MET Guide

Aeronautical Meteorological Information

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GLOSSARY OF TERMS

- ACC: Area control centre.
- AIREP: Air-report. See code.
- AEMET: Spanish State Meteorological Agency.
- AESA: Spanish Aviation Safety and Security Agency.
- AFTN: Aeronautical fixed telecommunication network.
- AIP: Aeronautical information publication.
- AIRMET: Warnings for low-level flights. See code.
- AMA: Aeronautical meteorological self-service.
- ANSMET: National Authority for Meteorological Supervision.
- ARS: Designator for special AIREP message
- ATS: Air traffic service.
- DGAC   Spanish civil aviation authority.
- EMAe   Aeronautical meteorological station.
- ENAIRE: Air navigation and aeronautical information service provider in Spain.
- FIR: Flight information region.
- FL: Flight level.
- GAMET: Area forecast for low-level flights. See code.
- IATA: International Air Transport Association.
- ICAO: International Civil Aviation Organization (ICAO).
- METAR: Aerodrome routine meteorological report. See code.
- METAR AUTO: METAR containing fully automated observations. See code.
- MSG: Meteosat second generation.
- OMAe: Aerodrome meteorological office.
- OMD: Defense meteorological office.
- OPCU: Single european sky programme office.
- OVM: Meteorological watch office (MWO).
- RSS: Rapid scan service.
- RVR: Runway visual range.
- SAA: Aeronautical applications service.
- SIGMET: Warnings on en-route significant weather phenomena. See code.
- SIGWX: Chart of significant weather forecast for low-level flights.
- SPECI: Aerodrome special meteorological report. See code.
- TAF: Aerodrome forecast. See code.
- TMA: Terminal manoeuvring area.
- TREND: Tendency forecast . See code.
- UIR: Upper information region.
- UTC: Coordinated Universal Time.
- WAFC: World area forecast centre.
- WMO: World Meteorological Organization.

AERONAUTICAL METEOROLOGICAL SERVICE

The State Meteorological Agency of Spain (AEMET) operates under the Ministry for the Ecologic Transition through the State Secretary of Environment. The responsibility for the meteorological service, assigned to the Spanish State in the Article 149, 20th of the Spanish Constitution, is carried out by AEMET. The Article 8 of the *Real Decreto 186/2008*, on February 8th, in which the Statute of AEMET is approved, grants to AEMET the provision of weather and climate-related services, as well as the support to public and private activities entrusted to the Agency.

Therefore, as aeronautical meteorological authority in Spain, AEMET has the responsibility for providing weather-related services to support the air navigation in order to contribute to the safety, regularity and efficiency of air traffic.

Therefore, AEMET assumes the following responsibilities, among others:

- The provision of the necessary weather observation, watch, and forecast services in order to contribute to safety, regularity and efficiency air traffic.

- The provision of weather information to aviation users necessary to carry out their functions.

AEMET represents Spain at the World Meteorological Organization (WMO), as well as at the weather and communication groups of the International Civil Aviation Organization (ICAO). Every aeronautical weather-related product generated or internationally received by AEMET is disseminated by its Message Commutation System to AEMET's offices, to the Aeronautical Fixed Telecommunication Network (AFTN) through the leading air navigation and aeronautical information service provider in Spain (ENAIRE), to international weather databases, to the Aeronautical Meteorological Self-service (AMA), and to other aeronautical users.

In order to fulfil to the Single European Sky (SES) regulations, AEMET is immersed in a process to improve different products and services that are offered to aeronautical users, ensuring high quality procedures, updating all their systems and guaranteeing the availability and punctuality of the weather information provided.

In this context, AEMET now presents an updated version of the MET Guide for aeronautical meteorological information. This Guide includes updated information about the products and services provided by AEMET to all aeronautical users, making easy the access to information and available data. This guide shows the structure of AEMET units related to aeronautical meteorological services and the variety of products available for aeronautical users.

Aeronautical Applications Service
Single European Sky Programme Office

ORGANIZATION OF THE AERONAUTICAL METEOROLOGICAL SERVICE

Almost every single unit in AEMET (communications, equipment, observation, etc.) carries out tasks in order to support air navigation, although direct support comes from Aeronautical Meteorological Stations (EMAe), Aerodrome Meteorological Offices (OMAe), Meteorological Watch Offices (OVM), the Aeronautical Application Service (SAA), and the Single European Sky Programme Office (OPCU).

AERONAUTICAL METEOROLOGICAL STATIONS (EMAe)

AEMET provides the observational service at the aerodromes through the observational staff at the EMAe and the equipments installed in the aerodromes.

According to Annex 3 (ICAO), measurements of different meteorological variables are carried out (wind speed and direction, visibility, runway visual range, cloud amount, weather phenomena, temperature and atmospheric pressure).

Automatic measurements, amongst which are wind speed and direction, runway visual range, height of cloud base, vertical visibility, temperature, humidity and atmospheric pressure, are obtained through different installed sensors, in accordance to the specifications from ICAO and WMO.

The aerodrome observational products are the following:
- METAR or METAR AUTO
- SPECI
- Lightning detection warnings
- Different meteorological variable data measured by sensors

Measurements obtained by wind, temperature and pressure sensors are sent to the aerodrome control tower, where a graphical representation of the following variables is available in each control panel:
- Wind speed and direction in every runway.
- Instantaneous wind velocity.
- 2-minute averaged wind speed.
- Wind gusts.
- Instantaneous aerodrome temperature.
- Aerodrome QNH.

Besides more than 40 EMAe, AEMET has 7 Defence Meteorological Offices (OMD) located in military aerodromes open to civil aviation. There are also several aerodromes and heliports with automatic equipment which provide weather information 24 hours a day (see Annex I).

The necessary weather service to carry out airport operations is provided by these offices. The beneficiaries of this service are flight crew members, air traffic services units and airport managements. Some of their duties are the following:

- Maintain continuous monitoring of the aerodrome weather, in order to warn aerodrome authorities of severe weather conditions that may have an impact on aircrafts on land, facilities or aerodrome services.

- Perform regular weather observations in the aerodrome with a fixed frequency (usually every thirty minutes), as well as special observations when substantial changes occur related to surface wind speed or direction, visibility, etc.

- Prepare ordinary and special coded reports (METAR-SPECI) based on observations that are disseminated, almost instantaneously, to every aeronautical user in the world.

ORGANIZATION OF THE AVIATION METEOROLOGICAL SERVICE

AERONAUTICAL METEOROLOGICAL STATIONS (EMAe)

- Make the aerodrome warnings for Spain available to users
- Provide meteorological information (consultation and flight documentation) to aeronautical users operating in the aerodrome: operators, flight crew members, air traffic services units and airport managements
- Coordinate the institutional representation before the airport authorities
- Collect the specific requirements and needs from aeronautical users

See the section "Meteorological information available at EMAe" for more information.

AERODROME METEOROLOGICAL OFFICES (OMAe)

Units responsible for the meteorological and forecast and watch that affect the operation of an aerodrome.

AEMET has 5 OMAe providing meteorological suport for the aerodromes located in their geographical area: Madrid (central region), Santander (north region), Sevilla (south region), Valencia (east region) and Las Palmas (Canary region).

Entrusted competences:

- Continuous meteorological monitoring of the aerodromes under their charge and of the airspace of their coverage area, preparing and disseminating the corresponding meteorological warnings.

- Elaboration of the aerodrome forecast (TAF), with a validity of 24 or 30 hours.

- Elaboration of landing forecast (TREND) and forecast for take-off (in case of agreement with operators).

- Meteorological information support to air traffic units and general aviation.
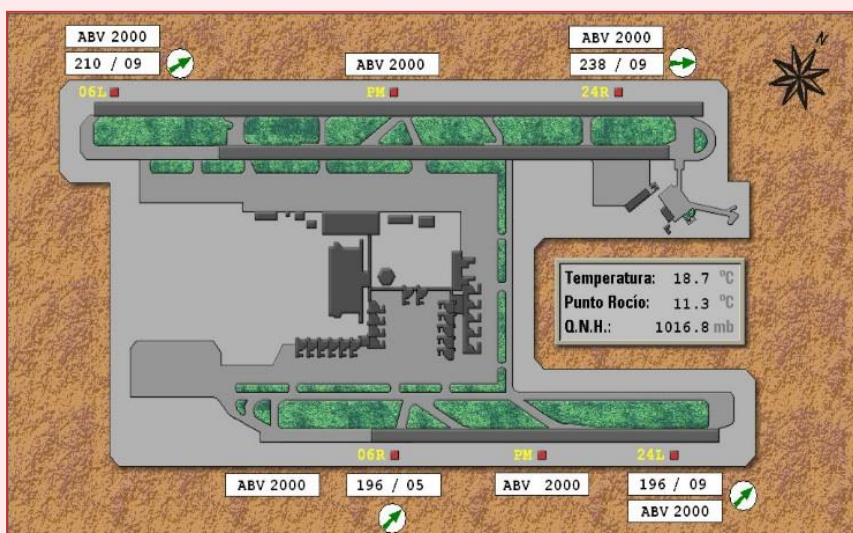
ORGANIZATION OF THE AVIATION METEOROLOGICAL SERVICE

METEOROLOGICAL WATCH OFFICES (OVM)

Units in charged of the forecast and watching of weather phenomena that may affect air traffic operations in the FIR/UIR in Spain.

AEMET has two OVM:

- Valencia OVM (Madrid FIR/UIR and Barcelona FIR/UIR)

- Las Palmas OVM (Canary Islands FIR/UIR).

Both OVM are entrusted with the following tasks:

- Elaboration and dissemination of:

    - Meteorological warnings of either real or expected severe weather conditions (SIGMET) that may have an impact on any flight level in the corresponding FIR/UIR.

    - Meteorological warnings of either real or expected severe weather conditions that may have an impact on low flight level (AIRMET) in the corresponding FIR.

    - Area forecast for low-level flights (GAMET).

    - Global forecasts of significant weather phenomena (SIGWX, from surface to FL150).

- Dissemination of special AIREP (air-report) based on information received by the area control centres to which aircrafts send the information.

ORGANIZATION OF THE AVIATION METEOROLOGICAL SERVICE

AERONAUTICAL APPLICATIONS SERVICE (SAA)

The Aeronautical Applications Service (SAA), under Single European Sky Programme Office (OPCU), actively participates in the provision of meteorological support to air navigation in order to cooperate in the safety, security, efficiency and economy of its activities.

The SAA is responsible for:

- Supervising the meteorological activities for air navigation.
- Applying the updated national and international regulations related to the meteorological service for air navigation through the elaboration of procedures, instructions, guides, technical specifications, etc., that must be fulfilled by the corresponding operational units (OMAe, EMAe, OVM).
- Promoting and taking part in training, updating and specialization courses.
- Taking part in workgroups with aeronautical users.
- Designing products of aeronautical meteorology necessary for both operational meteorology and user requests.
- Participating in the preparation of the necessary regulations for the proper functioning of AEMET aeronautical offices and monitor the fulfillment of the criteria that regulate the coding and emission of aeronautical products, establishing the necessary control procedures, and making the periodic reports that are established.
- Representation of AEMET in the aeronautical meteorology commissions of WMO and ICAO, among others.
- Managing the maintenance and improvement of the Aeronautical Meteorological Self-service (AMA).

SINGLE EUROPEAN SKY PROGRAMME OFFICE (OPCU)

This office is in charge of the following duties:

- Relationship with the following aeronautical users:
    - Air operators.
    - Airport managers.
    - Air navigation service providers.
    - Proffesional associations (pilots, airlines, air traffic controllers, etc.)
    - Civil aviation authorities (ICAO, DGAC and AESA) and ANSMET.
- Supervising the correct application of national and international aeronautical regulations related to the provision of meteorological services for air navigation.
- Coordinating processes of certification and audit carried out by ANSMET.
- Negotiating agreements with aeronautical users and other air navigations service providers.
- Organization of technical sessions of aeronautical meteorology about any topic of interest to users in order to meet their needs.
- Evaluating the grade of satisfaction of the users with respect to the provided services in order to set up actions to improve the service, as well as collecting and processing new provisions of services.

AERONAUTICAL METEOROLOGICAL SELF-SERVICE (AMA)
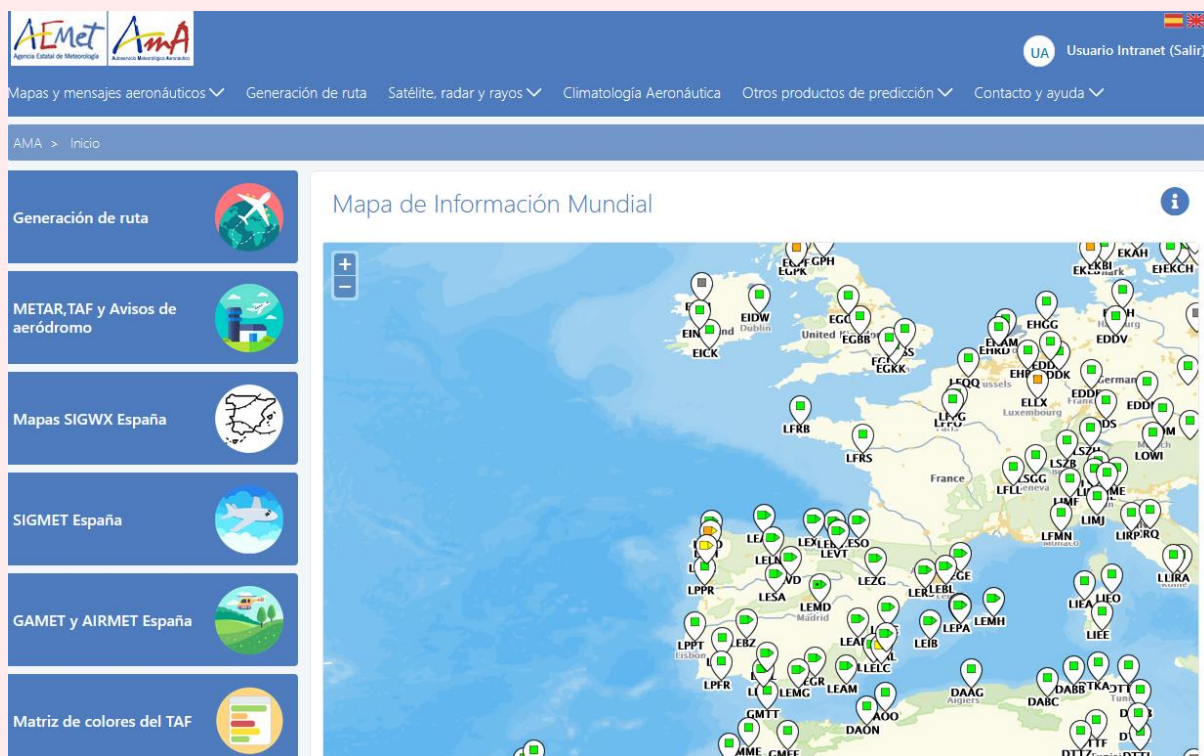
WHAT IS AMA?

AMA is a web service provided by AEMET that allows the aeronautical user to have access to updated reports and forecasts of aerodromes and areas, which inform about the current and expected weather during the flight. AMA is not a database, so old data and old charts are not stored.

HOW TO ACCESS AMA?

Aeronautical users can access AMA through the website http://ama.aemet.es, after registering by completing a registration form available on the same website.

WHAT INFORMATION IS AVAILABLE ON AMA?

Users have granted access to the following products:

- The latest METAR, SPECI and TAF reports from aerodromes around the world, available in AEMET databases, as well as SIGMET, including those for volcanic ash and tropical cyclone, from FIR regions around the world.

- GAMET and AIRMET information, wind, temperature and humidity charts at different levels, and en-route significant weather charts of the Iberian Peninsula, the Balearic Islands and Melilla, and the Canary Islands, prepared by AEMET.

- Aerodrome warnings for Spanish aerodromes.

- Teledetection: satellite images (visible, IR, water vapor, wind, cloud type, etc.), radar and lightning images on Spain.

- Previously generated and saved routes for flight planning.

- Charts with forecasts of different significant meteorological variables for aviation in Spain: precipitation, composed clouds, QNH, and surface pressure charts.

- Height of cloud tops, freezing level, wind shear, and expected lightning in TMA.

- Air-report (AIREP) from aound the world.

- Information about Airports in Spain.

- Advisory information on space weather phenomena.

AERONAUTICAL METEOROLOGICAL SELF-SERVICE (AMA)

- Significant weather charts, wind and temperature charts, and humidity charts, in altitude for four runs times (0Z, 6Z, 12Z, 18Z), three forecast ranges (H+12, H+18, H+24), for the specified areas and levels of the following ICAO regions:

  a) EUR (Europe): Significant weather, tropopause and maximum wind speed FL100-450

   Wind and temperature in 17 levels, from FL050 to FL530

   Humidity in 5 levels, from FL050 to FL180

  b) EURAFI (Europe-Africa): Significant weather, tropopause and maximum wind speed FL250-630

   Wind and temperature in 17 levels, from FL050 to FL530

   Humidity in 5 levels, from FL050 to FL180

  c) NAT (North Atlantic): Significant Weather, tropopause and maximum wind speed FL250-630

   Wind and temperature in 17 levels, from FL050 to FL530

   Humidity in 5 levels, from FL050 to FL180

  d) MID (Middle East): Significant Weather, tropopause and maximum wind speed FL100-450

   Wind and temperature in 17 levels, from FL050 to FL530

   Humidity in 5 levels, from FL050 to FL180

  e) EURSAM (Europe-South America): Significant Weather, tropopause and maximum wind speed FL250-630

   Wind and temperature in 17 levels, from FL050 to FL530

   Humidity in 5 levels, from FL050 to FL180

  f) ASIA (Asia): Significant Weather, tropopause and maximum wind speed FL250-630

   Wind and temperature in 17 levels, from FL050 to FL530

   Humidity in 5 levels, from FL050 to FL180
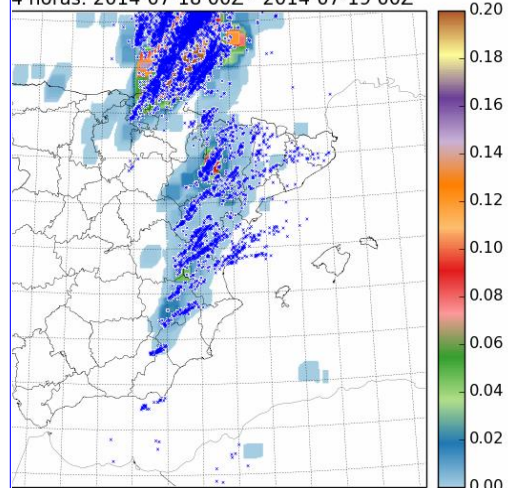
Additional information

It is possible to get access, through different links, to additional meteorological information that could help to achieve a better flight planning or interpret any received documentation. For example, the following:

- ICAO located codes for countries , FIR and aerodromes, and IATA codes.

- A guide to understand the aeronautical meteorological information available in AMA, as well as the services provided by AEMET to the aeronautical users.

- Aeronautical climatologies of Spanish aerodromes.

- Decoding of METAR, TAF and aerodrome warnings to natural language.

- Help tutorials.

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Viento y temperatura
Nivel FL150
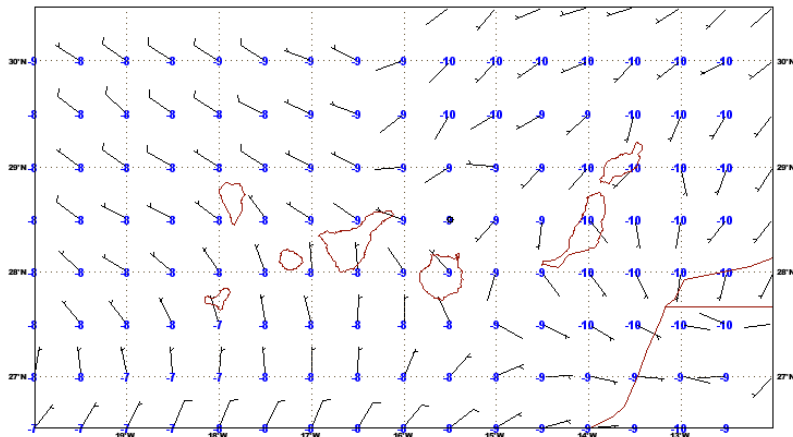
NIE: Rayos estimados (rayos/h/km^2)
24 horas: 2014-07-18 00Z - 2014-07-19 00Z

AERONAUTICAL CLIMATOLOGICAL INFORMATION AND AERODROME METEOROLOGICAL GUIDE

Aeronautical climatology: Meteorological information product that presents the average conditions of meteorological variables of interest for aeronautical users at a specific aerodrome.
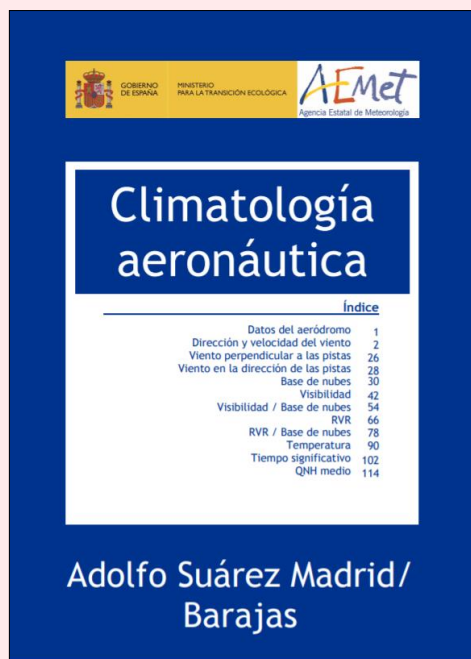
The relative frequencies and mean values of the following meteorological variables are presented in data table format:

• Wind velocity, plus its components parallel and perpendicular to the runway.

• Visibility.

• Runway visual range (RVR).

• Height of the lowest layer of clouds that covers more than half of the sky.

• Temperature.

• Mean QNH.

• Significant weather phenomena: precipitation, thunderstorms and causes of visibility reduction to 5000 m or below.

Aerodrome meteorological guide: Meteorological information product that presents potentially adverse meteorological phenomena in the operation of an aerodrome.

In the context of impact-oriented meteorology in an aerodrome the following should be noted:

• Impact phenomenom: meteorological phenomenom considered adverse in the operational framework of an aerodrome. Examples: windshear, fog, etc.

• Vulnerability: degree of predisposition of an aerodrome to be affected by the occurrence of an impact phenomenon.

• Impact: modification of the socioeconomic environment of an aerodrome due to the occurrence of an impact phenomenon. Examples: arrival regulations, activation of low visibility procedures, etc.

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Climatología aeronáutica

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Adolfo Suárez Madrid/Barajas

WS
TS
FG
+ SHRA

Guía Meteorológica de Aeródromo:
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AERODROME OBSERVATION (METAR/SPECI)

METAR: Aerodrome routine meteorological report. It is issued in intervals of either 30 minutes or one hour.
SPECI: Aerodrome special meteorological report. It is issued at any time if some criteria are fulfilled.

$$\left.\begin{array}{c}\text{METAR}\\ \text{or}\\ \text{SPECI}\end{array}\right\} \; CCCC \;\; YYGGgg\textbf{Z} \;\; \textbf{AUTO} \;\; dddff\textbf{G}f_mf_m\textbf{KT} \;\; d_nd_nd_n\textbf{V}d_xd_xd_x \;\; \left\{\begin{array}{c}VVVV\\ \text{or}\\ \textbf{CAVOK}\end{array}\right. \;\; V_NV_NV_NV_ND_V \;\; RD_RD_R/V_RV_RV_RV_Ri \;\; w'w' \;\; \left\{\begin{array}{c}N_SN_SN_Sh_Sh_Sh_S[cc]\\ \text{or}\\ \textbf{VV}h_Sh_Sh_S\\ \text{or}\\ \textbf{NSC}\end{array}\right.$$

$$T'T'/T'_dT'_d \;\; \textbf{Q}P_HP_HP_HP_H \;\; \textbf{RE}w'w' \;\; \left\{\begin{array}{c}\textbf{WS }RD_RD_R\\ \text{or}\\ \textbf{WS ALL RWY}\end{array}\right. \;\; \textbf{TREND} \text{ (see forecast)} \;\;\;\; \textbf{(RMK...)}$$

NOTE 1: METAR COR or SPECI COR is used for a corrected METAR or SPECI.
NOTE 2: The groups enclosed in brackets are used in accordance with regional or national decisions.

SPECIFICATIONS OF SYMBOLIC LETTERS

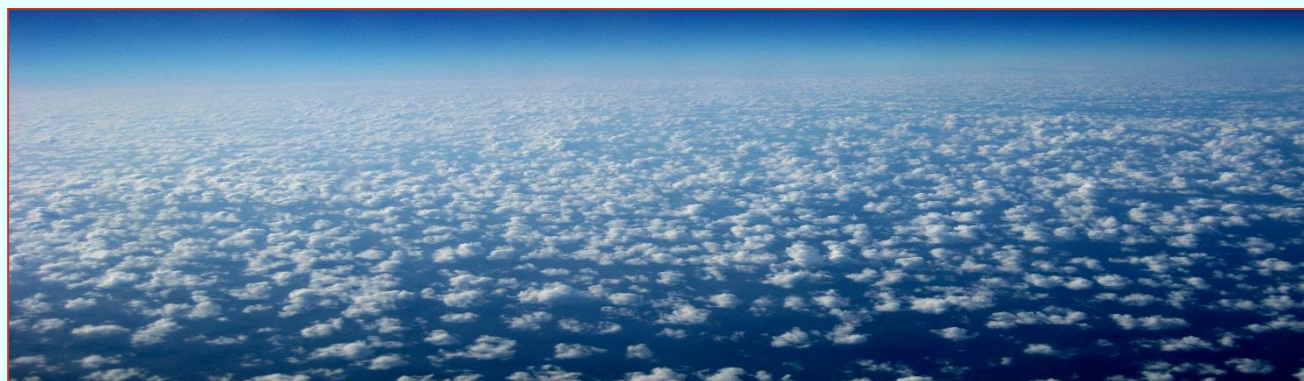|		
CCCC		**ICAO location indicator of the aerodrome.**
YYGGgg**Z**		**The day of the month and the time of observation in hours and minutes UTC.**
	YY	Day of the month.
	GGgg**Z**	Time of observation in hours and minutes followed by the letter Z (UTC).
AUTO		**The optional code word AUTO shall be inserted before the wind group when a report contains fully automated observations without human intervention (see METAR AUTO)**
dddff**G**f_mf_m**KT**		**Surface wind**
	ddd	Mean true direction in degrees rounded off to the nearest 10 degrees from which the wind is blowing. VRB (Variable): - ff < 3 kt and variation in ddd ≥ 60º or - ff ≥ 3 kt and variation in ddd ≥ 180º or undetermined wind direction
	ff	Mean speed of the wind over the 10-minute period immediately preceding the observation (knot is the reporting unit in Spain).
	G	Gust indicator
	f_mf_m**KT**	Maximum wind velocity in KT over the 10-minute period immediately preceding the observation. It must obey : $f_mf_m \geq$ ff + 10 KT.
d_nd_nd_n**V**d_xd_xd_x		**Total variation in wind direction** If, during the 10-minute period preceding the observation, the total variation in wind direction is 60°≤ variation ddd < 180° and the mean wind speed is ≥ 3 KT. V is the group separator.
VVVV		**Prevailing visibility or minimum visibility** Prevailing visibility, or minimum visibility when the visibility is fluctuating rapidly and the prevailing visibility cannot be determined. Visibility shall be reported as 9999 indicating 10 km or above.
CAVOK		**Code word CAVOK** The code word CAVOK shall be included in place of the groups of visibility, RVR, significant weather and cloud amount or vertical visibility when the following conditions occur simultaneously at the time of observation: a) Visibility reported in the group VVVV is 10 km or more and criteria for inclusion of the group $V_NV_NV_NV_ND_v$ are not met. b) No cloud below 1500 metres (5000 ft) or below the highest minimum sector altitude, whichever is greater, and no cumulonimbus and no towering cumulus. c) No significant weather phenomena.

AERODROME OBSERVATION (METAR/SPECI)

SPECIFICATIONS OF SYMBOLIC LETTERS

$V_NV_NV_NV_ND_v$		**Minimum visibility**
	$V_NV_NV_NV_N$	When the horizontal visibility is not the same in different directions and when the minimum visibility is different from the prevailing visibility, and less than 1500 m or less than 50% of the prevailing visibility, and less than 5000 m.
	D_v	Direction of minimum visibility with respect to one of the eight directions of the compass (if known)
$RD_RD_R/V_RV_RV_RV_Ri$		**Runway Visual Range (RVR)**
	R	Group indicator.
	D_RD_R	Runway designator (parallel runways should be distinguished by appending L = Left, C = Centre or R = Right).
	$V_RV_RV_RV_R$	Mean value of RVR over the 10-minute period immediately preceding the observation (in meters).
	i	Tendency of RVR over the 10-minute period immediately preceding the observation. If the runway visual range values during the 10-minute period preceding the observation show a distinct upward or downward tendency such that the mean during the first five minutes varies by 100 metres or more from the mean during the second five minutes of the period, this shall be indicated by i = U for upward and i = D for downward tendency of runway visual range values. When no distinct change in runway visual range is observed, i = N shall be used.
		Extreme values of runway visual range
		When actual RVR values are outside the measuring range of the observing system in use, the following procedure shall apply:
		a) When the RVR is greater than the maximum value which can be assessed with the system in use, the group $V_RV_RV_RV_R$ shall be preceded by the letter indicator P ($PV_RV_RV_R$) in which $V_RV_RV_RV_R$ is the highest value which can be assessed. When the RVR is assessed to be more than 2000 m, it shall be reported as P2000.
		b) When the RVR is below the minimum value which can be assessed with the system in use, the group $V_RV_RV_RV_R$ shall be preceded by the letter indicator M ($MV_RV_RV_R$) in which $V_RV_RV_RV_R$ is the lowest value which can be assessed. When the RVR is assessed to be less than 50 m, it shall be reported as M0050.
w'w'		**Present weather phenomena observed at or near the aerodrome**
		(See table 1)
		The w'w' group is formed by: intensity or proximity + descriptor + weather phenomenon.
		Up to three different groups can be included.
$N_sN_sN_sh_sh_sh_s[cc]$		**Cloud amount and cloud height (up to 4 groups)**
	$N_sN_sN_s$	Cloud amount: FEW (few) = 1 to 2 oktas, SCT (scattered) = 3 to 4 oktas, BKN (broken) = 5 to 7 oktas, OVC (overcast) = 8 oktas.
	$h_sh_sh_s$	Height of cloud base in steps of 100 ft.
	cc	Cloud type. Significant convective clouds CB (cumulonimbus) or TCU (cumulus congestus of great vertical extent).
$VVh_sh_sh_s$		**Vertical visibility**
		It replaces the cloud amount group when the sky is obscured and information on vertical visibility is available.
	VV	Group indicator.
	$h_sh_sh_s$	Vertical visibility in units of hundreds of feet. When the sky is obscured and information on vertical visibility is not available the group shall read ///.
NSC		If there are no clouds below CAVOK reference height, no CB and no TCU, and no restriction on vertical visibility, and the abbreviation CAVOK is not appropriate, then the abbreviation NSC shall be used.

AERODROME OBSERVATION (METAR/SPECI)

SPECIFICATIONS OF SYMBOLIC LETTERS

T'T'/T'$_d$T'$_d$	T'T' T'$_d$T'$_d$	**Temperature and dew-point temperature** Observed air temperature rounded to the nearest whole degree Celsius Observed dew-point temperature rounded to the nearest whole degree Celsius. Temperatures below 0°C shall be immediately preceded by M.
QP$_H$P$_H$P$_H$P$_H$	Q P$_H$P$_H$P$_H$P$_H$	**QNH** Group indicator. QNH value rounded down to the nearest whole hectopascal.
REw'w'	RE w'w'	Recent weather phenomena of operational significance. (up to 3 groups) Group indicator. Weather phenomena observed during the period since the last routine report, or last hour, whichever is shorter, but not at the time of observation. No intensity of the recent weather phenomena shall be indicated. Abbreviations from Table 1 shall be used for the following phenomena: - Freezing precipitation: REFZDZ, REFZRA - Moderate or heavy precipitation (including showers): REDZ, RESG, RERA, RESN, RESHRA, RESHSN, RERASN, RESHGR, RESHGS, REPL - Blowing snow: REBLSN - Sandstorm or duststorm: REDS, RESS - Thunderstorm: RETS, RETSRA, RETSSN, RETSGR, RETSGS - Funnel cloud(s) (tornado or waterspout): REFC - Volcanic ash: REVA When an automatic observing system is used and when the type of the precipitation cannot be identified by this system, the abbreviation REUP shall be used for recent precipitation.
WS RD$_R$D$_R$ o WS ALL RWY	WS RD$_R$D$_R$ ALL RWY	**Wind shear in the layer below 500 meters** Group indicator. Runway indicator and runway designator (L= Left, C= Center, R= Right). If the wind shear along the take-off path or approach path is affecting all runways in the airport.
TREND		See TREND code.
RMK…		Denotes the beginning of a section containing information included by national decision which shall not be disseminated internationally.

AERODROME OBSERVATION (METAR/SPECI)

TABLE 1   w'w': PRESENT AND FORECAST SIGNIFICANT WEATHER

QUALIFIER		WEATHER PHENOMENA		
INTENSITY OR PROXIMITY 1	DESCRIPTOR 2	PRECIPITATION 3	OBSCURATION 4	OTHER 5
- Light Moderate (no qualifier) + Heavy (well developed in the case of dust/sand) and funnel clouds) VC In the vicinity	MI Shallow BC Patches PR Partial (covering part of the aerodrome) DR Low drifting (height < 2 m) BL Blowing (height ≥ 2 m) SH Shower(s) TS Thunderstorm FZ Freezing (supercooled)	DZ Drizzle RA Rain SN Snow SG Snow grains PL Ice pellets GR Hail GS Small hail and/or snow pellets	BR Mist FG Fog FU Smoke VA Volcanic ash DU Widespread dust SA Sand HZ Haze	PO Dust/sand whirls (dust devils) SQ Squalls FC Funnel cloud(s) (tornado or waterspout) SS Sandstorm DS Duststorm

The w´w´ groups shall be constructed by considering columns 1 to 5 in the table above in sequence, that is, intensity, followed by description, followed by weather phenomena. Example: +SHRA (heavy shower(s) of rain).
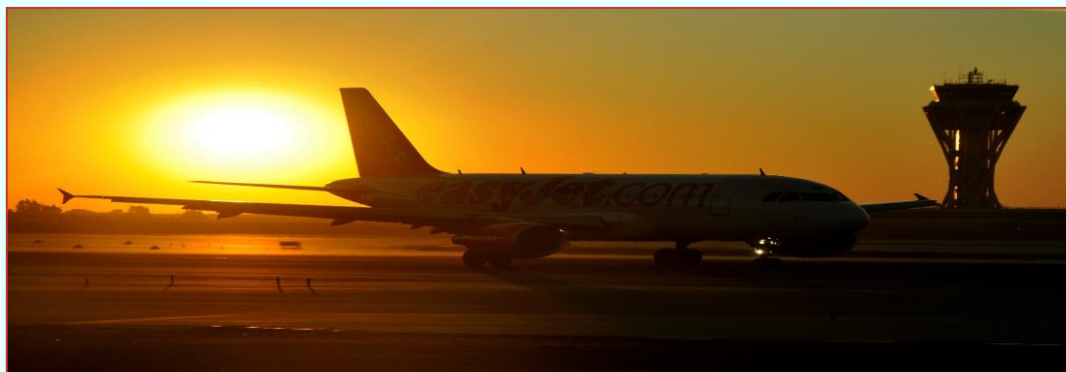
AERODROME OBSERVATION (METAR/SPECI AUTO)

METAR: : Aerodrome routine meteorological report with fully automated observations. It is issued every half hour.

$$\left.\begin{array}{c}\textbf{METAR}\\ \text{or}\\ \textbf{SPECI}\end{array}\right\} \text{CCCC YYGGgg}\textbf{Z} \ \textbf{AUTO} \ \text{ddddff}\textbf{G}f_mf_m\textbf{KT} \ d_nd_nd_n\textbf{V}d_xd_xd_x \left\{\begin{array}{c}\text{VVVV} \ V_NV_NV_NV_ND_V \ \textbf{R}D_RD_R/V_RV_RV_RV_Ri \ \ w'w'\\ \\ \text{or}\\ \\ \textbf{CAVOK}\end{array}\right. \left\{\begin{array}{c}N_SN_SN_Sh_Sh_Sh_S \ \text{or}\\ N_SN_SN_Sh_Sh_Sh_S/// \ \text{and/} \left[\begin{array}{c}\textbf{///TCU}\\ \textbf{///CB}\end{array}\right] \text{or}\\ \textbf{VV}h_Sh_Sh_S \ \text{or}\\ \textbf{VV}/// \ \text{or}\\ \textbf{NSC} \ \text{or}\\ \textbf{NCD}\end{array}\right\}$$

T'T'/T'$_d$T'$_d$ Q$P_HP_HP_HP_H$ RE$w'w'$ (RMK...)

SPECIFICATIONS OF SYMBOLIC LETTERS
(METAR AUTO symbols that are identical to those of METAR have the same meaning)

AUTO		Meteorological report with fully automated observations
w'w'		**Present weather phenomena observed at or near the aerodrome** (see Table 2). The w'w' group is formed by: intensity or proximity + descriptor + weather phenomenon. Up to three different groups can be included.
$N_SN_SN_Sh_Sh_Sh_S$	$N_SN_SN_S$ $h_Sh_Sh_S$	**Cloud amount and cloud height** Cloud amount: FEW (few) = 1 to 2 oktas, SCT (scattered) = 3 to 4 oktas, BKN (broken) = 5 to 7 oktas, OVC (overcast) = 8 oktas. Height of cloud base in steps of 100 ft.
$N_SN_SN_Sh_Sh_Sh_S///$		Symbols /// mean that there are convective clouds (TCU or CB) but it cannot be determined if they are linked to this layer.
///TCU		There are cumulus congestus of great vertical extent (TCU) but their amount and height cannot be determined
///CB		There are cumulonimbus clouds (CB) but their amount and height cannot be determined
$VVh_Sh_Sh_S$	**VV** $h_Sh_Sh_S$	**Vertical visibility** It replaces the cloud group when the sky is obscured and information on vertical visibility is available. Group indicator. Vertical visibility in hundreds of feet.
VV///		Vertical visibility whose height cannot be determined.
NSC		If there are no clouds below CAVOK reference height, no CB, no TCU and no restriction on vertical visibility, and the abbreviations CAVOK is not appropriate
NCD		No clouds are detected.

AERODROME OBSERVATION (METAR/SPECI AUTO)

TABLE 2	w'w': PRESENT SIGNIFICANT WEATHER FOR METAR AUTO		
QUALIFIER		WEATHER PHENOMENA	
INTENSITY OR PROXIMITY 1	DESCRIPTOR 2	PRECIPITATION 3	OBSCURATION 4
- Light Moderate (no qualifier) + Heavy VC In the vicinity	BC Patches SH Shower(s) TS Thunderstorm FZ Freezing (supercoooled)	DZ Drizzle RA Rain SN Snow GR Hail GS Small hail and/or snow pellets UP Unknown precipitation	BR Mist FG Fog FU Smoke DU Widespread dust HZ Haze

The w'w' groups shall be constructed by considering columns 1 to 4 in the table above in sequence, that is, intensity, followed by description, followed by weather phenomena. Example: +SHRA (heavy shower(s) of rain).

Comments on METAR AUTO

• The optional code word AUTO is inserted before the wind group when a report contains fully automated observations without human intervention.

• ICAO requirement is that all of the specified elements shall be reported. However, if any element cannot be observed, the group in which it would have been encoded shall be replaced by the appropriate number of solidi. The number of solidi depends on the number of symbolic letters for the specific group which is not able to be reported.

The coding of the groups is the same as in the non-automatic METAR. The abbreviations that are specific to the automatic METAR are the following:

▪ **UP:** When an automatic observing system is used and when the type of the precipitation cannot be identified by this system, the abbreviation UP is used for precipitation. The abbreviation UP may be combined, as necessary, with the following present weather: FZ (freezing) and TS (thunderstorm).

▪ **NCD:** When an automatic observing system is used and no clouds are detected by that system.

▪ **REUP, REFZUP, RETSUP:** For recent precipitation when an automatic observing system is used and when the type of the precipitation cannot be identified by this system.

▪ When cumulonimbus clouds or towering cumulus clouds are detected by the automatic observing system and the cloud amount and/or the height of cloud base cannot be observed, the cloud amount and/or the height of cloud base are replaced by /// (e.g.: ///CB, ///TCU).

▪ When the automatic observing system cannot assign the type of convective cloud detected to a specific layer of clouds, the cloud type is replaced by /// (e.g.: SCT020/// BKN025/// ///CB).

▪ When information on vertical visibility is not available the group shall read VV///.

▪ //////: When the cloud sensor is out of order.

AERODROME OBSERVATION (METAR NIL)

METAR CCCC YYGGggZ NIL=

• The code **NIL** is placed right after the day/hour group in case of missing report.

TREND FORECAST (TREND)

TREND: It is a forecast for the next two hours from the time of the METAR or SPECI report. It contains concise information related to expected changes in weather conditions. This information is appended at the end of either a METAR or SPECI bulletin. The TREND informs about important changes in one or more of the following variables: Surface wind velocity, visibility, weather conditions and cloud amount or vertical visibility. If no change is expected the code word "NOSIG" is used.

$$\left\{ \begin{array}{c} TTTTT \\ \text{or} \\ \textbf{NOSIG} \end{array} \right\} \quad TTGGgg \quad dddffGf_mf_m\textbf{KT} \quad \left\{ \begin{array}{c} VVVV \left\{ \begin{array}{c} w'w' \\ \text{o} \\ \textbf{NSW} \end{array} \right. \\ \text{or} \\ \textbf{CAVOK} \end{array} \right\} \left\{ \begin{array}{c} N_sN_sN_sh_sh_sh_s(cc) \\ \text{or} \\ \textbf{VV}h_sh_sh_s \\ \text{or} \\ \textbf{NSC} \end{array} \right.$$

NOTE 1: Only the groups of expected significant changes are included. However, in the case of significant changes of the clouds, all cloud groups, including any significant layer(s) or masses not expected to change, shall be given.

NOTE 2: The specific value of any of the elements and the time given in the forecast shall be understood by the recipient to be the most probable value which the element is likely to assume during the period of the forecast and the most probable time of occurrence.

SPECIFICATIONS OF SYMBOLIC LETTERS

TTTTT	**Change indicator (BECMG or TEMPO) for one or several of the observed elements**
	BECMG: It is used to describe expected changes to meteorological conditions which reach or pass specified threshold criteria at either a regular or irregular rate.
	TEMPO: It is used to describe expected temporary fluctuations to meteorological conditions which reach or pass specified threshold criteria and last for a period of less than one hour in each instance and in the aggregate cover less than half of the forecast period during which the fluctuations are expected to occur.
TTGGgg	**Indicator (TT) and time group (GGgg).** Optional field.
	TT: FM (from), TL (until) or AT (at).
	GGgg: Time group (hours and minutes UTC).
dddffGf$_m$f$_m$**KT**	**Surface wind**
	It indicates changes in observed wind direction and/or mean speed, according to some specified thresholds, as well as those values that are relevant in the operational task.
VVVV	**Prevailing forecast visibility**
	It indicates important changes in prevailing visibility considering some specified thresholds.
	It is specified in meters. The value 9999 indicates 10 km or above.
w'w'	**Present weather phenomena**
	It indicates the onset, cessation or change in intensity of the weather phenomena shown in Table 1 (present and forecast significant weather for METAR or SPECI).
$N_sN_sN_sh_sh_sh_s$(cc) o **VV**$h_sh_sh_s$	**Cloud amount or vertical visibility**
	It indicates changes, according to some specific thresholds, in the height of the layer of clouds and/or the amount of clouds, or the vertical visibility.
CAVOK	**Code word CAVOK**
	It applies when:
	a) Visibility reported in the group VVVV is 10 km or more.
	b) No cloud below 1500 metres (5000 ft) and no CB and no TCU are present.
	c) No significant weather phenomena.
NSW	End of significant weather phenomena w'w'.
NSC	If there are no clouds below CAVOK reference height, no CB, no TCU and no restriction on vertical visibility, and the abbreviations CAVOK is not appropriate.
NOSIG	None of the significant forecast weather is expected to change during the forecast time

EXAMPLES OF METAR, METAR AUTO, SPECI AND TREND

EXAMPLE 1:   METAR without TREND

METAR COR	LEAM	141200Z	21009KT	6000	NSC	24/10	Q1008=
a	b	c	d	e	f	g	h

a: Type of message: corrected METAR.

b: ICAO location indicator: LEAM, Almería.

c: Day and hour of observation 141200Z: 14th of the current month at 1200 UTC.

d: Mean true direction and mean wind speed in 10 minutes: 210º and 9 kt.

e: Prevailing visibility: 6000 m.

f: Cloud height above 1500 m (5000 feet) or above CAVOK's reference height of the aerodrome, and no CB or TCU are present.

g: Temperature and dew-point temperature 24/10: temperature +24ºC, dew-point temperature +10ºC.

h: Mean sea-level pressure, in accordance with the International Standard Atmosphere (or QNH), 1008 hPa.

EXAMPLE 2:   METAR with TREND = NOSIG

METAR	LEZL	150800Z	06003KT 350V100	6000	2000E	R27/0900U	PRFG	OVC009	13/13	Q1022	NOSIG=
	a	b	c	d	e	f	g	h	I	j	k

a: ICAO location indicator: LEZL, Sevilla-San Pablo.

b: Day and hour of observation 150800Z: 15th of the current month at 0800 UTC.

c: Mean true direction and mean wind speed in 10 minutes: 60º variable between 350º y 100º; mean wind speed: 3 kt.

d: Prevailing visibility: 6000 m.

e: Minimum visibility: 2000 m to the East.

f: Runway visual range R27/0900U: 900 m at runway 27 and increasing.

g: Present significant weather PRFG: fog covering part of the aerodrome (Table 1).

h: Cloud amount and cloud height OVC009: overcast sky (8 oktas) with the cloud base at 900 feet.

i: Temperature and dew-point temperature 13/13: temperature +13ºC, dew-point temperature +13ºC.

j: QNH, Q1022: 1022 hPa.

k: Trend forecast NOSIG: no forecast significant change for the next 2 hours following the observation time (until 1000 UTC).

EXAMPLE 3:   METAR with TREND = NOSIG

METAR	LEBB	160930Z	03008KT	3000	TSGRRA	SCT015TCU	BKN022CB	09/06	Q0993	NOSIG=
	a	b	c	d	e	f	g	h	i	j

a: ICAO location indicator: LEBB, Bilbao.

b: Day and hour of observation 160930Z: 16th of the current month at 0930 UTC.

c: Mean true direction and mean wind speed in 10 minutes: 30º, 8 kt.

d: Prevailing visibility: 3000 m.

e: Present significant weather TSGRRA: moderate thunderstorm with both hail and rain, but prevailing hail (Table 1).

f: Cloud amount and cloud height SCT015TCU (1st layer): 3 to 4 oktas of tower of cumulus and the cloud base at 1500 feet.

g: Cloud amount and cloud height BKN022CB (2nd layer): 5 to 7 oktas of cumulonimbus and cloud base at 2200 feet.

h: Temperature and dew-point temperature 09/06: temperature +9ºC, dew-point temperature +6ºC.

i: QNH, Q0993: 993 hPa.

j: Trend forecast NOSIG: no forecast significant change for the next 2 hours following the observation time (until 1130 UTC).

EXAMPLES OF METAR, METAR AUTO, SPECI AND TREND

EXAMPLE 4:   METAR and TREND

METAR   LEST   201230Z   21010G25KT   180V250   2000   1200   R17/1300U   R35/P2000   +SHRA   FEW010CB
a   b   c   d   e   f   g   h   i   j
SCT017   BKN027   12/07   Q1002   RETS   WS R17   BECMG   7000   NSW   NSC=
k   l   m   n   o   p   q   r

a: ICAO location indicator: LEST, Santiago-Labacolla.

b: Day and hour of observation 201230Z: 20th of the current month at 1230 UTC.

c: Mean true direction and mean wind speed in 10 minutes: 210º, 10 kt, gusts of 25 kt.

d: Total variation of wind direction 180V250: during the 10 minutes preceeding the observation wind direction has varied from 180º to 250º, being the mean wind speed 10 kt.

e: Prevailing visibility: 2000 m.

f: Minimum visibility: 1200 m.

g: Runway visibility range R17/1300U: 1300 m at runway 17, increasing.

h: Runway visibility range R35/P2000: P letter is added to indicate more than 2000 m at the runway 35.

i: Present significant weather + SHRA: heavy showers of rain (Table 1).

j: Cloud amount and cloud height FEW010CB (1st layer): 1 to 2 oktas of CB and the cloud base at 1000 feet.

k: Cloud amount and cloud height SCT017 (2nd layer): 3 to 4 oktas and the cloud base at 1700 feet.

l: Cloud amount and cloud height BKN027 (3rd layer): 5 to 7 oktas and the cloud base at 2700 feet.

m: Temperature and dew-point temperature 12/07: temperature +12ºC, dew-point temperature +7ºC.

n: QNH, Q1002: 1002 hPa.

o: Recent weather phenomena RETS: recent thunderstorm (but not at the time of observation) on the aerodrome.

p: Wind shear WS R17: wind shear along the take-off path or approach path, or both, on the runway 17

q: TREND forecast BECMG: expected changes to meteorological conditions.

r: Forecasted variations of the preceding meteorological conditions 7000 NSW NSC: During the next two hours a visibility of 7 km is expected and no significant weather and clouds are forecasted

EXAMPLE 5:   SPECI

SPECI   LEPP   050820Z   21015KT   1000   R15/0400U   R33/0600U   +SHSN   FEW015   BKN025CB
a   b   c   d   e   f   g   h   i
M03/M04   Q1000=
j   k

a: ICAO location indicator: LEPP, Pamplona.

b: Day and hour of observation 050820Z: 5th of the current month at 0820 UTC.

c: Mean true direction and mean wind speed in 10 minutes : 210º y 15 kt.

d: Prevailing visibility : 1000 m.

e: Runway visual range R15/0400U: 400 m at runway 15, increasing.

f: Runway visual range R33/0600U: 600 m at runway 33, increasing.

g: Present significant weather + SHSN: heavy showers of snow.

h: Cloud amount and cloud height FEW015 (1st layer): 1 to 2 oktas and the cloud base at 1500 feet.

i: Cloud amount and cloud height BKN025CB (2nd layer): 5 to 7 oktas of CB and the cloud base at 2500 feet.

j: Temperature and dew-point temperature M03/M04: temperature –3ºC, dew-point temperature –4ºC.

k: QNH, Q1000: 1000 hPa.

EXAMPLE 6:   METAR AUTO

METAR   LEPP 230200Z AUTO 10002KT 3700 0800NW R33/1800U R15/P2000–UP BCFG SCT003 BKN008
       a   b   c   d   e   f   g   h   i   j   k
OVC014 01/01 Q1006=
L   m   n

a: ICAO location indicator: LEPP, Pamplona.

b: Day and hour of observation 230200Z: 23rd of the current month at 2 UTC.

c: Code word AUTO: for a METAR AUTO report.

d: Mean true direction and mean wind speed over in 10 minutes: 100º, 2 kt.

e: Prevailing visibility: 3700 m. Minimum visibility of 800 m in Northwest direction.

f: Runway visibility range R33/1800U: 1800 m at runway 33, increasing.

g: Runway visibility range R15/P2000: more than 2000 m at runway 15.

h: -UP: Light unknown precipitation.

i: Fog banks.

j: Cloud amount and cloud height SCT003 (1st layer): 3 to 4 oktas and the cloud base at 300 feet.

k: Cloud amount and cloud height BKN008 (2nd layer): 5 to 7 oktas and the cloud base at 800 feet.

l: Cloud amount and cloud height OVC014 (3rd layer): 8 oktas and the cloud base at 1400 feet.

m: Temperature and dew-point temperature 01/01: temperature +1ºC, dew-point temperature +1ºC.

n: QNH, Q1006: 1006 hPa.

EXAMPLE 7:   METAR AUTO

METAR   LEBG 022230Z AUTO 21017KT 9999 VCTS SCT023/// BKN029/// BKN050/// ///CB 06/05 Q0991=
       a   b   c   d   e   f   g   h   i   j   k   l

a: ICAO location indicator: LEBG, Burgos.

b: Day and hour of observation 022230Z: 2nd of the current month at 2230 UTC.

c: Code word AUTO for a METAR AUTO report.

d: Mean true direction and mean wind speed over in 10 minutes : 210º and 17 kt.

e: Prevailing visibility 9999: more than 10 km.

f: Present significant weather VCTS: thunderstorms in the vicinity.

g: Cloud amount and cloud height SCT023/// (1st layer): 3 to 4 oktas and the cloud base at 2300 feet.

h: Cloud amount and cloud height BKN029/// (2nd layer): 5 to 7 oktas and the cloud base at 2900 feet.

i: Cloud amount and cloud height BKN050/// (3rd layer): 5 to 7 oktas and the cloud base at 5000 feet.

j: Cloud amount and cloud height ///CB (4th layer, convective clouds): amount and height unknown. Height cannot be associated to any of the preceding layers.

k: Temperature and dew-point temperature 06/05: temperature 6ºC, dew-point temperature 5ºC.

l: QNH, Q0991: 991 hPa.

OBSERVING SYSTEMS

Automatic weather station

Visibility sensor FD12

Indicators at an EMAe

Ceilometer CL31 for cloud height detection

Humidity and Temperature Probe HMP155

Wind Set WA15

AERODROME FORECAST (TAF)

TAF Concise statement of the expected meteorological conditions at an aerodrome for a specified period, including changes significant for the aircraft operations. The validity period of a routine TAF is 24 or 30 hours. For a modified TAF (AMD), the validity period is reduced according to the time of issue of the modified TAF.

$$\text{TAF CCCC } YYGGgg\mathbf{Z} \quad Y_1Y_1G_1G_1/Y_2Y_2G_2G_2 \quad dddff\mathbf{G}f_mf_m\,\mathbf{KT} \left\{ \begin{array}{l} VVVV \\ \text{or} \\ \mathbf{CAVOK} \end{array} \right\} w'w' \left\{ \begin{array}{l} N_sN_sN_sh_sh_sh_s(cc) \\ \text{or} \\ \mathbf{VV}h_sh_sh_s \\ \text{or} \\ \mathbf{NSC} \end{array} \right\} \mathbf{TX}T_FT_F/Y_FY_FGG\mathbf{Z} \quad \mathbf{TN}T_FT_F/Y_FY_FGG\mathbf{Z}$$

$$\left\{ \begin{array}{l} \mathbf{PROB}C_2C_2 \text{ o} \\ \mathbf{PROB}C_2C_2\,TTTTT \\ \text{or } TTTTT \\ \text{or} \\ TTYYGGgg \end{array} \right\} YYGG/YYG_eG_e \quad dddff\mathbf{G}f_mf_m\,\mathbf{KT} \left\{ \begin{array}{l} VVVV \\ \text{or} \\ \mathbf{CAVOK} \end{array} \right\} \left\{ \begin{array}{l} w'w' \\ \text{or} \\ \mathbf{NSW} \end{array} \right\} \left\{ \begin{array}{l} N_sN_sN_sh_sh_sh_s(cc) \\ \text{or} \\ \mathbf{VV}h_sh_sh_s \\ \text{or} \\ \mathbf{NSC} \end{array} \right\}$$

NOTE 1: TAF COR is used for a corrected TAF and TAF AMD for an amended TAF.

SPECIFICATIONS OF SYMBOLIC LETTERS

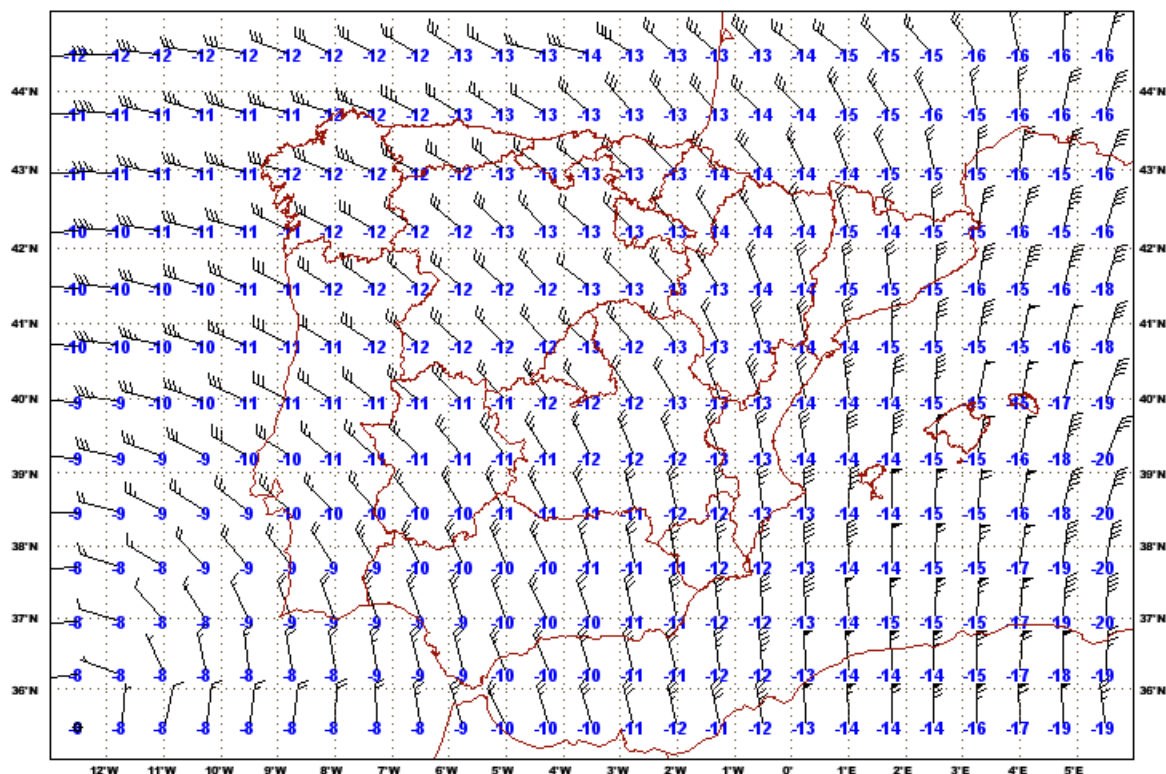|		
CCCC		**ICAO location indicator of the aerodrome**
$YYGGgg\mathbf{Z}$		**The day of the month and the time of forecast**
$Y_1Y_1G_1G_1/Y_2Y_2G_2G_2$	$Y_1Y_1G_1G_1$ $Y_2Y_2G_2G_2$	**Validity period of forecast** Day and hour UTC of origin of forecast. Day and hour UTC of end of forecast.
$dddff\mathbf{G}f_mf_m$		**Forecast wind on surface** Information on forecast wind has the same format as in the METAR/SPECI code.
VVVV		**Forecast prevailing visibility in meters** It is given in meters, excepting 9999, which indicates a visibility of 10 km or more.
CAVOK		**Code word CAVOK** The code word CAVOK shall be included in place of the groups of visibility, significant weather and cloud amount or vertical visibility when certain conditions are forecast (see METAR code)
w'w'		**Forecast significant weather** It indicates forecast significant meteorological phenomena according to the abbreviations shown in table 1 of METAR/SPECI code.
NSW		End of significant weather phenomena w'w'.
$N_sN_sN_sh_sh_sh_s(cc)$ $\mathbf{VV}h_sh_sh_s$		**Forecast cloud amount and cloud height** **Forecast vertical visibility** Information on forecast cloud amount, cloud height and visibility has the same format as in the METAR/SPECI code
NSC		If there are no forecast clouds below CAVOK reference height, no forecast CB, no forecast TCU, and the abbreviations CAVOK is not appropriate
$\mathbf{TX}T_FT_F/Y_FY_FG_FG_F\mathbf{Z}$ $\mathbf{TN}T_FT_F/Y_FY_FG_FG_F\mathbf{Z}$	TX (TN) T_FT_F $Y_FY_FG_FG_F\mathbf{Z}$	**Forecast maximum (minimum) temperature.** Letter indicator of maximum (minimum) temperature. Forecast maximum and minimum temperatures (in integer Celsius degrees) expected to occur during the period G_1G_1 to G_2G_2. Temperatures below 0°C shall be preceded by the letter M, that is, minus. Day and hour UTC of forecast maximum and minimum temperatures expected to occur

SPECIFICATIONS OF SYMBOLIC LETTERS

PROBC_2C_2 YYGG/$Y_eY_eG_eG_e$	PROBC_2C_2	**Significant changes in some or all the elements forecast** Probability of occurrence in % (C_2C_2 = 30 or 40) of a forecast element significant to the aircraft operations. The group PROB shall be always followed by the time group YYGG/$Y_eY_eG_eG_e$ or by the group TEMPO YYGG/$Y_eY_eG_eG_e$.
	YYGG $Y_eY_eG_eG_e$	Day and hour UTC of the origin of the period of the expected changes. Day and hour UTC of the end of the period of the expected changes.
TTTTT YYGG/$Y_eY_eG_eG_e$ or TTYYGGgg	TTYYGGgg	The change group TTTTT is used in the form of **BECMG** or **TEMPO**. **The change indicator BECMG YYGG/$Y_eY_eG_eG_e$** should be used to describe changes in the meteorological conditions at an unspecified time during the time period GG to G_eG_e. The time period should normally not exceed 2 hours but in any case should not exceed 4 hours. **The change indicator TEMPO YYGG/$Y_eY_eG_eG_e$** should be used to describe expected temporary fluctuations in the meteorological conditions at an unspecified time during the time period GG to G_eG_e. Following the change groups only elements that are expected to change significantly will be included. **The time indicator group FMYYGGgg** shall be used to indicate the beginning of a self-contained part of the forecast indicated by YYGGgg. When the group FMYYGGgg is used, all forecast conditions given before the group FMYYGGgg are superseded by the conditions indicated after the group.

HMAR (0.05º) 20190204 a 12 UTC. H+003. Validez: lunes, 04 de febrero de 2019, a 15 UTC.
Viento y temperatura
Nivel FL150

EXAMPLE 1:   TAF OF 30 HOURS LONG

```
TAF   LEMD   101100Z   1012/1118   30010KT   7000   SHRA   FEW008   SCT015TCU   BKN025   TEMPO
      a        b          c           d        e      f       g          h          i        j
1015/1017   3000   +SHRA   PROB30 TEMPO 1017/1019 TSRA FEW008 BKN012CB BKN025=
                     k
```

a: ICAO location indicator: LEMD, Adolfo Suárez Madrid-Barajas.

b: Day and time of the forecast 101100Z : Day 10th of the month at 1100 UTC.

c: Period covered by the forecast 1012/1118 : from 1200 UTC 10th to 1800 UTC of 11th.

d: Wind on surface: 300º, 10 kt.

e: Forecasted prevailing visibility: 7000 m (7 km).

f: Forecast significant weather SHRA: Moderate showers of rain.

g: Cloud amount and cloud height (1st layer): 1 to 2 oktas and cloud base at 800 feet.

h: Cloud amount and cloud height (2nd layer): 3 to 4 oktas of TCU with the cloud base at 1500 feet.

i: Cloud amount and cloud height (3rd layer): 5 to 7 oktas and the cloud base at 2500 feet.

j: Temporary fluctuations in forecast meteorological conditions TEMPO 1015/1017 3000 +SHRA: temporary, from 1500 UTC to 1700 UTC, reduced visibility 3000m (3 km) due to heavy showers of rain.

k: Temporary fluctuations in forecast meteorological conditions PROB30 TEMPO 1017/1019 TSRA FEW008 BKN012CB BKN025: Moderate probability (30%), temporary, from 1700 UTC to 1900 UTC, moderate thunderstorm of rain, 1 to 2 oktas and cloud base at 800 feet, 5 to 7 oktas of CB at 1200 feet and 5 to 7 oktas, with the cloud base at 2500 feet.

EXAMPLE 2:   TAF OF 24 HOURS LONG

```
TAF   LEST   191720Z   1918/2018   VRB02KT   6000   SCT050   TX18/2013Z TN10/2004Z
       a        b          c           d        e      f         g
BECMG 2003/2005 0900 FG BKN003 OVC008 TEMPO 2006/2009 0500 FG VV001 BECMG 2009/2011 04010KT 8000 NSW=
h                                     i                             j
```

a: ICAO location indicator: LEST, Santiago.

b: Day and time of the forecast 191720Z: Day 19th of the month at 1720 UTC.

c: Period covered by the forecast 1918/2018: from 1800 UTC of 19th to 1800 UTC of 20th.

d: Wind on surface: variable, 2 kt..

e: Forecasted prevailing visibility: 6000 m (6 km).

f: Cloud type and height of the clouds: 3 a 4 oktas and cloud base at 5000 feet.

g: Forecasted maximum and minimum temperature TX18/2013Z TN10/2004Z: max temperature 18ºC at 13Z and min temperature 10ºC at 04Z of 20th.

h: Change in forecast meteorological conditions BECMG 2003/2005 0900 FG BKN003 OVC040: changes from 0300 UTC and 0500 UTC: visibility 900 m due to presence of fog, very cloudy sky (5 to 7 oktas) with cloud base at 300 feet, covered sky (8 oktas) with cloud base at 800 feet.

i: Temporary fluctuations in forecast meteorological conditions TEMPO 2006/2009 0500 FG VV001: temporary, from 0600 UTC to 0900 UTC, reduced visibility 500 m due to the presence of fog, and vertical visibility of 100 feet.

j: Change in forecast meteorological conditions BECMG 2009/2011 04010KT 8000 NSW: changes from 0900 UTC to 1100 UTC, wind direction 40º and wind speed 10 kt, visibility 8000 m (8 km), and no significant weather.

SIGMET INFORMATION

SIGMET: "Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations."

FIRST LINE

ICAO location indicator of the ATS unit	Message identification and sequence number	Validity peiod (UTC)	Location indicator of MWO originating the message
LECM: for Madrid FIR/UIR LECB: for Barcelona FIR/UIR GCCC: for Canarias FIR/UIR	**SIGMET** n N: the number shall correspond with the number of SIGMET messages issued for the FIR/UIR since 0001 UTC on the day concerned.	Not more than 4 hours for normal SIGMET. In the special case of SIGMET messages for volcanic ash cloud and tropical cyclones, the period of validity shall be extended up to 6 hours. Day Hour Min/Day Hour Min	LEVA-: MWO of Valencia. GCGC-: MWO of Las Palmas de Gran Canaria.

FOLLOWING LINES

Location indicator + name of the FIR for which the SIGMET is issued	Description of phenomenon causing the issuance of SIGMET	Observed and/or forecast phenomenon	Location and flight level or altitude	Movement (direction and speed)	Changes in intensity
LECM MADRID FIR/UIR or LECB BARCELONA FIR/UIR or GCCC CANARIAS FIR/UIR	**OBSC**[2] **TS**: obscured thunderstorms **EMBD**[3] **TS**: embedded thunderstorms **FRQ**[4] **TS**: frequent thunderstorms **SQL**[5] **TS**: squall line thunderstorms **OBSC TSGR**[6]: obscured thunderstorms with hail **EMBD**[3] **TSGR**: embedded thunderstorms with hail **FRQ**[4] **TSGR**: frequent thunderstorms with hail **SQL**[5] **TSGR**: squall line thunderstorms with hail **TC** (+name): tropical cyclone **SEV TURB**[7]: severe turbulence **SEV ICE**[8]: severe icing **SEV ICE** (**FZRA**[9]): severe icing due to freezing rain **SEV MTW**[4]: severe mountain wave **HVY DS**: heavy duststorm **HVY SS**: heavy sandstorm **VA**(+name of volcano): volcanic ash **RDOACT CLD**: radioactive cloud	1. **OBS** is used when the phenomenon is observed and expected to continue. Time of observation is included, if known. 2. **FCST** is used when the phenomenon is forecast. Time of forecast is included, if known	**Location**, referring to latitude and longitude (in degrees and minutes)) and flight level or altitude, ENTIRE FIR: if the phenomenon is forecast for the entire FIR	**Direction** with reference to one of the sixteen points of compass, **Speed** in kt or in km/h. Or stationary (**STNR**)	1. **WKN**: weakening 2. **NC**: no changes 3. **INTSF**: intensifying

SIGMET INFORMATION

NOTES

1. Only one of the described phenomena shall be included in a SIGMET message, using the abbreviations as indicated above.

2. OBSC if it is obscured by haze or smoke or cannot be readily seen due to darkness. If there are no obscured TS but obscured CB, the descriptor OBSC TS shall be used.

3. EMBD if it is embedded within cloud layers and cannot be readily recognized. If there are no embedded TS but embedded CB, the descriptor EMBD TS shall be used.

4. FRQ descriptor and severe mountain waves (MTW) are defined in the notes of AIRMET.

5. SQL should indicate a thunderstorm along a line with little or no space between individual clouds.

6. GR (hail) should be used as a further description of the thunderstorm, as necessary.

7. TURB (severe and moderate turbulence) should refer only to: low-level turbulence associated with strong surface winds; rotor streaming; or turbulence whether in cloud or not in cloud (clear air turbulence, CAT). Turbulence should not be used in connection with convective clouds

8. ICE (severe) should refer to icing in other than convective clouds

9. FZRA (freezing rain) should refer to severe icing conditions caused by freezing rain.

10. TS, CB and tropical cyclones imply severe turbulence and severe icing, so these phenomena are not explicitly included.

11. SIGMET CANCELLATION : CNL abbreviation is used. Example:

    LECB SIGMET 3 VALID 101400/101600 LEVA-

    LECB BARCELONA FIR/UIR CNL SIGMET 2 101200/101600.

12. For volcanic ash, tropical cyclones or any other phenomenon hazardous to aviation (i.e. turbulence) the forecast position of the phenomenon at the end of the validity period is included in the message

EXAMPLES OF SIGMET MESSAGES

EXAMPLE 1: *SIGMET FOR FREQUENT THUNDERSTORMS WITH HAIL*

> *LECM SIGMET 1 VALID 210500/210700 LEVA-*
>
> *LECM MADRID FIR/UIR FRQ TSGR FCST N OF N4220 AND W OF W00630 TOP FL390 STRN WKN=*

Meaning:

First message SIGMET issued by the meteorological watch office LEVA for LECM FIR. The validity period is from 0500 UTC to 0700 UTC on the 21st of month. Frequent thunderstorms with hail are forecast at west of Galicia with cloud top at flight level 390. No significant movement is expected (stationary) and they will weaken

EXAMPLE 2: *SIGMET FOR SEVERE TURBULENCE*

> *LECM SIGMET 2 VALID 210600/210900 LEVA-*
>
> *LECM MADRID FIR/UIR SEV TURB OBS AT 0600Z N38 W008 FL240 MOV E 10KT WKN=*

Meaning:

Second message SIGMET issued by the meteorological watch office LEVA for LECM FIR. The message is valid form 0600 UTC to 0900 UTC on the 21st of month. Severe turbulence was observed at 0600 UTC at 38 degrees north and 8 degrees west, at flight level 240. The affected area of turbulence is expected to move to the east at 10 kt of speed and weakening

EXAMPLE 3: *SIGMET CANCELLATION OF EXAMPLE 2*

> *LECM SIGMET 3 VALID 210730/210900 LEVA-*
>
> *LECM MADRID FIR/UIR CNL SIGMET 2 VALID 210600/210900=*

EXAMPLE 4: *SIGMET FOR TROPICAL CYCLONE (fictitious location)*

> *YUCC SIGMET 3 VALID 251600/252200 YUDO-*
>
> *YUCC AMSWELL FIR TC GLORIA PSN N2706 W07306 CB OBS AT 1600Z WI 250NM OF TC CENTRE TOP FL500*
>   *MOV WNW 10KT NC FCST AT 2200Z TC CENTRE N2740 W07345=*

Meaning:

Third message SIGMET issued by the meteorological watch office YUDO for YUCC FIR. The message is valid form 1600 UTC to 2200 UTC on the 25th of month The tropical cyclone Gloria, whose center is at 27º6'N 73º6'W with the top of cumulonimbus at flight level 500, was observed at 1600 UTC at a distance of 250 miles from its center. It is moving to the west-northwest at 10 kt. No changes in intensity are expected. It is forecast that at 22 UTC the position of its center will be at 27º40'N 73º45'W.

EXAMPLE 5: *SIGMET FOR VOLCANIC ASH (fictitious location)*

> *YUDD SIGMET 2 VALID 101200/101800 YUSO–*
>
> *YUDD SHANLON FIR/UIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315*
>   *E02115 – N4345 E02145 – N4330 E02215 – N4245 E02130 – N4230 E02145 – N4315 E02115 FL250/370 MOV ESE*
>   *20KT WKN FCST AT 1800Z NO VA EXP=*

Meaning:

Second message SIGMET issued by the meteorological watch office YUSO for YUDD FIR. The message is valid form 1200 UTC to 1800 UTC on the 10th of month. Eruption of volcano of ASHVAL mount located at 43º15'N 21º15'E. The ash cloud was observed at 1200 UTC inside the polygon circumscribed by the following points: 43º15'N 21º15'E, 43º45'N 21º45'E, 43º30'N 22º15'E, 42º45'N 21º30'E, 42º30'N 21º45'E y 43º15'N 21º15'E (initial point with which the polygon closes), between flight levels 250 and 370, moving to the east-southeast at 20 knots, and weakening. It is forecast that at 1800 UTC the ash cloud will scatter.

AREA FORECAST GAMET

GAMET: It is an area forecast in abbreviated plain language for low-level flights (FL150) for a flight information region or sub-area thereof. It is issued every 6 hour and it has a 6 hour validity period. When a weather phenomenon hazardous to low-level flights has been included in the GAMET area forecast and the phenomenon forecast does not occur, or is no longer forecast, a GAMET AMD shall be issued, amending only the weather element concerned, using the abbreviation NSW.

FIRST LINE

ICAO location indicator of the ATS unit	Message identification	Validity period (UTC)	Meteorological watch office originating the message
LECM: Areas 1 and 2 of Madrid FIR LECB: Barcelona FIR GCCC: Sub-area Islands of Canarias FIR	GAMET or GAMET AMD: an amended GAMET is issued if any of the forecast phenomena in SECI of GAMET does not occur or is no longer forecast.	$YYGGgg/YYG_eG_eg_eg_e$ DayHourMin/DayHourMin The validity period is 6 hour	LEVA-: MWO of Valencia. GCGC-: MWO of Las Palmas de Gran Canaria

SECOND LINE

Location indicator and name of the FIR, or part thereof for which the GAMET is issued	Vertical limit of the responsibility area
LECM MADRID FIR/1 or LECM MADRID FIR/2 or LECB BARCELONA FIR or GCCC CANARIAS FIR SUBZONA ISLAS	BLW FL150: Below flight level 150

SECN I: Information on en-route weather phenomena hazardous to low-level flights (see note 1)

(1) **SFC WIND**: $[G_1G_1 /G_2G_2]$ (See note 2) [Location] [Direction] [Speed (kt)]: Widespread surface wind > 30 kt (see note 6).

(2) **SFC VIS**: $[G_1G_1 /G_2G_2]$ [Location] [Visibility in metres] [weather phenomena causing the reduction]: Widespread surface visibility < 5000 m (see note 6)

(3) **SIGWX**: $[G_1G_1 /G_2G_2]$ [Location] [Significant weather condition]: Any of the following significant weather conditions included: ISOL TS, OCNL TS, ISOL TSGR, OCNL TSGR, FRQ TS, OBSC TS, EMBD TS, HVY SS, HVY DS, SQL TS, FRQ TSGR, OBSC TSGR, EMBD TSGR, SQL TSGR, VA

(4) **MT OBSC**: $[G_1G_1 /G_2G_2]$ [Location]: Mountain obscuration.

(5) **SIG CLD**: $[G_1G_1 /G_2G_2]$ [Location] [Amount (BKN or OVC)] [CB and/or TCU with ISOL, OCNL, FRQ or EMBD] [Altitude of cloud base and top (ft)]: Only clouds with height of base less than1000 ft above ground level, and/or CB or TCU at any height, are included.

(6) **ICE**: $[G_1G_1 /G_2G_2]$ [Location] MOD or SEV [Altitude of cloud base and top (FL)]: Moderate or severe icing.

(7) **TURB**: $[G_1G_1 /G_2G_2]$ [Location] MOD or SEV [Altitude of cloud base and top (FL)]: Moderate or severe turbulence.

(8) **MTW**: $[G_1G_1 /G_2G_2]$ [Location] MOD or SEV [Altitude of cloud base and top (FL)]: Moderate or severe mountain wave.

(9) **SIGMET APLICABLES**: n.º of applicable message SIGMET to the FIR concerned or a sub-area thereof, for which the area forecast is valid.

When no elements are included in SECN I next message is included:

(10) **HAZARDOUS WX NIL**: No weather phenomena hazardous to low level flights and no applicable SIGMET are forecast.

NOTES:

1: Elements of points 1 to 10 will only appear in GAMET when the phenomena is forecast during the validity period.

2: G_1G_1 /G_2G_2 . Optional group. Starting and end time of the weather phenomena forecast.

3: Vertical distances are altitudes, so they are referenced to the mean sea level (MSL) and the unity is the feet (ft).The AMSL abbreviation is used after FT. For some elements level flights (FL) are used.

4: For each element more than one line could be used. Only approved ICAO abbreviation are allowed.

5: These notes are complemented by AIRMET notes.

6: The term "**areas extensas**" (widespread surface) is used to indicate a spatial coverage of more than 75% of the affected area.

SECN II: Additional information required by low-level flights

(11) **PSYS**: Data in abbreviated language on pressure centres and fronts and their expected movements and developments at the central hour of validity period of forecast.

(12) **WIND/T**: Upper wind (in kt) and upper-air temperature (in ºC) forecast for altitudes 02000, 05000, 10000, 15000 ft, for given locations at the central hour of validity period of forecast.

(13) **CLD**: Cloud information not included in Section I on clouds amount (BKN or OVC) between 1000 ft of height and FL150, showing the cloud type if known: ST, SC, CU, AS, AC and NS.

(14) **FZLVL**: Height indication of t = 0ºC level(s) for given locations at the central hour of validity period of forecast.

(15) **MNM QNH**: Forecast lowest QNH at the central hour of validity period of forecast (hectopascal).

(16) **VA**: Volcanic eruptions and name of volcano.

AIRMET INFORMATION

AIRMET: Information concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of low-level aircraft operations (below FL150) and which was not already included in the forecast issued for low-level flights in the flight information region concerned or sub-area thereof (SECN I of GAMET)

FIRST LINE

ICAO location indicator of the ATS unit	Message identification and sequence number	Validity period (UTC)	Location indicator of the meteorological watch office originating the message
LECM: Areas 1 and 2 of Madrid FIR LECB: Barcelona FIR GCCC: Sub-area Islands of Canarias FIR	AIRMET n n: the number shall correspond with the number of AIRMET messages issued for the FIR, or sub-area of FIR, since 0001 UTC on the day concerned	The period of validity shall be not more than 4 hours. Format: DayHourMin/DayHourMin	LEVA-: MWO of Valencia. GCGC-: MWO of Las Palmas de Gran Canaria

FOLLOWING LINES

Location indicator + name of the FIR, or part thereof for which the AIRMET is issued	Description of phenomenon causing the issuance of AIRMET	Observed or forecast phenomenon	Location and flight level or altitude	Movement (direction and speed)	Changes in intensity
LECM MADRID FIR/1 or LECM MADRID FIR/2 or LECB BARCELONA FIR or GCCC CANARIAS FIR SUBZONA ISLAS	* Widespread areas where mean surface wind speed > 30 kt (60 km/h): **SFC WIND** (+ wind speed, direction and units) * Widespread areas affected by reduction of visibility to less than 5000 m: **SFC VIS** (+ visibility in m + weather phenomena) * Thunderstorms: **ISOL TS**, **OCNL TS** (without hail) **ISOL TSGR**, **OCNL TSGR** (with hail) * Mountains obscured: **MT OBSC** * Widespread areas of BKN or OVC cloud with height of base less than 1000 ft above ground level: **BKN CLD** or **OVC CLD** (+ height of the base and top + units) * Cumulonimbus: **ISOL CB**, **OCNL CB**, **FRQ CB** * Towering cumulus clouds: **ISOL TCU**, **OCNL TCU**, **FRQ TCU** * Moderate icing: **MOD ICE** * Moderate turbulence: **MOD TURB** * Moderate mountain wave: **MOD MTW**	1. **OBS** is used when the phenomenon is observed and expected to continue. Time of observation is included, if known. 2. **FCST** is used when the phenomenon is forecast. Time of forecast is included, if known	**Location**, referring to latitude and longitude (in degrees and minutes)) and flight level or altitude	**Direction** with reference to one of the sixteen points of compass **Speed** in kt or in km/h Or stationary (**STNR**)	1. **WKN**: weakening 2. **NC**: no changes 3. **INTSF**: intensifying

AIRMET INFORMATION

NOTES

1. The term widespread areas is used to indicate a spatial coverage greater than 75 per cent of the area affected by the phenomenon.

2. ISOL (isolated): TS, CB or TCU which affect, or are forecast to affect, an area with a maximum spatial coverage less than 50 per cent of the area concerned (at a fixed time or during the period of validity).

3. OCNL (occasional): well-separated TS, CB or TCU which affect, or are forecast to affect, an area with a maximum spatial coverage between 50 and 75 per cent of the area concerned (at a fixed time or during the period of validity)

4. FRQ (frequent): an area of TS, CB o TCU if there is little or no separation between adjacent TS, CB o TCU with a maximum spatial coverage greater than 75 per cent of the area affected, or forecast to be affected, by the phenomenon (at a fixed time or during the period of validity).

5. Descriptors OBSC and TURB are defined in the notes of SIGMET.

6. A mountain waves should be considered:

    a) severe: whenever an accompanying downdraft ≥ 3.0 m/s (600 ft/min) and/or severe turbulence is observed or forecast.

    b) moderate: whenever an accompanying downdraft of 1.75–3.0 m/s (350–600 ft/min) and/or moderate turbulence is observed or forecast.

7. AIRMET information on icing and turbulence associated with TS, CB or TCU should not be included, as TS, CB and TCU imply these phenomena. However, hail will be included in AIRMET on TS.

8. CANCELLATION of AIRMET: The abbreviation CNL will be used.

9. These notes are complemented with the notes of GAMET.

EXAMPLES OF GAMET, GAMET AMD, AIRMET AND CNL AIRMET

EXAMPLE 1: *Routine GAMET* (from 0300 to 0900 UTC)

```
FASP40 LEMM 272300
LECM GAMET VALID 280300/280900 LEVA-
LECM MADRID FIR/1 BLW FL150


SECN I

SIGWX: N OF N41 OCNL TSGR
SIG CLD: 02500/ABV15000FT AMSL N OF N41 OCNL CB
ICE: 03/06 050/100FL AMSL N OF N4030 MOD
MTW: S OF N41 MOD
SIGMET APLICABLES: 1


SECN II

PSYS: 06 L 1004 HPA N38 E003 MOV E 05KT INTSF
```

WIND/T:	LA CORUÑA	MADRID	SANTANDER	ZARAGOZA
	N4330 W00838	N4049 W00359	N4342 W00382	N4166 W00101
02000FT	029/17KT PS03	351/13KT PS04	345/18KT PS02	321/14KT PS03
05000FT	024/20KT MS04	358/17KT MS03	328/21KT MS05	339/21KT MS05
10000FT	011/32KT MS12	349/23KT MS14	018/23KT MS16	338/14KT MS15
15000FT	224/55KT MS20	312/42KT MS23	234/20KT MS28	305/20KT MS27
CLD: ALL FIR BKN SC 02500/13000FT AMSL				
FZLVL:	03400FT AMSL	03900FT AMSL	02700FT AMSL	03100FT AMSL
MNM QNH: 1010 HPA=				

EXAMPLES OF GAMET, GAMET AMD, AIRMET AND CNL AIRMET

Meaning:

Area forecast for low-level flights (GAMET) for sub-area 1 of flight information region (FIR) of Madrid and location indicator of the area control centre LECM . It includes altitudes for below flight level 150 (FL150). The message is issued by the meteorological watch office of Valencia (LEVA). The message is valid from 0300 UTC to 0900 UTC on the 28th of the month.

Section I:

Significant weather phenomena (SIGWX): during the validity period occasional thunderstorms with hail at north of parallel 41º N.

Significant clouds (SIG CLD): during the validity period occasional cumulonimbus base 2500, top higher than 15000 feet at north of 41 degrees north, so these CB are related to the thunderstorms of the previous element SIGWX.

Icing (ICE): moderate between 0300 UTC and 0600 UTC between flight level 050 and 100, at north of 40 degrees and 30 minutes north.

Mountain waves (MTW): during the validity period moderate mountain waves at south of 41 degrees north.

SIGMET message n.º 1 applicable to the validity period and sub-area concerned of Madrid FIR.

Section II:

Pressure systems and fronts (PSYS): at 0600 UTC (central hour of forecast), low pressure of 1004 hectopascals at 38º degrees north 3 degrees west, expected to move eastwards at 5 knots and to strengthen in intensity.

Winds (direction degrees and speed knots) and temperatures (degrees Celsius): at 2000, 5000, 10000 and 15000 feet, in A Coruña, Madrid, Santander and Zaragoza (at the central hour of the forecast: 0600 UTC).

PS: positive temperature; MS: negative temperature. Example: in A Coruña, at 2000 ft, wind direction 29 degrees, wind speed 17 kt, temperature 3ºC. At 5000 ft, wind direction 24 degrees, wind speed 20 kt, temperature -4ºC.

Clouds (CLD): during the validity period broken stratocumulus, base 2500 ft, top 13000 ft altitude.

Freezing level (FZLVL): at 0600 UTC (central hour of the forecast), in A Coruña at 3400 ft, in Madrid at 3900 ft, in Santander at 2700 ft and in Zaragoza at 3100 ft altitude.

Minimum QNH: at 0600 UTC (central hour of the forecast), 1010 hectopascals.

EXAMPLE 2: *GAMET AMD (amendment to the previous GAMET)*

At 0430 UTC it is observed that forecast CB and associated thunderstorms are no longer present. Therefore an amended GAMET is issued.

```
FASP40 LEMM 272300 AAA
LECM GAMET AMD1 VALID 280430/280900
LECM MADRID FIR/1 BLW FL150
SECN I
SIGWX: NSW
SIG CLD: NSW
............ From here amended GAMET is similar to example 1.
```

Meaning:

Amendment number 1 to GAMET with validity period 280300/280900 UTC referred to a Madrid FIR area 1, valid from 0430 to 0900 UTC of day 28th. Message issued by the meteorological watch office of Valencia (LEVA), and destined to flights below flight level 150.

Section I:

Significant weather phenomena are no longer present since 0430 UTC.

The rest of the message is the same as the one in example 1.

EXAMPLES OF GAMET, GAMET AMD, AIRMET AND CNL AIRMET

EXAMPLE 3: *AIRMET FOR REDUCTION OF VISIBILITY*

At 04:55 UTC a reduction of visibility is observed less than 5000 m and it was not included in the current GAMET. For this reason, an AIRMET is issued including this phenomenon, which is hazardous for low level flights.

> *LECM AIRMET 1 VALID 280500/280900 LEVA-*
> *LECM MADRID FIR/1 SFC VIS 3000M RA OBS AT 0455Z N OF N4310 AND E OF W00720 STNR NC=*

Meaning:

First message AIRMET from 0001 UTC issued by the meteorological watch office LEVA for area 1 of Madrid FIR. The message is valid from 0500 UTC to 0900 UTC on 28th of the month. At 0455 UTC a reduction of visibility of 3000 m was observed, due to rain at north of 43º10' N and east of 7º20' W. Stationary visibility and no changes in intensity are forecast.

EXAMPLE 4: *CNL AIRMET (cancellation of the previous AIRMET)*

At 0600 UTC the visibility is greater than 5000 m. So, in that moment the AIRMET is cancelled.

> *LECM AIRMET 2 VALID 280600/280900 LEVA-*
> *LECM MADRID FIR/1 CNL AIRMET 1 280500/280900=*

SPECIAL AIREP

Special **AIREP** are special air-reports made by an aircraft in flight about adverse weather phenomena. These reports are issued to the appropriate air traffic services unit, and this unit issues the reports to the corresponding meteorological watch office (OVM). The OVM will encode the message and send it to the communication network so that it is available to aeronautical users.

The adverse weather phenome that should be included into the AIREP are the following:

Weather phenomenon	
SEV TURB	Severe turbulence
SEV ICE	Severe icing
MOD TURB	Moderate turbulence
MOD ICE	Moderate icing
SEV MTW	Severe mountain wave
TS	Thunderstorm without hail
TSGR	Thunderstorm with hail
HVY SS	Heavy duststorm or heavy sandstorm
VA [MT nnnnnnn]	Pre-eruption volcanic activity or volcanic eruption. Name and position of volcano, if known
VA CLD	Volcanic ash cloud

The format of the report is the following:

AIREP	
Message type designator	ARS (it means Special AIREP)
Aircraft identification	Given by the pilot
Weather phenomenon	As given in the previous table
Time of observation	OBS AT nnnnZ (nnnn: hours and minutes UTC)
Position	In latitude and longitude: degrees and minutes (NnnnnWnnnnn or NnnnnEnnnnn or SnnnnWnnnnn or SnnnnEnnnnn)
Flight level or altitude	FLnnn or FLnnn/nnn or nnnnM or [n]nnnnFT

EXAMPLE 1: *TURBULENCE*

UASP60 LEMM 112006 ARS RAM725A MOD TURB OBS AT 1735Z N3710W00359 FL390=

Message heading: UASP60 LEMM 112006

    AIREP (UA) for the Iberian Peninsula and the Balearic Islands (SP) of any of the phenomena given in the table of AIREP (60), excepting ash cloud, issued by AEMET (LEMM) day 11th of the month at 20:06 Z (112006)

ARS: Special AIREP

RAM725A: Aircraft identification

MOD TURB: Moderate turbulence

OBS AT 1735Z: observed at 17:35 Z

N3710W00359: observed in latitude 37º 10' N and longitude 03º 59' W

FL390: flight level 390

EXAMPLE 2: *ASH CLOUD*

UACR70 LEMM 081540 ARS VA812 VA CLD OBS AT 1530Z N2373 W01803 FL 300=

Message heading: UACR70 LEMM 081540

    AIREP (UA) for the Canary Islands (CR) of ash cloud (70), issued by AEMET (LEMM) day 8th at 15:40 Z (081540)

ARS: Special AIREP

VA812: Aircraft identification

VA CLD: Volcanic ash cloud

OBS AT 1530Z: observed at 15:30 Z

N2373W01803: observed in latitude 23º 73' N, and longitude 018º 3' W

FL300: fligh level 300
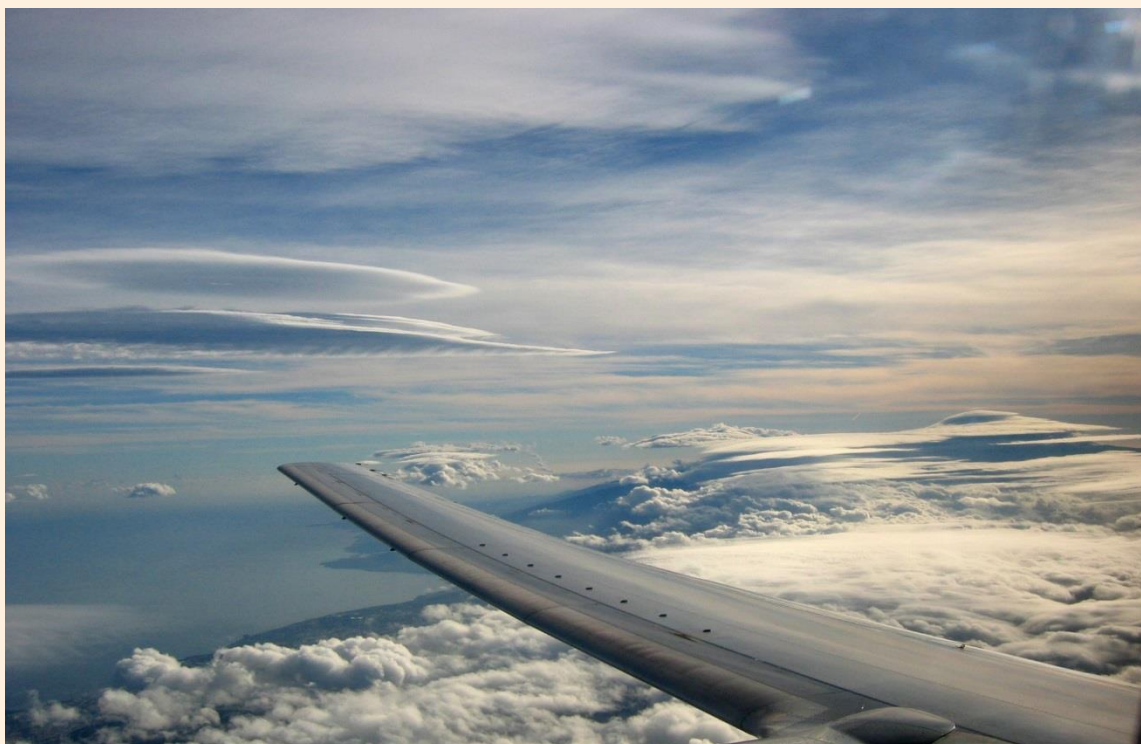
CHART OF LOW-LEVEL SIGNIFICANT WEATHER FORECAST (SIGWX SFC/150)

The responsible meteorological watch offices are Valencia (LEVA) and Las Palmas (GCGC). They prepare and issue this chart.

Horizontal limits: The Peninsula and the Balearic Islands: latitude 35ºN to 45ºN; longitude form 10ºW to 05ºE; The Canary Islands: latitude 26º30'N to 30º30'N; longitude 12º00'W to 20º00'W.

Vertical limits: From the surface to FL150 for both areas.

Significant weather forecast from 3 hours before and 3 hours after the validity time shown in the chart, excepting fronts, pressure centres, freezing level and state of the sea, given at validity time

INFORMATION INCLUDED IN THE CHART

1. Forecasts of significant en-route weather phenomena (see table 3). Top and base of the affected layer are shown for every phenomena forecast above the surface.

2. Cloud information included:
    i.   Areas with amount of clouds forecasts BKN or OVC. Format: Amount Type Base altitude/Top altitude
    ii. Cumulonimbus (CB) and cumulus congestus of great vertical extent (TCU) forecast. Format: Descriptor CB (or TCU) Base altitude/Top altitude.

3. Widespread surface wind exceeding 30 kt.

4. Widespread surface visibility below 5 000 m. Symbols V1 and V5 are used.
    V1: Visibility < 1000 m   V5: 1000 m ≤ Visibility < 5000 m

5. Pressure centres and fronts and their expected movements (see table 5).

6. Height indication of 0ºC level(s) at specified points.

7. Sea-surface temperature (in ºC) and state of the sea (wave height in meters)

8. Information on volcanic eruptions.

Table 3: SYMBOLS OF SIGNIFICANT WEATHER

Symbol	Symbol
Thunderstorms	Drizzle
Tropical cyclone	Rain
Severe squall line	Snow
Moderate turbulence	Shower / Hail
Severe turbulence	Widespread blowing snow
Mountain waves	Severe sand or dust haze
Moderate aircraft icing	Widespread sandstorm or duststorm duststorm
Severe aircraft icing	Widespread haze
Widespread fog	Widespread mist
Radioactive materials (3) in the atmosphere	Widespread smoke
Volcanic eruption (1)	Freezing precipitation (2)
Mountain obscuration	

ABBREVIATIONS:

ABV	above
AGL	above ground level
AMSL	above mean sea level
BLO	below clouds
BLW	below.
BTL	between layers
COT	on the coast
E (W)	East (West)
LAN	inland
LCA	local or locally
MAR	at sea
MON	over the mountains
MSL	mean sea level
MT	mountain
N (NE, NW)	North (Northeast, Northwest)
NM	nautical miles
OHD	overhead
OTP	on top
S (SE, SW)	South (Southeast, Southwest)
VAL	In the valleys

(1) The following should be included in a separated text box: volcanic eruption symbol; name of volcano; latitude and longitude of eruption. Check SIGMET, TC and VA advisories, and NOTAM or ASHTAM for VA.

(2) This symbol does not refer to icing caused by precipitation coming into contact with an aircraft with a very low temperature.

(3) The following should be included in a separated text box: symbol of radioactive materials in the atmosphere; latitude and longitude of the radioactive release. Check SIGMET and NOTAM for radioactive release.

CHART OF LOW-LEVEL SIGNIFICANT WEATHER FORECAST (SIGWX SFC/150)

Table 4: ABBREVIATIONS USED FOR DESCRIBING CLOUDS

Clouds (excepting CB and TCU)	Descriptors for CB and TCU
BKN = Broken sky (5 a 7 oktas) OVC = Overcast sky (8 oktas) LYR = Layer	ISOL = Isolated OCNL = Occasional FRQ = Frequent EMBD = Embedded in a layer

NOTES (clouds)

- Base and top altitude in hundreds of feet.
- Top altitude above FL150 is indicated by the abbreviation XXX.
- Symbol SFC is used if the forecast altitude of the cloud base is at ground level. In áreas where the forecast
- In areas where the presence of at least two layers of stratiform clouds with BKN or OVC coverage is forecast, whose respective distances from the top to the base do not exceed 3000 feet, LYR is used, followed by the altitude of the highest top and the lowest base.
- Inclusion of thunderstorm or CB implies the presence of associated turbulence or icing (severe or moderate).

EXAMPLES OF CLOUDS

$$BKNCU\frac{040}{020} \qquad ISOLCB\frac{XXX}{015} \qquad OVCLYR\frac{100}{SFC}$$

Table 5: OTHER SYMBOLS USED IN THE CHART OF LOW-LEVEL SIGNIFICANT WEATHER

Convergence line	Area of turbulence	Cold front at the surface
0º :100 — Freezing level, in hundreds of feet	Warm front at the surface	Occluded front at the surface
10 — State of the sea	18 — Sea-surface temperature	Quasi-stationary front at the surface
40 — Widespread strong surface wind > 30 kt	Direction and speed of the displacement (kt)	STRN: Stationary
L: Low pressure centre	H: High pressure centre	SLW: Slow displacement (<10 kt)

CHART OF LOW-LEVEL SIGNIFICANT WEATHER FORECAST (SIGWX SFC/150)

EXAMPLE OF CHART OF LOW-LEVEL SIGNIFICANT WEATHER
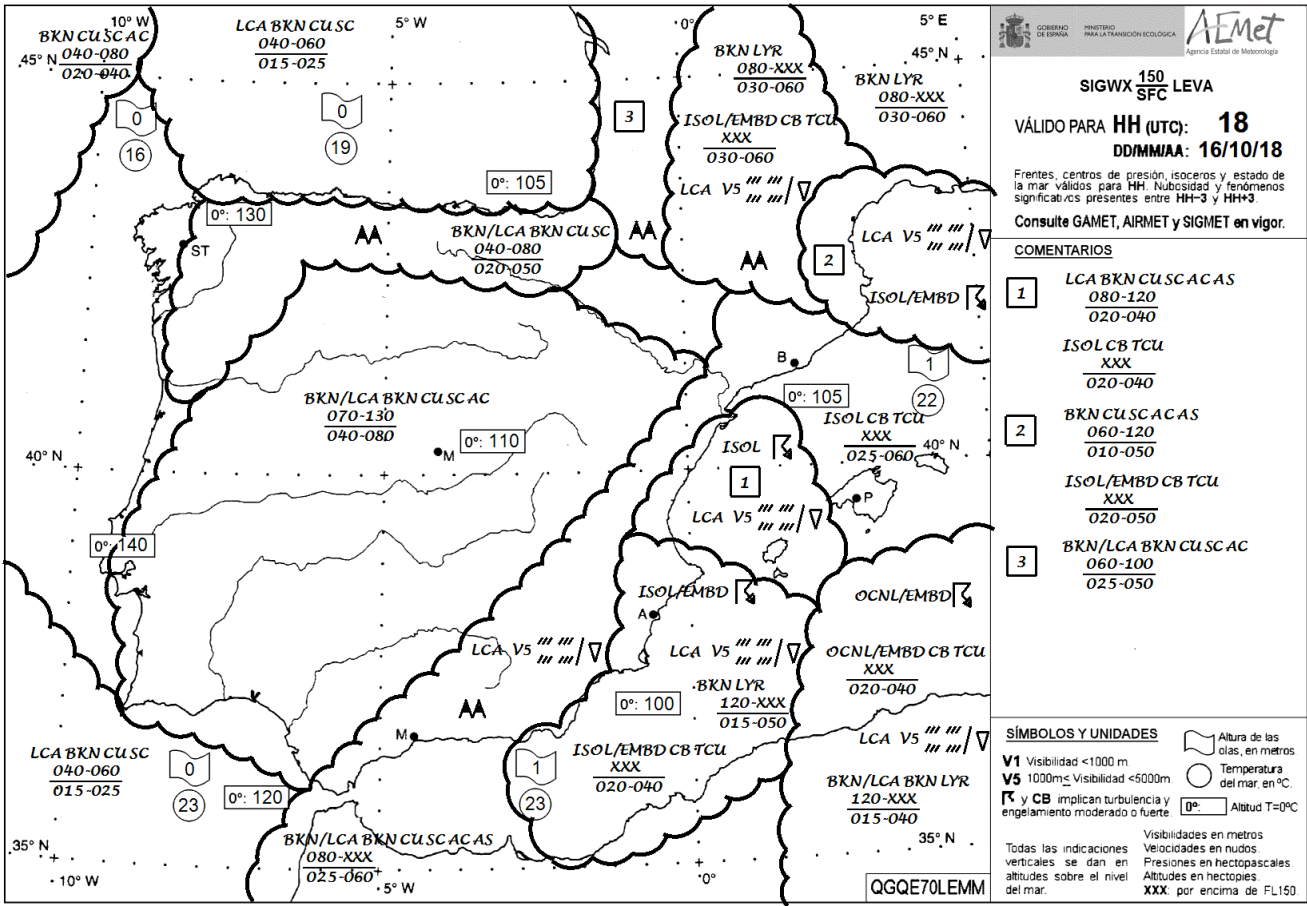
This chart contains the forecast weather phenomena for the low levels SFC/FL150 of the Iberian Peninsula and the Balearic Islands at 18 Z and date 16/10/2018. It has been elaborated by the meteorological watch office of Valencia.

Scalloped line: delimits areas of homogeneous cloudiness and/or significant weather.

It is shown in the chart widespread areas of local visibility below 5000 m (LCA V5) caused by rain or rain showers, BKN cloud layers, TCU and CB clouds, thunderstorms or mountains obscured.

<div align="center">
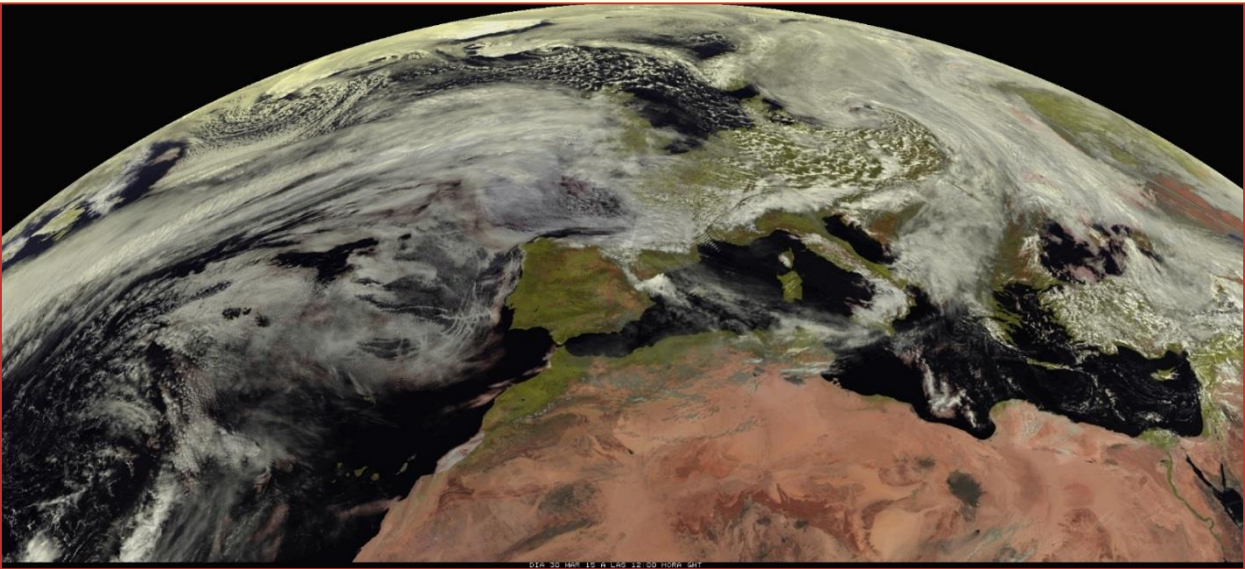
AERODROME WARNINGS

</div>

Aerodrome warnings shall give concise information of meteorological conditions which could adversely affect aircraft on the ground, including parked aircraft, and the aerodrome facilities and services.

- An aerodrome warning shall be issued for any of the phenomena listed in table 6. Every warning will be issued in the event of both forecasted or observed phenomena, but in the latter case only if they had not been forecasted. The only exception is frost, for which only forecasted warnings will be issued. In the case of wind gust and accumulated precipitation (in 1 or 12 hours) an aerodrome warning is issued in accordance with the following criterion, referred to the thresholds listed in table 7: when it is forecasted or observed (if it had not been forecasted) that it equalize or exceed those thresholds.
- When the phenomenon is forecasted the aerodrome warning shall be issued not more than 24 hours before the commencement of the period of validity.

Tabla 6: WEATHER PHENOMENA

Phenomenon (1)	Template (2)
Mean wind speed with maximum wind gust	SFC WSPD nn[n]KT MAX nn[n]
Mean surface wind (direction and speed) and maximum wind gust	SFC WIND nnn/nn[n]KT MAX nn[n]
Accumulated precipitation in 1 or 12 hours	RAINFALL IN 1HR MORE THAN nnMM RAINFALL IN 12HR MORE THAN nn[n]MM
Thunderstorm	[HVY] TS
Squall (3)	SQ
Hail	GR
Frost (4)	FROST T MSnnC
Snow (5) (including the expected or observed snow accumulation)	[PROB30, PROB40, PROB70][HVY] SN nnCM
Freezing precipitation	[HVY] FZRA o [HVY] FZDZ
Hoar frost or white rime	RIME
Sandstorm	[HVY] SS
Duststorm	[HVY] DS
Swirling sand or dust	SA (sand), DU (dust)
Volcanic ash [volcanic ash deposition]	VA [DEPO]
Tsunami	TSUNAMI
Toxic chemicals substances	TOX CHEM

1. In every warning only one phenomenon is included.

2. Brackets [ ] indicate that information inside brackets is included if needed.

3. Squall (SQ): Strong wind that arises suddenly and usually lasts at least one minute. It differs from wind gusts in its duration. The sudden increase in wind speed is 16 kt (32km/h), and the speed increases to 22 kt or more and lasts at least one minute. Squalls are often associated with large cumulonimbus clouds and a violent convective activity, extending several kilometers horizontally and several thousand feet vertically.

4. FROST shall always be used with temperature information in degrees Celsius. Negative temperature after FROST shall be preceded by abbreviation MS. T is the ICAO abbreviation for temperature and C for degrees Celsius. Only forecast warnings are given for frost.

5. For snow (SN) the thickness of the deposit in cm should be always included. In case it does not expect snow to accumulate on the ground, it will be indicated with 00CM. Probability will only be used for those aerodromes which have agreements on the forecast of snow. The probability refers to occurrence of the phenomenon and not to the thickness of the deposit.

AERODROME WARNINGS

FORMAT AND CONTENTS OF AERODROME WARNINGS

Message heading

The heading of the message consists of a line that includes the following:

WWSP60 or WWCR60	CCCC	DDHHMM
(a)	*(b)*	*(c)*

(a) Aerodrome warning identification. CR for the Canary Islands and SP for the rest of aerodromes
(b) Location indicator of the aerodrome originating the warnings
(c) Day, hour and minutes UTC of message issue

Message content

The message consists of a line that includes the following:

CCCC	AD	WRNG n[n]	VALID nnnnnn/nnnnnn	(met phenomenon)	(observed and/or forecast)	(intensity)
(a)	*(b)*		*(c)*	*(d)*	*(e)*	*(f)*

(a)   Location indicator of the aerodrome originating the warning. The same as the warning heading
(b)   Message identification: AD WRNG n[n]
- •   AD WRNG: Type of message.
- •   n: sequence number starting at 0001 UTC of the day the warning is issued. Numbering is different for every aerodrome. Only one digit is included for numbers less than 10.
(c)   Period of validity: VALID nnnnnn/nnnnnn
- •   Start and end of the validity period using 6 digits (two for the day, two for the hour and two for the minutes, in UTC), for each group separated by «/». Example: VALID 220900/220913.
- •   The validity period may be extended up to a maximum of 24 hours.
(d)   Meteorological phenomenon
- •   Each warning includes only one phenomenon from the table 6.
(e)   Observed or forecast phenomenon
- •   The following ICAO abbreviations are used:
  OBS [AT nnnnZ]: Indicates that the phenomenon was observed [at nnnnZ].
  FCST: Indicates that the phenomenon is forecast.
- •   Brackets [ ] after OBS indicate that when time of observation is known it will be included using the format inside the brackets. Example: OBS AT 1045Z.
(f)   Intensity changes
When the forecast of intensity changes is known the following abbreviations are used:
- •   INTSF: Intensifying
- •   WKN: weakening
- •   NC: No changes

CANCELLATION

Aerodrome warning is cancelled when the conditions that originated it no longer hold

UPDATE

An update of a warning is accomplished by cancelling it and issuing a new one, as long as it is the same phenomenon and its period of validity has not yet expired.

Updates of wind warnings will be issued when a change of ±10 KT is observed and/or forecasted, as long as the value continues to be greater than the given threshold.

Updates of warnings of accumulated snow on the ground will be issued when the quantity of snow changes ±5 cm.

Updates of frost warnings will be issued when the changes of temperatura is ±2ºC, as long as it is lower than 0º C.

AERODROME WARNINGS

Table 7. THRESHOLD VALUES FOR AERODROME WARNINGS

Aerodrome	Wind (kt) Max gust	Rainfall in 1 hour (mm)	Rainfall in 12 hours (mm)	Aerodrome	Wind (kt) Max gust	Rainfall in 1 hour (mm)	Rainfall in 12 hours (mm)
A Coruña	43	30	60	Lleida	43	30	60
Albacete	40	30	60	Logroño	43	30	60
Algeciras	43	30	60	Madrid / Adolfo Suárez –Barajas	25	30	60
Alicante	43	30	100	Madrid / Cuatro Vientos	30	30	60
Almería	43	30	80	Málaga	40	15	40
Andorra-La Seu	30	30	60	Mallorca/ Son Bonet	30	15	60
Asturias	43	30	60	Melilla	43	30	80
Badajoz	43	30	60	Menorca	30	15	60
Barcelona	30	30	80	Murcia / Región de Murcia	43	30	60
Bilbao	43	30	60	Palma de Mallorca	25 (2º,4º) 30 (1º,3º)	15	60
Burgos	43	15	30	Pamplona	43	30	40
Castellón	43	30	60	Reus	43	30	80
Ciudad Real	43	30	60	Sabadell	30	30	80
Córdoba	43	30	80	Salamanca	43	15	30
El Hierro	42	30	60	San Sebastián	35 (1º,2º) 45 (3º,4º)	30	60
Fuerteventura	49 (1º Cuad) 40 (2º,3º,4º)	30	60	Santander	43	30	60
Girona	43	30	80	Santiago	43	30	60
Gran Canaria	49 (1º Cuad) 40 (2º,3º,4º)	30	60	Sevilla	43	30	80
Granada	43	30	80	Tenerife Norte	43	30	60
Huesca	43	30	40	Tenerife Sur	40	30	60
Ibiza	30	15	60	Teruel	43	30	60
Jerez	43	30	80	Valencia	43	30	60
La Gomera	33	30	60	Valladolid	43	15	30
La Palma	40 (1º,2º) 15 (3º,4º)	30	60	Vigo	43	30	60
Lanzarote	49 (1º Cuad) 40 (2º,3º,4º)	30	60	Vitoria	35	30	60
León	43	15	30	Zaragoza	43	15	40

<div style="border: 2px solid yellow; background: lightyellow; display: inline-block; padding: 5px 15px;">**AERODROME WARNINGS**</div>

EXAMPLES OF AERODROME WARNINGS

WWSP60 LEST 100600

LEST AD WRNG 5 VALID 101200/101800 RAINFALL IN 1HR MORE THAN 45MM FCST NC=

Warning nº 5 for the airport of Santiago, valid between 1200Z and 1800Z: total rainfall in 1 hour more than 45 mm. No changes in intensity are forecast.

WWSP60 LEZG 122100

LEZG AD WRNG 1 VALID 130600/130800 FROST T MS02C FCST NC=

Warning nº 1 for the airport of Zaragoza, valid between 0600Z and 0800Z: frost with forecast temperature -2ºC. No changes in intensity are forecast.

WWCR60 GCLA 071200

GCLA AD WRNG 2 VALID 071200/071600 SFC WSPD 30KT MAX 40 OBS AT 1155Z INTSF=

Warning nº 2 for the airport of La Palma, valid between 1200Z and 1600Z: wind gusts of 40 knots observed at 1155Z and intensifying.

WWCR60 GCLA 071400

GCLA AD WRNG 3 VALID 071400/071600 CNL AD WRNG 2 071200/071600=

At 1400Z strong wind that caused the warning nº 2 is no longer observed or forecast, and it is cancelled.

WARNINGS OF LIGHTNING OBSERVED WITHIN THE AERODROME

The warnings of lightning observed within or close to the aerodrome are generated automatically with data from the AEMET network of cloud-ground electrical discharge detectors, using a software application. They are shown in text format and serve as support to the refueling operations of the aircraft.

Using the position (latitude-longitude) of each aerodrome and the detected lightning, the software program searches every 2 minutes for the detected lightning within a circle of 25 km of radius centered at the airport. Depending on the proximity to the airport, three different areas are defined:

- •Maximum alert : circle of 5 km of radius
- •Alert: circle of 8 km of radius
- •Prior alert: circle of 25 km of radius

Depending on the location of the lightning, four types of warning are generated: prior alert (25 km), alert (8 km), maximum alert (5 km) and normal situation (after 10 minutes without any lightning within those areas).

EXAMPLES OF LIGHTNING DETECTED

WWSP61 LEMD 220252

AGENCIA ESTATAL DE METEOROLOGIA

AVISO DE RAYOS EN EL AREA DEL AEROPUERTO DE MADRID/BARAJAS

22 DE MARZO DE 2015. 02:52 UTC. COMIENZO DEL ESTADO DE PREALERTA (CIRCULO DE 25 KM DE RADIO)

WWSP61 LESO 162134

AGENCIA ESTATAL DE METEOROLOGIA

AVISO DE RAYOS EN EL AREA DEL AEROPUERTO DE SAN SEBASTIAN

16 DE ENERO DE 2015. 21:34 UTC. COMIENZO DEL ESTADO DE ALERTA (CIRCULO DE 8 KM DE RADIO)

WWCR61 GCLA 301634

AGENCIA ESTATAL DE METEOROLOGIA

AVISO DE RAYOS EN EL AREA DEL AEROPUERTO DE LA PALMA

30 DE DICIEMBRE DE 2014. 16:34 UTC. COMIENZO DEL ESTADO DE ALERTA MAXIMA (CIRCULO DE 5 KM DE RADIO)

WWSP61 LEZL 131044

AGENCIA ESTATAL DE METEOROLOGIA

AVISO DE RAYOS EN EL AREA DEL AEROPUERTO DE SEVILLA

13 DE DICIEMBRE DE 2014. 10:44 UTC. COMIENZO DE LA SITUACION NORMAL

WARNINGS OF FORECASTING THUNDERSTORMS WITHIN THE AERODROME

The way to obtain the thunderstorm warnings is to perform a linear extrapolation of the stormy cores that can affect each airport in the next 20 minutes, generating then a forecasting storm warning. The extrapolation is performed by a computer application that runs every 10 minutes for all airports and makes use of the detected lightning in cloud-ground (within a radius of 25 km around the airport), the radar data and the fields of numerical prediction models.

FORMAT AND CONTENT OF THE WARNINGS

Heading:

WWSP62 (or WWCR62) CCCC DDHHMM

- WWSP62 (or WWCR62): WW (warning identification), SP or CR (area identification), 62: number of message.
- CCCC: ICAO location indicator of the aerodrome originating the message.
- DDHHMM: Day, hour and minutes UTC of message issue.

Text:

> *AGENCIA ESTATAL DE METEOROLOGÍA*
>
> *WWSP62 ACT CCCC AAMMDDHH:MM VAL 20m AAAAAA MOV nn/nn*
>
> *TORMENTA PREVISTA para el área del aeropuerto de NOMBRE AEROPUERTO*
>
> *MENSAJE emitido a las HH:MM UTC del DD de Mes de Año.*
>
> *Se detecta tormenta que posiblemente afectará a la zona del aeropuerto en los próximos 20 minutos, situada al nn, desplazándose hacia el nn.*

Meaning:

- ACT: abbreviation to indicate activity.
- CCCC: ICAO location indicator of the aerodrome for which the warning is issued.
- AAMMDDHH:MM: year (AA), month (MM), day (DD), hour (HH) and minute (MM) UTC when the warning is generated.
- VAL: abbreviation to indicate the validity period.
- 20m: validity of the message, 20 minutes.
- AAAAAA: it could take the following values:
    - o UNA: for a single thunderstorm.
    - o VARIAS: for several thunderstorms.
- MOV: movement of the thunderstorm (only for a single thunderstorm).
- nn/nn: Direction of the displacement of the thunderstorm with respect to one of the 8 points of the compass (N, NE, E, SE, S, SW, W, NW). First two letters before the slash indicate the current position, and two letters after the slash indicate the displacement.

Example:

> *WWSP62 LEBL 141804*
>
> *AGENCIA ESTATAL DE METEOROLOGIA*
>
> *WWSP62 ACT LEBL 15031418:00 VAL 20M UNA MOV NW/ N*
>
> *TORMENTA PREVISTA PARA EL AREA DEL AEROPUERTO DE BARCELONA*
>
> *MENSAJE EMITIDO A LAS 18:00 UTC DEL 14 DE MARZO DE 2015*
>
> *SE DETECTA TORMENTA QUE POSIBLEMENTE AFECTARA A LA ZONA DEL AEROPUERTO EN LOS PROXIMOS 20 MINUTOS, SITUADA AL NW, DESPLAZANDOSE HACIA EL N DEL AEROPUERTO*

METEOROLOGICAL INFORMATION AVAILABLE AT EMAe

REAL TIME INFORMATION OF THE AIRPORT

Direction and wind speed: instant wind, mean speed of the wind over 2-minutes and 10-minutes period, maximum and minimum wind speed. Temperature and dew-point temperature. Humidity. QNH and QFE. At most airports components of the wind on runways, clouds height and RVR are also shown.

ALPHANUMERIC INFORMATION AVAILABLE AT EMAe

METAR (SA).

SPECI (SP).

TAF (FC y FT) and amendments.

SIGMET (WS).

SIGMET for volcanic ash (WV).

SIGMET for tropical cyclone (WC).

Volcanic ash advisory information (FV).

Tropical cyclone advisory information (FK).

Special AIREP (UA).

GAMET for the Iberian Peninsula and the Balearic Islands (FASP) and for the Canary Islands (FACR).

AIRMET for the Iberian Peninsula and the Balearic Islands (WASP) and for the Canary Islands (WACR).

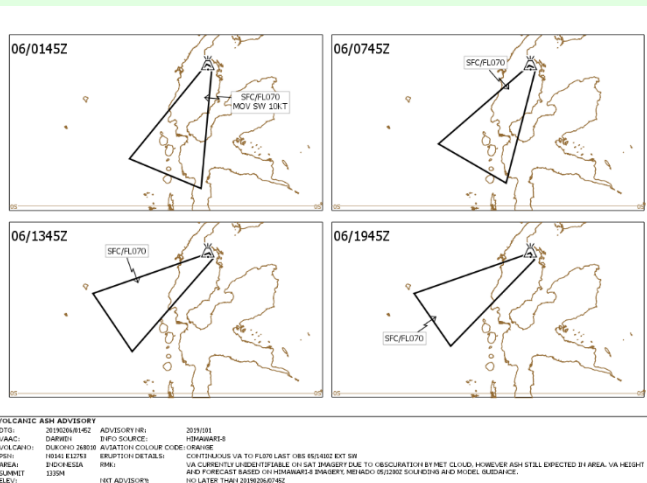Forecasts for take-off (by request, with agreement).

Forecast for temperature (below 0ºC).

Aerodrome warnings, observed and forecast.

Warnings of observed lightning and forecasting thunderstorms

Wind shear warnings (if available).

Radiosoundings in Madrid/Barajas, A Coruña, Santander, Huelva, Palma, Tenerife y Murcia.

VOLCANIC ASH ADVISORY INFORMATION (above) and SIGMET FOR VOLCANIC ASH : WAAZ SIGMET 05 VALID 060822/061345 WAAA- WAAZ UJUNG FIR PANDANG FIR VA ERUPTION MT DUKONO PSN N0141 E12753 VA CLD EST AT 0745Z WI N0144 E12751 - N0023 E12716 - N0018 E12757 - N 0144 E12756 - N0144 E12751 SFC/FL070 FCST AT 1345Z WI N0144 E12752 - N0140 E12757 - N0023 E12717 - N0048 E 12645 - N0144 E12752

IMAGES TAKEN BY THE METEOROLOGICAL RADAR

AEMET has a network of 15 C-band Doppler radars, 13 over the Peninsula, one in the Balearic Islands and one in the Canary Islands. Each of these radars covers an area of 240 kilometers radius (excepting the Canary Islands, with a radius of 300 kilometers) and generates a volume of data every 10 minutes. From these data, different types of products are obtained, among others: PPI of reflectivity, maximum reflectivity, Echo Top, radial wind speed, estimation of surface precipitation intensity, liquid water content in the column, cumulative rainfall in one hour and cumulative rainfall corrected with data from rain gauge

In addition, products of national coverage are also included, covering the entire territory excepting the Canary Islands and, in some cases, including Portuguese radars.

The radar information is shown on the IRIS-display work stations at OMAe, so that the particular area of interest for every OMAe and the national coverage are shown at the same time.

DETECTED LIGHTNING IMAGES

The AEMET lightning detection network is made up of three subsystems for the detection of lightning: the control of equipment, the analysis and location of their measurements and the exploitation of these data. There are twenty detection devices of lightning spread throughout the peninsular territory and the Balearic and the Canary islands. These devices capture, analyze and discriminate the electromagnetic radiation generated in the atmospheric electric discharges detected within its range.
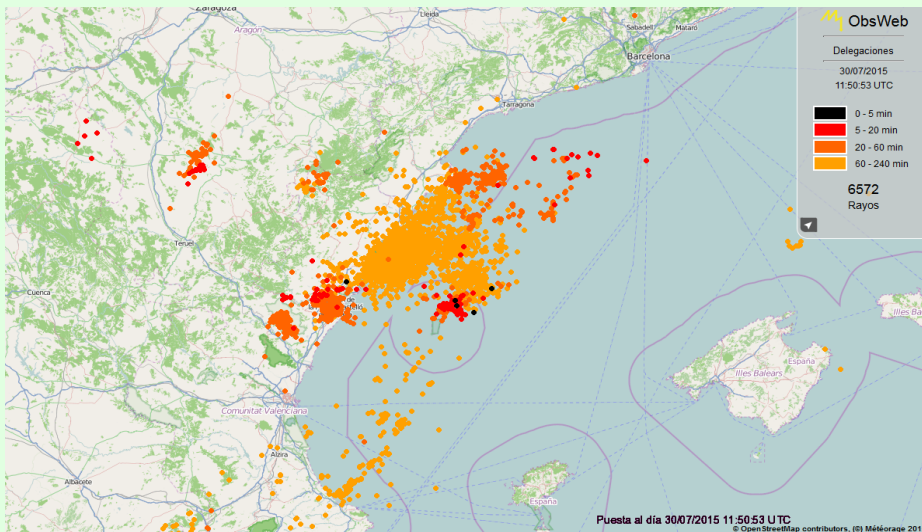
Data are exchanged with other countries, such as France and Portugal. For every airport and military air base, warnings of detected lightning are obtained for three different circles centered at the airport within a radius of 5 km, 8 km and 25 km. A software application shows these discharges at the EMAe.

SATELLITE IMAGES

AEMET provides at its offices Meteosat satellite images of the latest generation (MSG), as well as cloud type images. Satellite images are provided every 15 minutes on 11 different channels in the visible, infrared and water vapor bands (3 km) plus a high resolution visible channel (1 km).
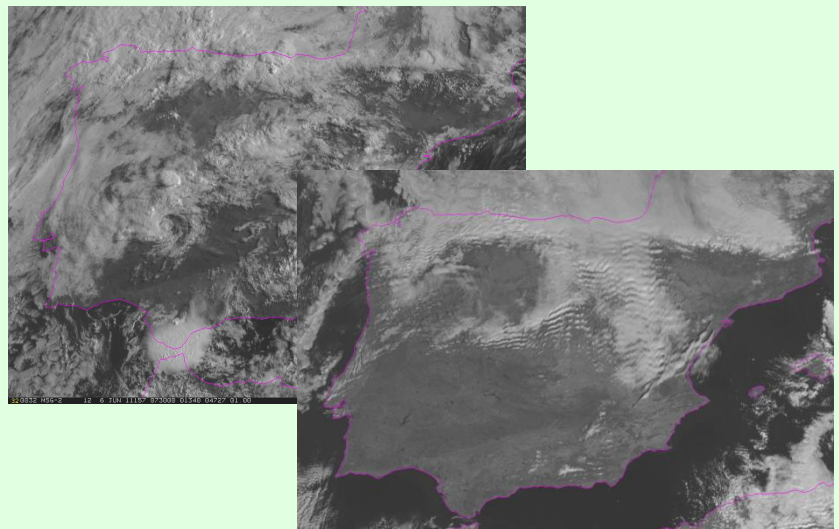
Currently, RSS mode (Rapid Scan Service) is also received, which allows images to be available every 5 minutes on the northern third of the satellite's coverage area (from Europe and North Africa to the Canary Islands). Products derived from data received from satellites are also provided, such as analysis of cloudiness, temperature and height of top cloud, global instability index, different precipitable water content products, analysis of air masses, etc.

METEOROLOGICAL INFORMATION AVAILABLE AT EMAe

AERONAUTICAL CHARTS

Forecast on en-route weather phenomena concerning upper wind, temperature and humidity, direction, speed and altitude of maximum wind, tropopause level, and significant weather in the following areas and ICAO regions:

a) The Iberian Peninsula, the Balearic Islands and the Canary Islands: significant weather chart from surfface to flight level FL150. Wind and temperature at flight levels: FL20, FL50, FL100, FL150, FL180, FL300.

b) EUR region: significant weather chart, tropopause and maximum wind FL100-450. Wind and temperature at 17 flight levels, from FL050 to FL530. Humidity at 5 flight levels, from FL050 to FL180

c) NAT region: significant weather chart, tropopause and maximum wind FL250-630. Wind and temperature at 17 flight levels, from FL050 to FL530. Humidity at 5 flight levels, from FL050 to FL180

d) EURSAM region: significant weather chart, tropopause and maximum wind FL250-630. Wind and temperature at 17 flight levels, from FL050 to FL530. Humidity at 5 flight levels, from FL050 to FL180

e) EURAFI region: significant weather chart, tropopause and maximum wind FL250-630. Wind and temperature at 17 flight levels, from FL050 to FL530. Humidity at 5 flight levels, from FL050 to FL180

f) MID region: significant weather chart, tropopause and maximum wind FL100-450. Wind and temperature at 17 flight levels, from FL050 to FL530. Humidity at 5 flight levels, from FL050 to FL180

g) ASIA region: significant weather chart, tropopause and maximum wind FL250-630. Wind and temperature at 17 flight levels, from FL050 to FL530. Humidity at 5 flight levels, from FL050 to FL180

METEOROLOGICAL INFORMATION AVAILABLE AT EMAe
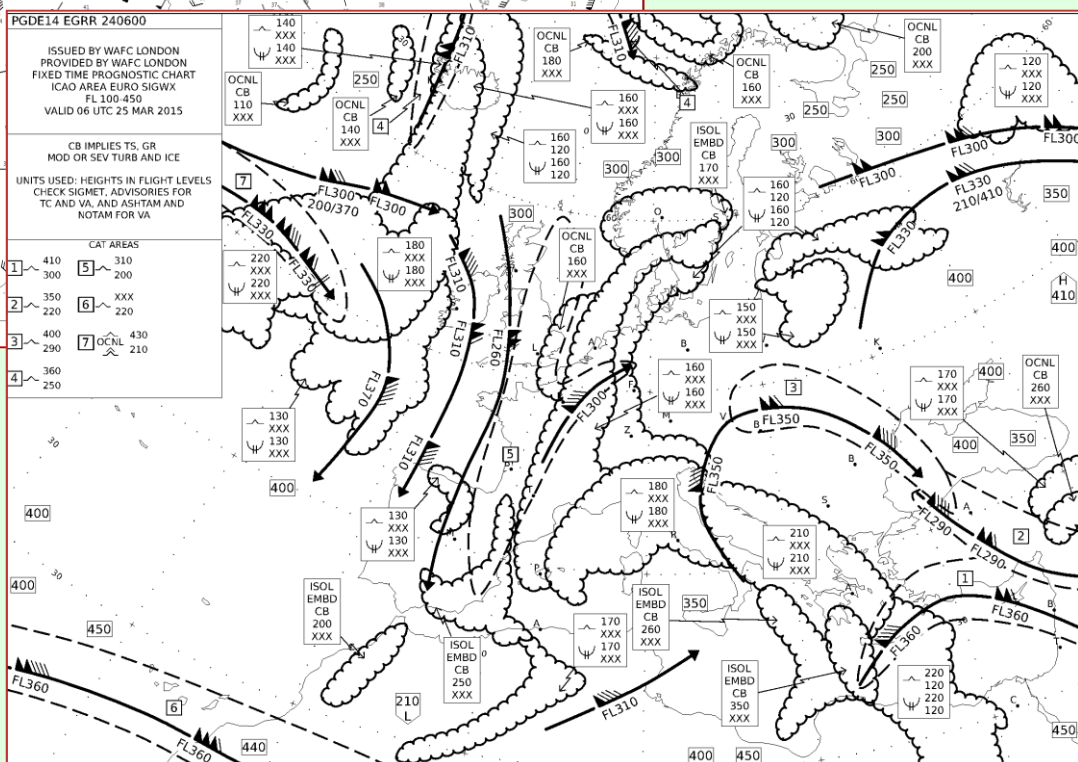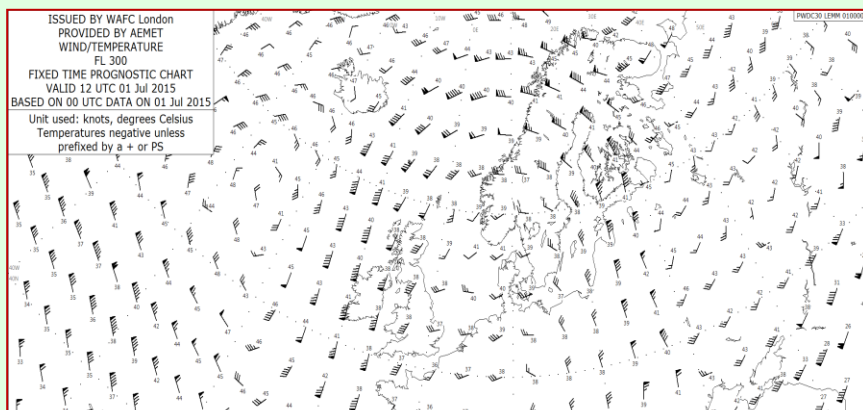
FORECAST SURFACE WEATHER CHARTS H+12, H+24, H+36, H+48, H+60 and H+72

Forecast charts of isobars and fronts for 12, 24, 36, 48, 60 y 72 hours ahead
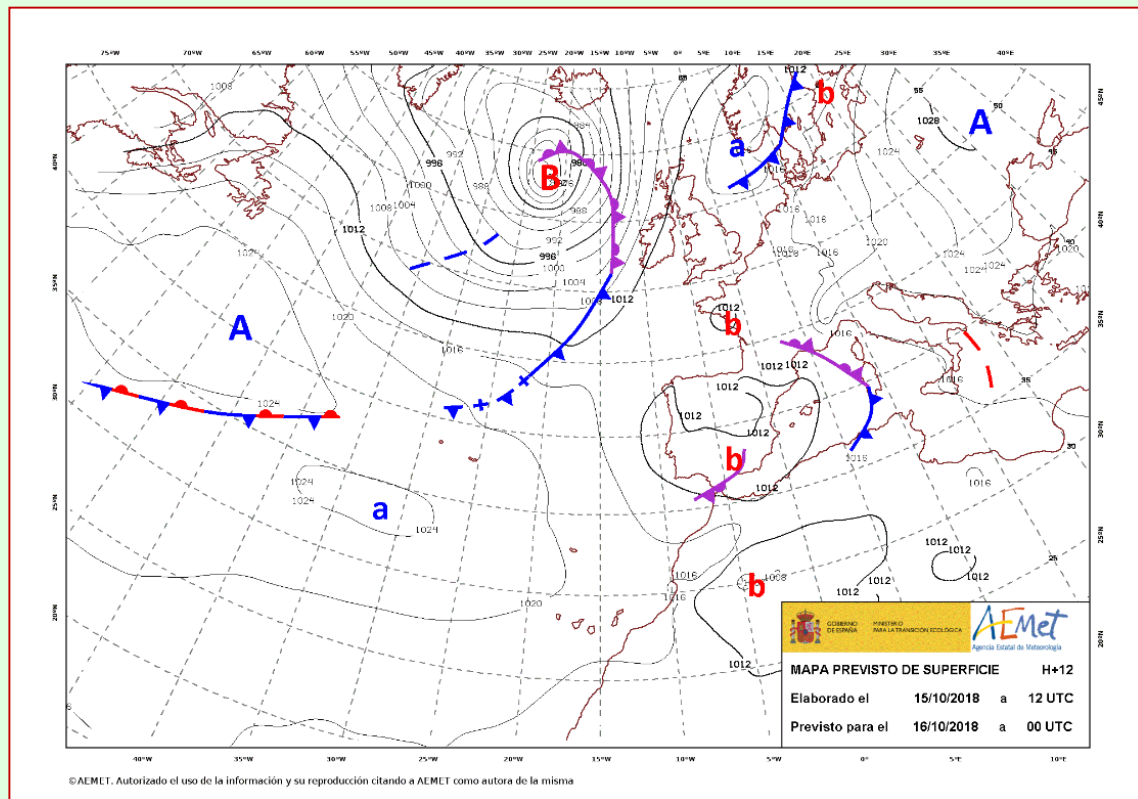
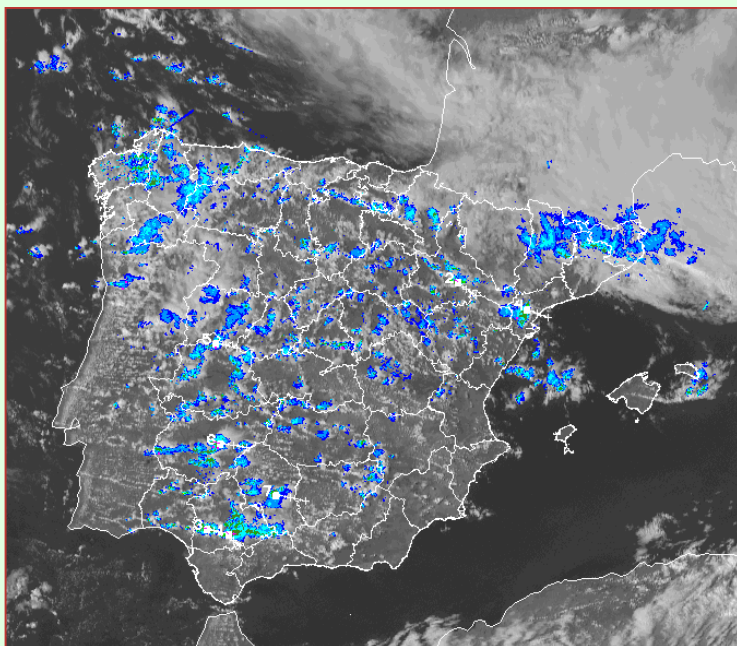## AERONAUTICAL CLIMATOLOGIES

See the corresponding section of this guide.

CONSULTATION DOCUMENTS

- Met Guide: Aeronautical meteorological information.
- Access to AMA. AMA access is available at EMAe for queries by aeronautical users. See the corresponding section of this guide for more information about AMA.
- Abbreviations and ICAO codes.
- ICAO location indicators.
- Aeronautical codes

AERODROME	ICAO LOCATION INDICATOR	TREND	Phone number
A Coruña	LECO	YES	981 134 647
Albacete	LEAB	YES	967 556 107
Alicante-Elche	LEAL	YES	966 919 215
Almería	LEAM	NO	950 290 000
Andorra-La Seu d'Urgell	LESU	NO	973 350 582
Asturias	LEAS	YES	985 127 566
Badajoz/Talavera la Real	LEBZ	NO	924 209 632
Barcelona/El Prat	LEBL	YES	932 983 812
Bilbao	LEBB	YES	944 869 901
Burgos	LEBG	NO	947 480 727
Castellón	LECH	NO	964 578 600 Ext 2007
Ciudad Real	LERL	NO	926 838 038
Córdoba	LEBA	NO	957 214 113
Fuerteventura	GCFV	NO	928 530 239
Girona	LEGE	NO	972 186 645
Gran Canaria	GCLP	YES	928 579 917
Granada/Federico García Lorca. Granada-Jaén	LEGR	NO	958 446 428
Hierro	GCHI	NO	922 551 004
Huesca	LEHC	NO	974 280 287
Ibiza	LEIB	YES	971 809 149
Jerez	LEJR	NO	956 150 069
La Gomera	GCGM	NO	922 873 019
La Palma	GCLA	NO	922 428 006
Lanzarote	GCRR	NO	928 821 897
Leon	LELN	NO	987 300 326
Lleida	LEDA	NO	973 179 500
Logroño	LELO	NO	941 279 416
Madrid/Adolfo Suárez Madrid–Barajas	LEMD	YES	913 055 782
Madrid/Cuatro Vientos	LEVS	NO	916 493 066
Málaga/Costa del Sol	LEMG	YES	952 048 890
Melilla	GEML	NO	952 698 619 952 674 416

ANNEX I: AERONAUTICAL METEOROLOGICAL STATIONS (EMAe)

AERODROME	ICAO LOCATION INDICATOR	TREND	Phone number
Menorca	LEMH	NO	971 361 545
Murcia/Región de Murcia	LEMI	NO	968 855 995
Palma de Mallorca	LEPA	YES	971 789 319
Pamplona	LEPP	NO	948 312 784
Reus	LERS	NO	977 770 406
Sabadell	LELL	NO	937 207 724
Salamanca	LESA	NO	923 129 775
San Sebastián	LESO	NO	943 668 544
Santander/Seve Ballesteros-Santander	LEXJ	NO	942 202 114
Santiago	LEST	YES	981 599 160
Sevilla	LEZL	YES	954 674 455
Tenerife Norte	GCXO	YES	922 260 352
Tenerife Sur/Reina Sofía	GCTS	YES	922 759 205
Valencia/Manises	LEVC	YES	961 598 653
Valladolid/Villanubla	LEVD	NO	983 369 679
Vigo	LEVX	YES	986 486 962
Vitoria	LEVT	NO	945 163 543
Zaragoza	LEZG	NO	976 324 647

NOTES

At some EMAe METAR AUTO are issued as well (see the schedules in the AIP).

See AIP for more information regarding schedules and products.

In the following aerodromes or heliports there are no personnel but METAR AUTO is issued 24 hours a day. TAF or aerodrome warnings are issued for some aerodromes or heliports, as shown in the following table:

AERODROME/HELIPORT	ICAO LOCATION INDICATOR	Aerodrome warnings	TREND	TAF
Mallorca/Son Bonet	LESB	YES	NO	NO
Teruel	LETL	YES	NO	YES
Algeciras (1)	LEAG	YES	NO	YES
Ceuta (2)	GECE	NO	NO	YES

(1): TAF issued from the 9th of September 2021

(2): METAR AUTO and TAF issued from the 9th of September 2021

ANNEX II: AERODROME METEOROLOGICAL OFFICES (OMAe)

List of OMAe: These offices are in charge of meteorological watch and are responsible for providing the forecast for the aerodromes. The address, telephone and fax number are included, as well as EMAe and OMD with civil flights, under their responsibility.

OMAe	ADDRESS	TELEPHONE/ FAX	EMAe / OMD	
Las Palmas de Gran Canaria	C/ Historiador Fernando de Armas, n.º 12 Tafira Baja 35017 - Las Palmas de Gran Canaria	Tel.: 928 430 603 Fax: 928 430 601	Fuerteventura EMAe Gran Canaria EMAe El Hierro EMAe La Gomera EMAe Lanzarote EMAe La Palma EMAe Tenerife Norte EMAe Tenerife Sur EMAe	
Madrid	Parque de El Retiro. Paseo de Uruguay, 2 Apdo. 285 Madrid	Tel.: 915 045 807 Fax: 915 045 899	Albacete OMD Madrid/Adolfo Suarez Madrid-Barajas EMAe Madrid/Cuatro Vientos OMD Logroño OMD León OMD Salamanca OMD Valladolid/Villanubla OMD Burgos EMAe	
Santander	C/ Ricardo Lorenzo, s/n Cueto 39071 – Santander	Tel.: 942 392 464 Fax: 942 391 680	Asturias EMAe San Sebastián EMAe Santander/Seve Ballesteros-Santander EMAe A Coruña EMAe Santiago EMAe Vigo EMAe Vitoria EMAe Pamplona EMAe Bilbao EMAe	
Sevilla	Avda. de Américo Vespucio, 3 Isla de la Cartuja 41092 – Sevilla	Tel.: 954 462 030 Fax: 954 461 626	Córdoba EMAe Sevilla EMAe Jerez EMAe Badajoz/Talavera la Real OMD Almería EMAe Granada/Federico García Lorca Granada-Jaén EMAe	Málaga/Costa del Sol EMAe Melilla EMAe Murcia/Región de Murcia EMAe Algeciras EMAe Ceuta EMAe
Valencia	C/ Botánico Cabanilles, n.º 3 Apdo. 22043 46010 – Valencia	Tel.: 963 931 953 Fax: 963 627 102	Alicante EMAe Valencia/Manises EMAe Palma de Mallorca EMAe Ibiza EMAe Menorca EMAe Huesca EMAe Zaragoza EMAe Castellón EMAe	Barcelona EMAe Girona EMAe Lleida EMAe Reus EMAe Sabadell EMAe Andorra-La Seu EMAe Son Bonet EMAe

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•Cover page. Photo taken by Fernando Bullón.

•Page 5. Photo of AEMET headquarters

•Page 6. Image of a wind indicator showing the wind data of a runway. AEMET.

•Page 7. Image of the runway of an aerodrome shown in the integrated data system of an EMAe. AEMET.

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- Image 1. Photo of the headquarters of the Meteorological Watch Office (OVM) of Valencia, taken by Marta Ferri, AEMET.
- Image 2. Map showing the list of EMAe, OMAe and OVM of AEMET. Image made by Fernando Asanza. AEMET.

•Page 9. Photo taken by Jordi Martín

•Page 10. Image of the main page of AMA. AEMET.

•Page 11. Experimental product of forecast of lightning on the Peninsula and the Balearic Islands (right), and chart of forecast winds for the Canary Islands at flight level 150 (left). Both images have been extracted from AMA. AEMET.

•Page 12. Image of the cover pages of aeronautical climatologies and aerodrome meteorological guides. AEMET.

•Page 15. Photo taken by Fernando Bullón.

•Page 16. Photo taken by Jordi Martín.

•Page 17. Photo taken by Jordi Martín.

•Page 23. Photos of aeronautical meteorology equipment. Juan Iglesias. AEMET.

•Page 28. Mount Teide. Photo taken by Rubén del Campo Hernández (Source: AME photo galleries)

•Page 34. Photo taken by Rubén del Campo Hernández.

•Page 35. Photo taken by Isabella Osetinsky (Source: AME photo galleries)

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- Image 1. Example of a low-level chart for the Peninsula and the Balearic Islands. AEMET.
- Image 2. Visible satellite image. AEMET.

•Page 43. Photo taken by Jordi Martín.

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- Image 1. Example of a volcanic ash advisory and the associated SIGMET (lower text). Image and text extracted from AMA.
- Image 2. Photo of the meteorological radar located in Pico Mijas (Málaga). AEMET.

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- Image 1. Image of detected lightning in the vicinity of Castellón airport. AEMET.
- Image 2. High resolution visible satellite image. AEMET.

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- Image 1. Chart of wind and temperature for Europe at flight level 300.
- Image 2. Significant weather chart for Europe at flight levels 100-450.

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- Image 1. Surface pressure chart. AEMET.
- Image 2. Image of observed precipitation, made from the radar of national composition. AEMET.

•Back cover. Photo taken by por Fernando Bullón.

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Acknowledgements

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