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GUIDANCE ON WIND SHEAR WARNINGS AND ALERTS

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Change Summary

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1.0	First Edition	ANSSO	

NOTE:

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Effective date:

Ms Toska Sem
Executive Director

GUIDANCE ON WIND SHEAR WARNINGS AND ALERTS

1. Purpose

1.1 This Advisory Circular (AP) provides guidance to Meteorological Service Provider on the technical specifications for preparation and issuance of wind shear warnings and alerts.

2. Background

2.1 Wind shear warnings must be prepared by the meteorological office for aerodromes where wind shear is considered a factor, in accordance with local arrangements with the ATS unit and operators concerned.

2.2 Wind variations at low altitude have long been recognized as a serious hazard to airplanes during take-off and approach. These wind variations can result from a large variety of meteorological conditions such as: topographical conditions, temperature inversions, sea breezes, frontal systems, strong surface winds, and the most violent forms of wind change and thunderstorm and rain shower.

3. Extracts from NAMCARs, PART 174

174.09.4 Wind shear warnings and alerts

(1) The meteorological watch office must ensure that wind shear warnings are issued in accordance with the standards set out in Document NAM-CATS-MET.

4. Extracts from NAM-CATS-MET

174.09.4 Wind shear warnings and alerts

1.1 Wind shear warnings must be prepared by the meteorological office for aerodromes where wind shear is considered a factor, in accordance with local arrangements with the ATS unit and operators concerned.

1.2 Wind shear warnings must give concise information on the observed or expected existence of wind shear which could adversely affect aircraft on the approach path or takeoff path or during circling approach between runway level and 1600 ft above that level and aircraft on the runway during the landing roll or takeoff run. Where local topography has been shown to produce significant wind shears at heights in excess of 1600 ft above runway level, then 1600 ft must not be considered restrictive.

topography has been shown to produce significant wind shears at heights in excess of 1600 ft above runway level, then 1600 ft must not be considered restrictive.

1.3 Wind shear warnings for arriving aircraft and/or departing aircraft must be cancelled when aircraft reports indicate that wind shear no longer exists or, alternatively, after an agreed elapsed time.

1.4 The criteria for the cancellation of a wind shear warning must be defined locally for each aerodrome, as agreed between the A-MET service provider, the ATS service provider and the operators concerned.

1.5 At aerodromes where wind shear is detected by automated, ground-based, wind shear remote-sensing or detection equipment, wind shear alerts generated by these systems must be issued.

1.6 Wind shear alerts must give concise, up-to-date information related to the observed existence of wind shear involving a headwind/tailwind change of 15 kt or more which could adversely affect aircraft on the final approach path or initial takeoff path and aircraft on the runway during the landing roll or takeoff run.

1.7 Wind shear alerts should be updated at least every minute. The wind shear alert should be cancelled as soon as the headwind/tailwind change falls below 7.5 m/s (15 kt)

GUIDANCE AND PROCEDURES ON WIND SHEAR WARNINGS AND ALERTS

1. General

1.1 The Namibia Civil Aviation Regulation (NAMCARs), under Regulation 174.02.2 require the Meteorological Service Provider to establish aerodrome meteorological office designated to provide meteorological services for aerodrome operations.

1.2 The aerodrome meteorological office shall prepare and issue wind shear warnings and alerts in accordance with NAMCARs 174.09.4.

2. Specifications related to wind shear warnings.

2.1 At aerodromes where wind shear is a factor, it is necessary to provide all stakeholders with specific wind shear warnings, which would alert ATS units and Pilots, to the existence or expected existence of this hazardous weather phenomenon that may impact operation of aircrafts. The wind shear warnings and alerts should be issued in addition to the inclusion of wind shear information in the supplementary information of local routine reports, local special reports, METAR and SPECI.

2.2 Detection of wind shear

2.2.1 Wind shear warnings and alerts should be prepared by the aerodrome meteorological office designated to provide service for aerodrome operations and should be prepared to give concise information on the observed or expected existence of wind shear, which could adversely affect:

i) Aircraft on the approach path or take-off path or during circling approach between runway level and 500 m (1 600 ft) above that level or higher, where local topography produces operationally significant wind shear at greater heights; and

ii) Aircraft on the runway during the landing roll and take-off run.

2.2.2 Evidence of the existence of wind shear should be derived from-

i) Ground-based, Low-Level Wind shear Observation System (LLWOS)

ii) Ground-based, wind shear remote-sensing equipment, for example, Doppler radar;

iii) Ground-based, wind shear detection equipment, for example, a system of surface wind and/or pressure sensors located in an array monitoring a specific runway or runways and associated approach and departure paths;

iv) Meteorological satellite observation data;

v) Routine and special aircraft observations during the climb-out or approach phases of flight to be made in accordance with NAMCARs 174.07.4 and 174.07.5; or

vi) Other meteorological information such as, Radiosonde data, data from appropriate sensors located on existing masts or towers in the vicinity of the aerodrome or nearby areas of high ground.

2.2.3 Wind shear conditions should be associated with the following phenomena:
i) thunderstorms, funnel cloud (tornado or waterspout) and gust fronts;
ii) frontal surfaces;
iii) strong surface winds coupled with local topography;
iv) sea breeze fronts;
v) mountain waves (including low-level rotors in the terminal area); and
vi) Low-level temperature inversions and microbursts.

2.2.4 Where microbursts are observed, reported by pilots, or detected by ground-based wind shear detection or remote-sensing equipment, the wind shear warnings and wind shear alerts must include a reference to microbursts.

2.3 Format and dissemination of wind shear warnings and alerts

2.3.1 The wind shear warnings shall be issued in accordance with the template in Appendix I to this Advisory Pamphlet and shall be disseminated to aviation users at the aerodrome including the ATS units, Pilots and aerodrome operators.

2.3.2 The sequence number referred to in the template in Appendix I to this Advisory Pamphlet and shall correspond with the number of wind shear warnings issued for the aerodrome starting at 0001 UTC on the particular day concerned.

2.3.3 The use of text additional to the abbreviations listed in the table in Appendix I to this Advisory Pamphlet should be kept to a minimum. Any additional text should be prepared in abbreviated plain language using approved ICAO abbreviations listed in Appendix II to this Advisory Pamphlet. If no ICAO approved abbreviations are available for any weather phenomena, English plain language text should be used.

2.3.4 When an aircraft report is used to prepare a wind shear warning or to confirm a warning previously issued, the corresponding aircraft report, including the aircraft type, should be disseminated unchanged to all aviation users concerned.

2.3.5 Following reported encounters by both arriving and departing aircraft, two different wind shear warnings may be issued: one should be issued for arriving aircrafts and one for departing aircrafts.

2.3.6 Specifications for reporting the intensity of wind shear should recognize that pilots when reporting wind shear, may use the qualifying terms "moderate," "strong" or "severe," based on their assessment of the intensity of the wind shear encountered.

2.3.7 The wind shear alerts can also be disseminated from automated, ground-based; wind shear remote sensing equipment when such equipment is installed by the meteorological service provider.

2.3.8 Where hazardous weather associated with microbursts are observed, reported by pilots, or detected by ground-based wind shear detection system or remote-sensing equipment, the wind shear warning and alert should include a specific reference to microburst.

2.3.9 Where information from ground-based, wind shear detection or remote-sensing equipment is used to prepare a wind shear alert, the alert shall, if practicable, relate to specific sections of the runway and distances along the approach path or take-off path.

2.3.10 Information on wind shear should be included as supplementary information in local routine reports, local special reports, METAR, and SPECI in accordance with the example in 2.4.4 below.

2.4 Meteorological Watch Office Reports of Wind Shear

2.4.1 Information on low-level wind shear at the aerodromes should be provided to the ATS units, pilots and aerodrome operators by the Meteorological watch office designated to serve a particular aerodrome in the following manner:

i) as wind shear warnings;
(ii) as wind shear alerts; or
(iii) as supplementary information on local routine reports, local special reports, METAR and SPECI

2.4.2 Wind shear warnings should be based on:

i) Ground-based wind shear warning equipment (e.g., tower-mounted anemometers);
ii) Aircraft reports received through an ATS unit;
iii) Direct observations from conventional MET equipment (e.g., anemometer); and
iv) Forecasts of meteorological phenomena known to produce wind shear (e.g., convective cloud).

2.4.3 The warnings should be prepared in abbreviated language and should be identified as "WS WRNG."

2.4.4 Example of reporting strong wind along the runway at FYWH:

"FYWH WS WRNG 01 21 1230 VALID 21 1245/21 1330 WS APCH RWY26 FCST SFC WIND: 320/30KT 60 M-WIND: 360/25KT". i.e., assuming actual winds are calmer than the observed.

2.4.5 When an aircraft report is used to prepare a warning or to confirm a warning previously issued, the corresponding aircraft report, including aircraft type, should be given unchanged.

2.4.6 This is an example of wind shear warning generated from aircraft report:

"FYWH WS WRING 02 201500 VALID TL 201545 MOD WS IN APCH REP AT 1455 B737 30KT LOSS 2NIM FNA RWY08".

2.5 Air Traffic Services (ATS) Reporting of Wind Shear

2.5.1 The ATS units are the critical communications interface between aircraft and between aircraft and Meteorological offices. On receipt of an air-report of "wind shear," the ATS unit concerned should:

i) Immediate\y relay the report to other aircraft concerned;
ii) Include a report in the automatic terminal information services (ATIS) broadcast (if available); and
iii) Pass the report to the associated meteorological office.

2.5.2 The reports should be relayed using the following standard sequence, the contents depending upon the details of the original report:

i) Wind shear – identifier;
ii) Aircraft type - added if not included in the original report;
iii) Description of event - no change to the report as received from the pilot;
iv) Height wind shear encountered - no change to the report as received from the pilot;
v) Phase of flight - no change to the report as received from the pilot;
vi) Runway - added if not included in the original report;
vii) Time of encounter - no change to the report as received from the pilot; and
viii) MET/operational information - no change to the report as received from the pilot.

2.5.3 Example of ATS report of wind shear:

"WIND SHEAR [B737 REPORTED STRONG WIND SHEAR AT 300 FT ON APPROACH RWY26 AT 0937 MAX THRUST REQUIRED".

2.5.4 Wind shear alerts should be updated continuously, and they are cancelled as soon as the headwind/tailwind component falls below 7.5 m/s (15 kt).

APPENDIX I – TEMPLATE FOR WINDSHEAR WARNING

Key: M = inclusion mandatory, part of every message;
C = inclusion conditional, included whenever applicable.

Note 1.— The ranges and resolutions for the numerical elements included in wind shear warnings are shown in Table A6-4 of this appendix.

Note 2.— The explanations for the abbreviations can be found in the PANS-ABC (Doc 8400).

Element	*Detailed content*	*Template(s)*	*Examples*
Location indicator of the aerodrome (M)	Location indicator of the aerodrome	nnnn	YUCC[1]
Identification of the type of message (M)	Type of message and sequence number	WS WRNG [n]n	WS WRNG 1
Time of origin and validity period (M)	Day and time of issue and, where applicable, validity period in UTC	nnnnnn [VALID TL nnnnnn] *or* [VALID nnnnnn/nnnnnn]	211230 VALID TL 211330 221200 VALID 221215/221315
IF THE WIND SHEAR WARNING IS TO BE CANCELLED, SEE DETAILS AT THE END OF THE TEMPLATE.			
Phenomenon (M)	Identification of the phenomenon and its location	[MOD] *or* [SEV] WS IN APCH *or* [MOD] *or* [SEV] WS [APCH] RWYnnn *or* [MOD] *or* [SEV] WS IN CLIMB-OUT *or* [MOD] *or* [SEV] WS CLIMB-OUT RWYnnn *or* MBST IN APCH *or* MBST [APCH] RWYnnn *or* MBST IN CLIMB-OUT *or* MBST CLIMB-OUT RWYnnn	WS APCH RWY12 MOD WS RWY34 WS IN CLIMB-OUT MBST APCH RWY26 MBST IN CLIMB-OUT
Observed, reported or forecast phenomenon (M)	Identification whether the phenomenon is observed or reported and expected to continue, or forecast	REP AT nnnn nnnnnnnn *or* OBS [AT nnnn] *or* FCST	REP AT 1510 B747 OBS AT 1205 FCST
Details of the phenomenon (C)[2]	Description of phenomenon causing the issuance of the wind shear warning	SFC WIND: nnn/nnMPS (or nnn/nnKT) nnnM (nnnFT)-WIND: nnn/nnMPS (or nnn/nnKT) *or* nnKMH (or nnKT) LOSS nnKM (or nnNM) FNA RWYnn *or* nnKMH (or nnKT) GAIN nnKM (or nnNM) FNA RWYnn	SFC WIND: 320/5MPS 60M-WIND: 360/13MPS (SFC WIND: 320/10KT 200FT-WIND: 360/26KT) 60KMH LOSS 4KM FNA RWY13 (30KT LOSS 2NM FNA RWY13)
OR			
Cancellation of wind shear warning[3]	Cancellation of wind shear warning referring to its identification	CNL WS WRNG [n]n nnnnnn/nnnnnn	CNL WS WRNG 1 211230/211330[3]

Notes.—

1. Fictitious location.
2. Additional provisions in 6.2.3.
3. End of the message (as the wind shear warning is being cancelled).

APPENDIX II – COMMONLY USED ABBREVIATIONS IN ICAO IN METEOROLOGICAL MESSAGES

ABBREVIATIONS

DECODE

A	
A	Amber
AAA	*(for AAB, AAC . . . etc., in sequence)* Amended meteorological message *(message type designator)*
A/A	Air-to-air
AAD	Assigned altitude deviation
AAR	Air to air refuelling
AAIM	Aircraft autonomous integrity monitoring
AAL	Above aerodrome level
ABI	Advance boundary information
ABM	Abeam
ABN	Aerodrome beacon
ABT	About
ABV	Above
AC	Altocumulus
ACARS†	*(to be pronounced "AY-CARS")* Aircraft communication addressing and reporting system
ACAS†	*(to be pronounced "AY-CAS")* Airborne collision avoidance system
ACC‡	Area control centre *or* area control
ACCID	Notification of an aircraft accident
ACFT	Aircraft
ACK	Acknowledge
ACL	Altimeter check location
ACN	Aircraft classification number
ACP	Acceptance *(message type designator)*
ACPT	Accept *or* accepted
ACT	Active *or* activated *or* activity
AD	Aerodrome
ADA	Advisory area
ADC	Aerodrome chart
ADDN	Addition *or* additional
ADF‡	Automatic direction-finding equipment
ADIZ†	*(to be pronounced "AY-DIZ")* Air defence identification zone
ADJ	Adjacent
ADO	Aerodrome office *(specify service)*
ADR	Advisory route
ADS*	Address *(when this abbreviation is used to request a repetition, the question mark (IMI) precedes the abbreviation, e.g. IMI ADS) (to be used in AFS as a procedure signal)*
ADS-B‡	Automatic dependent surveillance — broadcast
ADS-C‡	Automatic dependent surveillance — contract
ADSU	Automatic dependent surveillance unit
ADVS	Advisory service
ADZ	Advise
AES	Aircraft earth station
AFIL	Flight plan filed in the air
AFIS	Aerodrome flight information service
AFM	Yes *or* affirm *or* affirmative *or* that is correct
AFS	Aeronautical fixed service
AFT . . .	After *(followed by time or place)*
AFTN‡	Aeronautical fixed telecommunication network
A/G	Air-to-ground
AGA	Aerodromes, air routes and ground aids
AGL	Above ground level
AGN	Again
AIC	Aeronautical information circular
AIDC	Air traffic services interfacility data communications
AIM	Aeronautical information management
AIP	Aeronautical information publication
AIRAC	Aeronautical information regulation and control
AIREP†	Air-report

† *When radiotelephony is used, the abbreviations and terms are transmitted as spoken words.*

‡ *When radiotelephony is used, the abbreviations and terms are transmitted using the individual letters in non-phonetic form.*

* *Signal is also available for use in communicating with stations of the maritime mobile service.*

Signal for use in the teletypewriter service only.

AIRMET†	Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations
AIS	Aeronautical information services
ALA	Alighting area
ALERFA†	Alert phase
ALR	Alerting *(message type designator)*
ALRS	Alerting service
ALS	Approach lighting system
ALT	Altitude
ALTN	Alternate *or* alternating *(light alternates in colour)*
ALTN	Alternate *(aerodrome)*
AMA	Area minimum altitude
AMD	Amend *or* amended *(used to indicate amended meteorological message; message type designator)*
AMDT	Amendment *(AIP Amendment)*
AMS	Aeronautical mobile service
AMSL	Above mean sea level
AMSS	Aeronautical mobile satellite service
ANC . . .	Aeronautical chart — 1:500 000 *(followed by name/title)*
ANCS . . .	Aeronautical navigation chart — small scale *(followed by name/title and scale)*
ANS	Answer
AO	Aircraft operator
AOC . . .	Aerodrome obstacle chart *(followed by type and name/title)*
AP	Airport
APAPI†	*(to be pronounced "AY-PAPI")* Abbreviated precision approach path indicator
APCH	Approach
APDC . . .	Aircraft parking/docking chart *(followed by name/title)*
APN	Apron
APP	Approach control office *or* approach control *or* approach control service
APR	April
APRX	Approximate *or* approximately
APSG	After passing
APU	Auxiliary power unit
APV	Approach procedure with vertical guidance
ARC	Area chart
ARNG	Arrange
ARO	Air traffic services reporting office
ARP	Aerodrome reference point
ARP	Air-report *(message type designator)*
ARQ	Automatic error correction
ARR	Arrival *(message type designator)*
ARR	Arrive *or* arrival
ARS	Special air-report *(message type designator)*
ARST	Arresting *(specify (part of) aircraft arresting equipment)*
AS	Altostratus
ASAP	As soon as possible
ASC	Ascend to *or* ascending to
ASDA	Accelerate-stop distance available
ASE	Altimetry system error
ASHTAM	Special series NOTAM notifying by means of a specific format change in activity of a volcano, a volcanic eruption and/or volcanic ash cloud that is of significance to aircraft operations
ASPH	Asphalt
AT . . .	At *(followed by time at which weather change is forecast to occur)*
ATA‡	Actual time of arrival
ATC‡	Air traffic control *(in general)*
ATCSMAC . . .	Air traffic control surveillance minimum altitude chart *(followed by name/title)*
ATD‡	Actual time of departure
ATFM	Air traffic flow management
ATIS†	*(to be pronounced "AY-TIS")* Automatic terminal information service
ATM	Air traffic management
ATN	Aeronautical telecommunication network
ATP . . .	At *(followed by time or place)*
ATS	Air traffic services
ATTN	Attention

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Signal for use in the teletypewriter service only.

AT-VASIS†	*(to be pronounced "AY-TEE-VASIS")* Abbreviated T visual approach slope indicator system
ATZ	Aerodrome traffic zone
AUG	August
AUTH	Authorized *or* authorization
AUTO	Automatic
AUW	All up weight
AUX	Auxiliary
AVBL	Available *or* availability
AVG	Average
AVGAS†	Aviation gasoline
AWOS	Automated weather observation system
AWTA	Advise at what time able
AWY	Airway
AZM	Azimuth

B

B	Blue
BA	Braking action
BARO-VNAV†	*(to be pronounced "BAA-RO-VEE-NAV")* Barometric vertical navigation
BASE†	Cloud base
BCFG	Fog patches
BCN	Beacon *(aeronautical ground light)*
BCST	Broadcast
BDRY	Boundary
BECMG	Becoming
BFR	Before
BKN	Broken
BL...	Blowing *(followed by DU = dust, SA = sand or SN = snow)*
BLDG	Building
BLO	Below clouds
BLW	Below
BOMB	Bombing
BR	Mist
BRF	Short *(used to indicate the type of approach desired or required)*
BRG	Bearing
BRKG	Braking
BS	Commercial broadcasting station
BTL	Between layers
BTN	Between
BUFR	Binary universal form for the representation of meteorological data

C

...C	Centre *(preceded by runway designation number to identify a parallel runway)*
C	Degrees Celsius *(Centigrade)*
CA	Course to an altitude
CAA	Civil aviation authority *or* civil aviation administration
CAT	Category
CAT	Clear air turbulence
CAVOK†	*(to be pronounced "KAV-OH-KAY")* Visibility, cloud and present weather better than prescribed values or conditions
CB‡	*(to be pronounced "CEE BEE")* Cumulonimbus
CC	Cirrocumulus
CCA	*(or CCB, CCC ... etc., in sequence)* Corrected meteorological message *(message type designator)*
CCO	Continuous climb operations
CD	Candela
CDN	Coordination *(message type designator)*
CDO	Continuous descent operations
CDR	Conditional route
CF	Change frequency to ...
CF	Course to a fix
CFM*	Confirm *or* I confirm *(to be used in AFS as a procedure signal)*
CGL	Circling guidance light(s)
CH	Channel
CH#	This is a channel-continuity-check of transmission to permit comparison of your record of channel-sequence numbers of messages received on the channel *(to be used in AFS as a procedure signal)*

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\# *Signal for use in the teletypewriter service only.*

CHEM	Chemical
CHG	Modification *(message type designator)*
CI	Cirrus
CIDIN†	Common ICAO data interchange network
CIV	Civil
CK	Check
CL	Centre line
CLA	Clear type of ice formation
CLBR	Calibration
CLD	Cloud
CLG	Calling
CLIMB-OUT	Climb-out area
CLR	Clear(s) *or* cleared to . . . *or* clearance
CLRD	Runway(s) cleared *(used in METAR/SPECI)*
CLSD	Close *or* closed *or* closing
CM	Centimetre
CMB	Climb to *or* climbing to
CMPL	Completion *or* completed *or* complete
CNL	Cancel *or* cancelled
CNL	Flight plan cancellation *(message type designator)*
CNS	Communications, navigation and surveillance
COM	Communications
CONC	Concrete
COND	Condition
CONS	Continuous
CONST	Construction *or* constructed
CONT	Continue(s) *or* continued
COOR	Coordinate *or* coordination
COORD	Coordinates
COP	Change-over point
COR	Correct *or* correction *or* corrected *(used to indicate corrected meteorological message, message type designator)*
COT	At the coast
COV	Cover *or* covered *or* covering
CPDLC‡	Controller-pilot data link communications
CPL	Current flight plan *(message type designator)*
CRC	Cyclic redundancy check
CRM	Collision risk model
CRP	Compulsory reporting point
CRZ	Cruise
CS	Call sign
CS	Cirrostratus
CTA	Control area
CTAM	Climb to and maintain
CTC	Contact
CTL	Control
CTN	Caution
CTR	Control zone
CU	Cumulus
CUF	Cumuliform
CUST	Customs
CVR	Cockpit voice recorder
CW	Continuous wave
CWY	Clearway

D

D	Downward *(tendency in RVR during previous 10 minutes)*
D . . .	Danger area *(followed by identification)*
DA	Decision altitude
D-ATIS†	*(to be pronounced "DEE-ATIS")* Data link automatic terminal information service
DCD	Double channel duplex
DCKG	Docking
DCP	Datum crossing point
DCPC	Direct controller-pilot communications
DCS	Double channel simplex
DCT	Direct *(in relation to flight plan clearances and type of approach)*
DE*	From *(used to precede the call sign of the calling station) (to be used in AFS as a procedure signal)*
DEC	December
DEG	Degrees
DEP	Depart *or* departure
DEP	Departure *(message type designator)*
DEPO	Deposition
DER	Departure end of the runway

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DES	Descend to *or* descending to
DEST	Destination
DETRESFA†	Distress phase
DEV	Deviation *or* deviating
DF	Direction finding
DFDR	Digital flight data recorder
DFTI	Distance from touchdown indicator
DH	Decision height
DIF	Diffuse
DIST	Distance
DIV	Divert *or* diverting
DLA	Delay *or* delayed
DLA	Delay *(message type designator)*
DLIC	Data link initiation capability
DLY	Daily
DME‡	Distance measuring equipment
DNG	Danger *or* dangerous
DOF	Date of flight
DOM	Domestic
DP	Dew point temperature
DPT	Depth
DR	Dead reckoning
DR . . .	Low drifting *(followed by DU = dust, SA = sand or SN = snow)*
DRG	During
DS	Duststorm
DSB	Double sideband
DTAM	Descend to and maintain
DTG	Date-time group
DTHR	Displaced runway threshold
DTRT	Deteriorate *or* deteriorating
DTW	Dual tandem wheels
DU	Dust
DUC	Dense upper cloud
DUPE#	This is a duplicate message *(to be used in AFS as a procedure signal)*
DUR	Duration
D-VOLMET	Data link VOLMET
DVOR	Doppler VOR
DW	Dual wheels
DZ	Drizzle

E

E	East *or* eastern longitude
EAT	Expected approach time
EB	Eastbound
EDA	Elevation differential area
EDTO	Extended diversion time operations
EEE#	Error *(to be used in AFS as a procedure signal)*
EET	Estimated elapsed time
EFC	Expect further clearance
EFIS†	*(to be pronounced "EE-FIS")* Electronic flight instrument system
EGNOS†	*(to be pronounced "EGG-NOS")* European geostationary navigation overlay service
EHF	Extremely high frequency [30 000 to 300 000 MHz]
ELBA†	Emergency location beacon — aircraft
ELEV	Elevation
ELR	Extra long range
ELT	Emergency locator transmitter
EM	Emission
EMBD	Embedded in a layer *(to indicate cumulonimbus embedded in layers of other clouds)*
EMERG	Emergency
END	Stop-end *(related to RVR)*
ENE	East-north-east
ENG	Engine
ENR	En route
ENRC . . .	Enroute chart *(followed by name/title)*
EOBT	Estimated off-block time
EQN	Equatorial latitudes northern hemisphere
EQPT	Equipment
EQS	Equatorial latitudes southern hemisphere
ESE	East-south-east
EST	Estimate *or* estimated *or* estimation *(message type designator)*
ETA*‡	Estimated time of arrival *or* estimating arrival
ETD‡	Estimated time of departure *or* estimating departure
ETO	Estimated time over significant point

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EUR RODEX	European regional OPMET data exchange
EV	Every
EVS	Enhanced vision system
EXC	Except
EXER	Exercises *or* exercising *or* to exercise
EXP	Expect *or* expected *or* expecting
EXTD	Extend *or* extending *or* extended

F

F	Fixed
FA	Course from a fix to an altitude
FAC	Facilities
FAF	Final approach fix
FAL	Facilitation of international air transport
FAP	Final approach point
FAS	Final approach segment
FATO	Final approach and take-off area
FAX	Facsimile transmission
FBL	Light *(used to indicate the intensity of weather phenomena, interference or static reports, e.g. FBL RA = light rain)*
FC	Funnel cloud *(tornado or waterspout)*
FCST	Forecast
FCT	Friction coefficient
FDPS	Flight data processing system
FEB	February
FEW	Few
FG	Fog
FIC	Flight information centre
FIR‡	Flight information region
FIS	Flight information service
FISA	Automated flight information service
FL	Flight level
FLD	Field
FLG	Flashing
FLR	Flares
FLT	Flight
FLTCK	Flight check
FLUC	Fluctuating *or* fluctuation *or* fluctuated
FLW	Follow(s) *or* following
FLY	Fly *or* flying
FM	Course from a fix to manual termination *(used in navigation database coding)*
FM	From
FM...	From *(followed by time at which weather change is forecast to begin)*
FMC	Flight management computer
FMS‡	Flight management system
FMU	Flow management unit
FNA	Final approach
FPAP	Flight path alignment point
FPL	Flight plan
FPM	Feet per minute
FPR	Flight plan route
FR	Fuel remaining
FREQ	Frequency
FRI	Friday
FRNG	Firing
FRONT†	Front *(relating to weather)*
FROST†	Frost *(used in aerodrome warnings)*
FRQ	Frequent
FSL	Full stop landing
FSS	Flight service station
FST	First
FT	Feet *(dimensional unit)*
FTE	Flight technical error
FTP	Fictitious threshold point
FTT	Flight technical tolerance
FU	Smoke
FZ	Freezing
FZDZ	Freezing drizzle
FZFG	Freezing fog
FZRA	Freezing rain

G

G	Green
G...	Variations from the mean wind speed (gusts) *(followed by figures in METAR/SPECI and TAF)*
GA	General aviation
GA	Go ahead, resume sending *(to be used in AFS as a procedure signal)*

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G/A	Ground-to-air
G/A/G	Ground-to-air and air-to-ground
GAGAN†	GPS and geostationary earth orbit augmented navigation
GAIN	Airspeed or headwind gain
GAMET	Area forecast for low-level flights
GARP	GBAS azimuth reference point
GBAS†	*(to be pronounced "GEE-BAS")* Ground-based augmentation system
GCA‡	Ground controlled approach system *or* ground controlled approach
GEN	General
GEO	Geographic *or* true
GES	Ground earth station
GLD	Glider
GLONASS†	*(to be pronounced "GLO-NAS")* Global navigation satellite system
GLS‡	GBAS landing system
GMC . . .	Ground movement chart *(followed by name/title)*
GND	Ground
GNDCK	Ground check
GNSS‡	Global navigation satellite system
GOV	Government
GP	Glide path
GPA	Glide path angle
GPIP	Glide path intercept point
GPS‡	Global positioning system
GPU	Ground power unit
GPWS‡	Ground proximity warning system
GR	Hail
GRAS†	*(to be pronounced "GRASS")* Ground-based regional augmentation system
GRASS	Grass landing area
GRIB	Processed meteorological data in the form of grid point values expressed in binary form *(in meteorological code)*
GRVL	Gravel
GS	Ground speed
GS	Small hail and/or snow pellets
GUND	Geoid undulation

H

H	High pressure area *or* the centre of high pressure
H . . .	Significant wave height *(followed by figures in METAR/SPECI)*
H24	Continuous day and night service
HA	Holding/racetrack to an altitude
HAPI	Helicopter approach path indicator
HBN	Hazard beacon
HCH	Heliport crossing height
HDF	High frequency direction-finding station
HDG	Heading
HEL	Helicopter
HF	Holding/racetrack to a fix
HF‡	High frequency [3 000 to 30 000 kHz]
HGT	Height *or* height above
HJ	Sunrise to sunset
HLDG	Holding
HLP	Heliport
HLS	Helicopter landing site
HM	Holding/racetrack to a manual termination
HN	Sunset to sunrise
HNH	High latitudes northern hemisphere
HO	Service available to meet operational requirements
HOL	Holiday
HOSP	Hospital aircraft
HPA	Hectopascal
HR	Hours
HRP	Heliport reference point
HS	Service available during hours of scheduled operations
HSH	High latitudes southern hemisphere
HUD	Head-up display
HUM	Humanitarian
HURCN	Hurricane
HVDF	High and very high frequency direction-finding stations *(at the same location)*
HVY	Heavy
HVY	Heavy *(used to indicate the intensity of weather phenomena, e.g. HVY RA = heavy rain)*
HX	No specific working hours
HYR	Higher
HZ	Haze
HZ	Hertz *(cycle per second)*

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I

IAC . . .	Instrument approach chart *(followed by name/title)*
IAF	Initial approach fix
IAO	In and out of clouds
IAP	Instrument approach procedure
IAR	Intersection of air routes
IAS	Indicated airspeed
IBN	Identification beacon
ICAO	International Civil Aviation Organization
ICE	Icing
ID	Identifier *or* identify
IDENT†	Identification
IF	Intermediate approach fix
IFF	Identification friend/foe
IFR‡	Instrument flight rules
IGA	International general aviation
ILS‡	Instrument landing system
IM	Inner marker
IMC‡	Instrument meteorological conditions
IMG	Immigration
IMI*	Interrogation sign (question mark) *(to be used in AFS as a procedure signal)*
IMPR	Improve *or* improving
IMT	Immediate *or* immediately
INA	Initial approach
INBD	Inbound
INC	In cloud
INCERFA†	Uncertainty phase
INCORP	Incorporated
INFO†	Information
INOP	Inoperative
INP	If not possible
INPR	In progress
INS	Inertial navigation system
INSTL	Install *or* installed *or* installation
INSTR	Instrument
INT	Intersection
INTL	International
INTRG	Interrogator
INTRP	Interrupt *or* interruption *or* interrupted
INTSF	Intensify *or* intensifying
INTST	Intensity
IR	Ice on runway
IRS	Inertial reference system
ISA	International standard atmosphere
ISB	Independent sideband
ISOL	Isolated

J

JAN	January
JTST	Jet stream
JUL	July
JUN	June

K

KG	Kilograms
KHZ	Kilohertz
KIAS	Knots indicated airspeed
KM	Kilometres
KMH	Kilometres per hour
KPA	Kilopascal
KT	Knots
KW	Kilowatts

L

. . . L	Left *(preceded by runway designation number to identify a parallel runway)*
L	Litre
L	Locator
L	Low pressure area *or* the centre of low pressure
LAM	Logical acknowledgement *(message type designator)*
LAN	Inland
LAT	Latitude
LCA	Local *or* locally *or* location *or* located
LDA	Landing distance available
LDAH	Landing distance available, helicopter
LDG	Landing
LDI	Landing direction indicator
LEN	Length
LF	Low frequency [30 to 300 kHz]
LGT	Light *or* lighting
LGTD	Lighted

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LIH	Light intensity high
LIL	Light intensity low
LIM	Light intensity medium
LINE	Line *(used in SIGMET)*
LM	Locator, middle
LMT	Local mean time
LNAV†	*(to be pronounced "EL-NAV")* Lateral navigation
LNG	Long *(used to indicate the type of approach desired or required)*
LO	Locator, outer
LOC	Localizer
LONG	Longitude
LORAN†	LORAN *(long range air navigation system)*
LOSS	Airspeed or headwind loss
LPV	Localizer performance with vertical guidance
LR	Last message received by me was . . . *(to be used in AFS as a procedure signal)*
LRG	Long range
LS	Last message sent by me was . . . *or* Last message was . . . *(to be used in AFS as a procedure signal)*
LTA	Lower control area
LTD	Limited
LTP	Landing threshold point
LV	Light and variable *(relating to wind)*
LVE	Leave *or* leaving
LVL	Level
LVP	Low visibility procedures
LYR	Layer *or* layered

M

. . . M	Metres *(preceded by figures)*
M . . .	Mach number *(followed by figures)*
M . . .	Minimum value of runway visual range *(followed by figures in METAR/SPECI)*
MAA	Maximum authorized altitude
MAG	Magnetic
MAHF	Missed approach holding fix
MAINT	Maintenance
MAP	Aeronautical maps and charts
MAPT	Missed approach point
MAR	At sea
MAR	March
MATF	Missed approach turning fix
MATZ	Military aerodrome traffic zone
MAX	Maximum
MAY	May
MBST	Microburst
MCA	Minimum crossing altitude
MCTR	Military control zone
MCW	Modulated continuous wave
MDA	Minimum descent altitude
MDF	Medium frequency direction-finding station
MDH	Minimum descent height
MEA	Minimum en-route altitude
MEDEVAC	Medical evacuation flight
MEHT	Minimum eye height over threshold *(for visual approach slope indicator systems)*
MET†	Meteorological *or* meteorology
METAR†	Aerodrome routine meteorological report *(in meteorological code)*
MET REPORT	Local routine meteorological report *(in abbreviated plain language)*
MF	Medium frequency [300 to 3 000 kHz]
MHA	Minimum holding altitude
MHDF	Medium and high frequency direction-finding stations *(at the same location)*
MHVDF	Medium, high and very high frequency direction-finding stations *(at the same location)*
MHZ	Megahertz
MID	Mid-point *(related to RVR)*
MIFG	Shallow fog
MIL	Military
MIN*	Minutes
MIS	Missing . . . *(transmission identification)* *(to be used in AFS as a procedure signal)*
MKR	Marker radio beacon
MLS‡	Microwave landing system
MM	Middle marker
MNH	Middle latitudes northern hemisphere

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MNM	Minimum
MNPS	Minimum navigation performance specifications
MNT	Monitor *or* monitoring *or* monitored
MNTN	Maintain
MOA	Military operating area
MOC	Minimum obstacle clearance *(required)*
MOCA	Minimum obstacle clearance altitude
MOD	Moderate *(used to indicate the intensity of weather phenomena, interference or static reports, e.g. MODRA = moderate rain)*
MON	Above mountains
MON	Monday
MOPS†	Minimum operational performance standards
MOV	Move *or* moving *or* movement
MPS	Metres per second
MRA	Minimum reception altitude
MRG	Medium range
MRP	ATS/MET reporting point
MS	Minus
MSA	Minimum sector altitude
MSAS†	*(to be pronounced "EM-SAS")* Multi-functional transport satellite (MTSAT) satellite-based augmentation system
MSAW	Minimum safe altitude warning
MSG	Message
MSH	Middle latitudes southern hemisphere
MSL	Mean sea level
MSR#	Message . . . *(transmission identification)* has been misrouted *(to be used in AFS as a procedure signal)*
MSSR	Monopulse secondary surveillance radar
MT	Mountain
MTOM	Maximum take-off mass
MTU	Metric units
MTW	Mountain waves
MVDF	Medium and very high frequency direction- finding stations *(at the same location)*
MWO	Meteorological watch office
MX	Mixed type of ice formation *(white and clear)*

N

N	No distinct tendency *(in RVR during previous 10 minutes)*
N	North *or* northern latitude
NADP	Noise abatement departure procedure
NASC†	National AIS system centre
NAT	North Atlantic
NAV	Navigation
NAVAID	Navigation aid
NB	Northbound
NBFR	Not before
NC	No change
NCD	No cloud detected *(used in automated METAR/SPECI)*
NDB‡	Non-directional radio beacon
NDV	No directional variations available *(used in automated METAR/SPECI)*
NE	North-east
NEB	North-eastbound
NEG	No *or* negative *or* permission not granted *or* that is not correct
NGT	Night
NIL*†	None *or* I have nothing to send to you
NM	Nautical miles
NML	Normal
NN	No name, unnamed
NNE	North-north-east
NNW	North-north-west
NO	No (negative) *(to be used in AFS as a procedure signal)*
NOF	International NOTAM office
NONSTD	Non-standard
NOSIG†	No significant change *(used in trend-type landing forecasts)*
NOTAM†	Notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations
NOTAMC	Cancelling NOTAM
NOTAMN	New NOTAM

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NOTAMR	Replacing NOTAM
NOV	November
NOZ‡	Normal operating zone
NPA	Non-precision approach
NR	Number
NRH	No reply heard
NS	Nimbostratus
NSC	Nil significant cloud
NSE	Navigation system error
NSW	Nil significant weather
NTL	National
NTZ‡	No transgression zone
NW	North-west
NWB	North-westbound
NXT	Next

O

OAC	Oceanic area control centre
OAS	Obstacle assessment surface
OBS	Observe *or* observed *or* observation
OBSC	Obscure *or* obscured *or* obscuring
OBST	Obstacle
OCA	Obstacle clearance altitude
OCA	Oceanic control area
OCC	Occulting *(light)*
OCH	Obstacle clearance height
OCNL	Occasional *or* occasionally
OCS	Obstacle clearance surface
OCT	October
OFZ	Obstacle free zone
OGN	Originate *(to be used in AFS as a procedure signal)*
OHD	Overhead
OIS	Obstacle identification surface
OK*	We agree *or* It is correct *(to be used in AFS as a procedure signal)*
OLDI†	On-line data interchange
OM	Outer marker
OPA	Opaque, white type of ice formation
OPC	Control indicated is operational control
OPMET†	Operational meteorological *(information)*
OPN	Open *or* opening *or* opened
OPR	Operator *or* operate *or* operative *or* operating *or* operational
OPS†	Operations
O/R	On request
ORD	Order
OSV	Ocean station vessel
OTP	On top
OTS	Organized track system
OUBD	Outbound
OVC	Overcast

P

P . . .	Maximum value of wind speed or runway visual range *(followed by figures in METAR/SPECI and TAF)*
P . . .	Prohibited area *(followed by identification)*
PA	Precision approach
PALS	Precision approach lighting system *(specify category)*
PANS	Procedures for air navigation services
PAPI†	Precision approach path indicator
PAR‡	Precision approach radar
PARL	Parallel
PATC . . .	Precision approach terrain chart *(followed by name/title)*
PAX	Passenger(s)
PBC	Performance-based communication
PBN	Performance-based navigation
PBS	Performance-based surveillance
PCD	Proceed *or* proceeding
PCL	Pilot-controlled lighting
PCN	Pavement classification number
PCT	Per cent
PDC‡	Pre-departure clearance
PDG	Procedure design gradient
PER	Performance
PERM	Permanent
PIB	Pre-flight information bulletin
PJE	Parachute jumping exercise
PL	Ice pellets
PLA	Practice low approach
PLVL	Present level
PN	Prior notice required
PNR	Point of no return
PO	Dust/sand whirls *(dust devils)*
POB	Persons on board

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POSS	Possible
PPI	Plan position indicator
PPR	Prior permission required
PPSN	Present position
PRFG	Aerodrome partially covered by fog
PRI	Primary
PRKG	Parking
PROB†	Probability
PROC	Procedure
PROP	Propeller
PROV	Provisional
PRP	Point-in-space reference point
PS	Plus
PSG	Passing
PSN	Position
PSP	Pierced steel plank
PSR‡	Primary surveillance radar
PSYS	Pressure system(s)
PTN	Procedure turn
PTS	Polar track structure
PWR	Power

Q

QDL	Do you intend to ask me for a series of bearings? *or* I intend to ask you for a series of bearings *(to be used in radiotelegraphy as a Q Code)*
QDM‡	Magnetic heading *(zero wind)*
QDR	Magnetic bearing
QFE‡	Atmospheric pressure at aerodrome elevation *(or at runway threshold)*
QFU	Magnetic orientation of runway
QGE	What is my distance to your station? *or* Your distance to my station is *(distance figures and units) (to be used in radiotelegraphy as a Q Code)*
QJH	Shall I run my test tape/a test sentence? *or* Run your test tape/a test sentence *(to be used in AFS as a Q Code)*
QNH‡	Altimeter sub-scale setting to obtain elevation when on the ground
QSP	Will you relay to . . . free of charge? *or* I will relay to . . . free of charge *(to be used in AFS as a Q Code)*
QTA	Shall I cancel telegram number . . .? *or* Cancel telegram number . . . *(to be used in AFS as a Q Code)*
QTE	True bearing
QTF	Will you give me the position of my station according to the bearings taken by the D/F stations which you control? *or* The position of your station according to the bearings taken by the D/F stations that I control was . . . latitude . . . longitude (*or* other indication of position), class . . . at . . . hours *(to be used in radiotelegraphy as a Q Code)*
QUAD	Quadrant
QUJ	Will you indicate the TRUE track to reach you? *or* The TRUE track to reach me is . . . degrees at . . . hours *(to be used in radiotelegraphy as a Q Code)*

R

. . . R	Right *(preceded by runway designation number to identify a parallel runway)*
R	Rate of turn
R	Red
R . . .	Radial from VOR *(followed by three figures)*
R . . .	Restricted area *(followed by identification)*
R . . .	Runway *(followed by figures in METAR/SPECI)*
R*	Received *(acknowledgement of receipt) (to be used in AFS as a procedure signal)*
RA	Rain
RA	Resolution advisory
RAC	Rules of the air and air traffic services
RAG	Ragged
RAG	Runway arresting gear
RAI	Runway alignment indicator
RAIM†	Receiver autonomous integrity monitoring
RASC†	Regional AIS system centre
RASS	Remote altimeter setting source
RB	Rescue boat
RCA	Reach cruising altitude
RCC	Rescue coordination centre

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Signal for use in the teletypewriter service only.

RCF	Radiocommunication failure *(message type designator)*
RCH	Reach *or* reaching
RCL	Runway centre line
RCLL	Runway centre line light(s)
RCLR	Recleared
RCP‡	Required communication performance
RDH	Reference datum height
RDL	Radial
RDO	Radio
RDOACT	Radioactive
RE	Recent *(used to qualify weather phenomena, e.g. RERA = recent rain)*
REC	Receive *or* receiver
REDL	Runway edge light(s)
REF	Reference to . . . *or* refer to . . .
REG	Registration
RENL	Runway end light(s)
REP	Report *or* reporting *or* reporting point
REQ	Request *or* requested
RERTE	Re-route
RESA	Runway end safety area
RF	Constant radius arc to a fix
RFFS	Rescue and fire fighting services
RG	Range *(lights)*
RHC	Right-hand circuit
RIF	Reclearance in flight
RIME†	Rime *(used in aerodrome warnings)*
RL	Report leaving
RLA	Relay to
RLCE	Request level change en route
RLLS	Runway lead-in lighting system
RLNA	Requested level not available
RMK	Remark
RNAV†	*(to be pronounced "AR-NAV")* Area navigation
RNG	Radio range
RNP‡	Required navigation performance
ROBEX†	Regional OPMET bulletin exchange *(scheme)*
ROC	Rate of climb
ROD	Rate of descent
RON	Receiving only
RPDS	Reference path data selector
RPI‡	Radar position indicator
RPL	Repetitive flight plan
RPLC	Replace *or* replaced
RPS	Radar position symbol
RPT*	Repeat *or* I repeat *(to be used in AFS as a procedure signal)*
RQ*	Request *(to be used in AFS as a procedure signal)*
RQMNTS	Requirements
RQP	Request flight plan *(message type designator)*
RQS	Request supplementary flight plan *(message type designator)*
RR	Report reaching
RRA	*(or RRB, RRC . . . etc., in sequence)* Delayed meteorological message *(message type designator)*
RSC	Rescue sub-centre
RSCD	Runway surface condition
RSP	Responder beacon
RSP‡	Required surveillance performance
RSR	En-route surveillance radar
RSS	Root sum square
RTD	Delayed *(used to indicate delayed meteorological message; message type designator)*
RTE	Route
RTF	Radiotelephone
RTG	Radiotelegraph
RTHL	Runway threshold light(s)
RTN	Return *or* returned *or* returning
RTODAH	Rejected take-off distance available, helicopter
RTS	Return to service
RTT	Radioteletypewriter
RTZL	Runway touchdown zone light(s)
RUT	Standard regional route transmitting frequencies
RV	Rescue vessel
RVA	Radar vectoring area
RVR‡	Runway visual range
RVSM‡	Reduced vertical separation minimum [300 m (1 000 ft) between FL 290 and FL 410]
RWY	Runway

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Signal for use in the teletypewriter service only.

S

S	South *or* southern latitude
S . . .	State of the sea *(followed by figures in METAR/SPECI)*
SA	Sand
SALS	Simple approach lighting system
SAN	Sanitary
SAR	Search and rescue
SARPS	Standards and Recommended Practices [ICAO]
SAT	Saturday
SATCOM†	Satellite communication *(used only when referring generally to both voice and data satellite communication or only data satellite communication)*
SATVOICE†	Satellite voice communication
SB	Southbound
SBAS†	*(to be pronounced "ESS-BAS")* Satellite-based augmentation system
SC	Stratocumulus
SCT	Scattered
SD	Standard deviation
SDBY	Stand by
SDF	Step down fix
SE	South-east
SEA	Sea *(used in connection with sea-surface temperature and state of the sea)*
SEB	South-eastbound
SEC	Seconds
SECN	Section
SECT	Sector
SELCAL†	Selective calling system
SEP	September
SER	Service *or* servicing *or* served
SEV	Severe *(used to qualify icing and turbulence reports)*
SFC	Surface
SG	Snow grains
SGL	Signal
SH . . .	Shower *(followed by RA = rain, SN = snow, PL = ice pellets, GR = hail, GS = small hail and/or snow pellets or combinations thereof, e.g. SHRASN = showers of rain and snow)*
SHF	Super high frequency [3 000 to 30 000 MHz]
SI	International system of units
SID†	Standard instrument departure
SIF	Selective identification feature
SIG	Significant
SIGMET†	Information concerning en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations
SIMUL	Simultaneous *or* simultaneously
SIWL	Single isolated wheel load
SKED	Schedule *or* scheduled
SLP	Speed limiting point
SLW	Slow
SMC	Surface movement control
SMR	Surface movement radar
SN	Snow
SNOCLO	Aerodrome closed due to snow *(used in METAR/SPECI)*
SNOWTAM†	Special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format
SOC	Start of climb
SPECI†	Aerodrome special meteorological report *(in meteorological code)*
SPECIAL†	Local special meteorological report *(in abbreviated plain language)*
SPI	Special position indicator
SPL	Supplementary flight plan *(message type designator)*
SPOC	SAR point of contact
SPOT†	Spot wind
SQ	Squall
SQL	Squall line
SR	Sunrise
SRA	Surveillance radar approach
SRE	Surveillance radar element of precision approach radar system
SRG	Short range
SRR	Search and rescue region
SRY	Secondary
SS	Sandstorm

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SS	Sunset
SSB	Single sideband
SSE	South-south-east
SSR‡	Secondary surveillance radar
SST	Supersonic transport
SSW	South-south-west
ST	Stratus
STA	Straight-in approach
STAR†	Standard instrument arrival
STD	Standard
STF	Stratiform
STN	Station
STNR	Stationary
STOL	Short take-off and landing
STS	Status
STWL	Stopway light(s)
SUBJ	Subject to
SUN	Sunday
SUP	Supplement *(AIP Supplement)*
SUPPS	Regional supplementary procedures
SVC	Service *(message type only)*
SVCBL	Serviceable
SW	South-west
SWB	South-westbound
SWX	Space weather
SWXC	Space weather centre
SWY	Stopway

T

T	Temperature
. . . T	True *(preceded by a bearing to indicate reference to True North)*
TA	Traffic advisory
TA	Transition altitude
TAA	Terminal arrival altitude
TACAN†	UHF tactical air navigation aid
TAF†	Aerodrome forecast *(in meteorological code)*
TA/H	Turn at an altitude/height
TAIL†	Tail wind
TAR	Terminal area surveillance radar
TAS	True airspeed
TAX	Taxiing *or* taxi
TC	Tropical cyclone
TCAC	Tropical cyclone advisory centre
TCAS RA†	*(to be pronounced "TEE-CAS-AR-AY")* Traffic alert and collision avoidance system resolution advisory
TCH	Threshold crossing height
TCU	Towering cumulus
TDO	Tornado
TDZ	Touchdown zone
TECR	Technical reason
TEL	Telephone
TEMPO†	Temporary *or* temporarily
TF	Track to fix
TFC	Traffic
TGL	Touch-and-go landing
TGS	Taxiing guidance system
THR	Threshold
THRU	Through
THU	Thursday
TIBA†	Traffic information broadcast by aircraft
TIL†	Until
TIP . . .	Until past *(followed by place)*
TKOF	Take-off
TL . . .	Till *(followed by time by which weather change is forecast to end)*
TLOF	Touchdown and lift-off area
TMA‡	Terminal control area
TN . . .	Minimum temperature *(followed by figures in TAF)*
TNA	Turn altitude
TNH	Turn height
TO . . .	To *(followed by place)*
TOC	Top of climb
TODA	Take-off distance available
TODAH	Take-off distance available, helicopter
TOP†	Cloud top
TORA	Take-off run available
TOX	Toxic
TP	Turning point
TR	Track
TRA	Temporary reserved airspace
TRANS	Transmits *or* transmitter
TREND†	Trend forecast
TRG	Training
TRL	Transition level
TROP	Tropopause

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Signal for use in the teletypewriter service only.

TS	Thunderstorm *(in aerodrome reports and forecasts, TS used alone means thunder heard but no precipitation at the aerodrome)*
TS . . .	Thunderstorm *(followed by RA = rain, SN = snow, PL = ice pellets, GR = hail, GS = small hail and/or snow pellets or combinations thereof, e.g. TSRASN = thunderstorm with rain and snow)*
TSUNAMI†	Tsunami *(used in aerodrome warnings)*
TT	Teletypewriter
TUE	Tuesday
TURB	Turbulence
T-VASIS†	*(to be pronounced "TEE-VASIS")* T visual approach slope indicator system
TVOR	Terminal VOR
TWR	Aerodrome control tower *or* aerodrome control
TWY	Taxiway
TX . . .	Maximum temperature *(followed by figures in TAF)*
TXL	Taxilane
TXT*	Text *(when the abbreviation is used to request a repetition, the question mark (IMI) precedes the abbreviation, e.g. IMI TXT) (to be used in AFS as a procedure signal)*
TYP	Type of aircraft
TYPH	Typhoon

U

U	Upward *(tendency in RVR during previous 10 minutes)*
UA	Unmanned aircraft
UAB	Until advised by . . .
UAC	Upper area control centre
UAR	Upper air route
UAS	Unmanned aircraft system
UDF	Ultra high frequency direction-finding station
UFN	Until further notice
UHDT	Unable higher due traffic
UHF‡	Ultra high frequency [300 to 3 000 MHz]
UIC	Upper information centre
UIR‡	Upper flight information region
ULM	Ultra light motorized aircraft
ULR	Ultra long range
UNA	Unable
UNAP	Unable to approve
UNL	Unlimited
UNREL	Unreliable
UP	Unidentified precipitation *(used in automated METAR/SPECI)*
U/S	Unserviceable
UTA	Upper control area
UTC‡	Coordinated Universal Time

V

. . . V . . .	Variations from the mean wind direction *(preceded and followed by figures in METAR/SPECI, e.g. 350V070)*
VA	Heading to an altitude
VA	Volcanic ash
VAAC	Volcanic ash advisory centre
VAC . . .	Visual approach chart *(followed by name/title)*
VAL	In valleys
VAN	Runway control van
VAR	Magnetic variation
VAR	Visual-aural radio range
VASIS	Visual approach slope indicator systems
VC . . .	Vicinity of the aerodrome *(followed by FG = fog, FC = funnel cloud, SH = shower, PO = dust/sand whirls, BLDU = blowing dust, BLSA = blowing sand, BLSN = blowing snow, DS = duststorm, SS = sandstorm, TS = thunderstorm or VA = volcanic ash, e.g. VCFG = vicinity fog)*
VCY	Vicinity
VDF	Very high frequency direction-finding station
VER	Vertical
VFR‡	Visual flight rules
VHF‡	Very high frequency [30 to 300 MHz]
VI	Heading to an intercept
VIP‡	Very important person

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VIS	Visibility
VLF	Very low frequency [3 to 30 kHz]
VLR	Very long range
VM	Heading to a manual termination
VMC‡	Visual meteorological conditions
VNAV†	*(to be pronounced "VEE-NAV")* Vertical navigation
VOL . . .	Volume *(followed by I, II . .)*
VOLMET†	Meteorological information for aircraft in flight
VOR‡	VHF omnidirectional radio range
VORTAC†	VOR and TACAN combination
VOT	VOR airborne equipment test facility
VPA	Vertical path angle
VPT	Visual manoeuvre with prescribed track
VRB	Variable
VSA	By visual reference to the ground
VSP	Vertical speed
VTF	Vector to final
VTOL	Vertical take-off and landing
VV . . .	Vertical visibility *(followed by figures in METAR/SPECI and TAF)*

W

W	West *or* western longitude
W	White
W . . .	Sea-surface temperature *(followed by figures in METAR/SPECI)*
WAAS†	Wide area augmentation system
WAC . . .	World Aeronautical Chart — ICAO 1:1 000 000 *(followed by name/title)*
WAFC	World area forecast centre
WB	Westbound
WBAR	Wing bar lights
WDI	Wind direction indicator
WDSPR	Widespread
WED	Wednesday
WEF	With effect from *or* effective from
WGS-84	World Geodetic System — 1984
WI	Within
WID	Width *or* wide
WIE	With immediate effect *or* effective immediately
WILCO†	Will comply
WIND	Wind
WIP	Work in progress
WKN	Weaken *or* weakening
WNW	West-north-west
WO	Without
WPT	Way-point
WRNG	Warning
WS	Wind shear
WSPD	Wind speed
WSW	West-south-west
WT	Weight
WTSPT	Waterspout
WWW	Worldwide web
WX	Weather
WXR	Weather radar

X

X	Cross
XBAR	Crossbar *(of approach lighting system)*
XNG	Crossing
XS	Atmospherics

Y

Y	Yellow
YCZ	Yellow caution zone *(runway lighting)*
YES*	Yes (affirmative) *(to be used in AFS as a procedure signal)*
YR	Your

Z

Z	Coordinated Universal Time *(in meteorological messages)*

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