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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OPR: HQ AFFSA/XOFD (Maj Elizabeth A. Coates) **Pages: 33/Distribution X**

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."

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.

Weather/Obscuration Conversion Table

Description of Phenomenon	Types of Weather Phenomenon			
Step 1: Intensity (preceding group)	Step 3: Descriptor	Step 4: Precipitation	Step 5: Obscuration to Visibility	
Light -	MI Shallow	DZ Drizzle	BR Mist (vsby>=5/8 mile)	PO Well-developed - dust/sand whirls
Moderate ( ) or No sign	PR Partial (covering only part of the sky)	RA Rain	FG Fog (vsby<5/8 mile)	
Heavy (+)	BC Patches	SN Snow	FU Smoke	SQ Squalls
Note: + can also mean " a well-developed dust/sand storm, whirl, dust devil tornado waterspout	DR Low Drifting	SG Snow Grains	VA Volcanic Ash	FC Funnel cloud (s) ex. Tornado or Waterspout
	BL Blowing	IC Ice Crystals	DU Dust	
	SH Showers	PL Ice Pellets	SA Sand	SS Sandstorm
	TS Thunderstorm	GR Hail (>=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				

Examples:
TSRA -thunderstorm, moderate rain
+SN -heavy snow
+SHRASNPL -heavy rain showers, snow, ice pellets

-RAFG -light rain, fog
BR HZ -mist, haze (vis>=5/8 mi.)
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

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	≤ 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 milibars (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.

METAR Remarks Table

Code:	Decode as:	Definition:
SLP###	1001.5	Sea level pressure in millibars
A01	An automated station that can not distinguish between rain, snow, etc.	Automated Observation without precipitation discriminator (mm/snow)
A02	An automated station that can distinguish between rain, snow, etc.	Automated Observation with Precipitation discriminator
WSHFT45	Wind Shift at 45 minutes past the hour	Wind Shift
FROPA	due to FROntal PAssage	Frontal Passage
PK WND 28045/1955	Peak wind 280 at 45 knots occurred at 1955Z	Peak wind remark
PKWND 34036/36	Peak Wind 340 at 56 knots occurred at 36 minutes past the hour	Peak wind remark
RVRNO	RVR NOt reported	RVR remark
RAB06E16SNB21E55	Rain Began 06 min past hour, Ended at 16 min past hour, Snow Began at 21 min. past the hour, Ended at 55 min. past hour	Begin/End remark
RAB2005HB2055S	Rain and Snow Began at 20 min. past hour and Ended at 55 min past the hour	Precipitation Begin/End remark
TSB05E30	ThunderStorm Began at 05 min. past hour and Ended at 30 min. past the hour	Precipitation Begin/End remark
PRESRR/PRESFR	Pressure Rising Rapidly/PRESsure Falling Rapidly	Pressure change remark
RSC	Runway Surface Condition	Runway conditions as determined by the airfield or operations manager
RCR01	Runway Condition Reading value 0 to 25 - The highest values are optimum	Runway Condition Reading
LSR	Light Slush on runway	Self Explanatory
PSR	Packed Slush on Runway	Self Explanatory
IR	Ice on Runway	Self Explanatory
RCRNR	RCR NOT Reported or base operations closed	Self Explanatory
OCNL	OCcasioNaL (less than 1 flash/minute)	Frequency of Lightning
FRQ	FRequent (about 1 to 6 flashes/minute)	Frequency of Lightning
CONS	CONtiNuouS (more than 6 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
CB W MOV E	CumulonimBus West Moving East	Significant clouds
CBMAM DSNT S	CumulonimBus MAMatus DiStaNT South	Significant clouds
TCU OVD	Towering CUmulus OVerhead	Significant clouds
TCU W	Towering CUmulus West	Significant clouds
ACC W	AltoCumulus Castellanus West	Significant clouds
ACSL SW-S	AltoCumulus Standing Lenticular SouthWest through south	Significant clouds
CCSL OVR MT E	CirroCumulus Standing Lenticular OVeR the MounTain(s) East	Significant clouds
VIRGA	Virga at the station	Precipitation observed but not reaching ground
VIRGA SW	Virga southwest	Precipitation observed but not reaching ground
VIRGA DSNT NE	Virga distant northeast	Precipitation observed but not reaching ground
TWR VIS 1	ToWer Visibility 1 mile	Tower visibility (reported if greater than surface)
SFC VIS 2 1/2	SurFaCe Visibility 2-1/2 miles	Surface visibility (reported if greater than tower)
VIS 2 RY 11	VISibility 2 miles at Runway one-one	Second site sensor
VIS 1V2	VISibility Variable between 1 and 2 miles	Variable visibility
VIS N 2	VISibility to the North 2 miles	Sector Visibility
WR	Wet Runway	Self Explanatory

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

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

Figure 3.

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 **QNH2950IN**S 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	29.28	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