

Air Force Pamphlet 11-238
1 November 2000
Flying Operations

Aircrew

Quick Reference

to the

METAR/TAF Codes

Department of the Air Force

Introduction

The Aircrew Quick Reference Guide to the METAR/TAF code is a color-coded pamphlet, designed specifically for aircrews, to assist with the quick reference and interpretation of the METAR/TAF codes into plain language. Key groups and solutions are highlighted to ease data identification.

Differences between military and civilian renderings of the code will be discussed when and where appropriate. Further, many groups within the code are intended for use within the weather-community and not relevant for flight planning. These groups have been omitted.

In addition, we recommend that if the user has any additional weather-related questions, contact a certified US military forecaster or MAJCOM-approved weather source for clarification. Always be sure to completely check the METAR/TAF codes for all hazards to flying safety, to include thunderstorms, icing, turbulence, wind shear and any elements that may specifically affect your aircraft type.

Weather briefing requirements for USAF Aircrews are listed below as stated in AFI 11-202, Vol 3:

“PICs will obtain sufficient weather information to safely conduct their flight and comply with this instruction. When necessary, record the appropriate weather information on a DD Form 175-1, **Flight Weather Briefing**. The following weather sources are authorized:

- US Military Weather Services.
- MAJCOM-approved weather sources listed in the MAJCOM/MAJCOM MDS specific supplement to this instruction.

Alternate Method. If there are no possible means of obtaining weather from the above sources, pilots may fly in Visual Meteorological Conditions (VMC) to a point where contact can be established with an authorized weather source.”

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Report Type

What kind of report is this?

METAR KBLV 011657Z AUTO/COR 25015G30KT 210V290
3/8 SM R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

SPECI KBLV 011715Z 25015G30KT 210V290 3 SM BKN 015
01/M01 A2984 RMK SLP034

METAR (Aviation Routine Weather Report) refers to a scheduled observation taken between 55-59 minutes past the hour (also referred to as a routine *hourly* observation).

SPECI (Special Report) refers to an unscheduled observation that met a predefined criteria (such as a change from VFR to IFR) and may be taken at any time within the hour.

Location

How do I determine the location?

METAR **KBLV** 011657Z AUTO/COR 25015G30KT 210V290
3/8 SM R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

The 4-character ICAO identifier that follows the report type is the location identifier; **KBLV** (Scott AFB) is the location/station.

METAR

Date/Time

How do I determine the **date** and **time of issuance**?

METAR KBLV **011657Z** AUTO/COR 25015G30KT 210V290 3/8 SM R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

The 7-character group following the identifier is the date and time of issuance.

The first two digits are the date; the last four digits are the time (UTC).

In this example, **01** is the date of the month, **1657** is the time of issuance, "**Z**" is the UTC designator.

METAR

AUTO/COR

What does **Auto** and/or **Cor** mean, if included?

METAR KBLV 011657Z **AUTO/COR** 25015G30KT 210V290 3/8 SM R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

Let's look at the meanings of AUTO and COR separately.

METAR KSTL 011657Z **AUTO** 25015G30KT 210V290 3/8 SM R32L/1000FT FG BKN 005 01/M01 A2984 RMK **AO2** SLP034

AUTO refers to an observation taken by a machine called an **Automated Surface Observation System (ASOS)**. Only observations transmitted from an unattended ASOS site will contain this designation. AO2 denotes an ASOS with a precipitation (rain vs. snow) discriminator. AO1 denotes an ASOS without the precipitation discriminator.

METAR KBLV 011657Z **COR** 25015G30KT 210V290 3/8 SM R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

COR refers to a corrected observation. Disregard the previous transmission. Not every observation will have this designation.

METAR

Wind

How do I determine the wind speed and direction?

METAR KBLV 011657Z AUTO/COR **25015G30KT** 210V290 3/8 SM
R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

The data group followed by KT (knots) is the wind.

The first three digits will be the true direction to the nearest 10 degrees. The next two digits will be the speed. If gusts are present, the next two or three digits following the “G” will be the gust or peak wind speed.

In this example, the **25015G30KT** group is the wind direction and speed. Therefore, **250 degrees** is the direction (true), **15** kts is the sustained wind speed and **30** kts is the gust.

METAR

Wind Variability

How do I determine if the wind is varying between directions?

METAR KBLV 011657Z AUTO/COR 25015G30KT **210V290** 3/8
SM R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

A wind variability group will be reported, if the wind is variable by 60 degrees and the speed is greater than 6 knots. This remark will contain the extremes of the wind directions, separated by “V.”

In this example, **210** and **290** are the two directional limits.

Not every observation will contain this group. If there is no wind variation remark, move on to the next group.

METAR

Visibility

How do I determine the prevailing visibility?

METAR KBLV 011657Z AUTO/COR 25015G30KT 210V290 **3/8 SM**
R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

In this example, **3/8 SM (statute miles)** is the prevailing visibility. Prevailing visibility is the greatest horizontal visibility observed throughout at least half the horizon circle, and is not necessarily continuous. Sector visibility will be reported in the remarks section, if it differs from the prevailing and is less than 3 miles (see Remarks Tablet for sector visibility format).

At overseas locations, visibility is reported in meters vs. statute miles. The largest reportable metric value is 9999. This value represents a visibility greater than 9000 meters (7 statute miles or greater).

METAR

Runway Visual Range “R”

What if there is a group that begins with the letter “R”?

METAR KBLV 011657Z AUTO/COR 25015G30KT 210V290 3/8
SM **R32L/1000FT** FG BKN 005 01/M01 A2984 RMK SLP034

Runway Visual Range follows the visibility and begins with the letter “R.” The runway heading will follow the “R,” and in this example, “**32L**” represents runway 32-Left (C-Center, R-Right). The last four digits report the visibility in feet.

In this example, the RVR reads “runway visual range for 32 Left is 1,000 ft.”

At overseas locations, visibility is reported in meters. The same RVR at an overseas location would read R32L/0300 or “runway visual range for 32 Left is 300 meters.

How would I decode the formats **M0600FT** or **P6000FT** or **R06L2000V4000FT** (not in example)?

M0600FT

Reads “RVR is less than 600 feet.”
(M=less than)

P6000FT

Reads “RVR is greater than 6,000 feet.” (P = greater than)

R06L2000V4000FT

Indicates variable, if the RVR is variable between two thresholds. “R06L/2000V4000FT” is read as “RVR for 6 Left is variable between 2,000 and 4,000 feet.”

Weather/Obscuration Conversion Table

Description of Phenomenon		Types of Weather Phenomenon		
Step 1: Intensity (preceding group)	Step 3: Description	Step 4: Precipitation	Step 5: Obscuration to Visibility	
Light -	MI: Shower	DZ: Drizzle	BR: Mist (vsby>=5/8 mile)	PO: Well-developed -
Moderate () or No sign	PR: Partial (covering only part of the sky)	RA: Rain	FG: Fog (vsby < 5/8 mile)	dust/sand whirls
Heavy (+)	BC: Patches	SN: Snow	FU: Smoke	SQ: Squalls
Note: + can also mean "a well-developed dust/sand storm, whirf, dust devil (unless waterspout)"	DR: Low Drifting	SG: Snow Grains	VA: Volcanic Ash	FC: Funnel cloud (s)
	BL: Blowing	IC: Ice Crystals	DU: Dust	ex: Tornado or Waterspout
	SH: Showers	PL: Ice Pellets	SA: Sand	SS: Sandstorm
	TS: Thunderstorm	GR: Hail (s=5 mm or 25")	HZ: Haze	DS: Dust storm
Step 2: Proximity	FZ: Freezing	GS: Small Hail (<5 mm or 25")	PY: Spray	
In the Vicinity VC		UP: Unknown Precipitation (ASOS only)		
On station () OR No designation				

METAR Type of Weather

How do I determine if there is any weather?

METAR KBLV 011657Z AUTO/COR 25015G30KT 210V290 3/8 SM R32L/1000FT **FG** BKN 005 01/M01 A2984 RMK SLP034

If there is any precipitation or obstruction to visibility, it will be found in the group of data following the visibility. The absence of weather or an obscuration group indicates that neither phenomenon is occurring at the time of the observation. In this example, "FG" represents "Fog."

To methodically define a weather group, look for six key elements (depending on the phenomena, one or more may be omitted). In order, these are intensity (symbol preceding the code), proximity, descriptor, precipitation description, obscuration (other than precipitation), and other.

Refer to figure 1 for the Weather/Obscuration Conversion Table.

Examples: TERRA -thunderstorm, moderate rain +SN -heavy snow +SHRASNPL -heavy, light showers, snow, ice pellets	-RFG -light rain, fog BR: HZ -mist, haze (vsby=5/8 mile) FZDZ -freezing drizzle	BLPY -blowing spray BCFG -patchy fog FZDZ -freezing drizzle	VCSH -showers in the vicinity +DRSN -heavy snow, drifting	BLPY -blowing spray BCFG -patchy fog
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METAR

Clouds

How do I determine the layers of clouds?

METAR KBLV 011657Z AUTO/COR 25015G30KT 210V290
3/8 SM R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

Cloud height is always reported in hundreds of feet AGL. Add two zeros to the value given.

In this example, **005** represents the value “500” feet AGL.

Sky coverage (eighths):

- SKC Sky clear
 - FEW $\leq 0-2$
 - SCT 3-4
 - * BKN 5-7
 - * OVC 8
 - TCU Towering Cumulus present
 - CB Cumulonimbus/thunderstorm present
 - VV Vertical Visibility (indefinite ceiling)
- * Constitutes a “ceiling”

METAR

Temperature/Dew Point

How do I determine the current temperature and dew point?

METAR KBLV 011657Z AUTO/COR 25015G30KT 210V290 3/8
SM R32L/1000FT FG BKN 005 **01/M01** A2984 RMK SLP034

The group following the sky condition will be the temperature and dew point information in degrees Celsius.

In this example, the first two digits **01** are the temperature in degrees Celsius. The second two digits or **M01 or -1C** are the dew point in degrees Celsius. An “M” in the temperature field means “minus” or below zero.

METAR

Altimeter Setting

How do I determine the current altimeter setting?

METAR KBLV 011657Z AUTO/COR 25015G30KT 210V290
3/8 SM R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

The 5-character group beginning with the “A,” following the temperature/dew point group, is the altimeter setting in inches and hundredths of an inch of mercury in the United States.

In this example, A2984 represents 29.84 inches of mercury.

METAR

Remarks

What is RMK?

METAR KBLV 011657Z AUTO/COR 25015G30KT 210V290
3/8 SM R32L/1000FT FG BKN 005 01/M01 A2984 RMK SLP034

RMK refers to the Remarks section.

Remarks may be encoded or in plain language and will contain any supplementary data.

In this example, the remark SLP is the sea level pressure in millibars (hectopascals) to the nearest tenth. To decode, place a “10” or “9” before the group and a decimal before the last digit (use a 9 if the 3 digit value is 999 or less). The group in the above example would read “1003.4 millibars.”

Caution: Do not confuse the METAR “5- and 6-groups” with the TAF “5 group” (turbulence) and the TAF “6-group!” (icing). In contrast to TAF code usage, METAR utilizes the “5-” group to report the 3 hourly pressure tendency. The METAR “6-” group is used to report the “3 and 6 hourly precipitation amounts,” respectively. Decoding pressure tendency and precipitation amounts is beyond the scope of this pamphlet and will not be covered here. See pages 26 and 27 for more info on decoding icing and turbulence forecasts.

For a detailed listing of possible METAR Remarks, refer to page 17.

Code:	Decode as:	Definition:
SLP15	1007.5	Sea level pressure in millibars
AP1	An unmetalled apron that can not distinguish between rain, snow, etc.	Automated Observation without precipitation discriminator (metaraws)
AH2	An unmetalled apron that can distinguish between rain, snow, etc.	Automated Observation with precipitation discriminator
WSHFT45	Wind SHFT of 45 minutes past the hour	Wind Shift
FRDPA	Air to FROntal PASSage	Frontal Passage
PK WND 240451855	Peak wind 240 at 45 knots occurred at 185Z	Peak wind remark
PK WND 2403018	Peak Wind 340 at 30 knots occurred at 18 minutes past the hour	Peak wind remark
RVNO	RVR NOT reported	RVR remark
RABO1815N2825E5	Rain Began 08 min past hour/Ended at 30 min past hour, Snow Began at 26 min past the hour, Ended at 56 min past hour	Began/End remark
RABO1815N2825E5	Rain and Snow Began at 20 min past hour and Ended at 56 min past the hour	Begin/End remark
TSBGES3	Thunderstorm Began at 08 min past hour and Ended at 28 min past the hour	Thunderstorm remark
PRESRRPRESFR	Pressure Rising Rapidly/PRESure Falling Rapidly	Pressure change remark
REC	Runway Surface Condition	Runway condition as determined by the field or operations manager
RCRF1	Runway Condition Reading valued 0 to 25 - The highest values are optimum	Runway Condition Reading
LSR	Light Snow on runway	Self Explanatory
PSR	Packed Snow on Runway	Self Explanatory
IF	Ice on Runway	Self Explanatory
RC-NR	RCR NOT Reported or base operations closed	Self Explanatory
OCNL	OCCASIONAL (less than 1 flash/minute)	Frequency of Lightning
FRQ	FREQUENT (about 1 to 4 flashes/minute)	Frequency of Lightning
CONS	CONTINUOUS (more than 4 flashes/minute)	Frequency of Lightning
CG	Cloud to Ground	Type of Lightning
IC	In Cloud	Type of Lightning
CC	Cloud to Cloud	Type of Lightning
CA	Cloud to Air	Type of Lightning
CA W MOV E	Cumulonimbus West Moving East	Type of Lightning
CBMAM DBNT S	Cumulonimbus MAMMatus DownBNT South	Significant clouds
TGU DND	Towering Cumulus Downward	Significant clouds
TGU W	Towering Cumulus West	Significant clouds
ACC W	AltoCumulus Castellatus West	Significant clouds
ACC SW-S	AltoCumulus Castellatus Lowlevel - South/West through south	Significant clouds
CCSL CTR MTE	Cirrocumulus Standing Lenticular OVER the Mountain. Blat	Significant clouds
VRGA	Virga at the station	Significant clouds
VRGA SW	Virga southwest	Significant clouds
VRGA DBNT NE	Virga downburst northeast	Significant clouds
TKR VIS 1	TKR Visibility 1 mile	precipitation observed but not reaching ground
BFC VIS 2 1/2	BFC Visibility 2.5/2 miles	precipitation observed but not reaching ground
M2 RT 11	Visibility Reported at Runway end, one	tower visibility (reported if greater than surface)
M2 RT 2	Visibility Reported at Runway end, two	tower visibility (reported if greater than surface)
M2 RT 2	Visibility to the North 2 miles	surface visibility (reported if greater than tower)
WR	Wet Runway	Surface condition

TAF Report Type

What type of report is this?

TAF

KBLV 051212 14005KT 8000 BR FEW030 QNH2960INS
 WS010/18040KT
 BECMG 1314 16010KT 3200 -RASH OVC020 QNH2959INS
 TEMPO 1416 VRB15G30KT 1600 TSRA BKN008CB OVC020
 BECMG 1617 29008KT 3200 -RA OVC030 620304 QNH2958INS
 BECMG 1819 31012G22KT 9999 NSW SCT040 520004 QNH2952INS
 BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z

TAF

KBLV AMD 051812 VRB15G30KT 0800 TSRA BKN008CB OVC020
 BECMG 1819 29008KT 1600 -RA OVC030 620304 QNH2958INS VCTS
 BECMG 1920 31012G22KT 9999 NSW SCT040 520004 QNH2952INS
 BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z
AMD 051820.

TAF

KBLV AMD COR 051912 VRB15G30KT 0800 TSRA BKN005CB
 OVC020
 BECMG 1819 29008KT 1600 -RA OVC030 620304 QNH2958INS VCTS
 BECMG 1920 31012G22KT 9999 NSW SCT040 520004 QNH2952INS
 BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z
COR 051925.

TAF (Terminal Area Forecast) is a definitive forecast at an airport for a specific period (usually 24 hours).

TAF AMD (Amended Terminal Forecast) is issued because the previous version is no longer representative of the current or expected weather specific period (usually 24 hours). The amended TAF supersedes the previous TAF. In the above example, the forecast was **amended on the 5th of the month at 1820Z**. Always refer to the amendment date/time group at the end of the TAF to distinguish the most current forecast.

TAF COR (Corrected Terminal Forecast) is a TAF that has been corrected. When a corrected TAF is issued, disregard previous TAFs. In the above example, the amended forecast was corrected **on the 5th of the month at 1925Z**. Always refer to the correction date/time group at the end of the TAF for the most current forecast.

TAF

Location

How do I determine the **location**?

TAF
KBLV 051212 14005KT 8000 BR FEW030 QNH2960INS
WS010/18040KT
BECMG 1314 16010KT 3200 -RASH OVC020 QNH2959INS
TEMPO 1416 VRB15G30KT 1600 TSRA BKN008CB OVC020
BECMG 1617 29008KT 3200 -RA OVC030 620304 QNH2958INS
BECMG 1819 31012G22KT 9999 NSW SCT040 520004
QNH2952INS
BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z

The 4-character ICAO identifier that follows the report type is the location identifier. **KBLV** (Scott AFB, IL) is the location/station.

TAF

Date/Time

How do I determine the **date** and valid times of the forecast?

TAF
KBLV **050606** 14005KT 8000 BR FEW030 QNH2960INS
WS010/18040KT
BECMG 1314 16010KT 3200 -RASH OVC020 QNH2959INS
TEMPO 1416 VRB15G30KT 1600 TSRA BKN008CB OVC020
BECMG 1617 29008KT 3200 -RA OVC030 620304 QNH2958INS
BECMG 1819 31012G22KT 9999 NSW SCT040 520004
QNH2952INS
BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z

In a military TAF, the group following the ICAO identifier will be the valid times of the forecast. Preparation date and time is omitted. In this KBLV example, **the forecast valid times are from 5/06Z to 6/06Z.**

TAF
KSTL **051130Z 051212** 14008KT 5SM BR BKN030 WS010/18025KT
TEMPO 1316 1 1/2 SM BR FM 1600 16010KT P6SM NSW SKC
BECMG 2224 20013G20KT 4SM SHRA OVC020 PROB40 0006 2SM
TSRA OVC008CB BECMG 0608 21015KT P6SM NSW SCT040

Civilian forecasters encode the date/time group differently from military forecasters. In a civilian TAF, the next two groupings following the ICAO identifier are the date and time the **forecast was prepared** and the **valid times of the forecast**. The first group will be the date and time that the forecast was prepared. The second group will be the date and the beginning/ending hours that the forecast is valid. In the KSTL example, **05** is the date of the month and **1130Z** is the time of **issuance**. **The forecast valid times are from 5/12Z to 6/12Z.**

TAF Time and Type of Change Expected

How do I determine the **time and type of changes** that will occur?

TAF
KSTL 051130Z 051212 14008KT 5SM BR BKN030 WS010/18025KT
TEMPO 1316 1 1/2 SM BR **FM 1600** 16010KT P6SM NSW SKC
BECMG 2224 20013G20 KT 4SM SHRA OVC020 **PROB40 0006**
2SM TSRA OVC008CB **BECMG 0608** 21015KT P6SM NSW
SCT040

The time and type of change expected is encoded by civilian and military forecasters alike with **TEMPO**, **FM** and **BECMG** groups.

TEMPO represents a **temporary condition**. In this example, **TEMPO 1316** 1 1/2 SM BR is read “Temporary condition between 13Z and 16Z of 1 1/2 statute mile visibility in mist.” Only the temporary changing conditions are included in TEMPO groups.

FM represents “**from**” and will indicate the beginning of a new line in a TAF report and a rapid change, and all conditions in the previous line are superseded. In this example, “FM 1600 is read “From 16Z...”

BECMG represents “**becoming**” or a “gradual change” in meteorological conditions and becomes the predominant group by the end time listed. In this example, **BECMG 2224** is read as “Becoming from 22Z to 24Z.”

PROB40 (civilian use only) represents a **40%** probability or chance of conditions occurring along with associated weather conditions (wind, visibility, sky conditions).

In this example, **PROB40 0006** 2SM TSRA 0VCOO8CB is read “40% chance between 00Z and 06Z of 800 overcast cumulus nimbus clouds, visibility 2 statute miles in moderate thunderstorms.”

TAF Winds

How do I determine the **wind speed and direction**?

TAF
KBLV 051212 **14005KT** 8000 BR FEW030 QNH2960INS
WS010/18040KT
BECMG 1314 **16010KT** 3200 -RASH OVC020 QNH2959INS
TEMPO 1416 **VRB15G30KT** 1600 TSRA BKN008CB OVC020
BECMG 1617 **29008KT** 3200 -RA OVC030 620304 QNH2958INS
BECMG 1819 **31012G22KT** 9999 NSW SCT040 520004
QNH2952INS
BECMG 2021 **30008KT** 9999 SKC QNH2950INS TM01/11Z 08/18Z

The group after the valid time and followed by KT (knots) is the forecast wind speeds.

The first three digits within the groups will be the true direction to the nearest 10 degrees. The last two digits will be the sustained speed. If gusts are present, the next two or three digits following the “G” will be the peak wind speed.

In this example, **14005KT**, **16010KT**, **VRB15G30KT**, **29008KT**, **31012G22KT** and **30008KT** are the **wind direction and speed** groups.

Therefore, in the first group, **140** degrees (true) is the direction, **05** knots is the sustained wind speed.

TAF

Visibility

How do I determine the forecast visibility?

TAF
KBLV 051212 14005KT **8000** BR FEW030 QNH2960INS
WS010/18040KT
BECMG 1314 16010KT **3200** -RASH OVC020 QNH2959INS
TEMPO 1416 VRB15G30KT **1600** TSRA BKN008CB OVC020
BECMG 1617 29008KT **3200** -RA OVC030 620304 QNH2958INS
BECMG 1819 31012G22KT **9999** NSW SCT040 520004
QNH2952INS
BECMG 2021 30008KT **9999** SKC QNH2950INS TM01/11Z 08/18Z

TAF
KSTL 051130Z 051212 14008KT **5SM** BR BKN030 WS010/18025KT
TEMPO 1316 **1 1/2 SM** BR FM 1600 16010KT **P6SM** NSW SKC
BECMG 2224 20013G20 KT **4SM** SHRA OVC020 PROB40 0006
2SM TSRA OVC008CB BECOMG 0608 21015KT **P6SM** NSW
SCT040

CONUS civilian forecasters encode visibilities in statute miles. In CONUS, civilian TAFS forecast visibility in statute miles. The group following the winds and ending with “SM” (statute miles) will be the visibility. In the KSTL example, **5SM, 1-1/2SM, P6SM, 4SM, 2SM and P6SM** are the forecast visibilities in statute miles.

In the military and overseas locations, visibilities are forecast in meters. The 4-character group following the winds will be the forecast visibility.

In the KBLV example, **8000, 3200, 1600, 3200** and **9999** are the forecast visibilities in meters. 9999 is the greatest value forecasted. A value of 9999 indicates a forecast visibility of greater than 9000 meters (7 statute miles or greater).

Overseas locations may use the contraction “**CAVOK**” (ceiling and visibility OK). This will be used if there is no significant weather, the visibility is 10 km or greater and the ceilings are greater than 5,000 ft.

TAF

Precipitation

How do I determine if there is any forecast weather?

TAF
KBLV 051212 14005KT 8000 **BR** FEW030 QNH2960INS
WS010/18040KT
BECMG 1314 16010KT 3200 **-RASH** OVC020 QNH2959INS
TEMPO 1416 VRB15G30KT 1600 **TSRA** BKN008CB OVC020
BECMG 1617 29008KT 3200 **-RA** OVC030 620304 QNH2958INS
BECMG 1819 31012G22KT 9999 **NSW** SCT040 520004
QNH2952INS
BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z

Forecast precipitation or obstruction to visibility is found in the group of data following the visibility.

NSW (no significant weather) is used to indicate that the weather or obscuration listed in the previous group is no longer expected to occur. Absence of a weather or obscuration group indicates that no weather or obscuration is expected during the forecast period.

In the first group of this example, “**BR**,” represents “**Mist**.”

To methodically define a weather group, look for six key elements (depending on the phenomena, one or more may be omitted.) In order, these are intensity (symbol preceding the code), proximity, descriptor, precipitation description, obscuration (other than precipitation) and other.

Refer to page 12 for the Weather/Obscuration Conversion Table.

TAF

Clouds

How do I determine the layers of **forecast clouds**?

TAF
KBLV 051212 14005KT 8000 BR **FEW030** QNH2960INS
WS010/18040KT
BECMG 1314 16010KT 3200 -RASH **OVC020** QNH2959INS
TEMPO 1416 VRB15G30KT 1600 TSRA **BKN008CB OVC020**
BECMG 1617 29008KT 3200 -RA **OVC030** 620304 QNH2958INS
BECMG 1819 31012G22KT 9999 NSW **SCT040** 520004
QNH2952INS
BECMG 2021 30008KT 9999 **SKC** QNH2950INS TM01/11Z 08/18Z

Cloud height is always forecast in hundreds of feet. Add two zeros to the value given. In this example, **FEW030, OVC020, BKN008CB, OVC020, OVC030, SCT040 and SKC** represent the values 3,000 few, 2,000 overcast and 800broken, cumulus nimbus clouds, 2,000 overcast, 3,000 overcast, 4,000 scattered and sky clear, respectively.

Sky coverage (eighths):

- SKC Sky clear
- FEW ≤ 0-2
- SCT 3-4
- * BKN 5-7
- * OVC 8
- TCU Towering Cumulus present
- CB Cumulonimbus/thunderstorm present
- VV Vertical Visibility (indefinite ceiling)

* Constitutes a “ceiling”

TAF

Icing

How do I determine forecast **icing conditions**?

TAF
KBLV 051212 14005KT 8000 BR FEW030 QNH2960INS
WS010/18040KT
BECMG 1314 16010KT 3200 -RASH OVC020 QNH2959INS
TEMPO 1416 VRB15G30KT 1600 TSRA BKN008CB OVC020
BECMG 1617 29008KT 3200 -RA OVC030 **620304** QNH2958INS
BECMG 1819 31012G22KT 9999 NSW SCT040 520004
QNH2952INS
BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z

If forecast, the icing forecast will be prefixed by the number 6, and follows the cloud group. To decode, follow the instructions below:

1. Look for the icing designator “6” that follows the cloud group (6 2 0 3 0 4).
2. The next digit will determine the icing type and intensity (6 2 0 3 0 4).
3. The next three digits will determine the base of the icing layer in hundreds of feet (6 2 0 3 0 4).
4. The next digit will determine the thickness in thousands of feet (6 2 0 3 0 4), so add this value to the base height to determine the top limit of the icing conditions. Therefore, in the above example, the icing forecast will read light rime icing (in cloud) from 3,000 to 7,000 feet.

ICING INTENSITY	
CODE	DECODE
0	Trace or none (see note)
1	Light icing (light mixed)
2	Light icing in cloud (light rime)
3	Light icing in precipitation (light clear)
4	Moderate icing in cloud (moderate rime)
5	Moderate icing in precipitation (moderate clear)
6	Severe icing (severe mixed)
7	Severe icing in cloud (severe rime)
8	Severe icing in precipitation (severe clear)

Note: WMO code “0” is no icing

Figure 3.

Air Force Weather units will use “0” to indicate a trace of icing

TAF

Turbulence

How do I determine forecast turbulence conditions?

TAF

KBLV 051212 14005KT 8000 BR FEW030 QNH2960INS
WS010/18040KT
BECMG 1314 16010KT 3200 -RASH OVC020 QNH2959INS
TEMPO 1416 VRB15G30KT 1600 TSRA BKN008CB OVC020
BECMG 1617 29008KT 3200 -RA OVC030 620304 QNH2958INS
BECMG 1819 31012G22KT 9999 NSW SCT040 520004 QNH2952INS
BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z

If forecast, the turbulence forecast will be prefixed by the number 5, and will follow the cloud or icing group. To decode, follow the instructions below:

1. Look for the turbulence designator "5" that follows the cloud or icing group (5 2 0 0 0 4).
2. The next digit will determine the intensity (5 2 0 0 0 4). See figure 4.
3. The next three digits will determine the base limit of the turbulence layer in hundreds of feet (5 2 0 0 0 4).
4. The last digit will determine the thickness in thousands of feet (5 2 0 0 0 4), so add this value to the base height to determine the top limit of the turbulence conditions.

In the above example, the turbulence forecast will read light occasional moderate turbulence in clear air from surface to 4,000 feet.

TURBULENCE INTENSITY	
CODE	DECODE
0	Trace
1	Light turbulence
2	Light occasional moderate turbulence in clear air
3	Moderate turbulence in clear air
4	Light occasional moderate in cloud
5	Moderate turbulence in cloud
6	Light occasional severe turbulence in clear air
7	Severe turbulence in clear air
8	Light occasional severe turbulence in cloud
9	Severe turbulence in cloud

- Notes: 1. Air Force weather units will encode extreme turbulence by use of Code 6,7,8,9, and adding "EXTRM TURB in REMARKS
2. Occasional is defined as occurring less than 1/3 of the time

Figure 4.

TAF

Minimum Altimeter Setting

How do I determine the forecast lowest altimeter setting?

TAF

KBLV 051212 14005KT 8000 BR FEW030 QNH2960INS
WS010/18040KT
BECMG 1314 16010KT 3200 -RASH OVC020 QNH2959INS
TEMPO 1416 VRB15G30KT 1600 TSRA BKN008CB OVC020
BECMG 1617 29008KT 3200 -RA OVC030 620304 QNH2958INS
BECMG 1819 31012G22KT 9999 NSW SCT040 520004
QNH2952INS
BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z

Forecast minimum altimeter settings are only found in military forecasts. These are near the end of the line beginning with QNH (minimum) and ending with INS (inches).

In this example, QNH2960INS, QNH2959INS, QNH2958INS, QNH2952INS and QNH2950INS are read as minimum altimeter setting of 29.60, 29.59, 29.58, 29.52 and 29.50 inches of mercury, respectively.

TAF

Wind Shear

How do I determine if **wind shear** is in the forecast?

TAF
KBLV 051212 14005KT 8000 BR FEW030 QNH2960INS
WS010/18040KT
BECMG 1314 16010KT 3200 -RASH OVC020 QNH2959INS
TEMPO 1416 VRB15G30KT 1600 TSRA BKN008CB OVC020
BECMG 1617 29008KT 3200 -RA OVC030 620304 QNH2958INS
BECMG 1819 31012G22KT 9999 NSW SCT040 520004
QNH2952INS
BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z

A **wind shear** group is included if non-convective low level winds (up to 2,000 feet) will change in speed and/or direction and result in a tearing or shearing action. Wind shear is encoded with the contraction, **WS**, followed by a 3-digit height, slant character ”/,” and winds at the height indicated.

In this example, **010** (1,000 feet) is the height above the ground, **180** degrees is the direction (true) and **040KT** is the wind speed.

The remark WSCONDS is used to indicate the potential for wind shear when there is not enough information available to reliably predict the exact height, direction and speed of the wind shear. WSCONDS is normally used beyond the first 6 hours of the TAF.

TAF

Temperatures

How do I determine the forecast **temperatures**?

TAF
KBLV 051212 14005KT 8000 BR FEW030 QNH2960INS
WS010/18040KT
BECMG 1314 16010KT 3200 -RASH OVC020 QNH2959INS
TEMPO 1416 VRB15G30KT 1600 TSRA BKN008CB OVC020
BECMG 1617 29008KT 3200 -RA OVC030 620304 QNH2958INS
BECMG 1819 31012G22KT 9999 NSW SCT040 520004
QNH2952INS
BECMG 2021 30008KT 9999 SKC QNH2950INS **TM01/11Z 08/18Z**

Forecast temperatures for the forecast period are routinely found only in military TAFs. They are found on the last line, following the minimum altimeter and begin with the designator “T.”

In this example, the minimum temperature is **minus 1** or **-1 °C** and will occur at **11Z**. The maximum temperature is **8°C** and will occur at **18Z**.

MARVIN R. ESMOND, Lt General, USAF
DCS/Air and Space Operations

Attachment 1

Fahrenheit to Celsius											
°F		°C	°F		°C	°F		°C	°F		°C
From	To		From	to		From	To		From	To	
128.3	130.0	54	83.3	85.0	29	38.3	40.0	04	-4.8	-3.1	M20
126.5	128.2	53	81.5	83.2	28	36.3	38.2	03	-6.6	-4.9	M21
124.7	126.4	52	79.7	81.4	27	34.7	36.2	02	-8.4	-6.7	M22
122.9	124.6	51	77.9	79.6	26	32.9	34.6	01	-10.2	-8.5	M23
121.1	122.8	50	76.1	77.8	25	32.0	32.8	00	-12.0	-10.3	M24
119.3	121.0	49	74.3	76.0	24	31.2	31.9	M00	-13.8	-12.1	M25
117.5	119.2	48	72.5	74.2	23	29.4	31.1	M01	-15.6	-13.9	M26
115.7	117.4	47	70.7	72.4	22	27.6	29.3	M02	-17.4	-15.7	M27
113.9	115.6	46	68.9	70.6	21	25.8	27.5	M03	-19.2	-17.5	M28
112.1	113.8	45	67.1	68.8	20	24.0	25.7	M04	-21.0	-19.3	M29
110.3	112.0	44	65.3	67.0	19	22.2	23.9	M05	-22.8	-21.1	M30
108.5	110.2	43	63.5	65.2	18	20.4	22.1	M06	-24.6	-22.9	M31
106.7	108.4	42	61.7	63.4	17	18.6	20.3	M07	-26.4	-24.7	M32
104.9	106.6	41	59.9	61.6	16	16.8	18.5	M08	-28.2	-26.5	M33
103.1	104.8	40	58.1	59.8	15	15.0	16.7	M09	-30.0	-28.3	M34
101.3	103.0	39	56.3	58.0	14	13.2	14.9	M10	-31.8	-30.1	M35
99.5	101.2	38	54.5	56.2	13	11.4	13.1	M11	-33.6	-31.9	M36
97.7	99.4	37	52.7	54.4	12	9.6	11.3	M12	-35.4	-33.7	M37
95.9	97.6	36	50.9	52.6	11	7.8	9.5	M13	-37.2	-35.5	M38
94.1	95.8	35	49.1	50.8	10	6.0	7.7	M14	-39.0	-37.3	M39
92.3	94.0	34	47.3	49.0	09	4.2	5.9	M15	-40.8	-39.1	M40
90.5	92.2	33	45.5	47.2	08	2.4	4.1	M16	-42.6	-40.9	M41
88.7	90.4	32	43.7	45.4	07	0.6	2.3	M17	-44.4	-42.7	M42
86.9	88.6	31	41.9	43.6	06	-1.2	+0.5	M18	-46.2	-44.5	M43
85.1	86.8	30	40.1	41.8	05	-3.0	-1.3	M19	-48.0	-46.5	M44

Attachment 2

Statute Miles to Meters					
STATUTE MILES	METERS	STATUTE MILES	METERS	STATUTE MILES	METERS
0	0000	1-1/2	2400	3	4800
1/16	0100	-	2500	-	4900
1/8	0200	1-5/8	2600	-	5000
3/16	0300	-	2700	4	6000
¼	0400	1-3/4	2800	-	7000
5/16	0500	-	2900	5	8000
3/8	0600	1-7/8	3000	6	9000
-	0700	-	3100	7	9999
½	0800	2	3200	8	9999
-	0900	-	3300	9	9999
5/8	1000	-	3400	10	9999
-	1100	-	3500	11	9999
¾	1200	2-1/4	3600	12	9999
-	1300	-	3700	13	9999
7/8	1400	-	3800	14	9999
-	1500	-	3900	15	9999
1	1600	2-1/2	4000	20	9999
-	1700	-	4100	25	9999
1-1/8	1800	-	4200		
-	1900	-	4300		
1-1/4	2000	2-3/4	4400		
-	2100	-	4500		
1-3/8	2200	-	4600		
-	2300	-	4700		

(..etc, continue in 5 mile increments)

Attachment 3

Millibars to Inches										
	0	1	2	3	4	5	6	7	8	9
Millibars	Inches									
940	27.76	27.79	27.82	27.84	27.88	27.91	27.94	27.96	27.99	28.02
950	28.05	28.08	28.11	28.14	28.17	28.20	28.23	28.26	28.29	28.32
960	28.35	28.38	28.41	28.44	28.47	28.50	28.53	28.56	28.59	28.61
970	28.64	28.67	28.70	28.73	28.76	28.79	28.82	28.85	28.88	28.91
980	28.94	28.97	29.00	29.03	29.06	29.09	29.12	29.15	29.18	29.21
990	29.23	29.26	29.29	29.32	29.35	29.38	29.41	29.44	29.47	29.50
1000	29.53	29.56	29.59	29.62	29.65	29.68	29.71	29.74	29.77	29.80
1010	29.83	29.85	29.88	29.91	29.94	29.97	30.00	30.03	30.06	30.09
1020	31.12	30.15	30.18	30.21	30.24	30.27	30.30	30.33	30.36	30.39
1030	30.42	30.45	30.47	30.50	30.53	30.56	30.59	30.62	30.65	30.68
1040	30.71	30.74	30.77	30.80	30.83	30.86	30.89	30.92	30.95	30.98
1050	31.01	31.04	31.07	31.10	31.12	31.15	31.18	31.12	31.24	31.27

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