

METAR AND TAF CODES

1. Introduction

A METAR is an observation of weather conditions at an airport. The observation emphasizes information of interest to aviation: visibility, height of the bases of cloud layers, exact wind direction, etc. It is written in a compact code that allows for rapid transmission of information.

A TAF is a forecast for an aerodrome. Like the METAR, it emphasizes the weather elements of interest to aviation. Also like the METAR, it is written in a compact code.

An important part of pilot training is learning to decode and make use of the information contained in these bulletins.

2. METAR Code

A review of METAR code:

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
HEADER	WND	VSBY	RVR	SIG - WX	SKY COND	TEMP DP	ALTM	SUP- INFO	RMKS

What's in the code:

Column Number	Definition
1. HEADER	<ul style="list-style-type: none">• METAR/SPECI - Station ID - 4 letters, Date/Time.• SPECI contains <u>no</u> temperature, dew point temperature or pressure.
2. WIND DIRECTION - SPEED	<ul style="list-style-type: none">• 3 digits to the nearest 10 degrees.• V - Variable wind direction with windspeed > 3 knots.• Vrb - Wind speed \leq 3 knots with a variable direction.• Wind speed - 2 digits unless > 100 knots• G - Gusts• Kt - unit of speed (nautical mile per hour - i.e 29025G40KT)• Calm - 0000KT
3. VISIBILITY	<ul style="list-style-type: none">• SM - Statute Miles, 0SM to unlimited, Fractions below 3SM.
4. RUNWAY VISUAL RANGE	<ul style="list-style-type: none">• Omitted when prevailing visibility > 1 SM and/or RVR > 6000 ft.• R - Indicator. Runway designator - 2 digits.• Average 10 minutes RVR value 4 digits in feet.• V - Variable• Trend indicators; U- upward, D - downward, N - no change (i.e. R291000V2000U)
5. SIGNIFICANT WEATHER	<ul style="list-style-type: none">• M - less than P - more than (i.e. R29M0600 / R29P6000)• Precipitation/Obscuration• Omitted if no significant weather.• Format - Intensity/Descriptor/Precipitation/Obscuration.• Dominant weather type first.• Only one intensity and one descriptor per weather type (i.e. +TSRAGR)• Refer to "Weather Qualifier" list.

6. SKY CONDITION

- Summation amount in oktas
SKC - clear
FEW - trace-2 oktas
SCT - 3-4 oktas
BKN - 5-<8 oktas
OVC - 8 oktas
- There is no provision for thin layers or partial obscurations
- Cloud base - 3 digits in hundreds of feet AGL (i.e. SCT030 BKN080)
- Only CB is reported (i.e. BKN040CB)
- VV - obscured condition. Vertical visibility - 3 digits in hundreds of feet AGL (i.e. VV005)

7. TEMPERATURE - DEW POINT

- 2 digits.
- Whole degrees.
- Negative temperatures preceded by M (i.e. M01/M03)

8. ALTIMETER

- A - Pressure in inches.
- Q - Pressure in hectopascals.
- Four digits, no decimal (i.e. A2998)

9. SUPPLEMENTARY INFORMATION

- Significant weather or low level wind shear.
- RE - Indicator followed by significant weather since last report (i.e. REFZRA)
- WS - Indicator followed by RWY (runway) then runway identifier - 2 digits.
- Only reports of low level wind shear from surface to 1600 feet AGL (i.e. WS RWY29)

10. REMARKS

- Indicator followed by; Clouds and obscuring phenomena and opacity in oktas (i.e. SC4AC3)
- Will show partial obscurations not reported under sky condition (i.e. F2SC2AC3)
- General weather remarks (i.e. CB EMBDD LTGCG)
- SLP - indicator for sea level pressure followed by 3 digits (i.e. SLP015). This is always the last group in the METAR.

Allowed METAR Weather Qualifiers/Weather Phenomena:

QUALIFIER	WEATHER PHENOMENA			
	DESCRIPTOR	PRECIPITATION	OBSCURATION	OTHER
INTENSITY OR PROXIMITY				
- Light	MI Shallow	DZ Drizzle	BR Mist	PO dust/sand whirls
	PR Partial			
Moderate (no qualifier)	BC Patches	RA Rain	FG Fog	SQ Squalls
+ Heavy	DR Low drifting	SN Snow	FU Smoke	FC Funnel cloud(s) (tornado or water spout)
VC In the vicinity	BL Blowing	SG Snow grains	VA Volcanic dust	SS Sandstorm
	SH Showers	IC Ice crystals	DU Widespread dust	DS Duststorm
	TS Thunderstorm	PL Ice pellets	SA Sand	
	FZ Suppercooled (freezing on contact)	GR Hail	HZ Haze	

GS snow pellets

3. TAF Code

The description of forecast conditions shall always contain, as a minimum, information about the following elements: wind, visibility, weather; and cloud.

1.	2.	3.	4.	5.	6.	7.	8.
HEADER	WND	LLWS	VSBY	SIG -WX	SKY COND	PROB TEMPO FM BECMG	RMKS

Column Number	Definition (Reference MANAIR Chapter 2)
1. HEADER	<ul style="list-style-type: none">• TAF (code name for aerodrome forecast)• AMD (is used if forecast in corrected or amended)• Station ID - 4 letters• Date/Time (UTC)• Date and Period of coverage; e.g. TAF CYUL 191740Z 191818
2. WIND DIRECTION - SPEED	<ul style="list-style-type: none">• dddffGf_mf_mKT; always forecast mean wind direction and speed (KT); e.g. 24015KT• direction: 3 digits to the nearest 10 degrees.• forecast gusts (G) when G will exceed the mean speed by 10KT; e.g. 32020G30KT• 00000KT implies calm wind.• VRB03KT implies - speed £ 3 knots with a variable direction.• VRB can be used with higher speeds when forecasting thunderstorm gusts; e.g. VRB15G30KT.
3. LOW LEVEL WIND SHEAR	<ul style="list-style-type: none">• WS_{hhh}/dddffKT; e.g. WS015/24060KT.• where WS means low level wind shear• "hhh" is height above ground in feet; e.g. 015 is 1500 feet above ground.• "ddd" is wind direction at level "hhh"• and "ffKT" is speed in knots at level "hhh".• the WS group shall be included only when the forecaster has strong evidence that significant non-convective wind shear is expected.• guidelines:<ul style="list-style-type: none">• V.M. > 25KTS WTN 500 feet AGL• V.M. > 40KTS WTN 1000 feet AGL• V.M. > 50KTS WTN 1500 feet AGLa pilot report of loss or gain of indicated air speed of 20KTS or more WTN 1,500 feet AGL.
4. VISIBILITY	<ul style="list-style-type: none">• VVVVSM; horizontal prevailing visibility in statute miles (SM) and fractions up to 3 miles and whole miles up to 6 miles,• Visibility values allowed:<ul style="list-style-type: none">• zero to 3/4sm (increments of 1/8SM)

3/4SM to 21/2SM (increments of 1/4SM)
3SM to 6SM (increments of 1SM); and
P6SM (for visibility > 6SM)

5. SIGNIFICANT WEATHER

- **w'w'**; is comprised of weather phenomena which may contain one or more forms of precipitation, obscuration
- omitted if no significant weather is expected.
- Format: intensity - descriptor -precipitation -obscuration.
- Dominant weather type first.
- Only one intensity and one descriptor per weather type (i.e. +TSRAGR)
- Refer to "Weather Qualifier" lists.
- **NSW** (no significant weather) term is used to replace the w'w' group after a change group of the form TEMPO/BECMG to indicate the end of significant weather phenomena indicated in the w'w' prior to the change.

6. SKY CONDITION

- **NNNhhh** and **VVhhh**; shall be used in the initial time period and any subsequent FM groups to indicate cumulative cloud amounts "NNN" and height above ground "hhh" of the base of cloud layers in 100 feet.
- Summation amount in oktas
SKC - no cloud
FEW - trace to 2 oktas
SCT - 3-4 oktas
BKN - 5-<8 oktas
OVC - 8 oktas
- max of three cloud layers
- CBs shall always be indicated when expected; e.g. BKN040CB)
- "hhh" shall be forecast to the following intervals:
 - 100 ft increments from sfc to 1,500
 - 500 ft increments from 1,500 to 3000;
 - 1000 ft increments above 3000 ft.
- when the sky is totally obscured, the cloud group is replaced by the vertical visibility group "VVhhh"; e.g. VV005
- in the absence of clouds, SKC (sky clear) is used.

7.a) Probability Group - PROB

- **PROBCC GGG_eG_e**; indicates the probability of occurrence of an alternative value of a forecast condition; e.g. PROB40 2124 3SM TSRAGR.
- only the values 30 and 40% shall be allowed.
- PROB group used to forecast weather phenomena that may adversely affect aircraft operation; e.g. thunderstorm, freezing pcpn, ice pellets, snow grains, llws.

7.b) Transitory Change Group - TEMPO

- **TEMPO GGG_eG_e**; shall be used when a temporary fluctuation is some or all of the elements forecast is expected to occur during the period GG to G_eG_e .
- TEMPO is followed by a description of only those elements for which a change is forecast to occur; e.g. FM1200Z VRB03KT 3SM -RA BR OVC020 TEMPO 1215 1SM -RA BR

7.c) Change Groups - FM

- **FM GGG_eG_e** ; the period of coverage of the TAF may be divided into two or more self contained part periods and shall be done with the FM (from) group.

**7.d) Change Group -
BECMG**

- used to indicate a rapid and permanent change.
- a complete forecast must follow the FM group.
- **BECMG GGG_eG_e** ; shall be used to indicate a **gradual** evolution of meteorological conditions between GG to G_eG_e.
- GGG_eG_e shall not normally exceed 2 hours.
- BECMG shall be followed by a description of only those weather elements for which a change is forecast to occur; e.g. BECMG 1415 32020KT or BECMG 2224 4SM -SHSN
- **RMKS**; possible remarks include: FCST BASED ON AUTO OBS, or NXT FCST BY xxZ.
- See MANAIR 2.6.15 for additional authorized remarks.
- This is always the last group in the TAF.

8. REMARKS