

READING AND UNDERSTANDING METARS

METARS are covered on the private pilot knowledge test (written exam) as well as the practical test. One of the required skills in the [Private Pilot ACS](#) that a private pilot candidate must demonstrate the ability to do is “Correlate weather information to make a competent go/no-go decision.” The ability to read a METAR is an important part of making preflight decisions.

I. Preflight Preparation

Task	C. Weather Information
References	14 CFR part 91; FAA-H-8083-25; AC 00-6, AC 00-45, AC 00-54; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with weather information for a flight under VFR.
Knowledge	The applicant demonstrates understanding of:
PA.I.C.K1	Sources of weather data (e.g., National Weather Service, Flight Service) for flight planning purposes.
PA.I.C.K2	Acceptable weather products and resources required for preflight planning, current and forecast weather for departure, en route, and arrival phases of flight.
PA.I.C.K3	Meteorology applicable to the departure, en route, alternate, and destination under VFR in Visual Meteorological Conditions (VMC) to include expected climate and hazardous conditions such as:
PA.I.C.K3a	a. Atmospheric composition and stability
PA.I.C.K3b	b. Wind (e.g., crosswind, tailwind, windshear, <u>mountain wave</u> , etc.)
PA.I.C.K3c	c. Temperature
PA.I.C.K3d	d. Moisture/precipitation
PA.I.C.K3e	e. Weather system formation, including air masses and fronts
PA.I.C.K3f	f. Clouds
PA.I.C.K3g	g. Turbulence
PA.I.C.K3h	h. Thunderstorms and microbursts
PA.I.C.K3i	i. Icing and freezing level information
PA.I.C.K3j	j. Fog/mist
PA.I.C.K3k	k. Frost
PA.I.C.K3l	l. Obstructions to visibility (e.g., smoke, haze, volcanic ash, etc.)
PA.I.C.K4	Flight deck displays of digital weather and aeronautical information.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
PA.I.C.R1	Factors involved in making the go/no-go and continue/divert decisions, to include:
PA.I.C.R1a	a. Circumstances that would make diversion prudent
PA.I.C.R1b	b. Personal weather minimums
PA.I.C.R1c	c. Hazardous weather conditions to include known or forecast icing or turbulence aloft
PA.I.C.R2	Limitations of:
PA.I.C.R2a	a. Onboard weather equipment
PA.I.C.R2b	b. Aviation weather reports and forecasts
PA.I.C.R2c	c. Inflight weather resources
Skills	The applicant demonstrates the ability to:
PA.I.C.S1	Use available aviation weather resources to obtain an adequate weather briefing.
PA.I.C.S2	Analyze the implications of at least three of the conditions listed in K3a through K3l above, using actual weather or weather conditions in a scenario provided by the evaluator.
PA.I.C.S3	Correlate weather information to make a competent go/no-go decision.

A typical METAR report contains information in specific sequential order.

Usually, the sequence is: Place (Airport ICAO Code) – Date and Time – Wind – Visibility – Phenomena – Clouds – Temperature – Pressure.

Example:

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KLAX 300353Z 08003KT 10SM FEW020
SCT037 SCT050 10/06 A3004
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A METAR explains the weather conditions at an airport. It cannot and doesn't predict future weather.

Student pilots who are new to understanding weather should note the difference between a report (details a past period of weather) and a forecast (a prediction of future weather). In other words, weather reported in a METAR report has already occurred.

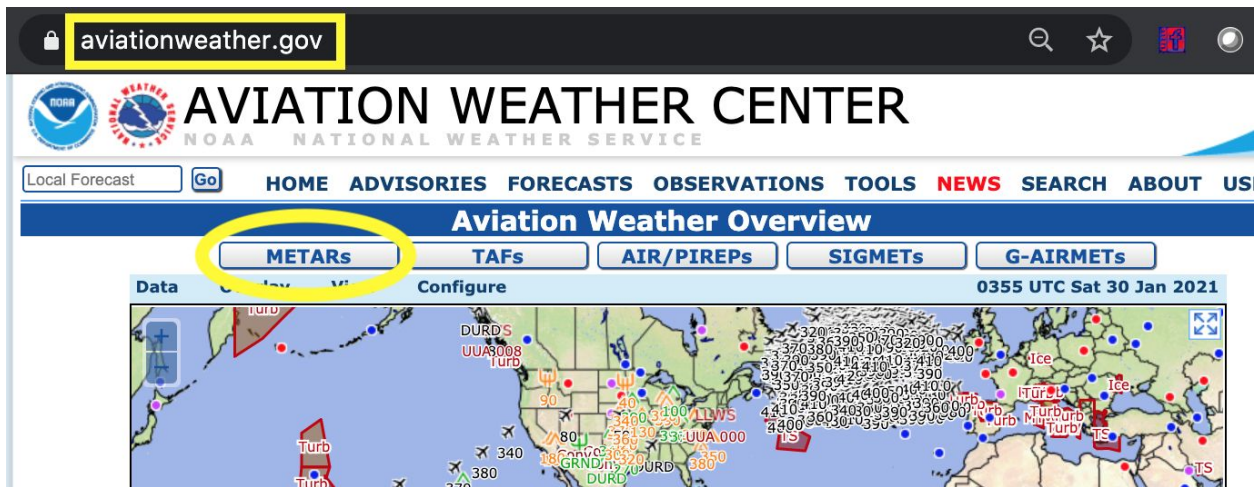
There are two types of METAR reports: routine and SPECI (aviation selected special weather report).

- ➔ A routine special report is usually issued 5 minutes before the top of an hour.
- ➔ A special report can be issued anytime to update rapidly changing weather conditions.

Pilots should know the definition of ceiling under [14 CFR § 1.1](#):

Ceiling means the height above the earth's surface of the lowest layer of clouds or obscuring phenomena that is reported as "broken", "overcast", or "obscuration", and not classified as "thin" or "partial".

Aviationweather.gov is a great place to read METARs and practice decoding them.



Let's look at some of the basic information in a METAR that is relevant to making a go / no-go decision.

A screenshot of the 'METAR Data' page on the Aviation Weather Center website. The page shows a list of METAR reports for stations KLAX, KJFK, and KORD. Several fields are highlighted with colored boxes and callouts:

- Station Identifier - Chicago O'Hare** (red box) points to 'KORD' in the station ID.
- Date / Time - 30th day of month 0253 Zulu time** (orange box) points to '0253Z' in the time field.
- Winds from the NW (320 degrees) at 16 knots gusting to 24 knots** (yellow box) points to '11006KT 10SM' in the wind and visibility fields.
- Visibility = 10 Statute Miles** (cyan box) points to '10SM' in the visibility field.
- Sky Cover/Ceiling Info - Few clouds at 18,000 feet above ground level (AGL). Overcast cloud deck at 25,000 feet AGL** (green box) points to 'FEW180 OVC250' in the cloud field.

Other highlighted fields include 'KLAX 300253Z' and 'KJFK 300251Z'.

Further Reading on METARs: [PHAK Chapter 13](#).



PRIVATE PILOT KNOWLEDGE TEST QUESTIONS

1. The information in a METAR is:

- a. Follows no specific format
- b. Sequential following a prescribed format.
- c. Depends on the amount of data presented.

Answer: _____

2. For aviation purposes, ceiling is defined as the height above the Earth's surface of the

- a. Lowest broken or overcast layer or vertical visibility into an obscuration.
- b. Lowest layer of clouds reported as scattered, broken, or thin.
- c. Lowest reported obscuration and the highest layer of clouds reported as overcast.

Answer: _____

3. If you read in a METAR the symbols "SKC" and "OVC", refer to:

- a. Sky Clear and Overcast.
- b. Sky clear and broken clouds.
- c. Few clouds and scattered clouds.

Answer: _____

4. Refer to figure 12. Which of the reporting stations have VFR weather?

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METAR KINK 121845Z 11012G18KT 15SM SKC 25/17 A3000
METAR KBOI 121854Z 13004KT 30SM SCT150 17/6 A3015
METAR KLAX 121852Z 25004KT 6SM BR SCT007 SCT250 16/15 A2991
SPECI KMDW 121856Z 32005KT 1 1/2SM RA OVC007 17/16 A2980 RMK
RAB35
SPECI KJFK 121853Z 18004KT 1/2SM FG R04/2200 OVC005 20/18 A3006
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FIGURE 12.—Aviation Routine Weather Reports (METAR).

- a. KINK, KBOI, and KJFK
- b. KINK, KBOI, and KLAX
- c. All.

Answer: _____

5. Refer to figure 12. What are the current conditions depicted for Chicago Midway Airport (KMDW)?

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METAR KINK 121845Z 11012G18KT 15SM SKC 25/17 A3000  
METAR KBOI 121854Z 13004KT 30SM SCT150 17/6 A3015  
METAR KLAX 121852Z 25004KT 6SM BR SCT007 SCT250 16/15 A2991  
SPECI KMDW 121856Z 32005KT 1 1/2SM RA OVC007 17/16 A2980 RMK  
RAB35  
SPECI KJFK 121853Z 18004KT 1/2SM FG R04/2200 OVC005 20/18 A3006
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FIGURE 12.—Aviation Routine Weather Reports (METAR).

- a. Sky 700 feet overcast, visibility 1-1/2SM, moderate rain.
- b. Sky 700 feet overcast, visibility 11, occasionally 2SM, with light rain.
- c. Sky 7,000 feet overcast, visibility 1-1/2SM, heavy rain.

Answer: _____

Answers

- 1. b.
- 2. a.
- 3. a.
- 4. b.
- 5. a.