<tr>
<td>ILS</td>
<td>Instrument Landing System</td>
</tr>
<tr>
<td>IM</td>
<td>Integrity monitoring</td>
</tr>
<tr>
<td>IMA</td>
<td>Integrated modular avionics</td>
</tr>
<tr>
<td>IMarE</td>
<td>Institute of Marine Engineers</td>
</tr>
<tr>
<td>IMC</td>
<td>Instrument meteorological conditions</td>
</tr>
<tr>
<td>IMCA</td>
<td>International Marine Contractors Association</td>
</tr>
<tr>
<td>IMEC</td>
<td>International Maritime Employers’ Committee</td>
</tr>
<tr>
<td>IMERP</td>
<td>Implementation of the European Radionavigation Policy</td>
</tr>
<tr>
<td>IMMR</td>
<td>Integrated Multi-Mode Receiver (Honeywell)</td>
</tr>
<tr>
<td>IMS</td>
<td>Integrity monitoring station (eg Galileo)</td>
</tr>
<tr>
<td>IMSO</td>
<td>International Mobile Satellite Organisation. An intergovernmental body to oversee Inmarsat’s delivery of its public service obligations, including GMDSS.</td>
</tr>
<tr>
<td>IMT 2000</td>
<td>International Mobile Telecommunications for 2000 and beyond (ITU)</td>
</tr>
<tr>
<td>IMU</td>
<td>Inertial Measurement Unit</td>
</tr>
<tr>
<td>INA</td>
<td>International Navigation Association</td>
</tr>
<tr>
<td>INE</td>
<td>Instituto de Navegacion de Espana</td>
</tr>
<tr>
<td>INITIATIVE</td>
<td>EU Project for electronic fee collection using GNSS</td>
</tr>
<tr>
<td>Inmarsat</td>
<td>InMaritime SATellite Organisation. Runs 13 compsat satellites mainly, but not only, for shipping.</td>
</tr>
<tr>
<td>INPHORMM</td>
<td>Info &amp; Pub Helping the Objective of Reducing Motorised Mobility (EU)</td>
</tr>
<tr>
<td>INS</td>
<td>Inertial navigation system</td>
</tr>
<tr>
<td></td>
<td>Integrated navigational system</td>
</tr>
</tbody>
</table>
InSAR Interferometric Synthetic Aperture Radar
InSAR Interferometric synthetic aperture radar (for ground vert movem’t)
INTEG EGNOS Integration into Galileo
   EC study to analyse a seamless transition from EGNOS to Galileo.

integrated navigation
   A system in which the information from 2 or more navigation aids is combined in a symbiotic manner to provide an output which is superior to any one of the component aids (IMO).

integrity
   The ability to provide users with warnings within a specified time when the system should not be used for navigation (IMO).

integrity risk
   Probability that a user will experience a position error larger than the threshold value without an alarm being raised within specified time-to-alarm at any instant of time at any location within the coverage area (IMO). A typical figure is $10^{-7}$.

INELFRET intelligent freight train
INTER intermittent or fluctuating (met)
INTERCARGO International Association of Dry Cargo Shipowners
Intercept Intermodal Concepts in European Passenger Transport
   EC DG TREN & DG XIII project.

International NAVTEX Co-ordinated broadcast and automatic reception on 518 kHz
   ‘of marine safety information by means of narrow-band direct-printing telegraphy using the English language.’

Intertanko International Tankers Organisation
INWAAS Indian WAAS
IOC Initial Operational Capability
   Intergovernmental Oceanographic Commission
IODC issue of data, clock (GPS)
IODE issue of data, ephemeris (GPS)
ION Institute of Navigation (US)
ION-CH Swiss Institute of Navigation
Ionosphere Part of atmosphere from ~120-350 km
IOR Indian Ocean Region (Inmarsat I-3 satellite at 64.5°E)
IORS integrated optical rotation sensor
IoT Internet of Things
IOT&E Initial Operational Test & Evaluation
IOV in-orbit validation
IP initial point (eg fix before run-in to target)
   instrumentation port
   Internet Protocol
IPAB International Programme for Antarctic Buoys
IPF Integrity Processing Facility (Galileo)
IPIN indoor positioning and indoor navigation
IPP Ionospheric Pierce Point (for measuring ionospheric delay (eg GPS)
IPS indoor positioning system
Also known as COLREGs.

In basic terms sea-level pressure of 1013.2mb and temperature of +15ºC, with temperature lapse rate of -1.98ºC per 1,000ft to 36,090ft.

Code for safe operation of ships and for pollution prevention.
ISTB  International Satellite Test Bed (EU initiative)
ISWG  Intersessional Working Group (IMO)
IT    information technology
ITCZ  Inter-Tropical Convergence Zone
ITF   International Transport (Workers) Federation
ITIS  Integrated Transport Information Services (travel info for logistics)
ITN   Integrated Transport Layer (OS MasterMap)
ITOFAR Interrogated Time Offset Frequency Agile Racon
ITRF  IERS Terrestrial Reference Frame (latest ITRF2014)
ITS   intelligent transportation system
          intermediate level test set
ITSF  International Timing and Sync Forum (int annual conf)
ITU   Intermodal Transport Unit (EU container for any form of transport)
          International Telecommunication Union (HQ Geneva)
          ITU-R is Radiocommunication Sector (ex-CCIR) and ITU-T is Telephony and Telegraphy
          (ex-CCITT). ITU is a UN Agency.
ITZ   Inshore Traffic Zone
IUGG  International Union of Geodesy and Geophysics
IUGS  International Union of Geological Sciences
IULS  Integrity Uplink Station (Galileo)
IUSM  International Union for Surveys and Mapping
IVHS  intelligent vehicle highway systems
IVI   Intelligent Vehicle Initiative (US)
IVIS  in-vehicle information system
IVU   in-vehicle unit
IWAAS Initial WAAS
          Capable of supporting navigation and CAT I precision approach but lacking internal
          redundancy and guaranteed availability.
IWV   integrated water vapour
J-band NATO radar band 10-20 GHz = 3-1.5 cm
J/S   jamming-to-signal ratio
JAA   Joint Aviation Authorities (based in Amsterdam)
          Represent aviation safety regulatory authorities of Euro countries.
JANE  Joint Air Navigation Experiments (EU)
JANSC Joint Air Navigation Services Council (MOD/NATS)
JAR   Joint Aviation Requirement (of the JAA)
JAXA  Japan Aerospace Exploration Agency (operate QZSS)
JCAB  Japanese Civil Aviation Bureau
JCG   Joint Coordinating Group
          Comprising chairmen & chief executives of the GLAs.
JD    Julian Day (count of days from midday on 1 January 4713 BC)


JGPSC  Japan GPS Council
JIN  Japan Institute of Navigation
JMC  Joint Maritime Commission (of ILO)
JMSA  Japan Maritime Safety Agency
JPALS  Joint Precision Approach and Landing System
JPEG  Joint Photographic Expert Group

*Standard for digital image compression.*

JPL  Joint Propulsion Laboratory (Pasadena CA, USA)
JPO  Joint Program Office (US)
JRC  Joint Research Centre (EC, based in Brussels)
JRCC  joint rescue co-ordination centre
JRSC  joint rescue secondary centre
JTIDS  Joint Tactical Information Distribution System (US/NATO DL)
JTSO  Joint Technical Standard Order (JAA)
JUCG  Joint User Consultative Group on Aids to Navigation

*Run by the GLAs with secretariat at TH.*

JWG  Joint Working Group (ICAO and IMO)
k  kilo (SI unit multiplier of 10³)

**K-band**
NATO radar band 20-40 GHz = 1.5-0.75 cm
Old radar band 18-27 GHz (ITU assigned 24.05-24.25 GHz) ~ 1.5 cm

**Kₚ-band**
Old radar band 27-40 GHz (ITU assigned 33.4-36.0 GHz) ~ 1 cm

**Kalman Filtering**

*Mathematical method of combining data to give optimal position (velcity etc) solutions whilst on the move.*

kbit  kilobit

1,024 bits or 128 8-bit bytes.

kbps  kilobits per second

**KDE**  kernel density estimation
kg  kilogram (1,000 grams)

**kHz**  kilohertz (1,000 cycles per second)

**KIAS**  knots indicated airspeed

KIN  Korean Institute of Navigation

**KL**  Knowledge Library (eg in AIS)

km  kilometre (1,000 metres)

kn  knot (unit of velocity and speed)

1 kn = 1 NM/h = 0.514444 m/s.

KNAG  Royal Dutch Geographical Society

KPS  Korean Positioning System (FOC 2034?)

kt  knot

KTA  key technical advisor

**Kₚ-band**  Old radar band 12-18 GHz ~ 2 cm

*(ITU assigned 13.4-14.0 & 15.7-17.7 GHz)*
kW  kilowatt (1,000 watts = 1.341 horsepower)
L-band  NATO radar band 40-60 GHz = 7.5-5 mm
Old radar band 1-2 GHz (ITU assigned 1,215-1,400 MHz) = 30-15 cm
L/L  latitude and longitude
L1, L2, L5  GPS carrier frequencies (in the old L-band)
Frequencies are 1,575.42 MHz (L1), 1,227.60 MHz (L2) & 1,176.45 MHz (L5).
LAADR  Low-Altitude Arrival/Departure Route
LAAS  Local Area Augmentation System (GPS etc)
LAB  Launch Authorisation Board (eg of space launch)
LADGNSS  Local Area Differential GNSS
LADGPS  Local Area Differential GPS
LADO  Launch & early orbit, Anomaly resolution & Disposal Operations (GPS)
LAHSO  land and hold short operations (to expand runway capacity)
LAL  lateral alert limit/level (eg for WAAS precision approach etc)
LAM  liquid apogee motor
LAN  local area network
longitude of the ascending node
The point that an orbit intercepts the equator when crossing from the southern to northern hemisphere.
Lanby  Large Automatic Navigational Buoy
LARS  Lower Airspace Radar Service
LAS  lower airspace service
laser  light amplification by stimulated emission of radiation
Lat  (LAT) (\(\varphi\)) latitude (angular distance from the equator, labelled N/S)
May be geographic, geodetic, geocentric or astronomical.
LAT  local apparent time
lowest astronomical tide
LATCC  London Area and Terminal Control Centre (ATC)
LATS  London Area Traffic Survey (UK DTLR)
LBA  Luftfahrt Bundesamt (German CAA)
LBMON  L-Band Monitor (computer program)
LBS  location-based service(s)
LCD  liquid crystal display
LCLA  Local Cave Leader Award
LCS  Launch and Checkout System (of GPS OCX)
LDA  linear discriminant analysis (statistics algorithm)
LDGPS  Local Differential GPS (or LADGPS)
LED  light-emitting diode
leeway angle  Angular difference between course through water and course to steer.
Leg intended ground track between 2 waypoints
LEO low earth orbit
   Satellite orbit of up to 2,000 km.
LEOP Launch and Early Orbit Phase (eg Galileo)
LEOSAR Low-altitude Earth Orbit Search and Rescue (satellites)
LEP linear error probable
   Half of the interval containing half of the results of the trials in a series of one-dimensional measurements.
LES land earth station (same as CES operationally)
LETFEL leterminating thin film electroluminescent device (for displays)
LF low frequency (30-300 kHz)
LFA low flying area
LFC low flying chart
LFS low flying system
LFV Luftfartsverket (Swedish CAA)
LGF LAAS ground facility
LHA local hour angle
LIBERALIB Liberalised and Interoperable Railways (EU)
LIDAR light detection and ranging
LINCS Low-cost Identification, Navigation, Communication, Surveillance
LINS laser inertial navigation system
LINZ Land Information New Zealand (overseeing SBAS)
LITAS low-intensity two-colour approach system
LKLY likely (met)
Im lumen (luminous flux in cd sr)
Lm Mean latitude (half the sum of the latitudes of 2 places)
LMDS local-multipoint distribution service
LMES land mobile earth station
LMT local mean time
   The arc of the celestial equator between the lower branch of the local celestial meridian and the hour circle of the true sun.
LNA low-noise amplifier
LNAV lateral navigation
   Initial WAAS service for non-precision approach down to 400-500ft.
LNAV/VNAV lateral and vertical navigation
   An initial WAAS service for precision approach down to 350ft and 1 NM. Also called non-precision approach with vertical guidance.
LNB low-noise block (antenna component)
LO local oscillator
LOA length overall
LOC localiser (azimuth guidance portion of ILS)
log-on-chart (light aircraft navigation technique)
LOC-I  loss of control in flight (coding of air accident - ECCAIRS)
LOIS  Land Ocean Interaction Study
Lon  
  (LON) (λ) longitude
  Angle at pole between prime meridian and meridian of a point, labelled E or W. May be geographic, geodetic, geocentric or astronomical.

LOP  line of position (also PL)
LOR  Long-term Operations & Replenishment (phase of Glileo)
Loran  LOng RAnge Navigation
  Loran-C is a terrestrial pulsed hyperbolic system in band 90-110kHz.

LOS  line-of-sight
Loxodrome  rhumb line
LPAT  Low Power ADS-B Transceiver (CAA)
LPWA  Low Power Wide Area (eg for M2M comms)
LPWAN  low-power wide area network
LR  Lloyd's Register
LRC  Long Range Certificate (for GMDSS MF/HF equipment)
LRIP  low rate initial production
LRK  long-range kinematic (of GPS)
LRNS  long range navigation system
LRU  line-replaceable unit
LS  leap seconds (=TAI - UTC; +37s Jan 18)
LSB  least significant bit
LSF  leap seconds future
LSI  large scale integration (of chips)
LSR  least squares residual
LT  local time
LTE  Long-Term Evolution (of high speed comms/data via phone)
LTE-U  LTE Unlicensed (in 5GHz band)
LTF  Legal Task Force (EUROCONTROL)
LTP  LAAS Test Prototype (US)
  Local Transport Plan
LUA  large unmanned aircraft (2 classes: 20-150 kg and >150 kg)
LUT  local user terminal (COSPAS-SARSAT)
LW  low water
lx  lux (illuminance in lm/m²)
μ  Earth’s gravitational constant (typically 3,99 x 10¹⁴ m³/s²)
  micro (SI unit multiplier of 10⁻⁶)
m  metre
  milli (SI unit multiplier of 10⁻³)
M-ADS  Modified Automatic Dependent Surveillance
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-band</td>
<td>NATO radar band &gt; 60 GHz = &lt; 5 mm</td>
</tr>
<tr>
<td>M-Code</td>
<td>Military Code for GPS</td>
</tr>
<tr>
<td>m/s</td>
<td>metres per second</td>
</tr>
<tr>
<td>M</td>
<td>Mach</td>
</tr>
<tr>
<td></td>
<td>magnetic</td>
</tr>
<tr>
<td></td>
<td>mega (SI unit multiplier of 10^6)</td>
</tr>
<tr>
<td></td>
<td>nautical mile on charts under IHO Spec of 1982</td>
</tr>
<tr>
<td></td>
<td>Approx 1,852 m or 6,080 ft.</td>
</tr>
<tr>
<td>M&amp;S</td>
<td>models and simulation</td>
</tr>
<tr>
<td>M&amp;T</td>
<td>measurement &amp; testing</td>
</tr>
<tr>
<td>M2M</td>
<td>machine-to-machine (comms)</td>
</tr>
<tr>
<td>Mach No</td>
<td>(M) Ratio of TAS to local speed of sound</td>
</tr>
<tr>
<td>mag</td>
<td>magnetic</td>
</tr>
<tr>
<td></td>
<td>magnitude (of star)</td>
</tr>
<tr>
<td>MagR</td>
<td>A protein with magnetic properties (animal navigation)</td>
</tr>
<tr>
<td></td>
<td><em>Forms rod-like clumps with light-sensitive cryptochrome proteins.</em></td>
</tr>
<tr>
<td>MAIB</td>
<td>Marine Accident Investigation Branch (UK)</td>
</tr>
<tr>
<td>MAP</td>
<td>missed approach point</td>
</tr>
<tr>
<td>MAPT</td>
<td>missed-approach point</td>
</tr>
<tr>
<td>MARAD</td>
<td>Maritime Administration (US)</td>
</tr>
<tr>
<td>MARE</td>
<td>(MERR) maximum allowable range error</td>
</tr>
<tr>
<td>MARREP</td>
<td>Mariner Reporting System</td>
</tr>
<tr>
<td>MARIS</td>
<td>Maritime Information Society (EC DG III - formed May 97)</td>
</tr>
<tr>
<td>MARPOL</td>
<td>Int Convention for the Prevention of Pollution from Ships (1973)</td>
</tr>
<tr>
<td>MARSOL</td>
<td>MARitime Safety of Life Working Group (ESA)</td>
</tr>
<tr>
<td>MARSOURCE</td>
<td>A fisheries &amp; marine environment info network (MARIS)</td>
</tr>
<tr>
<td>MARTRANS</td>
<td>Info network on movement of cargo vessels (MARIS)</td>
</tr>
<tr>
<td>MASPS</td>
<td>Minimum Aviation System Performance Standards</td>
</tr>
<tr>
<td></td>
<td><em>ICAO standards required of aircraft wishing to use areas of reduced separation standards.</em></td>
</tr>
<tr>
<td>MASRWG</td>
<td>Maritime Autonomous Systems Regulation Working Group (IMO)</td>
</tr>
<tr>
<td>MasterMap</td>
<td>OS definitive map database of UK</td>
</tr>
<tr>
<td>MATLAB</td>
<td>matrix laboratory (programming language developed by MathWorks)</td>
</tr>
<tr>
<td>MATO</td>
<td>military air traffic operations</td>
</tr>
<tr>
<td>MATS</td>
<td>Manual of Air Traffic Services (UK)</td>
</tr>
<tr>
<td>MATZ</td>
<td>Military Air Traffic Zone</td>
</tr>
<tr>
<td></td>
<td><em>Usually 5 n miles radius up to 3,000 ft with stubs to 10 n miles aligned with main runway.</em></td>
</tr>
<tr>
<td>Mayday</td>
<td>“m’aidez” - help me. International radio distress call</td>
</tr>
<tr>
<td>MB</td>
<td>magnetic bearing (angular distance from MN to the object)</td>
</tr>
<tr>
<td>Mb</td>
<td>megabyte (= 1,048,576 bytes)</td>
</tr>
</tbody>
</table>
mB

millibar

Superseded by the hectopascal (hPa). 1mB = 100 pascals = 1 hPa.

MBaaS
Mobile Backend as a Service (for web and mobile app developers)

MBB
Maritime Black Box (EU R&D project)

Mbps
Million bits per second

MBS
Metropolitan Beacon System (eg for urban/indoor navigation)

MC
magnetic course

Intended direction of movement (of the ship), defined by the angle between the magnetic meridian through its position and the fore-and-aft line (of the ship), expressed in angular units from magnetic north (000°).

main computer

MCA
Marine and Coastguard Agency (UK)

MCC
Mission Control Centre (COSPAS-SARSAT)(EGNOS)

multi-crew cooperation

MCF
master control facility (eg of satellite constellation)

MCM
multi-chip module

MCMF
multi-constellation, multi-frequency (eg in MOPS)

MCMT
mean corrective maintenance time

MCS
Master Control Station (GPS - Colorado Springs) (MSAS)

MCTA
military control area (ATC)

MCTZ
military control zone (ATC)

MCW
modulated continuous-wave

MCWG
Maps and Charts Working Group (CAA)

MDA
minimum decision altitude (of landing aircraft)

MDB
marginally detectable bias

The minimum size of the gross error in an observation that may be detected with given probability.

MDCE
Maritime Data Centre of Europe (independent, based in Copenhagen)

MDE
marginally detectable error

The maximum position offset caused by a MDB in a LOP or observation.

minimum detectable error

MDGPS
Maritime DGPS (USCG, part of NDGPS)

MDH
minimum descent height (of landing aircraft)

MDIS
Midlands Driver Information System

MDM
modem data manager

MDT
mean down time

mobile data terminal (in vehicle)

MDU
Mission Data Unit (GPS III)

MECP
Mobile Electronics Certified Professional (UK)

MEDEVAC
medical evacuation

MEGRIN
Multi-purpose Ground Related Information Network (mapping sys)

MEL
minimum equipment list
MELTT: French Ministry of Transport
MEMS: micro-electromechanical system (eg micro IMU)
MEO: medium earth orbit
Satellite orbits of 5,000-20,000 km altitude.
MEOLUT: MEO Local User Terminal (Galileo)
MEOSAR: Medium-altitude Earth Orbit Search and Rescue (satellites)
MEPC: Marine Environment Protection Committee (IMO)
Meridian: Great circle through the geographical poles of the earth
Meridional difference: (ΔΦ) Difference of the meridional parts of any 2 given parallels
Merparts: (Φ) Meridional parts
Length of the arc of a meridian between the equator and a given parallel on a Mercator chart, expressed in units of 1’ of longitude on the equator.
MERPR: maximum allowable error in pseudorange
MERR: (MARE) maximum allowable range error
MERSAR: MERchant ship Search And Rescue (IMO manual)
MERV: maximum tolerable vertical position error
MES: mobile earth station
For maritime use known as SES. For land use known as LES or LMES.
MESA: maximum entropy spectral analysis
Mobility for Emergency & Safety
Single platform for apps related to TETRA but on 3.8-4.9 GHz.
MESF: Mobile Electronics & Security Federation (UK)
MESFET: metal semiconductor field effect transistor
Mesosphere: Part of atmosphere from ~ 50-85 km
METAREA: Sea area for GMDSS meteorological information
MetFAX: UK Met Office faxed-based dial-up weather service
MF: magnetic field
medium frequency (300-3,000 kHz) (hectometric waves)
MFAKF: modified fuzzy adaptive Kalman filter
MFD: multi-function display
MGN: Marine Guidance Note (MCA)
MGUE: Military GPS User Equipment (US)
MH: magnetic heading
Actual direction in which the longitudinal axis (of the ship) is pointed, defined by the angle between the magnetic meridian through its position and the fore-and-aft line (of the ship), expressed in angular units from magnetic north (000°).
MHWN: mean high water neaps
MHWS: mean high water springs
MHz: megahertz (1,000,000 cycles per second)
MI: shallow (met)
MIA: measurement integrity assurance (eg for RTK robustness)
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIC</td>
<td>monolithic integrated circuit</td>
</tr>
<tr>
<td></td>
<td>mountain instructor certificate</td>
</tr>
<tr>
<td>Michibiki</td>
<td>Local name for Japan’s QZSS</td>
</tr>
<tr>
<td>microwaves</td>
<td>radio waves &gt; 1 GHz</td>
</tr>
<tr>
<td>MID</td>
<td>maritime identification digits</td>
</tr>
<tr>
<td>MIDAS</td>
<td>Motorway Incident Detection and Signalling System</td>
</tr>
<tr>
<td>MIDS</td>
<td>Multi-Instrument Data Analysis System (math model for ionos delay)</td>
</tr>
<tr>
<td>MIME</td>
<td>Multifunction Information Distribution System (data link)</td>
</tr>
<tr>
<td>MIN</td>
<td>Marine Information Note (UK)</td>
</tr>
<tr>
<td>min</td>
<td>minute</td>
</tr>
<tr>
<td>MIO</td>
<td>marine information object (time-variable object in ECDIS)</td>
</tr>
<tr>
<td>MIPS</td>
<td>million instructions per second</td>
</tr>
<tr>
<td>MIRA</td>
<td>Motor Industry Research Association</td>
</tr>
<tr>
<td>MIS</td>
<td>management information system</td>
</tr>
<tr>
<td>MJD</td>
<td>Modified Julian Day (started midnight 17 November 1858) Equal JD - 2,400,000.5.</td>
</tr>
<tr>
<td>mkr</td>
<td>marker/marker beacon (on 75 MHz for ILS)</td>
</tr>
<tr>
<td>ML</td>
<td>machine learning (statistics algorithm)</td>
</tr>
<tr>
<td>MLA</td>
<td>Mountain Leader Award</td>
</tr>
<tr>
<td>MLaaS</td>
<td>machine learning as a service</td>
</tr>
<tr>
<td>MLC</td>
<td>Mountain Leader Certificate</td>
</tr>
<tr>
<td>MLE</td>
<td>maximum likelihood estimator</td>
</tr>
<tr>
<td>MLS</td>
<td>Microwave Landing System</td>
</tr>
<tr>
<td>MLU</td>
<td>mid-life update</td>
</tr>
<tr>
<td>MLV</td>
<td>medium launch vehicle</td>
</tr>
<tr>
<td>MLWN</td>
<td>mean low water neaps</td>
</tr>
<tr>
<td>MLWS</td>
<td>mean low water springs</td>
</tr>
<tr>
<td>MmaxCT</td>
<td>maximum corrective maintenance time</td>
</tr>
<tr>
<td>MMI</td>
<td>man-machine interface (nowadays replaced by ‘HMI’)</td>
</tr>
<tr>
<td>MMLS</td>
<td>Mobile Microwave Landing System</td>
</tr>
<tr>
<td>MMR</td>
<td>multi-mode receiver</td>
</tr>
<tr>
<td>MMSI</td>
<td>Maritime Mobile Service Identity Code (GMDSS DSC)</td>
</tr>
<tr>
<td>MMW</td>
<td>millimeter-wave (eg radar)</td>
</tr>
<tr>
<td>MN</td>
<td>magnetic north</td>
</tr>
<tr>
<td></td>
<td><em>Northerly direction of the horizontal component of the earth’s magnetic field.</em></td>
</tr>
<tr>
<td>MNE</td>
<td>Marine Navigation Equipment (Sub-Group of UK SON Ctee)</td>
</tr>
</tbody>
</table>
Provides position estimate with associated errors by data fusion of dissimilar sensors.

Mode A - normal ATC codes, Mode C - encoded flight levels, Mode S - selective interrogation and downlinking of aircraft parameters (DAPs).

A set of standards defining minimum performance, functions and features for RNAV and, optionally, VNAV equipment.
Monitor Station (GPS)

Marine Safety Agency

Was part of DETR, replaced in Apr 98 by MCA.

minimum safe altitude

Merchant Shipping Acts (in UK empower the GLAs)

Multi-transport Satellite-based Augmentation System

Japanese WAAS.

most significant bit

Maritime Safety Committee (IMO)

minimum separation distance

multi-sensor data processor

Maritime Safety Information (IMO)

Maritime Safety Information Provider (GMDSS)

mean sea level

mean sea surface

mobile satellite service

mobile satcom unit

Mediterranean Test Bed (part of STENAV for Galileo)

mean time between critical failures

mean time between downing events

mean time between failures

The average time between 2 successive failures of a system or part of.

mean time between maintenance

maximum time interval error

maximum take-off weight

Multi-function Transport Satellite

Japanese (JCAB) geostationary satellite carrying met, comms, nav overlay and ATC surveillance functions.

minimum time track

mean time to repair

simultaneous use of 2 or more datalinks

multiplexer

manpack/vehicular user equipment

minimum variance unbiased estimator

multimedia wireless systems

Telecommunications and broadcasting via the same radio network.

nano (SI unit multiplier of 10⁻⁹)

newton (force in m kg s⁻²)

nautical mile (sometimes NM, M on charts)

Approx 1,852 m or 6,080 ft.

non-instrument (of aircraft approach)
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Na</td>
<td>nadir (point on the celestial sphere vertically below the observer)</td>
</tr>
<tr>
<td>NAD</td>
<td>North American Datum</td>
</tr>
<tr>
<td>NADC</td>
<td>National Antarctic Data Centre</td>
</tr>
<tr>
<td>NADICS</td>
<td>NAtional Driver Information and Control System (Scottish Office)</td>
</tr>
<tr>
<td>NAGU</td>
<td>Notice Advisory to Galileo Users</td>
</tr>
<tr>
<td>NAICS</td>
<td>North American Industry Classification System</td>
</tr>
<tr>
<td>NAU</td>
<td>Notice Advisory to Navstar Users</td>
</tr>
<tr>
<td>NAO</td>
<td>North Atlantic Oscillation</td>
</tr>
<tr>
<td>NAQU</td>
<td>Notice Advisory to QZSS Users</td>
</tr>
<tr>
<td>NARSIA</td>
<td>North American Remote Sensing Industries Association</td>
</tr>
<tr>
<td>NAS</td>
<td>National Airspace System (US)</td>
</tr>
<tr>
<td>NASA</td>
<td>National Aeronautics and Space Administration (US)</td>
</tr>
<tr>
<td>NASCTN</td>
<td>National Advanced Spectrum and Communications Test Network (US)</td>
</tr>
<tr>
<td>NASDA</td>
<td>National Space Development Agency of Japan</td>
</tr>
<tr>
<td>NAT SPG</td>
<td>North Atlantic Systems Planning Group</td>
</tr>
<tr>
<td>NATCA</td>
<td>National Air Traffic Controllers Association (US)</td>
</tr>
<tr>
<td>NATMAC</td>
<td>National Air Traffic Management Advisory Committee (UK)</td>
</tr>
<tr>
<td>NATO</td>
<td>North Atlantic Treaty Organisation (29 states in 2018)</td>
</tr>
<tr>
<td>NATS</td>
<td>National Air Traffic Services Ltd (UK ATSP)</td>
</tr>
<tr>
<td>NAV</td>
<td>IMO Sub-Committee on Safety of Navigation</td>
</tr>
<tr>
<td>NAV-msg</td>
<td>Navigation Message</td>
</tr>
<tr>
<td>NAV-area</td>
<td>Sea area for GMDSS radio navigation warnings</td>
</tr>
<tr>
<td>NAVCENT</td>
<td>Navigation Centre (USCG)</td>
</tr>
<tr>
<td>NAVD</td>
<td>North American Vertical Datum</td>
</tr>
<tr>
<td>NAVIC</td>
<td>NAVigation with Indian Constellation (IRNSS)</td>
</tr>
<tr>
<td>navigation</td>
<td>The process of planning, recording and controlling the movement of a craft from one place to another (IMO).</td>
</tr>
<tr>
<td>NAVISP</td>
<td>Navigation Innovation and Support Programme (ESA)</td>
</tr>
<tr>
<td>NAVSIP</td>
<td>Navigation Innovation and Support Programme (ESA initiative)</td>
</tr>
<tr>
<td>NAVSOL</td>
<td>navigation solution</td>
</tr>
<tr>
<td>NAVSTAR</td>
<td>NAVigation Satellites with Timing And Ranging (GPS)</td>
</tr>
<tr>
<td>NAVTEX</td>
<td>Navigational Information Telex Services</td>
</tr>
<tr>
<td>NAVWAR</td>
<td>NAVigation WARfare (US military GPS programme)</td>
</tr>
<tr>
<td>NAWC</td>
<td>Naval Air Warfare Centre (USN - Patuxent River)</td>
</tr>
<tr>
<td>NB-IoT</td>
<td>Narrowband Internet of Things</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>NBDP</td>
<td>narrow band direct printing (eg GMDSS and NAVTEX)</td>
</tr>
<tr>
<td>NCAA</td>
<td>Norwegian Civil Aviation Administration</td>
</tr>
<tr>
<td>NCES</td>
<td>NH Code Evasion and Stripping method</td>
</tr>
<tr>
<td>NCF</td>
<td>Navigation Control Facility (Galileo)</td>
</tr>
<tr>
<td>NCI</td>
<td>National Coastwatch Institution (UK)</td>
</tr>
<tr>
<td>NCS</td>
<td>Network Co-ordinating Station (Inmarsat)</td>
</tr>
<tr>
<td>NCSR</td>
<td>Navigation, Communications and Search and Rescue (IMO sub-ctee)</td>
</tr>
<tr>
<td>NDB</td>
<td>non-directional beacon</td>
</tr>
<tr>
<td>NDC</td>
<td>National Document Centre (Greek AGI)</td>
</tr>
<tr>
<td>NDGPS</td>
<td>Nationwide DGPS (US)</td>
</tr>
<tr>
<td>NDPB</td>
<td>non-departmental public body (UK)</td>
</tr>
<tr>
<td>NEAN</td>
<td>North European ADS-B Network (EU/EUROCONTROL)</td>
</tr>
<tr>
<td>NEAP</td>
<td>North-European ADS-B Application Project (EU)</td>
</tr>
<tr>
<td>NELS</td>
<td>Northwest European Loran-C System (now extinct)</td>
</tr>
<tr>
<td>NEOSIT</td>
<td>navigation/electro-optic sensor integration</td>
</tr>
<tr>
<td>NERC</td>
<td>Natural Environment Research Council (UK)</td>
</tr>
<tr>
<td></td>
<td>New En Route Centre (Swanwick, UK)</td>
</tr>
<tr>
<td>NES</td>
<td>Navigation Ground Earth Station (MSAS)</td>
</tr>
<tr>
<td>NESTBed</td>
<td>North European Satellite Test Bed (experimental SBAS)</td>
</tr>
<tr>
<td>NextGen</td>
<td>Next Generation (FAA future air traffic system)</td>
</tr>
<tr>
<td>NFC</td>
<td>near field communication</td>
</tr>
<tr>
<td>NGBPS</td>
<td>Non-GPS–Based Positioning System (a UHARS)</td>
</tr>
<tr>
<td>NGDC</td>
<td>National Geophysical Data Centre</td>
</tr>
<tr>
<td>NGDF</td>
<td>National Geospatial Data Framework (UK)</td>
</tr>
<tr>
<td>NGPS</td>
<td>Natural GPS (ie unaided)</td>
</tr>
<tr>
<td>NGS</td>
<td>National Geodetic Survey (US)</td>
</tr>
<tr>
<td>NGVD</td>
<td>National Geodetic Vertical Datum (US)</td>
</tr>
<tr>
<td>NH</td>
<td>Neumann-Hoffman code (eg in BeiDou)</td>
</tr>
<tr>
<td>NHTSA</td>
<td>National Highway Traffic Safety Administration (US)</td>
</tr>
<tr>
<td>NI</td>
<td>The Nautical Institute</td>
</tr>
<tr>
<td>NICER</td>
<td>Neutron-star Interior Composition Explorer (NASA)</td>
</tr>
<tr>
<td>NIKITA</td>
<td>Netherlands TMC service</td>
</tr>
<tr>
<td>NIMA</td>
<td>National Imagery and Mapping Agency (US)(ex-DMA)</td>
</tr>
<tr>
<td>NIMSA</td>
<td>National Interest Mapping Services Agreement (UK Gov and OS)</td>
</tr>
<tr>
<td>NIN</td>
<td>Netherlands Institute of Navigation</td>
</tr>
<tr>
<td>NIS</td>
<td>Navigation Information Service/System</td>
</tr>
<tr>
<td>NIST</td>
<td>National Institute of Standards and Technology (US)</td>
</tr>
<tr>
<td>nit</td>
<td>unit of luminance (equivalent to 1 candela per square metre)</td>
</tr>
<tr>
<td>NKTF</td>
<td>Norwegian Ass for Cartography, Geodesy, Hydro’ &amp; Photogrammetry</td>
</tr>
</tbody>
</table>
NLES: navigation land earth station (EGNOS)
NLOS: non-line-of-sight
NLP: natural language processing
NLR: Netherlands National Aerospace Laboratory
NLS: National Land Survey of Sweden
nm: nanometre ($10^9$ m)
NM: nautical mile (not universally used but better than 'nm') (also M)
Approx 1,852 m or 6,080 ft.

Notice to Mariners

NMA: Norwegian Mapping Authority
NMEA: National Marine Electronics Association (US)
Has set standard message formats for transferring GPS data.
NMRI: National Mayday Readiness Initiative (US)
NN: neural network (statistics algorithm)
NNAS: National Navigation Award Scheme (UK)
NNF: Nordisk Navigasjonsforum
Nordic Institute of Navigation. Åland Islands, Denmark, Faeroe Islands, Finland, Greenland, Iceland, Norway.
NNSS: Navy Navigation Satellite System (Transit)
NOAA: National Oceanic and Atmospheric Administration (US)
NODC: National Oceanographic Data Centre (US)
NON: unmodulated continuous-wave emission

Non-precision Approach

A standard instrument approach procedure in which only horizontal guidance is given.

NOSC: Naval Ocean Systems Centre (US)
NOSIG: no significant change (met)
NOTAM: Notice to Airmen
NP: Naval Publication
NPA: non-precision approach
A standard instrument approach in which no electronic glidepath/slope is provided.

NPI: National Positioning Infrastructure (eg Australian project)
NPL: National Physical Laboratory (UK)
NPPL: National Private Pilot’s Licence
(A) = aircraft, (B) = balloons, (H) = helicopters, A(M) = microlights.

NPRM: notice of proposed rulemaking (FAA, FCC etc)
NPV: non-precision approach with vertical guidance
NRL: Naval Research Laboratory (US)
NRP: National Route Program (US ATC)
NRS: Navigation-Related Communication Services (Galileo)
NRT: near real-time
net registered tonnage
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ns</td>
<td>nanosecond (1/1,000,000,000 of a second)</td>
</tr>
<tr>
<td>NS</td>
<td>Naval Station (US)</td>
</tr>
<tr>
<td>Ns</td>
<td>nimbostratus cloud</td>
</tr>
<tr>
<td>NSA</td>
<td>National Security Agency (US)</td>
</tr>
<tr>
<td>NSAP</td>
<td>Network Service Access Point (ATN)</td>
</tr>
<tr>
<td>NSC</td>
<td>no significant cloud</td>
</tr>
<tr>
<td>NSCC</td>
<td>Navigation System Control Centre (Galileo)</td>
</tr>
<tr>
<td>NSE</td>
<td>navigation system error</td>
</tr>
<tr>
<td>NSG</td>
<td>National Street Gazetteer (OS)</td>
</tr>
<tr>
<td>NSGU</td>
<td>Navigation Signal Generation Unit (Galileo)</td>
</tr>
<tr>
<td>NSO</td>
<td>Netherlands Space Office (the Hague)</td>
</tr>
<tr>
<td>NSP</td>
<td>navigation signal processor</td>
</tr>
<tr>
<td>NSRS</td>
<td>National Spatial Reference System (US)</td>
</tr>
<tr>
<td>NSTB</td>
<td>National Satellite Test Bed (WAAS)</td>
</tr>
<tr>
<td>NSW</td>
<td>no significant weather</td>
</tr>
<tr>
<td>NTD</td>
<td>National Topographic Database (UK)</td>
</tr>
<tr>
<td>NTDS</td>
<td>Navy Tactical Data System (US)</td>
</tr>
<tr>
<td>NTE</td>
<td>not-to-exceed</td>
</tr>
<tr>
<td>NTF</td>
<td>National Transfer Format (OS format to transfer digital mapping)</td>
</tr>
<tr>
<td>NTIA</td>
<td>National Telecommunications and Information Administration (US)</td>
</tr>
<tr>
<td>NTO</td>
<td>nitrogen tetroxide (storable rocket propellant)</td>
</tr>
<tr>
<td>NTS</td>
<td>National Travel Survey (UK DTLR)</td>
</tr>
<tr>
<td>NTSB</td>
<td>Navigation Technology Satellite</td>
</tr>
<tr>
<td>NTSC</td>
<td>National Television Standard Committee (US/Japan TV standard)</td>
</tr>
<tr>
<td>NTSB</td>
<td>National Transportation Systems Center (US)</td>
</tr>
<tr>
<td>NUP</td>
<td>NEAN Update Programme (EUROCONTROL)</td>
</tr>
<tr>
<td>NVC</td>
<td>National Vocational Qualification (UK)</td>
</tr>
<tr>
<td>NVEE</td>
<td>night vision enhancement equipment</td>
</tr>
<tr>
<td>NVG</td>
<td>night vision goggles</td>
</tr>
<tr>
<td>ν</td>
<td>Aries (vernal equinox)</td>
</tr>
<tr>
<td>°</td>
<td>degree (unit of angle = □/180 rad)</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>operations and maintenance</td>
</tr>
<tr>
<td>O&amp;S</td>
<td>operations and support</td>
</tr>
<tr>
<td>OAB</td>
<td>operational advisory broadcast</td>
</tr>
<tr>
<td>OAC</td>
<td>Oceanic Area Control</td>
</tr>
</tbody>
</table>
Operations Advisory Committee (CAA)

OACC Oceanic Area Control Centre

OAS Open Access Service (Galileo basic service, free of charge)

OASIS Operational and Supportability Implementation System (FAA)

OAT operational air traffic
   outside air temperature

OBD on-board diagnostics (eg OBD-II 16-pin generic vehicle connector)

OBDS on-board diagnostic system

OBI omni-bearing indicator

OBS omni-bearing selector

OBU on-board unit

OCA obstacle clearance altitude
   Oceanic Control Area

OCC Operations Control Centre (Inmarsat)

OCH obstacle clearance height (for landing aircraft)

OCIMF Oil Companies International Marine Forum

OCR optical character recognition

OCS operational control system

OCX Next Generation Operational Control System (for GPS III)

ODAS Ocean Data Acquisition System

ODN Ordnance Datum Newlyn (UK system for orthometric height amsl)

OEM original equipment manufacturer

OFTEL Office of Telecommunications (UK)

OGC Open GIS Consortium (international, main base US)

OGDI Open Geospatial Datastore Interface

OHI Organisation hydrographique internationale (IHO)

OIG Office of the Inspector General (US DOT)

okta one-eighth (of cloud cover)

OLED organic light-emitting display

OM&S Operation, Maintenance and Support (US)

Omega VLF navigation system now out of service (withdrawn 30 Sep 97)

OMUX output multiplexer

ONR Office of Naval Research (USN)

OnStar 2nd generation in-vehicle nav system (GPS + GSM) (General Motors)

OOW Officer of the Watch

OpEval operational evaluation

OPRG optical passive ring-resonator gyro

ORD observed range deviation
   operational requirement document
OREGIN ORganisation of European GNSS and service IIndustries (frm 2000)
45 companies to provide tech & market expertise. Led by FDC France.

ORN olfactory receptor neuron (animal navigation)

ORR operational readiness review

Orthodrome great circle

ORV off-road vehicle

OS Open Service (Galileo)
Ordnance Survey (UK)

OSA own speed across track

OSCAR Ordnance Survey digital dataset for mapping UK

OSGB Ordnance Survey GB (OSGB-36 datum hitherto used on OS charts)

OSGi Open Service Gateway Initiative (telematics standard)

OSGM91 Ordnance Survey Geoid Model 1991 (UK)

OSI Open System Interconnection (defined by ISO 7-layer model)

OSL own speed along track

OSMA Office of Safety & Mission Assurance (NASA)

OSPAR Oslo and Paris Commission

Euro body to co-ord national decisions on maritime environment issues.

OSPF Orbitography and Synchronisation Processing Facility (Galileo)

OSS Orbitography and Synchronisation Station (Galileo)

OSTN97 Ordnance Survey National Grid Transformation 1997 (UK)

Used to convert from ETRS89 to OSGB36 and ODN.

OT&E Operational Test and Evaluation

OTA operational technical accuracy

Accuracy with which craft is controlled as measured by indicated craft position with respect to indicated command or desired position. Does not include blunder errors.

OTDOA observed time difference of arrival (cellphone location technique)

OTF on-the-fly

Open Telematics Framework

OTS Organised Track Structure (N Atlantic)

OVC overcast (8 oktas of cloud)

OVN Österreichischer Verein für Navigation
Austrian Institute of Navigation

OWC obstacle warning and cueing

P pico (SI unit multiplier of 10^{-12})

P positioning

P-Code (or P(Y)) Precision (or Pseudorandom) Code

PRN code tx by GPS satellites. 2.35 x 10^{14} chips sent at 10.23 Mbps.

P-RNAV precision area navigation

P2P peer-to-peer (comms)
pseudorange and phase post-processor

pascal (pressure in N/m²)

position approximate precision approach

Platform as a Service (eg in IoT)

Performance Assessment & System Checkout Facility (EGNOS)

Located at Toulouse.

Pilot Action for Combined Transport (EU)

Prag for finance support to innovative combined transport schemes.

packet assembly/disassembly device

predicted area of danger (ARPA etc)

Postal Address File (UK Royal Mail)

Phase Alternating Line (European TV standard)

Uses 25Hz frame rate of 720x576 pixels.

international radio call signalling ‘urgency’

Prototyping a Navigation Database of Road-Network Attributes

EU, led by UK.

precision approach path indicator

precision approach radar

Circle on the celestial sphere parallel to the celestial horizon, connecting all points of equal altitude. Also called circle of equal altitudes.

Circle on the earth’s surface parallel to the equator

Performance requirements defined in terms of accuracy, integrity, availability, continuity and functionality.

passive bistatic radar (eg basis of SPYGLASS)

personal computer

possible course of action

preferred compass direction (used in animal navigation work)

phase code interval (Loran-C)(20 times the GRI)

pulse code modulation

Personal Computer Memory Card International Association

phase centre variation (eg of GNSS antenna)

public domain

personal digital assistant

personal digital communicator
PDD  Presidential Decision Directive (US)
    PDD NSTC-6 (28 Mar 96) applied to GPS. Included provision of SPS free of user charges.

PDF  Portable Document Format

PDOP positional dilution of precision
    The factor by which the accuracy of a 3-D fix is degraded by geometrical considerations.

PDR  preliminary design review

PDSS Pilot Decision Support System (maritime)

PE-90 A Russian terrestrial reference frame

PED  personal electronic device

PEGASUS Prototype EGNOS Analysis System Using SAPHIRE (EUROCON’T’L)

PERFECT Power Efficiency Revolution For Embedded Computing Technologies
    DARPA project.

PETAL Preliminary EUROCONTROL Test of Air/Ground Data Link (prog)

PF  pilot flying (as opposed to PM)

PFA  Popular Flying Association

PFI  Private Finance Initiative (UK type of PPP)

PFL  practice forced landing

PFM  prototype flight model

PGCAS Predictive Ground Collision Avoidance System

PHARE Prog for Harmonised Air Traff’c Manage’t & Res’ch in EUROCONTROL

PHEMT pseudomorphic high electron mobility transistor

PHEV plug-in hybrid electric vehicle

PHEVLER plug-in hybrid electric vehicle long electric range

PHM  passive hydrogen maser (clock)

PHMI probability of hazardously misleading information

PI  pre-planned product improvement

PIANC International Navigation Association (also AIPCN, Brussels based)

PIC  pilot in command

PinS point in space (eg in airfield approach procedure)

PIR  portable ILS receiver

pixel picture element
    The smallest element of a display or output that can be controlled.

PL  ice pellets (met)
    position line (also LOP)

PLB  personal locator beacon

PLD  programmable logic device

PLEDM phase-state low electron drive memory

PLGR Precision Lightweight GPS Receiver (US)

PLL  phase-locked loop
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLOG</td>
<td>pilot log (flying)</td>
</tr>
<tr>
<td>PLSS</td>
<td>Precision Location Strike System (US)</td>
</tr>
<tr>
<td>PM</td>
<td>pilot monitoring (as opposed to PF)</td>
</tr>
<tr>
<td>PMB</td>
<td>Programme Management Board (Galileo)</td>
</tr>
<tr>
<td>PMO</td>
<td>Port Meteorological Office(r)</td>
</tr>
<tr>
<td>PMR</td>
<td>private mobile radio</td>
</tr>
<tr>
<td>PMU</td>
<td>processing and monitoring unit</td>
</tr>
<tr>
<td>PN</td>
<td>north geographic pole</td>
</tr>
<tr>
<td>PNAV</td>
<td>Precise NAVigation</td>
</tr>
<tr>
<td>PNF</td>
<td>Polish Navigation Forum</td>
</tr>
<tr>
<td>PNR</td>
<td>point of no return</td>
</tr>
<tr>
<td>PNT</td>
<td>prior notice required</td>
</tr>
<tr>
<td>PNTAB</td>
<td>position, navigation and timing</td>
</tr>
<tr>
<td>PO</td>
<td>US National Space-Based Positioning, Nav’ &amp; Timing Advisory Board</td>
</tr>
<tr>
<td>POC</td>
<td>dust devils (met)</td>
</tr>
<tr>
<td>POCP</td>
<td>proof-of-concept</td>
</tr>
<tr>
<td>POD</td>
<td>Point of Contract Platform (Galileo PRS)</td>
</tr>
<tr>
<td>POP</td>
<td>precise orbit determination</td>
</tr>
<tr>
<td>PORT</td>
<td>Post Office Protocol (Internet)</td>
</tr>
<tr>
<td>POR</td>
<td>Pacific Ocean Region (Inmarsat I-3 satellite at 178E)</td>
</tr>
<tr>
<td>POS/LV</td>
<td>Position &amp; Orientation System for Land Vehicles</td>
</tr>
<tr>
<td>POS/NAV</td>
<td>positioning and navigation</td>
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<tr>
<td>PoSAT</td>
<td>Portuguese Satellite (-1 carries GPS experiments)</td>
</tr>
<tr>
<td>POSSUM</td>
<td>Policy Scenarios for Sustainable Mobility (EU)</td>
</tr>
<tr>
<td>POST</td>
<td>precision orbital satellite technology (POST2 2017)</td>
</tr>
<tr>
<td>POSYDON</td>
<td>Positioning System for Deep Ocean Navigation (DARPA/BAE)</td>
</tr>
<tr>
<td>POTS</td>
<td>plain old telephone system!</td>
</tr>
<tr>
<td>PPC</td>
<td>predicted point of collision</td>
</tr>
<tr>
<td>PPD</td>
<td>personal privacy device (eg GPS jammer)</td>
</tr>
<tr>
<td>Presidential Policy Directive (US)</td>
<td></td>
</tr>
<tr>
<td>PPI</td>
<td>plan position indicator</td>
</tr>
<tr>
<td>PPL()</td>
<td>Private Pilot’s Licence</td>
</tr>
<tr>
<td>PPM</td>
<td>(A) = aircraft, (B) = balloons, (H) = helicopters, A(M) = microlights.</td>
</tr>
<tr>
<td>ppm</td>
<td>parts per million</td>
</tr>
<tr>
<td>PPP</td>
<td>precise point positioning (GNSS technique)</td>
</tr>
<tr>
<td>PPPS</td>
<td>public-private partnership</td>
</tr>
<tr>
<td>PPPS</td>
<td>pulse pairs per second (DME, TACAN etc)</td>
</tr>
<tr>
<td>PPS</td>
<td>path planning sub-system (eg of ANS)</td>
</tr>
</tbody>
</table>
Precise Positioning Service

The full accuracy positioning service provided to the military by GPS. Includes access to unencrypted P-Code transmissions.

pulses per second

**PPS-SM**  PPS Security Mode/Module

**PR**  banks (met)

**PRC**  Performance Review Commission (EUROCONTROL)

 pseudorange correction

**precision**  The accuracy of a measurement or a position with respect to random errors (IMO).

**Precision Approach**  A standard instrument approach procedure in which both horizontal and glidepath/slope guidance is given.

**PRF**  pulse repetition frequency

**Primary Means of Navigation**  Airborne nav system that must meet accuracy and integrity requirements but need not meet full availability or continuity-of-service requirements.

**Prime meridian**  Reference meridian 000°; origin for measurement of longitude

Also known as the Greenwich Meridian. The most enduring definition was by Sir George Airy in 1851; this has been replaced by that of WGS-84, which is about 102 metres to the east.

**PRISMA**  GSA Project (2015)

Development of low-end operational Galileo PRS receivers including security modules architectures.

**PRM**  preferred route message (North Atlantic ATC)

**PRN**  pseudorandom noise (code)

Deterministic binary sequences with noise-like properties, also called pseudonoise codes. Used in spread-spectrum comms and ranging transmissions. GPS C/A and P-Code are PRN codes.

**PRNAV**  precision RNAV (ICAO)

**PROB**  probability (met)

**ProGIS**  Promoting Geographic Information Systems (Finnish AGI)

**PROUD**  PBN Rotorcraft Operations Under Demonstration (SESAR project)

**PRS**  Public Regulated Service (Galileo)

**Ps**  south geographic pole

**PS-QZSS**  Performance Standard (QZSS)

**PSC**  Port State Control

**PSDR**  preliminary system design review

**Pseudolite**  Pseudo-satellite

Ground-based transmitter designed to mimic a satellite (GPS).

**PSLV**  Polar Satellite Launch Vehicle (Indian satellite launch rocket)

**PSMA**  Public Sector Mapping Agreement (OS)

**PSoc**  Photogrammetric Society (became RSPSoc on 1 Jan 01)

**PSS**  packet switching stream

**PSTN**  Public Switched Telephone Network

**PSU**  power supply unit
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTAN</td>
<td>precision terrain-aided navigation</td>
</tr>
<tr>
<td>PTC</td>
<td>Positive Train Control (US DOT initiative)</td>
</tr>
<tr>
<td>PTS</td>
<td>Polar Track Structure</td>
</tr>
<tr>
<td></td>
<td>Precision Timing Station (Galileo)</td>
</tr>
<tr>
<td>ptt</td>
<td>press-to-transmit</td>
</tr>
<tr>
<td>PTTI</td>
<td>precise time and time interval</td>
</tr>
<tr>
<td>PUFFIN</td>
<td>Pedestrian User-Friendly INtelligent crossing (UK DTLR)</td>
</tr>
<tr>
<td>PUNE</td>
<td>position component of the user navigation error (3-dimensional)</td>
</tr>
<tr>
<td>PV</td>
<td>pilot vessel</td>
</tr>
<tr>
<td>PVC</td>
<td>percent volume contour</td>
</tr>
<tr>
<td>PVT</td>
<td>Position, Velocity and Time (eg Galileo Service)</td>
</tr>
<tr>
<td>PWC</td>
<td>personal water craft (jetski)</td>
</tr>
<tr>
<td>PWSA</td>
<td>Ports and Waterways Safety Act (US)</td>
</tr>
<tr>
<td>PZ-90</td>
<td>Soviet geocentric co-ordinate system used by GLONASS (SGS90)</td>
</tr>
<tr>
<td>QAR</td>
<td>quick-access recorder (air - stores data from FDR)</td>
</tr>
<tr>
<td>QDA</td>
<td>quadratic discriminant analysis (statistics algorithm)</td>
</tr>
<tr>
<td>QDM</td>
<td>magnetic bearing to a DF station</td>
</tr>
<tr>
<td>QDR</td>
<td>magnetic bearing from a DF station</td>
</tr>
<tr>
<td>QFE</td>
<td>atmospheric pressure at aerodrome elevation</td>
</tr>
<tr>
<td>QFI</td>
<td>qualified flying instructor</td>
</tr>
<tr>
<td>QGH</td>
<td>controlled descent through cloud</td>
</tr>
<tr>
<td>QGO</td>
<td>airfield closed due to weather</td>
</tr>
<tr>
<td>QHM</td>
<td>Queen’s Harbour Master</td>
</tr>
<tr>
<td>QinetiQ</td>
<td>The private arm of DERA from 2 Jul 01</td>
</tr>
<tr>
<td></td>
<td>A nonsensical name taken from the Greek ‘kinetikos’ – to move.</td>
</tr>
<tr>
<td>QNH</td>
<td>atmospheric pressure at sea level</td>
</tr>
<tr>
<td>QSY</td>
<td>change frequency</td>
</tr>
<tr>
<td>QTE</td>
<td>true bearing from DF station</td>
</tr>
<tr>
<td>QUATTRO</td>
<td>Quality Approach in Tendering/Contracting Urban Public Trans Ops</td>
</tr>
<tr>
<td></td>
<td>An EC project Dec 96 - May 98.</td>
</tr>
<tr>
<td>QZO</td>
<td>quasi zenith orbit (of satellite)</td>
</tr>
<tr>
<td>QZS</td>
<td>Quasi-Zenith Satellite (eg QZS-I)</td>
</tr>
<tr>
<td>QZSS</td>
<td>Quasi-Zenith Satellite System (Japan)</td>
</tr>
<tr>
<td>R</td>
<td>°Relative</td>
</tr>
<tr>
<td>R-GEO</td>
<td>GEO ranging (GEO-based GPS-like ranging signal, as in EGNOS)</td>
</tr>
<tr>
<td>R-GNS</td>
<td>Robust-Global Navigation System (MOD - also RGNS)</td>
</tr>
<tr>
<td>R-IORS</td>
<td>re-entrant integrated optical rotation sensor</td>
</tr>
<tr>
<td>R/T</td>
<td>(RT) radio telephony</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>research and development</td>
</tr>
<tr>
<td>R&amp;E</td>
<td>research and engineering</td>
</tr>
</tbody>
</table>

67
Radio Equipment & Telecommunications Terminal Equipment Directive
EC legislation applying to vehicles. Mandatory from 8 Apr 01.

Radiocommunications Agency (UK)
Established as an Executive Agency of the DTI in 1990.

rain (met)
resolution advisory (TCAS)
right ascension

right ascension of the ascending node
Equatorial angle from the celestial principal direction to the ascending node.

radar transponder beacon
radian (180/□ degrees)
Radar RAdio Detection And Ranging

The determination of position, or the obtaining of information relating to position, by means of the propagation properties of radio waves (IMO).

Radio determination used for purposes other than radionavigation (IMO).

The use of radio waves in navigation for the determination of position or direction, or for obstruction warning (IMO).

Royal Aero Club of the United Kingdom
Royal Aeronautical Society
rubidium atomic frequency standard (clock)
rubidium atomic frequency standard evaluation unit
Registro Aeronautico Italiano (Italian CAA)
Rangeless Airborne Information Datalink System
receiver autonomous integrity monitoring
A technique whereby all navigation sensor information available at a receiver is autonomously processed to monitor the integrity of the navigation signals (IMO).

Rutherford Appleton Laboratory (Oxford)
random access memory
reliability and maintainability
That error which can be predicted only on a statistical basis (IMO).

radar advisory service (ATC)
rectified airspeed
replenishment at sea
robotics and autonomous systems

ram air turbine (aux power for aircraft)
Netherlands Council for Geographic Information
rubidium (clock)
relative bearing indicator
radio beacon
Rescue Co-ordination Centre
Recreational Craft Directive (EU)
Raster chart display system
RCM  reliability centred maintenance
RCP  required communications performance
RCS  radar cross-section (normally given in square metres)
RCVR receiver (or Rx)
RD  requirements document/definition
RDF  radio direction find(er)(ing)
RDS  Radio Data System

- Sub-carrier on FM broadcasts carrying data, which may include DGPS corrections and TMC.

RDS-EON  Radio Data System - Enhanced Other Networks
- Digital traffic messages carried by RDS.

RDS-TMC  Radio Data System - Traffic Message Channel
- Digital traffic messages carried by RDS.

RDSS  Radio Determination Satellite Service (uses round-trip timing)
REDAN  REd de Datos de Aeropuertos y Navegación (Spanish aero comms net)
redundancy  The existence of multiple equipment or means for accomplishing a given function (IMO).

REGAL  REconfigurable REceiver for GALileo
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 (IMO).
reliability  (of a position fix)

- A measure of the propagation of a non-detected gross error in an observation, to the position fix. This 'external' reliability is usually expressed in terms of the MDE (IMO).

- (of a service)

- The probability that a service, when it is available, performs a specified function without failure under given conditions for a specified period of time (IMO).

- (of an observation)

- ('internal' reliability). A measure of the effectiveness with which gross errors may be detected. Usually expressed in terms of the MDB (after IMO).

RENG  REngeobroadcasting
RENC  Regional Electronic Chart Coordinating Centre
- Provide a single source for all countries' ENC data. The Northern Europe RENC is at Stavanger, Norway.
repeatability  The accuracy of a positioning system, taking into account only the random errors. Normally expressed in a 95% probability circle (IMO).
repeatable accuracy  The accuracy with which a user can return to a position whose coordinates have been measured at a previous time with the same navigation system (IMO).

RESCU  2nd generation in-vehicle nav system (GPS + GSM) (Ford)
RF  radio frequency

- random forest (statistics algorithm)
- reference frame
RFI  radio frequency interference
RFP  request for proposal
RGB  Red-Green-Blue (colour system for colour monitors)
RGNS  Robust-Global Navigation System (MOD - also R-GNS)
RGPF  Règlement Général de Police Français (French derivative of CEVNI)
**RHCP** right hand circularly polarised

**RHL** rhumb line

**RI** restricted information (e.g., value-added data on chart)

**RIB** rigid inflatable boat

**RIG** rate integrating gyro

**RIMS** ranging and integrity monitoring station (EGNOS)

**RIN** Royal Institute of Navigation

**RINA** The Royal Institution of Naval Architects

**RINEX** Receiver-INdependent EXchange (format for exchanging GPS data)

**RIS** radar information service (ATC)

River Information Service

**RISC** reduced instruction set computer

**RL** rhumb line (loxodrome)

*Line on the surface of the earth forming the same angle with all meridians; a straight line on a Mercator chart.*

**RLD** Rijksluchtvaardienst (Netherlands CAA)

**RLP** rejected landing procedure

**RLSS** Royal Life Saving Society (UK)

**RM** relative motion

**RMA** reliability, maintainability, availability

**RME** range measurement equation

**RMI** radio magnetic indicator

**rms** root mean square (error)

*The variability of a measurement such as a single LOP in one dimension; with no bias also an estimate of the standard deviation of the errors.*

**RMU** radio management unit

**RNA** Regulated Navigation Area (e.g., USCG)

**RNAS** Royal Naval Air Station

**RNAV** area navigation

**RNC** raster navigational chart

**RNEU** Radio Navigation Experimentation Unit (ESA)

**rng** range

**RNLI** Royal National Lifeboat Institution

**RNP** radionavigation plan

**Required Navigational Performance**

*A statement of navigational performance necessary for operation under specified conditions (air).*

**RNP AR** Required Navigational Performance (Authorisation Required)

**RNS** relative navigation system

**RNSS** Radio Navigation Satellite Service (GPS-like service)

**RNT** Resilient Navigation and Time (Foundation)
RO        radio occultation
ROM       read-only memory
ROMANSE   Road Management System for Europe (EU)
ROP       responsible operator position (in SAR)
ROPME     Regional Organisation for the Protection of the Marine Environment
RORO      (ro-ro) roll-on/roll-off (vessel)
ROT       rate of turn
ROV       remotely operated vehicle
RP         reporting point
RPA       remotely piloted aircraft
RPAS      remotely piloted aircraft system (assoc systems/operators reqd)
RPIN      Russian Public Institute of Navigation
RPNR      Règlement de Police pour Navigation du Rhin (Rhine deriv of CEVNI)
RPS       Regional Positioning System (to provide WAAS in a particular area)
           Regional Pressure Setting
RR         Radio Regulations (ITU)
           reference receiver (eg LAAS)
RRAIM     relative receiver autonomous integrity monitoring
RRC       root raised cosine (shape of an autocorrelated pulse in navsat sig)
RS        radio spectrum
           ranging source (eg WAAS)
           reference station (eg LAAS)
RSA       relative speed across track
RSD       radar system data
RSL       relative speed along track
RSM       reduced separation minima (air traffic)
RSPSoc    Remote Sensing and Photogrammetry Society
           *Formed 1 Jan 01 from RSS and P Soc. Based Nottingham University.*
RSS       Regional Safety Service (Galileo)
           Register of Shipping and Seamen
           Remote Sensing Society (became RSPSoc on 1 Jan 01)
rss       root sum square
RSU       road side unit (eg for V2X)
RT         (R/T) radio telephony
           Ranging and Timing (Galileo service)
           remote terminal
RTA       required time of arrival (ATC)
           Road Traffic Advisor (UK collaborative project led by TRL)
           *Test bed uses 350 km of road between Swansea and Gatwick.*
RTB       return to base
RTC  real-time clock
RTCA Radio Technical Commission for Aeronautics (US)
RTCM Radio Technical Commission for Maritime Services (US)

RTCM SC-104 developed the recommended standards for DGPS.

RTD Research and Technological Development (EU transport projects)
RTE radar target enhancer

RTI road traffic informatics (sometimes ‘infrastructure’)
RTK real-time kinematic

A DGPS procedure whereby carrier-phased corrections are transmitted in real time from a reference rx to user’s rx.

RTLS real time location system
RTO rejected takeoff
RTOS real-time operating system
RTT round trip time/timing
RU receiving unit
RUC road user charging (a form of EFC)
RULES RA Unified Licensing Executive System
RV recreational vehicle
RVR runway visual range
RVSM reduced vertical separation minima
eg ICAO proposal to reduce vertical separation between aircraft from FL290 to FL410 from 2,000 to 1,000 ft. Introduction in EUROCONTROL 24 Jan 02.

RWP radar wind profiler (pulse-doppler radar to find winds aloft)
Rwy runway
Rx (RCVR) receiver
RYA Royal Yachting Association
s second

S-57 Standard for exchange of ECDIS data (IHO)
S-band Old radar band 2-4 GHz = 15-7.5 cm
(ITU assigned 2,300-2,500 & 2,700-3,700 MHz).

S-CRPA small controlled reception pattern antenna
S-Mode Standard-Mode (of eg maritime e-navigation)
S-VDR simplified voyage data recorder
S@tcom BNSC programme (includes sponsorship of Galileo Partnership)
S/N signal-to-noise ratio
S&R (SAR) search and rescue
SA sand (met)

Selective Availability (or S/A)

The intentional degradation of the GPS Standard Positioning Service. Was set to give 95% prob accuracies of 100m (300m 99.99% prob) horizontal, 156m vertical and 334ns in time. Set to zero on 1 May 00.
system architecture

SAASM  selective availability anti-spoofing module
SAC    Special Area of Conservation (EU Habitats & Bird Directives)
SAFEMAR Development project for ship reporting system (MARIS)
Safety Regulation Definition & enforcement of rules relating to safety
SAFI   semi-automatic flight inspection
SAGA   Standardisation Activities for Galileo
        Platform for establishing world-wide interoperability between Galileo and other systems.
        Consortium led by Sextant Avionique.
SAM    System Area Monitor (Loran-C)
SAMSO  Space and Missile Systems Organization (US)
SAPPHIRE Satellite & Aircr’ft Database Project for System Integrity Research
        EUROCONTROL project.
SAR    (S&R) search and rescue
        synthetic aperture radar
SARGAL study for Search And Rescue in GALileo (EC)
SARIS  Search and Rescue Information Service
SARPS  Standards and Recommended Practices (ICAO)
SARSAT SAR Satellite-Aided Tracking
SART   search and rescue transponder
SAS    Safety Access Service (Galileo)
        Requirements for aviation safety-critical applications include:
        En-route & non-precision approach: 45m hor, 15m vert, alert time 30s.
        Cat I precision approach: 16m hor, 4-7.7m vert, alert time 6s.
        Cat II/III precision approach: 6m hor, 1m vert, alert time 1s.
SAT    site acceptance test
SATCO  senior air traffic control officer
SATNAV satellite-based navigation
SATURN SATellite-based aUtonomous tRain localisationN system
SB     service bulletin (eg of aircraft or equipment)
SBAC   Society of British Aerospace Companies Ltd
SBAS   satellite-based augmentation system
SBB    smart buffer box
SBC    single board computer
SBP    swift binary protocol (eg for RTK corrections)
SC     Special Committee (eg RTCM SC-104)
Sc     stratocumulus cloud
SCAAR  State Civil Aviation Authority of Russia
SCADA  supervisory control and data acquisition
SCAR   Scientific Committee on Antarctic Research
SCART  Syndicat des Constructeurs d’Aparcils Radiorecepeuteurs de Televeiseurs
        Also known as Peritel or Euroconnector (for video).

73
Controlling traffic signals automatically to reflect traffic flow.

For a normal linear distribution 68% of readings should lie within 1 SD and 95% with 2 SDs.

Sea Areas A1 - A4: GMDSS areas representing differing coverage

A1 - within RT range of at least one VHF coast station in which continuous DSC alerting is available.
A2 - excludes A1, but covered by at least MF coast station with continuous DSC alert.
A3 - outside A1 & A2 but covered by Inmarsat with continuous alert.
A4 - outside A1, A2 and A3.

SEIFR: single-engine IFR
Selcal: selective calling (HF and VHF)
SELS: Southern Europe Loran-C System
SENC: system electronic navigational chart
SEP: spherical error probable
The radius of a sphere, centered at the measured position, inside which the true position lies with 50% probability.

Service capacity: The number of users a service can accommodate simultaneously (IMO).

SES: ship earth station
SESAR: Single European Sky ATM Research (EU programme)
SET: selective event training (of simulation)
SEXTANT: Station Explorer for X-ray Timing & Navigation Technology (NASA)
SF: stride frequency
SFD: satellite failure detection (component of SBAS)
SFF: small form factor
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG</td>
<td>snow grains (met)</td>
</tr>
<tr>
<td>SGP</td>
<td>Space Growth Partnership (UK)</td>
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<tr>
<td>SH</td>
<td>showers (met)</td>
</tr>
<tr>
<td>SHA</td>
<td>sidereal hour angle</td>
</tr>
<tr>
<td>SHIPPOS</td>
<td>SHIP POSitioning Reporting Service</td>
</tr>
<tr>
<td>SHOM</td>
<td>Service Hydrographique et Oceanographique de la Marine (FR)</td>
</tr>
<tr>
<td>SI</td>
<td>Système Internationale d'Unités</td>
</tr>
<tr>
<td>SID</td>
<td>standard instrument departure</td>
</tr>
<tr>
<td>SIF</td>
<td>sudden ionospheric disturbance</td>
</tr>
<tr>
<td>SIG</td>
<td>GIS (geographic information systems) in many languages</td>
</tr>
<tr>
<td>sigma</td>
<td>Greek letter α normally used for standard deviation</td>
</tr>
<tr>
<td>SIL</td>
<td>safety integrity level</td>
</tr>
<tr>
<td>SIM</td>
<td>system integration laboratory</td>
</tr>
<tr>
<td>single point of failure</td>
<td>That part of a navigation system which lacks redundancy, so that a failure in that part would result in a failure of the whole system (IMO).</td>
</tr>
<tr>
<td>SINS</td>
<td>shipborne INS</td>
</tr>
<tr>
<td>SIPT</td>
<td>Société internationale de photogrammétrie et de télédétection (ISPRS).</td>
</tr>
<tr>
<td>SIS</td>
<td>signal-in-space</td>
</tr>
<tr>
<td>SISA</td>
<td>signal-in-space accuracy</td>
</tr>
<tr>
<td>SISRE</td>
<td>signal-in-space range error</td>
</tr>
<tr>
<td>SKC</td>
<td>sky clear (met)</td>
</tr>
<tr>
<td>sl</td>
<td>(s/l) sea level</td>
</tr>
<tr>
<td>SL</td>
<td>step length</td>
</tr>
<tr>
<td>SLA</td>
<td>Service Level Agreement (eg for Galileo)</td>
</tr>
<tr>
<td>SLAM</td>
<td>simultaneous localisation and mapping</td>
</tr>
<tr>
<td>SLAS</td>
<td>Sub-meter Level Augmentation Service (QZSS)</td>
</tr>
<tr>
<td>SLD</td>
<td>superfluorescent laser diade</td>
</tr>
<tr>
<td>SLR</td>
<td>satellite laser ranging</td>
</tr>
<tr>
<td>SLS</td>
<td>Satellite Landing System</td>
</tr>
<tr>
<td>SMAG</td>
<td>Spectrum Management Advisory Group (RA NDPB)</td>
</tr>
<tr>
<td>SMART</td>
<td>Self-Managed Arrival Resequencing Tool (MITRE for FAA)</td>
</tr>
<tr>
<td>SMC</td>
<td>Space and Missile Systems Center (USAF)</td>
</tr>
<tr>
<td>SMF</td>
<td>separation monitoring function (ATC)</td>
</tr>
<tr>
<td>SMG</td>
<td>speed made good (speed (of ship) between 2 fixes)</td>
</tr>
<tr>
<td>SMGCS</td>
<td>Surface Movement Guidance &amp; Control System (for airfields)</td>
</tr>
</tbody>
</table>
SMLC  summer mountain leader certificate
SMS  Short Message Service (brief text messages over mobile phones)
SN  snow (met)
SNAG  Satellite Navigation Applications Group (EUROCONTROL)
SNI  simultaneous non-interfering (eg in airfield approach operations)
SNMTT  Satellite Navigation and Mobile Telephone Technology (CARDME)
SNR  signal-to-noise ratio
SNU  standard navigation unit
SOA  speed of advance (speed to make good)
          Estimated speed (of ship) relative to the earth.
SoC  system on chip
SOCRATES  System of Cellular Radio for Traffic Efficiency and Safety (EU)
SOG  speed over ground
          Speed (of ship) relative to the earth, measured on board (the ship).
SOGI  Swiss Organisation for Geo-Information
SOIT  Satellite Operational Implementation Team (FAA)
SoL  safety of life
SOLAS  Safety of Life at Sea (often SOLAS 74)
Sole Means of Navigation  An approved system that must meet 4 performance requirements: accuracy, integrity, availability and continuity-of-service.
SOP  signals of oppotunity
          standard operating procedure
SoP  Statement of Principles (EC statement inviting compliance by states)
SOURDINE  French for ‘mute’. EC DGVII Project for reducing airport noise
SP  service (and content) provider (eg of telematics services)
SPA  Special Protection Area (EU Habitats & Bird Directives)
          Specially Protected Area
SPACECOM  US Space Command (Colorado Springs)
SPAD  signal passed at danger (railway)
SPD  speed (own (ship’s) speed in dead-ahead direction)
SPOC  SAR Point of Contact
SPOS  Ship Performance Optimisation System
SPS  smart parking system (vehicles)
          Standard Positioning Service of GPS
                      The service available to civilian users with a stand-alone receiver having access only to the C/A code and L1 carrier.
SPWG  Strategic Planning Working Group (IHO)
SPYGLASS  Galileo-based Passive Radar System for Maritime Surveillance
          Uses Galileo signal reflections as a passive bistatic radar.
SQ  squalls (met)
SQL  Structured Query Language (for databases)
SQS  Safety Quality Management and Standardisation (EUROCONTROL)
squawk  to transmit via a transponder
sr  steradian (solid angle)
SR  small hail or snow pellets (met)
sunrise
SRA  surveillance radar approach
SRC  Safety Review Commission (EUROCONTROL)
Short Range Certificate (for GMDSS VHF equipment)
SRD  short-range device
SRG  Safety Regulation Group (CAA)
SRR  Search and Rescue Region
SRU  shop-replaceable unit
SS  sandstorm (met)
signal strength
space segment
sunset
SSB  single sideband
SSDR  single-seat deregulated aircraft
SSFC  sequential single-frequency code system
SSH  sea surface height
SSL  Secure Sockets Layer (security protocol)
SSOA  Standby Ship Operators’ Association (became ERRVA in May 2000)
SSOG  solid-state optical gyro
SSPA  solid-state power amplifier
SSR  Sagnac sensing ring (of optical gyro)
secondary surveillance radar
SSSI  Site of Special Scientific Interest
SST  sea surface temperature
supersonic transport
St  stratus cloud
Standard Time  The legally established time for a given zone
STAR  Standard Terminal Arrival Route
STARS  Standard Terminal Automation Replacement System (FAA)
STC  Supplemental Type Certificate (eg for aircraft equipment upgrade)
STCA  Short Term Conflict Alert (System) (used in ATC centres)
STCW  Standards of Training, Certification & Watchkeeping for Seafarers
Set in 1978 (STCW 78) and amended in 1995 (STCW 95).
STDAM  standard CDU
STDMA  self-organising time-division multiple-access
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STENAV</td>
<td>A Galileo simulation facility (space, ground segment &amp; user equipment)</td>
</tr>
<tr>
<td>STERO</td>
<td>Solar Terrestrial Relations Observatory (2 NASA sats solar activity)</td>
</tr>
<tr>
<td>STL</td>
<td>Satellite Time and Location (Iridium feature)</td>
</tr>
<tr>
<td>STM</td>
<td>Sea Traffic Management</td>
</tr>
<tr>
<td>STP</td>
<td>standard temperature and pressure (=ISA)</td>
</tr>
<tr>
<td>STPM</td>
<td>synchronizer time-pulse modulator (Chayka)</td>
</tr>
<tr>
<td>Stratosphere</td>
<td>Part of atmosphere from ~ 14-50 km</td>
</tr>
<tr>
<td>STRV</td>
<td>Space Technology Research Vehicle</td>
</tr>
<tr>
<td>STW</td>
<td>speed through water (speed of ship relative to the water surface)</td>
</tr>
<tr>
<td>SUA</td>
<td>small unmanned aircraft (2 categories are &lt;7 kg and 7-20 kg) special use airspace</td>
</tr>
<tr>
<td>sUAS</td>
<td>small unmanned air system</td>
</tr>
<tr>
<td>SUP</td>
<td>south pole up (of a magnet)</td>
</tr>
<tr>
<td>Supplemental Means of Nav</td>
<td>An approved system that can be used in conjunction with a Sole Means of Navigation.</td>
</tr>
<tr>
<td>SURNAV</td>
<td>Système français de comptes rendus de mouvements (French info and surveillance service for marine navigation.</td>
</tr>
<tr>
<td>SUSA</td>
<td>small unmanned surveillance aircraft</td>
</tr>
<tr>
<td>SUT</td>
<td>Society for Underwater Technology (UK)</td>
</tr>
<tr>
<td>SV</td>
<td>space vehicle (eg satellite) synthetic vision</td>
</tr>
<tr>
<td>SVD</td>
<td>singular value decomposition</td>
</tr>
<tr>
<td>SVFR</td>
<td>special visual flight rules</td>
</tr>
<tr>
<td>SVG</td>
<td>Scalable Vector Graphic</td>
</tr>
<tr>
<td>SVGGA</td>
<td>Standard display format of 800 x 600 pixels</td>
</tr>
<tr>
<td>SVM</td>
<td>support vector machine (statistics algorithm)</td>
</tr>
<tr>
<td>SVS</td>
<td>synthetic vision system</td>
</tr>
<tr>
<td>SWaP</td>
<td>size, weight and power (of systems)</td>
</tr>
<tr>
<td>SWEPOS</td>
<td>Swedish permanent national GPS network (24 stations)</td>
</tr>
<tr>
<td>SXGA</td>
<td>Standard display format of 1,280 x 1,024 pixels</td>
</tr>
<tr>
<td>SXI</td>
<td>Solar X-ray Imager NASA/NOAA imager giving X-ray image of sun each minute for predicting solar flares. Carried on Goes-M.</td>
</tr>
<tr>
<td>systematic error</td>
<td>An error which is non-random in the sense that it conforms to some kind of pattern (IMO).</td>
</tr>
<tr>
<td>T</td>
<td>°True</td>
</tr>
<tr>
<td>Tera</td>
<td>tera (SI unit multiplier of (10^{12}))</td>
</tr>
<tr>
<td>Tesla</td>
<td>tesla (magnetic flux density in Wb/m(^2))</td>
</tr>
<tr>
<td>T&amp;E</td>
<td>test and evaluation</td>
</tr>
<tr>
<td>TA</td>
<td>timing advance (method of Cellphone positioning) traffic advisory (TCAS)</td>
</tr>
</tbody>
</table>
transition altitude

Type Approval

**TACAN**  
TACTical Air Navigation  
*Military beacon system giving bearing and range.*

**TACIS**  
Technical Assistance to the CIS (EU)

**TAI**  
International Atomic Time  
*Determined by comparison of atomic clocks around the world. Does not change with variations of earth rotation rate. Time unit is the SI second, ‘the duration of 9,192,631,770 periods of the radiation corresponding to the transition between 2 hyperfine levels of the caesium 133 atom’.*

**TAP-T**  
Telematics Application Programme - Transport Sector (EU)

**TAS**  
true airspeed

**TAWS**  
Terrain Awareness and Reporting System

**TB**  
true bearing (angular distance from TN to the object)

**TBO**  
time between overhauls

**TBS**  
Terrestrial Beacon System (eg for urban/indoor navigation)

**TC**  
terminal control (ATC)

true course (course to steer)  
*The intended direction of movement (of a ship), defined by the angle between the meridian through its position and the fore-and-aft line (of the ship), expressed in angular units from true north (000°).*

**TCA**  
The Coastguard Agency (UK)  
*Merged with MSA in April 1998 to become MCA.*

time of closest approach  
*Time that a satellite is closest to a beacon or rx during a pass.*

**TCAA**  
Translalatic Common Aviation Area

**TCAR**  
three-carrier ambiguity resolution

**TCAS**  
Traffic-alert and Collision Avoidance System  
*TCAS-I generates conflicting traffic advisories. TCAS-II also gives collision avoidance instructions in vertical plane.*

**TCC**  
Traffic Control Centre (UK Highways Agency)

**TCO**  
total cost of ownership

**TCP/IP**  
Transmission Control Protocol/Internet Protocol

**TCPA**  
time to closest point of approach

**TCS**  
track control system

**TCu**  
towering cumulus cloud

**TD**  
time difference

**TDA**  
temporary danger area (ATC)

**TDD**  
time division duplex (eg 4G wireless telecom network)

**TDMA**  
time-division multiple-access

**TDMS**  
Traffic Demand Management Strategy (UK DTLR)

**TDOA**  
time difference of arrival
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDOP</td>
<td>Time Dilution of Precision. The factor by which accuracy of receiver clock bias determination is degraded by geometrical considerations.</td>
</tr>
<tr>
<td>TDWR</td>
<td>Terminal Doppler Weather Radar.</td>
</tr>
<tr>
<td>TEC</td>
<td>Total Electronic Content (typically of ionosphere). Integrated value of electronic concentration - delay of GPS signal is directly proportional to TEC.</td>
</tr>
<tr>
<td>TEMPO</td>
<td>Temporarily (met).</td>
</tr>
<tr>
<td>TEN</td>
<td>Trans-European (Transport) Networks (EU)</td>
</tr>
<tr>
<td>TERNAV</td>
<td>Terrain-referenced navigation.</td>
</tr>
<tr>
<td>TERPS</td>
<td>Terminal Instrument Procedures.</td>
</tr>
<tr>
<td>TETRA</td>
<td>Terrestrial Trunked Radio (TETRA) - Combines functions of digital mobile phones, PMR radio systems and mobile data. Uses 410-430 MHz.</td>
</tr>
<tr>
<td>TEU</td>
<td>Twenty-foot equivalent unit (inter-modal freight container).</td>
</tr>
<tr>
<td>TF</td>
<td>Terrain Following</td>
</tr>
<tr>
<td>TFM</td>
<td>Traffic Flow Management</td>
</tr>
<tr>
<td>TFOM</td>
<td>Time Figure of Merit</td>
</tr>
<tr>
<td>TFR</td>
<td>Terrain Following Radar</td>
</tr>
<tr>
<td>Tgd</td>
<td>Estimated Group Delay Differential</td>
</tr>
<tr>
<td>TGRS</td>
<td>Translated GPS Range System</td>
</tr>
<tr>
<td>TH</td>
<td>Trinity House</td>
</tr>
<tr>
<td>THD</td>
<td>Transmitting Heading Device</td>
</tr>
<tr>
<td>Thermosphere</td>
<td>Part of atmosphere from ~ 85-120 km</td>
</tr>
<tr>
<td>THLS</td>
<td>Trinity House Lighthouse Service</td>
</tr>
<tr>
<td>THUCC</td>
<td>Trinity House User Consultative Committee</td>
</tr>
<tr>
<td>TIA</td>
<td>US Telecomms Standards Institute (equiv of Europe's ETSI)</td>
</tr>
<tr>
<td>TIBA</td>
<td>Traffic Information Broadcast for Aircraft</td>
</tr>
<tr>
<td>TID</td>
<td>Travelling Ionospheric Disturbance</td>
</tr>
<tr>
<td>TIDE</td>
<td>Technology Initiatives for Disabled and Elderly People (EU)</td>
</tr>
<tr>
<td>TIFF</td>
<td>Tagged Image File Format</td>
</tr>
<tr>
<td>TIGER</td>
<td>Traffic Information and Guidance on European Roads (EU DRIVE 2)</td>
</tr>
<tr>
<td>TIH</td>
<td>Traffic Information Highway (carries data from TCCs)</td>
</tr>
<tr>
<td>TIS</td>
<td>Traffic Information Service (air)</td>
</tr>
<tr>
<td>TIS-B</td>
<td>Traffic Information Services - Broadcast</td>
</tr>
<tr>
<td>TL</td>
<td>Transition Level</td>
</tr>
</tbody>
</table>

80
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLM</td>
<td>telemetry</td>
</tr>
<tr>
<td>TLS</td>
<td>target level of safety</td>
</tr>
<tr>
<td></td>
<td>total least squares</td>
</tr>
<tr>
<td></td>
<td>Transport Layer Security (security protocol)</td>
</tr>
<tr>
<td>TMA</td>
<td>terminal manoeuvring area (ATC)</td>
</tr>
<tr>
<td>TMAS</td>
<td>Traffic Management Advisor (ATC automation tool) (US)</td>
</tr>
<tr>
<td>TMAS</td>
<td>telemedical assistance service</td>
</tr>
<tr>
<td>TMC</td>
<td>Traffic Message Channel (digital traffic messages carried by RDS)</td>
</tr>
<tr>
<td>TMG</td>
<td>track made good (true track between 2 fixes)</td>
</tr>
<tr>
<td>TMHD</td>
<td>transmitting magnetic heading device (maritime)</td>
</tr>
<tr>
<td>TMIC</td>
<td>terahertz monolithic integrated circuit</td>
</tr>
<tr>
<td>TMS</td>
<td>Testbed Master Station (GRAS)</td>
</tr>
<tr>
<td>TN</td>
<td>true north (northerly direction of the meridian)</td>
</tr>
<tr>
<td>TNSE</td>
<td>total navigation system error</td>
</tr>
<tr>
<td>TOA</td>
<td>time of arrival (in cellphone location could give accuracy of 125 m)</td>
</tr>
<tr>
<td>TOC</td>
<td>time of coincidence (eg Loran-C timing)</td>
</tr>
<tr>
<td>TOCI</td>
<td>time of coincidence interval (eg Loran-C timing)</td>
</tr>
<tr>
<td>TOGA</td>
<td>take-off and go-around (mode of autopilot)</td>
</tr>
<tr>
<td>TOPS</td>
<td>Total Operations Processing System (for train movements)</td>
</tr>
<tr>
<td>TORT</td>
<td>Generic legal term relating to breach of duty and liability</td>
</tr>
<tr>
<td>TOW</td>
<td>time-of-week</td>
</tr>
<tr>
<td></td>
<td><em>Least 19 significant bits of GPS Z-Count giving time through the week in 1.5-second units. Truncated version in 6-second epochs included in navigation message HOW.</em></td>
</tr>
<tr>
<td>TPEG</td>
<td>Traffic Protocol Experts Group</td>
</tr>
<tr>
<td></td>
<td><em>A protocol for relaying traffic information. Used by DAB for in-vehicle systems.</em></td>
</tr>
<tr>
<td>TRA</td>
<td>temporary restricted area (ATC)</td>
</tr>
<tr>
<td>TRACON</td>
<td>Terminal Radar Approach Control</td>
</tr>
<tr>
<td>Trafficmaster</td>
<td>System that collects road traffic flows and disseminates them (UK)</td>
</tr>
<tr>
<td>Transit</td>
<td>discarded US navigation satellite system (pre-GPS)</td>
</tr>
<tr>
<td>TRANSSC</td>
<td>Transport Safety Standards Committee (IAEA)</td>
</tr>
<tr>
<td>TREASURE</td>
<td>Training, Research and Applications project (EU)</td>
</tr>
<tr>
<td>TREN</td>
<td>(Directorate General) TRansport and ENergy (EC - was DG VII)</td>
</tr>
<tr>
<td>trk</td>
<td>track</td>
</tr>
<tr>
<td>trkg</td>
<td>tracking</td>
</tr>
<tr>
<td>TRL</td>
<td>Transport Research Laboratory (UK)</td>
</tr>
<tr>
<td>TRN</td>
<td>terrain-referenced navigation</td>
</tr>
<tr>
<td>TROPIC</td>
<td>Traffic Optimisation by the Integration of Information &amp; Control</td>
</tr>
<tr>
<td>TRS</td>
<td>Testbed Reference Station (GRAS)</td>
</tr>
<tr>
<td>TRSB</td>
<td>time-referenced scanning beam</td>
</tr>
</tbody>
</table>
true position

The error-free latitude and longitude (2D) and height (3D) co-ordinates in a specified geodetic datum (IMO).

TS
thunderstorm (met)
Tracking Station (GPS)

TSA
target speed across track

TSCPTS
Traffic Signal Controller Performance Test System (UK DTLR)

TSD
traffic situation display (ADS-B)

TSE
total system error (also TNSE = total navigation system error)

TSL
target speed along track

TSO
Technical Standard Order (US FAA or JAA as JTSO)

TSP
telematics service provider

TSPI
time, space and positioning information

TSS
traffic separation scheme

TT
true track (actual path of (ship’s) movement relative to the earth

TT&C
telemetry, tracking and command

TTA
time to alarm/alert

TTC
telemetry, tracking & command

TTFF
time to first fix

TTG
time to go

TTI
Tourist and Traveller Information

TUNE
time component of the user navigation error

TURB
turbulence (coding of occurrence in air accident - ECRAIRS)

TVAC
thermal vacuum test (eg of satellite)

TVE
total vertical error

TVOR
terminal VOR (low-powered as an approach aid)

TWDL
two-way data link

TWG
Transport Council Working Group (EU)

TWTA
traveling wave tube amplifier

Tx
transmitter

UA
unmanned aircraft

UAC
Upper Air Control

UACC
Upper Air Control Centre

UAIS
Universal Automatic Identification System (IMO MSC 74(69) Anx C)

UAR
upper air route

UAS
unmanned aircraft system (drone)

upper airspace service

UASRA
upper airspace special rules area

UAT
universal access transceiver
UAV unmanned aerial vehicle (drone)
UBI usage-based insurance
UCaaS Unified Communication as a Service
UCAV unmanned combat air vehicle
UCP User Consultation Platform (Galileo)
UDA upper advisory area
UDF UHF direction finding
UDMH unsymmetrical dimethyl hydrazine (storable rocket propellant)
UDMS Urban Data Management Society
UDP User Datagram Protocol (Internet)
UDR untethered dead reckoning (eg INS added to GNSS chip)
UDRE user differential range error (eg in WAAS)
UE user equipment
UERE (or URE) user equivalent range error

Any error contributing to the error budget of a stand-alone satnav rx, expressed as an equivalent error in the range between the user's rx and satellite. Total UERE is the rss of the individual errors.

UGV unmanned ground vehicle
UHARS Ultra High Accuracy Reference System (~1 cm . . USAF)
UHDS ultra high density satellite (for comms)
UHF ultra high frequency (300-3,000 MHz)
UI user interface
UIC Union Internationale des Chemins de Fer (based in Paris)

International Union of Railways.

UIG Urban ITS Group (UK DTLR)
UIR Upper Information Region (FIR above FL245)
UITP Union Internationale de Transport Public
UKAB United Kingdom Airprox Board
UKF Unscented Kalman Filter
UKHO United Kingdom Hydrographic Office
UKISC United Kingdom Industrial Space Committee
UKLFHB UK Low Flying Handbook (military)
UKMF UK Maritime Forum

Informal forum of ICS, IMarE, NI, RIN, RINA, and SUT.

UKMO UK Meterological Office
UKRNES UK Radio-communication, Navigation Equipment and SAR (committee)
UKSA UK Space Agency
UKSAR United Kingdom Search & Rescue Committee
UKSCC United Kingdom Satnav Co-ordination Committee
UKSON UK Safety of Navigation (MCA Ctee)
ULI Research & Development Council for Land (Swedish AGI)
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNE</td>
<td>user navigation error</td>
</tr>
<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
</tr>
<tr>
<td>UNIGRACE</td>
<td>Unification of Gravity Systems in Central and Eastern Europe</td>
</tr>
<tr>
<td>UNISIG</td>
<td>Railway signalling &amp; comms industry consortium</td>
</tr>
<tr>
<td>UNTOC</td>
<td>un-TOC second offset (Loran-C)</td>
</tr>
<tr>
<td>UPRN</td>
<td>Unique Property Reference Number (OS)</td>
</tr>
<tr>
<td>UQ</td>
<td>ultra-quick flashing light</td>
</tr>
</tbody>
</table>
| URA     | user range accuracy  
Prediction of max UERE (minus ionospheric error) broadcast in each GPS satellite’s navigation message. |
| URAV    | unmanned reconnaissance air vehicle |
| URE     | user range error (see UERE) |
| URL     | Uniform Resource Locator (Internet address) |
| URSI    | International Union of Radio Science |
| USB     | Universal Serial Bus |
| USC     | United States Code |
| USCAHC  | US/Canada Hydrographic Commission |
| USCG    | United States Coast Guard |
| USGIC   | US GPS Industry Council |
| USGS    | US Geological Survey |
| USNO    | US Naval Observatory |
| USRN    | Unique Street Reference Number (OS) |
| USSPACECOM | US Space Command |
| USV     | unmanned surface vessel |
| UT      | Universal Time |
| UT0     | Uncorrected Universal Time |
| UT1     | UT0 corrected for polar variation  
The mean solar time of the prime meridian obtained from direct astronomical observation and corrected for the effects of small movements of the earth relative to the axis of rotation (polar variation). |
| UT2     | UT0 corrected for polar & seasonal variations |
| UTC     | Co-ordinated Universal Time  
Corresponds exactly with TAI but differs from it by an integral number of positive or negative leap seconds - to ensure that the departure of UTC from UT1 never exceeds ±0.9 secs. GPS time differed by 18 leap seconds in Jan 18, otherwise always within 100ns. |
| UTM     | Universal Transverse Mercator (using a meridian as line of contact) |
| UTMCC   | Urban Traffic Management and Control (DTLR 5-year R&D prog) |
UTP  unshielded twisted pair (of wires carrying data)
USER  user terminal prototype (eg STENAV)
UUVE  unmanned underwater vehicle
UWB  ultra-wide band (transmission)
UXO  unexploded ordnance
V&V  verification and validation
V2X  vehicle-to-everything (connectivity)
VA  volcanic ash (met)
VADR  voice and data recorder (aircraft)
VAFORIT  Very Advanced Flight Data Processing OR Implementation System
         German DFS contract.
VAL  vertical alert limit/level (eg for WAAS precision approach etc
VANET  Vehicular Ad Hoc Network
Var  variation
         Angle between TN and MN, from TN eastwards named E (+), westwards named W (-).
VAS  value-added service
VASP  value-added service provider
VC  in vacinity (met)
VCA  Vehicle Certification Agency (for EMC of vehicles)
VCR  visual control room (ATC)
VCS  voice communications system (ATC)
VDB  VHF data broadcast (eg for LAAS)
VDF  VHF direction finding
VDL  VHF Digital Link (ARINC)
         Civil air data link for air-to-ground business and ATS messages. VDL Mode 4 gives
         19,200 baud in band 117.975–137 MHz.
VDOP  vertical dilution of precision
         The factor by which the one-dimensional vertical accuracy of a fix is degraded by
         geometrical considerations.
VDR  voyage data recorder
vertical circle  Great circle of the celestial sphere throught the zenith & nadir
Vetronics  vehicle electronics (often military)
VFR  visual flight rules
VGA  Standard display format of 640 x 480 pixels
VGS  VHF ground station
         visual guidance system
VHF  very high frequency (30-300 MHz) (metric waves)
VHSIC  very high speed integrated circuit
VICS  Vehicle Information and Communications System (Japan)
VLA  very light aeroplane (not exceeding 750 kg MTOW)
VLBI  very long baseline interferometry
VLF  very low frequency (3-30 kHz)
VLSIC very large scale integrated circuit
VMC  visual meteorological conditions
VML  Vector Mark-up Language
VMS  variable message sign (for roads)
VNAV vertical navigation (extension of RNAV)
VNO  virtual network operator (of mobile phones)
VNSE vertical navigation system error
Volpe John A Volpe National Transportation Systems Center (US)
VOR  VHF Omnidirectional Range
VORTAC collocated VOR and TACAN
VPL  vertical protection level (SBAS - used by VAL in precision approach)
VPL_Ho fault-free vertical protection level
VPN  virtual private network
VPS  Vehicle Positioning Systems (=MPS)(term used in Hong Kong)
VR  virtual reality
VRD  virtual retinal display (data projected onto lightweight spectacles)
VRM  variable range marker
VRML Virtual Reality Model Language
VRP  visual reporting point
VRS  virtual reference station (Trimble technique for RTK)
VRSS virtual reality ship simulator
VSAT very small aperture terminal
VSI  vertical speed indicator
VTE  vessel technical error
VTM  vessel traffic management
VTMIS vessel traffic management and information services (EC)
VTMIS-NET VTMIS Network (EC)
VTMS vessel traffic management service
VTS  vehicle traffic service
VUNE vertical component of the user navigation error
W watt
W-Code GPS encryption code to add to P-Code to create Y-Code
WAAS Wide-Area Augmentation System
WAC  World Aeronautical Chart (1:1 million scale)
WACS wireless airport communication system
WAD  wide-area differential
WADGPS  wide area DGPS
WAFS  World Area Forecast System (ICAO)
WAGE  Wide Area GPS Enhancement
WAH  when able higher (ATC)
WAIC  Wireless Avionics Intra-Communications
WAN  wide area network (often joining together LANs)
WAP  wireless application protocol
   Specification to enable mobile phone, pager or PDA to access the Internet.
WARC  World Administrative Radio Conference (now WRC)
Wb  weber (magnetic flux)
WBMOD  Wide-band Scintillation Model (for GPS)
WCV  waypoint closure velocity
WDOP  weighted dilution of precision (see DOP)
WEND  Worldwide Electronic Navigational Chart Database (IHO)
WG-GGI  Working Group on Geodesy and Geographic Information
WGS  World Geodetic System
   A consistent set of parameters describing the size and shape of the earth. Most common system is WGS-84 (1984), used by GPS; uses semi-major axis of 6,378,137 m and flattening of 1/298.257.
WIG  wing-in-ground craft
WIMP  windows, icons, mouse, pointer (describes windows style displays)
WIP  work in progress
WIPP  WAAS Integrity Performance Panel (US)
WLS  weighted least-squares
WML  Wireless Markup Language (for WAP)
WMO  World Meteorological Organisation (UN - HQ Geneva)
WMS  Wide Area Master Station (WAAS)
WNTI  World Nuclear Transport Institute (formed 1998, based in London)
WpB  bearing of a waypoint
WpD  distance to waypoint
WPT  waypoint
WRC  World Radio Conference (of the ITU) eg WRC-2015
WRO1024  GPS week roll-over
WRS  Wide Area Reference Station (WAAS)
WSN  Wide Space Network (comms links between satellites)
WSO  Weapons Systems Officer
WSSE  weighted sum of squared errors
WT  water track (path of ship’s movement through the water)
WWNWS  World-Wide Navigational Warning Service (IMO & IHO)
WWRNS  World-wide Radionavigation System
www  World-wide Web (Internet)
<table>
<thead>
<tr>
<th><strong>WX</strong></th>
<th>weather</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WX NIL</strong></td>
<td>no significant weather</td>
</tr>
<tr>
<td><strong>WYSIWYG</strong></td>
<td>what you see is what you get</td>
</tr>
<tr>
<td><strong>X-band</strong></td>
<td>Old radar band 8-12 GHz (ITU assigned 8,500-10,680 MHz) ~ 3 cm</td>
</tr>
<tr>
<td><strong>XGA</strong></td>
<td>Standard display format of 1,024 x 768 pixels</td>
</tr>
<tr>
<td><strong>XML</strong></td>
<td>Extensible Mark-up Language (complements HTML)</td>
</tr>
<tr>
<td><strong>XTD</strong></td>
<td>cross-track distance (perpendicular to ground track)</td>
</tr>
<tr>
<td><strong>XTE</strong></td>
<td>cross-track error (perpendicular to ground track)</td>
</tr>
<tr>
<td><strong>Y-Code</strong></td>
<td>encrypted P-Code (comprises modulo-2 addition of P-Code &amp; W-Code)</td>
</tr>
<tr>
<td><strong>Y2K</strong></td>
<td>Year 2000</td>
</tr>
<tr>
<td><strong>YAH</strong></td>
<td>You are here (maps for pedestrians)</td>
</tr>
<tr>
<td><strong>Z</strong></td>
<td>zenith (point on the celestial sphere vertically overhead)</td>
</tr>
<tr>
<td><strong>Z-Count</strong></td>
<td>Fundamental GPS time unit</td>
</tr>
<tr>
<td></td>
<td>A 29-bit binary number of which 10 most significant bits give GPS week number and 19 least significant give time-of-week (TOW) count in units of 1.5 seconds. Truncated TOW in 6-sec epochs included in navigation message HOW.</td>
</tr>
<tr>
<td><strong>ZT</strong></td>
<td>zone time</td>
</tr>
<tr>
<td></td>
<td>The local mean time of a reference or zone meridian, whose time is kept throughout a designated zone. The zone meridian is usually the nearest meridian whose longitude is exactly divisible by 15 º.</td>
</tr>
<tr>
<td><strong>ZTD</strong></td>
<td>zenith tropospheric delay</td>
</tr>
<tr>
<td>⧫</td>
<td>autumnal equinox</td>
</tr>
<tr>
<td></td>
<td>Point of intersection of the ecliptic and the celestial equator, occupied by the sun as it changes from north to south declination. Also called 'first point of Libra'.</td>
</tr>
<tr>
<td></td>
<td>ohm (unit of resistance = ratio V/A)</td>
</tr>
</tbody>
</table>