

# Technical Procedures Bulletin

**Subject:**  
**AVN-based MOS Guidance -  
The Alphanumeric Messages**

Series No. 463

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Science Division,

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This bulletin, written by J. Paul Dallavalle and Mary C. Erickson of the National Weather Service Techniques Development Laboratory, describes the format of the new Aviation (AVN) Model Output Statistic messages. The messages became operational during the 1200 UTC forecast cycle on May 30, 2000.

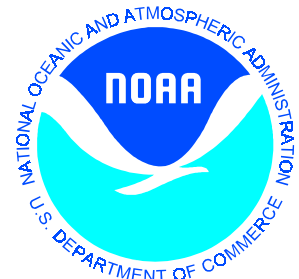
These messages contain forecasts of the:

- max/min temperature;
- time-specific surface temperature and dew point;
- total sky cover;
- surface wind direction and wind speed;
- probability of precipitation (PoP) for 6- and 12-h periods;
- probability of thunderstorms and conditional probability of severe thunderstorms for 6- and 12-h periods;
- conditional probability of precipitation type (freezing, snow, or liquid) and a corresponding category;
- categories of quantitative precipitation for 6- and 12-h periods;
- snowfall amount; and
- categories of ceiling height, visibility, and obstruction to vision.

Guidance is provided for projections of 6 to 72 hours for most weather elements.



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AVN-BASED MOS GUIDANCE - THE ALPHANUMERIC MESSAGES

by

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1. INTRODUCTION

This Technical Procedures Bulletin (TPB) describes the format and contents of the new AVN MOS messages. These messages contain forecasts of the max/min temperature; time-specific surface temperature and dew point; total sky cover; surface wind direction and wind speed; probability of precipitation (PoP) for 6- and 12-h periods; probability of thunderstorms and conditional probability of severe thunderstorms for 6- and 12-h periods; conditional probability of precipitation type (freezing, snow, or liquid) and a corresponding category; categories of quantitative precipitation for 6- and 12-h periods; snowfall amount; and categories of ceiling height, visibility, and obstruction to vision. Guidance is provided for projections of 6 to 72 hours for most weather elements. Note that a particular element line (see Sections 3 - 20) is not included in the message when all of the forecasts in that line are unavailable. The messages became operational during the 1200 UTC forecast cycle on May 30, 2000.

2. MESSAGE HEADING

```
KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC
DT /OCT 24 /OCT 25 /OCT 26 /
HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00
```

The message heading shown above (see Figs. 1 and 2 also) identifies the station for which the guidance is valid, the forecast cycle, and the day and hour for which the forecasts are valid. In this example, the message is valid for Albany, NY (KALB). All stations are identified by the ICAO four-character identifier.

The "AVN MOS GUIDANCE" appearing on the same line as the station call letters identifies the message contents. The date of the forecast cycle during which the message is issued follows this information. The form of mm/dd/yyyy where mm is the month (1 through 12), dd is the day (1 through 31), and yyyy is the four-digit year is used. The forecast cycle is identified by the standard 0000 or 1200 UTC. In this example, the MOS guidance for KALB was issued from the 0000 UTC forecast cycle of the AVN on October 24, 1999.

The DT and HR lines denote the date and hour at which the forecasts are valid. The DT line indicates the day of the month. Note that the month is denoted by the standard three or four letter abbreviation. Note, also, that the message for the 1200 UTC cycle does not contain the month indicator in the DT line for the first forecast period (Fig. 2). For temperature, dew point, sky cover, wind direction and speed, precipitation type, ceiling height, visibility, and obstruction to vision, the date and hour denote the specific time that the forecasts are valid. Note that forecasts are valid every 3 hours until 60 hours after initial time and then every 6 hours until 72 hours after initial time. For PoP, quantitative precipitation, thunderstorms, severe weather, and snowfall amount, the time indicates the end of the period over which the forecasts are valid. For the max/min temperature, the date group gives only the approximate ending time of the daytime and nighttime periods for which the max and min temperature guidance, respectively, are valid.

3. X/N - MAXIMUM/MINIMUM TEMPERATURE

```
KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC
DT /OCT 24 /OCT 25 /OCT 26 /
HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00 X/N
    49          30          61          43          61
```

The max/min surface temperature forecasts are displayed for projections of 24, 36, 48, 60, and 72 hours after the initial data time (0000 or 1200 UTC). Although the forecasts are presented at consecutive 12-h intervals, each forecast is actually valid for a daytime or nighttime period. For the AVN-based MOS guidance, daytime is defined as 7 a.m. to 7 p.m. Local Standard Time (LST). Nighttime is defined as 7 p.m. to 8 a.m. LST. Thus, the valid date in the appropriate column of the DT and HR lines must be converted by the forecaster

to his/her local date. This local date then denotes the appropriate daytime or nighttime for the max or min temperature forecast. For the 0000 UTC forecast cycle, the temperatures are shown in max/min (X/N) order and are valid for today's max, tonight's min, tomorrow's max, tomorrow night's min, and the day after tomorrow's max. For the 1200 UTC cycle, the temperatures are shown in min/max (N/X) order and are valid for tonight's min, tomorrow's max, tomorrow night's min, the day after tomorrow's max, and the night after tomorrow night's min. Each temperature forecast is presented to the nearest whole degree Fahrenheit, and three characters are allowed. A missing forecast is indicated by a 999.

4. TMP - SURFACE TEMPERATURE

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00 ...  
 TMP 32 30 30 41 47 47 38 34 32 32 34 47 58 60 54 50 48 47 49 57 53

Time-specific 2-m temperature forecasts are valid every 3 hours from 6 to 60 hours, and then every 6 hours to 72 hours after 0000 and 1200 UTC. These forecasts are valid at 0600, 0900, ..., 2100, 0000 UTC, and so forth. Each temperature forecast is presented to the nearest whole degree Fahrenheit; a missing forecast is indicated by a 999. Note that only three characters are available for the temperature forecasts. Thus, two consecutive forecasts of 100 degrees or more or of -10 degrees or less appear with no spaces between them.

5. DPT - SURFACE DEW POINT

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00 ...  
 DPT 25 23 23 24 23 23 24 26 28 28 30 32 34 37 39 41 43 43 45 45 44

Time-specific 2-m dew point forecasts are valid every 3 hours from 6 to 60 hours, and then every 6 hours to 72 hours after 0000 and 1200 UTC. These forecasts are valid at 0600, 0900, ..., 2100, 0000 UTC, and so forth. Each dew point forecast is presented to the nearest whole degree Fahrenheit; a missing forecast is indicated by a 999. Three characters are available for the dew point forecasts so that two consecutive forecasts of -10 degrees or less appear with no spaces between them.

6. CLD - TOTAL SKY COVER CATEGORIES

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00  
 ...  
 CLD CL CL CL CL CL CL CL CL SC SC CL CL CL CL CL CL SC SC SC SC

Forecast categories of total sky cover (see the following table) are available in plain language for projections at 3-h intervals from 6 to 60 hours, and then every 6 hours to 72 hours after the initial data times (0000 and 1200 UTC). All forecasts are valid for specific times (i.e., 0600, 0900, 1200, and so forth). Two characters identify the category (CL - clear; SC - scattered; BK - broken; OV - overcast); a missing forecast is denoted by XX.

- Total Sky Cover Categories  
 CL - clear;  
 SC - > 0 to 4 octas of total sky cover;  
 BK - > 4 to < 8 octas of total sky cover;  
 OV - 8 octas of total sky cover or totally obscured.

7. WDR - SURFACE WIND DIRECTION / WSP - SURFACE WIND SPEED

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00 ...  
 WDR 32 32 32 31 31 32 32 00 00 00 36 15 16 15 16 16 16 16 18 18 19 WSP 08 08  
 08 11 12 09 02 00 00 00 01 04 10 08 04 06 08 06 11 12 8

Surface wind direction (WDR) and speed (WSP) forecasts are given at 3-h intervals for projections of 6 to 60 hours, and then every 6 hours to 72 hours after the initial data times (0000 and 1200 UTC). These are forecasts of the 10-m winds (a 2-minute average) at specific times throughout each day (i.e., 0600, 0900, 1200 UTC, and so forth). The wind direction is given in tens of degrees and varies from 01 (10 degrees) to 36 (360 degrees). The normal meteorological convention for specifying wind direction is followed. The wind speed is given in knots; the maximum speed allowed in the message is 98 knots. For both direction and speed, missing forecasts are denoted by 99. A calm wind is indicated by a wind direction and speed of 00.

8. P06 - PROBABILITY OF PRECIPITATION IN A 6-H PERIOD

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00  
 ...  
 P06 0 0 0 3 5 0 0 9 14 15 20

The P06 forecasts are for the probability of 0.01 inches or more of liquid-equivalent precipitation (PoP), occurring during a 6-h period. The 6-h PoP's are valid for intervals of 6-12, 12-18, 18-24, 24-30, 30-36, 36-42, 42-48, 48-54, 54-60, 60-66, and 66-72 hours after the initial data times (0000 and 1200 UTC). In the message, the forecast values are displayed under the ending time of the period. The probability is given to the nearest percent. Values range from 0 to 100%. A missing forecast value is indicated by 999.

9. P12 - PROBABILITY OF PRECIPITATION IN A 12-H PERIOD

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00 ...  
 P12 0 6 0 17 25

The P12 forecasts are for the probability of 0.01 inches or more of liquid-equivalent precipitation (PoP) occurring during a 12-h period. For nearly all stations, the 12-h PoP's are valid for intervals of 12-24, 24-36, 36-48, 48-60, and 60-72 hours after the initial data times (0000 and 1200 UTC). For stations in Hawaii, however, the 12-h PoP's are valid for intervals of 6-18, 18-30, 30-42, 42-54, and 54-66 hours after 0000 and 1200 UTC. In the message, the forecast values are displayed under the ending time of the period. The probability is given to the nearest percent. Values range from 0 to 100%. A missing forecast value is indicated by 999.

10. T06 - PROBABILITY OF THUNDERSTORMS/CONDITIONAL PROBABILITY OF SEVERE THUNDERSTORMS IN A 6-H PERIOD

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00  
 ...  
 T06 0/ 7 0/ 1 0/ 2 0/ 4 2/ 1 1/ 1 2/ 1 18/ 3 4/ 2 22/ 3

The T06 line represents forecasts for the probability of thunderstorms (to the left of the diagonal) and the conditional probability of severe thunderstorms (to the right of the diagonal) occurring during a 6-h period. The 6-h probability forecasts are valid for intervals of 6-12, 12-18, 18-24, 24-30, 30-36, 36-42, 42-48, 48-54, 54-60, 60-66, and 66-72 hours after the initial data times (0000 and 1200 UTC). In the message, the pair of forecast values are displayed under the ending time of the period. The thunderstorm probability is given to the nearest whole percent. Values range from 0 to 100%. A missing forecast value is indicated by 999. The conditional severe thunderstorm probability is given to the nearest whole percent. Values range from 0 to 98%. A missing forecast value is given by 99. Both the thunderstorm and conditional severe storm probabilities are available year-round for stations in the contiguous U.S. Note that these probabilities represent the likelihood of the event within a box approximately 47 km on a side and containing the station specified. Forecasts are unavailable for stations in Alaska, Hawaii, or Puerto Rico because reports from the National Lightning Detection Network used to define the thunderstorm predictand were unavailable for locations in those areas.

11. T12 - PROBABILITY OF THUNDERSTORMS/CONDITIONAL PROBABILITY OF SEVERE THUNDERSTORMS IN A 12-H PERIOD

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00  
 T12 0/ 7 0/ 3 4/ 2 14/ 4 10/ 3

The T12 line represents forecasts for the probability of thunderstorms (to the left of the diagonal) and the conditional probability of severe thunderstorms (to the right of the diagonal) occurring during a 12-h period. The 12-h probability forecasts are valid for intervals of 6-18, 18-30, 30-42, 42-54, and 54-66 hours after the initial data times (0000 and 1200 UTC). In the message, the pair of forecast values are displayed under the ending time of the period. The thunderstorm probability is given to the nearest whole percent. Values range from 0 to 100%. A missing forecast value is indicated by 999. The conditional severe thunderstorm probability is given to the nearest whole percent. Values range from 0 to 98%. A missing forecast value is given by 99. Both the thunderstorm and conditional severe storm probabilities are available year-round for stations in the contiguous U.S. Note that these probabilities represent the likelihood of the event within a box approximately 47 km on a side and containing the station specified. Forecasts are unavailable for stations in Alaska, Hawaii, or Puerto Rico because reports from the National Lightning Detection Network used to define the thunderstorm predictand were unavailable for locations in those areas.

12. POZ - PROBABILITY OF FREEZING PRECIPITATION (CONDITIONAL)

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00 ...  
 POZ 0 0 5 9 11 9 15 13 7 10 5 0 0 0 0 1 0 1 0 0 0

Conditional probability of freezing precipitation (given that precipitation is occurring) forecasts are available for specific times every 3 hours from 6 to 60 hours and then every 6 hours to 72 hours after 0000 and 1200 UTC. Freezing precipitation is defined as the occurrence of freezing rain or drizzle, ice pellets (sleet), or any mixture of freezing rain, drizzle, or ice pellets with other precipitation types. The probabilities are given to the nearest whole percent, and values range from 0 to 100%. Missing values are indicated by 999. These probabilities are used in producing the categorical TYP forecast described in Section 14. The POZ guidance is transmitted only during the period of September 1 - May 31. Because of the rarity of the freezing rain or sleet events, many stations do not have forecast equations for the POZ category. In these cases, the POZ line will not appear in the message at any time of the year.

13. POS - PROBABILITY OF SNOW (CONDITIONAL)

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00  
 POS 84 90 95 90 75 47 35 16 20 5 6 0 0 0 0 1 1 1 0 0 0

Conditional probability of snow (given that precipitation is occurring) forecasts are available for specific times every 3 hours from 6 to 60 hours and then every 6 hours to 72 hours after 0000 and 1200 UTC. Snow is defined as the occurrence of a pure snow event, that is, snow, snow showers, snow grains, or snow pellets or any combination of those elements. Snow mixed with rain is considered a liquid precipitation event. The probabilities are given to the nearest whole percent, and values range from 0 to 100%. Missing values are indicated by 999. These probabilities are used in producing the categorical TYP forecast described in Section 14. The POS guidance is transmitted only during the period of September 1 - May 31. Note that the conditional probability of liquid precipitation is not given in the message, but can be inferred by the user since the sum of the



hour indicating the end of the period. The QPF guidance is a categorical forecast of liquid-equivalent precipitation equaling or exceeding certain specified amounts in the 12-h periods. The categories are as follows:

QPF Categories

- 0 = no precipitation expected;
- 1 = 0.01 - 0.09 inches;
- 2 = 0.10 - 0.24 inches;
- 3 = 0.25 - 0.49 inches;
- 4 = 0.50 - 0.99 inches;
- 5 = 1.00 - 1.99 inches;
- 6 =  $\geq$  2.00 inches.

Missing forecasts are denoted by 9.

17. SNW - SNOW AMOUNT CATEGORICAL FORECAST

KALB	AVN MOS GUIDANCE															10/24/1999					0000 UTC						
DT	/OCT 24					/OCT 25					/OCT 26					/											
HR	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	18	00	03	06	09	12	18	00
SNW							0						0	...		0							0				0

Categorical forecasts of snow amount are available in the message for 24-h periods ending approximately 24, 36, 48, 60, and 72 hours after 0000 or 1200 UTC. Since observations from the cooperative observer network are used to define the event, the valid times are approximations. The categories are denoted as follows:

Snow Amount Categories

- 0 = no snow or a trace expected;
- 1 =  $>$  a trace to  $<$  2 inches expected;
- 2 = 2 to  $<$  4 inches;
- 4 =  $\geq$  4 to  $<$  6 inches;
- 6 =  $\geq$  6 to  $<$  8 inches;
- 8 =  $\geq$  8 inches.

A missing forecast is denoted by 9; forecasts are disseminated only for the period of September 1 - May 31.

18. CIG - CEILING HEIGHT CATEGORICAL FORECASTS

KALB	AVN MOS GUIDANCE															10/24/1999					0000 UTC						
DT	/OCT 24					/OCT 25					/OCT 26					/											
HR	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	18	00	03	06	09	12	18	00
CIG	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7

Forecasts of seven categories of ceiling height (see the following table) are available for specific times valid every 3 hours from 6 to 60 hours and then every 6 hours to 72 hours after 0000 and 1200 UTC. The forecasts are displayed beneath the time of the day for which they are valid. Values of 1 through 7 are allowed for the categorical guidance; a value of 9 denotes a missing forecast. The categories are as follows:



Ceiling Height Categories

- 1 = ceiling height of < 200 feet;
- 2 = ceiling height of 200 - 400 feet;
- 3 = ceiling height of 500 - 900 feet;
- 4 = ceiling height of 1000 - 3000 feet;
- 5 = ceiling height of 3100 - 6500 feet;
- 6 = ceiling height of 6600 - 12,000 feet;
- 7 = ceiling height of > 12,000 feet or unlimited ceiling.

The categorical guidance is prepared by using probability forecasts of the same categories.

19. VIS - VISIBILITY CATEGORICAL FORECASTS

<b>KALB</b>	<b>AVN</b>	<b>MOS</b>	<b>GUIDANCE 10/24/1999 0000 UTC</b>																			
<b>DT</b>	<b>/OCT 24</b>			<b>/OCT 25</b>										<b>/OCT 26</b>				<b>/</b>				
<b>HR</b>	<b>06</b>	<b>09</b>	<b>12</b>	<b>15</b>	<b>18</b>	<b>21</b>	<b>00</b>	<b>03</b>	<b>06</b>	<b>09</b>	<b>12</b>	<b>15</b>	<b>18</b>	<b>21</b>	<b>00</b>	<b>03</b>	<b>06</b>	<b>09</b>	<b>12</b>	<b>18</b>	<b>00</b>	
<b>VIS</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>5</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>5</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>6</b>	<b>7</b>

Forecasts of seven categories of visibility (see the following table) are available for specific times valid every 3 hours from 6 to 60 hours and then every 6 hours to 72 hours after 0000 and 1200 UTC. The forecasts are displayed beneath the time of the day for which they are valid. Values of 1 through 7 are allowed for the categorical guidance; a value of 9 denotes a missing forecast. The categories are as follows:

Visibility Categories

- 1 = visibility  $\leq$  1/4 mi;
- 2 = visibility of > 1/4 mi to  $\leq$  1/2 mi;
- 3 = visibility of > 1/2 mi to < 1 mi;
- 4 = visibility of 1 to < 3 mi;
- 5 = visibility of 3 to 5 mi;
- 6 = visibility of 6 mi;
- 7 = visibility of > 6 mi.

The categorical guidance is prepared by using probability forecasts of the same categories.

20. OBV - OBSTRUCTION TO VISION CATEGORICAL FORECASTS

KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC  
 DT /OCT 24 /OCT 25 /OCT 26 /  
 HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00  
 ....  
 OBV N N N N N N N N N N HZ N N N N HZ HZ FG HZ HZ N

Forecasts of five categories of obstruction to vision (see the following table) are available for specific times valid every 3 hours from 6 to 60 hours and then every 6 hours to 72 hours after 0000 and 1200 UTC. The forecasts are displayed in plain language beneath the time of the day for which they are valid. The categories are denoted by the letters "N", "HZ", "BR", "FG", and "N"; a value of "X" denotes a missing forecast. The categories are as follows:

Obstruction to Vision Categories

- N = none of the following;
- HZ = haze, smoke, dust;
- BR = mist (fog with visibility  $\geq 5/8$  mi);
- FG = fog or ground fog (visibility  $< 5/8$  mi);
- BL = blowing dust, sand, snow.

The categorical guidance is prepared by using probability forecasts of the same categories. In the equation development, cases of fog or mist were not stratified by the occurrence of precipitation. Thus, a forecast of fog can be coincidental with a forecast of precipitation. Lower visibilities caused exclusively by precipitation occurrence are not indicated by the obstruction to vision guidance.

21. AVAILABILITY

The AVN MOS guidance is available twice daily (from the 0000 and 1200 UTC runs of the AVN model) in 10 alphanumeric messages: six containing guidance for stations in the contiguous U.S. and Puerto Rico, three containing guidance for Alaskan sites, and one containing guidance for stations in Hawaii. The following two-line WMO headers are used:

WMO Header - Region

- FOPA20 KWNO - Pacific Region  
MAVPA0
- FOUS21 KWNO - Northeast U.S.  
MAVNE1
- FOUS22 KWNO - Southeast U.S.  
MAVSE1
- FOUS23 KWNO - North Central U.S.  
MAVNC1
- FOUS24 KWNO - South Central U.S.  
MAVSC1
- FOUS25 KWNO - Rocky Mountain Region  
MAVRM1
- FOUS26 KWNO - West Coast Region  
MAVWC1
- FOAK37 KWNO - Southeast Alaska (Juneau)  
MAVAJK
- FOAK38 KWNO - Central Alaska (Anchorage)

MAVAFC

FOAK39 KWNO - Northern Alaska (Fairbanks)  
MAVAFG

22. STATION LIST

The AVN MOS guidance is available for 1060 stations in the United States. The reader may check the following home page for the station list and the corresponding WMO headers:

<http://www.nws.noaa.gov/tdl/synop>

**Figure 1. Sample 0000 UTC message.**

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KALB AVN MOS GUIDANCE 10/24/1999 0000 UTC
DT /OCT 24 /OCT 25 /OCT 26 /
HR 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00 X/N
    49 30 61 43 61 TMP 32 30 30 41 47 47
38 34 32 32 34 47 58 60 54 50 48 47 49 57 53
DPT 25 23 23 24 23 23 24 26 28 28 30 32 34 37 39 41 43 43 45 45 44 CLD CL CL
CL CL CL CL CL CL SC SC CL CL CL CL CL CL SC SC SC SC WDR 32 32 32 31 31
32 32 00 00 00 36 15 16 15 16 16 16 16 18 18 19 WSP 08 08 08 11 12 09 02 00
00 00 01 04 10 08 04 06 08 06 11 12 8 P06 0 0 0 3 5
0 0 9 14 15 20 P12 0 0 6 0
17 25
T06 0/ 7 0/ 1 0/ 2 0/ 4 2/ 1 1/ 1 2/ 1 18/ 3 4/ 2 22/ 3
T12 0/ 7 0/ 3 4/ 2 14/ 4 10/ 3 POZ 0 0
5 9 11 9 15 13 7 10 5 0 0 0 0 1 0 1 0 0 0 POS 84 90 95 90 75 47
35 16 20 5 6 0 0 0 0 1 1 1 0 0 0
TYP S S S S S S S R R R R R R R R R R R R R R Q06
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Q12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
SNW 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
CIG 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
VIS 7 7 7 7 7 7 7 7 7 7 7 5 7 7 7 7 5 5 1 5 6 7 OBV N N
N N N N N N N N HZ N N N N HZ HZ FG HZ HZ N

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**Figure 2. Sample 1200 UTC message.**

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KALB AVN MOS GUIDANCE 11/24/1999 1200 UTC
DT /NOV 24 /NOV 25 /NOV 26 /NOV 27
HR 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 06 12
N/X 38 47 37 51 38
TMP 61 59 55 50 46 42 39 43 45 44 39 39 39 41 40 43 48 48 47 43 39
DPT 55 53 49 44 38 34 31 31 31 31 33 33 35 37 38 41 43 44 43 41 38
CLD SC BK BK OV SC SC SC BK OV OV OV OV OV OV OV OV OV OV OV OV
WDR 17 17 20 24 26 30 31 34 01 01 00 00 05 09 13 13 13 12 14 16 15
WSP 12 10 08 08 05 05 05 02 02 02 00 00 03 03 07 03 03 02 05 04 03
P06 26 30 16 8 23 29 44 55 54 45 51
P12 36 23 51 70 65
T06 9/ 2 2/ 0 2/ 4 1/ 2 0/ 0 2/ 0 7/ 0 8/ 1 5/ 2 8/ 3
T12 9/ 1 2/ 4 1/ 0 12/ 1 10/ 3
PZP 0 0 4 2 5 2 10 15 8 3 3 2 3 4 4 6 0 1 5 0 1
PSN 0 0 0 0 1 4 4 6 6 5 1 3 3 6 8 5 7 8 8 6 3
TYP R R R R R R R R R R R R R R R R R R R R R R
Q06 1 0 0 0 0 0 1 1 2 1 1
Q12 1 0 1 3 2
SNW 0 0 0 0 0 0 0 0 0 0
CIG 7 4 4 4 7 7 7 7 7 6 5 5 4 5 4 4 4 4 4 4 4
VIS 7 7 7 7 7 7 7 7 7 7 7 2 2 1 2 5 7 7 7 2 2
OBV N N N N N N N N N N N FG FG FG FG HZ N N N FG FG

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