Observing Weather at Summit Station Greenland

Quick Reference

Table of Contents

Contents

Purpose of Weather Obs

Flight Safety

Pilots rely on timely and accurate weather obs to land and take off safely from your site. Your accuracy and attention to detail make a critical difference to pilots, crew and passengers.

Support Weather Forecasting

Weather forecasters rely on your observations when creating forecasts for your site. For this reason, you may be asked to make observations 6 hours in advance of aircraft departing for your site.

Contribute to Climate Data

Data gathered in the field contributes to climate models and data used by worldwide researchers in their studies regarding climate change and polar circulation.

TAF

Terminal Aerodrome Forecast

A TAF is a weather forecast created to support aircraft operations.

AERODROME

An aerodrome is a location from which aircraft flight operations take place.

Where to Observe Weather

Outdoors

Weather observations MUST be made while outdoors. Observations may NOT be made while indoors looking out through a window.

Consistent Location

Select a site from which observations will be made and for consistency, use that site for all future observations.

Consistent Height

Six feet off the ground is the standard height from which to make weather observations.

360 Degree View

The observer must be able to see all of the sky and horizon in order to make the best observation.

On or Near Landing Area

Ideally, weather observations are taken while on the skiway or aircraft landing zone. This is not always possible due to timeliness and observer safety.

Always Save a Record of Your Observations

Quality Control

It is best practice for the observer on the next shift to go through the previous observations for accurate coding and note any corrections. Your recorded observations must be as accurate as possible.

Air Force Form 3803

AF Form 3803

This is the form used by weather observers working at the US Polar Programs. Keep copies on station of all weather observations.

SURFACE WEATHER OBSERVATIONS *(METAR/SPECI)*	LATITUDE	LONGITUDE	STATION ELEVATION Feet (MSL)	TIME CONVERSION *(LST to UTC)* - 13 Hrs.	MAG TO TRUE 0 Deg.	DAY *(LST)*	MONTH	YEAR	STATION *(or grid coord)* & STATE OR COUNTRY 0 WAIS DIVIDE, ANTARCTICA

TYPE (1)	TIME *(UTC)* (2)	WIND DRCTN *(True)* (9A)	WIND SPEED *(Knots)* (10)	WIND MAX WIND *(Knots)* (11)	WIND VARIABLITY *(True)* (9B)	VISIBILITY METERS (4A)	VISIBILITY STATUTE MILES *(SM)* (4B)	RUNWAY VISUAL RANGE LOCAL (4C)	WEATHER AND OBSTRUCTIONS TO VISION (5)	SKY CONDITION (3)	TEMP *(°C)* (7)	DEW POINT *(°C)* (8)	ALSTG *(Inches)* (12)	STA PRES-SURE *(Inches)* (17)	TOTAL SKY CVR (21)	OBS INIT (18)
(13) RMK																
(13) RMK																
(13) RMK																
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Column

- 1 - Type
- 2 - Time
- 9A - Wind Direction
- 10 - Wind Speed
- 11 - Wind Gusts
- 9B - Wind Variability
- 4A - Visibility in Meters
- 4B - Visibility in Statute Miles (not used)
- 5 - Weather and Obstructions to Vision
- 3 - Sky Condition
- 7 - Temperature
- 8 - Dew Point
- 12 - ALSTG (Altimeter)
- 17 - Station Pressure (not used)
- 21 - Total Sky Cover
- 18 - Observer’s Initials
- 13 - REMARKS

AF FORM 3803 EXAMPLES

TYPE (1)	TIME (UTC) (2)	WIND DRCT (GRID) (9A)	WIND SPEED Knots (10)	WIND GUSTS (Knots) (11)	WIND VARIABILITY (GRID) (9B)	VISIBILITY METERS (4A)	VISIBILITY STATUTE MILES (4B)	WEATHER AND OBSTRUCTIONS TO VISION (5)	SKY CONDITION (3)	TEMP (°C) (7)	DEW POINT (°C) (8)	ALTM SETTING (Inches) (12)	STA PRESSURE (Inches) (17)	TOTAL SKY CVR (21)	OBS INIT (18)
M	0055	040	12			9999		DRSN	FEW010 SCT080	M42	M	2856		3	KB
(13) RMK SDG/HDG															
S	0129	030	15			6000		BLSN	BKN010 BKN080	M40	M	2856		6	KB
(13) RMK SDF/HDF															
M	0155	020	17			4800		BLSN	BKN010 OVC060	M39	M43	2855		8	KB
(13) RMK SDF/HDP															
M	0255	360	17			4800		IC BLSN	BKN012 OVC060	M35	M38	2853		8	KB
(13) RMK VIS SW-W 2400 SDF/HDP															
S	0311	350	16	23		2400		IC BLSN	SCT012 BKN030 OVC060	M34	M37	2852		8	JT
(13) RMK VIS NE 4000 SDP/HDP															
M	0355	360	18			1600		-SG BLSN	FEW000 BKN012 OVC030	M33	M35	2850		8	JT
(13) RMK BLSN FEW000 SDP/HDN															
S	0418	340	20	30		0400		BLSN FZFG	VV005	M32	M35	2851		8	JT
(13) RMK SDN/HDN															
M	0455	360	09			1600		DRSN BR	SCT000 BKN012 OVC030	M33	M35	2849		8	JT
(13) RMK BR SCT000 SDN/HDN															

Kestral Example:

M	0455	360	09			1600		DRSN BR	SCT000 BKN012 OVC030	M33	M35	2849		8	JT
(13) RMK BR SCT000 WIND DATA ESTIMATED SDN/HDN															

Note: black spacing lines have been added to this example for visual clarity. These lines do not exist on your ob sheet. Red letters are for emphasis in example only.

PRE-TRANSMISSION CHECKS

Use this list to check for mistakes before you transmit your ob.

Wind

- Wind direction is 3 digits to nearest 10 degrees.
- Speed is 2 digits to nearest knot.

Visibility

- 9999 for unrestricted; otherwise choose a reportable value in meters.
- If not 9999, make sure you have some weather and/or obscurations in col 5.

Weather and Obstructions

- Separate precipitation and obscurations with a space, e.g. IC BLSN.
- Ice Crystals? No intensity qualifier: IC.
- Snow or snow grains? If vis > 0800 meters, then it's light: −SN or −SG.
- Fog? If vis >0800 meters → BR. If vis ≤800 meters→ FZFG.
- DRSN goes with 9999 (unless accompanied by other precip/obscuration).
- BLSN goes with vis ≤9000 meters.
- Can have precipitation with 9999 (common for IC).

Sky Condition

- Code layers from lowest to highest; coverage is cumulative.
- Cloud heights are 3 digits in hundreds of feet, e.g. SCT003 for scattered layer at 300 ft.

Temperature

- Two digits in Celsius with an 'M' for negative temperatures, e.g. M09.
- Round to nearest whole degree.

Dew Point

- Two digits in Celsius with an 'M' for negative values, e.g. M13.
- If not reported by instrument, code 'M' for missing on the ob form.

Altimeter Setting

- Four digits to nearest hundredth of an inch, without the decimal point.
- Should usually be in the upper 20s, e.g. 2898.

Remarks

- Code in same order as body of report, i.e. start with wind remarks (if any).
- Sector vis? If different from prevailing and either sector or prevailing vis <4800 m.
- Partial obscuration? Remark required, e.g. FZFG FEW000.
- ACSL? Report with direction from station, e.g. ACSL DSNT NE.
- Surface and horizon definitions. Reported in ALL obs, e.g. SDG/HDF.

METAR Code

M BGSM 260850Z 320T19KT 9999 DRSN SCT150 M35/M38 A2980 RMK SDG/HDG 3 OKTAS

METAR

The term METAR is an acronym for Meterological Aerodrome Report. METAR reports capture information regarding wind, visibility, present weather and obscurations, sky condition, temperature, dew point and altimeter.

METAR Example:

M BGSM 061150 19018G26KT 4000M BLSN SCT000 OVC030 M18/M24 A2942 RMK VIS W 1600 RMD SDP/HDN

Writing METAR Code

The METAR format is highly standardized and is recognized by pilots and forecasters around the world. Accuracy and correct coding are important.

TYPE	ID	TIME	WIND	VIS	WEATHER	SKY	T/DEW	ALT	REMARKS
M	BGSM	0950	240T18KT	2400	BR BLSN	BKN000	M15/M19	2970	VIS W-NW 1600

Note: the METAR examples highlighted in green in this booklet are slightly different from standard. Transmissions from Summit Station include the sky cover percentage. For example “3 OKTAS” at the end of the Remarks section would indicate three oktas sky coverage. This addition was requested by the Danish Met Office.

The wind direction is written with the letter “T” to indicate True Direction. This addition was requested by the New York Air Guard.

Know the Rules

For detailed information on the regulations regarding METAR codes, check out the

Federal Meteorological Handbook No. 1:

FMH-1

Observation Type

M BGSM 041150Z 240T05KT 9999 IC SCT080 M18/M20 A2895 RMK SDG/HDG 4 OKTAS

METAR

METAR observations are made at regularly scheduled times beginning at 10 minutes before the top of each reporting hour and ending 1 minute before the top of the hour. At Summit Station during non-flight days, a single daily METAR observation is transmitted at 11:50 zulu via email to this address:

cps-summit-weather@transport.sri.com.

S BGSM 041124Z 240T05KT 4000 IC BR SCT000 M18/M20 A2974 RMK BR SCT000 SDF/HDP 4 OKTAS

Special Observations (SPECI)

Certain changing conditions require that a Special Observation (or SPECI) be recorded. This Special Observation can occur at any time.

Special Observations may be recorded as often as necessary to keep air crews and forecasters informed of changing conditions as they occur.

Special Observations are coded with the letter ‘S’.

SPECI Times

Special Observations may be taken at any time. Write and say the SPECI at exactly the time it occurred.

SPECI Example:

If your visibility at the most recent regular METAR time was 800 meters (1/2 mile) and then increases to 1 mile or more before the next METAR is due, it is important to call a SPECI. This will help the aircraft determine if the proper weather requirements are present to make a safe to landing.

Special Observation Criteria

S BGSM 041124Z 180T10KT 1600 IC BR BKN000 M18/M20 A2931 RMK BR BKN000 SDP/HDN 6 OKTAS

A SPECI is required if any of these occur:

Significant Wind Shift

Wind shifts 45 degrees or more within a 15 minute period. (The wind must be 10 knots or greater throughout the shift.)

Visibility Change

Decrease:
If visibility **was at** or **was greater than** 1, 2 or 3 miles **then falls below** any of them.

Increase:
If visibility **was below** 1, 2 or 3 miles then **increases to equal or exceed** one of them.

Visibility Change Criteria
1 mile (1600 meters)
2 miles (3200 meters)
3 miles (4800 meters)

Sky Condition Below 1,000' Changes

Report when any cloud layer or obscuring phenomena forms below 1,000' that was not reported in the previous METAR or SPECI.

Precipitation Begins or Ends

Report instances in which precipitation such as snow begins or ends.

A SPECI is not required when ice crystals begin nor end.

Squall

When squalls occur.

Special Observation Criteria

S BGSM 190815Z 220T07KT 4800 IC BR SCT000 M14/M16 A2974 RMK BR SCT000 SDF/HDP 8 OKTAS

A SPECI is required if any of these occur:

Ceiling Change

Remember:
'Ceiling' is defined as the lowest Broken or Overcast layer.
A cloud layer that is Few or Scattered is not a ceiling.

Ceiling Change Criteria
300 feet
500 feet
1,000 feet
1,500 feet
3,000 feet

Raises:
If the ceiling **was below** any of the heights listed in this chart and then **increases to equal or exceed** these heights.

Lowers:
If the ceiling **was at or was higher** than these heights and **goes below** any of them, a SPECI is required.

Aircraft Mishap

Make a SPECI upon notification of an aircraft mishap unless there has been an intervening METAR or SPECI.

An aircraft mishap could refer to any damage to the aircraft during operations such as loading, taxiing or landing.

In written records, the remark "(ACFT MSHP)" shall be placed within parenthesis in the remarks section. Transmit the SPECI but do not transmit the remark "(ACFT MSHP)".

Location

M BGSM 041150Z 240T05KT 9999 IC SCT080 M18/M20 A2895 RMK SDG/HDG 3 OKTAS

Summit Station Location ID = BGSM

Observing Site Distances

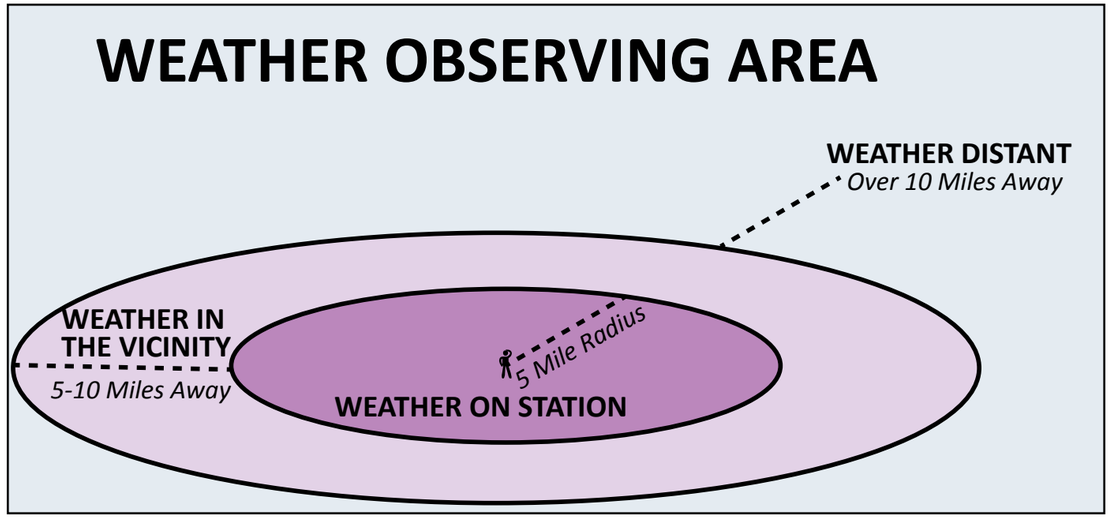
Phenomena recorded as Weather and Obstructions to Vision (Column 5 on AF Form 3803) are considered to be either "On Station", in the "Vicinity", or "Distant" depending on how far away they occur. The proximity of these phenomena determine where you will list it in your report.

On Station and In the Vicinity - Column 5

Weather and Obstructions to Vision that occur On Station (within a 5 mile radius) or In the Vicinity (5-10 miles away) are recorded in Column 5.

Distant Weather - Column 13: REMARKS

Weather phenomena that is visible more than 10 miles away is referred to as Distant. Record weather that is Distant in Column 13: REMARKS (RMK).



Date & Time

M BGSM 041150Z 240T05KT 4000 IC BR SCT000 M18/M20 A2943 RMK BR SCT000 SDF/HDF 4 OKTAS

Date & Time

After Station ID, the next section is a 7-character entry (no spaces) representing the date of the month and time of the day in Zulu (Z). The date is expressed as 2 characters. For example, on the 4th of the month, write 04. The 27th would be 27.

S BGSM 302214Z 240T25KT 1600 -SN BLSN SCT000 BKN020 M18/M20 A2972 RMK BLSN SCT000 SDP/HDN 7 OKTAS

The time is always written as 4 characters. Summit's daily observation (when no aircraft are scheduled) takes place at 12:00 Zulu. Summit transmits the observation at 10 minutes before the hour so it would be recorded at 1150. In summer, that is 9:50 am Local Time. (In Winter, 8:50 Local)

Date and Time Examples:

181150Z = *18th of the month, the 1200Z (11:50 am zulu) METAR observation*
300231Z = *30th of the month, Special Observation at 0231Z* (2:31 zulu)
221317Z = *22nd of the month, Special Observation at 1317Z (13:17 zulu)*
062350Z = *6th of the month, Zero Z (Summit's 23:50 zulu) METAR observation*

(The month and year are not represented in METAR code)

Time of the Observation

Go outside and begin looking at the visibility and sky condition about 20 minutes before the top of the hour. (Note: when aircraft are en route, be sure to go outside to check weather at least every 20 minutes in case a Special Observation is required.)

Saying the Observation Time

When speaking, refer to the observation as occurring at the top of the hour. For example, even if you write the observation time as 1150, you will still call it the "12z Observation" when you say it aloud.

Time

Zulu Conversion Chart - Summer/Winter

Greenwich Mean Time/UTC/Zulu

METAR observations are recorded in Zulu time which is another name for Greenwich Mean Time, the time at the Zero Meridian. Zulu is also called Universal Time Coordinated (UTC).

Zulu vs. Local Time

In summer, Summit Station is 2 hours behind Zulu. The 1150z observation is transmitted at 9:50 am local.

In winter, Summit Station is 3 hours behind Zulu. The 1150z ob is transmitted at 8:50 am local.

West Greenland Summer Time (WGST) is UTC-2.

WGST is usually from late-March through late-October.

Summit Time	Zulu		Summit Time	Zulu
0:00	2:00		12:00	14:00
1:00	3:00		13:00	15:00
2:00	4:00		14:00	16:00
3:00	5:00		15:00	17:00
4:00	6:00		16:00	18:00
5:00	7:00		17:00	19:00
6:00	8:00		18:00	20:00
7:00	9:00		19:00	21:00
8:00	10:00		20:00	22:00
9:00	11:00		21:00	23:00
10:00	12:00		22:00	0:00
11:00	13:00		23:00	1:00

West Greenland Time (WGT) is UTC-3

WGT is usually from November through late-March.

Summit Time	Zulu		Summit Time	Zulu
23:00	2:00		11:00	14:00
0:00	3:00		12:00	15:00
1:00	4:00		13:00	16:00
2:00	5:00		14:00	17:00
3:00	6:00		15:00	18:00
4:00	7:00		16:00	19:00
5:00	8:00		17:00	20:00
6:00	9:00		18:00	21:00
7:00	10:00		19:00	22:00
8:00	11:00		20:00	23:00
9:00	12:00		21:00	0:00
10:00	13:00		22:00	1:00

Times for Aircraft Operations

Hourly Observations for Aircraft

On days when aircraft are due at your site, begin hourly weather observations **3 hours in advance** of the scheduled departure from its point of origin (offdeck). Sometimes you may be asked to begin even earlier. This gives forecasters enough information to generate a forecast for the pilots as they prepare to depart. Hourlies continue as long as the aircraft is inbound and until the aircraft departs your site.

Basic Weather Watch

When you are observing weather for incoming aircraft, go outside and check weather at least every 20 minutes in case a Special Observation is required.

Report Trends

When reporting hourly observations, each e-mailed report should include the previous observations. This helps the forecasters spot the trends.

In the example below, the top line is the current observation. All of the previous observations from the day are included below the current one in order to show the trends.

EXAMPLE OF HOURLY OBSERVATION PROGRESSION DURING AIRCRAFT OPS

M BGSM 151250Z 333T15KT 4000 IC BR FEW000 SCT020 M20/M24 A2961 RMK BR FEW000 SDG/HDN 4 OKTAS

M BGSM 151150Z 300T12KT 1600 IC BR SCT000 SCT020 M20/M23 A2960 RMK BR SCT000 SDG/HDN 3 OKTAS
S BGSM 151125Z 300T11KT 4800 IC BR SCT000 SCT020 M20/M23 A2960 RMK BR FEW000 SDG/HDN 3 OKTAS
M BGSM 151050Z 290T10KT 9999 IC FEW020 SCT050 M21/M24 A2959 RMK FG DSNT N-SE SDG/HDG 3 OKTAS
M BGSM 150950Z 290T10KT 9999 IC FEW050 M21/M24 A2959 RMK VIS N-S 4000 VCFG N-SE SDG/HDG 1 OKTA
S BGSM 150935Z 290T10KT 4000 BR SCT000 OVC M21/M23 A2958 RMK BR SCT000 SDF/HDN 8 OKTAS
M BGSM 150850Z 290T10KT 1600 IC BR SCT000 BKN050 M21/M23 A2958 RMK BR SCT000 SDF/HDN 7 OKTAS

Wind

M BGSM 0411502Z 240T05KT 4000 IC BR SCT000 M18/M20 A2955 RMK BR SCT000 SDF/HDF 3 OKTAS

Wind Direction

Wind direction and speed are represented as 8 characters with no spaces.

(Summit transmits the letter "T" after wind direction to indicate True direction.)

Recording Direction

- Column 9A on AF Form 3803
- Always record wind direction as 3 digits
- Round wind direction to the nearest 10
  - 34 degrees is recorded as 030
  - 6 degrees is recorded as 010
  - 2 degrees is recorded as 360
  - 277 degrees is recorded as 280
- Coding example: 110T16KT

Variable Direction

6 knots or less

If the wind direction is Variable and speed is under 6 knots, record the direction as VRB. Ex: VRB03KT

Over 6 knots

Wind over 6 knots must vary by 60 degrees or more to be considered Variable, in which case the two extremes are recorded and separated by a 'V'. Ex: 180V240

True Direction

(Verses Magnetic or Grid Direction)

The New York Air Guard has requested *(as of April 2016)* that in Greenland locations, the letter "T" be included after the wind direction in the METAR observation to indicate that the wind direction is True. This will help them differentiate between True, Magnetic and Grid directions. The 'T' after wind direction is not used in regular METAR reports.

Wind

M BGSM 151150Z 310T11KT 9999 FEW060 M20/M24 A2958 RMK SDG/HDG 1 OKTA

Wind Speed

- Column 10 in AF Form 3803
- Always write wind speed as 2 digits (unless it equals or exceeds 100 knots)
- Report exactly as observed (do not round up or down)
- Speed is recorded in Knots (written as KT)
- Recorded as an average for a 2-minute observing time
- Coding example: 07006KT
- Calm winds are reported as 00000KT

Gusts

- Column 11 in AF Form 3803
- during the most recent 10 minutes
- must be 10 knots greater than the lowest recorded speed
- could be less than 10 knots greater than the reported wind speed when that speed is an average

For example if you report 17 knots as the wind speed (in Column 10), that could be the two minute average of winds varying from 10-24 knots. If your lowest wind speed was 10 knots, then a Gust of 24 knots is reportable. While 24 knots is not 10 knots greater than your average reported wind speed, it is 10 knots greater than your lowest wind speed and may be recorded.

Peak Wind

- Column 13: REMARKS of AF Form 3803
- top wind speed throughout the entire hour
- reported when wind speeds are greater than 25 knots
- different than gusts (since gusts are recorded within the 2-minute observing time)
- Record the direction, speed and time past the top of the hour at which the peak wind occured
- REMARKS coding example: PK WND 28045/15

Squall

Strong wind characterized by a sudden onset in which the wind speed increases at least 16 knots and is sustained at 22 knots or more for at least one minute.

Visibility

M BGSM 121150Z 150T05KT 9999 SCT060 M25/M28 A2880 RMK SDG/HDG 3 OKTAS

Report Visibility Distances in Meters

Summit Site visibility markers are placed at 1/2 mile, 1 mile, 2 mile and 3 mile intervals. METAR reports distances in meters.

Use the Reportable Values Table (next page) to convert miles to meters for your report.

Always Write Visibility as 4 Digits

- For example 800 meters is written as 0800.
- 7 miles or more is written as 9999.

Use Your Normal Vision

- do not use binoculars or telescope
- if you use corrective lenses for nearsightedness you must be wearing them at the time of the observation.

Report Prevailing Visibility

Prevailing visibility is the distance you can see for at least 4 eights of horizon (4 eights total, need not be contiguous).

Sharpness Offers Clues

For example, if the 1 Mile visibility marker is sharp and clear, visibility is farther than one mile. If it is hazy and just visible, visibility is just one mile.

Visibility is the distance you can see along the snow surface.

Visibility - Reportable Values

S BGSM 041124Z 240T05KT 4000 BR SCT000 M18/M20 A2991 RMK BR SCT000 SDF/HDP 3 OKTAS

Reportable Values Table

Statute Miles	Meters	Statute Miles	Meters	Statute Miles	Meters
0	0	**1**	**1600**	2 ½	4000
1/16	100	**1 ⅛**	1800	2 ¾	4400
⅛	200	1 ¼	2000	**3**	**4800**
3/16	300	1 ⅜	2200	**4**	**6000**
¼	**400**	**1 ½**	**2400**	5	8000
5/16	500	1 ⅝	2600	6	9000
⅜	600	**1 ¾**	2800	**7** or more	**9999**
½	**800**	1 ⅞	3000		**Unrestricted**
⅝	1000	**2**	**3200**		
¾	1200	2 ¼	3600		
⅞	1400				

Only report distances that correspond to specific statute mile distances. (See Reportable Values Table above.)

If your visibility is between two reportable values use the next lowest reportable value from the table.

For example, if you think the visibility is 700 meters, you must report it is as 600m (3/8 mile). 700 meters is not a reportable value.

Distances of 7 statute miles or greater are referred to as Unrestricted and written as 9999.

Think in Miles
Report in Meters

Sector Visibility

M BGSM 121150Z 150T05KT 9999 SCT060 M25/M A2880 RMK VIS S 6000 SDG/HDF 4 OKTAS

Determining Prevailing Visibility

First, divide the horizon into 8 equal sectors (45 degrees each).

Prevailing visibility takes up 4 sectors (180 degrees) or more. (need not be continuous)

Start with the sector with the highest visibility, then add sectors with that same visibility or the next-highest visibility until you have 4 sectors. Your prevailing visibility is equal to the lowest reading within those top 4 sectors.

If there are 2 different visibility readings with 4 sectors each, the highest distance becomes the prevailing visibility.

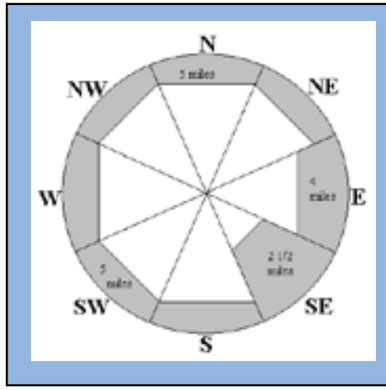
Sector Visibility

If at least one sector (one 8th) of the horizon meets the two criteria below, report a sector visibility.

- the difference between prevailing and sector visibility is one or more reportable value

AND

- either the prevailing or sector visibility is less than 3 miles (4800 meters).



Example:

Prevailing Visibility: 5 miles (8000 meters)

Sector Visibility: 2 ½ miles (4000 meters) SE

Written: RMK VIS SE 4000

Sector & Variable Visibility

M BGSM 121150Z 150T05KT 4800 BR FEW000 M25/M28 A2880 RMK VIS S-SW 3200 BR FEW000 SDG/HDF 1 OKTA

Sector Visibility

Report Sector Visibility in Column 13 - REMARKS, direction then distance: VIS SW-W 3200

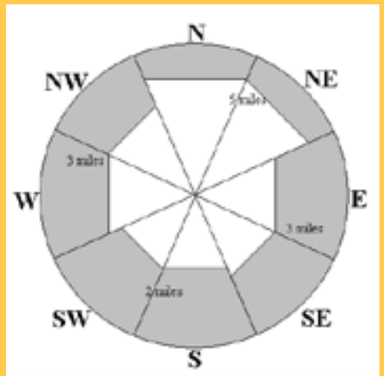
If more than one sector visibility is present, code the sectors in clockwise order starting from the north.

Example:

Prevailing Visibility: 3 miles (4800 meters)

Sector Visibility: 2 miles (3200 meters) S-SW

Written: RMK VIS S-SW 3200



Variable Visibility

Variable prevailing visibility shall be reported if the prevailing visibility is less than 3 miles and rapidly increases or decreases by 1/2 statute mile or more during the time of observation. The minimum and maximum visibility values observed shall be reported in the REMARKS section (column 13). Use the average of variability as the prevailing visibility in column 4a on the form 3803. If the actual visibility falls halfway between two reportable values, the lower value shall be reported.

For example, a visibility that was varying between 800 and 3200 meters would be coded:

Column 4A: **2000**

Column 13: **VIS 800V3200**

Weather & Obstructions to Visibility

M BGSM 141150Z 210T16KT 1600 -SN DRSN FEW000 OVC030 M18/M20 A2974 RMK DRSN FEW000 SDP/HDP 8 OKTAS

Present Weather

Any time visibility is less than 9999 in Column 4A there MUST be an entry in Column 5 that describes the present weather (precipitation or obstructions) that is restricting the visibility at your station.

For example:

0400 FZFG *"400 Meters and Freezing Fog"*
3200 BR *"3200 Meters and Mist"*
1000 -SN BLSN *"1000 Meters with Light Snow and Blowing Snow"*

Descriptors		
BC	**Patches**	Describes small-scale, discrete patches of fog, sun is often visible
PR	**Partial**	Describes a large scale bank of fog, reducing visibility to 1,000 m in some areas
BL	**Blowing**	Particles raised to the height of greater than 6 feet, visibility less than 9999
DR	**Drifting**	Particles raised to the height of less than 6 feet, visibility can be 9999
FZ	**Freezing**	Fog occurring at temps below 0ºC or precipitation freezing on surfaces to form a glaze
MI	**Shallow**	Only used to describe fog that is less than 6' in height
SH	**Showers**	Precipitation that suddenly starts and stops, rapid changes in intensity
VC	**In the Vicinity**	Occurring between 5-10 miles away *(within 5 miles is considered On Station)*
DSNT	**Distant**	Occurring more than 10 miles (up to 30 miles) away from your observing site

Precipitation - Falls from the sky		
-SN	**Light Snow**	Steady precipitation, Visibility greater than 800m (1/2 mile)
SN	**Moderate Snow**	Steady precipitation, Visibility between 400-800m (¼-1/2 mile)
+SN	**Heavy Snow**	Steady precipitation, Visibility less than 400m (1/4 mile)
SHSN	**Snow Showers**	Precip starts and stops/Vis less than 9000m (can be light, mod or heavy)
SG	**Snow Grains**	Steady precip/round, flat, opaque snow pieces/may occur at any visibility
IC	**Ice Crystals**	'Diamond Dust' crystals in the air, can occur in any visibility even 9999
-PL	**Light Ice Pellets**	Steady precip, translucent tiny hailstones <5mm, visibility not restricted
PL	**Moderate Ice Pellets**	Steady precip, translucent tiny hailstones <5mm, vis less than 9000m
+PL	**Heavy Ice Pellets**	Steady precip, translucent tiny hailstones <5mm, vis less than 4800m
DZ	**Drizzle**	Uniform precipitation, falls to the ground, may float with air currents

Weather & Obstructions to Visibility

S BGSM 220812Z 160T06KT 0400 FZFG BKN000 OVC060 M15/M17 A2921 RMK FZFG BKNOOO SDP/HDN 8 OKTAS

Present Weather

Obscurations - Suspended in the Air or Lifted from the Surface		
FZFG	Freezing Fog	Only reported when visibility is LESS than 1,000m (5/8 mile)
BR	Mist	Reported when visibllity is 1,000-9,000m (5/8 - 6 miles), "baby rain"
FU	Smoke	Caused by combustion. Smoke effects can travel over 100 miles.

In your report, list precipitation first followed by obscurations.

Vicinity Weather

Only Fog (VCFG), Showers (VCSH) or Blowing Snow (VCBLSN) may be record as In the Vicinity.

Any snow-like phenomenon in the vicinity is recorded as Showers (SH) not Snow (SN). There is no such thing as "Vicinity Snow" - ~~VCSN~~.

Is it Freezing Fog or Mist?

It Depends on the Visibility and Distance from Station

WHAT IS THE VISIBILITY? *(Or Distance Away)*	OBSCURATION	ABBR	NOTES
Less than 1,000m (5/8 mile)	**FOG**	FG	*When temps are at or above 0ºC*
Less than 1,000m (5/8 mile)	**FREEZING FOG**	FZFG	*Fog that occurs at temps below 0ºC is FZFG* *This is more common than FG in polar regions*
Less than 1,000m (5/8 mile) within the patch of fog	**PATCHY FOG**	BCFG	*Indicate fog direction and any sector visibility in REMARKS. Could have a prevailing vis of 9999 not inside the fog patch.*
More than 1,000m (5/8 mile) ***Up to 5 miles away***	**MIST**	BR	*If it's restricting visibility to over 1,000m but not more than 9,000m, it's Mist (BR)* *Mist is not coded with a descriptor. (No + or -)*
Between 5-10 miles away	**VICINITY FOG**	VCFG	*After 5 miles away, it's called Fog (FG) again*
Equal to or more than 10 miles away	**FOG IN THE DISTANCE**	FG DSNT	

When water droplets are suspended in the air close to you, **within 1,000 meters**, it's called **Fog (FG)** or **Freezing Fog (FZFG)** if temps are below 0ºC.

The **EXACT SAME** phenomenon is called **Mist (BR)** when it's **between 1,000-8,000 meters** away.

THEN, it goes back to being called **Fog (VCFG or FG DSNT)** when it's **over 8,000 meters** (5 miles) away.

Weather & Obstructions to Visibility

S BGSM 220812Z 160T06KT 0400 FZFG BKN000 OVC060 M15/M17 A2921 RMK FZFG BKN000 DP/HDN 8 OKTAS

Present Weather

Patches of Fog (BCFG)

A patch of fog (FG) is fog that unevenly covers a portion of the station.

The visibility within the patch(es) of fog must be less than 5/8 mile (1,000 m) and the prevailing visibility outside the patch(es) must be equal to or greater than 5/8 mile (1,000 m).

Patchy fog has a vertical extent of at least 6 feet and reduces horizontal visibility unevenly in one or more sectors (e.g. fog bank), but to a lesser extent vertically. BCFG may be coded with a prevailing visibility of 7 miles or greater.

When using BCFG, a sector visibility remark should also be encoded.

Coding Present Weather

On Station • Vicinity • Distant Phenomena

If the weather or obscuration occurs on station (within 5 miles) or in the vicinity (5 to 10 miles) code it in the body of your METAR report.

If the weather is observed Distant to the station (over 10 miles away) code the information in the REMARKS section.

Weather & Obstructions to Visibility

S BGSM 220812Z 160T06KT 0400 FZFG BKN000 OVC060 M15/M17 A2921 RMK FZFG BKN000 DP/HDN 8 OKTAS

Present Weather

Up to 3 types of present weather may be listed in order of decreasing dominance based on intensity.

List precipitation first, then Obscurations.

For example:

2400 -SN DRSN BR	"2400 Meters, Light Snow, Drifting Snow and Mist"
0200 +SN BLSN FZFG	"200 Meters, Heavy Snow, Blowing Snow and Freezing Fog"
0600 SN	"600 Meters and Moderate Snow"
4000 IC BR	"4000 Meters, Ice Crystals and Mist"

Is the Snow Blowing or Drifting?

(Both occur when wind moves snow from the surface)

Drifting Snow (DRSN)

- low to the surface, under 6' high
- Visibility can be 9999 (DRSN does not reduce visibility)

If the wind speed is 10 knots or more, look for the telltale waves of Drifting Snow on or low to the snow surface. "Snow Snakes".

Blowing Snow (BLSN)

- suspended over 6' high
- Visibility is less than 9999 (BLSN DOES reduce visibility)

If the wind speed is12-15 knots or higher, check to see if snow particles are being blown around six feet or more above the surface.

If you can't tell if snow is falling from the sky or being lifted by the wind, default to BLSN.

Neither DRSN nor BLSN are coded with descriptors. (No + or -)

Sky Cover - Cloud Layers

M BGSM 191150Z 270T09KT 4000 BR SCT000 BKN050 M18/M20 A2974 RMK CIG THN SDF/HDP 8 OKTAS

Reporting Cloud Layers

Each cloud layer is reported as two elements: Sky Cover and Cloud Height. Sky Cover uses a 3-characters abbreviation describing the number of eighths, or oktas of the sky that is covered up to and through a given layer. Cloud Height is coded as 3 characters describing the height of that cloud layer. For example, FEW100 or SCT060.

Up to 6 different layers of clouds may be reported.

List the cloud layers in order from the lowest to the highest.

Sky Cover: How Many Eights (Oktas) Are Covered?

Percent of Sky Cover		
Abbreviation	**Description**	**Oktas**
SKC	**Sky Clear**	**0**
FEW	**Few**	**>0/8 – 2/8**
SCT	**Scattered**	**3/8 – 4/8**
BKN	**Broken**	**5/8 – 7/8**
OVC	**Overcast**	**8/8**
VV	**Vertical Visibility** *(Sky Obscured)*	**8/8**

NEWBIE ALERT: Never report a layer with less sky cover above a layer that has more sky cover. Never record FEW layer over SCT or BKN for example.

Sky Cover - Cloud Layers

M BGSM 301150Z 270T19KT 0200 -SN BLSN VV006 M12/M14 A2927 RMK SDP/HDN 8 OKTAS

Cloud Heights

Heights of cloud layers are measured in feet from the landing surface to the bottom of the cloud layer.

When recording cloud heights in METAR format, the last two zeros are omitted. For example, 10,000 feet is written as 100. *(Imagine two invisible zeros after the 3 numbers in the code: **10**,**0**00 or **15**,**0**00.)*

Height to the Bottom of the Layer	Sky Cover	METAR Code
Surface	**3/8**	**SCT000**
400 feet	**6/8**	**BKN004**
1,000 feet	**1/8**	**FEW010**
1,800 feet	**8/8**	**OVO018**
12,000 feet	**5/8**	**BKN120**

Adding it Up - The Summation Principle

The number of oktas reported for a given cloud layer must also include the amount of sky that is covered by all of the clouds below it.

For example:

if you record a layer as BKN, you may not code FEW or SCT layers above it.

Even if the clouds in the higher layer represent fewer oktas, the layer must be coded to include the coverage from the clouds below it as well.

Cloud Layer	Sky Cover	METAR Code	Notes
First Layer	**3/8 at 1,000'**	**SCT010**	
Second Layer	**1/8 at 6,000'**	**SCT060**	*The clouds at 6,000' only equal FEW, but they must be combined with the layer below to equal 4/8 (SCT)*
Third Layer	**1/8 at 15,000'**	**BKN150**	*Again, the amount of clouds in the third layer only equal FEW but it must be combined with the two layers below and reported as broken. 3 oktas + 1 okta + 1 okta = 5 oktas or BKN*

Sky Condition - Cloud Layers

Weather At The Surface - Partial Obscurations

When freezing fog, mist or blowing snow obscure part of the sky, they are reported as a cloud layer.

When this occurs, determine what percentage of the sky is covered (FEW, SCT or BKN) then add 000 to represent “At The Surface”.

For example: FEW000, “Few At the Surface”.

This bank of fog might be reported as FEW000 or SCT000 depending on how much sky it obscures.

If you report a layer At The Surface, this is also known as a Partial Obscuration.

Any reported Partial Obscuration must be further explained in the REMARKS section to describe what is causing the effect.

For example: RMK FZFG SCT000 SDP/HDN

(this means Freezing Fog at the surface is obscuring 3/8 - 4/8 of the sky, surface definition is poor, horizon definition is nil).

Sky Condition - Cloud Layers

Vertical Visibility

If all of the celestial dome is covered by the fog or blowing snow and you can not determine the height of the lowest cloud layer, report a Vertical Visibility (VV).

Launch a ceiling balloon or use your surface visibility to determine how high into the obscuration you can see. For example, VV001 “Vertical Visibility 100 feet”. *(Avoid use in high winds as you will lose sight of the balloon horizontally.)*

A Vertical Visibility (VV) is **not** further described in REMARKS because it is a full, not partial obscuration.

Vertical Visibility (VV)

When the height of the base of the lowest cloud level cannot be discerned.

Present weather such as freezing fog or blowing snow may obscure any visible cloud base. If this is the case, your options are:

- launch a ceiling balloon
- if you don’t have a ceiling balloon, estimate VV using your ground visibility. If you can only see 300’ through fog, then estimate your vertical visibility as 300’ as well.

Be Careful with Meters vs Feet!

Visibility for distance over the surface is reported in meters while Vertical Visibility is reported in feet. For example: if your ground visibility is 200 meters, VV will likely be closer to 600 feet.

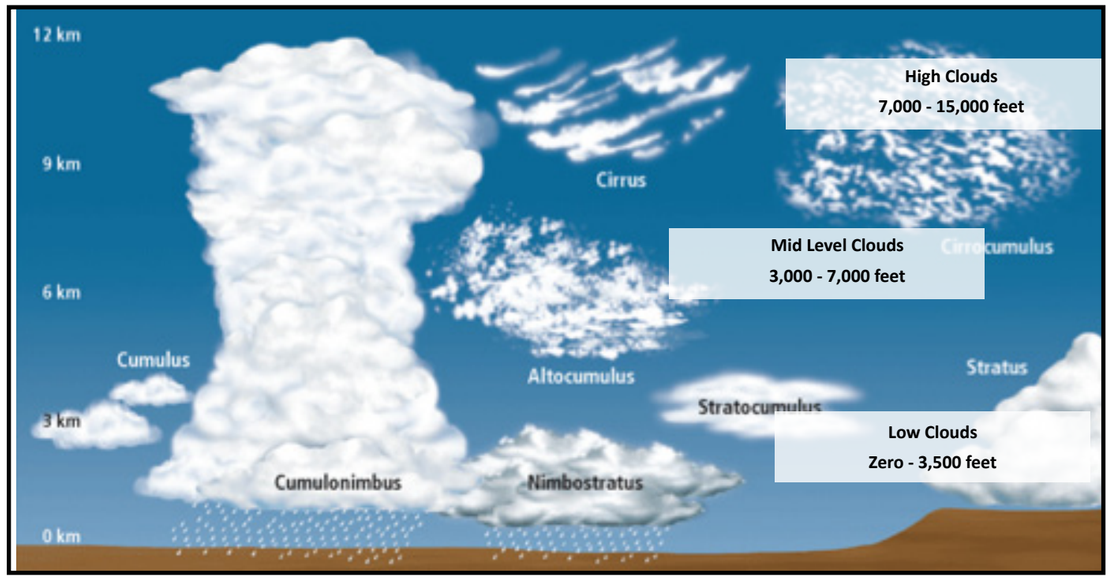
Sky Condition - Cloud Layers

M BGSM 111150Z 290T10KT 9999 SCT010 BKN100 M05/M07 A2984 RMK SDG/HDG 6 OKTAS

Determining Cloud Heights by Cloud Type

Identifying a cloud's type provides information about the cloud's height. High, mid level and low clouds are found at predictable height ranges. These ranges are a bit more compressed in polar regions than they are in other areas of the globe.

If you see one type of cloud forming in different areas of the sky, it is likely that all areas are the same cloud height. Report it as one layer.



AGL vs. MSL

AGL = Above Ground Level (measured from the landing surface)

MSL = Mean Sea Level (measured from sea level, typical in aviation)

Example: If your location is 500' above sea level and you are calling a cloud height at 1,000' that is 1,000 AGL. If the pilot says the cloud is at 1,500' it may match your observation if the pilot is giving the height in MSL. Be sure to clarify.

Sky Condition - Cloud Layers

M BGSM 191150Z 160T08KT 9999 FEW150 M21/M23 A2921 RMK SDG/HDG 1 OKTA

Ways to Determine Cloud Heights

Cloud Type

Certain cloud types *(ex: stratus, cumulus, cirrus)* are most commonly seen at specific height ranges. *(see examples next page)*

Ceilometer

These devices only measure the height of the cloud directly above them, not clouds in other areas of the sky.

They sometimes measure temperature inversions. A strange reading of 200-300' that doesn't match the clouds you see might mean the device is measuring not clouds but temp inversions.

PIREP- Pilot Report

Asking an incoming or departing pilot to identify the heights of the cloud layers as they fly through them is a great tool. Be sure to clarify if the heights they are giving are in AGL or MSL.

Remember - pilots have a lot to do in the 5-10 minutes before take off and landing. It's best to ask for PIREPs before or after this time window.

Ceiling Balloons

Helium-filled balloons that are filled to a specific weight-lifting capability will rise to the clouds at predictable rates. Fill the balloon with helium while attached to a weighted fill-kit to get the correct size and weight then release the balloon outside. Time how many seconds from release to when the color begins to fade as the balloon enters the cloud layer. Use the correct ceiling balloon chart to determine the cloud height. Note: the balloon may continue to be visible while in the cloud but your timing should end as soon as the balloon's color fades.

CAUTION: use protection for eyes and ears while filling balloons.

Cloud Layers

M BGSM 191150Z 160T08KT 9999 FEW150 M21/M23 A2921 RMK SDG/HDG 1 OKTA

Low Clouds

Surface to 3,500 feet

- low clouds appear to move more quickly than high clouds
- components are closer, larger, easily visible
- low clouds are often darker in color
- stratus like a solid blanket, cumulus puffy blobs

Clouds: Stratus • Stratocumulus • Cumulus (summer)
Obscurations: Fog • Mist • Smoke

Mid Level Clouds

3,000-7,000 feet

- similar to low clouds but with smaller features
- altostratus is often a bit thinner than stratus, higher
- altocumulus - some parts can be darker than others
- the sun is often dimly visible through the layers

Altostratus • Altocumulus • ACSL

High Clouds

7,000 - 15,000 feet

- wispy, streaky, distant
- composed of ice crystals, often form halos
- usually very thin
- aircraft contrails count as clouds

Cirrus • Cirrostratus • Cirrocumulus

Cloud Layers

M BGSM 191150Z 160T08KT 9999 FEW150 M21/M23 A2921 RMK SDG/HDG 2 OKTAS

Thin Clouds

If clouds are visible above a thin overcast level, do not code two OVC layers. Code thin overcast in Column 13 as THN CIG (ceiling thin) or SUN DMLY VSBL (sun dimly visible).

Reportable Cloud Heights

The heights of clouds are rounded to the closest hundred, five hundred or thousand feet depending on their height range.

Cloud Layer Height Range	Round to
Surface – 5,000 Feet	Nearest 100 Feet
Between 5,000 – 10,000 Feet	Nearest 500 Feet
Over 10,000 Feet	Nearest 1,000 Feet

Kilometers	Feet
.25	820
.5	1,640
.75	2,460
1	3,281
1.5	4,921
2	6,562
2.5	8,202
3	9,843
3.5	11,483
4	13,123
4.5	14,764
5	16,404
5.5	18,045
6	19,685
6.5	21,326
7	22,966

Temperature & Dew Point

M BGSM 191150Z 160T08KT 9999 FEW150 M21/M23 A2921 RMK SDG/HDG 1 OKTA

Temperature

- Column 7 in AF Form 3803
- Always recorded as 2 digits (09, 13, 02)
- Round up or down to the nearest whole number
- Reported in Celsius
- Temps below 0 degrees Celsius will be recorded with the letter M (minus) prior to the temp readings. (M04, M22)
- If the temperature is missing code as “M” for missing.

Dew Point

- Column 8 in AF Form 3803
- Always recorded as 2 digits
- Reported in Celsius
- Temps below 0 degrees Celsius will be recorded with the letter M (minus) prior to the temp readings. (M34, M07)
- If the dew point is missing code as “M” for missing.

Rounding Negative Temperature Readings

When recording temperatures that are below zero, round .5 readings up towards zero. For example M4.5 would be coded M04.

Air Temperature and Dew Point

Dew point is the temperature to which the air must be cooled to reach saturation, which is when water vapor begins to condense into water droplets.

Temp and dew point that are far apart in range mean dry air is present, close together means moisture in the air.Pilots are interested in temperature and dew point because it can indicate the chance of fog. Fog can form when the difference between temp and dew point are 2.5 degrees C or closer.

Dew point will be either the same as or a colder reading than air temperature.

Altimeter

M BGSM 191150Z 160T08KT 9999 SKC M14/M19 A2921 RMK SDG/HDG 0 OKTAS

Altimeter

- Column 12 in AF Form 3803
- Always recorded as 4 digits
- Preceded by the letter ‘A’
- Example: A2976 *(the decimal point is not encoded)*

Altimeter setting is the value an aircraft altimeter must be set to in order to display the correct altitude above sea level. It is reported in inches of mercury to the nearest hundredth of an inch.

Summit Altimeter

Altimeter value is determined using the pressure from the NOAA weather station and converted to an altimeter using a station height of 10,530’ MSL (mean sea level).

In the event of disruption to the weather page, the science techs will provide the ‘Altimeter Setting Calculation’ to manually provide altimeter.

Note: Description and procedures of Elevation and Altimeter Reporting is included in the Summit Station Science Protocols documentation.

The backup method of checking altimeter are the aviation altimeters located in the Big House office. The altimeter has been calibrated to the elevation of Summit Station (10530’ MSL). In order to read the current pressure, turn the knob on the front so that the small hand points at the red dot just below “1” and the big hand points at the red dot between “5” and “6”. The pressure is read from the dial to the nearest hundredth and is reported in “Hg.” The altimeters are calibrated on a regular rotation.

Backup barometer options will be used only if the NOAA pressure data or the weblink is not available. If used, note in the Remarks and notify aircrew.

Remarks

M BGSM 121150Z 160T08KT 1600 BR FEW000 M21/M23 A2921 RMK VIS E-SE 4800 BR FEW000 SDG/SDF 1 OKTA

REMARKS

REMARKS are listed at the end of the METAR report and are coded as RMK. Include a REMARKS section only if required.

Code remarks in the following order:

Peak Wind

For example, a peak wind of 45 knots from 280 degrees that occurred at 15 minutes past the hour would be coded “PK WND 28045/15”.

Wind Shift

If a shift in wind is coded, the time of the shift may be coded in REMARKS. For example, WSHFT 30 means a wind shift occurred 30 minutes after the hour (the hour is inferred by the METAR time).

Kestrel Users

Include the code WIND DATA ESTIMATED when you use a Kestrel.

Variable Prevailing Visibility

For example, a visibility that was varying between 0800 and 3200 meters would be coded “VIS 0800V3200”.

Sector Visibility

For example, a visibility of 4000 meters in the northeastern octant would be coded “VIS NE 4000”.

Virga

Virga is precipitation that appears to hang under a cloud and that evaporates before it reaches the ground. Code it in remarks as “VIRGA SW”.

Variable Ceiling Height

“CIG 005V010” would indicate a ceiling that was varying between 500 and 1,000 feet.

When listing directions in remarks, use the eight points of the compass coded in a clockwise order starting with North.

Remarks

M BGSM 191150Z VRB03KT 9999 OVC 1500 M21/M23 A2921 RMK THN OVC SDF/HDN 8 OKTAS

Ceiling Remarks

For example, a thin ceiling could be indicated by THN OVC (thin overcast), CIG THN (ceiling thin), or SUN DMLY VSBL (sun dimly visible).

Obscurations

Surface-based obscurations shall have a height of “000”. For example, fog that was hiding 3-4 oktas of the sky would be coded “FG SCT000”.

Present Weather Descriptors

Present weather coded in METAR as VC may be further described in REMARKS to include direction from the station “VCFG NE-SE”

Distant weather

ie. “SN DSNT W”

Variable Sky Condition

A cloud layer at 1,400 feet that is varying between broken and overcast would be coded “BKN014 V OVC”.

Standing Lenticular Clouds

The most common lenticular cloud is ACSL (altocumulus standing lenticular) but SCSL (stratocumulus standing lenticular) or CCSL (cirrocumulus standing lenticular) may also occur. Indicate the cloud’s direction, “ACSL NE”.

Aircraft Mishap

The remark ACFT_MSHP shall be coded in the report but not transmitted.

Surface and Horizon Definitions

(see next page)

Oktas

From Greenland stations only, the Danish Met Service has requested that weather observations include the exact number of oktas covered by cloud.

Remarks

M BGSM 191150Z 160T08KT 9999 FEW150 M21/M23 A2921 RMK CIG THN SDG/HDG 1 OKTA

Surface and Horizon Definitions

To help with safe landings on snow and ice, pilots rely on cues in the surface and horizon definition. Example, SDF/HDP (surface definition fair/horizon definition poor) or SDG/HDG (surface definition good/horizon definition good).

Surface

GOOD: Snow surface features such as sastrugi, drifts, and gullies are easily identified by shadows. The sun is usually not obscured.

FAIR: Snow features can be identified by contrast. No definite shadows exist. The sun is usually partially obscured.

POOR: Snow surfaces cannot be readily identified except from close up. The sun is usually totally obscured.

NIL: Snow surfaces cannot be identified. No shadows or contrast exist. Dark colored objects appear to float in the air. The sun is totally obscured although the overcast may exhibit considerable glare.

Horizon

GOOD: The horizon is sharply defined by shadow or contrast.

FAIR: The horizon may be identified although the contrast between the sky and snow is not sharply defined.

POOR: The horizon is barely discernible.

NIL: Total loss of the horizon as the snow merges with the whiteness of the sky.

Communications

E-mail Your Observation

Each weather report is e-mailed to the Summit Station weather distribution list. SRI administers the distribution list. The e-mail address is cps-summit- weather@transport.sri.com, and the alias is “Wx” from the Manager e-mail account. For winter turnover operations, additional names may be added to the cc list to include the air vendor, pilots, etc.

cps-summit- weather@transport.sri.com

Requesting a TAF

Sometimes the flight crew will ask you to call for a forecast of what the weather will be like in Kanger when they are expected to return.

If they ask for this, tell them to standby. Then email or call Raven Ops in Kanger to get the forecast. Once you have it, relay it to the flight crew over the radio. “Skier 51 I have your forecast when you are ready to copy.”

Raven Ops: 139ravenops@gmail.com

9-011-299-841-395 (from a VoIP phone)

“PHONING IT IN”

If the internet is down, call the Danish MET Office with your weather observation. Their phone number is

+299 84 10 22.

GLOSSARY

actual time of observation
For METARs, it is the time the last element of the report is observed or evaluated. For SPECIs, it is the time that the criteria for a SPECI was met or noted.

aircraft mishap
An inclusive term to denote the occurrence of an aircraft accident or incident.

altimeter setting
The pressure value to which an aircraft altimeter scale is set so that it will indicate the altitude above mean sea level of an aircraft on the surface at the location for which the value was determined.

atmospheric pressure
The pressure exerted by the atmosphere at a given point.

barometric pressure
The pressure value indicated by a pressure sensor (barometer).

blowing snow
Snow lifted from the surface by the wind to a height of 6 feet or more and blown about in such quantities that the reported horizontal visibility is reduced to less than 7 miles.

body of report
That portion of a METAR or SPECI beginning with the type of report and ending with the altimeter setting.

broken layer
A layer covering whose summation amount of sky cover is 5/8ths through 7/8ths.

ceiling
The lowest layer reported as broken or overcast; or the vertical visibility into an indefinite ceiling.

ceilometer
A device used to evaluate the height of clouds or the vertical visibility into a surface-based obscuration.

cloud height
The height of the base of a cloud or cloud layer above the surface of the earth.

GLOSSARY

cloud layer
An array of clouds whose bases are at approximately the same level.

Coordinated Universal Time (UTC)
The time in the zero degree meridian time zone (also known as Greenwich Mean Time (GMT) or Zulu (Z) time).

cumulus
A principal cloud type in the form of individual, detached elements which are generally dense and possess sharp non-fibrous outlines.

dew point
The temperature to which a given parcel of air must be cooled at constant pressure and water vapor content in order for saturation to occur.

few
A layer whose summation amount of sky cover is 1/8th through 2/8ths.

field elevation
The elevation above sea level of the highest point on the runway/skiway.

fog
A visible aggregate of minute water particles based at the surface that reduces horizontal visibility to less than 5/8 statute miles (1000 m) and, unlike drizzle, does not fall to the ground.

freezing fog
Fog that occurs with an air temperature below zero Celsius.

frozen precipitation
Any form of precipitation that reaches the ground in solid form (snow, hail, snow pellets, snow grains, ice pellets, or ice crystals).

gust
Rapid fluctuations in wind speed with a variation of 10 knots or more between peaks and lulls.

GLOSSARY

ice crystals (diamond dust)
A fall of non-branched (snow crystals are branched) ice crystals in the form of needles, columns, or plates.

ice pellets
Precipitation of transparent or translucent pellets of ice, which are round or irregular and have a diameter of 0.2 inch (5 mm) or less.

indefinite ceiling
The ceiling classification applied when the reported ceiling value represents the vertical visibility upward into a surface-based obscuration.

low drifting snow
Snow that is raised by the wind to less than 6 feet above the surface; visibility is not reduced below 7 miles at eye level.

mist
A visible aggregate of minute water droplets or ice crystals suspended in the atmosphere that reduces visibility to less than 7 miles but greater than or equal to 5/8 statute miles (1000 m).

obscured sky
The condition when the entire sky is hidden by a surface-based obscuration.

obscuration
Any phenomenon in the atmosphere, other than precipitation, that reduces horizontal visibility.

overcast
A layer whose summation amount of sky cover is 8/8ths.

peak wind speed
The maximum instantaneous wind speed since the last METAR that exceeded 25 knots.

prevailing visibility
The visibility that is considered representative of conditions at the station: the greatest distance that can be seen throughout at least half the horizon circle, not necessarily continuous.

GLOSSARY

scattered
A layer whose summation amount of sky cover is 3/8ths through 4/8ths.

sea-level pressure
The pressure value obtained by the theoretical reduction or increase of barometric pressure to sea level.

sector visibility
The visibility in a specified direction that represents at least a 45 degree arc of the horizon circle.

snow
Precipitation of snow crystals, mostly branched in the form of six-pointed stars.

snow grains
Precipitation of very small, white, opaque grains of ice.

squall
A strong wind characterized by a sudden onset in which the wind speed increases at least 16 knots and is sustained at 22 knots or more for at least one minute.

station elevation
The officially designated height above sea level to which station pressure pertains. It is usually the same as field elevation at an airport station.

station pressure
The atmospheric pressure at the designated station elevation.

surface visibility
The prevailing visibility determined from the usual point of observation.

variable ceiling
A ceiling of less than 3,000 feet which rapidly increases or decreases in height by established criteria during the period of observation.

GLOSSARY

variable prevailing visibility
A condition when the prevailing visibility is less than 3 statute miles and rapidly increases or decreases by 1/2 mile or more during the period of observation.

variable wind direction
A condition when (1) the wind direction fluctuates by 60 degrees or more during the 2-minute evaluation period and the wind speed is greater than 6 knots; or (2) the direction is variable and the wind speed is 6 knots or less.

vertical visibility
A subjective or instrumental evaluation of the vertical distance into a surface-based obscuration that an observer would be able to see.

vicinity
A proximity qualifier, VC, used to indicate weather phenomena observed between 5 and 10 statute miles of the observation point but not at the station.

virga
Visible wisps or strands of precipitation falling from clouds that evaporate before reaching the surface.

wind direction
The direction from which the wind is moving at a given location.

wind shift
A change in the wind direction of 45 degrees or more in less than 15 minutes with a sustained wind speed of 10 knots or more throughout the wind shift.

ABBREVIATIONS & ACRONYMS

Intensifiers

-	light
+	heavy
/	separator between temp/dew point
ACFT MSHP	aircraft mishap
ACSL	altocumulus standing lenticular cloud
BC	patches
BKN	broken clouds 5-7/8ths
BL	blowing
BR	mist
CIG	ceiling
CLR	clear sky 0/8ths
COR	correction to a previous disseminated report
DSNT	distant
E	east
FEW	few clouds 1-2/8ths
FG	fog
FROPA	frontal passage
FZ	freezing
IC	ice crystals
ICAO	International Civil Aviation Organization
KT	knots
LST	Local Standard Time
METAR	aviation routine weather report
MI	shallow
N	north
NCDC	National Climatic Data Center

ABBREVIATIONS & ACRONYMS

NE	northeast
NOSPECI	no Speci reports are taken at the station
NW	northwest
NWS	National Weather Service
OCNL	occasional
OFCM	Office of the Federal Coordinator for Meteorology
OVC	overcast
OHD	overhead
PL	ice pellets
PK WND	peak wind
PR	partial
RWY	runway
S	south
SCSL	stratocumulus standing lenticular cloud
SCT	scattered clouds 3-4/8ths
SE	southeast
SFC	surface
SG	snow grains
SH	shower(s)
SKC	sky clear 0/8ths
SM	statute mile
SN	snow
SPECI	an unscheduled report taken when certain criteria have been met
SQ	squalls
SW	southwest
TWR	tower

ABBREVIATIONS & ACRONYMS

UP	unknown precipitation
UTC	Coordinated Universal Time
V	variable
VC	in the vicinity
VIS	visibility
VRB	variable
VV	vertical visibility
W	west
WMO	World Meteorological Organization
WND	wind
WSHFT	wind shift
Z	zulu, i.e., Coordinated Universal Time

Summit Station Visibility Chart

All Distances Calculated from the Big House

Landmark	Statute Miles	Meters
Green House	1/16	0100
SOB	1/8	0200
MSF	3/16	0300
Swiss Tower	1/4	0400
TAWO		0700
East Vis Marker #1	1/2	0800
North Vis Marker #1	1	1600
East Vis Marker #2	1	1600
North Vis Marker #2	2	3200
North & East Vis Marker #3	3	4800
Unrestricted	7+	9999

Observing Weather Summit Station, Greenland

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Resources:

Federal Meteorological Handbook No. 1, Surface Weather Observations and Reports (FCM-H1-2005)

SOP # PFS424 - Weather Observations and Reporting, Operational

Air Force Pamphlet 11-238, Aircrew Quick Reference to the METAR and TAF Codes

Revised Field Observer Training.ppt, Mike Carmody, 2016