AVIATION ROUTINE WEATHER REPORTS (METAR)

Weather observations made hourly at selected airports are coded to international standards. Reports may be prepared manually or by automated equipment. Each METAR report contains the following sequence of elements which are explained below:

**Example METAR Report:**

```
METAR KPIT 091955Z COR 22015G25KT 3/4SM R28/2600FT +TSRA OVC010CB 18/16 A2992 RMK RAB50
```

1. **Type of Report (METAR - routine hourly report or SPECI - special report).**
2. **Station Designator (K indicates contiguous U.S.).**
3. **Date (2 digits) and Time (4 digits, UTC) of Report.**
4. **COR indicates corrected report; AUTO indicates automated observation; omitted if manual report.**
5. **Wind (3 digits true direction, 2-3 digits for speed. G indicates gust followed by 2-3 digit speed, KT indicates knots. Variable direction indicated by VRB. Calm indicated by 00000KT. If wind direction varies by 60° or more, range of direction appended, e.g. 180V260).**
6. **Prevailing Visibility (SM indicates statute miles).**
7. **Runway Visual Range (if reported, Runway designator/4 digit value in feet).**
8. **Weather and Obstructions to Visibility (See Figure 3-3).**
9. **Sky Condition (Cloud amount, height, and type. See Fig 3-4).**
10. **Temperature and Dew Point (In degrees Celsius. M indicates negative value).**
11. **Altimeter Setting (Inches of mercury).**
12. **RMK indicates remarks. (Added when observer deems necessary).**

### WEATHER AND OBSTRUCTIONS TO VISIBILITY

<table>
<thead>
<tr>
<th>QUALIFIER</th>
<th>Weather Phenomena</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intensity</strong> (Applies only to precipitation, not descriptor)</td>
<td>Precipitation</td>
</tr>
<tr>
<td>Light</td>
<td>Drizzle</td>
</tr>
<tr>
<td>None</td>
<td>RA Rain</td>
</tr>
<tr>
<td>Moderate</td>
<td>SN Snow</td>
</tr>
<tr>
<td>+ Heavy</td>
<td>SG Snow grains</td>
</tr>
<tr>
<td>Descriptor</td>
<td>Ice crystals</td>
</tr>
<tr>
<td>MI Shallow</td>
<td>PE Ice pellets</td>
</tr>
<tr>
<td>BC Patches</td>
<td>GR Hail</td>
</tr>
<tr>
<td>PR Partial</td>
<td>GS Small hail/snow pellets</td>
</tr>
<tr>
<td>TS Thunderstorm</td>
<td></td>
</tr>
<tr>
<td>Blowing</td>
<td></td>
</tr>
<tr>
<td>SH Showers</td>
<td></td>
</tr>
<tr>
<td>DR Drifting</td>
<td></td>
</tr>
<tr>
<td>FZ Freezing</td>
<td></td>
</tr>
<tr>
<td>Proximity</td>
<td>VC Vicinity, but not at airport (between 5 and 10SM from airport).</td>
</tr>
<tr>
<td><strong>Obscuration</strong></td>
<td></td>
</tr>
<tr>
<td>WR Mist (Vis ≥5/8SM)</td>
<td>BR Mist (Vis &lt;5/8SM)</td>
</tr>
<tr>
<td>FG Fog</td>
<td>F G Fog (Vis &lt;5/8SM)</td>
</tr>
<tr>
<td>F U Smoke</td>
<td>S A Sand</td>
</tr>
<tr>
<td>VA Volcanic ash</td>
<td>H Z Haze</td>
</tr>
<tr>
<td>DU Widespread dust</td>
<td>PY Spray</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
</tr>
<tr>
<td>SQ Squall</td>
<td>SA Sand</td>
</tr>
<tr>
<td>SS Sandstorm</td>
<td>H Z Haze</td>
</tr>
<tr>
<td>DS Duststorm</td>
<td>PY Spray</td>
</tr>
<tr>
<td>PO Well developed</td>
<td></td>
</tr>
<tr>
<td>FC Funnel cloud</td>
<td></td>
</tr>
<tr>
<td>+FC Tornado/waterspout</td>
<td></td>
</tr>
<tr>
<td>D dust/sand whirls</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3-3
SKY CONDITION

SKC - Sky Clear (CLR used if AUTO report to indicate clear below 12,000 feet)
FEW - Few (<1/8 to 2/8 coverage)
SCT - Scattered (3/8 to 4/8 coverage)
BKN* - Broken (5/8 to 7/8 coverage)
OVC* - Overcast (8/8 coverage)
VV* - Vertical visibility in 100's of feet (clouds obscured)

Cloud bases reported by three digits in hundreds of feet AGL.
Towering cumulus (TCU) or Cumulonimbus (CB) are reported if present.
* Constitutes a ceiling

Figure 3-4

The METAR shown in Figure 3-2 is decoded as follows:

<table>
<thead>
<tr>
<th>METAR</th>
<th>Routine hourly report</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPIT</td>
<td>Pittsburgh</td>
</tr>
<tr>
<td>091955Z</td>
<td>9th day of month, 1955 UTC</td>
</tr>
<tr>
<td>COR</td>
<td>Corrected observation</td>
</tr>
<tr>
<td>22015G25KT</td>
<td>Wind from 220° true direction at 15 knots, maximum gusts to 25 knots</td>
</tr>
<tr>
<td>3/4SM</td>
<td>Visibility 3/4 statute mile</td>
</tr>
<tr>
<td>R28/2600FT</td>
<td>Runway 28 visibility range 2,600 feet</td>
</tr>
<tr>
<td>+TSRA</td>
<td>Thunderstorm, heavy rain</td>
</tr>
<tr>
<td>OVC010CB</td>
<td>Overcast, cumulonimbus clouds, bases at 1,000 feet AGL</td>
</tr>
<tr>
<td>18/16</td>
<td>Temperature 18 °C, dew point 16 °C</td>
</tr>
<tr>
<td>A2992</td>
<td>Altimeter setting 29.92 &quot;Hg</td>
</tr>
<tr>
<td>RMK RAB50</td>
<td>Remarks: Rain began at 1950Z</td>
</tr>
</tbody>
</table>

Examples of REMARKS:

R E    Recent weather events
RAB20  Rain began at 20 minutes past the hour
SNE45  Snow ended at 45 minutes past the hour
WS TKO RW04 Wind shear reported during takeoff from runway 4
WS LDG RW27 Wind shear reported during landing on runway 27
PK WND 22030/18 Peak wind from 220° at 30 knots. Observed at 18 minutes past the hour
SLP045 Sea level pressure 1004.5 hPa
T01820159 Temperature 18.2 °C, dew point 15.9 °C
$ Automated equipment in need of maintenance
METAR/TAF ABBREVIATIONS

AO1 Automated Observation without precipitation discriminator (rain/snow)
AO2 Automated Observation with precipitation discriminator (rain/snow)
AMD Amended Forecast (TAF)
BECMG Becoming (expected between 2 digit beginning hour and 2 digit ending hour)
COR Correction to observation
FEW Few (<1/8 to 2/8 cloud coverage)
FM From (4 digit beginning time in hours and minutes)
LDG Landing
M In temperature field mean minus (below zero)
MDG In RVR listing indicates visibility less than lowest reportable sensor value (e.g. M600FT = less than 600 feet)
NO Not available (e.g. SPLNO, RVRNO)
NSW No Significant Weather
OVC Overcast (8/8 cloud coverage)
P In RVR indicates visibility greater than highest reportable sensor value (e.g. P6000FT = greater than 6000 feet)
P6SM Visibility greater than 6 SM (TAF only)
PROB30 Probability 30 to 39 percent (precipitation forecasts)
PROB40 Probability 40 to 49 percent (precipitation forecasts)
R Runway (in RVR reports)
RE Recent weather events (in remarks)
RMK Remark

SG Snow Grains
SN Snow
SPIN Special Report
SPLO Special Local Observations
SS Sandstorm
SVHO Snow Halos
SYNO Snowy
TAF Terminal Area Forecast
TCU Towering Cumulus
TDW Tornado
TSNO Thunderstorm Information Not Available
TSO Thunderstorm Information Available
TSU Thunderstorm Information Unknown
TUR Turbulence
U P Unknown Precipitation (automated observations)
V A Volcanic Ash
NORMALIZED

AGI Automated Observation without precipitation discriminator
AGM Automated Observation with precipitation discriminator
MFD Meteorological Forecast Document
TEMPO Temporary changes expected (between 2 digit beginning hour and 2 digit ending hour)
TKOF Takeoff

V V Vertical Visibility (Indefinite ceiling)
W S Wind Shear (in TAF, low level and not associated with convective activity)

"+" Heavy

DESCRIPTORS

BC Patches
BL Blowing
C B Cumulonimbus
CBMAM Cumulonimbus Mammatus
CDU Cactus Desert Unusual
CMU Cloud Mammatus
CSL Cirrus Lenticular
CUR Cloud Cover

F G Fog (Visibility less than 5/8SM)
FU Smoke
GR Hail
GS Small Hail/Snow Pellets
HZ Haze
IC Ice Crystals
IP Ice Pellets
PO Dust/Sand Whirls
PY Spray
R Finding
SA Sand
SG Snow Grains
SN Snow

maintenance needed on the system