

AVIATION WEATHER PRODUCTS

Graphical Area Forecast (GAF)

Bureau of Meteorology › Aviation Meteorological Services

Effective from 9 November 2017



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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). GAF provides 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.

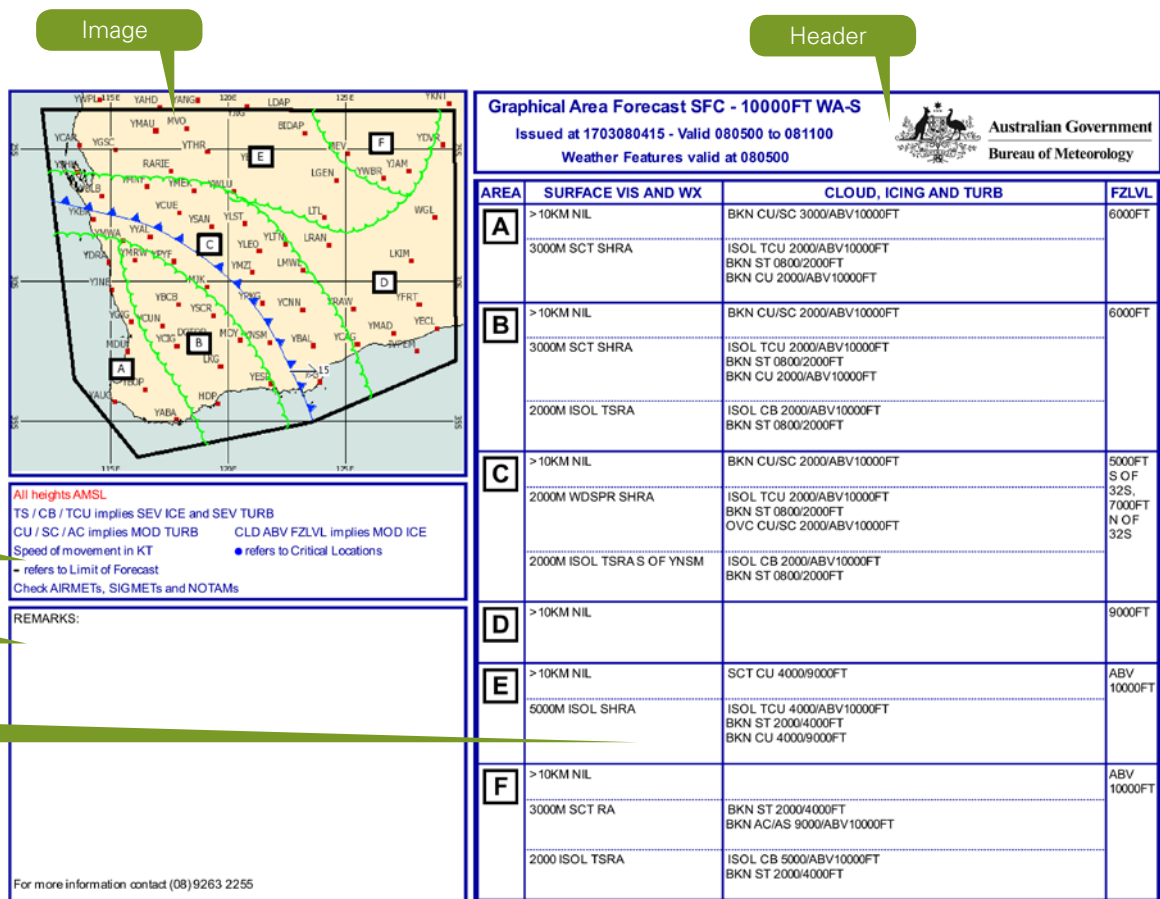
Updates to GAF and GAF Corrections

GAFs are not **amended**. If specified phenomena not forecast in the GAF occur, or are expected, an AIRMET will be issued (NB: a SIGMET will always be issued for its specified phenomena). A corrected GAF can be issued between standard issue times for the following reasons:

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



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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:

Abbreviation	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 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 has been corrected.

Image

The image is derived from the Airservices Planning Chart Australia (PCA) chart, with the boundary of the GAF area overlayed 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;
- requests the user to check AIRMETS, SIGMETs and NOTAMs;
- highlights that critical locations on the map are marked by a blue/bold circle;
- speed of movement of weather features, are 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:

Code	Description
ABV	Above
BASE(S)	Cloud base(s)
BECMG	Becoming
BLW	Below
CLD	Cloud
COAST	Coast
COR	Correction
E	East
FT	Feet
FZ LVR	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). The elevation (ELEV) of each location is 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 5000 FT above ground level and nil significant weather.

Table

Meteorological information is provided in a tabular format, and is separated into weather areas. For each area, the relevant alpha character is displayed in the first column, forecast surface visibility and weather is displayed in the second column, the third column displays the cloud, icing and turbulence information, and the fourth and final column details freezing level information. 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.

Column 3: CLOUD, ICING AND TURB

Information on any cloud, icing and/or turbulence associated with each surface visibility and weather listed is provided in this column.

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	Thunderstorm	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	Altostratus
CB	Cumulonimbus
CU	Cumulus
NS	Nimbostratus
SC	Stratocumulus
ST	Stratus
TCU	Towering cumulus

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.

Information relating to the occurrence of moderate or severe icing and/or turbulence, including mountain waves, outside of the situations mentioned in the legend are also included in this column. Icing and turbulence may not be associated with a specific visibility and weather, thus will often be in a section of their own.

When a layer of turbulence or icing is forecast it will be written in the following formats:

- If the layer is not bounded by the surface or 10000FT descriptions such as 4000/9000FT are used, or if the top is bounded by 10000FT descriptions such as 5000/10000FT are used;
- If the base of the turbulent/icing layer is occurring below 10000FT and the vertical extent is expected to extend above 10000FT, descriptions such as ABV 8000FT are used;
- If the top of the turbulent/icing layer is expected to occur below 10000FT and the turbulence is expected to extend to ground level, descriptions such as BLW 8000FT or BLW 10000FT are used; and
- 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.

There is 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 pint Wind and Temperature (GPWT) Forecast.



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