



GRAFOR

Low Level Graphical Aviation Forecast (GRAFOR)
and Aviation Area Winds (AAW)

USER GUIDE

GRAFOR

(Graphical Aviation Forecast)

1. Introduction

- 1.1 As a part of its Aviation Resilience project, MetService has developed the Low Level Graphical Aviation Forecast (GRAFOR) that aims to deliver information about flight conditions at low levels (SFC – FL100) to our customers, in a more intuitive way. Along with the Low Level Graphical NZ SigWX chart and Aviation Area Winds (AAW), it supersedes the textual Low Level Area Forecast (ARFOR).
- 1.2 These forecasts are mainly intended for planning and conducting VFR flying.

2. Product Overview

- 2.1 GRAFOR will be issued twice a day as a set of three, covering a total period of 18 hours. Issue 1 will be made available at 11Z - valid for 18, 00, 06Z. Issue 2 will be available at 21Z - valid for 00, 06, 12Z.
- 2.2 The coast line of New Zealand and 15NM envelope (adjusted over the Southern Taranaki Bight) that marks the forecast area coverage will be displayed on the chart.
- 2.3 The fixed validity time will be displayed on the chart. However, some of the elements will cover three hours prior and subsequent to the fixed validity time (refer to the examples in Appendix 1).
- 2.4 Amendments will be issued if there are widespread weather conditions not corresponding to the forecast. In that case abbreviation AMD will be added to the chart caption.
- 2.5 AAW will be issued twice a day, along with GRAFOR. Issue 1, available at 11Z, will be valid from 12Z until 06Z and issue 2, available at 21Z, will be valid from 21Z until 12Z. AAW will be in form of tables that correspond to previous ARFOR areas. A temperature forecast is also provided for levels 5000ft, 7000ft and 10000ft.

3 Accessing GRAFOR

- 3.1 GRAFOR and AAW will be available via all MetService aviation delivery systems – MetFlight GA, MetFlight Commercial, MetJet, WeatherTrak and aviation web pages.
- 3.2 GRAFOR and AAW will be added by default to the existing packages.

4 Release Date

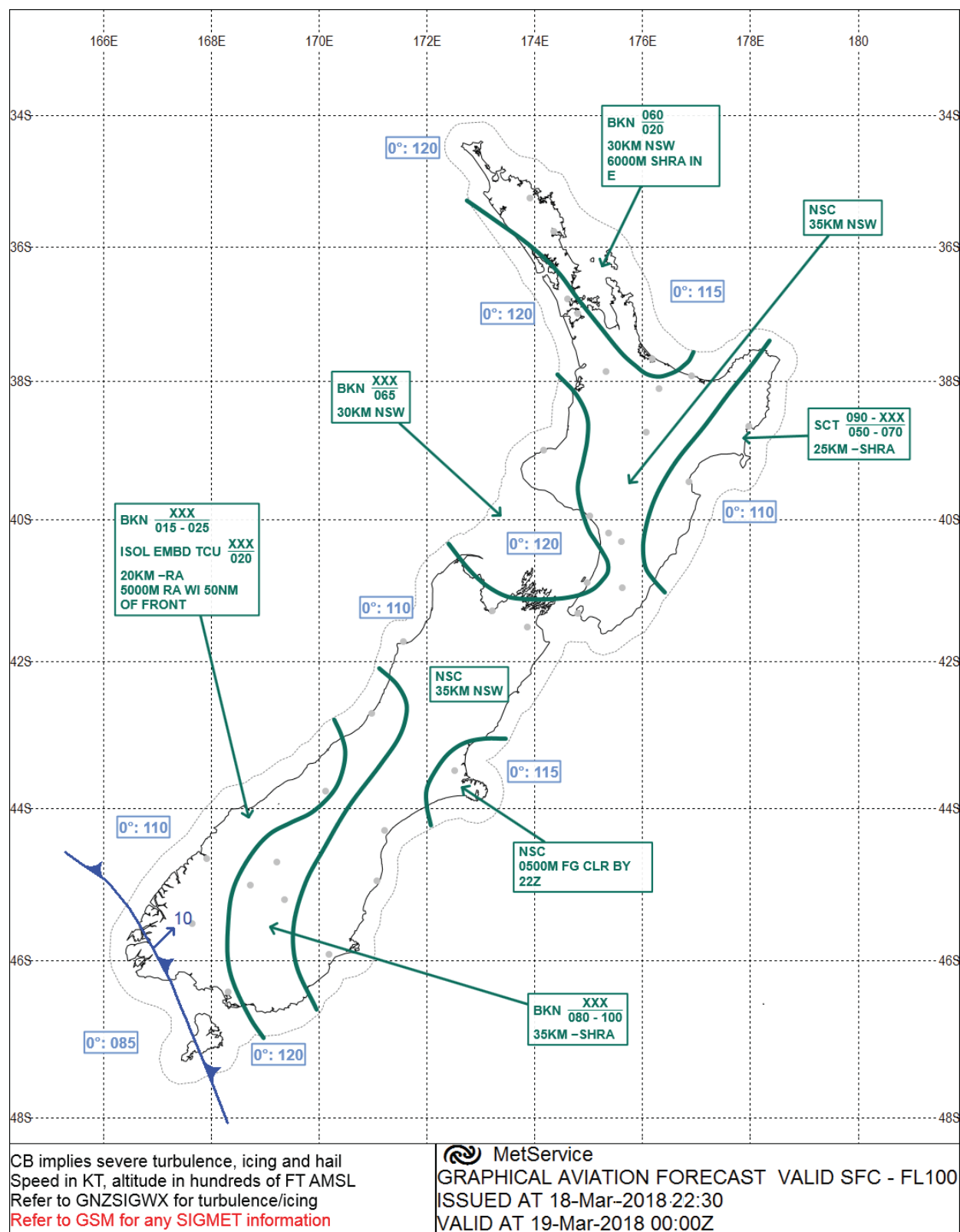
- 4.1 GRAFOR and AAW are planned for release on 26 June 2018.

5 Examples

- 5.1 Example of GRAFOR and guidance notes for interpretation are provided in Appendix 1.
- 5.2 Example of AAW is provided in Appendix 2.
- 5.3 A table of commonly used abbreviations is included in Appendix 3.


Appendix 1 – GRAFOR Guidance and Interpretation Notes

GRAFOR Examples



Explanation and decode

The caption of each chart consists of a disclaimer box and a validity box.

CB implies severe turbulence, icing and hail Altitude in hundreds of FT AMSL Refer to GNZSIGWX for turbulence/icing Refer to GSM for any SIGMET information	 MetService GRAPHICAL AVIATION FORECAST VALID SFC - FL100 ISSUED AT 18-Mar-2018 22:30 VALID AT 19-Mar-2018 00:00Z
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If the chart is amended, the abbreviation AMD is inserted in validity box and remark box is added above the validity box to briefly explain why the amendment has been made.










RMK AMD: FG OVER SOUTH ISLAND E COT CLEARED  MetService GRAPHICAL AVIATION FORECAST AMD VALID SFC - FL100 ISSUED AT 24-May-2018 20:02 VALID AT 24-May-2018 18:00Z

Chart elements

Information	Symbol	Description and units	Fixed validity time	Validity $\pm 3h$ to fixed time
Freezing level		Hundreds of feet AMSL.	✓	
Fronts		Location of significant weather features.	✓	
		Cold front		
		Warm front		
		Occluded front		
		Stationary front		
Cloud/weather areas		Delineated by thick green lines.	✓	
Cloud/weather group		Box with cloud, weather and visibility information, with an arrow pointing to the relevant chart area.		✓



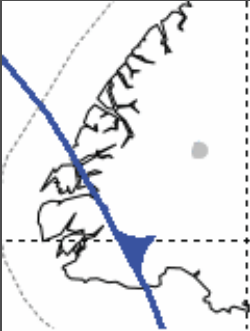
Information	Symbol	Description and units	Fixed validity time	Validity ±3h to fixed time
Non deep convective cloud	BKN 090 - XXX 015 - 025	<p>Described by amounts (in octas), bases and tops (in hundreds of feet AMSL, as a single value or a range).</p> <p>Amounts can be: OVC – 8 octas BKN – 5-7 octas SCT – 3-4 octas NSC – nil significant cloud (less than 3 octas and/or bases higher than 10,000 FT AMSL).</p>		✓
Deep convective cloud	ISOL EMBD TCU XXX 020	<p>Described by spatial coverage: ISOL – area with maximum spatial coverage up to 50% OCNL – area with maximum spatial coverage greater than 50% but less than 75% FRQ – area with maximum spatial coverage greater than 75%</p> <p>EMBD can be added to indicate that convective cloud is embedded in layers of other cloud.</p> <p>Type of cloud: TCU or CB.</p> <p>Bases and tops (in hundreds of feet AMSL, as a single value or a range). XXX means tops are above 10,000 FT AMSL.</p>		✓
Visibility and weather	20KM -RA 5000M RA WI 50NM OF FRONT	<p>Prevailing visibility with dominant type of weather, along with deterioration of conditions given as the lowest visibility, type of weather that's causing it, location and timing of the occurrence.</p> <p>If there isn't any significant weather, abbreviation NSW (nil significant weather) will be used.</p>		✓

List of significant weather that will be used on GRAFOR

Qualifier		Weather Phenomena		
Intensity	Descriptor	Precipitation	Obscuration	Other
- Light Moderate (no qualifier) + Heavy	SH Shower(s)	DZ Drizzle	BR Mist	SQ Squall
	TS Thunderstorm	RA Rain	FG Fog	PO Dust/sand whirls
	FZ Freezing (Super-cooled)	GS Small Hail and/or snow pellets	HZ Haze	FC Funnel Cloud(s)
			FU Smoke	SS Sandstorm
	DR Low Drifting	GR Hail	VA Volcanic Ash	DS Duststorm
	BL Blowing	SN Snow	DU Dust	
		SG Snow grains	SA Sand	

Decoded GRAFOR example (from page 2)

Information or symbol	Decode
0°: 085	Freezing level: 8,500 FT AMSL.
0°: 115	Freezing level: 11,500 FT AMSL.
BKN 060 020 30KM NSW 6000M SHRA IN E	Cloud: 5-7 octas with base at 2000 FT AMSL and top at 6000 FT AMSL. Visibility and weather: 30 KM in good conditions, but reduced to 6000 M in showers of rain in the eastern part of the delineated area.
BKN XXX 065 30KM NSW	Cloud: 5-7 octas with base at 6500 FT AMSL and top ABV 10,000 FT. Visibility and weather: 30 KM, nil significant weather.
SCT 090 - XXX 050 - 070 25KM - SHRA	Cloud: 3-4 octas with bases between 5000 and 7000 FT AMSL and tops ABV 9000 FT AMSL. Visibility and weather: 25KM, light showers of rain can often be observed in the area.
NSC 35KM NSW	Cloud: Nil significant. Visibility and weather: 35KM, nil significant weather.
BKN XXX 015 - 025 ISOL EMBD TCU XXX 020 20KM -RA 5000M RA WI 50NM OF FRONT	Cloud: 5-7 octas with bases between 1500 and 2500 FT AMSL, and tops ABV 10,000 FT AMSL. Less than 50% of the area covered by embedded TCU with base 2000 FT AMSL and top ABV 10,000 FT AMSL. Visibility and weather: 20 KM, light rain can often be observed in the area; reduced to 5000 M in rain within 50 NM of the front.

	<p>Cloud: Nil significant cloud. Visibility and weather: 500 M in fog, that will dissipate by 22Z.</p>
	<p>Cloud: 5-7 octas with bases between 8000 and 10,000 FT AMSL, and tops ABV 10,000 FT AMSL. Visibility and weather: 35KM, light showers of rain can often be observed in the area.</p>
	<p>Cold front lying over southern Fiordland. Grey circle represents location of Manapouri Aerodrome (NZMO).</p>

Appendix 2 – Aviation Area Winds

AAW example

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AVIATION AREA ED VALID 2100 TO 1200 UTC
BECOMING                0300-0600      0600-0900
 1000      34015          01005
 3000      33025          34005          09010
 5000      32025 PS10     33005 PS10
 7000      31025 PS06     31010 PS06
10000      31020 PS01
RMK: Test data only.

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Appendix 3 - Commonly Used Abbreviations

ABT	About
ABV	Above
AMSL	Above Mean Sea Level
AFT	After
AMD	Amend/Amended
COT	At the coast
BECMG	Becoming
BFR	Before
BDRY	Boundary
BKN	Broken
BLDG	Building
CLR	Clear
BASE	Cloud Base
CONS	Continuous
CB	Cumulonimbus
DTRT	Deteriorating/deteriorate
EMBD	Embedded in a layer
EXC	Except
EXTD	Extended
FRQ	Frequent
FM	From
IMPR	Improving
VAL	In Valleys
LAN	Inland
INTSF	Intensifying
ISOL	Isolated
LCA	Local/locally/location/located
MT	Mountain
MOV	Moving/Move
NSC	Nil Significant Cloud
NSW	Nil Significant Weather
OCNL	Occasional/occasionally
OVC	Overcast
SCT	Scattered
SECT	Sector
SFC	Surface
TS	Thunderstorm
TL	Till (followed by time by which weather change is forecast to end)
TCU	Towering Cumulus
VCY	Vicinity
WKN	Weakening
WDSRP	Widespread
WI	Within



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