

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 <i>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.</i>
2SOPS	2nd Space Operations Sqn (of 50th Space Wing, USAF) <i>Exercise command and control of GPS satellite constellation.</i>
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 10 ⁻¹⁸)
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
AIA	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	airfield 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	Airports Authority of India 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 <i>London based private company owning several UK ports.</i>
ABS	Automatic Blink System (Loran-C integrity channel)
absolute accuracy	(geodetic or geographic accuracy) <i>The accuracy of a position with respect to the geographic or geodetic coordinates of the earth (IMO).</i>
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) <i>Civil air data link for air-to-ground business and ATS messages.</i>
ACAS	Airborne Collision Avoidance System
Acc	altocumulus castellanus cloud
ACC	adaptive cruise control area control centre (ATC)
accuracy	<i>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).</i>
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) air data computer
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 advisory route (ATC) automotive dead reckoning
ADRS	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 <i>For access to the Web using normal phone lines at speeds between 512 and 2,000 kbps.</i>
ADSP	Automatic Dependent Surveillance Panel (of ICAO)
ADT	Autonomous Distress Tracking (ICAO applicable from 2021)
ADVANCE	Advanced Driver & Vehicle Advisory Navigation Concept (US)
AE	antenna electronics
a_e	Earth's equatorial radius (typically 6.378 x 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 Sistemas 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 <i>EC telematics project Oct 2000 - Apr 2002.</i>
AGU	American Geophysical Union
AHMS	Aeronautical Mesage Handling System (to replace AFTN in 2000+)
AHO	Australian Hydrographic Office
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 internationale de géodésie (IAG)
AIM	Aeronautical Information Management (eg NOTAMs etc)
AIN	Arab Institute of Navigation
AION	Australian Institute of Navigation
AIOTI	Alliance for Internet of Things Innovation (initiated by the EC in 20150)
AIP	Aeronautical Information Publication

AIPCN	Association Internationale de Navigation (also PIANC) <i>Brussels based - www.pianc-aipcn.org.</i>
AIRPROX	UK term for 'airmiss'
AIS	Aeronautical Information Service Automatic Identification System (for shipping)
AIV	all in view
AIZ	aerodrome information zone
AJAS	anti-jam antenna system (eg for GNSS)
AL	alert limit/level <i>Max allowable error (in a measured position for example) found during integrity monitoring before an alarm is triggered.</i> autonomy level (levels 0-6, from Lloyd's Register)
ALA	approach and landing accidents
ALAR	Approach and Landing Accident Reduction (eg FSF WG)
ALARP	as low as reasonably practicable (of risk in using a system)
ALFENS	Automated Low Flying Enquiry & Notification System
ALL	Admiralty List of Lights
along-track error	<i>A position error in the direction of the intended track (IMO).</i>
ALPA	Air Line Pilots Association (US)
ALPR	automatic licence-plate recognition
ALRS	Admiralty List of Radio Signals
ALS	aerodrome lighting system
AM	amplitude modulation
AM/FM Europe	Automated Mapping/Facilities Management - European Division
AM/FM It	Automated Mapping/Facilities Management - Italy
AMAS	Autonomous Mobility Appliqué System (Lockheed for US Army)
AMASS	Airport Movement Area Safety System (FAA) (software package)
ambiguity	<i>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).</i>
AMCP	Aeronautical Mobile Communication Panel (of ICAO)
AMCS	Alternate Master Control Station (GPS) - Vandenberg AFB
AME	authorised medical examiner (for aviation licences)
AMI-C	Automotive Multimedia Interface Collaboration (telematics standard)
AMLCD	active matrix liquid crystal display
amsl	above mean sea level
AMSS	Aeronautical Mobile Satellite Service
AMTICS	Advanced Mobile Traffic Information System (Japan)
AMVER	Automated Mutual-Assistance Vessel Rescue System
ANA	area navigation approach
ANC	Air Navigation Commission (ICAO)

ANO	Air Navigation Order <i>Statutory legal instrument defining the laws of air navigation, pilot licensing etc in UK.</i>
ANPR	automatic number plate recognition
ANR	active noise reduction
ANS	automatic navigation system
ANSI	American National Standards Institute
ANSP	air navigation service provider
ANT	antenna
AOA	Airport Operators Association angle of arrival angle of attack (aircraft indicator)
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) <i>AOR-W 54W, AOR-E 15.5W</i>
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-GA	All-Party Parliamentary Group on General Aviation (UK)
APR	approach control radar
APU	auxiliary power unit
APV-I	Approach with Vertical Guidance - I (to runway) <i>Requires accuracies (95%) of 220 m H, 20 m V. HAL 556 m, VAL 50 m. Time to alert 10 s.</i>
APV-II	Approach with Vertical Guidance - 2 (to runway) <i>Requires accuracies (95%) of 16 m H, 8 m V. HAL 40 m, VAL 20 m. Time to alert 6 s.</i>
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 <i>Centre nominated by national SAR agency to which CES normally routes distress calls.</i>
ARCS	Admiralty Raster Chart Service
ARINC	Aeronautical Radio Inc (now just called 'ARINC') <i>US avionics standards-setting body whose standards are accepted world-wide.</i>
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)
ARSR	air route surveillance radar
ARTCC	air route traffic control centre
ARTEMIS	Advanced Relay and TEchnology MISsion satellite (ESA)
ARTES	Advanced Research in TElecommunications Systems <i>ESA initiatives. Element 9 involves development work for GNSS.</i>
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 <i>Comprises letters, digits and special characters each represented by 8 bits or 1 byte.</i>
ASDE	airport surface detection equipment (radar) (can feed AMASS)
ASE	altimetry system error
ASECAP	<i>Association Européenne de Concessionnaires d'Autoroutes et d'Ouvrages à Péage</i>
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 altimeter setting region

	aviation safety report
ASR-WSP	airport surveillance radar - weather systems processor (FAA)
ASRS	Aviation Safety Reporting System (NASA)
ASTRON	Applications on the Synergy of Earth Obs with Sat Telecoms & Nav <i>Under EC 5th Framework RTD Programme.</i>
Astronomical lat	<i>Angular distance between the plane of the celestial equator and the point's plumb line.</i>
Astronomical lon	<i>Angle between the plane of the prime meridian and the plane of the point's celestial meridian.</i>
ASUPF	adaptive square-root unscented particle filtering (statistics algorithm)
ASV	Advanced Safety Vehicle (Japanese concept)
ATA	actual time of arrival Air Transport Association (US)
	automatic tracking aid
ATAG	Air Transport Action Group <i>Industry lobby gp, 80 members funded by IATA, Boeing and Airbus.</i>
ATC	air traffic control ancillary terrestrial component (ground comms towers)
ATCAA	air traffic control assigned airspace
ATCC	air traffic control centre
ATCO	air traffic control officer
ATCRBS	Air Traffic Control and Radar Beacon System
ATCRU	air traffic control radar unit
ATD	actual time of departure
ATE	along track error automatic test equipment
ATFM	air traffic flow management
ATIS	advanced traveller information system automatic terminal information station/service <i>Continuous broadcast of routine non-control aerodrome information.</i>
ATLB	Air Transport Licensing Board
ATM	aerodrome traffic monitor air traffic management
Atmosphere	Shell round earth extending to height of 350 km <i>Comprises troposphere, stratosphere, mesosphere, thermosphere and ionosphere.</i>
ATMSP	Air Traffic Management Service Provider <i>eg: AENA - Spain, ANA - Portugal, DFS - Germany, DGAC - France, ENAV - Italy, NATS - UK.</i>
ATMWG	Air Traffic Management Working Group (IATA)
ATN	Aeronautical Telecommunications Network
ATNS	Air Traffic Navigation Service (South Africa)
ATOL	Association of Tour Operators and Leaders
AtoN	(ATON) aid to navigation

ATOP	Advanced Technologies and Oceanic Procedures (FAA)
ATP	Allied Tactical Publication (NATO) Automatic Train Protection (UK signalling safeguard)
ATPL	Air Transport Pilot's Licence
ATR	Air Transport Racking (ARINC) <i>A standard size for avionics boxes. All 10 ins high, full ATR 10 ins wide, half ATR 5 ins wide etc.</i>
ATS	air traffic service Aircrew Training System (USAF)
ATSOCAS	air traffic services outside controlled airspace
ATSP	Air Traffic System Provider
ATSU	air traffic service unit
ATT	Admiralty Tide Tables advanced transport telematics
ATTS	advanced transport telematics system
ATZ	aerodrome traffic zone <i>Usually 2 or 2.5 NM radius up to 2,000ft aal.</i>
AU	astronomical unit
augmentation	<i>Any technique of providing enhancement in order to provide improved navigation performance to the user (IMO).</i>
AUGUR	A predictive GPS receiver autonomous integrity monitoring system <i>EUROCONTROL.</i>
AUM	all-up mass (aircraft)
AUV	autonomous underwater vehicle
AUW	all-up weight (aircraft)
AV	autonomous vehicle
availability	<i>The percentage of time that an aid, or system of aids, is performing a required function under stated conditions (IMO).</i>
AVC	automatic vehicle classification
AVG	automatic vehicle guidance
avgas	aviation gasoline (for piston aircraft)
AVI	automatic vehicle identification
AVID	Added Value Information Dissemination (EU project)
AVL	automatic vehicle location
AVLS	automatic vehicle location system
AVM	automatic vehicle monitoring
AVN	audio, video, navigation (in-car infotainment systems)
avtur	aviation turbine fuel (kerosine) (for jets/turboprops)
AWARE	Advanced Weather and Reporting Enhancements <i>Tool being from NASA to present better weather info for GA pilots.</i>
AWDS	Automated Weather Distribution System
AWG	aural warning generator

AWN	Aviation Weather Network (US)
AWNIS	Allied Worldwide Navigational Information System <i>Classified NATO navigational warning system.</i>
AWO	all-weather operations
AWOP	All-Weather Operations Panel (ICAO)
AWOS	automated weather observation 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 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 <i>1 baud = 1 bit per second for most purposes.</i>
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 Bīdǒu means ‘Northern Dipper’)
BELF	breakeven load factor (air)
BER	bit error rate
BEST	Beginning-to-End for Simulation and Training <i>NATS ATC simulation system for NERC.</i>
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 Mesures
bit	binary digit <i>A single unit of binary data.</i>
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 <i>Basic is up to 10 metres using 2.4 GHz at 720 kbps.</i>
BMAA	British Microlight Aircraft Association
BMC	British Mountaineering 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)
bot	Short for ‘robot’, an automated program that runs over the Internet.
botnet	Group of computers connected in coordinated fashion for malicious purposes.
BOW	basic operating weight (everything except payload)
BPA	British Parachute Association British Ports Association (Trade association representing ~ 87 ports)

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
BRIG	Blackett Review Implementation Team (UK Cabinet Office)
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)
BWMS	ballast water management system
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) <i>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.</i>
C/No	carrier-to-noise power density <i>Ratio of power level of a signal carrier to the noise power in a 1 Hz bandwidth.</i>
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	<i>Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance.</i>
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 fm Philips)
CARPILOT	An autonomous in-car navigation system (DR and map-matching, NL)
CAS	calibrated/corrected airspeed <i>IAS corrected for air density and compressibility.</i> Controlled Access Service (of Galileo - for registered users only) controlled airspace
CASST	Commercial Aviation Safety Strategy Team (FAA)
CAST	China Academy of Space Technology (designers of BeiDou)
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 (A,B 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.

CATRIV

Conceptual Analysis for Transportation on Rivers (EU)

CAV

connected and autonomous vehicle

CAVOK

'cav-okay' - ceiling and visibility OK

Basically 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 (000°).

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
CE	total compass error correction <i>Sum of Var and Dev. Angle between TN and CN, from TN eastwards named E (+), westwards named W (-).</i>
CEAC	Conférence Européenne de l'Aviation Civile (= ECAC)
CEATS	Central European Air Traffic Services (based in Vienna from 2006)
CEGRN	Central European GPS Reference Network <i>Initially 31 sites in 11 countries, over 60 sites in 2000. Gives accuracy of 2-4 mm horizontal and 4-8 mm vertical.</i>
CEI	Central European Initiative (Scientific programme with 17 nations)
celestial horizon	<i>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.</i>
Cell-ID	network cell identification (cellphone positioning) <i>Accuracy of 250 m - 10 km.</i>
CEN	Comité Européen de Normalisation <i>European standards body for IT.</i>
CENELEC	Comité Européen de Normalisation Electrotechnique <i>European Committee for Electrotechnical Standardisation. Central Secretariat based in Brussels.</i>
CEO/JRC	Centre for Earth Observations/Joint Research Centre
CEP	circular error probable <i>The radius of a circle, centred at the measured position, inside which the true position lies with 50% probability.</i>
	Committee for Environmental Protection
CEPT	Conference of European Postal Telecommunications Administrations
CER	Community of European Railways
CERCO	Comité Européen des responsables de la cartographie officielle
CERDEC	Comms Electronics Research, Development and Engineering Center <i>US Army Materiel Command.</i>
CERGOP	Central European Region Geodynamics Project (CEI) <i>Phase 1 concluded 1998 led to CEGRN. CERGOP-2 from 2000.</i>
CES	coast earth station (same as LES operationally)
CESAR	Certification Policies, Procedures & Requirements <i>For satellite-based navigation and landing systems and corresponding research activities.</i>
CEST	Centre for Exploitation of Science and Technology
CETRF	Central European Terrestrial Reference Frame

CEV	Centre d'Essais en Vol (French national flight test centre)
CEVNI	Code Européen de Voie de la Navigation Intérieur <i>The rules for inland waters of mainland Europe.</i>
CFAR	constant false alarm rate (eg in radar)
CFI	chief flying instructor
CFIT	controlled flight into terrain
CFMU	Central Flow Management Unit
CFR	Code of Federal Regulations (US)
CG	Coastguard
CGAS	Coast Guard Air Station (US)
CGPM	General Conference of Weights and Measures
CGS	Civil GPS Service
CGSIC	Civil GPS Service Interface Committee
Ch	Channel
CH	compass heading <i>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°).</i>
CHA	Competent Harbour Authority
Chayka	Russian Loran-C system
chip	binary element or digit that conveys no information
CHIRP	Confidential Human Factors Incident Reporting Procedure
CHS	Canadian Hydrographic Service
Ci	cirrus cloud
CIC	cave instructor certificate Concentrated Inspection Campaign (of Paris MoU on shipping)
CICADA	close-in covert autonomous disposable aircraft (US military)
CIGTF	Central Inertial and GPS Test Facility (USAF Holloman AFB)
CIKR	critical infrastructure and key resource (sectors)
CIL	Commissioners of Irish Lights
CIN	China Institute of Navigation
CIR	cockpit image recorder corotation interaction region (of Sun geomagnetic activity)
CIRM	Comité International Radio Maritime
CIS	Commonwealth of Independent States
CISC	complex instruction set computer
CIWG	Communication Infrastructure Working Group (IATA)
CLAS	Centimeter Level Augmentation Service (QZSS)
CLCS	Commission on the Outer Limits of the Continental Shelf (UN)
cld	cloud

CLGE	Comité de liaison des géomètres Européens <i>Council of European Geodetic Surveyors.</i>
CMA	Central Monitoring Agency (NATS)
CMATZ	combined military air traffic zones
CMCU	Clock Monitoring and Control Unit (Galileo)
CME	coronal mass ejection (from sun)
CMG	course made good (rhumb line direction between 2 fixes)
CMIC	Civil Military Interface Standing Committee (EUROCONTROL)
CMOS	complementary metal oxide semiconductor
CMR	civil marine radar
CMU	communications management unit
CMYK	Cyan, Magenta, Yellow and black (colour system for printing)
CN	compass north <i>Northerly direction of the needle or zero-index of a magnetic compass.</i>
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)
CO	Cabinet Office (UK)
COA	course of advance (course to make good) <i>Direction from the (ship's) last fix to next estimated position, expressed in angular units from true north.</i>
COBA	cost-benefit analysis
CODA	Central Office of Delay Analysis (EUROCONTROL)
COG	course over the ground <i>Direction of (the ship's) movement relative to the earth, measured on board (the ship).</i>
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 <i>21 African states. Initiatives include adoption of an 'open skies' policy and a joint CNS/ATM system (by late 2002).</i>
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	<i>The numerical range within which an unknown is estimated to be with a given probability.</i>

confidence level	<i>The percentage of confidence that a given statement is correct or that a stated interval includes an unknown.</i>
confidence limits	<i>The extremes of confidence interval.</i>
CONOPS	Concept of Operations (US)
continuity	<i>The ability of a system to function within specified performance limits without interruption during a specified period (IMO).</i>
CONUS	Continental United States
CONVERGE	Completed (2000) EU project on deployment of ITS
Conversion angle	<i>Angular difference between rhumb line and great circle between two points.</i>
CoP	Conformity of Production (assessment of client under VCA)
Copernicus	EU space infrastructure programme (was GMES)
correction	<i>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.</i>
CORS	continuously operating reference station (DGPS)
COS	continuity of service
COSPAS-SARSAT	Cosmicheskaya Sistyema Poiska Avarynich Sudov - SAR Sat-aided Trkg <i>Satellite-aided SAR system based on low altitude near polar orbit satellites designed to locate distress beacons on 121.5 and 406 MHz.</i>
COST	COoperation in the field of Scientific & Technical research <i>Cooperation between 17 European countries: Austria, Belgium, Czech Rep, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Ireland, Netherlands, Slovakia, Spain, Sweden, Switzerland & UK.</i>
COTS	commercial off-the-shelf (equipment)
coverage	<i>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).</i>
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 <i>CPDLC Build 1 is based on VDL Mode 2.</i>
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)
CPNT	complementary position, navigation and timing
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) <i>Responsible for the collection of aviation navigation charges.</i>
CRLB	Cramér-Rao lower bound <i>For carrier-phase ranging & carrier-frequency velocity measurements.</i>
CRM	crew resource management (has also been known as 'cockpit' RM)
cross-track error	<i>Position error perpendicular to the intended track.</i>
CRP	compulsory reporting point
CRPA	controlled radiation/reception pattern antenna
CRS	CIGTF Reference System (USAF)
	coast radio station
	course (heading) <i>Angle measured in horizontal plane from a reference direction, counted clockwise from 000° through 360°, written as a 3 digit number.</i>
CRT	cathode ray tube
CRY	cryptochrome
CS	cesium (clock)
	Commercial Service (Galileo)
	control segment
Cs	cirrostratus cloud
CSE	course course selection error
CSEL	Combat Survivor Evader Locator (US)
CSG	Centre Spatial Guyanais (Guiana Space Centre, Kourou)
	computer symbol generator
CSIRO	Commonwealth Scientific and Industrial Research Organisation (Australia)
CSMA/CA	carrier-sense multiple access with collision avoidance
CSOC	Consolidated Space Operations Centre
CT	computerised tomography (to image ionosphere electron density)
CTA	control area (ATC)
CTAS	Centre-TRACON Automation System (FAA) <i>ATC automation tools - TMA, FAST and DA.</i>
CTP	Common Transport Policy (EU)
CTR	Chain Time Reference (Loran-C)
CTS	course to steer (true course) <i>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°).</i>
CTSC	Converging Technology and Services Committee (FEI)

CTW	course through water <i>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 (000°).</i>
Cu	cumulus cloud
CUAP	Chart User's Advisory Panel (of HO)
CUG	closed user group
CUPT	constant velocity update
CURSOR	proprietary positioning system using GSM phones
CVO	commercial vehicle operator
CVR	cockpit voice recorder
CVS	combined vision system (HUD blending synthetic & thermal/low-light images)
CW	continuous-wave
CWAAS	Canadian WAAS
CWG	Conspicuity Working Group (CAA)
CWS	collision warning system
CYCC	Conference of Yacht Cruising Clubs (main UK clubs)
CZIN	Czech Republic Institute of Navigation
d	deci (SI unit multiplier of 10 ⁻¹)
D-band	NATO radar band 1-2 GHz = 30-15 cm
d.lat	difference of latitude <i>Shorter arc of any meridian between the parallels of 2 places.</i>
d.lon	difference of longitude <i>The shorter arc of a parallel between the meridians of 2 places.</i>
D&D	Distress and Diversion (UK ATC facility)
D2B	International multimedia networking protocol for use within vehicles
D3	DAGR Distributed Device (US military)
da	deca (SI unit multiplier of 10 ¹)
DA	Descent Advisor (ATC management tool, US)
DAB	digital audio broadcast(ing)
DAC	digital-to-analogue converter
DADI	datalinking of aircraft-derived information
DAGR	Defense Advanced GPS Receiver (US)
DAISY	Digital Automatic Identification System
DAL	design assurance level
DAP	downlinked aircraft parameter (SSR Mode S)
DARC	data radio channel
DARPA	Defense Advanced Research Projects Agency (US)
DARS	Digital Audio Radio Service (satellite broadcast)

Datatrak	proprietary navigation system (Siemens UK) <i>Was a coherent LF DTMA nav system giving an accuracy about 1.5 times better than raw GPS, post-SA. Transmitters ~120 km apart.</i>
dB	decibel <i>Power ratio in dB = 10log(power ratio). Voltage or current ratio in dB = 20log(voltage or current ratio).</i>
dB<i>i</i>	decibels, isotropic
dBW	decibel watts (Power level relative to 1 watt)
DCDB	Data Centre on Digital Bathymetry
DCE	data circuit-terminating equipment
DCPC	direct controller/pilot communications
DCPS	differentially corrected positioning service
DCS	Data Collection System (IMO for fuel use monitoring)
DCT	direct
DD	double-difference (method of GNSS fixing)
DDGI	German umbrella organisation for geoinformation
DDM	difference in depth of modulation
DDoS	distributed denial-of-service attack (eg via botnet)
DDV	Design, Development and In-Orbit Validation (phase of Galileo) <i>~ 2001-2005.</i>
DE&S	Defence Equipment and Support (part of UK MOD)
dead ahead	direction ahead of a (ship's) fore-and-aft line
Dec	declination
Decca	hyperbolic LF navigation system <i>In UK funded by THLS until 31 Mar 00.</i>
DECT	Digital European Cordless Telecommunications <i>Short range speech or data system. TDMA on 1.88-1.90 GHz.</i>
deg	degrees
DEKF	desensitised extended Kalman filter
DEM	digital elevation model/map
Demeter	Digital Electronic Mapping of European Territory <i>Covers data standards for road networks for nav systems.</i>
Dep	departure <i>Distance between 2 meridians at any given parallel of latitude, expressed in nautical miles.</i>
DERA	Defence Evaluation and Research Agency (UK) <i>On 1 Apr 01 split into New DERA and the Defence Science and Technology (DST) Lab. New DERA becomes 'QinetiQ' on 2 Jul 01.</i>
DES	Data Encryption Standard
Dest	destination
DETR	Department of the Environment, Transport and the Regions (UK) <i>Ceased in Jun 01 - most became DTLR.</i>

Dev	deviation <i>Angle between MN and CN, from MN eastwards named E (+), westwards named W (-).</i>
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_c	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. <i>German Institute of Navigation.</i>
DGPS	(or D-GPS) Differential GPS
DGT	digital GPS translator (of TGRS)
DH	decision height (of landing aircraft) <i>Height above runway at which pilot must have runway approach lights in sight or initiate the missed-approach procedure.</i>
DHS	Department of Homeland Security (US)
DI	direction indicator
differential system	<i>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.</i>
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) <i>Development of end-to-end prototype capable of testing the security aspects of Galileo PRS service provision.</i>
dist	distance
DIT	Department for International Trade (UK)
DIW	dead in water
DL	datalink
D_L	distance between 2 points on a rhumb line (loxodromic distance)
DLL	delay locked loop
DLoran	Differential Loran

DLR	Deutsches Zentrum für Luft- und Raumfahrt <i>German National Space Agency.</i>
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 <i>Produced by phytoplankton in response to zooplankton grazing - its odour attracts some birds, enabling them to navigate to food-rich sources.</i>
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 <i>A dimensionless number that accounts for the contribution of relative satellite geometry to errors in position determination.</i>
DORIS	Doppler Orbitography and Radiopositioning by Satellite
DoS	denial of service (such as GNSS)
DOT	Department of Transportation (US)
DP	dew-point
DPS	dynamic positioning system
DQ	data quality
DQM	data quality monitoring
DR	dead (deduced) reckoning drifting (met)
DR_{cor}	corrected DR position <i>Estimated position obtained by adding to the last fix course (track) and speed.</i>
DRFM	digital radio frequency memory
DRG	digital route guidance
DRI	driver restriction information (eg info on blocked roads)
Drift angle	<i>Angular difference between: (Sea) course of advance and course through water; (Air) heading and track.</i>
DRISL	Data Relay Inter-Satellite Links (part of WSN)
DRIVE	Dedicated Road Infrastructure for Vehicle Safety in Europe (EU)
DRL	data relay link (eg between satellite and ground)
dRMS	distance root-mean-square <i>The root-mean-square of the radial distances from the true position to the observed positions obtained from a number of trials.</i>

DRS	dead reckoning system
DS	duststorm (met)
DSAC	Deep Space Atomic Clock (NASA)
DSB	double sideband
DSC	digital selective calling (GMDSS) dynamically supported craft
DSCOV R	Deep Space Climate Observatory (NOAA satellite, Jul 16)
DSI	detailed spectrum investigation
DSN	Deep Space Network
DSP	digital signal process(ing)(or)
DSRC	dedicated short-range communication (system)
DSRR	Digital Short-Range Radio <i>Direct connection between hand-portables over short distances. Typically use 880-890 and 933-935 MHz.</i>
DSSS	direct sequence spread spectrum (modulation)
DST	daylight saving time
Dstl	Defence Science and Technology Laboratory (UK - ex-DERA) <i>Formed on 1 Apr 01 as the defence arm of what was DERA.</i>
DSTO	Defence Science and Technology Organisation (Australia)
DT	decision trees (statistics algorithm)
DT&E	Development Test and Evaluation
DTE	data terminal equipment
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) <i>Formed from DETR in Jun 01.</i>
DTM	digital terrain model
DTOA	difference in time of arrival (of events in 2 signals)
DTS	Digital Terrain System <i>Predictive GPWS for military ac.</i>
DU	dust (met)
DUA	dedicated user area (ATC)
duplex	use of separate radio channels for transmission and reception
DUT I	value of predicted difference between UTC and UT I
DVB	digital video broadcast(ing)
DVD	digital versatile disc <i>Initially stood for 'digital video disc'. Holds up to 17 Gigabytes.</i>
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)
EAB	Editorial Advisory Board (RIN Journal)
EADI	electronic attitude director indicator
EAEU	Euroasian Economic Union (6 nations)
EAN	European Aviation Network (WiFi for aviation - Inmarsat/Deutsche)
EASA	European Aviation Safety Agency (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 <i>Under EUROCONTROL's ATM2000 initiative.</i>
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 <i>66 member states in Europe and Mediterranean area plus 51 associate member states.</i>
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 <i>Hardware and software that can display ENC data.</i>
ECEF	earth-centred earth-fixed (coordinate system)
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 <i>EC air transport (ATM) safety project to ensure that the human element is adequately trained for technical innovations, especially the 'glass cockpit'.</i>
ECP	Engineering Change Proposal European Common Proposal (for WRC)
ECPINS	Electronic Chart Precise Integrated Navigation System (US)
ECS	electronic chart system
ECSA	European Community Shipowners' Association
ED	European Datum <i>Most commonly used is ED-50 (of 1950). This uses a non-geocentric geoid to express latitude & longitude within Europe.</i>
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
EFMS	electronic fuel management system (shipping)
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 <i>Space-based augmentation system for GPS, GLONASS.(& Galileo)</i>
EGPWS	Enhanced Ground Proximity Warning System
EGR	embedded GPS receiver
eGRC	Enterprise Governance Risk Compliance
EGS	European Geophysical Society (Katlenberg-Lindau, Germany)

	European GNSS 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 (eg vehicles)
ELNS	Enhanced Link Navigation System (US mil for GPS-denied environments)
ELT	emergency location transmitter <i>Transmitter fixed to aircraft which transmits on emergency frequencies on impact or immersion.</i>
ELT (DT)	emergency location transmitter for distress tracking (EU)
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 <i>Independent body formed December 1999 from the European GNSS Maritime Advisory Forum.</i>
EN	Européen Normalisation (European Standard)
ENAC	Italian CAA
ENAV	Ente Nazionale di Assistenza al Volo (Italian ATSP)
ENC	electronic navigational chart <i>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.</i>
ENCASIA	European Network of Safety Investigation Authorities (inc AAIB)
ENS	electronic navigation system (eg GNSS)
ENT	EGNOS Network Time
ENU	East-North-Up (system of defining coordinates)
ENVISAT	Environmental Satellite (ERS follow-on)

EO	Earth observation electro-optics
EOARD	European Office of the Aerospace Research and Development (US)
EOG	EGNOS Operators' Group <i>Alliance between ATS providers of France, Germany, Italy, Spain and UK which are contributing to the EGNOS project.</i>
EOIG	EGNOS Operator and Infrastructure Group <i>Consortium of EU aviation administrations.</i>
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) <i>Could give accuracy of <100 m.</i>
EOW	end-of-week <i>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.</i>
EP	estimated position (most probable position) <i>Most probable position obtained by adding to the last fix course (track) and speed, considering all estimated influence. (After ISO)</i>
	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)
EPSRC	Engineering and Physical Sciences Research Council (UK)
EPVS	electronic plotting video symbols (maritime)
EQM	electrical qualification model
Equator	primary great circle of the earth
ERA	Emergency Road Assistance (GLONASS facility) European Regions Airline Association
ERBL	electronic range and bearing line (radar)
ERC	en-route chart European Radiocommunications Committee
ERD	estimated range deviation
ERDM	equation restore difference method (eg for DGPS)

ERF	European Union Road Federation (part of IRF)
ERNP	European Radionavigation Plan
ERO	European Radiocommunications Office (of the ERC, Copenhagen) <i>Based in Copenhagen.</i>
EROPS	extended range operations (aircraft)
ERP	effective radiated power <i>The product of power and gain of a transmitting aerial in a particular direction.</i>
	electronic road pricing (a form of EFC)
ERRI	European Rail Research Institute (based in Utrecht, NL)
ERRV	Emergency Response and Rescue Vessel
ERRVA	Emergency Response and Rescue Vessel Association <i>Was the SSOA until May 2000.</i>
ERS	En Route Supplement (for aircrew) European Remote Sensing satellite
ERTICO	Euro Road Transport Telematics Implementation Coord Organisation <i>Coordinating body based in Brussels. Custodian of the GATS Forum.</i>
ERTMS	European Rail Traffic Management System (EU) <i>ETCS + GSM-R + ETML + HEROE.</i>
ES	environmental surveillance
ESA	electronic sub-assembly European Space Agency
ESARR	EUROCONTROL Safety Regulation Requirement
ESCAPE	European Safety Critical Applications Positioning Engine (GSA)
ESD	electro-static discharge
ESGN	electrically-suspended gyro navigator
ESNP	European Satellite Navigation Programme (ETG)
ESOC	European Space Operations Centre (Darmstadt, Germany)
ESP	extended service programme (eg for older aircraft)
ESPO	European Sea Ports Organisation
ESSP	European Satellite Services Provider (run EGNOS, based Toulouse)
ESTB	EGNOS System Test Bed
ESV	earth station (located on a vessel (for maritime comms))
ETA	estimated time of arrival
ETACS	Extended Total Access Communication System (cellphone standard)
ETC	electronic toll collection (a form of EFC)
ETCS	European Train Control System (part of ERTMS) <i>Internationally Interoperable signalling and safety system.</i>
ETD	estimated time of departure
ETE	estimated time en route
ETG	European Tripartite Group <i>A cooperation between EC, ESA and EUROCONTROL to develop EGNOS and perform preliminary work on GNSS-2.</i>

ETML	European Traffic Management Layer (part of ERTMS)
ETOPS	extended-range twin-engine operations
ETRF	European Terrestrial Reference Frame <i>Almost identical to WGS-84, but accommodates European continental drift.</i>
ETRO	estimated time to return of operations (eg of GPS satellite)
ETS	European Telecommunications Standard
ETSI	European Telecommunications Standards Institute
EU	European Union
EU-MRV	EU - Monitoring, Reporting, Verification
EUFRANET	European Freight Railway Network (EU)
EUGIN	European Group of Institutes of Navigation <i>Institutes (2001): Austria, France, Germany, Italy, Netherlands, Nordic, Spain, Switzerland, UK.</i>
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EUR	European Region (of ICAO)
EUREF	European Reference Frame (eg ED-50)
EUREKA	Coordinated EU R&D programme for collaboration between industries
EUROBALISE	<i>Use of magnetic transponders (balises) for comms between track and train. Part of ETCS.</i>
EUROCAE	European Organisation for Civil Aviation Electronics
EUROCONTROL	European Organisation for the Safety of Air Navigation <i>41 member states in 2018. HQ Brussels, UACC Maastricht, Experimental Centre Brétigny-sur-Orge, Inst of Air Navigation Services, Luxembourg.</i>
Eurofix	<i>Datalink system whereby GNSS differential and integrity data was transmitted by LORAN-C and Chayka.</i>
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 <i>Linked to Intercept Project.</i>
EUORADIO	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 <i>Development of ROMANSE and SCOPE.</i>
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 <i>Final stage of WAAS, capable of supporting navigation and CAT I precision approach.</i>
EWAN	EGNOS Wide Area Network
EWS	Emergency Warning Service (could become a Galileo feature)

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) Fleet 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 <i>Body for verification of aeronautical record attempts and sporting activities.</i>
failure	<i>The unintended termination of the ability of a system, or part of a system, to perform its required function.</i>
failure rate	<i>The average number of failures of a system, or part of a system, per unit time.</i>
FANG	Flight Management System Air Traffic Management Next Generation
FANS	Future Air Navigation System (ICAO)
FANS-I/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	<i>Facilitating Smart Card Technology for Electronic Ticketing & Seamless Travel</i>
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)
FCEV	fuel cell electric vehicle
FCL	flight crew licensing
FCOM	flight crew operations manual
FCS	Federation of Communications Services (UK)
FCS-MPC	finite control set model predictive control (eg for autonomous vehs)
Fcst	forecast
FD	flight director

FDA	flight data analysis (FDR data to monitor quality of operations)
FDD	frequency division duplex (eg wireless telecom network)
FDE	fault detection and exclusion
FDI	fault/failure detection and isolation
FDMA	frequency division multiple access
FDPS	flight data processing system
FDR	flight data recorder
FEC	forward error correction
FEI	Federation of Electronics Industries (UK)
FEM	front-end module
FERNS	Far East RadioNavigation System (Loran-C and Chayka system)
FET	field effect transistor
FEW	few clouds (1-2 oktas)
FFL	fixed and flashing light
FFSK	fast frequency-shift keying
FFT	Fast Fourier Transform
FG	fog (met)
FGDC	Federal Geographic Data Committee (US)
FGMU	Frequency Generation and Modulation Unit (Galileo)
FGUU	frequency generator and upconverter unit (eg in Galileo satellite)
FHWA	Federal Highway Administration (US)
FIC	Flight Information Centre
FID	Field Identifying Number (for farming, created in UK in 1995)
FIG	Fédération Internationale des Géomètres <i>International Federation of Surveyors.</i>
FIR	Flight Information Region
Firewire	Computer connection at up to 400 Mbps (IEEE-1394)
FIS	Field Identification System (of farming maps) Flight Information Service
FISO	Flight Information Service Officer
fix	<i>A position established by processing information from a number of navigation observations. Determined without reference to any other former position.</i>
fix interval	<i>Maximum time between fixes.</i>
fix rate	<i>The number of fixes per unit time.</i>
FL	flight level <i>Altitude expressed in hundreds of ft, with ISA pressure setting of 1013.2mb set on altimeter.</i>
FLAS	Flight Level Allocation Scheme
FLIP	Flight Information Publication
FLIR	forward-looking infrared
FLL	frequency-locked loop

FLP	fused location provider (geofencing)
FLS	Forward Link Service (Galileo SAR service)
flt	flight
FM	flight model
	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
	flight management system
FNPT	flight and navigation procedure trainer
FNS	flight navigation system
FOC	flag of convenience
	Full Operational Capability
FOG	fibre-optic gyro
FOGM	first-order Gauss–Markov (statistical process)
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) <i>Provision of processes and tools to support GSA activities related to the definition of new Galileo PRS use cases.</i>
FREER	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
FRUIT	false 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
FSRU	floating storage regasification unit
FSS	fixed satellite services
	frequency-selective surface (for rf selection in nav/com systems)
FST	fuzzy set theory
FSU	floating LNG gas storage unit
FTA	fault tree analysis
	Federal Transit Administration (US)
FTD	flight training device
FTE	flight technical error
FTP	File Transfer Protocol (Internet)
FU	smoke (met)
FVEY	'Five Eyes' alliance of Australia, Canada, NZ, UK, US for intelligence gathering.
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 Spatial Temporal Anti-jam Receiver
G/S	groundspeed
GA	general aviation <i>Executive, company, private and flying club aircraft. Gliders, sport aviation, airships/balloons & aerial work.</i>
	ground antenna
GAAC	General Aviation Awareness Council (UK)
GaAs	gallium arsenide
GADSS	Global Aeronautical Distress & Safety System (ICAO)
GAFLEX	Galileo Flight Experiment (Germany-Russia industrial team) <i>Trial of Galileo signal structure on a GLONASS-M in late 2002.</i>
GAGAN	GPS Aided GEO Augmented Navigation (Indian SBAS)
GAGE	GPS at Geostationary Transfer Orbit Experiment <i>NASA/GPS JPO/DERA project using UK STRV (2000).</i>
GAINS	General Aviation Improved Navigation and Surveillance (SESAR proj)
GAJT	GPS anti-Jam technology
Gal	unit of acceleration of 1 cm/s^2 used in gravimetry (also mGal/ μ Gal)
GALA	GALileo overall Architecture definition (EC contract ~2000)
GALILEAN	Galileo Applications Network <i>EU-funded thematic network on GNSS applications.</i>
Galileo	European GNSS <i>Proposed on 10 Feb 99 as a PPP with industry contributing up to half of €3 billion cost over 10 years.</i>

GalileoSat	ESA definition study contract for Galileo (~2000)
GAMA	General Aviation Manufacturers Association (US)
GAMTA	General Aviation Manufacturers and Traders Association (UK)
GaN	gallium nitride (semiconductors for radar, RF & microwaves)
GAN	global area network (the ultimate wide area network)
GAO	General Accounting Office (US)
GAPAN	Guild of Air Pilots and Air Navigators <i>In 2014 became the Honourable Company of Air Pilots incorporating Air Navigators.</i>
GAPS	GPS Analysis and Positioning Software (University of New Brunswick)
GAS	Government Access Service (of Galileo)
GASCo	General Aviation Safety Council (UK)
GASIL	General Aviation Safety Information Leaflet (CAA)
GAST	Galileo Architecture Support Team (16 experts Dec 99 - Apr 01)
GAT	general air traffic
GATCO	Guild of Air Traffic Control Officers (UK)
GATM	Global Air Traffic Management (USAF programme)
GATS	Global Automotive Telematics Standard <i>GATS Forum created an open standard for transferring traffic info, emergency call, breakdown, dynamic navigation and general info using GPS and GSM.</i>
GAUL	Galileo Assist Using eLoran
GAUSS	Global AUgmentation for Satellite Systems <i>Concept of integrated navigation using core satellite-based and augmentation systems.</i>
Gb	gigabyte (= 1,024 megabytes)
GB	ground-based gyro bearing (angular distance from GN to the object)
GBAS	Ground-Based Augmentation System
GBAS-B	Ground-Based Augmentation System - Broadcast
GC	great circle (orthodrome) <i>The intersection of a sphere on the earth and a plane through its centre.</i> gyro course <i>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 (000°).</i>
GCA	ground-controlled approach
GCS	Ground Control Segment/System (Galileo)
GDF	Geographic Data File <i>The European standard used to describe and transfer road networks and road-related data for the mapping industry.</i>
GDOP	geometric dilution of precision <i>The factor by which the accuracy of a 3-D fix and time are degraded by geometrical considerations.</i>
GE	gyro error correction <i>Correction of gyro heading error (inc speed error) of a gyro compass. Angle between TN and GN, from TN: E (+) or W (-).</i>

GEBCO	General Bathymetric Chart of the Ocean (IHO project)
GEC	groundtrack equatorial crossing <i>Equatorial angle from the prime meridian to the location that a groundtrack intersects the equator when crossing from the southern to northern hemisphere.</i>
GEMINUS	Galileo European Multimodal Integrated Navigation User System <i>EC study to define Galileo services. Nov 99 - Dec 00.</i>
GENESIS	Galileo European Network of Experts to Support the Eur commISSION <i>Network to support EC in Galileo matters. Nov 99 - Nov 03.</i>
GEO	geosynchronous equatorial orbit <i>Satellite height of ~35,786 km in equatorial plane.</i>
Geocentric lat	<i>Angle at the centre of of the reference ellipsoid between the celestial equator and the radius vector to a point on the ellipsoid.</i>
Geocentric lon	<i>Angle between the plane of the geocentric prime meridian and the plane of a point's geocentric meridian.</i>
Geodetic accuracy	<i>The accuracy of a position with respect to the geodetic coordinates of the earth (IMO).</i>
Geodetic datum	<i>A set of parameters specifying the reference coordinate system used for geodetic control in the calculation of coordinates of points on the earth (ISO).</i>
Geodetic lat	<i>Angular distance between the plane of the geodetic equator and the normal to a point on the earth ellipsoid.</i>
Geodetic lon	<i>Angular distance between the plane of the geodetic prime meridian and the plane of a point's geodetic meridian.</i>
Geographic accuracy	<i>The accuracy of a position with respect to the geographic coordinates of the earth (IMO).</i>
GERTS	Galileo Enhanced Robust Time Server
GES	ground earth station
GFLOPS	1 billion floating point operations per second
GH	gyro heading <i>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 (000°).</i>
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
ISIS	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
	grid ionospheric vertical error (eg in WAAS)
GLAN	geographic longitude of the ascending node <i>Equatorial angle from the prime meridian to the ascending node.</i>
GLAs	British & Irish General Lighthouse Authorities
GLF	General Lighthouse Fund
GLONASS	GLObal NAvigation Satellite System <i>Russian Globalnaya Navigatsionnaya Sputnikovaya Sistema</i>
GLONASS-M	Second generation GLONASS system
GLORIA	GNSS & Loran-C in Road & Rail Applications (EC)
GLS	GPS Landing System <i>Generic term with limits of 350ft cloudbase and 1 nautical mile vis.</i>
GLSSU	GPS/SBAS landing system unit (Air)
GMC	ground movement controller (ATC)
GMDSS	Global Maritime Distress & Safety System (see Sea Areas)
GMES	Global Monitoring for Environment and Security <i>Flagship EU space program, became 'Copernicus'.</i>
GML	Geography Markup Language
GMS	Ground Monitor Station (MSAS)
GMSK	gaussian minimum shift keying <i>Typically allows 8 kbps to be transmitted over a 12.5 kHz channel.</i>
GMSP	Global Multimission Service Platform (USA) <i>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.</i>
GMT	Greenwich Mean Time <i>May be regarded as the general equivalent of UT1.</i>
GMU	GPS-based monitoring unit <i>US system for checking aircraft navigation performance.</i>
GN	grid north <i>Northerly direction indicated by the gyro-compass 000° index.</i>
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
GNSSP	Global Navigation Satellite Systems Panel (ICAO)
GOCE	Gravity Filed and Steady State Ocean Circulation Explorer (ESA)

Goes	Geostationary Operational Environmental Satellite <i>Geos-M carries the SXL.</i>
GOV	GNSS-I Operational Validation (EUROCONTROL)
GP	general purpose glidepath
GP&C	global position & communication
GPIP	glidepath intercept point (of landing aircraft)
GPMS	GPS Performance Monitoring System (UK NATS)
GPRS	General Packet Radio Service (GSM-based protocol)
GPS	Global Positioning System (NAVSTAR) <i>Spec is 21 + 3 sats in 6 orbital planes at 55° inclination and 20,200 km altitude, giving 12 h orbits.</i>
GPS III	Next generation GPS
GPS Time	Time to which GPS signals are referred <i>A composite of all monitor and satellite system clocks, steered over a period to keep within 1 microsec of UTC, ignoring UTC leap seconds. Equalled UTC in Jan 80; in Jan 18 was ahead of UTC by 18 secs.</i>
GPS Week	Modulo 1,024 number of elapsed GPS weeks <i>Began 6 Jan 80 with first roll-over on 22 Aug 99.</i>
GPS-RO	GPS radio occultation (for weather forecasting)
GPS/GSM	Global Positioning System/Global System for Mobile Communication
GPtS	Global Positioning and Timing Service
GPU	graphics processing unit
GPWS	Ground Proximity Warning System
GPX	GPS eXchange format (for filing/exchanging GNSS routes in text/mapping)
GR	hail >5 mm (met)
GRACE	Generalised Rules for Advanced Constellation Evaluation Gravity Recovery and Climate Experiment (NASA)
GRADU	gradual (met reports)
GRALLE	Galileo-based Reliable Automatic and Low Latent Emergency warning service
GRAM	GPS receiver application module
GRAPE	GPS Routine for Attitude Parameter Estimation <i>Software package for processing GPS signals.</i>
GRAS	GPS Receiver for Atmospheric Sounding Ground-based Regional Augmentation System (eg Australia)
GRC	Galileo Reference Centre (in The Netherlands)
GRI	Group Repetition Interval (Loran-C) <i>Integer in range 4,000 to 9,999. Time interval between pulse groups in 10s of microseconds.</i>
GRICAS	<i>Galileo Search-And-Rescue Return-Link Implementation for a better Civil Aviation Safety system</i>
GRINGO	GPS RINEX Generator (IESSG)
GRM	GPS receiver module

gross error	Or 'outlier' is error other than random or systematic error. Often large and, by definition, unpredictable (After IMO).
GRT	gross registered tonnage
GS	glideslope
GSA	European Global Navigation Satellite Systems Agency (Prague)
GSC	GNSS Service Centre (run by GSA)
GSDI	Global Spatial Data Infrastructure
GSE	ground support equipment
GSM	Groupe Speciale Mobile or Global System for Mobile (communications) <i>Digital mobile phone structure also allowing 160-character alpha-numeric messages (SMS).</i>
GSM-R	GSM-Railway (part of ERTMS)
GSMC	Galileo Security Monitoring Centre (manages PRS - in Paris & Madrid)
GSO	geo-synchronous orbit
GSOp	Galileo Service Operator (Spaceopal GmbH)
GSSB	Galileo System Security Board
GSSF	Galileo System Simulation Facility (ESA)
GST	Galileo System Time (synched with UTC on 22 Aug 99)
GSTARS	Ground Safety Tracking and Reporting System (for airfields)
GSTB	Galileo System Test Bed
GT	gross tonnage ground track (intended path of ship's movement over ground)
GTO	geosynchronous transfer orbit
GTP	GPS translator processor (of TGRS)
GTR	Group Time Reference (Loran-C)
GTRF	Galileo Terrestrial Reference Frame (based on ITRF96)
GTS	Global Telecommunications System
GUI	graphical user interface
GUST	Galileo User Support Transport <i>EC project for Galileo receivers.</i>
GWGGTI	GalileoSat WG on the Galileo Time Interface
h	hecto (SI unit multiplier of 10^2)
H	henry (inductance in Wb/A)
H-band	NATO radar band 6-8 GHz = 5-3.75 cm
H-field	magnetic-field (eg of aerial)
H24	continuous round-the-clock operation
HA	high accuracy (eg service) Highways Agency (established by UK Government in 1994)
HAL	horizontal alert limit/level (eg for WAAS precision approach etc)
HAPS	high altitude pseudo-satellite (often helium-filled & semi-rigid)
HAT	height above terrain

HAV	hybrid air vehicle (part aircraft, part airship)
HBT	heterojunction bipolar transistor
HCMM	The Honourable Company of Master Mariners
HCS	heading control system
HD	head direction (used in animal navigation) high definition
HDC	Hydrographic Data Centre (UK)
HDG	heading (course) <i>Angle measured in horizontal plane from a reference direction, counted clockwise from 000° through 360°, written as a 3 digit number.</i>
HDLC	high-level data link control/communication
HDOP	horizontal dilution of precision <i>The factor by which a two-dimensional fix in a horizontal plane is degraded by geometrical considerations.</i>
HeliNet	Proposed netw'k of unmanned solar-powered stratospheric platforms <i>Project funded by EC Fifth Framework for environmental surveillance, broadband services and positioning.</i>
HEMS	Helicopter Emergency Medical Service
HEO	highly-elliptical orbit (typically 1,500-40,000 km)
HEROE	Harmonisation of European Rail Rules for Operating ERTMS (EU)
HEV	hybrid electric vehicle
HF	high frequency (3-30 MHz) (decametric waves)
HFDL	high frequency datalink
Hg	Refers to inches of mercury for atmospheric pressure <i>ISA 1013.2 mB or hPa = 29.92 ins Hg.</i>
HGS	head-up guidance system
HI	High Integrity (Galileo service)
HIAL	high intensity approach lighting
HIPS	Highly-Interactive Problem Solver (EUROCONTROL) <i>Software for real-time air traffic management.</i>
HIRL	high intensity runway lighting
HISL	high-intensity strobe light
HL	heading line (radar)
HLD	high level definition
HLG	High Level Group
HLS	helicopter landing site
HMAC	hydrogen maser atomic clock
HMD	helmet-mounted display
HMF	hypomagnetic field
HMI	hazardously misleading information human-machine interface
HMR	helicopter main route

HMU	health monitoring unit height-monitoring unit <i>Ground-based unit for very accurately checking on aircraft height.</i>
HNSE	horizontal navigation system error
HOB	Hydrographic Office Board (UK)
HoE	height of eye
HOTAS	hands on throttle and stick (ergonomic cockpit technology)
HOW	hand-over word
hPa	hectopascal <i>Supersedes the millibar. 1mB = 100 pascals = 1 hPa.</i>
HPA	high power amplifier
HPC	high-performance computing
HPEC	high-performance embedded comput(er/ing)
HPL	high-precision location (often GNSS augmentation using RTK) horizontal protection level
HPZ	helicopter protected zone
hr	hour
HSB	hue, saturation, brightness (system of specifying monitor colours)
HSC	high speed craft
HSI	horizontal situation indicator
HSS	high-speed stream (of solar wind)
HSSC	Hydrographic Services and Standards Committee (IHB)
HSSWS	high speed solar wind stream
HTML	HyperText Mark-up Language (for Web pages)
HTTP	HyperText Transfer Protocol
HTZ	helicopter traffic zone
HUD	head-up display
HUMS	health and usage monitoring systems (IoT)
HUNE	horizontal component of the user navigation error
HUNGAGI	Hungarian Association for Geo-information
HV	host vehicle
HW	high water
HZ	haze (met)
Hz	Hertz (cycles per second)
I-4	Inmarsat 4th generation GEO satellites <i>I-4 F1 143.5E, F2 63.5E, F3 98.4W.</i>
I-band	NATO radar band 8-10 GHz = 3.75-3 cm
I-Level	intermediate level
I-NMF	Integrity Network Management Facility (Galileo)
I²S	integrated information system

IA	intelligent awareness
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 <i>33 institutes & associated members. www.iainav.org</i>
IALA	International Association of Lighthouse Authorities <i>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.</i>
IAMF	International Aeronautical Monetary Fund (ICAO) <i>For implementation of CNS/ATM in poorer countries.</i>
IAN	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 <i>Based in Montreal. Founded in 1947 with 288 member airlines in 2018.</i>
IAU	International Astronomical Union
IBAN	Internet-Based Augmentation System (a WAAS using www)
IBC Code	International Bulk Carriers' Code <i>Includes equipment in ships carrying dangerous chemicals in bulk.</i>
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
ICE	internal combustion engine
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 <i>Based in Geneva. Sets standards for electrotechnical devices. IEC 61108-1 (1996-06) applies to GPS.</i>
IEE	Institute of Electrical Engineers (UK)
IEEE	Institute of Electrical and Electronic Engineers (US)
IERS	International Earth Rotation and Reference Systems Service <i>HQ Paris.</i>
IESSG	Institute of Engineering Surveying and Space Geodesy <i>At the University of Nottingham.</i>
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 <i>Includes equipment in ships carrying liquified gases in bulk.</i>
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
IGSO	inclined geosynchronous orbit <i>Satellite height of 36,000 km inclined to equatorial plane.</i>
IHB	International Hydrographic Bureau
IHO	International Hydrographic Organisation (Est 1921, 88 states 2018) <i>Established in 1921. 88 nations in 2018. Based Monaco.</i>
IHPT	Portugese Navy Hydrographic Institute
IIAR	instantaneous integer ambiguity resolution
IIM	Instituto Idrografico della Marina (Italian Hydrographic Office)
IIN	Italian Institue of Navigation
IISC	International Information Sub-Committee (of CGSIC)
IKD	in-kind delivery <i>Contribution to a project in-kind rather than by direct funding.</i>
ILA	International Loran Association
ILAMA	International Life-saving Appliances Manufacturers' Association
ILF	International Lifeboat Federation
ILO	International Labour Organisation (deals with marine crewing issues)
ILS	Instrument Landing System
IM	integrity monitoring
IMA	integrated modular avionics
IMarE	Institute of Marine Engineers
IMC	instrument meteorological conditions
IMCA	International Marine Contractors Association
IMEC	International Maritime Employers' Committee
IMERP	Implementation of the European Radionavigation Policy
IMMR	Integrated Multi-Mode Receiver (Honeywell)
IMO	International Maritime Organisation <i>A UN body formed in 1959 and based in London. 173 states.</i>
IMS	integrity monitoring station (eg Galileo)
IMSO	International Mobile Satellite Organisation <i>An intergovernmental body to oversee Inmarsat's delivery of its public service obligations, including GMDSS.</i>
IMT 2000	International Mobile Telecommunications for 2000 and beyond (ITU)
IMU	inertial measurement unit
INA	International Navigation Association
INE	Instituto de Navegacion de Espana
INITIATIVE	EU Project for electronic fee collection using GNSS
Inmarsat	INternational MARitime SATellite Organisation <i>Runs 13 comms satellites mainly, but not only, for shipping.</i>
INPHORMM	Info & Pub Helping the Objective of Reducing Motorised Mobility (EU)

INS	inertial navigation system integrated navigational system
InSAR	Interferometric Synthetic Aperture Radar
InSAR	Interferometric synthetic aperture radar (for ground vert movem't)
INTEG	EGNOS Integration into Galileo <i>EC study to analyse a seamless transition from EGNOS to Galileo.</i>
integrated navigation	<i>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).</i>
integrity	<i>The ability to provide users with warnings within a specified time when the system should not be used for navigation (IMO).</i>
integrity risk	<i>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}.</i>
INTELFRET	intelligent freight train
INTER	intermittent or fluctuating (met)
INTERCARGO	International Association of Dry Cargo Shipowners
Intercept	Intermodal Concepts in European Passenger Transport <i>EC DG TREN & DG XIII project.</i>
International NAVTEX	Co-ordinated broadcast and automatic reception on 518 kHz <i>'of marine safety information by means of narrow-band direct-printing telegraphy using the English language.'</i>
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	(Ipin) indoor positioning and indoor navigation

IPP	Ionospheric Pierce Point (for measuring ionospheric delay (eg GPS))
IPS	indoor positioning system
IPTS	International Port Traffic Signals
IPV	instrument approach with vertical guidance
IR	infrared Instrument Rating integrity risk
IRAC	Interdepartmental Radio Advisory Committee (US)
IRAC/SPS	IRAC Spectrum Planning Sub-committee (US)
IRAC/SSG	IRAC Space Systems Group (US)
IRF	International Road Federation
IRLOGI	Irish Organisation for Geographic Information
IRNSS	Indian Regional Navigation Satellite System
IRPCS	International Regulations for Preventing Collisions at Sea (1972) <i>Also known as COLREGs.</i>
IRS	inertial reference system
IRT	Independent Review Team (USAF)
IRU	inertial reference unit International Road Transport Union
IS	interface specification
IS-QZSS	Interface Specification (QZSS)
ISA	intelligent speed adaption International Standard Atmosphere <i>In basic terms sea-level pressure of 1013.2mb and temperature of +15°C, with temperature lapse rate of -1.98°C per 1,000ft to 36,090ft.</i>
ISAF	International Sailing Federation
ISATA	International Symposium on Automotive Technology & Automation
ISBAS	Intermittent Small Baseline Subset (used in InSAR)
ISBS	Intermittent Small Baseline Subset (InSAR technique)
ISDN	Integrated Services Digital Network
ISF	International Shipping Federation (London-based)
ISIS	integrated ship's information system
ISL	inter-satellite link
ISM	International Safety Management <i>Code for safe operation of ships and for pollution prevention.</i>
ISMASS	Ice Sheet Mass Balance and Sea Level
ISO	International Organisation for Standardisation
ISOL	isolated (met)
ISOTOPE	Improved Structure & Organisation for Trans Ops of Pax in Europe
ISP	Internet service provider
ISPRS	International Society of Photogrammetry and Remote Sensing

ISRO	Indian Space Research Organisation (Dept of Space)
IST	Information Society Technologies (EC)
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 inf 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) <i>ITU-R is Radiocommunication Sector (ex-CCIR) and ITU-T is Telephony and Telegraphy (ex-CCITT). ITU is a UN Agency.</i>
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 <i>Capable of supporting navigation and CAT I precision approach but lacking internal redundancy and guaranteed availability.</i>
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) <i>Represent aviation safety regulatory authorities of Euro countries.</i>
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 <i>Comprising chairmen & chief executives of the GLAs.</i>
JD	Julian Day (count of days from midday on 1 January 4713 BC)
JGPSC	Japan GPS Council
JIN	Japan Institute of Navigation
JISDM	Joint International Symposium on Deformation Monitoring
JMC	Joint Maritime Commission (of ILO)
JMSA	Japan Maritime Safety Agency
JPALS	Joint Precision Approach and Landing System
JPEG	Joint Photographic Expert Group <i>Standard for digital image compression.</i>
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 <i>Run by the GLAs with secretariat at TH.</i>
JWG	Joint Working Group (ICAO and IMO)
k	kilo (SI unit multiplier of 10^3)
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
K_a-band	Old radar band 27-40 GHz (ITU assigned 33.4-36.0 GHz) ~ 1 cm
Kalman Filtering	<i>Mathematical method of combining data to give optimal position (velocity etc) solutions whilst on the move.</i>
kbit	kilobit <i>1,024 bits or 128 8-bit bytes.</i>
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) <i>1 kn = 1 NM/h = 0.514444 m/s.</i>
KNAG	Royal Dutch Geographical Society
KPS	Korean Positioning System (FOC 2034?)

kt	knot
KTA	key technical advisor
K_u-band	Old radar band 12-18 GHz ~ 2 cm <i>(ITU assigned 13.4-14.0 & 15.7-17.7 GHz)</i>
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) <i>Frequencies are 1,575.42 MHz (L1), 1,227.60 MHz (L2) & 1,176.45 MHz (L5).</i>
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
LAMP	London Airspace Management Programme (2016)
LAN	local area network longitude of the ascending node <i>The point that an orbit intercepts the equator when crossing from the southern to northern hemisphere.</i>
Lanby	Large Automatic Navigational Buoy
LARS	Lower Airspace Radar Service
LAS	lower airspace service
laser	light amplification by stimulated emission of radiation
Lat	(LAT) (φ) latitude (angular distance from the equator, labelled N/S) <i>May be geographic, geodetic, geocentric or astronomical.</i>
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)
LCC	low cost carrier (air)
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	<i>Angular difference between course through water and course to steer.</i>
Leg	intended ground track between 2 waypoints
LEO	low earth orbit <i>Satellite orbit of up to 2,000 km.</i>
LEOP	Launch and Early Orbit Phase (eg Galileo)
LEOSAR	Low-altitude Earth Orbit Search and Rescue (satellites)
LEP	linear error probable <i>Half of the interval containing half of the results of the trials in a series of one-dimensional measurements.</i>
LES	land earth station (same as CES operationally)
LETTEL	lateral emitting 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
LIBERAIL	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)
lm	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 <i>The arc of the celestial equator between the lower branch of the local celestial meridian and the hour circle of the true sun.</i>
LNA	low-noise amplifier
LNAV	lateral navigation <i>Initial WAAS service for non-precision approach down to 400-500ft.</i>
LNAV/VNAV	lateral and vertical navigation <i>An initial WAAS service for precision approach down to 350ft and INM. Also called non-precision approach with vertical guidance.</i>
LNB	low-noise block (antenna component)

LNG	liquefied natural gas
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 <i>Angle at pole between prime meridian and meridian of a point, labelled E or W. May be geographic, geodetic, geocentric or astronomical.</i>
LOP	line of position (also PL)
LOR	Long-term Operations & Replenishment (phase of Glileo)
Loran	LONg RANge Navigation <i>Loran-C is a terrestrial pulsed hyperbolic system in band 90-110kHz.</i>
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/m^2)

μ	Earth's gravitational constant (typically $3,99 \times 10^{14} \text{m}^3/\text{s}^2$) micro (SI unit multiplier of 10^{-6})
m	metre milli (SI unit multiplier of 10^{-3})
M-ADS	Modified Automatic Dependent Surveillance
M-band	NATO radar band $> 60 \text{ GHz} = < 5 \text{ mm}$
M-Code	Military Code for GPS
m/s	metres per second
M	Mach magnetic mega (SI unit multiplier of 10^6) nautical mile on charts under IHO Spec of 1982 <i>Approx 1,852 m or 6,080 ft.</i>
M&S	models and simulation
M&T	measurement & testing
M2M	machine-to-machine (comms)
Mach No	(M) Ratio of TAS to local speed of sound
mag	magnetic magnitude (of star)
MagR	A protein with magnetic properties (animal navigation) <i>Forms rod-like clumps with light-sensitive cryptochrome proteins.</i>
MAIB	Marine Accident Investigation Branch (UK)
MAP	missed approach point
MAPT	missed-approach point
MARAD	Maritime Administration (US)
MARE	(MERR) maximum allowable range error
MAREP	Mariner Reporting System
MARIS	Maritime Information Society (EC DG III - formed May 97)
MARPOL	Int Convention for the Prevention of Pollution from Ships (1973)
MARSOL	MARitime Safety of Life Working Group (ESA)
MARSOURCE	A fisheries & marine environment info network (MARIS)
MARTRANS	Info network on movement of cargo vessels (MARIS)
MASPS	Minimum Aviation System Performance Standards <i>ICAO standards required of aircraft wishing to use areas of reduced separation standards.</i>
MASRWG	Maritime Autonomous Systems Regulation Working Group (IMO)
MasterMap	OS definitive map database of UK
MATLAB	matrix laboratory (programming language developed by MathWorks)
MATO	military air traffic operations
MATS	Manual of Air Traffic Services (UK)

MATZ	Military Air Traffic Zone <i>Usually 5 n miles radius up to 3,000 ft with stubs to 10 n miles aligned with main runway.</i>
Mayday	“m’aidez” - help me. International radio distress call
MB	magnetic bearing (angular distance from MN to the object)
Mb	megabyte (= 1,048,576 bytes)
mB	millibar <i>Superseded by the hectopascal (hPa). 1 mB = 100 pascals = 1 hPa.</i>
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 <i>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°).</i>
	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)
MCTOM	maximum certificated take-off mass (air)
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 <i>The minimum size of the gross error in an observation that may be detected with given probability.</i>
MDCE	Maritime Data Centre of Europe (independent, based in Copenhagen)
MDE	marginally detectable error <i>The maximum position offset caused by a MDB in a LOP or observation.</i>
	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)
MENA	Middle East and North Africa
MEO	medium earth orbit <i>Satellite orbits of 5,000-20,000 km altitude.</i>
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	$(\Delta\Phi)$ Difference of the meridional parts of any 2 given parallels
Merparts	(Φ) Meridional parts <i>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.</i>
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 <i>For maritime use known as SES. For land use known as LES or LMES.</i>
MESA	maximum entropy spectral analysis Mobility for Emergency & Safety <i>Single platform for apps related to TETRA but on 3.8-4.9 GHz.</i>
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 <i>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°).</i>
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)
MIC	monolithic integrated circuit mounain instructor certificate
Michibiki	Local name for Japan's QZSS
microwaves	radio waves > 1 GHz
MID	maritime identification digits
MIDAS	Motorway Incident Detection and Signalling System Multi-Instrument Data Analysis System (math model for ionos delay)
MIDS	Multifunction Information Distribution System (data link)
MIME	Multipurpose Internet Mail Extension
MIN	Marine Information Note (UK)
min	minimum minute
MIO	marine information object (time-variable object in ECDIS)
MIPS	million instructions per second
MIRA	Motor Industry Research Association
MIS	management information system Marine Information System (ECDIS may contribute to it)
MJD	Modified Julian Day (started midnight 17 November 1858) <i>Equals JD - 2,400,000.5.</i>
mkr	marker/marker beacon (on 75 MHz for ILS)
ML	machine learning (statistics algorithm)
MLA	Mountain Leader Award
MLaaS	machine learning as a service
MLC	Mountain Leader Certificate
MLE	maximum likelihood estimator
MLS	Microwave Landing System
MLU	mid-life update
MLV	medium launch vehicle
MLWN	mean low water neaps
MLWS	mean low water springs
MmaxCT	maximum corrective maintenance time
MMI	man-machine interface (nowadays replaced by 'HMI')

MMLS	Mobile Microwave Landing System
MMR	multi-mode receiver
MMSE	minimum mean square error
MMSI	Maritime Mobile Service Identity Code (GMDSS DSC)
MMW	millimeter-wave (eg radar)
MN	magnetic north <i>Northerly direction of the horizontal component of the earth's magnetic field.</i>
MNE	Marine Navigation Equipment (Sub-Group of UK SON Ctee)
MNM	mathematical navigation monitor <i>Provides position estimate with associated errors by data fusion of dissimilar sensors.</i>
MNP	Master Navigation Plan (US)
MOA	memorandum of agreement
MOB	man overboard
MoBIC	Mobility of Blind and Elderly People Interacting with Computers
MOD	Ministry of Defence
Mode	SSR mode of operation <i>Mode A - normal ATC codes, Mode C - encoded flight levels, Mode S - selective interrogation and downlinking of aircraft parameters (DAPs).</i>
modem	modulator-demodulator
mogas	car fuel
MOIE	Mission-Oriented Investigation and Experimentation (FAA projects)
MOMENTUM	Mobility Management for the Urban Environmnt (EU)
MoODS	MoBIC Outdoor System
MOPS	Minimum Operational Performance Standards <i>A set of standards defining minimum performance, functions and features for RNAV and, optionally, VNAV equipment.</i>
MORANE	Mobile Radio for Railway Networks in Europe (EU RTD project)
MOSAIC	Mobility Strategy Applications in the Community (EU)
MOST	Media Orientated System Transport (protocol for mobile internet)
MOTS	modified/military off-the-shelf (equipment)
MOU	(MoU) memorandum of understanding
MOVA	Microprocessor Optimised Vehicle Actuated (traffic signal prog)
MP	meridian passage
MPA	maritime patrol aircraft
MPCU	Marine Pollution Control Unit (UK)
MPNTP	Master Positioning, Navigation and Timing Plan (US)
MPS	Mobile Positioning Systems (=VPS)(generic term used by DTLR)
MPT	European radio regulation prefix to be replaced by ETS
MQM	measurement quality monitoring
MRAC	Marine Radio Advisory Committee (MCA)
MRCC	Maritime Rescue Co-ordination Centre

	multiple receiver consistency check
MRO	maintenance, repair and overhaul
MRR	Mission Readiness Review (eg of space launch)
MRS	Monitor and Ranging Station (MSAS)
MRSA	mandatory radar service area (military ATC)
MRSC	Maritime Rescue Secondary (Sub) Centre
MRT	mountain rescue team
ms	millisecond (one-thousandth of a second)
MS	Monitor Station (GPS)
MSA	Marine Safety Agency <i>Was part of DETR, replaced in Apr 98 by MCA.</i>
	minimum safe altitude
MSAs	Merchant Shipping Acts (in UK empower the GLAs)
MSAS	Multi-transport Satellite-based Augmentation System <i>Japanese WAAS.</i>
MSB	most significant bit
MSC	Maritime Safety Committee (IMO)
MSD	minimum separation distance
MSDP	multi-sensor data processor
MSI	Maritime Safety Information (IMO)
MSIP	Maritime Safety Information Provider (GMDSS)
msl	mean sea level
MSS	mean sea surface
	mobile satellite service
MSU	mobile satcom unit
MTB	Mediterranean Test Bed (part of STENAV for Galileo)
MTBCF	mean time between critical failures
MTBDE	mean time between downing events
MTBF	mean time between failures <i>The average time between 2 successive failures of a system or part of.</i>
MTBM	mean time between maintenance
MTIE	maximum time interval error
MTOW	maximum take-off weight
MTSAT	Multi-function Transport Satellite <i>Japanese (JCAB) geostationary satellite carrying met, comms, nav overlay and ATC surveillance functions.</i>
MTT	minimum time track
MTTR	mean time to repair
multistack	simultaneous use of 2 or more datalinks
MUX	multiplexer
MVUE	manpack/vehicular user equipment

	minimum variance unbiased estimator
MWS	multimedia wireless systems <i>Telecommunications and broadcasting via the same radio network.</i>
n	nano (SI unit multiplier of 10^{-9})
N	newton (force in m kg s^{-2})
n mile	nautical mile (sometimes NM, M on charts) <i>Approx 1,852 m or 6,080 ft.</i>
N/I	non-instrument (of aircraft approach)
Na	nadir (point on the celestial sphere vertically below the observer)
NAD	North American Datum
NADC	National Antarctic Data Centre
NADICS	NAtional Driver Information and Control System (Scottish Office)
NAGU	Notice Advisory to Galileo Users Notice Advisory to GLONASS Users
NAICS	North American Industry Classification System
NANU	Notice Advisory to Navstar Users
NAO	North Atlantic Oscillation
NAQU	Notice Advisory to QZSS Users
NARSIA	North American Remote Sensing Industries Association
NAS	National Airspace System (US) Naval Air Station (US)
NASA	National Aeronautics and Space Administration (US)
NASCTN	National Advanced Spectrum and Communications Test Network (US)
NASDA	National Space Development Agency of Japan
NAT SPG	North Atlantic Systems Planning Group
NATCA	National Air Traffic Controllers Association (US)
NATMAC	National Air Traffic Management Advisory Committee (UK)
NATO	North Atlantic Treaty Organisation (29 states in 2018)
NATS	National Air Traffic Services Ltd (UK ATSP)
NAV	IMO Sub-Committee on Safety of Navigation nano aerial vehicle (typically less than 7.5 cm)
NAV-msg	Navigation Message <i>A 37,500-bit data message included in the GPS signal, sent at 50 bps. Includes satellite ephemeris, clock data, almanac etc.</i>
NAVAREA	Sea area for GMDSS radio navigation warnings
NAVCEN	Navigation Centre (USCG)
NAVD	North American Vertical Datum
NAVIC	NAVigation with Indian Constellation (IRNSS)
navigation	<i>The process of planning, recording and controlling the movement of a craft from one place to another (IMO).</i>
NAVISP	Navigation Innovation and Support Programme (ESA)

NAVSIP	Navigation Innovation and Support Programme (ESA initiative)
NAVSOL	navigation solution
NAVSTAR	NAVigation Satellites with Timing And Ranging (GPS)
NAVTEX	Navigational Information Telex Services
NAVWAR	NAVigation WARfare (US military GPS programme)
NAWC	Naval Air Warfare Centre (USN - Patuxent River)
NB-IoT	Narrowband Internet of Things
NBDP	narrow band direct printing (eg GMDSS and NAVTEX)
NCAA	Norwegian Civil Aviation Administration
NCES	NH Code Evasion and Stripping method
NCF	Navigation Control Facility (Galileo)
NCI	National Coastwatch Institution (UK)
NCS	Network Co-ordinating Station (Inmarsat) network communication system
NCSR	Navigation, Communications and Search and Rescue (IMO sub-ctee)
NDB	non-directional beacon
NDC	National Document Centre (Greek AGI)
NDGPS	Nationwide DGPS (US)
NDPB	non-departmental public body (UK)
NEAN	North European ADS-B Network (EU/EUROCONTROL)
NEAP	North-European ADS-B Application Project (EU)
NELS	Northwest European Loran-C System (now extinct)
NEOSIT	navigation/electro-optic sensor integration
NERC	Natural Environment Research Council (UK) New En Route Centre (Swanwick, UK)
NES	Navigation Ground Earth Station (MSAS)
NESTBed	North European Satellite Test Bed (experimental SBAS)
NextGen	Next Generation (FAA future air traffic system)
NFC	near field communication
NGBPS	Non-GPS–Based Positioning System (a UHARS)
NGDC	National Geophysical Data Centre
NGDF	National Geospacial Data Framework (UK)
NGPS	Natural GPS (ie unaided)
NGS	National Geodetic Survey (US)
NGVD	National Geodetic Vertical Datum (US)
NH	Neumann-Hoffman code (eg in BeiDou)
NHTSA	National Highway Traffic Safety Administration (US)
NI	The Nautical Institute
NICER	Neutron-star Interior Composition Explorer (NASA)
NIKITA	Netherlands TMC service

NIMA	National Imagery and Mapping Agency (US)(ex-DMA)
NIMSA	National Interest Mapping Services Agreement (UK Gov and OS)
NIN	Netherlands Institute of Navigation
NIS	Navigation Information Service/System
NIST	National Institute of Standards and Technology (US)
nit	unit of luminance (equivalent to 1 candela per square metre)
NKTF	Norwegian Ass for Cartography, Geodesy, Hydro' & Photogrammetry
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) <i>Approx 1,852 m or 6,080 ft.</i>
	Notice to Mariners
NMA	Norwegian Mapping Authority
NMEA	National Marine Electronics Association (US) <i>Has set standard message formats for transferring GPS data.</i>
NMRI	National Mayday Readiness Initiative (US)
NN	neural network (statistics algorithm)
NNAS	National Navigation Award Scheme (UK)
NNF	Nordisk Navigasjonsforum <i>Nordic Institute of Navigation. Åland Islands, Denmark, Faeroe Islands, Finland, Greenland, Iceland, Norway.</i>
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	<i>A standard instrument approach procedure in which only horizontal guidance is given.</i>
NOSC	Naval Ocean Systems Centre (US)
NOSIG	no significant change (met)
NOTAM	Notice to Airmen
NP	Naval Publication
NPA	non-precision approach <i>A standard instrument approach in which no electronic glidepath/slope is provided.</i>
NPEF	N'nal Space-Based Positioning, Navigation & Timing Sys' Engineering Forum US
NPI	National Positioning Infrastructure (eg Australian project)
NPL	National Physical Laboratory (UK)
NPPF	National Planning Policy Framework (eg UK airspace planning)

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
ns	nanosecond (1/1,000,000,000 of a second)
NS	Naval Station (US)
Ns	nimbostratus cloud
NSA	National Security Agency (US)
NSAP	Network Service Access Point (ATN)
NSC	no significant cloud non-standard C/A code (GPS)
NSCC	Navigation System Control Centre (Galileo)
NSE	navigation system error
NSG	National Street Gazetteer (OS)
NSGU	Navigation Signal Generation Unit (Galileo)
NSO	Netherlands Space Office (the Hague)
NSP	navigation signal processor
NSRS	National Spatial Reference System (US)
NSTB	National Satellite Test Bed (WAAS)
NSW	no significant weather
NTD	National Topographic Database (UK)
NTDS	Navy Tactical Data System (US)
NTE	not-to-exceed
NTF	National Transfer Format (OS format to transfer digital mapping)
NTIA	National Telecommunications and Information Administration (US)
NTO	nitrogen tetroxide (storable rocket propellant)
NTS	National Travel Survey (UK DTLR) Navigation Technology Satellite
NTSB	National Transportation Safety Board (US)
NTSC	National Television Standard Committee (US/Japan TV standard) National Transportation Systems Center (US)
NUP	NEAN Update Programme (EUROCONTROL) north pole up (of a magnet)
NVC	National Vocational Qualification (UK)
NVEE	night vision enhancement equipment

NVG	night vision goggles
v	Aries (vernal equinox) <i>Point of intersection of the ecliptic and the celestial equator, occupied by the sun as it changes from south to north declination.</i>
°	degree (unit of angle = $\square/180$ rad)
O&M	operations and maintenance
O&S	operations and support
OAB	operational advisory broadcast
OAC	Oceanic Area Control 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 INdustries (fm 2000) <i>45 companies to provide tech & market expertise. Led by FDC France.</i>
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 <i>Euro body to co-ord national decisions on maritime environment issues.</i>
OSPF	Orbitography and Synchronisation Processing Facility (Galileo)
OSS	Orbitography and Synchronisation Station (Galileo)
OSTN97	Ordnance Survey National Grid Transformation 1997 (UK) <i>Used to convert from ETRS89 to OSGB36 and ODN.</i>
OT&E	Operational Test and Evaluation
OTA	operational technical accuracy <i>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.</i> over-the-air
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	Osterreichischer Verein für Navigation <i>Austrian Institute of Navigation</i>
OWC	obstacle warning and cueing
P	pico (SI unit multiplier of 10^{-12})
P	positioning
P-CDM	Port Collaborative Decision Making (port traffic management tool)
P-Code	(or P(Y)) Precision (or Pseudorandom) Code <i>PRN code tx by GPS satellites. 2.35×10^{14} chips sent at 10.23 Mbps.</i>
P-RNAV	precision area navigation
P2P	peer-to-peer (comms)
P3I	pre-planned product improvement
P4	pseudorange and phase post-processor
Pa	pascal (pressure in N/m^2)
PA	position approximate precision approach
PaaS	Platform as a Service (eg in IoT)
PACF	Performance Assessment & System Checkout Facility (EGNOS) <i>Located at Toulouse.</i>
PACT	Pilot Action for Combined Transport (EU) <i>Prog for finance support to innovative combined transport schemes.</i>
PAD	packet assembly/disassembly device predicted area of danger (ARPA etc)
PAF	Postal Address File (UK Royal Mail)
PAL	Phase Alternating Line (European TV standard) <i>Uses 25Hz frame rate of 720x576 pixels.</i>
Pan	international radio call signalling ‘urgency’
PANDORA	Prototyping a Navigation Database of Road-Network Attributes <i>EU, led by UK.</i>
PAPI	precision approach path indicator
PAR	precision approach radar
Parallel of altitude	<i>Circle on the celestial sphere parallel to the celestial horizon, connecting all points of equal altitude. Also called circle of equal altitudes.</i>
Parallel of latitude	<i>Circle on the earth’s surface parallel to the equator</i>
PARC	Performance-based operations Aviation Rulemaking Committee (US)
Paris MoU	Paris Memorandum of Understanding <i>27 participating maritime administrations and covers the waters of the European coastal States and the North Atlantic basin from North America to Europe.</i>
pax	passengers
PAYS	pay as you sail (eg for ENCs)
PB-NAV	Programme Board for Navigation (ESA)

PBN	performance-based navigation (ICAO) <i>Performance requirements defined in terms of accuracy, integrity, availability, continuity and functionality.</i>
PBR	passive bistatic radar (eg basis of SPYGLASS)
PC	personal computer
PCA	possible course of action
PCD	preferred compass direction (used in animal navigation work)
PCI	phase code interval (Loran-C)(20 times the GRI)
PCM	pulse code modulation
PCMCIA	Personal Computer Memory Card International Association
PCV	phase centre variation (eg of GNSS antenna)
PD	public domain
PDA	personal digital assistant
PDC	personal digital communicator pre-departure clearance (ATC)
PDD	Presidential Decision Directive (US) <i>PDD NSTC-6 (28 Mar 96) applied to GPS. Included provision of SPS free of user charges.</i>
PDF	Portable Document Format probability density function
PDOP	positional dilution of precision <i>The factor by which the accuracy of a 3-D fix is degraded by geometrical considerations.</i>
PDR	pedestrian dead (deduced) reckoning 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 SAPPHIRE (EUROCONT'L)
PERFECT	Power Efficiency Revolution For Embedded Computing Technologies <i>DARPA project.</i>
PETAL	Preliminary EUROCONTROL Test of Air/Ground Data Link (prog)
PF	particle filtering (optimal recursive Bayesian filtering method) 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 Traf'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	photonic integrated circuit pilot in command
PinS	point in space (eg in airfield approach procedure)
PIR	portable ILS receiver
pixel	picture element <i>The smallest element of a display or output that can be controlled.</i>
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
PLOG	pilot log (flying)
PLSS	Precision Location Strike System (US)
PM	pilot monitoring (as opposed to PF)
PMB	Programme Management Board (Galileo)
PMO	Port Meteorological Office(r)
PMR	private mobile radio
PMU	processing and monitoring unit
P_N	north geographic pole
PN	pseudo-noise
PNAV	Precise NAVigation
PNF	Polish Navigation Forum
PNR	point of no return prior notice required
PNT	position, navigation and timing
PNTAB	US National Space-Based Positioning, Nav' & Timing Advisory Board
PNTTG	Positioning, Navigation and Timing Technical Group (reports to BRIG)
PO	dust devils (met)
POC	proof-of-concept
POCP	Point of Contract Platform (Galileo PRS)
POD	precise orbit determination
POP	Post Office Protocol (Internet)
POR	Pacific Ocean Region (Inmarsat I-3 satellite at 178E)

POS/LV	Position & Orientation System for Land Vehicles
POS/NAV	positioning and navigation
PoSAT	Portuguese Satellite (-I carries GPS experiments)
POSSUM	Policy Scenarios for Sustainable Mobility (EU)
POST	precision orbital satellite technology (POST2 2017)
POSYDON	Positioning System for Deep Ocean Navigation (DARPA/BAE)
POTS	plain old telephone system!
PP	post-processing (eg of VRS or RTK fixing)
PPC	predicted point of collision
PPD	personal privacy device (eg GPS jammer) Presidential Policy Directive (US)
PPI	plan position indicator
PPL()	Private Pilot's Licence <i>(A) = aircraft, (B) = balloons, (H) = helicopters, A(M) = microlights.</i>
ppm	parts per million
PPP	precise point positioning (GNSS technique) public-private partnership
PPPS	pulse pairs per second (DME, TACAN etc)
PPS	path planning sub-system (eg of ANS) Precise Positioning Service <i>The full accuracy positioning service provided to the military by GPS. Includes access to unencrypted P-Code transmissions.</i>
	pulses per second
PPS-SM	PPS Security Mode/Module
PR	banks (met)
PRC	Performance Review Commission (EUROCONTROL) pseudorange correction
precision	<i>The accuracy of a measurement or a position with respect to random errors (IMO).</i>
Precision Approach	<i>A standard instrument approach procedure in which both horizontal and glidepath/slope guidance is given.</i>
PRF	pulse repetition frequency
Primary Means of Navigation	<i>Airborne nav system that must meet accuracy and integrity requirements but need not meet full availability or continuity-of-service requirements.</i>
Prime meridian	Reference meridian 000°; origin for measurement of longitude <i>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.</i>
PRISMA	GSA Project (2015) <i>Development of low-end operational Galileo PRS receivers including security modules architectures.</i>
PRM	preferred route message (North Atlantic ATC)

PRN	pseudorandom noise (code) <i>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.</i>
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)
PRSS	Personnel Recovery Support System (US military)
P_s	south geographic pole
PS-QZSS	Performance Standard (QZSS)
PSC	Port State Control
PSDR	preliminary system design review
Pseudolite	Pseudo-satellite <i>Ground-based transmitter designed to mimic a satellite (GPS).</i>
PSLV	Polar Satellite Launch Vehicle (Indian satellite launch rocket)
PSMA	Public Sector Mapping Agreement (OS)
PSoc	Photogrammetric Society (became RPSoc on 1 Jan 01)
PSS	packet switching stream
PSTN	Public Switched Telephone Network
PSU	power supply unit
PTAN	precision terrain-aided navigation
PTC	Positive Train Control (US DOT initiative)
PTS	Polar Track Structure Precision Timing Station (Galileo)
ptt	press-to-transmit
PTTI	precise time and time interval
PUFFIN	Pedestrian User-Friendly INtelligent crossing (UK DTLR)
PUNE	position component of the user navigation error (3-dimensional)
PV	pilot vessel
PVC	percent volume contour
PVT	Position, Velocity and Time (eg Galileo Service)
PWC	personal water craft (jetski)
PWSA	Ports and Waterways Safety Act (US)
PZ-90	Soviet geocentric co-ordinate system used by GLONASS (SGS90)
QAM	quadrature amplitude modulation
QAR	quick-access recorder (air - stores data from FDR)
QDA	quadratic discriminant analysis (statistics algorithm)
QDM	magnetic bearing to a DF station
QDR	magnetic bearing from a DF station

QFE	atmospheric pressure at aerodrome elevation
QFI	qualified flying instructor
QGH	controlled descent through cloud
QGO	airfield closed due to weather
QHM	Queen's Harbour Master
QinetiQ	The private arm of DERA from 2 Jul 01 <i>A nonsensical name taken from the Greek 'kinetikos' - to move.</i>
QNH	atmospheric pressure at sea level
QPSK	quadrature phase-shift keying
QSY	change frequency
QTE	true bearing from DF station
QUATTRO	Quality Approach in Tendering/Contracting Urban Public Trans Ops <i>An EC project Dec 96 - May 98.</i>
QZO	quasi zenith orbit (of satellite)
QZS	Quasi-Zenith Satellite (eg QZS-1)
QZSS	Quasi-Zenith Satellite System (Japan)
R	°Relative
R-GEO	GEO ranging (GEO-based GPS-like ranging signal, as in EGNOS)
R-GNS	Robust-Global Navigation System (MOD - also RGNS)
R-IORS	re-entrant integrated optical rotation sensor
R/T	(RT) radio telephony
R&D	research and development
R&E	research and engineering
R&TTE	Radio Equipment & Telecommunications Terminal Equipment Directive <i>EC legislation applying to vehicles. Mandatory from 8 Apr 01.</i>
RA	Radiocommunications Agency (UK) <i>Established as an Executive Agency of the DTI in 1990.</i>
	rain (met)
	resolution advisory (TCAS)
	right ascension
RAAN	right ascension of the ascending node <i>Equatorial angle from the celestial principal direction to the ascending node.</i>
RACON	radar transponder beacon
rad	radian (180/□ degrees)
Radar	RAdio Detection And Ranging
radio determination	<i>The determination of position, or the obtaining of information relating to position, by means of the propagation properties of radio waves (IMO).</i>
radiolocation	<i>Radio determination used for purposes other than radionavigation (IMO).</i>
radionavigation	<i>The use of radio waves in navigation for the determination of position or direction, or for obstruction warning (IMO).</i>
RAeC	Royal Aero Club of the United Kingdom

RAeS	Royal Aeronautical Society
RAFS	rubidium atomic frequency standard (clock)
RAFS EU	rubidium atomic frequency standard evaluation unit
RAI	Registro Aeronautico Italiano (Italian CAA)
RAIB	Rail Accident Investigation Branch (UK)
RAIDS	Rangeless Airborne Information Datalink System
RAIM	receiver autonomous integrity monitoring <i>A technique whereby all navigation sensor information available at a receiver is autonomously processed to monitor the integrity of the navigation signals (IMO).</i>
RAL	Rutherford Appleton Laboratory (Oxford)
RAM	random access memory reliability and maintainability
random error	<i>That error which can be predicted only on a statistical basis (IMO).</i>
RAS	radar advisory service (ATC) rectified airspeed replenishment at sea robotics and autonomous systems
RAT	ram air turbine (aux power for aircraft)
RAVI	Netherlands Council for Geographic Information
RB	rubidium (clock)
RBI	relative bearing indicator
RBN	radio beacon
RCC	Rescue Co-ordination Centre
RCD	Recreational Craft Directive (EU)
RCDS	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 <i>Sub-carrier on FM broadcasts carrying data, which may include DGPS corrections and TMC.</i>
RDS-EON	Radio Data System - Enhanced Other Networks <i>Digital traffic messages carried by RDS.</i>
RDS-TMC	Radio Data System - Traffic Message Channel <i>Digital traffic messages carried by RDS.</i>
RDSS	Radio Determination Satellite Service (uses round-trip timing)
REDAN	REd de Datos de Aeropuertos y Navegación (Spanish aero comms net)
redundancy	<i>The existence of multiple equipment or means for accomplishing a given function (IMO).</i>

REGAL	REconfigurable REceiver for GALileo
relative accuracy	<i>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).</i>
reliability	(of a position fix) <i>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).</i> (of a service) <i>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).</i> (of an observation) <i>('internal' reliability). A measure of the effectiveness with which gross errors may be detected. Usually expressed in terms of the MDB (after IMO).</i>
RENC	Regional Electronic Chart Coordinating Centre <i>Provide a single source for all countries' ENC data. The Northern Europe RENC is at Stavanger, Norway.</i>
repeatability	<i>The accuracy of a positioning system, taking into account only the random errors. Normally expressed in a 95% probability circle (IMO).</i>
repeatable accuracy	<i>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).</i>
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)
RH	relative humidity
RHCP	right hand circularly polarised
RHL	rhumb line
RI	restricted information (eg 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) <i>Line on the surface of the earth forming the same angle with all meridians; a straight line on a Mercator chart.</i>
RLD	Rijksluchtvaartdienst (Netherlands CAA)
RLP	rejected landing procedure
RLS	Return Link Service (eg in Galileo to acknowledge a distress call)
RLSS	Royal Life Saving Society (UK)
RM	relative motion
RMA	reliability, maintainability, availability
RME	range measurement equation
RMI	radio magnetic indicator
rms	(RMSE) root mean square (error) <i>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.</i>
RMU	radio management unit
RNA	Regulated Navigation Area (eg 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 <i>A statement of navigational performance necessary for operation under specified conditions (air).</i>
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)
RoSPA	Royal Society for the Prevention of Accidents (UK)
RoSPA	Royal Society for the Prevention of Accidents (UK)
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 <i>Formed 1 Jan 01 from RSS and PSoc. Based Nottingham University.</i>
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) <i>Test bed uses 350 km of road between Swansea and Gatwick.</i>
RTB	return to base
RTC	real-time clock
RTCA	Radio Technical Commission for Aeronautics (US)
RTCM	Radio Technical Commission for Maritime Services (US) <i>RTCM SC-104 developed the recommended standards for DGPS.</i>
RTD	Research and Technological Development (EU transport projects)
RTE	radar target enhancer route
RTI	road traffic informatics (sometimes 'infrastructure')

RTK	real-time kinematic <i>A differential GNSS procedure whereby carrier-phased corrections are transmitted in real time from a reference rx to user's rx.</i>
RTLS	real time location system
RTO	rejected takeoff
RTOS	real-time operating system
RTT	round trip time/timing
RTX	Real Time eXtended (Trimble GNSS correction service)
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 <i>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.</i>
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 <i>(ITU assigned 2,300-2,500 & 2,700-3,700 MHz).</i>
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) <i>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.</i>
	system architecture
SAARC	South Asian Association for Regional Cooperation
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 <i>Platform for establishing world-wide interoperability between Galileo and other systems. Consortium led by Sextant Avionique.</i>
SAM	System Area Monitor (Loran-C)
SAMSO	Space and Missile Systems Organization (US)
SAPPHIRE	Satellite & Aircraft Database Project for System Integrity Research <i>EUROCONTROL project.</i>
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) <i>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 III/III precision approach: 6m hor, 1m vert, alert time 1s.</i>
SAT	site acceptance test
SATCO	senior air traffic control officer
SATNAV	satellite-based navigation
SATURN	SATellite-based aUtonomous tRain localisation 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
SBIR	Small Business Innovative Research (US mil contracts)
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 Radiorecepteurs de Téléviseurs <i>Also known as Peritel or Euroconnector (for video).</i>
SCAT-I	Special CAT I (ILS)
SCF	Signal Control Facility (Galileo)
SCH	set clearance height (ATC)
ScOACC	Scottish and Oceanic Area Control Centre (ATC)

SCOOT	Split, Cycle and Offset Optimisation Technique <i>Controlling traffic signals automatically to reflect traffic flow.</i>
SCOR	Scientific Committee on Oceanic Research
SCT	scattered cloud (3-4 oktas)
SD	semi-diameter (astro) standard deviation <i>For a normal linear distribution 68% of readings should lie within 1 SD and 95% with 2 SDs.</i>
SDCM	System for Differential Correction & Monitoring (GLONASS WAAS)
SDD	Service Definition Document (eg EGNOS)
SDGPS	Smoothed DGPS
SDK	software developers'/service development kit
SDLC	synchronous data link control
SDME	speed and distance measuring equipment (maritime)
SDP	software-defined perimeter (ring-fence using eg GNSS)
SDR	software-defined radio
SDST	Single/Double Summer Time
SDV	self-driving vehicle
Sea Areas A1-A4	GMDSS areas representing differing coverage <i>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.</i>
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 <i>The radius of a sphere, centered at the measured position, inside which the true position lies with 50% probability.</i>
service capacity	<i>The number of users a service can accommodate simultaneously (IMO).</i>
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
SG	snow grains (met)
SGP	Space Growth Partnership (UK)
SH	showers (met)

SHA	siderial hour angle
SHIPPOS	SHIP POSitioning Reporting Service
SHOM	Service Hydrographique et Oceanographique de la Marine (FR)
SI	<p>Système Internationale d'Unités</p> <p><i>International system of units, the outcome of the 9th General Conference of Weights and Measures in 1948.</i></p>
SIA	Satellite Industry Association (US, based Washington DC)
SID	<p>standard instrument departure</p> <p>sudden ionospheric disturbance</p>
SIF	selective identification feature (ATC secondary radar)
SIG	GIS (geographic information systems) in many languages
sigma	<i>Greek letter σ normally used for standard deviation</i>
SIL	<p>safety integrity level</p> <p>system integration laboratory</p>
SIM	subscriber identification module
single point of failure	<i>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).</i>
SINS	shipborne INS
SIP	Strategy Implementation Plan (eg IMO)
SIPT	Société internationale de photogrammétrie et de télédétection (ISPRS).
SIS	signal-in-space
SISA	signal-in-space accuracy
SISRE	signal-in-space range error
SKC	sky clear (met)
sl	(s/l) sea level
SL	step length
SLA	Service Level Agreement (eg for Galileo)
SLAM	simultaneous localisation and mapping
SLAS	Sub-meter Level Augmentation Service (QZSS)
SLD	superfluorescent laser diode
SLR	satellite laser ranging
SLS	Satellite Landing System
SMAG	Spectrum Management Advisory Group (RA NDPB)
SMART	Self-Managed Arrival Resequencing Tool (MITRE for FAA)
SMC	Space and Missile Systems Center (USAF)
SMF	separation monitoring function (ATC)
SMG	speed made good (speed (of ship) between 2 fixes)
SMGCS	Surface Movement Guidance & Control System (for airfields)
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)
SNoT	satellite navigation of things
SNR	signal-to-noise ratio
SNU	standard navigation unit
SOA	speed of advance (speed to make good) <i>Estimated speed (of ship) relative to the earth.</i>
SoC	system on chip
SOCRATES	System of Cellular Radio for Traffic Efficiency and Safety (EU)
SOG	speed over ground <i>Speed (of ship) relative to the earth, measured on board (the ship).</i>
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) <i>IMO Convention of 1974.</i>
Sole Means of Navigation	<i>An approved system that must meet 4 performance requirements: accuracy, integrity, availability and continuity-of-service.</i>
SOP	signals of opportunity 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 <i>The service available to civilian users with a stand-alone receiver having access only to the C/A code and L1 carrier.</i>
SPWG	Strategic Planning Working Group (IHO)
SPYGLASS	Galileo-based Passive Radar System for Maritime Surveillance <i>Uses Galileo signal reflections as a passive bistatic radar.</i>
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
STANAG	STANdardization AGreement (NATO) <i>Defines processes, procedures, terms and conditions for common military or technical procedures or equipment.</i>
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 <i>Set in 1978 (STCW 78) and amended in 1995 (STCW 95).</i>

STDCDU	standard CDU
STDMA	self-organising time-division multiple-access
STEM	Science, Technology, Engineering and Mathematics
STENAV	A Galileo simulation facility (space, ground segment & user equipment)
STEREO	Solar Terrestrial Relations Observatory (2 NASA sats solar activity)
STL	Satellite Time and Location (Iridium feature)
STM	Sea Traffic Management
STP	standard temperature and pressure (=ISA)
STPM	synchronizer time-pulse modulator (Chayka)
Stratosphere	Part of atmosphere from ~ 14-50 km
STRV	Space Technology Research Vehicle
STW	speed through water (speed of ship relative to the water surface)
SUA	small unmanned aircraft (2 categories are <7 kg and 7-20 kg) special use airspace
sUAS	small unmanned air system
SUP	south pole up (of a magnet)
Supplemental Means of Nav	<i>An approved system that can be used in conjunction with a Sole Means of Navigation.</i>
SURNAV	Système français de comptes rendus de mouvements <i>French info and surveillance service for marine navigation.</i>
SUSA	small unmanned surveillance aircraft
SUT	Society for Underwater Technology (UK)
SV	space vehicle (eg satellite) synthetic vision
SVD	singular value decomposition
SVFR	special visual flight rules
SVG	Scalable Vector Graphic
SVGA	Standard display format of 800 x 600 pixels
SVM	support vector machine (statistics algorithm)
SVS	synthetic vision system
SWaP	size, weight and power (of systems)
SWEPOS	Swedish permanent national GPS network (24 stations)
SXGA	Standard display format of 1,280 x 1,024 pixels
SXI	Solar X-ray Imager <i>NASA/NOAA imager giving X-ray image of sun each minute for predicting solar flares. Carried on Goes-M.</i>
systematic error	<i>An error which is non-random in the sense that it conforms to some kind of pattern (IMO).</i>
T	°True tera (SI unit multiplier of 10 ¹²) tesla (magnetic flux density in Wb/m ²)

T&E	test and evaluation
TA	timing advance (method of Cellphone positioning) traffic advisory (TCAS) transition altitude Type Approval
TACAN	TACTical Air Navigation <i>Military beacon system giving bearing and range.</i>
TACIS	Technical Assistance to the CIS (EU)
TAI	International Atomic Time <i>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'.</i>
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 Trajectory-based Operations (eg NextGen)
TBS	Terrestrial Beacon System (eg for urban/indoor navigation)
TC	terminal control (ATC) true course (course to steer) <i>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°).</i>
TCA	The Coastguard Agency (UK) <i>Merged with MSA in April 1998 to become MCA.</i> time of closest approach <i>Time that a satellite is closest to a beacon or rx during a pass.</i>
TCAA	Transatlantic Common Aviation Area
TCAR	three-carrier ambiguity resolution
TCAS	Traffic-alert and Collision Avoidance System <i>TCAS-I generates conflicting traffic advisories. TCAS-II also gives collision avoidance instructions in vertical plane.</i>
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
TDOP	time dilution of precision <i>The factor by which accuracy of receiver clock bias determination is degraded by geometrical considerations.</i>
TDWR	terminal doppler weather radar
TEC	total electronic content (typically of ionosphere) <i>Integrated value of electronic concentration - delay of GPS signal is directly proportional to TEC.</i>
TEMPO	temporarily (met)
TEN	Trans-European (Transport) Networks (EU)
TERNAV	terrain-referenced navigation
TERPS	Terminal Instrument Procedures
TETRA	TErrestrial Trunked RAdio <i>Combines functions of digital mobile phones, PMR radio systems and mobile data. Uses 410-430 MHz.</i>
TEU	twenty-foot equivalent unit (inter-modal freight container)
TF	terrain following
TFM	traffic flow management
TFOM	time figure of merit
TFR	terrain following radar
Tgd	estimated group delay differential
TGRS	Translated GPS Range System
TH	Trinity House true heading <i>Actual direction in which the longitudinal axis (of the ship) is pointed, 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 N.</i>
THD	transmitting heading device
Thermosphere	Part of atmosphere from ~ 85-120 km
THLS	Trinity House Lighthouse Service
THUCC	Trinity House User Consultative Committee
TIA	US Telecomms Standards Institute (equiv of Europe's ETSI)
TIBA	Traffic Information Broadcast for Aircraft
TID	travelling ionospheric disturbance
TIDE	Technology Initiatives for Disabled and Elderly People (EU)
TIFF	Tagged Image File Format <i>Standard for digital image compression; includes JPEG.</i>
TIGER	Traffic Information and Guidance on European Roads (EU DRIVE 2)
TIH	Traffic Information Highway (carries data from TCCs)
TIS	Traffic Information Service (air)

TIS-B	Traffic Information Services - Broadcast
TL	transition level until (met)
TLM	telemetry
TLS	target level of safety total least squares Transport Layer Security (security protocol)
TMA	terminal manoeuvring area (ATC) Traffic Management Advisor (ATC automation tool)(US)
TMAS	telemedical assistance service
TMC	Traffic Message Channel (digital traffic messages carried by RDS)
TMG	track made good (true track between 2 fixes)
TMHD	transmitting magnetic heading device (maritime)
TMIC	terahertz monolithic integrated circuit
TMS	Testbed Master Station (GRAS)
TN	true north (northerly direction of the meridian)
TNSE	total navigation system error
TOA	time of arrival (in cellphone location could give accuracy of 125 m)
TOC	time of coincidence (eg Loran-C timing) top of climb
TOCI	time of coincidence interval (eg Loran-C timing)
TOGA	take-off and go-around (mode of autopilot)
TOPS	Total Operations Processing System (for train movements)
TORT	Generic legal term relating to breach of duty and liability.
TOW	time-of-week <i>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.</i>
TPEG	Traffic Protocol Experts Group <i>A protocol for relaying traffic information. Used by DAB for in-vehicle systems.</i>
TRA	temporary restricted area (ATC)
TRACON	Terminal Radar Approach Control
Trafficmaster	System that collects road traffic flows and disseminates them (UK)
Transit	discarded US navigation satellite system (pre-GPS)
TRANSSC	Transport Safety Standards Committee (IAEA)
TREASURE	Training, Research and Applications project (EU) <i>Training REsearch and Applications network to Support the Ultimate Real time high accuracy EGNSS solution.</i>
TREN	(Directorate General) TRansport and ENergy (EC - was DG VII)
trk	track
trkg	tracking
TRL	Transport Research Laboratory (UK)

TRN	terrain-referenced navigation
TROPIC	Traffic Optimisation by the Integration of Information & Control
TRS	Testbed Reference Station (GRAS)
TRSB	time-referenced scanning beam
true position	<i>The error-free latitude and longitude (2D) and height (3D) co-ordinates in a specified geodetic datum (IMO).</i>
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 <i>The time elapsed between the occurrence of a failure in a system and its presentation to the user (after IMO).</i>
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 - ECCAIRS)
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 <i>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.</i>
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) <i>International Union of Railways.</i>
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 <i>Informal forum of ICS, IMarE, NI, RIN, RINA, and SUT.</i>
UKMO	UK Meteorological 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)
UMTS	Universal Mobile Telecommunications Service <i>3rd generation mobile phone standard (2002+) combining speech and internet (IP). Works up to 2 Mbps. Internationally known as IMT 2000.</i>
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNE	user navigation error
UNFCCC	United Nations Framework Convention on Climate Change
UNIGRACE	Unification of Gravity Systems in Central and Eastern Europe
UNISIG	Railway signalling & comms industry consortium
UNTOC	un-TOC second offset (Loran-C)
UPF	unscented particle filtering (statistics)
UPRN	Unique Property Reference Number (OS)
UQ	ultra-quick flashing light
URA	user range accuracy <i>Prediction of max UERE (minus ionospheric error) broadcast in each GPS satellite's navigation message.</i>
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 unscented transformation (statistics)
UT0	Uncorrected Universal Time
UT1	UT0 corrected for polar variation <i>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).</i>
UT2	UT0 corrected for polar & seasonal variations

UTC	Co-ordinated Universal Time <i>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.</i>
UTM	Universal Transverse Mercator (using a meridian as line of contact)
UTMC	Urban Traffic Management and Control (DTLR 5-year R&D prog)
UTP	unshielded twisted pair (of wires carrying data) user terminal prototype (eg STENAV)
UUV	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 <i>German DFS contract.</i>
VAL	vertical alert limit/level (eg for WAAS precision approach etc)
VANET	Vehicular Ad Hoc Network
Var	variation <i>Angle between TN and MN, from TN eastwards named E (+), westwards named W (-).</i>
VAS	value-added service
VASP	value-added service provider
VC	in vicinity (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) <i>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.</i>
VDOP	vertical dilution of precision <i>The factor by which the one-dimensional vertical accuracy of a fix is degraded by geometrical considerations.</i>
VDR	voyage data recorder
vertical circle	Great circle of the celestial sphere through 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 (for use in RTK positioning)
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
VTSS	vehicle traffic service
	vessel 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 <i>FAA term describing their GNSS-I, augmenting GPS SPS from a geostationary satellite with additional navigation information plus differential and integrity data.</i>
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
WAM	wide angle multilateration (locatin by timing returns from series of radars)
WAN	wide area network (often joining together LANs)
WAP	wireless application protocol <i>Specification to enable mobile phone, pager or PDA to access the Internet.</i>
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 <i>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.</i>
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
WROI024	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)
Wx	weather
WX NIL	no significant weather
WYSIWYG	what you see is what you get
X-band	Old radar band 8-12 GHz (ITU assigned 8,500-10,680 MHz) ~ 3 cm
XGA	Standard display format of 1,024 x 768 pixels
XML	Extensible Mark-up Language (complements HTML)
XTD	cross-track distance (perpendicular to ground track)
XTE	cross-track error (perpendicular to ground track)
Y-Code	encrypted P-Code (comprises modulo-2 addition of P-Code & W-Code)
Y2K	Year 2000
YAH	You are here (maps for pedestrians)
Z	zenith (point on the celestial sphere vertically overhead)
Z-Count	Fundamental GPS time unit <i>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.</i>
ZT	zone time <i>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 °.</i>
ZTD	zenith tropospheric delay
□	autumnal equinox <i>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'.</i>
	ohm (unit of resistance = ratio V/A)