

## North American METAR codes

North American METARs deviate from the WMO (who write the code on behalf of ICAO) FM 15-XII code. Details are listed in the FAA's Aeronautical Information Manual (AIM), but the non-compliant elements are mostly based on the use of non-standard units of measurement. This METAR example is from [Trenton-Mercer Airport](#) near [Trenton, New Jersey](#), and was taken on 5 December 2003 at 18:53 UTC.

**METAR KTTN 051853Z 04011KT 1/2SM VCTS SN FZFG BKN003 OVC010 M02/M02 A3006 RMK AO2 TSB40 SLP176 P0002 T10171017=<sup>[7]</sup>**

- **METAR** indicates that the following is a standard hourly observation.
- **KTTN** is the ICAO identifier for the Trenton-Mercer Airport.
- **051853Z** indicates the day of the month is the 5th and the time of day is 1853 Zulu/UTC, 6:53PM GMT, or 1:53PM [Eastern Standard Time](#).
- **04011KT** indicates the wind is from 040° true (north east) at 11 knots (20 km/h; 13 mph). In the United States, the wind direction must have a 60° or greater variance for variable wind direction to be reported and the wind speed must be 7 knots (13 km/h; 8.1 mph) or higher.
- **1/2SM** indicates the prevailing visibility is ½ mi (800 m).
- **VCTS** indicates a [thunderstorm](#) (TS) in the vicinity (VC), which means from 5–10 mi (8–16 km).
- **SN** indicates snow is falling at a moderate intensity; a preceding plus or minus sign (+/-) indicates heavy or light precipitation.
- **FZFG** indicates the presence of freezing [fog](#).
- **BKN003 OVC010** indicates a broken (5/8 to 7/8 of the sky covered) cloud layer at 300 ft (91 m) [above ground level](#) (AGL) and an overcast (8/8 of the sky covered) layer at 1,000 ft (300 m).
- **M02/M02** indicates the temperature is −2 °C (28 °F) and the dewpoint is −2 °C (28 °F). An M in front of the number indicates that the temperature/dew point is below zero (0) Celsius.
- **A3006** indicates the altimeter setting is 30.06 inHg (1,018 hPa).
- **RMK** indicates the remarks section follows.

*Note that what follows are not part of standard observations outside of the United States and can vary significantly.*

- **AO2** indicates that the station is automated with a rain/snow precipitation sensor. Stations that aren't equipped with a rain/snow sensor are designated **AO1**.<sup>[8]</sup>
- **TSB40** indicates the thunderstorm began at 40 minutes past the hour at 1840 Zulu/UTC, 6:40PM GMT, or 1:40PM Eastern Standard Time.
- **SLP176** indicates the current barometric pressure extrapolated to sea level is 1,017.6 hPa (30.05 inHg).
- **P0002** indicates that 0.02 inches (0.5 mm) of [liquid](#)-equivalent precipitation accumulated during the last hour.

- **T10171017** is a breakdown of the temperature and dew point in 8 digits separated into two groups of four. the first four digits (1017) is the temperature. The first digit (1) designates above or below zero Celsius (0=above zero 1=below zero). The next three digits in the group '017' is the temperature in degrees and tenths of a degree,  $-1.7\text{ }^{\circ}\text{C}$  ( $28.94\text{ }^{\circ}\text{F}$ ). The last four digits '1017' is the same as the first group but for dew point,  $-1.7\text{ }^{\circ}\text{C}$  ( $28.94\text{ }^{\circ}\text{F}$ ). Note: ASOS software, as of this update, uses whole degrees in  $^{\circ}\text{F}$  to compute the  $^{\circ}\text{C}$  values in this group.<sup>[[citation needed](#)]</sup>
- = indicates the end of the METAR report.

In Canada, *RMK* is followed by a description of the cloud layers and opacity, in eighths of the sky (*oktas*). For example, *CU5* would mean Cumulus in 5/8 of the sky.<sup>[9]</sup>

## [\[edit\]](#) Cloud reporting

[Cloud coverage](#) is reported by the number of '[oktas](#)' (eighths) of the sky that is occupied by cloud.

This is reported as:<sup>[10]</sup>

SKC = 'No cloud/Sky clear' used worldwide but in North America is used to indicate a human generated report<sup>[11][12]</sup>

CLR = 'No clouds below 12,000 ft (3,700 m) (US) or 10,000 ft (3,000 m) (Canada)' used mainly within North America and indicates a station that is at least partly automated<sup>[11][12]</sup>

NSC = 'No (nil) significant cloud' (i.e. none below 5,000 ft (1,500 m) and no [TCU](#) or [CB](#)) not used in North America

FEW = 'Few' = 1-2 oktas

SCT = 'Scattered' = 3-4 oktas

BKN = 'Broken' = 5-7 oktas

OVC = '[Overcast](#)' = 8 oktas (ie full cloud coverage)

## [\[edit\]](#) Flight categories

METARs can be expressed concisely using so-called *aviation flight categories*, which indicates what classes of flight can operate at each airport by referring to the visibility and ceiling in each METAR. Four categories are used:<sup>[13]</sup>

Category	Visibility	Ceiling
<a href="#">VFR</a>	> 5 mi	> 3,000 ft
Marginal VFR	Between 3 and 5 mi	Between 1,000 and 3,000 ft
<a href="#">IFR</a>	1 mi or more but less than 3 mi	500 ft or more but less than 1,000 ft
Low IFR	< 1 mi	< 500 ft

## [\[edit\]](#) US METAR abbreviations

The following are METAR abbreviations used in the United States, however some are used worldwide:<sup>[4]</sup>

### METAR and TAF Abbreviations and Acronyms:

Abbreviation	Meaning	Abbreviation	Meaning
\$	maintenance check indicator	(+)	heavy intensity
(-)	light intensity	/	indicator that visual range data follows; separator between temperature and dew point data.
ACC	<a href="#">altocumulus castellanus</a>	ACFT MSHP	aircraft mishap
ACSL	altocumulus standing <a href="#">lenticular cloud</a>	ALP	airport location point
AO1	automated station without precipitation discriminator	AO2	automated station with precipitation discriminator
APCH	approach	APRNT	apparent
APRX	approximately	ATCT	airport traffic <a href="#">control tower</a>
AUTO	fully automated report	B	began
BC	patches	BKN	broken (5-7/8ths of the sky covered with <a href="#">cloud</a> )
BL	blowing	BR	<a href="#">mist</a> (from the word <i>brume</i> <sup>[14]</sup> )
C	center (with reference to runway designation)	CA	cloud-air <a href="#">lightning</a>
CB	<a href="#">cumulonimbus cloud</a>	CBMAM	cumulonimbus <a href="#">mammatus cloud</a>
CC	cloud-cloud lightning	CCSL	<a href="#">cirrocumulus</a> standing <a href="#">lenticular cloud</a>
cd	<a href="#">candela</a>	CG	cloud-ground lightning
CHI	cloud-height indicator	CHINO	sky condition at secondary location not available
CIG	ceiling	CLR	clear sky
CONS	continuous	COR	correction to a previously disseminated observation
DOC	<a href="#">Department of Commerce</a>	DOD	<a href="#">Department of Defense</a>
DOT	<a href="#">Department of</a>	DR	low drifting

	<a href="#">Transportation</a>			
DS	<a href="#">duststorm</a>	DSIPTG	dissipating	
DSNT	distant	DU	widespread <a href="#">dust</a>	
DVR	dispatch visual range	DZ	<a href="#">drizzle</a>	
E	east, ended, estimated ceiling (SAO)	FAA	<a href="#">Federal Aviation Administration</a>	
FC	<a href="#">funnel cloud</a>	FEW	few clouds (1-2/8ths of the sky covered with <a href="#">cloud</a> )	
FG	<a href="#">fog</a>	FIBI	filed but impracticable to transmit	
FIRST	first observation after a break in coverage at manual station	FMH-1	Federal Meteorological Handbook No.1, Surface Weather Observations & Reports (METAR)	
FMH2	Federal Meteorological Handbook No.2, Surface Synoptic Codes	FROPA	<a href="#">frontal</a> passage	
FROIN	Frost On The Indicator	FRQ	frequent	FT <a href="#">feet</a>
FU	<a href="#">smoke</a>	FZ	freezing	
FZRANO	freezing rain sensor not available	G	gust	
GR	<a href="#">hail</a>	GS	<a href="#">small hail and/or snow pellets</a>	
HLSTO	hailstone	HZ	<a href="#">haze</a>	
IC	ice crystals, in-cloud lightning	ICAO	<a href="#">International Civil Aviation Organization</a>	
INCRG	increasing	INTMT	intermittent	
KT	<a href="#">KNOTS</a>	L	left (with reference to runway designation)	
LAST	last observation before a break in coverage at a manual station	LST	Local Standard Time	
LTG	<a href="#">lightning</a>	LWR	lower	
M	minus, less than	max	maximum	
METAR	routine weather report provided at fixed intervals	MI	shallow	
min	minimum	MOV	moved/moving/movement	

MT	<a href="#">mountains</a>	N	north
N/A	not applicable	NCDC	<a href="#">National Climatic Data Center</a>
NE	northeast	NOS	<a href="#">National Ocean Survey</a>
NOSPECI	no SPECI reports are taken at the station	NOTAM	<a href="#">Notice to Airmen</a>
NW	northwest	NWS	<a href="#">National Weather Service</a>
OCNL	occasional	OFCM	Office of the Federal Coordinator for Meteorology
OHD	overhead	OVC	overcast (8/8ths of the sky covered with <a href="#">cloud</a> )
OVR	over	P	indicates greater than the highest reportable value
PCPN	<a href="#">precipitation</a>	PK WND	peak wind
PL	<a href="#">ice pellets</a>	PNO	precipitation amount not available
PO	dust/sand whirls ( <a href="#">dust devils</a> )	PR	partial
PRES	<a href="#">Atmospheric pressure</a>	PRESFR	<a href="#">pressure</a> falling rapidly
PRESRR	<a href="#">pressure</a> rising rapidly	PWINO	precipitation identifier sensor not available
PY	spray	R	right (with reference to runway designation), <a href="#">runway</a>
RA	<a href="#">rain</a>	RTD	Routine Delayed (late) observation
RV	reportable value	RVR	<a href="#">Runway visual range</a>
RVRNO	<a href="#">RVR</a> system values not available	RY	<a href="#">runway</a>
S	<a href="#">snow</a> , south	SA	sand
SCSL	<a href="#">stratocumulus</a> standing <a href="#">lenticular cloud</a>	SCT	scattered (3-4/8ths of the sky covered with cloud)
SE	southeast	SFC	surface (i.e. ground level)
SG	<a href="#">snow grains</a>	SH	shower(s)
SKC	sky clear	SLP	<a href="#">sea-level pressure</a>
SLPNO	<a href="#">sea-level pressure</a> not available	SM	<a href="#">statute miles</a>
SN	<a href="#">snow</a>	SNINCR	snow increasing rapidly
SP	<a href="#">snow pellets</a>	SPECI	an unscheduled report taken when certain criteria have been met
SQ	<a href="#">squalls</a>	SS	<a href="#">sandstorm</a>

STN	station	SW	<a href="#">snow</a> shower, southwest
TCU	<a href="#">towering cumulus</a>	TS	<a href="#">thunderstorm</a>
TSNO	<a href="#">thunderstorm</a> information not available	TWR	<a href="#">tower</a>
UNKN	unknown	UP	unknown <a href="#">precipitation</a>
UTC	<a href="#">Coordinated Universal Time</a>	V	variable
VA	<a href="#">volcanic ash</a>	VC	in the vicinity
VIS	<a href="#">visibility</a>	VISNO	visibility at secondary location not available
VR	visual range	VRB	variable
VV	vertical visibility	W	west
WG/SO	Working Group for Surface Observations	WMO	<a href="#">World Meteorological Organization</a>
WND	<a href="#">wind</a>	WS	<a href="#">wind shear</a>
WSHFT	wind shift	Z	Zulu, i.e., <a href="#">Coordinated Universal Time</a>

## For reference only

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