BASICS FOR AIR TRAFFIC CONTROL – CURRENT WEATHER (METAR/SPECI)

MODULE OVERVIEW

Purpose: This module will teach you the format and contents of the Aviation Routine Weather Report (METAR) and the Aviation Selected Special Weather Report (SPECI). METAR/SPECI is used worldwide to report surface aviation weather observations. You will also learn how to decode these reports into FAA phraseology so that you can convey them to the flying public.

MODULE OUTLINE

Lesson: METAR/SPECI Reports

Purpose: This lesson will identify the contents, format, and phraseology for the beginning of the Aviation Routine Weather Report (METAR) and the Aviation Selected Special Weather Report (SPECI).

Objectives:

- Identify types of METAR
- Identify content of the METAR/SPECI
- Identify format of the METAR/SPECI

Topics:

- Types of Observations
  - Automated
  - Augmented
  - Manual
- Type of Report
  - Aviation Routine Weather Report (METAR)
  - Aviation Selected Special Weather (SPECI)
- Announcing Report
  - Announcing Missing Elements
  - Type of Report
  - Station Identifier
  - ICAO Airport Codes Prefix
- Knowledge Check
- Announcing Report (continued)
  - Location Name
  - Date and Time of Report
  - Date and Time Phraseology
  - Report Modifier
- Report Element Phraseology
- Knowledge Check
- Review/Summary

Question and Answer Session – *Parking Lot*

Study Aid – Criteria for SPECI

Activity – Weather Reporting

Lesson: Wind Group

Purpose: The purpose of this lesson is to translate the digits of the wind group when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI) and demonstrate how to properly announce surface wind.

Objective:

- Decode wind groups recorded on a METAR/SPECI

Topics:

- Wind Group
  - Wind Group Decoding
  - Wind Group Format
  - Announcing Wind
  - Wind Group Phraseology
- Knowledge Check
- Review/Summary

Exercise – Wind Group Decoding

Lesson: Visibility and RVR Groups

Purpose: The purpose of this lesson is to translate the digits of the visibility and Runway Visual Range (RVR) groups when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI) and demonstrate how to properly announce each group.

Objectives:

- Decode visibility groups recorded on a METAR/SPECI
- Decode RVR groups recorded on a METAR/SPECI

Topics:

- Visibility Group
  - Visibility Group Decoding
  - Announcing Visibility
  - Visibility Group Phraseology
- Knowledge Check
- Runway Visual Range (RVR) Group
  - RVR Group Decoding
  - Announcing RVR
  - RVR Group Phraseology
- Knowledge Check
- Review/Summary

Exercise – Visibility and RVR Groups Decoding

Lesson: Present Weather Group

Purpose: The purpose of this lesson is to translate the digits of the present weather group when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI) and explain how to properly announce this group.

Objective:

- Decode present weather groups recorded on a METAR/SPECI

Topics:

- Present Weather Group
  - Notations for Reporting Present Weather
  - Announcing Present Weather Group
- Knowledge Check
- Review/Summary

Study Aid – Present Weather Notation Definitions

Exercise – Present Weather Group Decoding

Lesson: Sky Condition Group

Purpose: The purpose of this lesson is to translate the digits of the sky condition group when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI).

Objective:

- Decode sky condition group recorded on a METAR/SPECI

Topics:

- Sky Condition Group
- Sky Condition Group Definitions
- Contractions for Sky Cover
- Coding Formats
  - Cloud Cover
  - Vertical Visibility
  - Clear Skies
- Knowledge Check
- Review/Summary

Question and Answer Session – *Parking Lot*

Lesson: Sky Condition Group Phraseology

Purpose: The purpose of this lesson is to identify how to properly announce sky condition group when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI).

Objective:

- Decode sky condition group phraseology recorded on a METAR/SPECI

Topics:

- Sky Condition Group
- Ceiling and Sky Coverage
- Cloud Heights
- Sky Conditions
- Examples of Sky Group Phraseology
- Knowledge Check
- Review/Summary

Question and Answer Session – *Parking Lot*

Exercise – Sky Condition Group Decoding

Lesson: Temperature/Dew Point and Altimeter Groups

Purpose: The purpose of this lesson is to translate the digits of the temperature/dew point and altimeter groups when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI) and explain how to properly announce these groups.

Objective:

- Decode temperature/dew point and altimeter groups recorded on a METAR/SPECI

Topics:

- Temperature/Dew Point Group
  - Temperature/Dew Point Format
  - Announcing Temperature/Dew Point Group
- Knowledge Check
- Altimeter
  - Altimeter Decoding
  - Announcing Altimeter
- Knowledge Check
- Review/Summary

Question and Answer Session – *Parking Lot*

Exercise – Temperature/Dew Point and Altimeter Groups Decoding

Lesson: Remarks

Purpose: The purpose of this lesson is to identify the components of the remarks group as shown on an Aviation Routine Weather Report or an Aviation Selected Special Weather Report (SPECI), and to practice translating and announcing the entire report.

Objectives:

- Identify components of remarks as shown on a METAR/SPECI
- Identify decoded examples of a METAR/SPECI

Topics:

- Remarks
- Information Contained in Remarks
  - Volcanic Eruption Phraseology
  - Funnel Cloud Coding and Phraseology
  - Peak Wind Coding and Phraseology
- Knowledge Check
  - Wind Shift Coding and Phraseology
  - Tower or Surface Visibility Coding and Phraseology
  - Variable Prevailing Visibility Coding and Phraseology
  - Sector Visibility Coding and Phraseology
- Knowledge Check
  - Lightning Decoding/Frequency of Lightning
  - Beginning and Ending of Precipitation Coding and Phraseology
  - Beginning and Ending of Thunderstorms Coding and Phraseology
  - Thunderstorm Location Coding and Phraseology
  - Hailstone Size Coding and Phraseology
  - Virga Coding and Phraseology
  - Variable Ceiling Height Coding and Phraseology
  - Obscurations Coding and Phraseology
  - Variable Sky Condition

- Knowledge Check
  - Significant Cloud Type Remarks
    - Cumulonimbus/Cumulonimbus Mammatus Coding
    - Towering Cumulus Coding
    - Altocumulus Castellanus Coding
    - Standing Lenticular or Rotor Clouds Coding
- Pressure Rising or Falling Rapidly Phraseology
- Snow Increasing Rapidly Coding and Phraseology
- METAR/SPECI Decoding Examples
- Knowledge Check
- Review/Summary

Study Aid – METAR/SPECI Phraseology

Exercise – METAR/SPECI Decoding Review

Question and Answer Session – *Parking Lot*

End-of-Module (EOM) Test

INTRODUCTION

LESSONS	■ METAR/SPECI Reports ■ Wind Group ■ Visibility and RVR Groups ■ Present Weather Group ■ Sky Condition Group ■ Sky Condition Group Phraseology ■ Temperature/Dew Point and Altimeter Groups ■ Remarks
TOTAL ESTIMATED RUN TIME	9 hrs. 31 mins.
MODULE CONTENT	■ Module Overview ■ Lesson: METAR/SPECI Reports ■ Q&A Session – Parking Lot ■ Study Aid – Criteria for SPECI ■ Activity – Weather Reporting ■ Lesson: Wind Group ■ Exercise – Wind Group Decoding ■ Lesson: Visibility and RVR Groups ■ Exercise – Visibility and RVR Groups Decoding ■ Lesson: Present Weather Group ■ Study Aid – Present Weather Notation Definitions ■ Exercise – Present Weather Group Decoding ■ Lesson: Sky Condition Group ■ Q&A Session – Parking Lot ■ Lesson: Sky Condition Group Phraseology ■ Q&A Session – Parking Lot ■ Exercise – Sky Condition Group Decoding ■ Lesson: Temperature/Dew Point and Altimeter Groups ■ Q&A Session – Parking Lot ■ Exercise – Temperature/Dew Point and Altimeter Groups Decoding ■ Lesson: Remarks ■ Study Aid – METAR/SPECI Phraseology ■ Exercise – METAR/SPECI Decoding Review ■ Q&A Session – Parking Lot ■ End-of-Module Test

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Instruct students to select ***Current Weather (METAR/SPECI)*** module link within Blackboard ■ Instruct students to read the module introduction and then wait quietly for additional instructions	Blackboard **EST. RUN TIME** 2 min.

Weather is perhaps the most significant factor that affects the flow of air traffic. Just as knowing the location of other aircraft is important, knowing the weather that affects your traffic is equally important.

This module will teach you the format and contents of the Aviation Routine Weather Report (METAR) and the Aviation Selected Special Weather Report (SPECI). METAR/SPECI is used worldwide to report surface aviation weather observations. You will also learn how to decode these reports into FAA phraseology so that you can convey them to the flying public.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *METAR/SPECI Reports*** lesson in Blackboard ■ Instruct students to navigate to the ***METAR/SPECI Reports*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed	Blackboard **EST. RUN TIME** 20 mins.

METAR/SPECI REPORTS

Purpose: This lesson will identify the contents, format, and phraseology for the Aviation Routine Weather Report (METAR) and the Aviation Selected Special Weather Report (SPECI).

Objectives:

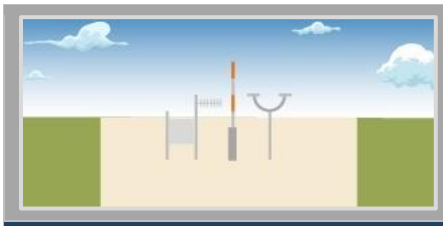
- Identify types of METAR
- Identify content of the METAR/SPECI
- Identify format of the METAR/SPECI

References for this lesson are as follows:

- AC 00-45, Aviation Weather Services
- FAA Order JO 7110.10, Flight Services
- Federal Meteorological Handbook No. 1 (FMH-1)

Types of Observations

There are three types of weather observation used in aviation.

		
Automated Observation	**Augmented Observation**	**Manual Observation**
Obtained from an automated surface weather observing system that prepares the meteorological reports for transmission without a certified weather observer.	An automated surface weather observing system that prepares the meteorological reports for transmission with certified weather observers signed on to the system to modify information under augmented observation.	Taken by a certified weather observer who is responsible for meteorological observations.

Note: *Air traffic control (ATC) towers that are responsible for taking weather observations have the capability to augment observations. Manual observations are usually only taken for training observers and during periods of equipment malfunction.*

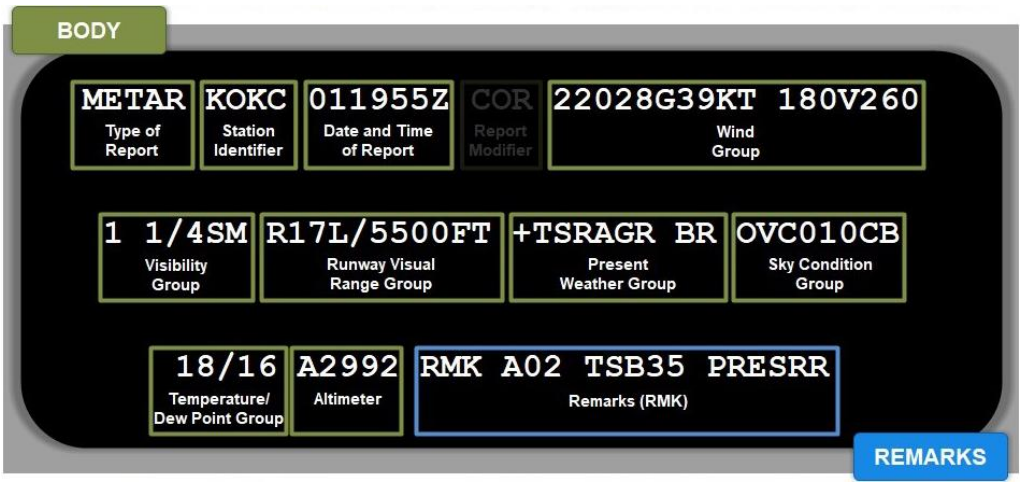
Automated Observation

There are three automated observation systems used at U.S. airports, each with similar sensors:

- Automated Weather Observing System (AWOS)
- Automated Surface Observing System (ASOS)
- Automated Weather Sensor System (AWSS)

Type of Report

Aviation Routine Weather Report (METAR) is the primary observation code used in the United States (and worldwide) for reporting surface meteorological data. METARs are scheduled reports transmitted at fixed intervals (at least once per hour). A METAR has two major sections: the “Body” and the “Remarks.” When an element does not occur or cannot be observed, the corresponding group is omitted from that particular report.



Aviation Selected Special Weather Report (SPECI) is an unscheduled report taken when certain criteria have been observed.

- These criteria denote weather changes important to aircraft safety
- A SPECI contains all of the data elements found in a METAR
- SPECI criteria are only applicable to stations that have the capability of evaluating the event
    - For example, visually evaluated elements, such as a tornado, are not applicable to non-staffed automated stations

Announcing Report

Announcing Missing Elements

With the exception of Report Modifier, Runway Visual Range (RVR), Present Weather group, and Remarks, announce the word “missing” when any item or component of a weather report is not reported.

Also, announce the word “missing” in place of unreadable or obviously incorrect items or portions of weather reports.

Type of Report

The type, **METAR** or **SPECI**, is included in all reports.

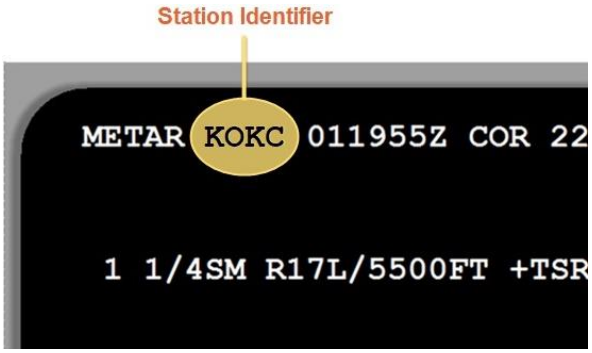
- If the report is a SPECI, announce as “special report”
- Do not announce the type of report if it is a METAR

Station Identifier

The **Station Identifier** is included in all reports to identify the station to which the coded report applies.

The station identifier is the four-letter International Civil Aviation Organization (ICAO) airport code used to designate each airport around the world.

In the contiguous U.S., most airport identifiers are coded “K,” followed by the three-letter identifier.

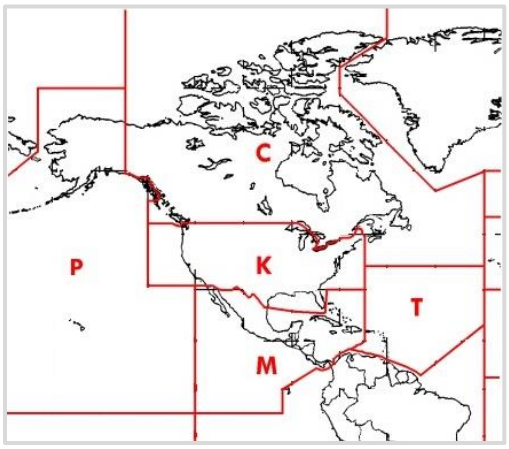


ICAO Airport Codes Prefix

The **ICAO Airport** codes have a regional structure, are not duplicated, and are comprehensive.

- In general, the first letter is allocated by region and represents a country or group of countries within that region
- The second letter generally represents a country within that region
- The final two letters are used to identify each airport

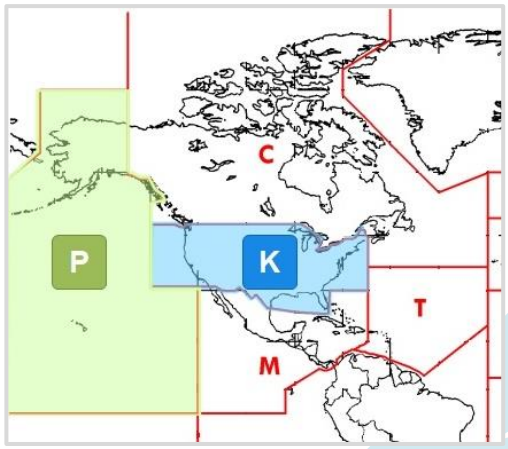
Exception: In larger countries that have single-letter country codes (like the contiguous USA), the remaining three letters identify the airport.



In the contiguous United States of America region, the ICAO prefix is “**K**.”

In the Eastern North Pacific region, the ICAO prefix begins with “**P**,” followed by the appropriate country code, with the last two letters used to identify each airport.

- Alaska’s ICAO prefix is “PA”
- Hawaii’s ICAO prefix is “PH”
- The Marianas Islands’ (including Guam) ICAO prefix is “PG”



"P" Region Airports			"K" Region Airports		
Location	**ICAO Prefix**	**ICAO Station Identifier**	**Location**	**ICAO Prefix**	**ICAO Station Identifier**
Anchorage International, AK	PA	PANC	Caribou, ME	K	KCAR
Nome, AK	PA	PAOM	Key West, FL	K	KEYW
Honolulu, HI	PH	PHNL	Dodge City, KS	K	KDDC
Hilo, HI	PH	PHTO	Salt Lake City, UT	K	KSLC
Agana, GU	PG	PGUM	Bellingham, WA	K	KBLI
Anderson AFB, GU	PG	PGUA	San Diego, CA	K	KSAN

Knowledge Check A

REVIEW what you have learned so far about types of observations and reports. ANSWER the questions listed below.

1. What is a METAR? *(Select the correct answer.)*
   - ❑ **An Aviation Routine Weather Report**
   - ❑ A Meteorology Evaluation Technical Aviation Report
   - ❑ An Aeronautical Routine Weather Report
   - ❑ An Aviation Selected Special Weather Report

2. What is a SPECI? *(Select the correct answer.)*
   - ❑ An Aviation Routine Weather Report
   - ❑ An Aeronautical Special Weather Report
   - ❑ An Aeronautical Routine Weather Report
   - ❑ **An Aviation Selected Special Weather Report**

3. Which types of information would be found on an aviation weather report? *(Select all correct answers that apply.)*
   - ❑ **Temperature/dew point group**
   - ❑ **Altimeter**
   - ❑ Weather minima
   - ❑ **Wind group**
   - ❑ **Station identifier**

4. Which of the following are true about ICAO airport codes? *(Select all correct answers that apply.)*
   - ❑ **Are not duplicated**
   - ❑ Can be duplicated if the countries reside in separate hemispheres
   - ❑ **First letter represents a country or group of countries**
   - ❑ The first two letters identify each airport

5. Choose the ICAO prefix for each region. Enter your answers in the spaces below.

a Contiguous U.S.	a. K
d Alaska	b. PG
b Marianas Islands, Guam	c. PH
c Hawaii	d. PA

Location Name

Guidelines for location name phraseology:

- Announce the geographic name (not the identifier) once for communications
- When the location name is duplicated within 500 miles, follow the location name with the state name
- When weather reports originate at more than one airport at the same geographic location, identify the airport
- Where it is considered necessary and is requested by the military base commander, broadcast military observations by stating:
  - Location
  - Name of the airport (if different)
  - Controlling military branch

Examples of Report Element Phraseology			
KPAH	*"Paducah"*	KORD	*"Chicago O'Hare"*
KSGF	*"Springfield, Missouri"*	KFRI	*"Fort Riley, Marshall Army Air Field"*
KOKC	*"Oklahoma City Will Rogers World Airport"*	KNGU	*"Norfolk Naval Air Station"*
KMDW	*"Chicago Midway"*	KORF	*"Norfolk International Airport"*

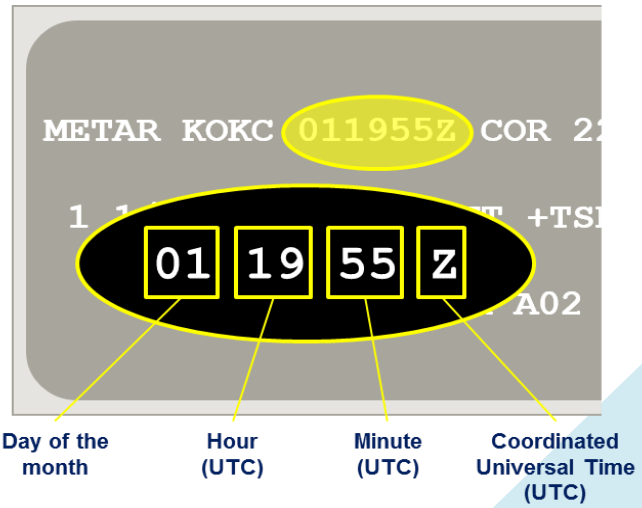
Date and Time of Report

The **Date and Time** (Coordinated Universal Time [UTC]) of the report element is the actual time of the report or when the criteria for a SPECI was met or noted.

If the report is a correction to a previously disseminated report, the time of the corrected report is the same as the report being corrected.

The date and time of report coding format is:

- **01** – First two digits are the day of the month
- **19** – The next two digits are the hour (UTC)
- **55** – Final two digits are the minute (UTC)
- **Z** – Coordinated Universal Time (UTC)



Date and Time Phraseology

If a special report (SPECI) is the most recent observation available, follow the location with the words “special report, (last two digits of the time) observation.”

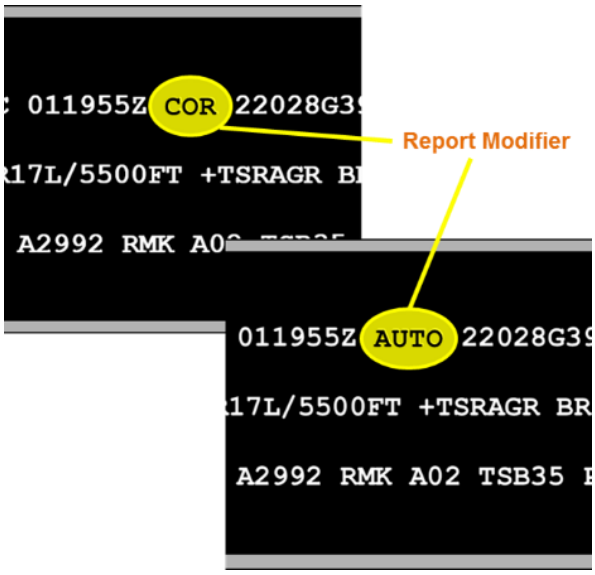
- A METAR’s time of report may be given upon request
- Follow the location with “(all four digits of the time) observation”

Examples of Date and Time Phraseology	
METAR KOKC 021250Z…	*“…one two five zero observation…”*
METAR KOKC 091952Z…	*“…one niner five two observation…”*
SPECI KOKC 222108Z…	*“…special report, zero eight observation…”*
SPECI KOKC 310023Z…	*“…special report, two three observation…”*

Report Modifier

The **Report Modifier AUTO** identifies the METAR/SPECI as a fully automated report with no human intervention or oversight.

- In the event of a corrected METAR or SPECI, the report modifier **COR** is substituted in place of AUTO
- The omission of a “Report Modifier” element indicates either a manual or augmented observation
- Announce **AUTO** as “(location) automated”
- Announce **COR** as “(location) corrected”



Report Element Phraseology

Announce METAR/SPECI report elements in the following order:

1. Station identifier	2. Report modifier	3. Type of report	4. Date and time of report
	(If Applicable)	(SPECI only – Do not announce if METAR)	■ If SPECI, only announce the minutes ■ If METAR, announce hours and minutes upon request

Examples of Report Element Phraseology	
METAR KMCI 010255Z…	*“Kansas City International, (zero two five five observation)…”*
METAR KMTH 071954Z AUTO…	*“Marathon, automated, (one niner five four observation)…”*
SPECI KOKB 141242Z AUTO…	*“Oceanside, automated, special report, four two observation…”*
SPECI PHMK 302316Z COR…	*“Molokai, corrected, special report, one six observation…”*

Note: *The remaining METAR/SPECI elements are announced in their listed order.*

Knowledge Check B

REVIEW what you have learned so far about types of reports. ANSWER the questions listed below.

1. What is the correct phraseology if a special report is the most recent observation available? *(Select the correct answer.)*
   - ❑ Kansas City International, automated, one niner three five observation
   - ❑ **Oceanside, automated, special report, three two observation**
   - ❑ Marathon, automated report, four two observation

2. What does the Report Modifier "AUTO" tell you about the METAR/SPECI report? *(Select the correct answer.)*
   - ❑ **That it is a fully automated report**
   - ❑ That it is a partially automated report
   - ❑ That it is a fully manual report

3. Match the correct order for stating METAR/SPECI elements. Enter your answers in the spaces below.

d	1	a. Type of report
c	2	b. Date and time of report
a	3	c. Report modifier
b	4	d. Station identifier

METAR/SPECI Reports Summary

Pilots live by the weather. You must not only be able to identify the weather, but report it as well. This lesson identified the contents, format, and phraseology for the beginning of the METAR and the SPECI. Your ability to report the weather in a brief and accurate manner is a crucial part of your job.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Review content presented in the ***METAR/SPECI Reports*** lesson ■ Navigate to the ***Parking Lot*** link within Blackboard and review any student questions ■ Address ***Parking Lot*** questions and facilitate a brief discussion of the lesson content	Facilitated Discussion **EST. RUN TIME** 20 mins.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ This portion of training will be conducted by the facilitator ■ Instruct students to locate study aid ***Criteria for SPECI*** in ***Student Guide*** ■ Facilitator will review content included in the study aid ■ Instruct students to reference the study aid while continuing module	Study Aid **EST. RUN TIME** 5 mins.

STUDY AID: CRITERIA FOR SPECI

1	**Wind Shift**	Wind direction changes by 45 degrees or more in less than 15 minutes and the wind speed is 10 knots or more throughout the wind shift.
2	**Visibility**	Surface visibility as reported in the body of the report decreases to less than or, if below, increases to equal or exceed: a. 3 miles b. 2 miles c. 1 mile d. The lowest standard instrument approach procedure minimum as published in the National Ocean Service (NOS) U.S. Instrument Procedures; if none published, use ½ mile
3	**Runway Visual Range (RVR)**	The highest value from the designated RVR runway decreases to less than or, if below, increases to equal or exceed 2,400 feet during the preceding 10 minutes. U.S. military stations may not report a SPECI based on RVR.
4	**Tornado, Funnel Cloud, or Waterspout**	a. Is observed b. Disappears from sight or ends
5	**Thunderstorm**	a. Begins (a SPECI is not required to report the beginning of a new thunderstorm if one is currently reported) b. Ends
6	**Precipitation**	a. Hail begins or ends b. Freezing precipitation begins, ends, or changes intensity c. Ice pellets begin, end, or change intensity
7	**Squalls**	When they occur.
8	**Ceiling**	The ceiling (rounded off to reportable values) forms or dissipates below, decreases to less than, or if below, increases to equal or exceed: a. 3,000 feet b. 1,500 feet c. 1,000 feet d. 500 feet e. The lowest standard instrument approach procedure minimum as published in the NOS U.S. Instrument Procedures; if none published, use 200 feet
9	**Sky Condition**	A layer of clouds or obscurations aloft is present below 1,000 feet and no layer aloft was reported below 1,000 feet in the preceding METAR or SPECI.
10	**Volcanic Eruption**	When an eruption is first noted.
11	**Aircraft Mishap**	Upon notification of an aircraft mishap, unless there has been an intervening observation.
12	**Miscellaneous**	Any other meteorological situation designated by the responsible agency that, in the opinion of the observer, is critical.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Weather Reporting*** student activity in ***Exercises and Activities*** folder in Blackboard ■ Instruct students to navigate to the ***Exercises and Activities*** folder in Blackboard ■ Instruct students to locate student activity ***Weather Reporting*** in Blackboard ■ The activity will be performed individually ■ Instruct students to answer each question ■ The activity will evaluate the students' performance and provide feedback	Activity **EST. RUN TIME** 15 mins.

ACTIVITY: WEATHER REPORTING (ANSWER KEY)

Note: *The questions in the key and their distractors may appear in a different order than displayed here due to activity question randomization.*

Question	Answers
1. METAR KOKC 070553Z…	**"Oklahoma City Will Rogers, zero five five three observation…"** "METAR Oklahoma City Will Rogers, zero five five three observation…" "Oklahoma City, zero seven zero five five three observation…"
2. METAR KOKC 201554Z AUTO…	**"Oklahoma City Will Rogers, automated, one five five four observation…"** "Oklahoma City Will Rogers, one five five four, automated, observation…" "Oklahoma City Will Rogers, auto, one five five four observation…"
3. METAR KOKC 092355Z COR…	**"Oklahoma City Will Rogers, corrected, two three five five observation…"** "Oklahoma City Will Rogers, automated, one five five four observation…" "Oklahoma City Will Rogers, correction, one five five four observation…"
4. SPECI KOKC 021001Z…	**"Oklahoma City Will Rogers, special report, zero one observation…"** "Oklahoma City Will Rogers, SPECI, two three five five observation…" "Oklahoma City Will Rogers, automated, one five five four observation…"

Question	Answers
5. SPECI KOKC 121619Z AUTO…	**“Oklahoma City Will Rogers, automated, special report, one niner observation…”** “Oklahoma City Will Rogers, special report, zero one observation…” “Oklahoma City Will Rogers, automated, two three five five observation…”
6. SPECI KOKC 302238Z COR…	**“Oklahoma City Will Rogers, corrected, special report, three eight observation…”** “Oklahoma City Will Rogers, special report, corrected, three eight observation…” “Oklahoma City Will Rogers, automated, corrected, special report, three eight observation…”

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Wind Group*** lesson in Blackboard ■ Instruct students to navigate to the ***Wind Group*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed	Blackboard **EST. RUN TIME** 10 mins.

WIND GROUP

Purpose: The purpose of this lesson is to translate the digits of the wind group when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI) and demonstrate how to properly announce surface wind.

Objective:

- Decode wind groups recorded on a METAR/SPECI

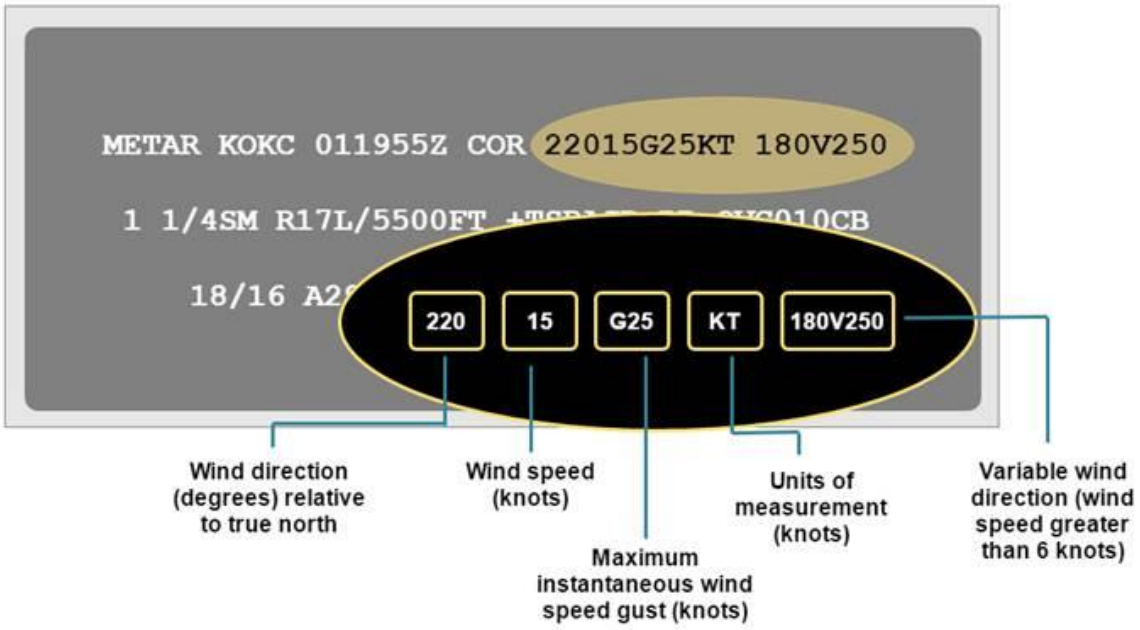
References for this lesson are as follows:

- AC 00-45, Aviation Weather Services
- FAA Order JO 7110.10, Flight Services
- Federal Meteorological Handbook No. 1 (FMH-1)

Wind Group

Wind is the horizontal motion of the air past a given point.

Wind Group Decoding



Wind Group Format

The wind group coding format is: **22015G25KT 180V250**

220	The first three digits indicate the wind direction relative to true north, coded in tens of degrees, using three digits. ■ **VRB** is coded if the wind direction is variable and the speed is 6 knots or less
15	The next two (or three) digits indicate the wind speed in knots. ■ **00000KT** denotes "*wind calm*"
G25	If the wind is gusty, **G** is coded followed by two (or three) digits that indicate the maximum instantaneous wind speed gust. ***Note:*** *Wind gusts are rapid fluctuations in wind speed.*
KT	**KT** indicates the unit of measurement is knots.
180V250	If the wind direction is variable and the speed is greater than 6 knots, a variable wind group consisting of the extremes of the wind directions separated by a V will follow the wind group.

Announcing Wind

Announce surface wind direction and speed by stating:

- Word *"Wind"*
- Digits of the indicated wind direction, to the nearest 10−degree multiple
- Word *"at"*
- Digits of the indicated velocity in knots, including any gusts
- For speeds less than 10 knots, the leading zero is not spoken, e.g., "*Wind one two zero at five*"

A "**G**" between two wind speed values is announced as "*Gusts.*"

Announce the variability of wind at the end of the wind group.

Wind Group Phraseology

Examples of Wind Group Phraseology	
00000KT	*"Wind calm"*
26012KT	*"Wind two six zero at one two"*
30008KT	*"Wind three zero zero at eight"*
36012G20KT	*"Wind three six zero at one two gusts two zero"*
VRB04KT	*"Wind variable at four"*
29012KT 260V320	*"Wind two niner zero at one two, wind variable between two six zero and three two zero"*
33037G46KT 300V010	*"Wind three three zero at three seven gusts four six, wind variable between three zero zero and zero one zero"*

Knowledge Check C

REVIEW what you have learned so far about decoding wind group on a METAR/SPECI report and wind group phraseology. ANSWER the questions listed below.

1. Which one of these winds would be denoted as calm in METAR? *(Select the correct answer.)*
   - ❑ 01010KT
   - ❑ **00000KT**
   - ❑ 010CLM

2. When announcing surface wind direction and speed, which of the following formats is correct? *(Select the correct answer.)*
   - ❑ State "wind," then combine digits of speed and wind direction
   - ❑ State digits of speed and then digits of wind direction
   - ❑ **State "wind," digits of wind direction, "at" and then digits of velocity including gusts**

3. Match the wind group decoding description to the characters that appear in the example METAR/SPECI format. Enter your answers in the spaces below.

Example: 08026G32KT 050V180

Decoding Description	Wind Group Characters
e Wind direction relative to true north	a. 26
c Unit of measurement	b. 050V180
a Wind speed	c. KT
b Variable wind direction	d. G32
d Maximum instantaneous wind speed gust	e. 080

Wind Group Summary

Wind speeds can affect all aircraft, although the larger the aircraft, the less significant the impact. Depending upon the aircraft and its performance, certain wind speeds can present hazardous situations for the pilots. As a controller, providing current surface wind information helps to ensure an aircraft is aware of the presence of hazardous wind conditions.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Instruct students to locate student exercise ***Wind Group Decoding*** in the printed ***Student Guide*** ■ The exercise will be performed individually ■ Instruct students to answer each question ■ Randomly select students to read aloud their answers to questions ■ Evaluate student responses, provide feedback and generate class discussion	Exercise
	EST. RUN TIME
	25 mins.

EXERCISE: WIND GROUP DECODING

Purpose
This exercise reinforces your ability to use the correct phraseology for a METAR/SPECI wind group.

Directions
Decode the following METAR/SPECI wind groups into the correct phraseology.

Detailed Facilitator Instructions: *Direct students to work individually to answer the following questions. After completion, select students randomly to provide answers orally while other students assess their own answers. Encourage student discussion with this exercise and resolve any questions the students may have on the exercise or phraseology for METAR/SPECI wind groups.*

WIND GROUP	DECODED
1. 00000KT	**"Wind calm"**
2. VRB05KT	**"Wind variable at five"**
3. 01008KT	**"Wind zero one zero at eight"**
4. 09010KT	**"Wind zero niner zero at one zero"**
5. 36012KT	**"Wind three six zero at one two"**
6. 32015G28KT	**"Wind three two zero at one five gusts two eight"**
7. 08032G45KT	**"Wind zero eight zero at three two gusts four five"**
8. 02007KT 340V050	**"Wind zero two zero at seven, wind variable between three four zero and zero five zero"**
9. 21022G37KT 160V220	**"Wind two one zero at two two gusts three seven, wind variable between one six zero and two two zero"**
10. 240101G116KT	**"Wind two four zero at one zero one gusts one one six"**

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Visibility and RVR Groups*** lesson in Blackboard ■ Instruct students to navigate to the ***Visibility and RVR Groups*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed	Blackboard **EST. RUN TIME** 15 mins.

VISIBILITY AND RVR GROUPS

Purpose: The purpose of this lesson is to translate the digits of the visibility and Runway Visual Range (RVR) groups when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI) and demonstrate how to properly announce each group.

Objectives:

- Decode visibility groups recorded on a METAR/SPECI
- Decode RVR groups recorded on a METAR/SPECI

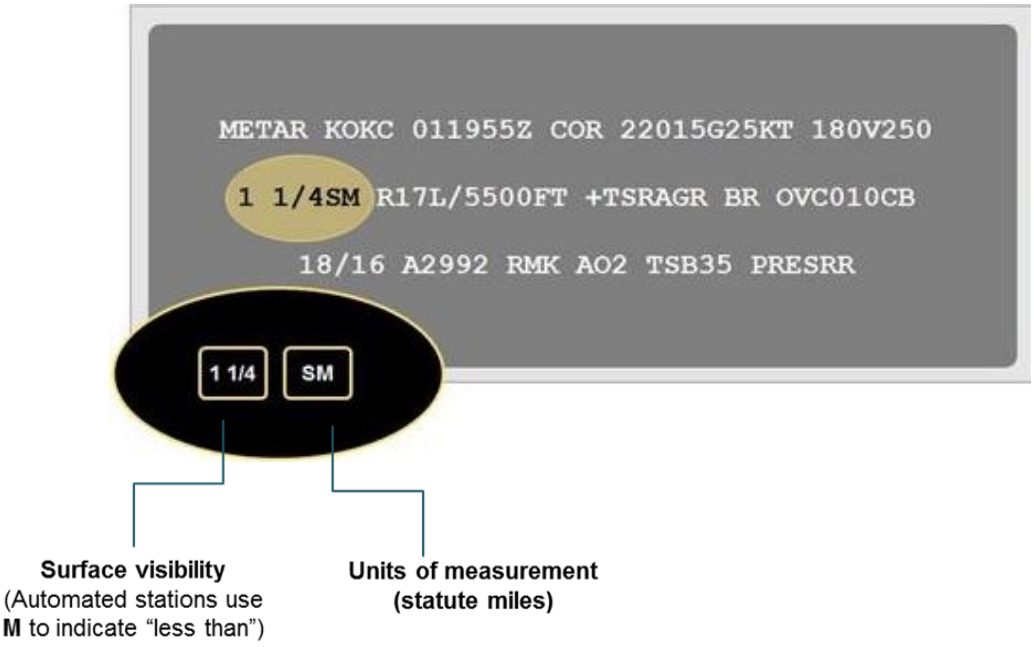
References for this lesson are as follows:

- AC 00-45, Aviation Weather Services
- FAA Order JO 7110.10, Flight Services
- Federal Meteorological Handbook No. 1 (FMH-1)

Visibility Group

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

Visibility Group Decoding



Announcing Visibility

State the word "*Visibility*" followed by the visibility value in statute miles and/or fractions of statute miles, and announce values indicated by the figure 0 as "zero."

- Announce the separate digits of whole numbers as applicable

Visibility Group Phraseology

Examples of Visibility Group Phraseology			
0SM	*"Visibility zero"*	3/4SM	*"Visibility three-quarters"*
1/16SM	*"Visibility one sixteenth"*	1 1/2 SM	*"Visibility one and one half"*
1/8SM	*"Visibility one eighth"*	8SM	*"Visibility eight"*
M1/4SM	*"Visibility less than one quarter"*	10SM	*"Visibility one zero"*

Knowledge Check D

REVIEW what you have learned so far about decoding visibility group on a METAR/SPECI report and phraseology. ANSWER the questions listed below.

1. What does the letter "M" indicate when used in a visibility group coding format? *(Select the correct answer.)*
   - ❑ Zero visibility
   - ❑ Meters
   - ❑ **Less than**

2. What unit of measurement is used in a visibility group format? *(Select the correct answer.)*
   - ❑ **Statute mile**
   - ❑ Knot
   - ❑ Standard mile

3. In this visibility group example, what does “3/4SM” represent? *(Select the correct answer.)*

Example: 3/4SM

   - ❑ Wind
   - ❑ Vertical visibility
   - ❑ Automated stations
   - ❑ **Surface visibility in statute miles**

Runway Visual Range (RVR) Group

The runway visual range (RVR) is an instrumentally derived value that represents the horizontal distance a pilot may see down the runway, or the distance the specified lights or markers delineating it can be seen from a position above a specific point on its center line. This value is normally determined by visibility sensors or transmissometers located alongside and higher than the center line of the runway. RVR is used operationally to assess whether visibility conditions are good enough to allow a particular operation, such as an instrument landing.

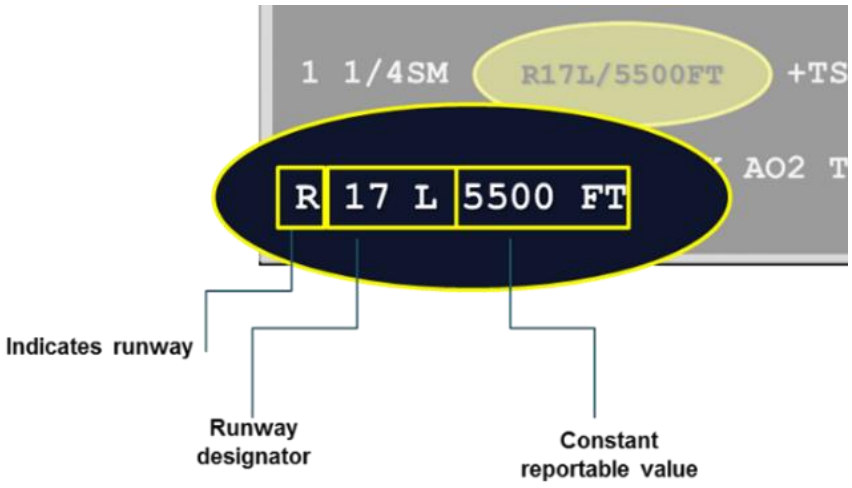
RVR is reported whenever:

- Visibility is 1SM or less
- RVR for the designated instrument runway is 6,000 feet or less

RVR Group Decoding

Note: *Constant reportable value in feet.*

- If the RVR is less than its lowest reportable value, the group is preceded by an “**M**” and spoken as *“less than”*
- If the RVR is greater than its highest reportable value, the group is preceded by a “**P**” and spoken as *“more than”*
- When the RVR is variable, both the lowest and highest values are coded with a “**V**” between them



Announcing RVR

Provide RVR information by stating the runway, the abbreviation RVR, and the indicated value.

- When the indicated values are separated by a “**V**,” preface the values with the words *“variable,”* followed by the first value, the word *“to,”* then the second value

Omit RVR when it is not reported.

RVR Group Phraseology

Examples of RVR Group Phraseology	
R16/M0600FT	*"Runway one six RVR less than six hundred"*
R17L/2400V3000FT	*"Runway one seven left RVR variable two thousand four hundred to three thousand"*
R28L/3500FT	*"Runway two eight left RVR three thousand five hundred"*
R35R/P6000FT	*"Runway three five right RVR more than six thousand"*

Knowledge Check E

REVIEW what you have learned so far about decoding RVR group on a METAR/SPECI report and phraseology. ANSWER the questions listed below.

1. In this example of an RVR group format, what does the "V" represent? *(Select the correct answer.)*

Example: R22/2100V3000FT

- ❑ More than
- ❑ **Variable**
- ❑ Value

2. What letter precedes the constant reportable value to indicate the RVR is greater than its highest reportable value? *(Select the correct answer.)*
   - ❑ M
   - ❑ V
   - ❑ **P**

3. In this example of an RVR group format, which characters designate the runway? *(Select the correct answer.)*

Example: R10L/2000FT

- ❑ R10
- ❑ **R10L**
- ❑ 2000

Visibility and RVR Groups Summary

A METAR or SPECI containing information related to visibility and RVR will determine if pilots can operate on a particular runway using a specific approach.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Instruct students to locate student exercise ***Visibility and RVR Groups Decoding*** in the printed ***Student Guide*** ■ The exercise will be performed individually ■ Instruct students to answer each question ■ Randomly select students to read aloud their answers to questions ■ Evaluate student responses, provide feedback and generate class discussion	Exercise **EST. RUN TIME** 25 mins.

EXERCISE: VISIBILITY AND RVR GROUPS DECODING

Purpose
This exercise reinforces your ability to use the correct phraseology for a METAR/SPECI visibility and RVR groups.

Directions
Decode the following METAR/SPECI wind groups into the correct phraseology.

Detailed Facilitator Instructions: *Direct students to work individually to answer the following questions. After completion, select students randomly to provide answers orally while other students assess their own answers. Encourage student discussion with this exercise and resolve any questions the students may have on the exercise or phraseology for METAR/SPECI visibility and RVR groups.*

Visibility or RVR GROUPS	DECODED
1. 4SM	**"Visibility four"**
2. 10SM	**"Visibility one zero"**
3. M 1/4 SM	**"Visibility less than one quarter"**
4. 1 1/2 SM	**"Visibility one and one half"**
5. R17/4500FT	**"Runway one seven, RVR four thousand five hundred"**
6. R26R/2400FT	**"Runway two six right, RVR two thousand four hundred"**
7. R18/2000V3000FT	**"Runway one eight, RVR variable two thousand to three thousand"**
8. R35C/M0600V1500FT	**"Runway three five center, RVR variable less than six hundred to one thousand five hundred"**

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Present Weather Group*** lesson in Blackboard ■ Instruct students to navigate to the ***Present Weather Group*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed	Blackboard **EST. RUN TIME** 12 mins.

PRESENT WEATHER GROUP

Purpose: The purpose of this lesson is to translate the digits of the present weather group when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI) and explain how to properly announce this group.

Objective:

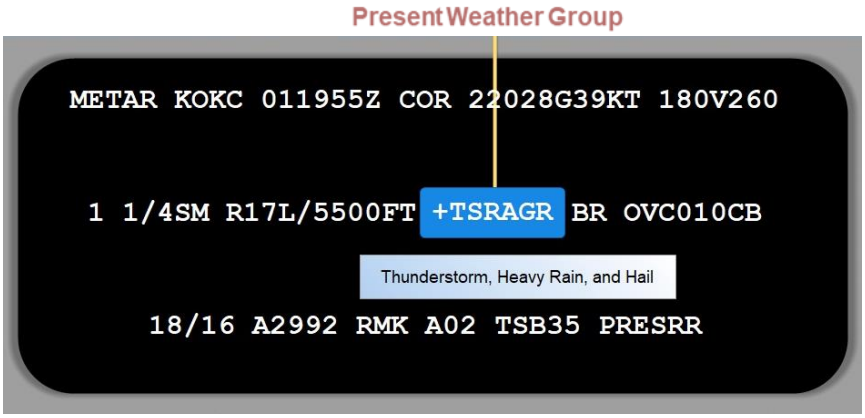
- Decode present weather groups recorded on a METAR/SPECI

References for this lesson are as follows:

- AC 00-45, Aviation Weather Services
- FAA Order JO 7110.10, Flight Services
- Federal Meteorological Handbook No. 1 (FMH-1)

Present Weather Group

The **present weather group** specifies any weather phenomena occurring at or in the vicinity of the station.



Notations for Reporting Present Weather

The weather groups are constructed by considering columns 1 to 5 in the sequence shown here, i.e., intensity, followed by description, followed by weather phenomena.

Qualifier		Weather Phenomena		
Intensity or Proximity 1	Descriptor 2	Precipitation 3	Obscuration 4	Other 5
- Light	MI Shallow	DZ Drizzle	BR Mist	PO Well-developed dust/sand whirls
Moderate	PR Partial	RA Rain	FG Fog	SQ Squalls
+ Heavy	BC Patches	SN Snow	FU Smoke	FC Funnel cloud, tornado, waterspout
VC in the vicinity	DR Low drifting	SG Snow grains	VA Volcanic Ash	SS Sandstorm
	BL Blowing	IC Ice crystals	DU Widespread dust	DS Dust storm
	SH Shower(s)	PL Ice pellets	SA Sand	
	TS Thunderstorm	GR Hail	HZ Haze	
	FZ Freezing	GS Small hail and/or snow pellets	PY Spray	
		UP Unknown precipitation		+TSRAGR

Qualifiers may be used in various combinations to describe the weather phenomena.

QUALIFIER		
Intensity or Proximity 1	**Descriptor 2**	
Intensity qualifiers are: ■ Light (-) ■ Moderate (no entry) ■ Heavy (+)		The **proximity qualifier** "vicinity" (VC) indicates weather phenomena between 5 and 10 statute miles from the point(s) of observation.
	Descriptors are qualifiers that further amplify weather phenomena and are used with certain types of precipitation and obscurations.	

Weather Phenomena

WEATHER PHENOMENA		
Precipitation 3	**Obscuration 4**	**Other 5**
Precipitation is any of the forms of water particles, whether liquid or solid, that fall from the atmosphere and reach the ground. Precipitation is listed in order of descending predominance.	**Obscuration** is any phenomenon in the atmosphere, other than precipitation, that reduces horizontal visibility.	

Example: Heavy freezing rain is coded as +FZRA

When more than one type of present weather is reported at the same time, present weather shall be reported in the following order:

- Tornadic activity – Tornado, Funnel Cloud, or Waterspout
- Thunderstorm(s) with or without associated precipitation
- Present weather in order of dominance, i.e., most dominant type first
- Left to right in the table (Columns 1 through 5)

QUALIFIER		WEATHER PHENOMENA		
Intensity or Proximity 1	**Descriptor 2**	**Precipitation 3**	**Obscuration 4**	**Other 5**

Announcing Present Weather Group

The **intensity qualifiers** are:

- Light (-) intensity spoken as "light"
- Moderate (no entry) intensity is not spoken
- Heavy (+) intensity spoken as "heavy"

Intensity qualifiers are coded with precipitation types, except ice crystals (IC) and hail (GR), including those associated with a thunderstorm (TS) and those of a showery nature (SH).

Tornadoes and waterspouts are coded as heavy (+FC).

No intensity is ascribed to the obscurations of blowing dust (BLDU), blowing sand (BLSA), and blowing snow (BLSN).

Only moderate or heavy intensity is ascribed to sandstorm (SS) and duststorm (DS).

The **proximity qualifier** (**VC**) is spoken as *"(phenomena) in the vicinity*."

Descriptors are spoken ahead of the weather phenomenon. Except for "showers," which is spoken after the precipitation.

Qualifier			
Intensity or Proximity 1		**Descriptor 2**	
-	Light	**MI**	Shallow
	Moderate	**PR**	Partial
+	Heavy	**BC**	Patches
VC	in the vicinity	**DR**	Low drifting
		BL	Blowing
		SH	Shower(s)
		TS	Thunderstorm
		FZ	Freezing

Note: *Since thunderstorms imply showery precipitation, "showers" may be used to describe precipitation that accompanies thunderstorms.*

Examples of Present Weather Phraseology			
-FZRA	*"Light freezing rain"*	**BLDU**	*"Blowing dust"*
+TSRA	*"Thunderstorm, heavy rain (showers)"*	**-FZDZ**	*"Light freezing drizzle"*
VCFG	*"Fog in the vicinity"*	**FZRA**	*"Freezing rain"*
VCBLSA	*"Blowing sand in the vicinity"*	**VCSH**	*"Showers in the vicinity"*
VCTS	*"Thunderstorm in the vicinity"*	**-FZRAPL FG**	*"Light freezing rain, ice pellets, fog"*
BCFG	*"Patchy fog"*	**+SHRA BR SQ**	*"Heavy rain showers, mist, squalls"*
DRSN	*"Low drifting snow"*	**+FC +TSRAGR**	*"Tornado, thunderstorm, heavy rain showers, hail"*
SHSN	*"Snow showers"*	**SN BLSN**	*"Snow, blowing snow"*

Note: *When multiple precipitation types are encoded, do NOT speak the word "and" between them.*

Knowledge Check F

REVIEW what you have learned so far about decoding present weather group on a METAR/SPECI report. ANSWER the questions listed below.

1. The present weather group specifies weather phenomena in which vicinity? *(Select the correct answer.)*
   - ❑ Aircraft
   - ❑ **Station**
   - ❑ Terminal

2. Which is the correct order for stating the present weather group? Enter your answers in the spaces below.

c	1	a. Other
b	2	b. Descriptor
d	3	c. Intensity or Proximity
e	4	d. Precipitation
a	5	e. Obscuration

3. If more than one type of present weather is reported at the same time, in which order should the following be reported? Enter your answers in the spaces below.

c	1	a. Thunderstorm weather
a	2	b. Present weather
b	3	c. Tornadic weather

4. What does intensity refer to in the present weather group? *(Select the correct answer.)*
   - ❑ **Precipitation**
   - ❑ Descriptors
   - ❑ Obscuration

Present Weather Summary

Weather can change at a moment's notice and must be reported as quickly as possible. Coding for the present weather group was designed for this. This lesson decoded the digits of the present weather group when recorded on a METAR or SPECI, and explained how to properly announce this group.

You must be prepared to interpret the weather identification codes rapidly and accurately.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ This portion of training will be conducted by the facilitator ■ Instruct students to locate study aid ***Present Weather Notation Definitions*** in ***Student Guide*** ■ Facilitator will review the terms and abbreviations in the study aid ■ Inform students of relevance of terminology to a METAR/SPECI ■ Address questions and facilitate a brief discussion ■ Instruct students to reference the study aid as they continue the module content	Study Aid **EST. RUN TIME** 25 mins.

STUDY AID: PRESENT WEATHER NOTATION DEFINITIONS

Blowing (BL)	A descriptor used to amplify observed weather phenomena whenever the phenomena are raised to a height of 6 feet or more above the ground.
Drizzle (DZ)	Fairly uniform precipitation composed exclusively of fine drops (diameter less than 0.02 inch or 0.5 mm) very close together. Drizzle appears to float while following air current, although unlike fog droplets, it falls to the ground.
Duststorm (DS)	A severe weather condition characterized by strong winds and dust-filled air over an extensive area.
Fog (FG)	A visible aggregate of minute water particles (droplets) that are based at the Earth's surface and reduce horizontal visibility to less than 5/8 statute mile and, unlike drizzle, do not fall to the ground.
Freezing (FZ)	A descriptor, FZ, used to describe drizzle and/or rain that freezes on contact with the ground or exposed objects. It is also used to describe fog that is composed of minute ice crystals.
Funnel cloud (FC)	A violent, rotating column of air that does not touch the surface, usually appended to a cumulonimbus cloud.
Hail (GR)	Precipitation in the form of small balls or other pieces of ice falling separately or frozen together in irregular lumps.
Haze (HZ)	A suspension in the air of extremely small, dry particles invisible to the naked eye and sufficiently numerous to give the air an opalescent appearance.
Ice crystals (diamond dust) (IC)	A fall of non-branched (snow crystals are branched) ice crystals in the form of needles, columns, or plates.
Ice pellets (PL)	Precipitation of transparent or translucent pellets of ice, which are round or irregular, rarely conical, and that have a diameter of 0.2 inch (5 mm) or less. There are two main types: a. Hard grains of ice consisting of frozen raindrops or largely melted and refrozen snowflakes. b. Pellets of snow encased in a thin layer of ice that has formed from the freezing either of droplets intercepted by the pellets or of water resulting from the partial melting of the pellets.
Intensity qualifier	Intensity qualifiers are used to describe whether a phenomenon is light (-), moderate (no symbol used), or heavy (+).
Low drifting (DR)	A descriptor, DR, used to describe snow, sand, or dust raised to a height of less than 6 feet above the ground.
Mist (BR)	A visible aggregate of minute water droplets or ice crystals suspended in the atmosphere that reduces visibility to less than 7 statute miles but greater than or equal to 5/8 statute mile.
Obscuration	Any phenomenon in the atmosphere, other than precipitation, that reduces the horizontal visibility in the atmosphere.
Partial (PR)	A descriptor, PR, used only to report fog that covers part of the airport.
Patches (BC)	A descriptor, BC, used only to report fog that occurs in patches at the airport.
Precipitation	Any of the forms of water particles, whether liquid or solid, that fall from the atmosphere and reach the ground.

Rain (RA)	Precipitation either in the form of drops larger than 0.02 inch (0.5 mm) or smaller drops that, in contrast to drizzle, are widely separated; for automated stations, precipitation that remains in the liquid state upon impact with the ground or other exposed objects.
Sand (SA)	Loose particles of granular material.
Sandstorm (SS)	Particles of sand carried aloft by a strong wind. The sand particles are mostly confined to the lowest 10 feet and rarely rise more than 50 feet above the ground.
Shallow (MI)	A descriptor, MI, used only to describe fog when the visibility at 6 feet above the ground is 5/8 statute mile or more and the apparent visibility in the fog layer is less than 5/8 statute mile.
Shower(s) (SH)	A descriptor, SH, used to qualify precipitation characterized by the suddenness with which it starts and stops, by the rapid changes of intensity, and usually by rapid changes in the appearance of the sky.
Smoke (FU)	A suspension in the air of small particles produced by combustion. A transition to haze may occur when smoke particles have traveled great distances (25 to 100 statute miles or more) and when the larger particles have settled out and the remaining particles have become widely scattered through the atmosphere.
Snow (SN)	Precipitation of snow crystals, mostly branched in the form of six-pointed stars; for automated stations, any form of frozen precipitation other than hail.
Snow grains (SG)	Precipitation of very small, white, opaque grains of ice.
Snow pellets (GS)	Precipitation of white, opaque grains of ice. The grains are round or sometimes conical. Diameters range from about 0.08 to 0.2 inch (2 to 5 mm).
Spray (PY)	An ensemble of water droplets torn by the wind from an extensive body of water, generally from the crests of waves, and carried up into the air in such quantities that it reduces the horizontal visibility.
Squall (SQ)	A strong wind characterized by a sudden onset in which the wind speed increases at least 16 knots and is sustained at 22 knots or more for at least one minute.
Thunderstorm (TS)	A cumulonimbus cloud that is accompanied by lightning and thunder, or for automated systems, a storm detected by lightning detection systems.
Tornado (+FC)	A violent, rotating column of air touching the ground; funnel cloud that touches the ground (see funnel cloud and waterspout).
Unknown Precipitation (UP)	Precipitation type that is reported if the automated station detects the occurrence of precipitation but the precipitation discriminator cannot recognize the type.
Vicinity (VC)	A proximity qualifier, VC, used to indicate weather phenomena observed between 5 and 10 statute miles of the usual point of observation but not at the station.
Volcanic ash (VA)	Fine particles of rock powder that originate from a volcano and that may remain suspended in the atmosphere for long periods.
Waterspout (+FC)	A violent, rotating column of air that forms over a body of water and touches the water surface; tornado or funnel cloud that touches a body of water (see funnel cloud and tornado).
Well-developed dust/sand whirl (PO)	An ensemble of particles of dust or sand, sometimes accompanied by small litter, raised from the ground in the form of a whirling column of varying height with a small diameter and an approximately vertical axis.
Widespread dust (DU)	Fine particles of earth or other matter raised or suspended in the air by the wind that may have occurred at or far away from the station.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Instruct students to locate student exercise ***Present Weather Group Decoding*** in the printed ***Student Guide*** ■ The exercise will be performed individually ■ Instruct students to answer each question ■ Randomly select students to read aloud their answers to questions ■ Evaluate student responses, provide feedback and generate class discussion	Exercise **EST. RUN TIME** 25 mins.

EXERCISE: PRESENT WEATHER GROUP DECODING

Purpose
This exercise reinforces your ability to use the correct phraseology for METAR/SPECI present weather group.

Directions
Decode the following METAR/SPECI present weather group into the correct phraseology.

Detailed Facilitator Instructions: *Direct students to work individually to answer the following questions. After completion, select students randomly to provide answers orally while other students assess their own answers. Encourage student discussion with this exercise and resolve any questions the students may have on the exercise or phraseology for METAR/SPECI present weather group.*

Visibility or RVR GROUPS	DECODED
1. BLSA	**"Blowing sand"**
2. +FZDZ	**"Heavy freezing drizzle"**
3. SNSGPL	**"Snow, snow grains, ice pellets"**
4. -RA FG	**"Light rain, fog"**
5. +DS	**"Heavy dust storm"**
6. VCFG	**"Fog in the vicinity"**
7. -TSRA VA	**"Thunderstorm, light rain (showers), volcanic ash"**
8. FC TS	**"Funnel cloud, thunderstorm"**
9. -SHRA FG SQ	**"Light rain shower, fog, squalls"**
10. RASN BR	**"Rain, snow, mist"**

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Sky Condition Group*** lesson in Blackboard ■ Instruct students to navigate to the ***Sky Condition Group*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed	Blackboard **EST. RUN TIME** 10 mins.

SKY CONDITION GROUP

Purpose: The purpose of this lesson is to translate the digits of the sky condition group when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI).

Objective:

- Decode sky condition group recorded on a METAR/SPECI

References for this lesson are as follows:

- AC 00-45, Aviation Weather Services
- FAA Order JO 7110.10, Flight Services
- Federal Meteorological Handbook No. 1 (FMH-1)

Sky Condition Group

Sky condition is the state of the sky in terms of sky cover, layers and associated heights, ceiling, and cloud types.

Sky Condition Group Definitions

The following definitions are associated with the sky condition group.

Sky Cover	The amount of sky which is covered by clouds or obscurations in contact with the surface.
Layer	An array of clouds and/or obscurations whose bases are at approximately the same level.
Summation Layer Amount	A categorization of the amount of sky cover at and below each reported layer.
Ceiling	The lowest layer aloft reported as broken or overcast; or the vertical visibility into an indefinite ceiling.
Vertical Visibility	A subjective or instrumental evaluation of the vertical distance into a surface-based obscuration that an observer would be able to see.
Indefinite Ceiling	The ceiling classification applied when the reported ceiling value represents the vertical visibility upward into a surface-based obscuration.

Contractions for Sky Cover

The following contractions are used to report visible sky cover.

Reportable Contraction	Meaning	Summation Amount of Layer
VV	Vertical Visibility	8/8
SKC or CLR[1]	Clear	0
FEW[2]	Few	1/8-2/8
SCT	Scattered	3/8-4/8
BKN	Broken	5/8-7/8
OVC	Overcast	8/8

*[1] **CLR** is used at automated stations when no layers at or below 12,000 feet are reported; **SKC** is used at manual stations when no layers are reported.*

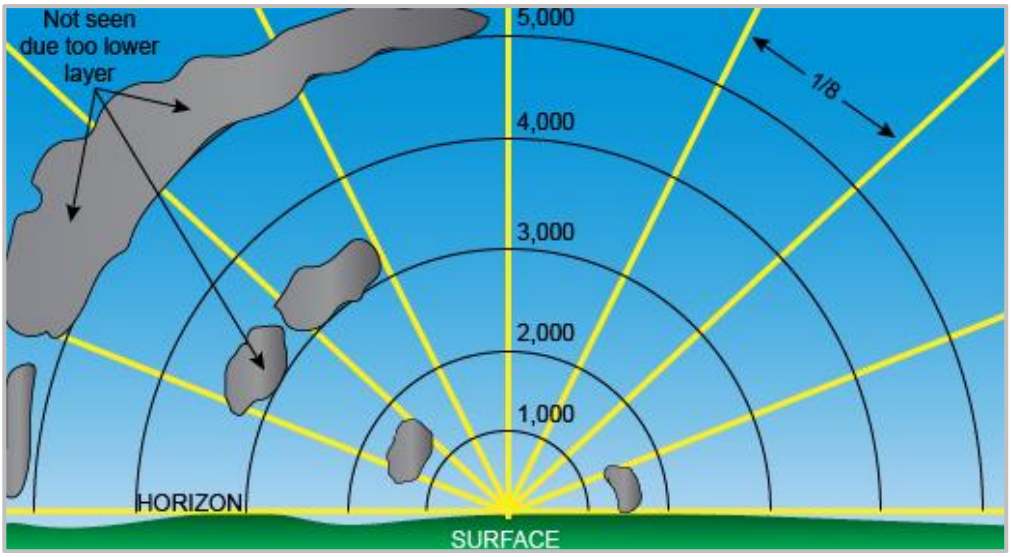
*[2] Any layer amount greater than 0 but less than 1/8 is reported as **FEW.***

Coding Formats

The sky condition group is coded in one of the following formats:

Cloud Cover Decoding

Sky Cover	**BKN** 012 TCU	The first three letters identify the amount of sky cover: (**FEW**, **SCT**, **BKN**, or **OVC**).
Height	BKN **012** TCU	Three digits that indicate the height of the layer in hundreds of feet AGL. ■ "000" indicates a layer is 50 feet or less **AGL** ■ "///" indicates the layer is below station level (e.g., FEW///)
Cloud Type	BKN 012 **TCU**	At manual stations, if towering cumulus (**TCU**) or cumulonimbus (**CB**) clouds are present, they are reported by appending the appropriate contraction to the layer that represents their base. ■ When a portion of the sky is obscured by a surfaced-based obscuration, the obscuration is reported using the appropriate sky cover contraction (**FEW**, **SCT** or **BKN**), with "000" entered for the layer height *Example:* **SCT000** • Remarks section will specify the cause of the partial obscuration *Example:* **RMK FG SCT000** ■ Sky condition is coded in ascending order • Each layer is separated from other layers by a space

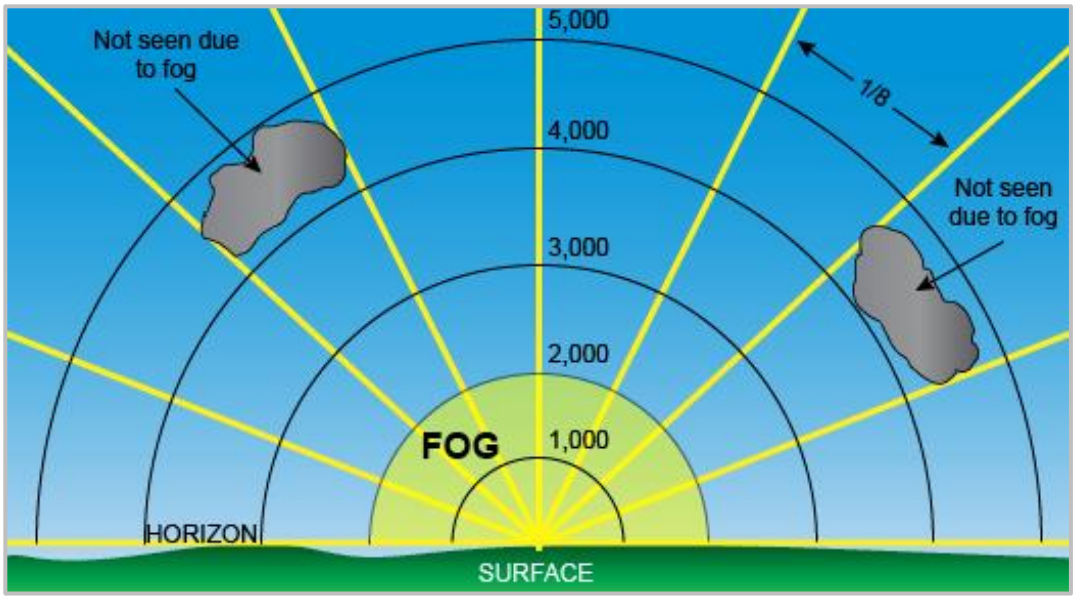
Example	Cloud Cover FEW013 SCT030 BKN050
	
	The sky condition group is coded: **FEW013 SCT030 BKN050**. ■ From the surface observer's position, a layer at 1,300 feet covers 2/8 of the sky **(FEW013)** ■ A higher layer at 3,000 feet covers an additional 1/8 of the sky • Therefore, the summation total equals 3/8 of the celestial dome **(SCT030)** ■ The highest layer at 5,000 feet covers an additional 2/8 of the sky • Therefore, the summation total equals 5/8 of the sky **(BKN050)**

Vertical Visibility Decoding

VV 005	**Format** **VV** – Indicates an indefinite ceiling **005 –** Vertical visibility into the indefinite ceiling *(in hundreds of feet **AGL**)*

Vertical Visibility Example

Vertical Visibility VV005



Example

The sky condition group is coded: **VV005**.

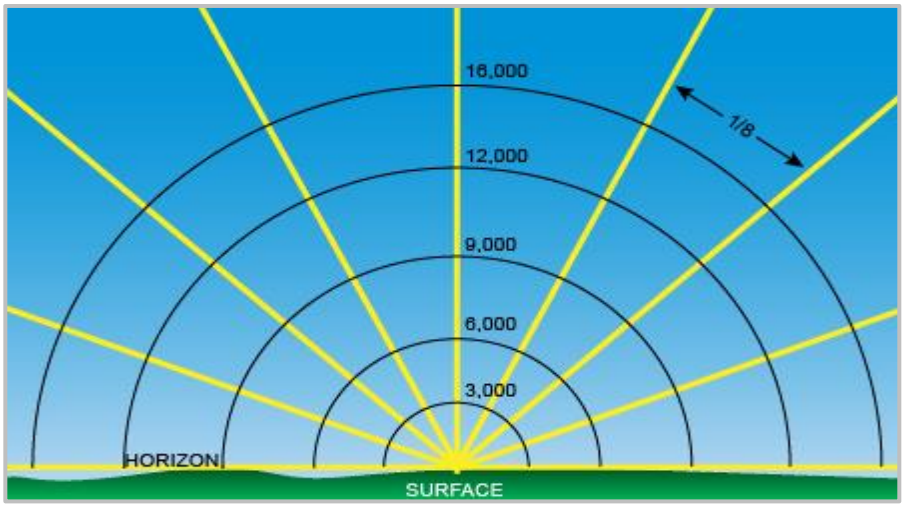
- Fog obscures the entire sky
- Vertical visibility into this surface-based obscuration is 500 feet

Clear Skies Decoding

SKC	**Format** Used by manual stations to indicate no layers are present
CLR	**Format** Used by automated stations to indicate no layers are detected at or below 12,000 feet above the surface

Clear Skies Examples

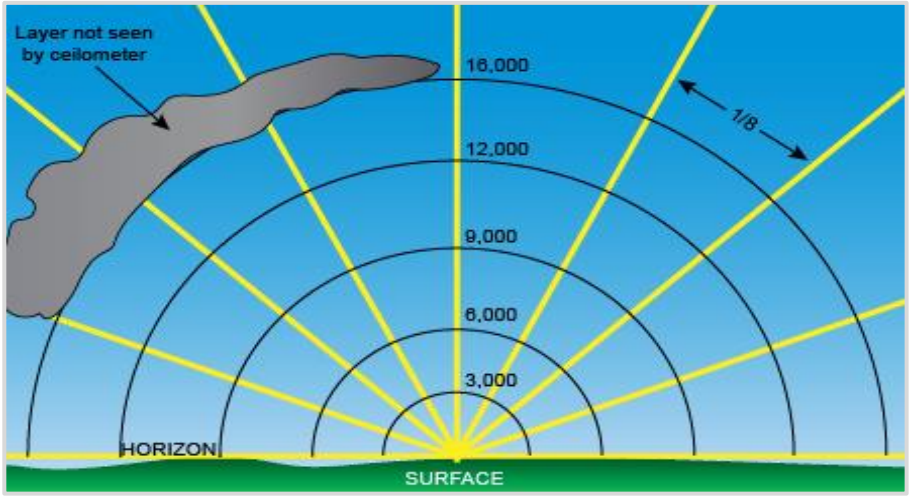
Example of SKC



The sky condition group is coded: **SKC**.

- The sky is clear as determined by manual observation

Example of CLR



The sky condition group is coded: **CLR**.

- The sky is clear at or below 12,000 feet as determined by an automated observing system
- The ceilometers at automated stations cannot presently detect layers above 12,000 feet

Knowledge Check G

REVIEW what you have learned so far about decoding sky condition group on a METAR/SPECI report. ANSWER the questions listed below.

1. Match the terms associated with sky condition group with the definition of the term. Enter your answers in the spaces below.

   b The lowest layer aloft reported as broken or overcast

   d The amount of sky that is covered by clouds or obstructions in contact with the surface

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

   e The state of the sky in terms of sky cover, layers, and associated heights, ceiling, and cloud types

   c An array of clouds and/or obscurations whose bases are approximately the same level

   a. Vertical visibility
   b. Ceiling
   c. Layer
   d. Sky cover
   e. Cloud cover

2. What does the contraction "FEW" indicate when reported in a sky condition group coding format? *(Select the correct answer.)*
   - ❑ Height of layers
   - ❑ **Amount of sky cover**
   - ❑ Cloud type

3. How should the contractions "TCU" or "CB" be included in a sky condition group format on a METAR report? *(Select the correct answer.)*
   - ❑ Append the contraction as a remark and add RMK
   - ❑ Append the contraction with "000" entered for the layer height
   - ❑ **Append the contraction to the layers that represent their base**

Sky Condition Group Summary

Visibility is important in all phases of flight, but especially when an aircraft is maneuvering on or close to ground. Departing and arriving aircraft are limited by visibility and require current sky group conditions provided by a METAR/SPECI. As a controller, it is essential to understand and correctly report current visible sky cover conditions to all aircraft.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Review content presented in ***Wind, Visibility and RVR, Present Weather,*** and ***Sky Condition Group*** lessons ■ Navigate to the ***Parking Lot*** link within Blackboard and review any student questions ■ Address ***Parking Lot*** questions and facilitate a brief discussion of the lesson content	Facilitated Discussion **EST. RUN TIME** 30 mins.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Sky Condition Group Phraseology*** lesson in Blackboard ■ Instruct students to navigate to the ***Sky Condition Group Phraseology*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed	Blackboard **EST. RUN TIME** 12 mins.

SKY CONDITION GROUP PHRASEOLOGY

Purpose: The purpose of this lesson is to identify how to properly announce sky condition group when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI).

Objective:

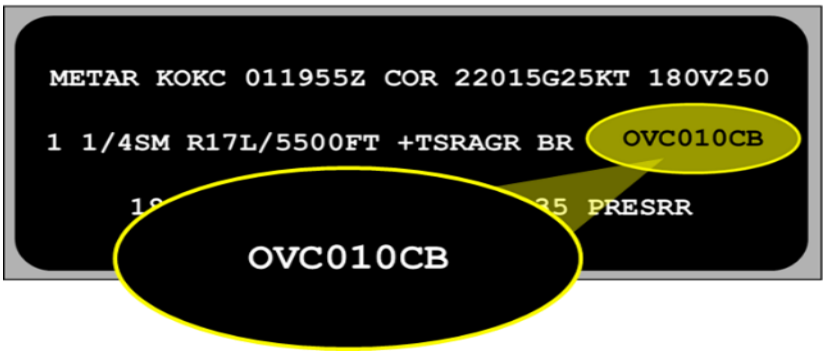
- Decode sky condition group phraseology recorded on a METAR/SPECI

References for this lesson are as follows:

- AC 00-45, Aviation Weather Services
- FAA Order JO 7110.10, Flight Services
- Federal Meteorological Handbook No. 1 (FMH-1)

Sky Condition Group

Sky condition is the state of the sky in terms of sky cover, layers and associated heights, ceiling, and cloud types.



Ceiling and Sky Coverage

State sky coverage in the same order as reported on the weather observation.

"Ceiling" before the lowest layer aloft reported as: Broken or Overcast

"Sky partially obscured" for partial-surface based obscurations

"Indefinite ceiling" in place of Vertical Visibility (VV)

Contraction	Phraseology
BKN000[1]	*"Sky partially obscured"*
BKN000[2]	*"Ceiling less than five zero broken"*
FEW000[1]	*"Sky partially obscured"*
FEW000[2]	*"Few clouds at less than five zero"*
SCT000[1]	*"Sky partially obscured"*
SCT000[2]	*"Less than five zero scattered"*
(lowest layer aloft) **BKN/OVC**	*(precede with) "Ceiling"*
VV	*"Indefinite ceiling"*

[1] *Surface-based obscurations. Requires remarks, i.e. RMK FG SCT000, FU BKN000. etc.*

[2] *No remark means the layer is aloft.*

Cloud Heights

State cloud heights in tens, hundreds and/or thousands of feet.

Spoken as zero only when used with VV

Layer Height	Phraseology
000	*"Indefinite ceiling zero"*
003	*"Three hundred"*
018	*"One thousand, eight hundred"*
200	*"Two zero thousand"*

Note:

When the ceiling is less than 3,000 feet and variable, the variable limits will be reported in the remarks.

Sky Conditions

Announce sky conditions as indicated below

Automated weather reports

Contraction	Phraseology
SKC	*"Sky clear"*
CLR	*"Clear below one two thousand"*
FEW	*"Few clouds at (height)"*
SCT	*"(height) scattered"*
BKN	*"Ceiling (height) broken"*
OVC	*"Ceiling (height) overcast"*

Significant Cloud Types

At manual stations, cumulonimbus (**CB**) or towering cumulus (**TCU**) is appended to the associated layer.

Contraction	Phraseology
CB	*"Cumulonimbus"*
TCU	*"Towering cumulus"*

Examples of Sky Condition Group Phraseology

FEW004 SCT016 BKN085	*"Few clouds at four hundred, one thousand six hundred scattered, ceiling eight thousand five hundred broken"*
SCT037TCU OVC150	*"Three thousand seven hundred scattered towering cumulus, ceiling one five thousand overcast"*
VV000	*"Indefinite ceiling zero"*
VV006	*"Indefinite ceiling six hundred"*
FEW000 BKN014CB BKN250 (no remarks)	*"Few clouds at less than five zero, ceiling one thousand four hundred broken cumulonimbus, two five thousand broken"*
BKN000 BKN010 OVC049 RMK FG BKN000	*"Sky partially obscured, ceiling one thousand broken, four thousand niner hundred overcast"*
SCT000 SCT021 OVC036 RMK BR SCT000	*"Sky partially obscured, two thousand one hundred scattered, ceiling three thousand six hundred overcast"*

Knowledge Check H

REVIEW what you have learned so far about decoding sky condition group phraseology on a METAR/SPECI report. ANSWER the questions listed below.

1. Which of the following are correct when reporting sky condition group on a METAR/SPECI report? *(Select all correct answers that apply.)*
   - ❑ **State cloud heights in tens, hundreds and/or thousands of feet**
   - ❑ State cloud widths in tens, hundreds and/or thousands of feet
   - ❑ State cloud coverage reported in weather observation, then sky coverage
   - ❑ **State sky coverage in same order as reported in weather observation**

2. Match the contraction or designator associated with sky condition group with the correct phraseology. Enter your answers in the spaces below.

a.	SKC	____	"Indefinite ceiling"
b.	SCT000	____	"Clear"
c.	FEW005	____	"Ceiling one thousand broken"
d.	VV	____	"Few clouds at five hundred"
e.	BKN010	____	"Sky partially obscured"

Sky Condition Group Phraseology Summary

As a controller, it is essential to correctly announce current sky cover conditions recorded on a METAR or SPECI to all aircraft, especially as they maneuver to depart and arrive when visibility is limited.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Review content presented in the ***Sky Condition Group Phraseology*** lesson ■ Navigate to the ***Parking Lot*** link within Blackboard and review any student questions ■ Address ***Parking Lot*** questions and facilitate a brief discussion of the lesson content	Facilitated Discussion **EST. RUN TIME** 30 mins.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Instruct students to locate student exercise ***Sky Condition Group Decoding*** in the printed ***Student Guide*** ■ The exercise will be performed individually ■ Instruct students to answer each question ■ Randomly select students to read aloud their answers to questions ■ Evaluate student responses, provide feedback and generate class discussion	Exercise **EST. RUN TIME** 15 mins.

EXERCISE: SKY CONDITION GROUP DECODING

Purpose
This exercise reinforces your ability to use the correct phraseology for METAR/SPECI sky condition group.

Directions
Decode the following METAR/SPECI sky condition group into the correct phraseology.

Detailed Facilitator Instructions: *Direct students to work individually to answer the following questions. After completion, select students randomly to provide answers orally while other students assess their own answers. Encourage student discussion with this exercise and resolve any questions the students may have on the exercise or phraseology for METAR/SPECI sky condition group.*

SKY CONDITION GROUP	DECODED
1. FEW013 BKN034TCU	**"Few clouds at one thousand three hundred, ceiling three thousand four hundred broken towering cumulus"**
2. BKN022 BKN035	**"Ceiling two thousand two hundred broken, three thousand five hundred broken"**
3. FEW009 BKN018CB OVC250	**"Few clouds at niner hundred, ceiling one thousand eight hundred broken cumulonimbus, two five thousand overcast"**
4. VV002	**"Indefinite ceiling two hundred"**
5. FEW000 BKN007 (no remarks)	**"Few clouds at less than five zero, ceiling seven hundred broken"**
6. SCT000 SCT200 RMK FU SCT000	**"Sky partially obscured, two zero thousand scattered"**

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Temperature/Dew Point and Altimeter Groups*** lesson in Blackboard ■ Instruct students to navigate to the ***Temperature/Dew Point and Altimeter Groups*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed	Blackboard **EST. RUN TIME** 10 mins.

TEMPERATURE/DEW POINT AND ALTIMETER GROUPS

Purpose: The purpose of this lesson is to translate the digits of the temperature/dew point and altimeter groups when recorded on an Aviation Routine Weather Report (METAR) or the Aviation Selected Special Weather Report (SPECI) and explain how to properly announce these groups.

Objective:

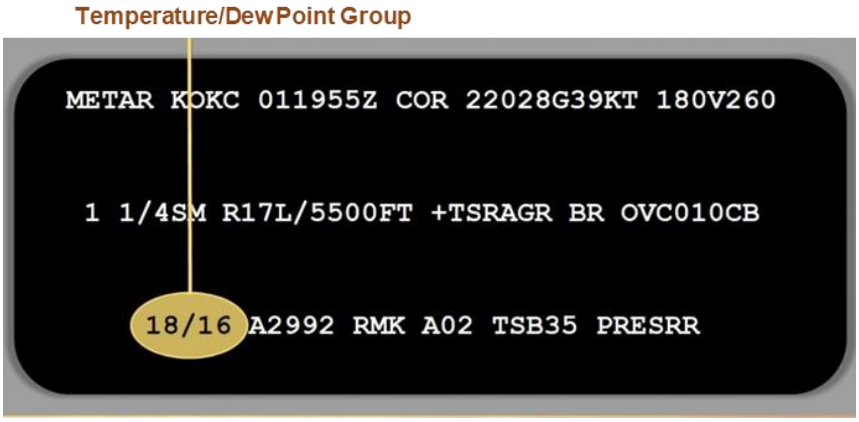
- Decode temperature/dew point and altimeter groups recorded on a METAR/SPECI

References for this lesson are as follows:

- AC 00-45, Aviation Weather Services
- FAA Order JO 7110.10, Flight Services
- Federal Meteorological Handbook No. 1 (FMH-1)

Temperature/Dew Point Group

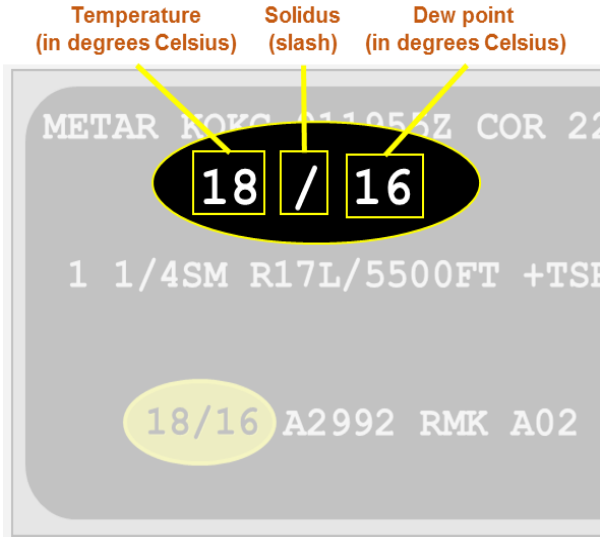
Temperature is a measure of the hotness or coldness of the air as measured by a thermometer. **Dew point** is the temperature to which the air must be cooled at constant pressure and constant water-vapor content in order for saturation to occur.



Temperature/Dew Point Format

The **Temperature/Dew Point Group** coding format is:

- **18** – The first two digits indicate the temperature rounded to the nearest whole degree Celsius
- / – Solidus or slash
- **16** – The final two digits indicate the dew point rounded to the nearest whole degree Celsius



Temperatures and dew points below zero are prefixed with an **M.**

If the dew point is not available, the temperature is coded followed by a solidus "**/**" and no entry made for dew point.

If the temperature is not available, the entire group will not be coded.

Announcing Temperature/Dew Point Group

Announce surface temperature and dew point by stating the words “temperature” or “dew point” as appropriate, followed by the temperature in degrees Celsius.

- Temperatures below zero are announced by prefixing the word “Minus” before the value
- The leading zero is not spoken in single-digit temperatures

Examples of Temperature/Dew Point Phraseology			
32/18	*“Temperature three two, dew point one eight”*	M03/M12	*“Temperature minus three, dew point minus one two”*
14/06	*“Temperature one four, dew point six”*	15/	*“Temperature one five, dew point missing”*
00/M06	*“Temperature zero, dew point minus six”*	*(no entry displayed)*	*“Temperature missing, dew point missing”*

Knowledge Check I

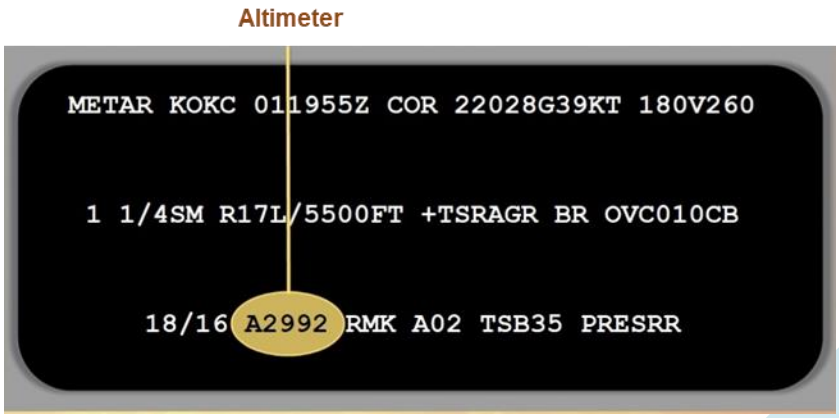
REVIEW what you have learned so far about decoding temperature/dew point group on a METAR/SPECI report. ANSWER the questions listed below.

1. When the temperature is unavailable, how is it displayed? *(Select the correct answer.)*
   - ❑ Only the altimeter is displayed
   - ❑ **The entire group will not be coded**
   - ❑ The temperature is displayed in zeros

2. How are temperatures below zero prefixed? *(Select the correct answer.)*
   - ❑ L…
   - ❑ B…
   - ❑ **M…**

Altimeter

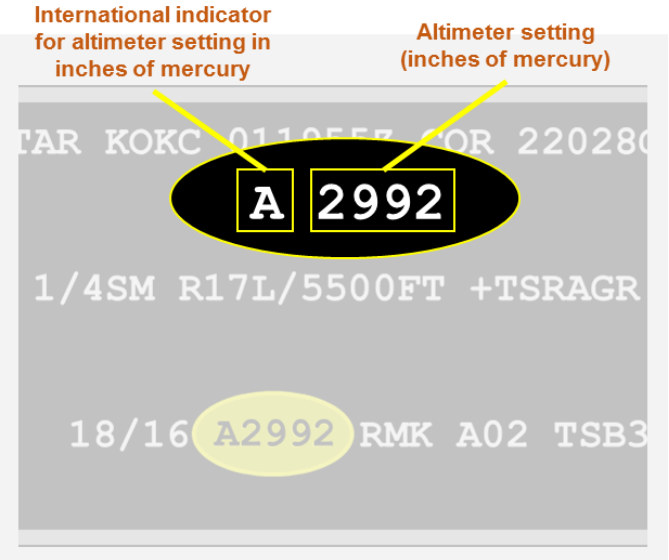
Altimeter Setting is the pressure value to which an aircraft altimeter scale is set so that it will indicate the altitude above mean sea level (MSL) of an aircraft on the ground at the location for which the value was determined.



Altimeter Decoding

The altimeter coding format is:

- A – The international indicator for altimeter setting in inches of mercury
- 2992 – The altimeter setting coded as a four-digit group using the tens, units, tenths, and hundredths of inches of mercury
    - The decimal point is not coded



Announcing Altimeter

State the word “altimeter” followed by the four digits of the altimeter setting.

- The decimal point is not spoken

Examples of Altimeter Phraseology			
A3042	*“Altimeter three zero four two”*	A2987	*“Altimeter two niner eight seven”*
A3025	*“Altimeter three zero two five”*	A2961	*“Altimeter two niner six one”*

Knowledge Check J

REVIEW what you have learned so far about decoding altimeter group on a METAR/SPECI report. ANSWER the question listed below.

1. Which of the following features are true about an altimeter setting? *(Select all correct answers that apply.)*
    - ❑ **Indicates the pressure value of an aircraft altimeter**
    - ❑ Indicates the altitude above ground level
    - ❑ **Measured in inches of mercury**
    - ❑ Stated “alt” when read from a weather report
    - ❑ **The reading does not code the decimal point**

Temperature/Dew Point and Altimeter Groups Summary

A weather report may not always include temperature/dew point and altimeter measurements, but it is important to know how to report them. This lesson translated the digits of the temperature/dew point and altimeter groups when recorded on a METAR or a SPECI, and explained how to properly announce these groups. Be prepared to interpret these codes rapidly and accurately to your pilots.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Review content presented in ***Temperature/Dew Point and Altimeter Groups*** lesson ■ Navigate to the ***Parking Lot*** link within Blackboard and review any student questions ■ Address ***Parking Lot*** questions and facilitate a brief discussion of the lesson content	Facilitated Discussion **EST. RUN TIME** 10 mins.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Instruct students to locate student exercise ***Temperature/Dew Point and Altimeter Groups Decoding*** in the printed ***Student Guide*** ■ The exercise will be performed individually ■ Instruct students to answer each question ■ Randomly select students to read aloud their answers to questions ■ Evaluate student responses, provide feedback and generate class discussion	Exercise **EST. RUN TIME** 20 mins.

EXERCISE: TEMPERATURE/DEW POINT AND ALTIMETER GROUPS DECODING

Purpose
This exercise reinforces your ability to use the correct phraseology for METAR/SPECI temperature/dew point and altimeter groups.

Directions
Decode the following METAR/SPECI temperature/dew point and altimeter groups into the correct phraseology.

Detailed Facilitator Instructions: *Direct students to work individually to answer the following questions. After completion, select students randomly to provide answers orally while other students assess their own answers. Encourage student discussion with this exercise and resolve any questions the students may have on the exercise or phraseology for METAR/SPECI temperature/dew point and altimeter groups.*

TEMP/DEW POINT OR ALTIMETER GROUP	DECODED
1. 34/21	**"Temperature three four, dew point two one"**
2. 15/06	**"Temperature one five, dew point six"**
3. 00/M08	**"Temperature zero, dew point minus eight"**
4. M07/	**"Temperature minus seven, dew point missing"**
5. A3047	**"Altimeter three zero four seven"**
6. A3015	**"Altimeter three zero one five"**
7. A2986	**"Altimeter two niner eight six"**
8. A2973	**"Altimeter two niner seven three"**

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ ***ENABLE Remarks*** lesson in Blackboard ■ Instruct students to navigate to the ***Remarks*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed	Blackboard
	EST. RUN TIME
	45 mins.

REMARKS

Purpose: The purpose of this lesson is to identify the components of the remarks group as shown on an Aviation Routine Weather Report or an Aviation Selected Special Weather Report, and to practice translating and announcing the entire report.

Objectives:

- Identify components of remarks as shown on a METAR/SPECI
- Identify decoded examples of a METAR/SPECI

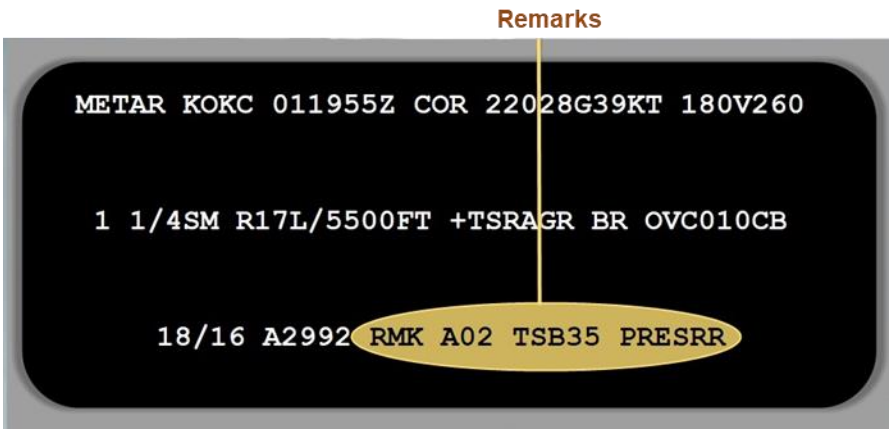
References for this lesson are as follows:

- AC 00-45, Aviation Weather Services
- FAA Order JO 7110.10, Flight Services
- Federal Meteorological Handbook No. 1 (FMH-1)

Remarks

Remarks are plain language or coded data added to the body of the METAR/SPECI to report significant information not provided in the body of the report.

- Remarks are separated from the body of the report by the contraction **RMK**
- If there are no remarks, the contraction **RMK** is omitted
- Remarks fall into two categories:
  - Automated, Manual, and Plain Language
  - Additive and Automated Maintenance Data
- Time entries for remarks are generally coded in minutes past the hour if the phenomenon occurs during the same hour the observation was taken
  - Hours and minutes are coded if the hour is different



- **DSNT** indicates weather phenomena beyond 10 statute miles (SM) of the point(s) of observation

Note: *Plain language remarks are only provided from manual stations. A manual station is a control tower that inputs weather data.*

Information Contained in Remarks

Here is the kind of information you will find in the remarks section of a METAR/SPECI.

- Volcanic eruption
- Funnel cloud
- Peak wind
- Wind shift
- Tower or surface visibility
- Variable prevailing visibility
- Sector visibility
- Lightning
- Beginning and ending of precipitation
- Beginning and ending of thunderstorms
- Thunderstorm location
- Hailstone size
- Virga
- Variable ceiling height
- Obscurations
- Variable sky condition
- Significant cloud types
- Pressure rising or falling rapidly
- Snow increasing rapidly
- Other significant information

Volcanic Eruption Phraseology

Volcanic Eruption is an explosion caused by the intense heating of subterranean rock that expels lava, steam, ashes, etc., through vents in the Earth's crust. Volcanic eruptions are coded in plain language.

Volcanic eruptions contain:

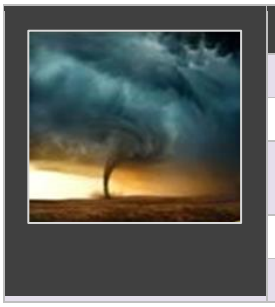
1. NAME	2. LOCATION	3. DATE/TIME	4. DESCRIPTION	5. OTHER DATA
Name of volcano	Latitude and longitude or the direction and approximate distance from the station	Date/time (UTC) of the eruption	Size, description, approximate height, and direction of movement of the ash cloud	Any other pertinent data about the eruption

Example:

MT. AUGUSTINE VOLCANO 70 MILES SW ERUPTED 231505 LARGE ASH CLOUD EXTENDING TO APRX 30000 FEET MOVING NE.	*"Mount Augustine volcano, seven zero miles southwest, erupted at one five zero five, large ash cloud extending to approximately three zero thousand feet, moving northeast."*

Funnel Cloud Coding and Phraseology

Funnel cloud is a violent, rotating column of air that does not touch the surface, usually appended to a cumulonimbus cloud. **Tornado** is a violent, rotating column of air touching the ground. **Waterspout** is a violent, rotating column of air that forms over a body of water and touches the water surface; tornado that touches a body of water.



RMK TORNADO B 2159 1/4NW MOV NE	
TORNADO	Tornado activity **(TORNADO, FUNNEL CLOUD, or WATERSPOUT)**
B	**B** denotes beginning; **E** denotes ending
2159	Time of occurrence (UTC) (Only the minutes are required if the hour can be inferred from the report time)
1/4NW	Location and/or direction of the phenomena from the station
MOV NE	Movement (if known)

Examples:

FUNNEL CLOUD B38 OVHD MOV NE	*"Funnel cloud began at three eight, overhead, moving northeast"*
TORNADO B13 1SE MOV NE	*"Tornado began at one three, one southeast, moving northeast"*

Peak Wind Coding and Phraseology

Peak Wind Speed is the maximum instantaneous wind speed that exceeded 25 knots since the last METAR.

PK WND 19042/2157	
PK WND	Remark identifier
190	Direction (degrees) of the peak wind
42	Speed (knots) of the peak wind since the last METAR
/	Solidus or slash
2157	Time of occurrence

Examples:

PK WND 33048/22	*"Peak wind three three zero at four eight occurred at two two past the hour"*
PK WND 28065/2359	*"Peak wind two eight zero at six five occurred at two three five niner"*

Knowledge Check K

REVIEW what you have learned so far about decoding remarks on a METAR/SPECI report. ANSWER the questions listed below.

1. How are volcanic eruptions coded? *(Select the correct answer.)*
   - ❑ Raw code
   - ❑ Contractions
   - ❑ **Plain language**

2. How would **FUNNEL CLOUD B38 OVHD MOV NE** be decoded? *(Select the correct answer.)*
   - ❑ ***"Funnel cloud began at three eight, overhead, moving northeast"***
   - ❑ *"Funnel cloud started at three eight, overhead, moving northeast"*
   - ❑ *"Funnel cloud began at three eight, overhead, moving southeast"*

3. Peak wind speed is the maximum wind speed that has exceeded how many knots since the last METAR? *(Select the correct answer.)*
   - ❑ 30
   - ❑ 15
   - ❑ **25**

Wind Shift Coding and Phraseology

Wind Shift is a change in the wind direction of 45 degrees or more in less than 15 minutes with sustained wind speeds of 10 knots or more throughout the wind shift.

WSHFT 0159 FROPA	
WSHFT	Remark identifier
0159	Followed by either two (or four) digits that indicate the time the wind shift began (UTC) *(Only the minutes are required if the hour can be inferred from the report time)*
FROPA	The contraction **FROPA** may be entered following the time if it is reasonably certain that the wind shift was the result of a frontal passage

Examples:

WSHFT 0258	*"Wind shifted at zero two five eight"*
WSHFT 30 FROPA	*"Wind shifted at three zero due to frontal passage"*

Tower or Surface Visibility Coding and Phraseology

Surface Visibility is the prevailing visibility determined from the usual point of observation. **Tower Visibility** is the prevailing visibility determined from the airport traffic control tower (ATCT) when the surface visibility is determined from another location.

TWR VIS 1 1/4	
TWR VIS	**TWR VIS** or **SFC VIS** – tower or surface visibility identifier
1 1/4	Observed tower/surface visibility value in statute miles

Examples:

SFC VIS 1/2	*"Surface visibility one-half"*
TWR VIS 1 3/4	*"Tower visibility one and three-quarters"*

Variable Prevailing Visibility Coding and Phraseology

Variable Prevailing Visibility is a condition when the prevailing visibility is less than 3 statute miles and rapidly increases and decreases by ½ mile or more during the period of observation.

VIS 1/2 V 2	
VIS	Remark identifier
1/2	Lowest visibility evaluated (statute miles)
V	Denotes variability between two values
2	Highest visibility evaluated (statute miles)

Examples:

VIS 1V3	*"Visibility variable between one and three"*
VIS 3/4V1 1/2	*"Visibility variable between three-quarters and one and one-half"*

Sector Visability Coding and Phraseology

Sector Visibility is the visibility in a specified direction that represents at least a 45-degree arc of the horizon circle.

VIS SE-S 1 1/2	
VIS	Remark identifier
SE-S	Defines the sector to eight points of the compass
1 1/2	Sector visibility (statute miles)

Examples:

VIS S 1 W 1/4	*"Visibility south one, west one-quarter"*
VIS NE-SE 1/4 S-SW 3/4	*"Visibility northeast through southeast one-quarter, south through southwest three-quarters"*

Knowledge Check L

REVIEW what you have learned so far about decoding remarks on a METAR/SPECI report. ANSWER the questions listed below.

1. Wind shift is a change in the wind direction of at least how many degrees? *(Select the correct answer.)*
   - ❑ 35
   - ❑ **45**
   - ❑ 65

2. How would *"Surface visibility one-half"* be coded? *(Select the correct answer.)*
   - ❑ SRF VIS ½
   - ❑ **SFC VIS ½**
   - ❑ TWR VIS ½

3. Sector visibility covers how many degrees of the horizon circle in a specified direction? *(Select the correct answer.)*
   - ❑ **45**
   - ❑ 35
   - ❑ 90

Lightning Decoding/Frequency of Lightning

Lightning generally includes any and all forms of visible electrical discharge produced by a thunderstorm. Frequency and type of lightning are reported when seen by the weather observer.

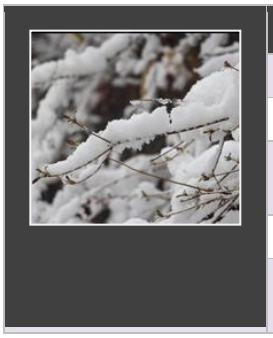
Frequency of Lightning		
Frequency	**Contraction**	**Definition**
Occasional	OCNL	Less than 1 flash/minute
Frequent	FRQ	1 to 6 flashes/minute
Continuous	CONS	More than 6 flashes/minute
Type of Lightning		
Type	**Contraction**	**Definition**
Cloud-to-ground	CG	Lightning occurring between cloud and ground
In-cloud	IC	Lightning that takes place within the cloud
Cloud-to-cloud	CC	Streaks of lightning reaching from one cloud to another
Cloud-to-air	CA	Streaks of lightning that pass from a cloud to the air but do not strike the ground

Examples of Lightning Phraseology:

OCNL LTGCG OHD	*"Occasional lightning cloud-to-ground overhead"*
OCNL LTG DSNT NW	*"Occasional lightning distant northwest"*
FRQ LTGCGCC W	*"Frequent lightning, cloud-to-ground, cloud-to-cloud, west"*
CONS LTGCGICCCCA ALQDS	*"Continuous lightning, cloud-to-ground, in-cloud, cloud-to-cloud, cloud-to-air, all quadrants"*

Beginning and Ending of Precipitation Coding and Phraseology

This format is used at designated stations.



RAB0758E12	
RA	Type of precipitation
B	Denotes beginning
0758	Beginning time of occurrence (UTC) (Only the minutes are required if the hour can be inferred from the report time)
E	Denotes ending
12	Ending time of occurrence (UTC) (Only the minutes are required if the hour can be inferred from the report time)

Examples:

PLE16SNB16	*"Ice pellets ended at one six, snow began at one six"*
SHRAB05E30SHSNB20E55	*"Rain showers began at zero five, ended at three zero, snow showers began at two zero, ended at five five"*

***Note*: *See present weather group for a list of precipitation types*.**

Beginning and Ending of Thunderstorms Coding and Phraseology

TSB1258E37	
TS	Indicates thunderstorm
B	Denotes beginning
1258	Beginning time of occurrence (UTC) (Only the minutes are required if the hour can be inferred from the report time)
E	Denotes ending
37	Ending time of occurrence (UTC) (Only the minutes are required if the hour can be inferred from the report time)

Examples:

TSB22E44	*"Thunderstorm began at two two, ended at four four"*
TSB0159E30	*"Thunderstorm began at zero one five niner, ended at three zero"*

Thunderstorm Location Coding and Phraseology

TS NE MOV SE	
TS	Identifies thunderstorm activity
NE	Location of the thunderstorm(s) from the station
MOV SE	Movement with direction (if known)

Examples:

TS OHD MOV E	*"Thunderstorm overhead, moving east"*
TS W MOV E	*"Thunderstorm west, moving east"*

Hailstone Size Coding and Phraseology

GR 3 3/4	
GR	Remark identifier
3 3/4	Diameter of the largest hailstone coded in ¼-inch increments; "LESS THAN ¼" for small hail

Examples:

GR 3/4	*"Hailstones three-quarter inches in diameter"*
GR 2	*"Hailstones two inches in diameter"*

Virga Coding and Phraseology

Virga is visible wisps or strands of precipitation falling from clouds that evaporate before reaching the surface.

VIRGA NE-E	
VIRGA	Remark identifier
NE-E	Direction from the station

Examples:

VIRGA	*"Virga"*
VIRGA SW	*"Virga southwest"*

Note: *Virga is important because it could indicate the beginning of a dry microburst. Also, the virga could consist of supercooled water droplets and be an icing hazard at altitude.*

Variable Ceiling Height Coding and Phraseology

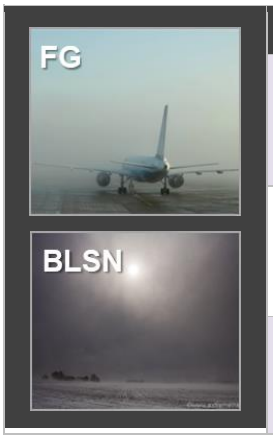
Variable Ceiling is a ceiling of less than 3,000 feet that rapidly increases or decreases in height during the period of observation.

CIG 007V018	
CIG	Remark identifier
007	Lowest ceiling height evaluated (feet)
V	Denotes variability between two values
018	Highest ceiling height evaluated (feet)

Examples:

CIG 005V010	*"Ceiling variable between five hundred and one thousand"*
CIG 012V028	*"Ceiling variable between one thousand two hundred and two thousand eight hundred"*

Obscurations Coding and Phraseology



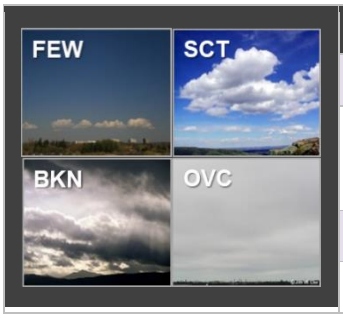
BLDU SCT 000	
BLDU	Weather causing the obscuration at the surface or aloft (Multiple obscurations may be listed)
SCT	• Applicable sky cover amount of the obscuration • Aloft (**FEW, SCT, BKN, OVC**) or at the surface (**FEW, SCT, BKN**)
000	Applicable height (feet). Surface-based. (Obscurations have a height of "000")

Examples:

FG FU FEW000	*"Fog and smoke obscuring one to two-eighths of the sky"*
FU OVC012	*"Smoke layer one thousand two hundred overcast"*
BLSN BKN000	*"Blowing snow obscuring five to seven-eighths of the sky"*

Variable Sky Condition

The sky cover is considered variable if it varies by two or more ranges (**FEW**, **SCT**, **BKN**, **OVC**) during the period it is being evaluated.



FEW 015 V BKN	
FEW	Identifies one of the following sky conditions (**FEW, SCT, BKN,** or **OVC**)
015	Layer height of the variable layer (feet) (If there are several layers with the same sky condition amount, the layer height of the variable layer is coded in feet using three digits)
V	Denotes the variability between the two ranges
BKN	Identifies one of the following sky conditions (**FEW, SCT, BKN,** or **OVC**)

Examples:

BKN V OVC	*"Broken variable overcast"*
SCT020 V BKN	*"Two thousand scattered variable broken"*

Knowledge Check M

REVIEW what you have learned so far about decoding remarks on a METAR/SPECI report. ANSWER the questions listed below.

1. Which phenomena best describes virga? *(Select the correct answer.)*
   - ❑ **Rain that evaporates before reaching the earth**
   - ❑ Visible electrical discharge produced by a thunderstorm
   - ❑ Violent thunderstorms with potential to create tornados

2. During an observation period, a variable ceiling is a rapidly decreasing and increasing ceiling of less than how many feet? *(Select the correct answer.)*
   - ❑ **3,000**
   - ❑ 4,000
   - ❑ 5,000

3. What is **OCNL LTG DSNT NW** decoded as? *(Select the correct answer.)*
   - ❑ *"Occasional lightning cloud-to-ground overhead"*
   - ❑ ***"Occasional lightning distant northwest"***
   - ❑ *"Continuous lighting, cloud-to-ground, in-cloud, cloud-to-cloud, cloud-to-air, all quadrants"*

Significant Cloud Type Remarks

The **Significant Cloud Type Remarks** are classified into four groups:

Towering Cumulus

Altocumulus Castellanus

Standing Lenticular or Rotor

Cumulonimbus and Cumulonimbus Mammatus

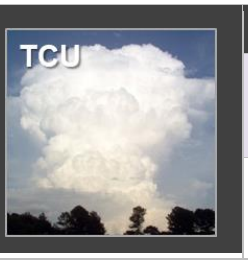
Cumulonimbus and Cumulonimbus Mammatus Coding and Phraseology

CB SW MOV NE	
CB	Cloud type (**CB** or **CBMAM**)
SW	Direction from the station
MOV NE	Movement with direction (if known)

Examples:

CB W MOV E	*"Cumulonimbus west, moving east"*
CBMAM DSNT S	*"Cumulonimbus mammatus distant south"*

Towering Cumulus Coding and Phraseology

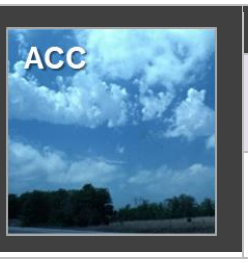


TCU W-N	
TCU	Cloud type
W-N	Direction from the station

Examples:

TCU W	*"Towering cumulus west"*
TCU NE-SE	*"Towering cumulus northeast through southeast"*

Altocumulus Castellanus Coding and Phraseology



ACC E-SE	
ACC	Cloud type
E-SE	Direction from the station

Examples:

ACC NW	*"Altocumulus castellanus northwest"*
ACC DSNT S-W	*"Altocumulus castellanus distant south through west"*

Note: *Altocumulus castellanus (ACC) indicates convective turbulence and icing above the freezing level.*

Standing Lenticular or Rotor Coding and Phraseology

SCSL NE-SE	
SCSL	Cloud type (**SCSL, ACSL, CCSL,** or **ROTOR CLD**)
NE-SE	Direction from the station

Examples:

CCSL S	*"Cirrocumulus standing lenticular south"*
ACSL OVR RDG SW	*"Altocumulus standing lenticular over ridge southwest"*
ROTOR CLD NE	*"Rotor cloud northeast"*
SCSL NW	*"Stratocumulus standing lenticular northwest"*

Pressure Rising or Falling Rapidly Phraseology

At designated stations, when the pressure is rising or falling rapidly at the time of observation, the remark **PRESRR** (pressure rising rapidly) or **PRESFR** (pressure falling rapidly) is included in the report.

PRESRR	*"Pressure rising rapidly"*
PRESFR	*"Pressure falling rapidly"*

Note: *PRESRR and PRESFR indicate rapid changes of altimeter setting are also occurring. Air traffic controllers should ensure pilots have the latest altimeter setting so they can maintain proper altitude.*

Snow Increasing Rapidly Coding and Phraseology

At designated stations, the **Snow Increasing Rapidly Remark** is reported in the next METAR whenever the snow depth has increased by 1 inch or more in the past hour. In the **Other Significant Information Remark**, agencies may add other information significant to their operations to a report.

SNINCR 2/7	
SNINCR	Remark identifier
2	Snow depth increase in the past hour (inches)
/	Solidus or slash
7	Total snow depth on the ground at the time of the report (inches)

Examples:

SNINCR 1/4	*"Snow increase one inch during the past hour, four inches on the ground"*
SNINCR 3/10	*"Snow increase three inches during the past hour, ten inches on the ground"*

METAR/SPECI Decoding Examples

```
SPECI KOWB 201737Z 19023KT 2SM +TSRA BR
OVC020CB 15/13 A2967 RMK AO2 PK WND
19031/35 OCNL LTG W TS W MOV NE TSB22
P0004
```

"Owensboro/Davies, special report three seven observation, wind one niner zero at two three, visibility two, thunderstorm, heavy rain (showers), mist, ceiling two thousand overcast cumulonimbus, temperature one five, dew point one three, altimeter two niner six seven, peak wind one niner zero at three one occurred at three five past the hour, occasional lightning west, thunderstorm west moving northeast, thunderstorm began at two two"

```
METAR KLXV 141853Z AUTO 12013G25KT
080V170 1/4SM +SN FG VV003 01/M01 A2923
RMK AO2 PK WND 08031/1833 SLP899 P0007
T00111006 TSNO $
```

"Leadville, automated, (one eight five three observation), wind one two zero at one three gusts two five, wind variable between zero eight zero and one seven zero, visibility one-quarter, heavy snow, fog, indefinite ceiling three hundred, temperature one, dew point minus one, altimeter two niner two three, peak wind zero eight zero at three one occurred at one eight three three, thunderstorm/lightning information not available"

Knowledge Check N

REVIEW what you have learned so far about decoding remarks on a METAR/SPECI report. ANSWER the question listed below.

1. How would this report be decoded? *(Select the correct answer.)*

   METAR KDLN 031653z AUTO 00000KT 10SM CLR 06/03 A2984 RMK A02 SLP103 T00560028

   - ❑ ***"Dillon, automated, (one six five three observation), wind calm, visibility one zero, clear below one two thousand, temperature six, dew point three, altimeter two niner eight four"***
   - ❑ *"METAR Dillon, corrected, (one six five three observation), wind calm, visibility one zero, clear below one two thousand, temperature six, dew point three, altimeter two niner eight four"*
   - ❑ *"Dillon, automated, (zero three one six five three observation), wind calm one zero, clear above one two thousand, temperature six, dew point three, altimeter two niner eight four"*

2. How would **CB W MOV E** be decoded? *(Select the correct answer.)*
   - ❑ ***"Cumulonimbus west, moving east"***
   - ❑ *"Cumulonimbus mammatus distant south"*
   - ❑ *"Cumulonimbus south, moving east"*

3. How would *"Altocumulus castellanus distant south through west"* be coded? *(Select the correct answer.)*
   - ❑ ACC DSNT SW
   - ❑ ACC DSNT NW
   - ❑ **ACC DSNT S-W**

4. How would **PRESFR** be decoded? *(Select the correct answer.)*
   - ❑ *"Pressure rising rapidly"*
   - ❑ ***"Pressure falling rapidly"***
   - ❑ *"Pressure failing rapidly"*

Remarks Summary

METAR and SPECI reports give you a fast and streamlined reporting process that allows you to relay weather information to your pilots in real time. The remarks section of the report displays any crucial information not included in the body of the report. This lesson identified the components of the remarks group as shown on a METAR or SPECI report and gave examples of reports.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ This portion of training will be conducted by the facilitator ■ Instruct students to locate study aid ***METAR/SPECI Phraseology*** in ***Student Guide*** ■ Facilitator will review content presented in the study aid ■ Instruct students to reference the study aid as they complete the exercise and continue the module content	Study Aid **EST. RUN TIME** 5 mins.

STUDY AID: METAR/SPECI PHRASEOLOGY

Purpose

This study aid is an additional review for use to reinforce your ability to practice decoding METAR/SPECI reports.

ELEMENT	PHRASEOLOGY	EXAMPLES
Type of Report	If SPECI, follow the location with the words *"special report, (last two digits of the time) observation."* (If METAR, do not announce the type of report.)	*"Special report, two three observation"*
Station Identifier	Announce the geographic name (not the identifier) once for communications. When the location name is duplicated within 500 miles, follow the location name with the state name. When the weather reports originate at more than one airport at the same geographic location, identify the airport. Where it is considered necessary and is requested by the military base commander, broadcast military observations by stating the location, the name of the airport if different, and the controlling military branch.	*"Tallahassee"* *"Springfield, Missouri"* *"Chicago O'Hare"* *"Enid, Vance Air Force Base"*
Date and Time of Report	If SPECI, follow the location with the words *"special report, (last two digits of the time) observation."* If METAR, time of report may be given upon request. Follow the location with *"(all four digits of the time) observation."*	*"Special report, one six observation"* *"(One niner five five observation)"*

ELEMENT	PHRASEOLOGY	EXAMPLES
Report Modifier	If AUTO, announce *"Automated."* (If COR, announce "*Corrected*.") When the Report Modifier is omitted (e.g., a manual or augmented observation), do not announce as missing.	*"Automated"* *"Corrected"*
Wind Group	Announce surface wind direction and speed by stating the word "*wind*" followed by the separate digits of wind direction to the nearest 10 degrees and the separate digits of the speed. A "G" between two wind speed values is announced as "*Gusts*." State local wind as it appears in the report. Announce the variability of wind at the end of the wind group. (If a variable wind group is coded, announce *"Wind variable between (three-digit direction) and (three-digit direction)."*) (If VRB is coded as the wind direction, announce *"Wind variable at (wind speed)."*) (00000KT is announced as "*Wind calm*.")	*"Wind two seven zero at niner"* *"Wind zero one zero at one zero, gusts two five"* *"Wind variable between one one zero and two two zero"* *"Wind variable at five"* *"Wind calm"*
Visibility Group	State the word "*Visibility*" followed by the visibility values in miles and/or fractions of statute miles, but announce values indicated by the figure 0 as *"zero."* Announce the separate digits of whole numbers as applicable. (If M is coded before a value, it is spoken as *"less than."*)	*"Visibility one and one-half"* *"Visibility three-quarters"* *"Visibility less than one-quarter"*
Runway Visual Range (RVR) Group	Provide RVR information by stating the runway, *"visual range,"* and the indicated value. The abbreviation *"R-V-R"* may be spoken in lieu of *"visual range."* When the indicated values are separated by a **V**, preface the values with the word *"variable,"* followed by the first value, the word *"to,"* then the second value. If the RVR is less than its lowest reportable value, the group is preceded by an "**M**" and spoken as "*less than*." If the RVR is greater than its highest reportable value, the group is preceded by a "**P**" and spoken as "*more than*." When RVR is not reported, do not announce as missing.	*"Runway two right R-V-R three thousand"* *"Runway one R-V-R less than six hundred"* *"Runway two one R-V-R more than six thousand"* *"Runway one five left visual range variable one thousand to two thousand"*

ELEMENT	PHRASEOLOGY	EXAMPLES
Present Weather Group	See AC 00-45 or FAA JO 7110.10 for a listing of contractions. Intensity refers to precipitation, not descriptors. Proximity is spoken after the phenomenon to which it refers. Descriptors are spoken ahead of weather phenomenon with the exception of *"showers,"* which is spoken after the precipitation. When present weather is not reported, do not announce as missing.	*"Patchy fog"* *"Thunderstorm, heavy rain (showers), hail"*
Sky Condition Group	State sky coverage in the same order as reported on the weather observation. For SCT, BKN, and OVC layers, state the height of the layer followed by the amount of sky cover. Announce "*ceiling*" before the lowest layer aloft reported as broken or overcast, or "*indefinite ceiling*" in place of vertical visibility. Announce partial surface-based obscurations as "*Sky partially obscured*."	*"One thousand two hundred scattered, ceiling two thousand five hundred broken, cumulonimbus"* *"Indefinite ceiling seven hundred"* *"Sky clear" or "Clear below one two thousand"*
Temperature/ Dew Point Group	Announce surface temperature and dew point by stating the words "*Temperature*" or "*Dew point*" as appropriate, followed by the temperature in degrees Celsius. Temperatures below zero are announced by prefixing the word *"minus"* before the value.	*"Temperature one two, dew point seven"* *"Temperature minus one, dew point missing"*
Altimeter	State the word "*Altimeter*" followed by the four digits of the altimeter setting.	*"Altimeter three zero one zero"*
Remarks (RMK)	Announce pertinent remarks from surface weather observations in accordance with FAA JO 7340.2, Contractions, and as shown in the examples from FAA JO 7110.10. Do not state additive data or other information intended for NWS analysis or processing that does not contribute to the description of the conditions occurring at the station.	*"Peak wind three five zero at three seven occurred at two two past the hour"* *"Tower visibility two and one-half"* *"Thunderstorm north moving southeast"*
Note: *If weather data is not available, state the location and the word "missing."* ***Note:*** *Do not announce units of measure.*		

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Instruct students to locate student exercise ***METAR/SPECI Decoding Review*** in the printed ***Student Guide*** ■ The exercise will be performed as whole group, in teams, or small groups ■ Instruct students to collaboratively decode each METAR/SPECI or answer from the Suggested Question bank listed below ■ Feel free to supplement other questions relevant to a METAR/SPECI ■ Call on a group representative or team member to orally provide answer to class ■ Evaluate responses and solicit correct responses from other students, if needed ■ Provide feedback and resolve any questions from students	Exercise **EST. RUN TIME** 30 mins.

EXERCISE: METAR/SPECI DECODING REVIEW

Purpose
This exercise reinforces your ability to correctly decode phraseology for a METAR/SPECI report.

Directions

Reference the example METAR/SPECI reports, then decode and respond aloud to questions related to identifying groups or phraseology within the reports.

Detailed Facilitator Instructions: *This exercise can be completed as whole group, in teams, or in small groups. Direct students to locate* ***METAR/SPECI Decoding Review*** *in* ***Student Guide****. As students are referencing the worksheet, ask random questions (see suggested questions below) related to identifying groups or phraseology in the METAR/SPECI reports. Students will answer questions aloud as facilitator checks for accuracy and provides feedback.*

Suggested Questions:

What type of report is this (automated or special)?

What is the time of the report?

Which airport is the report referring to?

How would you state the cloud ceiling group?

How would you state the altimeter setting?

What is the dew point?

What is the surface visibility?

What is the remark telling us?

Note: *Encourage student discussion with this exercise and resolve any questions the students may have on the exercise or phraseology for METAR/SPECI reports.*

1.	**METAR: KPHX 011956Z 26008KT 10SM CLR 39/10 A2989**
	“Phoenix (one niner five six observation), wind two six zero at eight, visibility one zero, clear below one two thousand, temperature three niner, dew point one zero, altimeter two niner eight niner.”
2.	**METAR: KORD 011856Z 08011KT 10SM FEW075 BKN250 30/11 A3005**
	“Chicago O’Hare (one eight five six observation), wind zero eight zero at one one, visibility one zero, few clouds at seven thousand five hundred, ceiling two five thousand broken, temperature three zero, dew point one one, altimeter three zero zero five.”
3.	**SPECI: KMIA 021727Z 28011G20KT 1SM +TSRA BR FEW003 OVC010CB 23/22 A3004 RMK OCNL LTGICCG**
	“Miami special report two seven observation, wind two eight zero at one one gusts two zero, visibility one, thunderstorm, heavy rain (showers), mist, few clouds at three hundred, ceiling one thousand overcast, cumulonimbus, temperature two three, dew point two two, altimeter three zero zero four, occasional lightning in-cloud, cloud-to-ground.”
4.	**METAR: KDET 091350Z AUTO 04008KT 8SM -RA FEW008 BKN029 OVC055 18/17 A3000**
	“Detroit City automated (one three five zero) observation, wind zero four zero at eight, visibility eight, light rain, few clouds at eight hundred, ceiling two thousand niner hundred broken, five thousand five hundred overcast, temperature one eight, dew point one seven, altimeter three zero zero zero..
5.	**SPECI: KTOL 091242Z 04008KT 2SM BR BKN006 OVC009 21/20 A2997 RMK SFC VIS 6 CIG 003V007**
	“Toledo special report four two observation wind zero four zero at eight, visibility two, mist, ceiling six hundred broken, niner hundred overcast, temperature two one, dew point two zero, altimeter two niner niner seven, surface visibility six, ceiling variable between three hundred and seven hundred.”
6.	**SPECI: KPIT 091231Z 23006KT 8SM FEW008 BKN018 OVC110 21/19 A3000**
	“Pittsburg International special report three one observation, wind two three zero at six, visibility eight, few clouds at eight hundred, ceiling one thousand eight hundred broken, one one thousand overcast, temperature two one, dew point one niner, altimeter three zero zero zero.”
7.	**METAR: KLVS 091553Z AUTO 04011KT 10SM CLR 28/M03 A3030 RMK PRESRR**
	“Las Vegas Municipal automated (one five five three) observation, wind zero four zero at one one, visibility one zero, clear below one two thousand, temperature two eight, dew point minus three, altimeter three zero three zero, pressure rising rapidly.”
8.	**METAR: KTUS 091555Z VRB05KT 10SM CLR 32/07 A3002**
	“Tucson (one five five five observation), wind variable at five, visibility one zero, clear below one two thousand, temperature three two, dew point seven, altimeter three zero zero two.”
9.	**SPECI: KLAS 091536Z 01005KT 10SM FEW025 33/07 A2998 RMK TCU W**
	“McCarran International special report three six observation, wind zero one zero at five, visibility one zero, few clouds at two thousand five hundred, temperature three three, dew point seven, altimeter two niner niner eight, towering cumulus west.”
10.	**METAR: KATL 101253Z 25010KT 10SM FEW010CB SCT015 BKN025 26/22 A3008 RMK SLP174 CB DSNT W-NW**
	“Atlanta Hartsfield (one two five three observation), wind two five zero at one zero, visibility one zero, few clouds at one thousand cumulonimbus, one thousand five hundred scattered, ceiling two thousand five hundred broken, temperature two six, dew point two two, altimeter three zero zero eight, cumulonimbus distant west through northwest.”

SUMMARY

The purpose of this module was to teach you the format and contents of the METAR/SPECI Report and how to decode these reports into FAA phraseology so that you can convey them to the flying public.

In accordance with AC 00-45, FAA Order JO 7110.10, Flight Services; Federal Meteorological Handbook No. 1 (FMH-1), you should now be able to:

- Identify types of METAR
- Identify content of the METAR/SPECI
- Identify format of the METAR/SPECI
- Decode wind groups recorded on a METAR/SPECI
- Decode visibility groups recorded on a METAR/SPECI
- Decode runway visual range (RVR) groups recorded on a METAR/SPECI
- Decode present weather groups recorded on a METAR/SPECI
- Decode sky condition groups recorded on a METAR/SPECI
- Decode sky condition groups phraseology recorded on a METAR/SPECI
- Decode temperature/dew point and altimeter groups recorded on a METAR/SPECI
- Identify components of the remarks recorded on a METAR/SPECI
- Identify examples of a METAR/SPECI

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Navigate to the ***Parking Lot*** link within Blackboard and review any student questions ■ Address ***Parking Lot*** questions and facilitate a brief discussion of the lesson content ■ Instruct students to prepare for the End-of-Module test by putting away their Student Guides	Facilitated Discussion **EST. RUN TIME** 30 mins.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Current Weather (METAR/SPECI) End-of-Module Test*** link in Blackboard ■ Instruct students: ○ Clear desks ○ Do not write anything during or after the test ○ Navigate to the ***Current Weather (METAR/SPECI) End-of-Module Test*** link in Blackboard ○ Once they are satisfied with their responses, click "Save and Submit;" do not click "OK" to review results until directed to do so ○ Choose "Cancel" if they receive a warning message that the test has unanswered questions; choosing OK will submit the test and not allow them to go back and answer the questions ○ Leave the room after submitting the test and return at the "Be Back" time ■ ***Note:*** *This test is scored but not graded* ■ During test, monitor students to ensure a secure testing environment ■ Identify the most commonly missed questions by reviewing student statistics in Blackboard ■ Instruct students to click "View Results" when ready to review commonly missed questions ■ Review commonly missed questions with students	Blackboard Assessment **EST. RUN TIME** 35 mins.

END-OF-MODULE TEST (ANSWER KEY)

Note: *Test questions in Blackboard are presented to the students in random order. Please be aware the test key question order will not match the student version.*

1. "An unscheduled report taken when a certain criteria has been observed" describes a _____. *(Select the correct answer.)*
   - ❑ **SPECI**
   - ❑ TAF
   - ❑ UUA
   - ❑ METAR

   Reference(s): AC 00-45; FMHI, Chap. 2

2. Which of the following ICAO station identifiers correctly identifies the Will Rogers World Airport, Oklahoma City, OK? *(Select the correct answer.)*
   - ❑ **KOKC**
   - ❑ KCAR
   - ❑ KSAN
   - ❑ KSLC

   Reference(s): AC 00-45

3. What format appears in the date/time field of a METAR? *(Select the correct answer.)*
   - ❑ **The first two digits are the day of the month, the second two digits are the hour, and the last two digits are the minutes in UTC**
   - ❑ The six digits represent the hour, minutes, and seconds of the observation in UTC
   - ❑ The first two digits are the day of the month, the second two digits are the hour, and the last two digits are the minutes in local time
   - ❑ The six digits represent the hour, minutes, and seconds of the observation in local time

   Reference(s): AC 00-45; FMH1, Chap. 12

4. Which of the following correctly decodes the wind group in the METAR/SPECI: 08023G37KT? *(Select the correct answer.)*
   - ❑ **"Wind zero eight zero at two three gusts three seven"**
   - ❑ "Wind zero eight three seven gusts at two three"
   - ❑ "Zero eight zero wind at three seven gusts twenty-three"
   - ❑ "Wind gusts at zero eight zero knots at two three"

   Reference(s): JO 7110.65, Chap. 2

5. What term refers to the greatest distance that can be seen throughout at least half the horizon circle (180 degrees), not necessarily continuous? *(Select the correct answer.)*
   - ❑ **Prevailing visibility**
   - ❑ RVR
   - ❑ Sector visibility
   - ❑ Tower visibility

   Reference(s): FMH1, Glossary

6. Which of the following correctly decodes the RVR in the METAR/SPECI: R17/M0600FT? *(Select the correct answer.)*
   - ❑ **"Runway one seven R-V-R less than six hundred"**
   - ❑ "Runway one seven visual range more than six hundred feet"
   - ❑ "R-V-R runway one seven below six hundred"
   - ❑ "R-V-R runway one seven less than six hundred feet"

   Reference(s): FMH1, Chap. 12

7. If a METAR/SPECI reported "SHSN" for the present weather group, what is the intensity of the precipitation? *(Select the correct answer.)*
   - ❑ **Moderate**
   - ❑ Light
   - ❑ Heavy
   - ❑ Increasing

   Reference(s): JO 7110.10, Chap. 12

8. Which of the following correctly decodes the sky condition group in the METAR/SPECI: SCT030 BKN080 OVC120? *(Select the correct answer.)*
   - ❑ **"Three thousand scattered, ceiling eight thousand broken, one two thousand overcast"**
   - ❑ "Scattered three thousand, ceiling broken eight hundred, overcast one two thousand"
   - ❑ "Scattered three thousand, broken eight hundred, ceiling one two thousand overcast"
   - ❑ "Three thousand scattered, eight thousand broken, ceiling one thousand two hundred overcast"

   Reference(s): JO 7110.10, Chap. 12

9. In the METAR/SPECI, sky condition “SKC” is spoken_____. *(Select the correct answer.)*
   - ❑ **“Sky Clear”**
   - ❑ “Scattered”
   - ❑ “Sky”
   - ❑ “Partially clear”

   Reference(s): JO 7110.10

10. How is the temperature displayed in a METAR/SPECI if it is unavailable? *(Select the correct answer.)*
   - ❑ **The entire group will not be coded**
   - ❑ Only the altimeter is displayed
   - ❑ The temperature is displayed in zeros
   - ❑ Enter last recorded temperature

   Reference(s): AC 00-45; FMH1, Glossary

11. Which of the following correctly decodes the remarks in the METAR/SPECI: CIG 005V008? *(Select the correct answer.)*
   - ❑ **“Ceiling variable between five hundred and eight hundred”**
   - ❑ “Ceiling five hundred variable eight hundred”
   - ❑ “Ceiling five hundred feet variable eight hundred feet”
   - ❑ “Ceiling variable between five hundred feet and eight hundred feet”

   Reference(s): AC 00-45; FMH1, Chap. 12

12. Based on the following SPECI, identify the temperature and dew point. *(Select the correct answer.)*

    SPECI PADM 071513Z AUTO 00000KT 4SM -SN BR BKN008 BKN017 OVC029 M01/M02 A2983
    RMK CIG 005V011 UPE10SNB10

   - ❑ **M01/M02**
   - ❑ -SN BR BKN008 BKN017
   - ❑ AUTO 00000KT 4SM
   - ❑ CIG 005V011

   Reference(s): AC 00-45; JO 7110.10, Chap. 12