

Decoding Metar Messages

Definition:

A METAR is a codified observation message indicating an airfield weather conditions observed at a given time. Such a message is established every hour, even sometimes every 30 minutes or shorter due to fast and heavy weather changes which affects the traffic flow.

Message structure:

1) Location identifier:

LOWW 031220 29013KT 3000 R34/1500 +RASH BKN025TCU 12/09 Q1021 RETS M2 34231091

Almost all airfields in the world have a 4-letter identifier (ICAO rules). Here LOWW stands for Vienna.

1st = a sector in the world (Austria is in sector L)

2nd = a country, region or state into the world sector (O stands for Austria)

3rd = a given sector in the country, region or state (W means international airport)

4th = specific to the airfield (W for Vienna)

LOWW = Vienna	EDDF = Frankfurt
LOWG = Graz	CYYZ = Toronto
LOWK = Klagenfurt	KLAX = Los Angeles
LOWI = Innsbruck	PANC = Anchorage
LOWS = Salzburg	RJAA = Tokyo
LOWL = Linz	YSSY = Sydney

2) date/time:

LOWW 031220 29013KT 3000 R34/1500 +RASH BKN025TCU 12/09 Q1021 RETS M2 34231091

Observation made at the 3rd day of the current month at 1220 Z (UTC).

3) wind:

LOWW 031220 **29013KT** 3000 R34/1500 +RASH BKN025TCU 12/09 Q1021 RETS M2 34231091

Wind is blowing from 290° with 13kt (knots).

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Also available:

00000KT = wind calm

29013G25KT = 290° / 13 kt gusting 25 kt

VRB02KT = variable direction with 2 kt

29013KT 270V310 = average wind 290° / 13kt, direction varying from 270° to 310°

4) visibility:

LOWW 031220 29013KT 3000 R34/1500 +RASH BKN025TCU 12/09 Q1021 RETS M2 34231091

Minimal visibility observed on a 360° round is 3000m.

Runway Visual Range (RVR) for runway 34 is 1500m.

Also available:

4000 = 4km

09SM = visibility in status miles

0000 = visibility less than 50m

9999 = visibility higher than 10km

4000NE = visibility 4000m to the north-east (→ average visibility = 1.5x4000 = 6000)

1400S 4000N = visibility 1400m to the south and 4000m to the north

R11/M0075 = RVR runway 11 is less than 75m

R16/P1500 = RVR runway 16 is higher than 1500m

R34/1000D = RVR runway 34 is 1000m, deterioration expected (D=down)

R34/0900N = RVR runway 34 is 900m, no change expected (N=no change)

R34/0150V0300U = RVR runway 34 is variable (V) from 150m to 300m, improvement expected (U=up)

5) significant weather:

LOWW 031220 29013KT 3000 R34/1500 +RASH BKN025TCU 12/09 Q1021 RETS M2 34231091

Currently heavy rain shower where observed.

Also available:

As far as intensity is concerned:

+ = heavy - = light **nothing** = moderate

As far as proximity is concerned:

VC = ViCinity (within 8km)

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As far as description is concerned:

BC = BanC - fog bench
BL = BLowing
DR = DRifting
FZ = FreeZing
MI = MInce - thin fog layer
SH = SHower
TS = ThunderStorm

As far as precipitation is concerned:

DZ = DriZzle
GR = GRêle - hail (diameter > 5mm)
GS = GrêSil - hail (diameter < 5mm)
IC = Ice Cristal
PE = ice PEllets
RA = RAin
SG = Snow Grains
SN = SNow

As far as other phenomenon is concerned:

BR = BRume - mist (vis 1000 to 3000m)
DU = DUst
FG = FoG (vis < 1000m)
FU = FUmêe - smoke (vis < 3000m)
HZ = HaZe - dry mist (vis < 3000m)
SA = SAnd
VA = Volcanic Ashes
DS = Dust Storm
FC = Funnel Clouds
PO = dust spins
SQ = SQuall
SS = Sand Storm

6) clouds and ceiling:

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Clouds are towering cumulus broken at 2500ft.

Cloudiness:

FEW = few - 1 à 2 octas
SCT = scattered - 3 à 4 octas
BKN = broken - 5 à 7 octas
OVC = overcast - 8 octas

Type of clouds (indicated in the following cases only):

CB = cumulonimbus
TCU = towering cumulus or cumulus congestus

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Also available:

SKC = Sky Clear (no clouds)

OVC/// = clouds covering the sky and which base is below aerodrome level

VV/// = sky not visible

VV002 = Vertical Visibility is 200ft

CAVOK = Ceiling And Visibility OK (vis > 10km and SKC)

7) air temperature and dew point:

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Air temperature is 12°C, dew point is 9°C.

The closest to the air temperature is the dew point, the higher is the risk of precipitation (simplified explanation).

Also available:

02/M01 = air at 2°C, dew point at -1°C

M03/M05 = air at -3°C, dew point at -5°C

The temperature can be indicated in °F (e.g. US METARs)

8) QNH (altimeter setting):

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QNH = 1021 hPa (hectopascals - 1hPa = 1mb - millibar)

Also available:

A2985 = altimeter setting 29.85 inHg

9) additional information:

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Recent ThunderStorm

Also available:

RERA = REcent RAin

RESN = REcent SNow

NOSIG = NO SIGNificant change

WS TKOF RWY 16 = WindShear when taking off runway 16

WS LDG RWY 34 = WindShear when landing runway 34

WS ALL RWYS = WindShear all runways

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10) trend indicator:

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RVR deterioration

M stands for Mauvais (deterioration)

B stands for Bon (improvement)

0 = max wind speed

1 = average wind speed and direction

2 = RVR runway visual range

3 = clouds

4 = precipitations

7 = dust storm, sand storm or snow storm

8 = storm with or without precipitations

9 = squall

11) runway status:

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Rwy 34, wet (2) covering 26 to 50% of runway surface (3), 10mm thick (10),
poor braking action (91).

1st and 2nd figures (here 34) = runway

3rd figure (here 2, wet) = type of deposit on the runway:

0 = runway clean and dry

1 = damp

2 = wet

3 = frost

4 = snow

5 = wet snow

6 = slush

7 = ice

8 = compacted snow

9 = snow drift

/ = unknown, removal in progress

4th figure (here 3, 26-50%) = percentage of runway surface covered:

1 = less than 10%

2 = 11 to 25%

3 = 26 to 50%

4 = 51 to 100%

/ = unknown, removal in progress

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5th and 6th figures (here 10) = deposit thickness

01 to 90 = millimeters

92 = 10cm

93 = 15cm

94 = 20cm

95 = 25cm

96 = 30cm

97 = 35cm

98 = 40cm

99 = unknown

// = unable to measure

7th and 8th figures (here 91) = braking action

01 to 90 = coefficient 0.01 to 0.90

or

95 = good

94 = medium to good

93 = medium

92 = medium to poor

91 = poor

99 = uncertain

// = unknown

12) trend:

BECMG AThm = BECoMinG AT (time in hours and minutes) Z (UTC)

BECMG FMhm TLhm = BECoMinG FroM [...] TiL [...]

TEMPO FMhm = TEMPOrary FroM [...]