Aviation Weather Reports

Aviation Weather Reports

METAR: hourly weather report (issued **on the hour every hour**)

SPECI: special weather observations issued at times other than on the hour, as a result of a significant weather change.

METAR CYQQ 201400Z 00000KT 20SM BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

SPECI CYKF 201347Z AUTO 19011KT 9SM SCT008 BKN015 OVC021 09/ A2919 RMK MAX WND 21016KT AT 1305Z=

METAR - Airport Identifier

INTERNATIONAL - 4 LETTERS

EXAMPLE

CYWG	Winnipeg	(C – Canadian airport)
KSEA	Seattle, USA	(K – American airport)
EDDT	Berlin, Germany	
NZOA	Omarama, New Zealand	

METAR CYQQ 201400Z 00000KT 20SM BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

SPECI CYKF 201347Z AUTO 19011KT 9SM SCT008 BKN015 OVC021 09/ A2919 RMK MAX WND 21016KT AT 1305Z=

METAR – Date and Time

The date and time of the observation are always given in six digits, using universal coordinated time (UTC);

201400Z → 20th day at 1400 (2pm) Zulu
201347Z → 20th day at 1327 (1:37pm) Zulu
Note: In Ontario, there is a 5 hour (daylight saving time) difference between eastern time and zulu time . Therefore 1400 is 0900.

METAR CYQQ 201400Z 00000KT 20SM BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

SPECI CYKF 201347Z AUTO 19011KT 9SM SCT008 BKN015 OVC021 09/ A2919 RMK MAX WND 21016KT AT 1305Z=

METARS - Surface Winds

Wind Direction - degrees true, always 3 digits to the nearest 10 degrees.
If direction varies 60° or more and the mean speed exceeds 3 KTs

Ex. 060V130 – wind direction is varying from 060 degrees – 130 degrees

Wind Speed – The last two numbers refer to the speed in knots.
When the mean wind speed is 3kt or less and variable in direction

Ex. VRB02KT – wind speed is variable at 2 KT

00000KT → 000 degrees T at 00 KT
AUTO 19011G20KT → Automated observation, 190 degrees T at 11 KT gusting to 20 KT

METAR CYQQ 201400Z 00000KT 20SM BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

SPECI CYKF 201347Z AUTO 19011G20KT 9SM SCT008 BKN015 OVC021 09/ A2919 RMK MAX WND 21016KT AT 1305Z=

METARS – Prevailing Visibility

Is the greatest visibility common to 1/2 or more of the horizontal circle (observation point);

- reported in statute miles and fractions

2 1/2SM → 2.5 statute miles

9SM → 9 statute miles

METAR CYQQ 201400Z 00000KT 2 1/2SM SCT004 BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

SPECI CYKF 201347Z AUTO 19011G20KT 9SM SCT008 BKN015 OVC021 09/ A2919 RMK MAX WND 21016KT AT 1305Z=

METARS – Prevailing Visibility

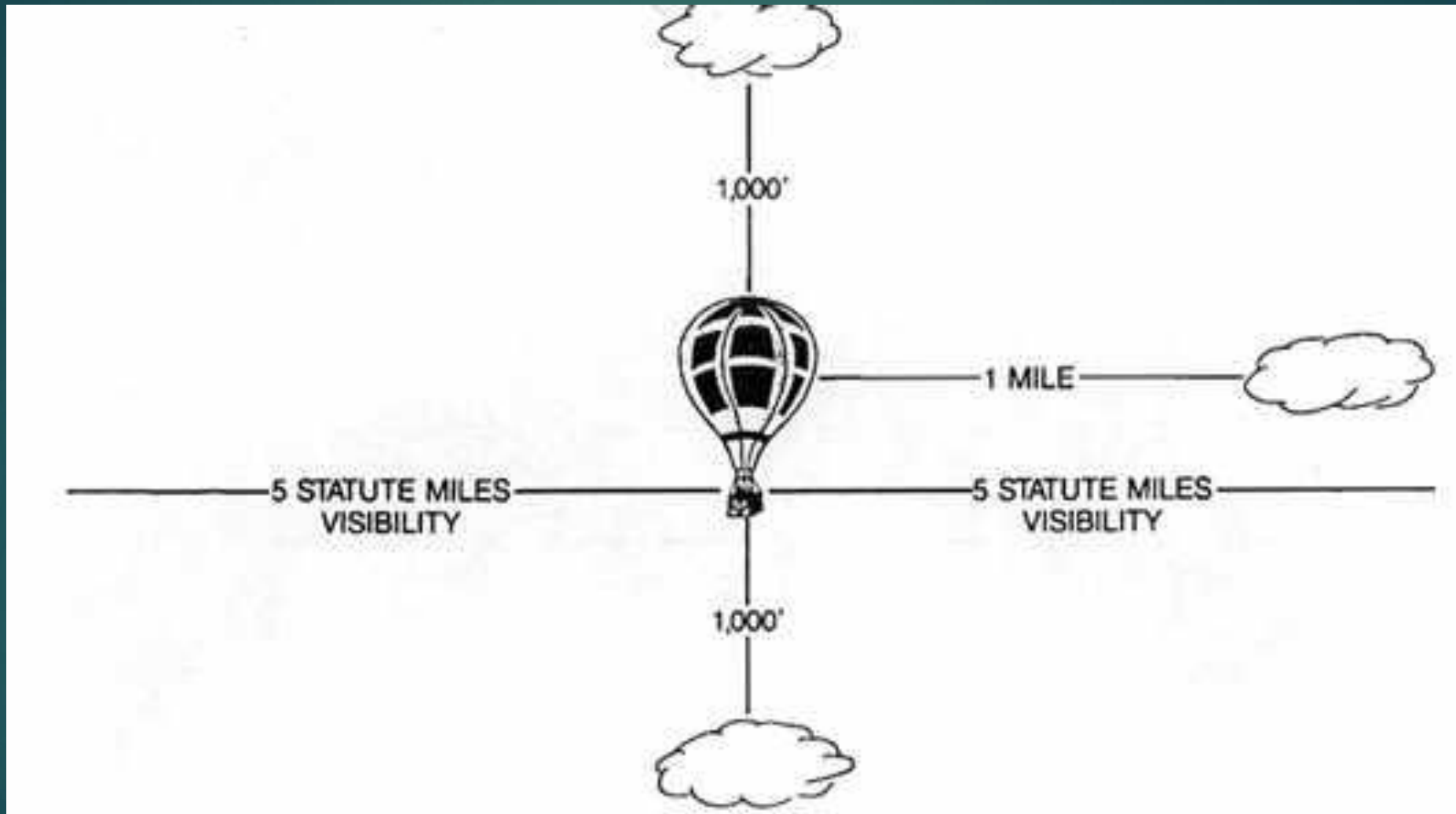

FIGURE 5. CLASS G AIRSPACE AT OR ABOVE 10,000 FEET MSL

METAR - Runway Visual Range

- Reported whenever prevailing visibility is 1 mile more or less and/or the RVR is indicating 6,000 ft or less (10 minute average)

R36L/4000FT/D → Runway 36 left has a visual range of 4000 feet and the trend is *decreasing*

R06/3000FT/N→ Runway 06 has a visual range of 3000 feet and the trend is *no change*

METAR CYWG 132000Z 30015 3/4SM R36L/4000FT/D SCT004 BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

SPECI CYKF 201347Z AUTO 19011G20KT 3/4SM R06/3000FT/N SCT008 BKN015 OVC021 09/ A2919 RMK MAX WND 21016KT AT 1305Z=

METAR – Present Weather

Present weather is comprised of weather phenomena (precipitation, obscuration, or other phenomena) preceded by one or two qualifiers (intensity or proximity to the station and descriptor)

Intensity modifier	+	Type of Weather
"-" for "light"		SN (snow)
No modifier "moderate"		RA (rain)
"+" for "heavy"		FG (fog)

METAR CYWG 132000Z 30015 3/4SM -RA SCT004 BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

METAR – Weather Abreviations

SH SHOWERS
BL BLOWING
MI SHALLOW
PR PARTIAL
FZ FREEZING
DR LOW DRIFTING
BC PATCHES
TS THUNDERSTORM
RA RAIN
DZ DRIZZLE
IC ICE CRYSTALS
PL ICE PELLETS

SN SNOW
SG SNOW GRAINS
GR HAIL
GS SNOW PELLETS
UP UKNOWN PRECITATION **(AWOS only)**

METARS – Obscuring Phenomena

OBSCURING PHENOMENA

HZ HAZE

SA SAND

DU DUST

FU SMOKE

FG FOG (VSBY **<** 5/8)

BR MIST (VSBY ≥ 5/8)

VA VOLCANIC ASH

OTHER

+FC TORNADO or WATERSPOUT

FC FUNNEL CLOUD

SS SAND STORM

+SS SAND STORM (VSBY **<** 5/16)

DS DUSTSTORM

+DS DUSTSTORM (VSBY **<** 5/16)

SQ SQUALLS

METARS – Sky Conditions

Sky Condition – learned about this last class

The sky is divided into 8 segments, each called an okta

Codes for sky cover amounts are:

SKC…… Sky clear

FEW …… Few Trace to 2/8

SCT…… Scattered 3/8 to 4/8

BKN …… Broken 5/8 to 7/8

OVC…… Sky Overcast 8/8

A cloud ceiling is said to exist when the coverage symbol BKN or OVC is reported.

METARS – Sky Conditions cont.

SCT004 BKN025 BKN160 → scattered at 400’ AGL, broken at 2500’AGL, broken at 16000’AGL

BKN009 BKN025 OVC030 → broken at 900’AGL, overcast at 3000’

FEW100 → few at 10000’AGL

If clouds are low, height are given in a vertical visibility height

Ex. VV002 → vertical visibility of 200’ AGL

METAR CYWG 132000Z 30015 3/4SM SHRA SCT004 BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

METAR CYQQ 041200Z 23018G25 5SM +TSRA BKN009 OVC030 15/12 A2899 RMK CB5TCU2=

METARS – TEMP AND DEW POINT

Temperature recorded in degrees Celsius

“M” signifies a negative temperature

Temperature and dew point are separated by a slash **(/)**

06/05 → Temperature 6 degrees/ dewpoint 5 degrees

M07/M09 → Temperature -7 degrees/ dewpoint -9 degrees

METAR CYQQ 201400Z 00000KT 2 1/2SM SCT004 BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

SPECI CMYKF 201347Z AUTO 19011G20KT 9SM SCT008 BKN015 OVC021 M07/M09 A2919 RMK MAX WND 21016KT AT 1305Z=

METARS - Altimeter Setting

“A” is the group identifier that indicates altimeter setting

Reported in inches of mercury

Altimeter settings are given in hundredths of an inch of mercury.

A3006 → 30.06 Inches of mercury (“Hg)

A2919 → 29.19”Hg

METAR CYQQ 201400Z 00000KT 2 1/2SM SCT004 BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

SPECI CMYKF 201347Z AUTO 19011G20KT 9SM SCT008 BKN015 OVC021 M07/M09 A2919 RMK MAX WND 21016KT AT 1305Z=

METARS – Remarks

Includes the following information:

- cloud layer type and opacity in eights of sky concealed
- sea level pressure (SLP) in hectopascal (hPa);
- other weather significant to aviation.

RMK SC3AC1 SLP179= → Remarks Stratocumulus 3 oktas, altocumulus 1 okta, sea level pressure 1017.9mb

METAR CYQQ 201400Z 00000KT 2 1/2SM SCT004 BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

SPECI CMYKF 201347Z AUTO 19011G20KT 9SM SCT008 BKN015 OVC021 M07/M09 A2919 RMK MAX WND 21016KT AT 1305Z=

METARS – Remarks

RMK MAX WND 21016KT AT 1305Z SLP 995= → Remarks: maximum wind is 210 degrees at 16 kt recorded at 1305Z. Sea level pressure 999.5mb

Note on Sea level pressure:

When the SLP is between 0 and 5 put 10 in front of the number

SLP162 = 1016.2mb

When the SLP is between 6 and 9 put a 9 in front of the number

SLP993 = 999.3mb

METAR CYQQ 201400Z 00000KT 2 1/2SM SCT004 BKN025 BKN160 06/05 A3006 RMK SC3AC1 SLP179=

SPECI CMYKF 201347Z AUTO 19011G20KT 9SM SCT008 BKN015 OVC021 M07/M09 A2919 RMK MAX WND 21016KT AT 1305Z=

METARS – Cloud Abbreviations

Remarks: Cloud abbreviations

The following abbreviations are used for cloud types:

CI	cirrus	ST	stratus
CS	cirrostratus	SF	stratus fractus
CC	cirrocumulus	SC	stratocumulus
AS	altostratus	CU	cumulus
AC	altocumulus	CUFRA	cumulus fractus
NS	nimbostratus	TCU	towering cumulus
CBc	umulonimbus	ACC	altocumulus castellanus

METARS - Other

What else might you see in the remarks?

- "RE" identifies the group weather phenomena that was observed during the hour since the last METAR but not at the time of observation.

  REFZRA = recent freezing rain

- "WS" identifies wind shear up to 1600'AGL

  WS All RWY = wind shear on all runways

  WS RWY 20R = wind shear on runway 20 right

Note on METAR: you will see many other abbreviations. Often add in some vowels and you should be able to figure out the word

METARS – Decode (Practice)

- **METAR CYTR 132000Z 12003KT 2 1/2SM BR OVC013 03/03 A2982 RMK SC8 SLP023**
- **METAR CYYZ 132000Z 11003KT 1/8SM R06/1200FT/D -RADZ FG VV002 04/04 A2976 RMK FG8 SLP 001**
- **SPECI CYYZ 132035Z 12006KT 3SMBR OVC008 RMK ST8**
- **METAR CYYC 021600Z 05008KT 20SM FEW018 BKN057 OVC080 05/01 A2986 RMK SC2SC5AC1 SLP147**

METARS – Practice Exam Question

METAR CYOW 291600Z 14004KT 6SM BKN009 M05/M08 A2999 ……

From the abbreviated weather report, it can be determined that:

a) the air temperature is -5 degrees F.
b) the visibility is 6 nautical miles.
c) the altimeter setting is 2999 hectopascals.
d) The dew point temperature is -8 degrees C.

METARS – Practice Exam Question

METAR CYOW 291600Z 14004KT 6SM BKN009 OVC012

……..

From the abbreviated weather report detailed above, the ceiling is defined as:

a) 900 feet above sea level.
b) 1200 feet above seal level.
c) 1200 feet above ground.
d) 900 feet above ground.

TAF – Terminal Area Forecast

- A Terminal Area Forecast **(TAF)** is a coded prediction of the surface weather expected that will affect landing and take-off at the aerodrome;

- It gives the same information as in a METAR except it does not forecast temperature, dewpoint, altimeter setting, type of clouds, or sea level pressure

TAF - Decoding

A lot of the information in TAF is the same as in a METAR

TAF CYQQ 251130Z 2512/2612 30003KT P6SM FEW005 FEW030 FM251800 VRB03KT P6SM FEW030 BECMG 2604/2606 14010KT SCT030 BKN150 OVC250 BECMG 2609/2611 14020KT RMK NXT FCST BY 251800Z=

TAF - Decoding

What is the same?

- Type of Report – decoded the same way – METAR or TAF
- Airport Identifier: represented the same way

METAR CYKF 251800Z AUTO 28011G17KT 9SM -RA BKN044 BKN055 OVC073 09/05 A3010 RMK SLP200 MAX WND 26017KT AT 1753Z=

TAF CYQQ 251130Z 2512/2612 30003KT P6SM FEW005 FEW030 FM251800 VRB03KT P6SM FEW030 BECMG 2604/2606 14010KT SCT030 BKN150 OVC250 BECMG 2609/2611 14020KT RMK NXT FCST BY 251800Z=

TAF - Decoding

Forecasted winds

- Calm wind forecasted as 00000KT
- Wind speeds of 3KTs or less may be encoded as variable direction e.g. VRB03KT.

TAF CYQQ 251130Z 2512/2612 30003KT P6SM FEW005 FEW030 FM251800 VRB03KT P6SM FEW030 BECMG 2604/2606 14010KT SCT030 BKN150 OVC250 BECMG 2609/2611 14020KT RMK NXT FCST BY 251800Z=

TAF - Decoding

Forecasted Visibility

- Prevailing visibility is forecast in statute miles (SM) and fractions up to 3 miles, then in whole miles up to 6 miles.
- *However, when visibilities are forecasted to be greater than 6 SMs, will be coded as P6SM.*

TAF CYQQ 251130Z 2512/2612 30003KT P6SM FEW005 FEW030 FM251800 VRB03KT P6SM FEW030 BECMG 2604/2606 14010KT SCT030 BKN150 OVC250 BECMG 2609/2611 14020KT RMK NXT FCST BY 251800Z=

TAF - Decoding

Forecasted Weather and Clouds

- same abbreviations/codes for weather phenomena as in METARs

- however, NSC (no significant cloud) and CAVOK (ceiling and visibility OK) not used in TAFs in Canada

TAF CYQQ 251130Z 2512/2612 30003KT P6SM FEW005 FEW030 FM251800 VRB03KT P6SM FEW030 BECMG 2604/2606 14010KT SCT030 BKN150 OVC250 BECMG 2609/2611 14020KT RMK NXT FCST BY 251800Z=

TAF - Decoding

Issued time and validity time – NEW!!

- TAFs are issued 4 times a day often 20 minutes before it become valid
- They are usually valid for 12 to 24 hours
- Read in date and hour format

251130Z 2512/2612 : Issued on the 25th day at 1130 Zulu
Valid from the 25th at 12Z to the 26th at 12Z

TAF CYQQ 251130Z 2512/2612 30003KT P6SM FEW005 FEW030 FM251800 VRB03KT P6SM FEW030 BECMG 2604/2606 14010KT SCT030 BKN150 OVC250 BECMG 2609/2611 14020KT RMK NXT FCST BY 251800Z=

TAFs - Decoding

- Other Terms used are:
  - FM – from, indicates a permanent change
  - BECMG – becoming, indicates change in some elements
  - TEMPO – temporarily, indicates fluctuation for a brief time
  - PROB – probability (either 30 or 40%)

TAFs - Decoding

From: FM

- **FM** indicates ***a permanent change in all weather*** to occur ***rapidly***

FM251800: The weather will change starting on the 25th day at 1800Z

TAF CYQQ 251130Z 2512/2612 30003KT P6SM -RA FEW005 FEW030 FM251800 VRB03KT P6SM -SHRA FEW030 BECMG 2604/2606 14010KT SCT030 BKN150 OVC250 BECMG 2609/2611 14020KT RMK NXT FCST BY 251800Z=

TAFs - Decoding

Becoming: BECMG

- indicates ***a gradual and permanent change*** from one condition to another in ***some*** of the elements

BECMG 2604/2606 : Becoming on the 26th day at 0400Z to the 26th day at 0600Z

BECMG 2609/2611: Becoming on the 26th day at 0900Z to the 26th day at 1100Z

TAF CYQQ 251130Z 2512/2612 30003KT P6SM -RA FEW005 FEW030 FM251800 VRB03KT P6SM -SHRA FEW030 BECMG 2604/2606 14010KT SCT030 BKN150 OVC250 BECMG 2609/2611 14020KT RMK NXT FCST BY 251800Z=

TAFs - Decoding

Temporarily: TEMPO

- indicates fluctuation in the forecast are to occur between the times indicated to some of the weather elements

TEMPO 2519/2602 : Temporarily from the 25th day at 1900Z to the 26th day at 0200Z

TAF CYKF 251343Z 2514/2602 21005KT P6SM SCT050 FM251600 26008KT P6SM BKN050 FM251900 28012KT P6SM -SHRA SCT020 OVC050 TEMPO 2519/2602 5SM -SHRA BR BKN020 BECMG 2519/2521 33005KT RMK FCST BASED ON AUTO OBS. NXT FCST BY 252000Z=

TAFs - Decoding

Probability: PROB30 or PROB40

Used with aviation hazards like thunderstorms, freezing rain, low level wind shear below 1500ft AGL; or ceiling and visibility values important to aircraft operations

PROB30 2513/2516: There is a 30% probability that between the 25th day at 1300Z and the 25th day at 1600Z (that there will be….)

TAF CYQD 251238Z 2513/2601 VRB03KT P6SM SCT010 SCT040 TEMPO 2513/2516 BKN010 PROB30 2513/2516 1SM BR OVC003 RMK NXT FCST BY 251900Z=

TAFs - Decoding

Remarks: RMK

- Remark give extra information. Often when the next forecast will be given
- AUTO OBS indicates forecast based on observations from an automatic weather station (AWOS) data
- RMK FCST BY 251900Z: Remark, next forecast will be on the 25th day at 1900Z

TAF CYKF 251343Z 2514/2602 21005KT P6SM SCT050 FM251600 26008KT P6SM BKN050 FM251900 28012KT P6SM -SHRA SCT020 OVC050 RMK FCST BASED ON AUTO OBS. NXT FCST BY 251900Z=

TAF CYQD 251238Z 2513/2601 VRB03KT P6SM SCT010 SCT040 TEMPO 2513/2516 BKN010 PROB30 2513/2516 1SM BR OVC003 RMK NXT FCST BY 251900Z=

TAFs – Decode (Practice)

- **TAF CYZU 251410Z 2514/2523 27006KT P6SM FEW090**
  BECMG 2517/2519 29010G20KT
  RMK NXT FCST BY 251900Z=

- **TAF CYED 251115Z 2512/2524 28010KT P6SM FEW080 SCT250**
  BECMG 2516/2518 29010G20KT
  BECMG 2522/2524 31010KT
  RMK FCST BASED ON AUTO OBS. NXT FCST BY 251800Z

- **TAF CYWL 251240Z 2513/2601 VRB03KT P6SM BKN050 PROB30 2513/2517**
  1/2SM FZFG FM251700 14006KT P6SM SCT050
  RMK NXT FCST BY 251900Z=

METARS/TAFs - Resources

For more practice:

- Look in the FTGU pg 160-163
- Check out the aviation weather website

www.flightplanning.navcanada.ca (google AWWS)

Next week…

- Section 2 of 5 is completed!
- Test next week will cover only meteorology material
  - Approximately 40-50 questions
  - A few theory of flight review questions…(maybe)
- Quiz 2 will be released soon
  - If you have any questions, use the contact us section of the website
- Next section will be Air Law
- Good Luck!