

AVIATION WEATHER PRODUCTS

Graphical Area Forecast (GAF)

Bureau of Meteorology > Aviation Meteorological Services



The Graphical Area Forecast (GAF) is designed primarily to meet the needs of pilots flying in the airspace between the surface and 10000 feet (AMSL)

Graphical Area Forecasts

The Graphical Area Forecast (GAF) is designed primarily to meet the needs of pilots flying in the airspace between the surface and 10000 feet above mean sea level (AMSL). GAFs provide information on weather, cloud, visibility, icing, turbulence and freezing level in a graphical layout with supporting text. GAFs are provided for 10 areas covering Australian airspace, broadly State-based, as shown in the map below.



Issue and validity times of GAFs are standardized nationally with standard validity times of 2300Z-0500Z, 0500Z-1100Z, 1100Z-1700Z and 1700Z-2300Z.

Each GAF product is valid for 6 hours with two consecutive products issued at each issuance time, therefore providing a forecast for a 12 hour period.

Updates to GAF and GAF Corrections

GAFs are not **amended**. If a weather event or phenomena occurs or is expected to occur that was not originally forecast in the GAF, an AIRMET will be issued. (N.B. A SIGMET will always be issued for its specific phenomena). A **CORRECTED** GAF can be issued between standard issue times for the following reasons:

1. Typographical errors
2. Transmission errors
3. Improvements in conditions



Australian Government
Bureau of Meteorology

Graphical Area Forecast SFC - 10000FT WA-S
 Issued at 1703080415 - Valid 080500 to 081100
 Weather Features valid at 080500

Australian Government
Bureau of Meteorology

AREA	SURFACE VIS AND WX	CLOUD, ICING AND TURB	FZLVL
A	>10KM NIL 3000M SCT SHRA	BKN CU/SC 3000/ABV10000FT ISOL TCU 2000/ABV10000FT BKN ST 0800/2000FT BKN CU 2000/ABV10000FT	6000FT
B	>10KM NIL 3000M SCT SHRA 2000M ISOL TSRA	BKN CU/SC 2000/ABV10000FT ISOL TCU 2000/ABV10000FT BKN ST 0800/2000FT BKN CU 2000/ABV10000FT ISOL CB 2000/ABV10000FT BKN ST 0800/2000FT	6000FT
C	>10KM NIL 2000M WDSR SHRA 2000M ISOL TSRA S OF YNSM	BKN CU/SC 2000/ABV10000FT ISOL TCU 2000/ABV10000FT BKN ST 0800/2000FT OVC CU/SC 2000/ABV10000FT ISOL CB 2000/ABV10000FT BKN ST 0800/2000FT	5000FT S OF 32S, 7000FT N OF 32S
D	>10KM NIL		9000FT
E	>10KM NIL 5000M ISOL SHRA	SCT CU 4000/9000FT ISOL TCU 4000/ABV10000FT BKN ST 2000/4000FT BKN CU 4000/9000FT	ABV 10000FT
F	>10KM NIL 3000M SCT RA 2000 ISOL TSRA	BKN ST 2000/4000FT BKN AC/AS 9000/ABV10000FT ISOL CB 5000/ABV10000FT BKN ST 2000/4000FT	ABV 10000FT

Legend

All heights AMSL
 TS / CB / TCU implies SEV ICE and SEV TURB
 CU / SC / AC implies MOD TURB CLD ABV FZLVL implies MOD ICE
 Speed of movement in KT • refers to Critical Locations
 - refers to Limit of Forecast • refers to Critical Locations
 Check AIRMETS, SIGMETs and NOTAMs

Remarks

REMARKS:

Table

For more information contact (08)9263 2255

Symbol	Weather Feature
	Cold fronts
	Significant low pressure systems
	Significant surface trough
	Direction-of-motion arrows
	Tropical cyclones (severe and non-severe)

Approved abbreviations and terms used in Critical Location Forecasts:

Abbr/Term	Description
CAVOK	Ceiling and Visibility OK
CLD ON GND	Cloud on ground
ELEV	Elevation
INTER	Intermittent conditions
TEMPO	Temporary conditions
VAL	Valley/s

GAF Layout and Contents

Header

The header field contains the title of the product, GAF area name, issue time, validity times (written in DDHHMM TO DDHHMM, where DD is the day of the month and HHMM is the time in hours and minutes UTC), validity time of any weather features and the Bureau of Meteorology logo. The word 'CORRECTED' will be included if the GAF is corrected.

Graphical Area Forecast SFC - 10000FT VIC
CORRECTED
 Issued at 1709150209Z - Valid 151100 to 151700Z
 Weather Features valid at 151100Z

Australian Government
Bureau of Meteorology

Image

The image is derived from the Airservices Planning Chart Australia (PCA) chart, with the boundary of the GAF area overlaid in black. The image shows weather areas that are labelled with an alpha character (such as A, B, etc.), with alphanumeric labels (such as A1 or B1) highlighting a sub area(s). The green scalloped lines separate the areas and sub areas. Some weather features will be displayed using symbols, with their movement depicted using an arrow and their speed of movement given in knots. The position of this feature is valid at the start time of the validity period.

Legend

The legend specifies the following:

- all heights are AMSL
- TS/CB/TCU will always imply severe icing and severe turbulence
- CU/SC/AC will always imply moderate turbulence
- cloud above Freezing Level (CLD ABV FZLVL) will always imply moderate icing
- request the user checks AIRMETS, SIGMETs and NOTAMs
- highlights that critical locations on the map are marked by a blue/bold circle
- speed of movement of weather features in knots
- the solid black line on the graphic denotes the limit of the forecast area

Remarks

The remarks field briefly includes additional information of operational relevance, including forecasts for critical locations and a summary of any GAF corrections. The phone number of the duty forecaster is also provided.

Approved abbreviations and terms used in GAF:

Abbr/Term	Description
ABV	Above
BASE(S)	Cloud base(s)
BECMG	Becoming
BLW	Below
CLD	Cloud
COAST	Coast
COR	Correction
E	East
FT	Feet
FZ LZR	Freezing Layer
FZLVL	Freezing Level
FM	From
ICE	Icing
IMPR	Improvement in conditions
INLAND	Inland
KM	Kilometres
KT	Knot
LAND	Land
M	Metres
MOD	Moderate
MTW	Mountain Waves
NM	Nautical mile
NIL	Nil weather
N	North
NE	Northeast
NW	Northwest
SEA	Over sea/water
SEV	Severe
S	South
SE	Southeast
SW	Southwest
SQL	Squall
STNR	Stationary
SFC	Surface
THERMALS	Thermals
TL	Until
TOP(S)	Cloud Top(s)
TRANS ERR	Transmission error
TURB	Turbulence
TYPO	Typographical error
VIS	Visibility
W	West
WI	Within
Z	Zulu/UTC time

Critical locations and associated forecasts

Critical locations are locations such as gaps in mountain ranges which are frequently used by general aviation aircraft.

Critical location forecasts are included in New South Wales East (NSW-E) GAFs (Bowral, Mt Victoria and Murrurundi) and Victoria (VIC) GAF (Kilmore Gap). The critical location forecasts are in a format similar to Aerodrome Forecasts (TAFs) with the elevation (ELEV) of each location included.

Cloud amount and type are given with the cloud height in feet AMSL in 1000 feet increments. When the forecast cloud is at or below ground level, CLD ON GND (cloud on ground) is written. Surface visibility is reported when the cloud is not on the ground and is given in metres. When the visibility is expected to be greater than 10 kilometres, it is reported as 9999. CAVOK is used to indicate visibility greater than 10 KM, cloud ceiling above 5000FT above ground level and nil significant weather.

Table

Meteorological information is provided in a tabular format and is separated into weather areas. Solid blue lines separate areas, with dotted lines separating different visibility/weather and associated cloud, icing and/or turbulence.

Column 1: AREA

This column indicates the area, such as A, B, C etc. corresponding to the areas outlined in the image.

Column 2: SURFACE VIS AND WX

This column lists different surface visibilities with associated weather, with the highest visibility in an area listed first and any remaining visibilities given in descending order.

Horizontal visibility is given in metres to the nearest 100M up to and including 1000M, and in 1000M increments above that value. The forecast value is followed by the units used e.g. 8000M or 0500M. Visibility greater than 10KM is expressed as >10KM.

Any visibility reductions will be accompanied by an appropriate weather descriptor using approved abbreviations (given in the table below), with each unique visibility/weather in an area occupying its own section (separated by dotted line). If there is no significant weather present the term NIL is used.

The amount of weather coverage is given as **ISOL** (isolated), **SCT** (scattered), or **WDSRPR** (widespread). An area of weather is considered:

- **ISOL** if it consists of individual features which affect, or are forecast to affect, an area with a maximum spatial coverage of up to 50%; or
- **SCT** if it consists of well separated features which affect, or are forecast to affect, an area with a maximum spatial coverage greater than 50% but not more than 75%; or
- **WDSRPR** if it consists of features with little or no separation which affect, or are forecast to affect, an area with a maximum spatial coverage greater than 75%.

Qualifier		Weather Phenomena							
Intensity		Descriptor		Precipitation		Obscuration		Other	
-	Light	MI	Shallow	DZ	Drizzle	BR	Mist	PO	Dust/sand whirls(dust devils)
No qualifier	Moderate	DR	Low drifting	RA	Rain	FG	Fog	SQ	Squalls
+	Heavy	BL	Blowing	SN	Snow	FU	Smoke	FC	Funnel cloud (tornado or water sprout)
		SH	Shower(s)	SG	Snow grains	VA	Volcanic Ash	SS	Sandstorm
		TS	Thunder-storm	PL	Ice pellets	DU	Wide-spread Dust	DS	Duststorm
		FZ	Freezing (Super-cooled)	GR	Hail	SA	Sand		
				GS	Small hail or snow pellets	HZ	Haze		

Cloud amount is given using the following abbreviations:

Code	Cloud Amount
FEW	Few (1 to 2 oktas)
SCT	Scattered (3 to 4 oktas)
BKN	Broken (5 to 7 oktas)
OVC	Overcast (8 oktas)

...except for cumulonimbus and towering cumulus, for which amount is described as:

Code	Cloud Amount
ISOL	Isolated
OCNL	Occasional
FRQ	Frequent
EMBD	Embedded

Definitions

Isolated

Individual features which affect, or are forecast to affect up to 50% of an area.

Occasional

Well-separated features which affect, or are forecast to affect, greater than 50% but not more than 75% of an area.

Frequent

Little or no separation between adjacent features affecting, or forecast to affect, greater than 75% of an area.

Embedded

Embedded within cloud layers and cannot be readily recognised.

Cloud type is given using the following abbreviations:

Code	Cloud Type
AC	Alto cumulus
AS	Alto stratus
CB	Cumulonimbus
CU	Cumulus
NS	Nimbostratus
SC	Stratocumulus
ST	Stratus
TCU	Towering cumulus

Column 3: CLOUD, ICING AND TURB

This column provides information on any cloud, icing and/or turbulence associated with the surface visibility and weather conditions provided in column 2.

The inclusion of cloud is restricted to:

- any cumulonimbus (CB) or towering cumulus (TCU)
- any cloud with a base below 10000FT AMSL
- any cloud associated with any forecast precipitation affecting the airspace below 10000FT AMSL

Cloud amount and type are given using the abbreviations in the tables on the left.

If there is no cloud expected in an area, or associated with a specific weather, such as fog or smoke, the cell is left blank.

When CU and SC, or AC and AS, occur together at similar heights they may be combined. (i.e. CU/SC or AC/AS.)

Cloud base and tops are given in feet AMSL.

If a layer of turbulence and/or icing is forecast the following applies:

- if the base of the turbulent/icing layer is occurring below 10,000 feet and the vertical extent is expected to extend above 10,000 feet, descriptions such as ABV 8000FT are used. This indicates that there is turbulence/icing above 8000 feet (if the turbulence/icing layer extends above 10,000 feet, the user should refer to the Midlevel SIGWX chart – or High-level SIGWX chart if required – to determine the vertical extent).
- if the top of the turbulent/icing layer is expected to occur below 10,000 feet and the phenomenon is expected to extend to ground level, descriptions such as BLW 8000FT are used. This indicates that the turbulence or icing extends from the surface to 8000 feet.
- if the layer is not bounded by the surface or 10,000 feet descriptions such as 4000/9000FT are used, or if the top is bounded by 10,000 feet descriptions such as 5000/10000FT are used.
- if the layer is occurring from the surface to above 10000FT, SFC/ABV 10000FT shall be used.

Column 4: FZLVL

Freezing level is the height in feet AMSL where the air temperature is zero degrees celsius. Freezing level is displayed in feet up to 10000FT. If the freezing level is above 10000FT then the level will be indicated by ABV 10000FT.

Reference is made to any variations in height greater than 2000FT, and to the occurrence of more than one freezing level (where required).

There is at least one freezing level description provided for each area.

Sub Areas

A sub area is used to highlight conditions that are slightly different to that of the associated area, and the information that the text refers to only applies to the sub area. Sub areas are identified with alphanumeric labels, such as A1 or B1. Sub areas are not included in the area column but they are referenced within the SURFACE VIS AND WX and CLOUD, ICING AND TURBULENCE columns.

NOTE: For wind and temperature information, refer to Grid Point Wind and Temperature (GPWT) Forecast.



Australian Government
Bureau of Meteorology

Airservices Australia is the official distributor of aviation forecasts, warnings and observations issued by the Bureau of Meteorology. Airservices' flight briefing services are available at www.airservicesaustralia.com. Telephone contact details for elaborative briefings are contained in Airservices' Aeronautical Information Publication Australia (AIP), which is available online through their website.

Other brochures produced by the Bureau of Meteorology's aviation weather services program can be found at www.bom.gov.au/aviation/knowledge-centre.

For more information on Graphical Area Forecasts (GAF) visit: www.bom.gov.au/aviation/gaf