

 workfromanywhere

Become a Professional Drone Pilot



Aviation Weather Reports



I Weather for Pilots

Now that you've learned to make sense of sectional charts, we're moving on to yet another incredibly cryptic district of the aeronautical world—Aviation Weather Reports.

Here's a quick example of a weather report that you're going to learn how to read.

```
METAR KGGG 161753Z AUTO 14021G26KT 3/4SM  
+TSRA BR BKN008 OVC012CB 18/17 A2970 RMK  
PRESFR
```

Just like with sectional charts, we're going to cut this up and the pieces will fall into place.

Report Type

METAR KGGG 161753Z AUTO 14021G26KT 3/4SM
+TSRA BR BKN008 OVC012CB 18/17 A2970 RMK
PRESFR

There are three types of weather reports, METAR, SPECI, and TAF.

METAR is a routine weather report while a SPECI is for when there's "breaking news" in the weather. Both report the weather "here and now" whereas a TAF forecasts weather over 24–30 hours.

Airport Identifier

METAR **KGGG** 161753Z AUTO 14021G26KT 3/4SM
+TSRA BR BKN008 OVC012CB 18/17 A2970 RMK
PRESFR

This is simply letting us know which airport produced the report. Airports in the contiguous 48 states start with K and are followed by three letters. Airports in Hawaii start with PH and airports in Alaska start with PA.

Time

METAR KGGG **161753Z** AUTO 14021G26KT 3/4SM
+TSRA BR BKN008 OVC012CB 18/17 A2970 RMK
PRESFR

Check for a Z at the end to let you know that this is the time. There are always six digits. The first two are the day of the month (in this case, the 16th), and the following four is the time (in this case, 17:53 or 5:53pm).

The Z stands for “Zulu Time” (also known as UTC). Since this airport is in East Texas, where Central Time is 6 hours behind UTC, 161753Z means the 16th of the month at 11:53am.

Modifier

METAR KGGG 161753Z **AUTO** 14021G26KT 3/4SM
+TSRA BR BKN008 OVC012CB 18/17 A2970 RMK
PRESFR

When AUTO is included, it means the METAR was automatically generated. A report without AUTO was released manually. COR is another modifier for reports that correct previous information.

Wind

METAR KGGG 161753Z AUTO **14021G26KT** 3/4SM
+TSRA BR BKN008 OVC012CB 18/17 A2970 RMK
PRESFR

Check for KT to spot a wind reading. The first three digits refer to the direction the wind is coming from, in this case 140° or from the southeast. The following two digits refer to the speed of the wind in knots. If the wind is gusty, a G will be added with the speed of the gusts in knots.

Visibility

```
METAR KGGG 161753Z AUTO 14021G26KT 3/  
4SM +TSRA BR BKN008 OVC012CB 18/17 A2970  
RMK PRESFR
```

If you see SM, the number preceding it refers to current visibility measured in statute miles.

Weather Conditions

```
METAR KGGG 161753Z AUTO 14021G26KT 3/  
4SM +TSRA BR BKN008 OVC012CB 18/17 A2970  
RMK PRESFR
```

Weather conditions are constructed using two-letter components from the following five categories. For the most part, these are clear, guessable truncations. The ones that aren't obvious are actually truncations of a French word (since this is a globally used system after all).

Intensity / Proximity	<ul style="list-style-type: none"> – (Light) + (Heavy) VC (In the vicinity)
Descriptor	<ul style="list-style-type: none"> DR (Low Drifting) BL (Blowing) SH (Showers) TS (Thunderstorms) FZ (Freezing) PR (Partial) MI (Shallow – <i>fr</i>: Mince) BC (Patches – <i>fr</i>: Banc)
Precipitation	<ul style="list-style-type: none"> DZ (Drizzle) RA (Rain) SN (Snow) SG (Snow Grain) IC (Ice Crystals) PL (Ice Pellets) UP (Unknown Precipitation) GR (Hail – <i>fr</i>: Grêle) GS (Small Hail – <i>fr</i>: Gresil)
Obscuration	<ul style="list-style-type: none"> SA (Sand) HZ (Haze) VA (Volcanic Ash) FG (Fog) DU (Dust) PY (Spray) BR (Mist – <i>fr</i>: Brume) FU (Smoke – <i>fr</i>: Fumée)
Other	<ul style="list-style-type: none"> SQ (Squalls) SS (Sandstorm) DS (Duststorm) FC (Funnel Clouds) +FC (Tornado – <i>lit</i>: Heavy Funnel Clouds) PO (Dust / Sand Whirls – <i>fr</i>: Poussiere)

So, accordingly, **+TSRA BR** means heavy thunderstorms with rain and mist.

Sky Conditions

METAR KGGG 161753Z AUTO 14021G26KT 3/4SM
+TSRA BR BKN008 OVC012CB 18/17 A2970 RMK
PRESFR

Sky conditions are constructed from three components:
amount, height, and type.

Amount

SKR (Sky Clear) or **CLR** (Clear)
FEW (Few)
SCT (Scattered)
BKN (Broken)
OVC (Overcast)

Height

Height is always defined with three digits and refers to height in hundreds of feet—AKA drops two zeros. For example, 001 equals 100 feet, 010 equals 1,000 feet, and 100 equals 10,000 feet.

Type

TCU (Towering Cumulus)
CB (Cumulonimbus)

So the example **BKN008 OVC012CB** means “Broken at 800 feet” and “Overcast at 1,200ft with cumulonimbus clouds.”

Temperature

METAR KGGG 161753Z AUTO 14021G26KT 3/4SM
+TSRA BR BKN008 OVC012CB **18/17** A2970 RMK
PRESFR

Two numbers with a / in between indicate a temperature reading. The first digit is the current temperature in celsius, and the second is the current dew point. The dew point is the temperature at which the air can hold no more water and must release it as rain.

Pressure

METAR KGGG 161753Z AUTO 14021G26KT 3/4SM
+TSRA BR BKN008 OVC012CB 18/17 **A2970** RMK
PRESFR

A stands for “altimeter,” which is an instrument that measures barometric pressure. The following four digits refer to the altimeter reading and is read with a decimal point between the first two and last two digits. 29.92Hg is standard. This example indicates 29.70Hg.

Remark

METAR KGGG 161753Z AUTO 14021G26KT 3/4SM
+TSRA BR BKN008 OVC012CB 18/17 A2970 **RMK**
PRESFR

Remark is an optional component and precedes any additional statements, like...

...PRESFR

This means pressure falling rapidly. The other option is PRES-RR for when pressure is rising rapidly.

All together now

```
METAR KGGG 161753Z AUTO 14021G26KT 3/4SM  
+TSRA BR BKN008 OVC012CB 18/17 A2970 RMK  
PRESFR
```

So let's look at this again. All together it reads:

“A routine weather report from KGGG submitted automatically on the 16th of the month at 17:53 UTC. Winds 140° at 21 knots, gusting at 26 knots. 3/4 of a mile of visibility. Heavy thunderstorms with rain and mist. Clouds broken at 800 feet and overcast at 1,200 feet, displaying cumulonimbus characteristics. Temperature 18 degrees celsius with a dew point of 17 degrees. Pressure at 29.70HG and falling rapidly.”

Let's do one more. Try this one yourself.

```
SPECI KJFK 121853Z 18004KT 1/2SM FG R04/2200  
OVC005 20/18 A3006
```

There's one new element here. $R_{04/2200}$. The R tells us that this is a measure of visibility for a runway, in this case, runway 4. Since runway visibility should be specific, this measurement does not drop any zeros.

So give it a shot! When you're ready, continue on and check your work against the answer.

SPECI KJFK 121853Z 18004KT 1/2SM FG R04/2200
OVC005 20/18 A3006

Answer: A special weather report from KJFK generated on the 12th of the month at 18:53 UTC. Winds 180° at 4 knots. Half a statute mile of visibility. Fog. 2,200 feet of visibility at Runway 4. Overcast at 500 feet. Temperature at 20° celsius with a dew point at 18°. Barometric pressure at 30.06Hg.

How did it go?

This is one of my favorite examples, because it's easy to imagine a real world scenario to go with it. Some unexpected fog falls over JFK, and a "breaking news" report is manually released to announce the changes in visibility.

More Practice

Ready for some more examples? See how you do with these.

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