

Because the TTF is such a short term forecast, it is very accurate and if the conditions in the original TAF are not the same as the current TTF, the TTF replaces the TAF.

Consider the TAF and TTF METAR given below.

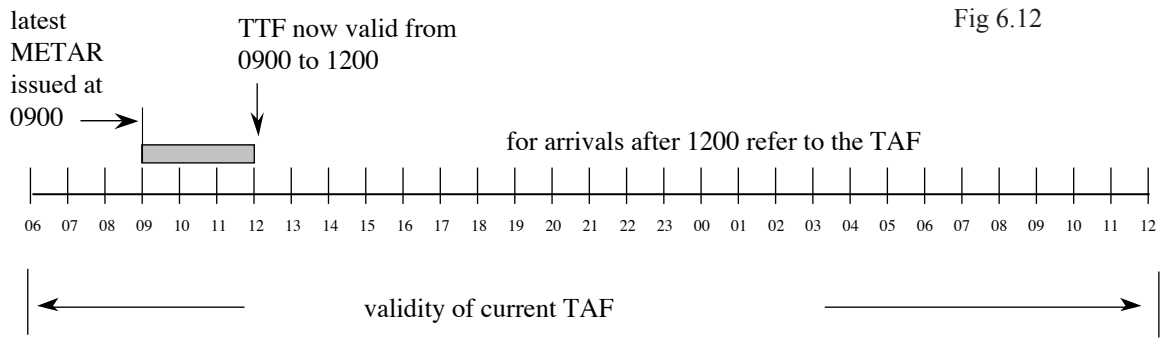
**TAF YPAD 050550Z 0506/0612Z 14010KT 9999 SCT035  
T15 13 10 07 Q1018 1020 1020 1019**

**TTF METAR YPAD 050900Z 15015KT 9000 BKN035 SCT015  
15/091018 NOSIG  
RMK RF00.0/000.0**

Note the term 'NOSIG' indicates no significant change [VFRG Page 2.53]. When 'NOSIG' is attached to the end of a METAR or SPECI, it indicates that no significant change in the conditions observed in the METAR is expected in the next three hours.

Aircraft arriving between 0900 and 1200 should plan for the conditions described in the METAR i.e. less visibility and more cloud than that contained in the original forecast.

Aircraft arriving after 1200, should plan for the conditions described in the original forecast. In an hour's time another TTF METAR will be issued to cover the period from 1000 to 1300 and so on. Aircraft arriving use the current TAF until the current TTF METAR covers their arrival.



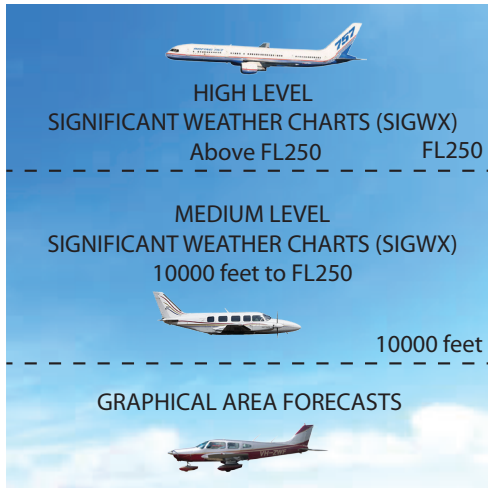
### GRAPHICAL AREA FORECASTS (GAF)

So far the forecasts and reports we have considered all relate to the area within 5 nm radius of the aerodrome [AIP GEN page 3.5 para 3.21]. Before we launch out into the 'wild blue' we will need to examine the weather likely to be encountered en-route. En-route information is presented in the form of a Graphical Area Forecast (GAF) [AIP GEN 3.5 para 3.1, 3.2 & 10.3].

GAFs are issued routinely for flights below 10 000 ft. To find which GAF you need, you turn to Air Service's Planning Chart Australia [AUS PCA]. On this chart you will find, marked in red, the boundaries and names for each of Australia's GAF areas [see ERSA GEN PF para 1.2 for phone or fax numbers to request them].

## FLIGHT FORECASTS

Flight Forecasts are issued on request for flights for which GAFs are not available. They are subject to the requirements of *AIP GEN 3.5 para 3.1* and *AIP GEN 3.5 para 10.3*. Flight forecasts are rarely used in VFR General aviation operations.

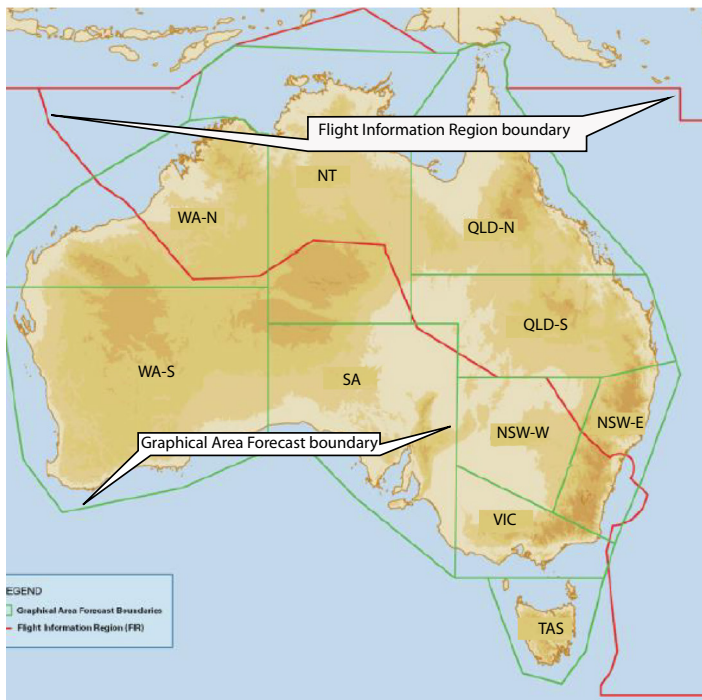


## GRAPHICAL AREA FORECASTS (GAF)

Unlike at TAF, a Graphical Area Forecast (GAF) does not describe conditions expected at a particular location, it refers to a defined area and is intended for use in planning the enroute phase of flight. GAFs cover the airspace between the surface and 10000 feet AMSL and are therefore most useful for unpressurised, non oxygen-equipped general aviation aircraft.

From 10000 feet to FL250 medium level Significant Weather Charts (SIGWX) are used and above FL250, high level Significant Weather Charts (SIGWX) are used, but they don't concern us at the moment.

Ten GAF areas have been created in Australia and their boundaries are indicated on the Planning Chart Australia (PCA). See also *AIP GEN 3.5 para 18*.



The GAF areas are named according to the state that contains them, QLD-N, QLD-S, NSW-E, NSW-W, VIC, TAS, SA, WA-S, WA-N and NT.

The GAFs are issued two at a time, each with a 6 hour validity period, so that each issue covers the next 12 hours.

The validity periods are:

2300Z to 0500Z  
0500Z to 1100Z  
1100Z to 1700Z  
1700Z to 2300Z

Two 6 hour GAFs are issued no later than 30 minutes before the commencement of each 12 hour validity period.

GAFs feature clearly defined sections comprised of -

A HEADER giving details of the time of issue and the associated validity period.

AN IMAGE of the GAF area along with subdivisions if necessary, defined by letters such as **A**. Any further subdivisions with those subdivisions will be identified as **A1**, **A2** etc.

A TABLE containing a description of the weather forecast for each area subdivision.

**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	>10KMNIL	BKN CU/SC 3000/ABV10000FT	6000FT
	3000M SCT SHRA	ISOL TCU 2000/ABV10000FT BKN ST 0800/2000FT BKN CU 2000/ABV10000FT	
B	>10KMNIL	BKN CU/SC 2000/ABV10000FT	6000FT
	3000M SCT SHRA	ISOL TCU 2000/ABV10000FT BKN ST 0800/2000FT BKN CU 2000/ABV10000FT	
C	>10KMNIL	BKN CU/SC 2000/ABV10000FT	5000FT S OF 32S
	2000M WDSR SHRA	ISOL TCU 2000/ABV10000FT BKN ST 0800/2000FT OVC CU/SC 2000/ABV10000FT	7000FT N OF 32S
D	>10KMNIL		9000FT
	2000M SOL TSRA	ISOL CB 2000/ABV10000FT BKN ST 0800/2000FT	
E	>10KMNIL	SCT CU 4000/9000FT	ABV 10000FT
	5000M ISOL SHRA	ISOL TCU 4000/ABV10000FT BKN ST 2000/4000FT BKN CU 4000/9000FT	
F	>10KMNIL		ABV 10000FT
	3000M SCT RA	BKN ST 2000/4000FT BKN AC/AS 9000/ABV10000FT	
	2000 ISOL TSRA	ISOL CB 5000/ABV10000FT BKN ST 2000/4000FT	

**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  
 Check AIRMETs, SIGMETs and NOTAMs

REMARKS:

For more information contact (08) 9263 2255

A LEGEND explaining the association between cloud, icing and turbulence. For example-

The presence of TS, CB or TCU always implies severe icing and severe turbulence. Severe icing and turbulence may not be separate forecast elements.

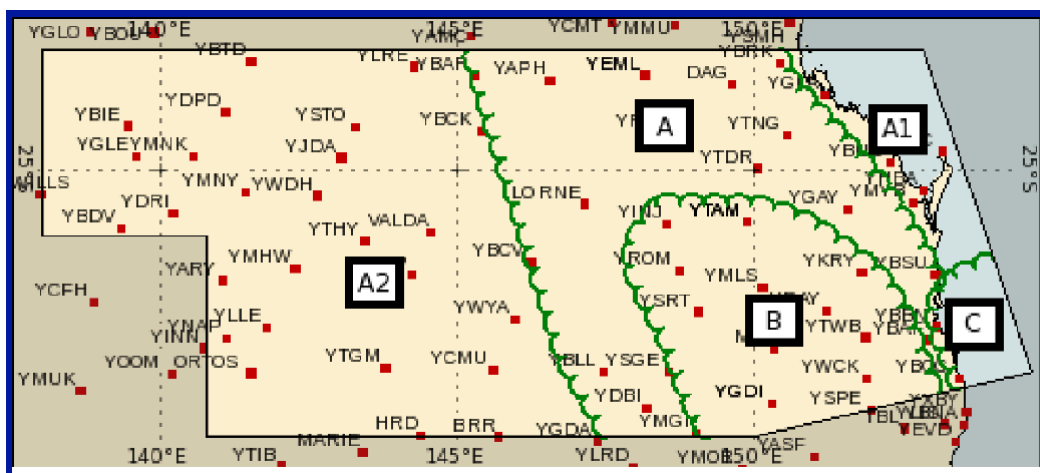
The presence of CU, SC or AC always implies moderate turbulence even if turbulence is not mentioned as a separate item.

Any cloud above the freezing level (CLD ABV FZLVL) always implies moderate icing even if icing is not mentioned as a separate item.

REMARKS The remarks section contains information on phone numbers, any corrections to the GAF and critical locations for NSW-E and VIC. Critical locations relate to areas frequently used by VFR aircraft where a combination of terrain and weather can present a hazard to those aircraft.

Another example of a GAF is shown on the over page. This is a GAF for QLD-S and it features a number of subdivisions.

The subdivisions are indicated by scalloped lines and identified as A, A1, A2, B and C.



Areas A1 and C represents the coastal strip down as far as Brisbane and the Gold Coast, area B represents the Darling Downs, area A represents the ranges and the western slopes of the ranges, while area A2 represents the area west of the ranges.

**Graphical Area Forecast SFC - 10000FT QLD-S**  
**Issued at 1709150132Z - Valid 150500 to 151100Z**  
**Weather Features valid at 150500Z**



AREA	SURFACE VIS AND WX	CLOUD, ICING AND TURB	FZLVL
<b>A</b>	>10KM NIL	SCT CU 5000/ABV10000FT, BASES 8000FT IN <b>A2</b> (SCT CU/SC 3000/6000FT IN <b>A1</b> )	ABV 10000FT
	8000M SCT FU BLW 10000FT LAND		
	5000M ISOL PO IN <b>A2</b> TL 08Z	MOD TURB BLW 10000FT	
	2000M ISOL FU BLW 6000FT LAND IN <b>A1</b> ONLY		
		MOD TURB BLW 10000FT IN THERMALS W OF YEML / YTAM TL 08Z	

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COLUMN 1 IDENTIFIES SUBDIVISION A

COLUMN 2 DESCRIBES VISIBILITY AND WEATHER FOR AREA A.

The visibility in subdivision A is forecast to be better than 10km except that-

Visibility will drop to 8000m in areas of smoke over land below 10000 feet.

Visibility will drop to 5000m in isolated areas with dust devils in Area A2 until 0800Z.

Visibility will drop to 2000m in isolated smoke below 6000 feet over land in Area A1 only



<b>B</b>	>10KM NIL	SCT CU 5000/ABV10000FT	ABV 10000FT
	8000M ISOL FU BLW 10000FT		
	3000M ISOL SHRA	ISOL TCU 3500/ABV10000FT BKN ST 2000/3500FT BKN CU/SC 3500/ABV10000FT	
	2000M ISOL TSRA	ISOL CB 3500/ABV10000FT BKN ST 2000/3500FT BKN CU/SC 3500/ABV10000FT	
		MOD TURB BLW 10000FT IN THERMALS W OF YGDI / YTAM TL 08Z	
1	2	3	4

COLUMN 1 IDENTIFIES SUBDIVISION B

COLUMN 2 DESCRIBES VISIBILITY AND WEATHER FOR AREA B.

The visibility in subdivision A is forecast to be better than 10km except that-

Visibility will drop to 8000m in isolated areas of smoke below 10000 feet throughout the area.

Visibility will drop to 3000m in isolated showers of rain.

Visibility will drop to 2000m in isolated thunderstorms with rain.

COLUMN 3 DESCRIBES CLOUD, ICING AND TURBULENCE IN AREA B

The forecast is for 3 to 4 eighths of cumulus cloud with a base of 5000 feet AMSL and tops above 10000 feet AMSL throughout area B.

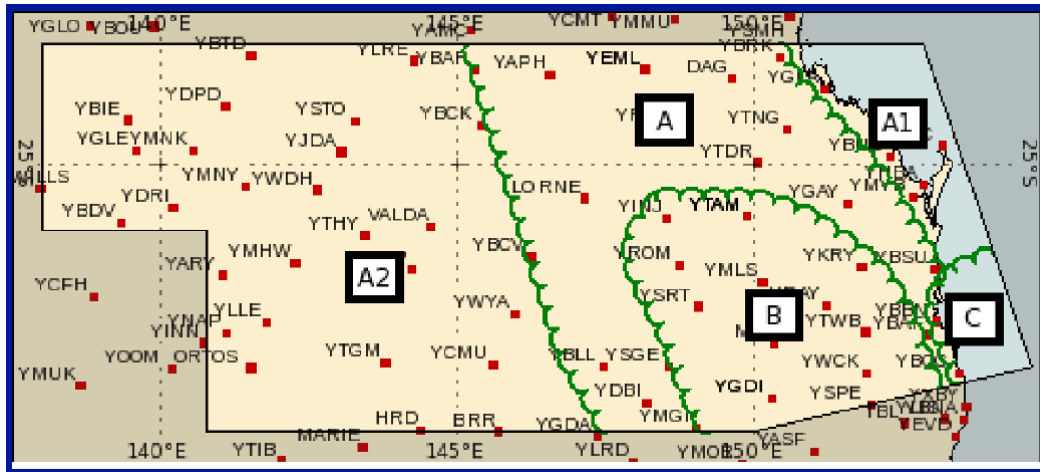
Associated with the reduced visibility in showers of rain (3000m) there will be isolated towering cumulus cloud with a base of 3500 feet AMSL and tops above 10000 feet AMSL. Also 5 to 7 eighths of stratus cloud with a base of 2000 feet AMSL and tops of 3500 feet AMSL plus 5 to 7 eighths of cumulus and strato cumulus with a base of 3500 feet and tops above 10000 feet AMSL

Associated with the reduced visibility of 2000 metres in isolated thunderstorms, there will be isolated cumulonimbus cloud with a base of 3500 feet and tops above 10000 feet AMSL. Also there will be 5 to 7 eighths of stratus cloud with a base of 2000 feet and tops of 3500 feet AMSL plus 5 to 7 eighths of cumulus and strato cumulus cloud with a base of 3500 feet and tops above 10000 AMSL.

There will be moderate turbulence in thermals without cloud west of a line from YGDI to YTAM.

COLUMN 4 INDICATES FREEZING LEVEL

Freezing Level above 10000ft.



<div style="border: 1px solid black; padding: 2px; display: inline-block; font-weight: bold; font-size: 1.2em;">C</div>	>10KM NIL  3000M ISOL SHRA	SCT CU/SC 3000/7000FT  BKN ST 1500/3000FT OVC CU/SC 3000/9000FT	ABV 10000FT
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COLUMN 1 IDENTIFIES SUBDIVISION C

COLUMN 2 DESCRIBES VISIBILITY AND WEATHER FOR AREA C.

The visibility in subdivision A is forecast to be better than 10km except that-

Visibility will be reduced to 3000 meters in isolated showers of rain.

COLUMN 3 DESCRIBES CLOUD, ICING AND TURBULENCE IN AREA C

The forecast is for 3 to 4 eighths of cumulus and strato cumulus cloud with a base of 3000 feet AMSL and tops of 7000 feet AMSL throughout area C

Associated with the areas of visibility reduced to 3000 metres in isolated showers of rain, there will be 5 to 7 eighths of stratus cloud with a base of 1500 feet and tops of 3000 feet AMSL. Also, there will be an overcast of cumulus and stratocumulus cloud with a base of 3000 feet and tops of 9000 feet AMSL.

COLUMN 4 INDICATES FREEZING LEVEL

Freezing Level above 10000ft.

## AREA QNH ZONE BOUNDARIES.

Apart from the GAF area boundaries, separate area boundaries have been created for defining Area QNH based on the current synoptic situation. The Area QNH boundaries define smaller areas that do not coincide with the GAF boundaries.



For example in the figure above shows that Coober Pedy is in the SA GAF boundary, and is in the Area QNH zone 52. Meanwhile, Ceduna is also in the SA GAF boundary but it is in the Area QNH zone 53, while Adelaide is also in the SA GAF boundary but is in the Area QNH zone 50. The GAF and Area QNH boundaries are shown on the Planning Chart Australia (PCA)

Area QNH Zones will be subdivided, if necessary, to meet the following standards of accuracy:

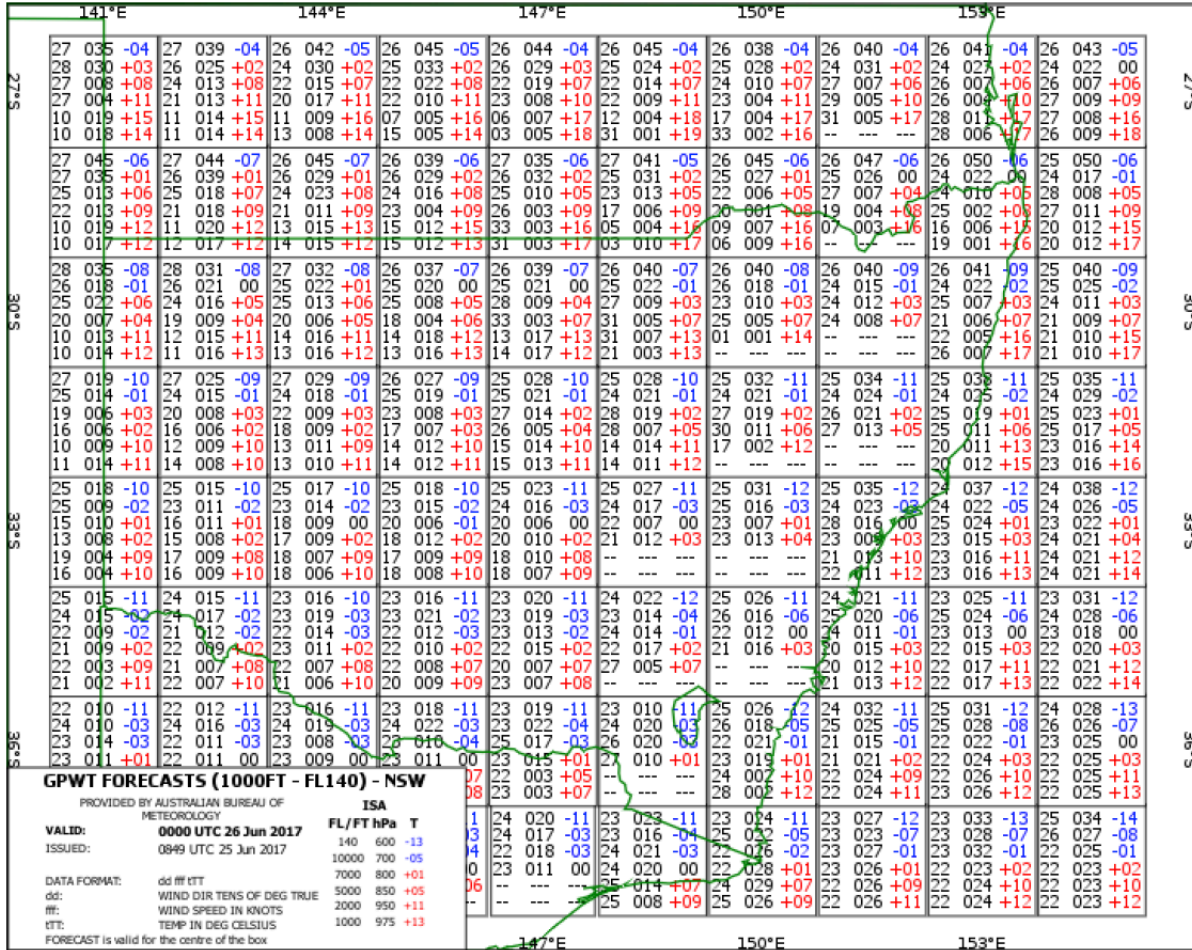
- Area QNH forecasts are to be within  $\pm 5$ HPA of the actual QNH at any low-level point (below 1,000FT AMSL) within or on, the boundary of the appropriate area during the period of validity of the forecasts.
- Area QNH must not differ from an adjoining Area QNH by more than 5HPA.



## GRID POINT WIND AND TEMPERATURE (GPWT) FORECASTS.

The GPWT chart presents wind and temperature information as a table of numbers contained within a grid that is overlaid on a map of the forecast area showing the coast line and state borders. The GPWT charts are produced for low, mid and high level layers of the atmosphere.

An example of a low level chart for NSW is shown below.



## GPWT FORECASTS (1000FT - FL140) - AUS

PROVIDED BY AUSTRALIAN BUREAU OF METEOROLOGY

**ISA**

**VALID:** 0000 UTC 24 May 2017      **FL/FT hPa T**

**ISSUED:** 0505 UTC 25 May 2017

140 600 -13

10000 700 -05

7000 800 +01

**DATA FORMAT:** dd fff tTT

dd: WIND DIR TENS OF DEG TRUE      5000 850 +05

fff: WIND SPEED IN KNOTS      2000 950 +11

tTT: TEMP IN DEG CELSIUS      1000 975 +13

FORECAST is valid for the centre of the box

## THE COLUMNS

28	031	-08
26	021	00
24	016	+05
19	009	+04
12	015	+11
11	016	+13

The left-hand column in each grid square consists of two-digit numbers representing the wind direction in tens of degrees true. (28 in this column indicates a wind from 280°T).

The centre column in each grid square consists of three-digit numbers representing the wind speed in knots. (031 in this column indicates a wind speed of 31 knots).

The right-hand column in each grid square consists of a + or - sign followed by a two digit number representing the temperature in degrees Celsius. (-08 in this column indicates a temperature of minus 8 degrees Celsius).

## THE ROWS

The horizontal rows in each grid square relate to set levels in the standard atmosphere (ISA). From the bottom up the levels are, 1000ft, 2000 ft, 5000ft, 7000ft, 10000ft and FL 140.

28	031	-08
26	021	00
24	016	+05
19	009	+04
12	015	+11
11	016	+13

This row relates to the 14000ft level in ISA.

This row relates to the 10000ft level in ISA.

This row relates to the 7000ft level in ISA.

This row relates to the 5000ft level in ISA.

This row relates to the 2000ft level in ISA.

This row relates to the 1000ft level in ISA.

## PUTTING IT ALL TOGETHER.

28	031	-08
26	021	00
24	016	+05
19	009	+04
12	015	+11
11	016	+13

FL140 the wind is from 280°T at 31 knots and temperature is -08°C

10000 the wind is from 260°T at 21 knots and temperature is 0°C

7000 the wind is from 240°T at 16 knots and temperature is +05°C

5000 the wind is from 190°T at 09 knots and temperature is +04°C

2000 the wind is from 120°T at 15 knots and temperature is +11°C

1000 the wind is from 110°T at 16 knots and temperature is +13°C

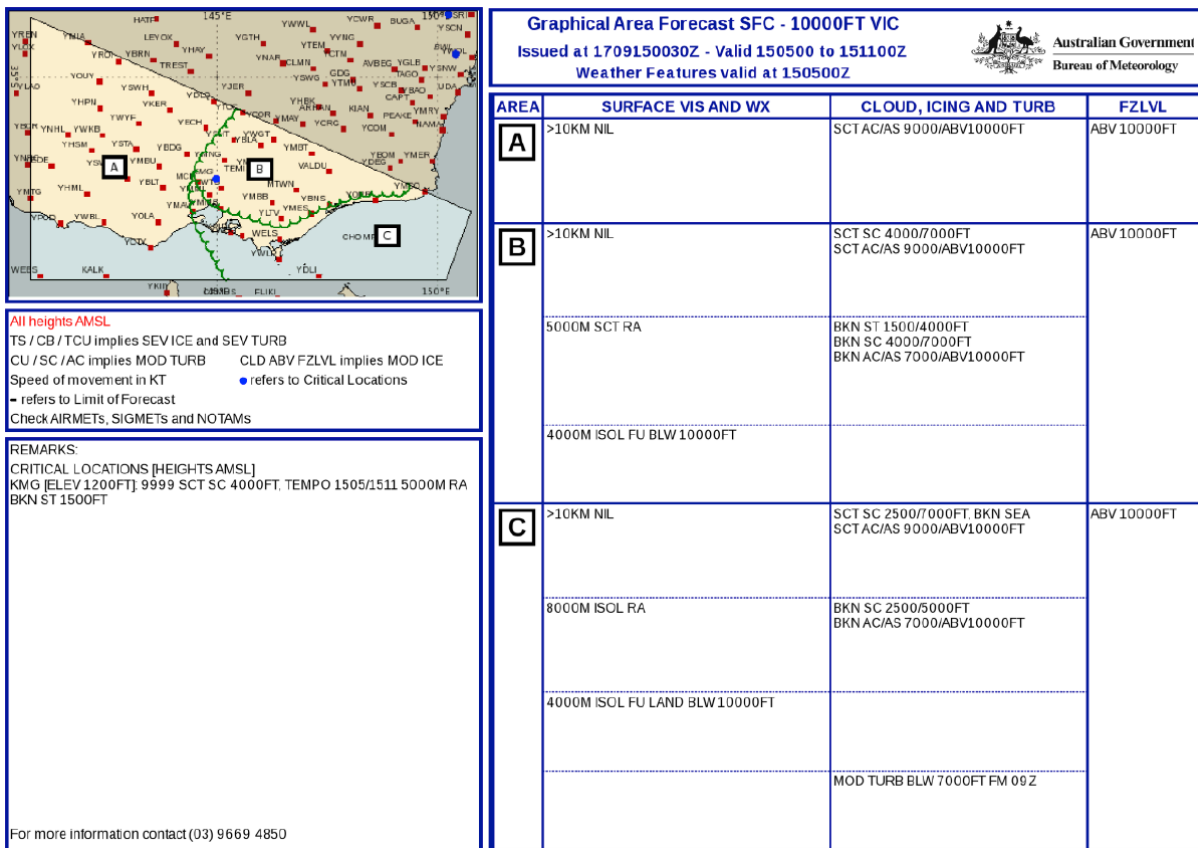
The dimensions of the each grid is 1.5° of latitude by 1.5° of longitude and the values contained in each grid relate to the centre point of each grid.

25	027	-11
24	017	-03
22	007	00
21	012	+03
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Sometimes, high terrain in a certain area may cause the 1000ft or 2000ft levels to be below ground level. When this happens, the data for those levels will be replaced by dashed lines.

Note that the levels do not correspond to the table of VFR cruising levels and a degree of interpolation may be necessary to obtain accurate figures for a particular cruising altitude.

## EXAMPLE GAF 1



### DECODE

This is a GAF for the Victorian (VIC) GAF area. The critical location in the REMARKS column on the left, is KMG (Kilmore Gap). This is a gap in the ranges frequently used by VFR aircraft operating OCTA. It has been the location of a number of weather related accidents over the years.

The cloud base at Kilmore Gap is 4000 feet AMSL with periods of up to 60 minutes of visibility down to 5000 metres in rain with 5 to 7 eighths of stratus cloud with a base of 1500 feet (note that's 300 feet AGL).

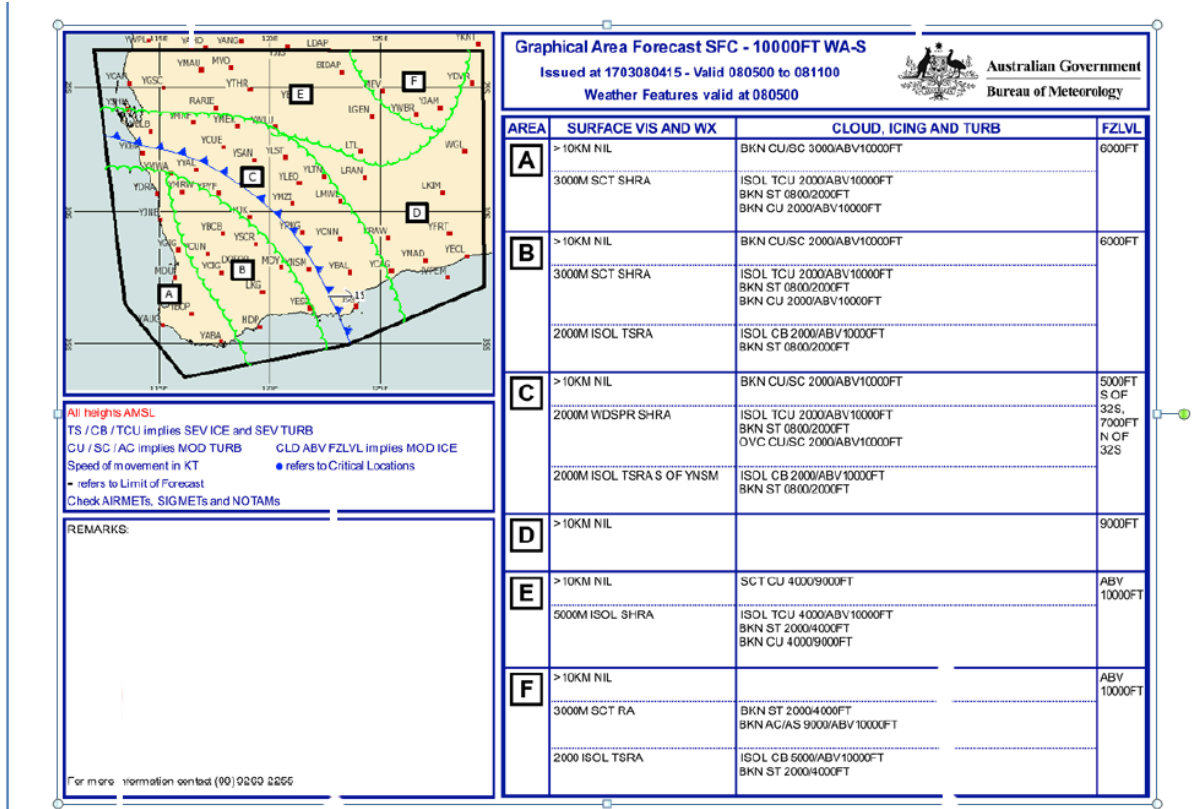
The GAF area has been subdivided into three sub-divisions **A**, **B**, and **C**, indicated by scalloped lines.

**Area A** (reading left to right), has unrestricted visibility of greater than 10 kilometers with 3 to 4 eighths of alto cumulus and alto stratus cloud with a base of 9000 feet and tops above 10000 feet. Freezing level is above 10000 feet.

**Area B** has visibility greater than 10 kilometers with 3 to 4 eighths of stratocumulus cloud with a base of 4000 and tops of 7 thousand feet. The altocumulus and altostratus cloud described in area A is also present in area B. Visibility will drop to 5000 metres in isolated rain areas with 5 to 7 eighths of the following cloud types. Stratus cloud with a base of 1500 feet and tops of 4000 feet, stratocumulus cloud with a base of 4000 and tops of 7000 feet. Also 5 to 7 eighths of altocumulus and altostratus cloud with a base of 7000 and tops above 10000 feet.

**Area C** has visibility better than 10 kilometers with 3 to 4 eighths of stratocumulus cloud with a base of 2500 feet and tops of 7000 feet increasing to 5 to 7 eighths over the sea. Also 3 to 4 eighths of altocumulus and altostratus with a base of 9000 and tops above 10000 feet. Visibility will be reduced to 8000 metres in isolated areas of rain with 5 to 7 eighths of stratocumulus cloud with a base of 2500 and tops of 5000 feet and 5 to 7 eighths of altocumulus and altostratus cloud with a base of 7000 and tops above 10000 feet. Smoke will reduce visibility to 4000 metres in isolated areas over land below 10000 feet. There will be moderate turbulence below 7000 feet due to thermal activity with no associated cloud after 0900Z. Freezing level will be above 10000 feet.

**EXAMPLE GAF 2**



**DECODE**

This is a GAF for the Western Australia South (WA-S) GAF area. There are no critical locations listed.

The GAF area has been subdivided into a number of sub-divisions **A, B, C, D, E** and **F** whose boundaries are indicated by scalloped lines. A cold front is passing West to East across the area and the sub-areas **D, E** and **F** are in the warm air sector ahead of the front, sub-area **C** is in the vicinity of the front, while sub-areas **A** and **B** are in the cold air sector behind the front.

**Area A** (reading left to right), has unrestricted visibility of greater than 10 kilometers, reducing to 3000 metres in scattered showers of rain. There will be 5 to 7 eighths of cumulus and stratocumulus cloud with a base of 3000 and tops above 10000 feet. With the showers of rain there will be isolated towering cumulus cloud with a base of 2000 and tops above 10000 feet. Also 5 to 7 eighths of stratus with a base of 800 and tops of 2000 feet and cumulus cloud with a base of 2000 and tops above 10000 feet. Freezing level will be at 6000 feet.

**Area B** has unrestricted visibility of greater than 10 kilometers, reducing to 3000 metres in scattered showers of rain. There will be 5 to 7 eighths of cumulus and stratocumulus cloud with a base of 2000 and tops above 10000 feet. With the showers of rain there will be isolated towering cumulus cloud with a base of 2000 and tops above 10000 feet. Also 5 to 7 eighths of stratus with a base of 800 and tops of 2000 feet and cumulus cloud with a base of 2000 and tops above 10000 feet. Visibility will reduce to 2000 metres in isolated thunderstorms with cumulonimbus cloud with a base of 2000 and tops above 10000 feet, Also 5 to 7 eighths of stratus with a base of 800 and tops of 2000 feet. Freezing level will be at 6000 feet. .

**Area C** has unrestricted visibility of greater than 10 kilometers, reducing to 2000 metres in scattered showers of rain. There will be 5 to 7 eighths of cumulus and stratocumulus cloud with a base of 2000 and tops above 10000 feet. Visibility will reduce to 2000 metres in widespread showers of rain with isolated towering cumulus cloud with a base of 2000 and tops above 10000 feet. There will be 5 to 7 eighths of stratus cloud with a base of 800 and tops of 2000 feet and an overcast of cumulus and stratocumulus cloud with a base of 2000 and tops above 10000 feet. Visibility will reduce to 2000 metres in isolated thunderstorms with rain south of YNSM. In that area there will be isolated cumulonimbus cloud with a base of 2000 and tops above 10000 feet and 5 to 7 eighths of stratus with a base of 800 and tops of 2000 feet (I think I'll stay at home!) Freezing level will be 5000 feet South of 32°S and 7000 feet north of 32°S.

**Area D** has visibility better than 10 kilometres throughout and no weather or cloud. Freezing level will be at 9000 feet.

**Area E** has visibility better than 10 kilometres with 3 to 4 eighths of cumulus cloud with a base of 4000 and tops of 9000 feet. Visibility will reduce to 5000 metres in isolated showers of rain. There will be isolated towering cumulus cloud with a base of 4000 and tops above 10000 feet and 5 to 7 eighths of stratus cloud with a base of 2000 and tops of 4000 feet. Also 5 to 7 eighths of cumulus cloud with a base of 4000 and tops of 9000 feet. Freezing level will be above 10000 feet.

**Area F** has unrestricted visibility of greater than 10 kilometers, reducing to 3000 metres in scattered areas of rain with 5 to 7 eighths of stratus cloud with a base of 2000 and tops of 4000 feet and 5 to 7 eighths of altocumulus and altostratus with a base of 9000 and tops above 10000 feet. Visibility will reduce to 2000 metres in isolated thunderstorms with rain. There will be isolated cumulonimbus cloud with a base of 5000 and tops above 10000 feet. Also 5 to 7 eighths of stratus cloud with a base of 2000 and tops of 4000 feet. Freezing level will be above 10000 feet.