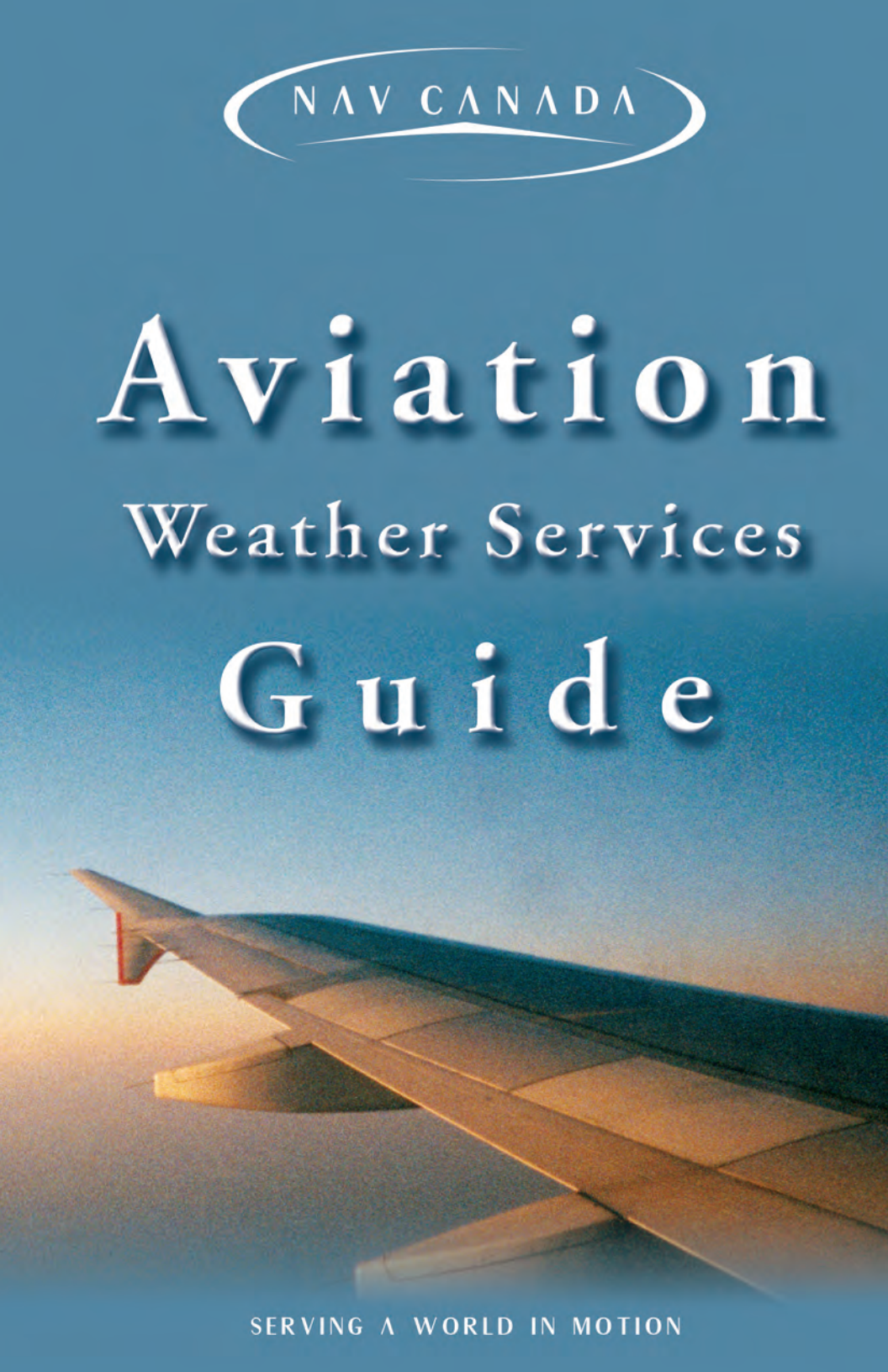
NAV CANADA

Aviation Weather Services Guide



SERVING A WORLD IN MOTION

January 2005

Introduction

NAV CANADA provides this guide as a quick reference to assist pilots and dispatchers regarding the availability of aviation weather products and services, and to help them to understand and use those products.

NAV CANADA is the non-share capital corporation responsible for the provision of civil air navigation services, including aviation weather dissemination within Canadian airspace and Canadian-controlled oceanic airspace in the North Atlantic to 30°W longitude.

For more detailed information on products and services, see the MET section of the Aeronautical Information Publication (AIP); Manual of Standards and Procedures for Aviation Weather Forecasts (MANAIR) available through the NAV CANADA Aviation Weather Web Site; the Air Command Weather Manual (and supplement); and specific airport information listed in the Canada Flight Supplement (CFS).

This guide is not intended as a comprehensive review of the NAV CANADA aviation weather service program. For more information, contact the Manager of Aviation Weather Services, NAV CANADA Head Office, Ottawa, Ontario (613) 563-5603.

To order additional copies of the Aviation Weather Services Guide, contact NAV CANADA Customer Service.

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Kamloops airport *Photo courtesy of NAV CANADA FIO*

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1. Aviation Weather Services

NAV CANADA makes available two levels of weather briefing service to pilots: the Aviation Weather Briefing Service (AWBS) provides interpretive briefings while the Aviation Weather Information Service (AWIS) provides descriptive information. The descriptive weather service includes briefings, automatic telephone and Internet access. Weather data may also be sent via facsimile from some locations. This service is indicated by the letter "F" in the FLT PLN area of the CFS Aerodrome/Facility Directory.

1.1 Aviation Weather Briefing Service (AWBS)

AWBS is a fully interpretive weather briefing service provided by specially trained Flight Service Specialists. Interpretation of changing or complex weather situations, special user needs, consultation on specific weather problems and flight documentation are all available. All Flight Information Centres (FIC) offer this service. AWBS is available toll-free and is indicated by the code W1 in the FLT PLN section of the CFS Aerodrome Facility Directory.

1.2 Aviation Weather Information Service (AWIS)

AWIS briefings are a plain language description of the weather, using mainly alphanumeric weather information, generally for flights operating below FL180. They include an outline of the major weather systems within 500NM of the FSS that might affect the route to be flown. AWIS, which is also available toll-free, is currently provided by many Flight Service Stations, however, this service will gradually be replaced by fully interpretive weather briefings from Flight Information Centres. AWIS is indicated by the code W2 in the FLT PLN area of the CFS Aerodrome/Facility Directory.

1.3 Aviation Weather Web Site (AWWS)

Internet access to Canadian aviation weather information is available through the Flight Operations section of the NAV CANADA Web Site (www.navcanada.ca / Flight Operations / Aviation Weather Web Site). U.S. weather information, while not on the Web Site, is made available through a link to the Aviation Digital Data Service (ADDS) Web Site.

The NAV CANADA Aviation Weather Web Site provides coded and plain language surface weather observations (METAR), aerodrome forecasts (TAF) and pilot weather reports (PIREP); route specific alphanumeric information; weather charts; satellite and composite radar imagery; plotted wind and temperature charts; tutorials; and various other supplemental information. Canadian NOTAM and images from Aviation Weather Cameras (Wx Cams) are also available.

The Aviation Weather Web Site is divided into 5 sections;

My Wx Data - Personal weather information page that allows the user to save up to 10 customized weather information folders. Pilots must "log in" to use this feature.

Route Data - Allows the user to retrieve weather information along a proposed flight route by specifying the departure, destination and enroute airports.

Regional Area Data - Retrieves user-selected weather information for one of seven GFA regions.

Local Data - Retrieves user-selected weather information within a 50 nautical mile (NM) radius of a selected aerodrome.

Forecasts & Observations - Provides direct access to all available weather information. This is also the default page for the Web Site.

Registered users of the Aviation Weather Web Site also have the option of filing flight plans to Canadian destinations on the internet. For information on becoming a registered user, refer to the "Internet Flight Planning System (IFS) User's Guide" on the Aviation Weather Web Site.

1.4 Pilot's Automatic Telephone Weather Answering System (PATWAS)

PATWAS is an automatically-generated, continuous voice recording of selected aviation weather information based on routes, areas or individual weather reporting stations. Through PATWAS, pilots can access the following weather data via telephone: Weather Advisories (AIRMET), Weather Reports (METAR & SPECI), Aerodrome Forecasts (TAF), and Forecast Winds and Temperatures Aloft.

PATWAS employs an Interactive Voice Response (IVR) system that combines an Automatic Telephone Answering Device (ATAD) with a text-to-voice generation system and a fax-back capability. The new PATWAS systems will be located at all Flight Information Centres across Canada. The system automatically generates and updates PATWAS voice and facsimile messages from text weather data provided by the Meteorological Service of Canada and makes the messages available for caller access via telephone.

PATWAS improves pilot access to basic weather information, particularly during peak demand periods. It provides NAV CANADA customers with an alternative, automated method of receiving routine weather information. Pilots access the system by telephone. Through the use of the telephone keypad, a number of weather information services can be selected.

There are three main categories of weather information services available to the caller from the "Main Menu":

#1 - Route Information
Provides weather information for a selection of routes to preassigned destinations.

#2 - Local Airport Information
Provides weather information for a preselected group of airports.

#3 - Multiple Airport Selection
Provides access to weather information for three selected sites by entering the airport identifier. The identifiers for Multiple Airport Selection may be entered using the telephone keypad, or by speaking the 3-letter airport identifier codes using the ICAO Phonetic Alphabet.

The following weather information is available through PATWAS:

- SIGMETs, AIRMETs and PIREPs
- METARs and SPECIs
- Aerodrome Forecasts (TAF)
- Low, Mid and High Level Winds and Temperature Aloft Forecasts (FD)
- Sunrise/Sunset Times (available only through the Multiple Airport Selection Menu).

How to use PATWAS

After you have reached the "**Main Menu**" use the telephone keypad to select from the following options:

MAIN MENU SELECTIONS

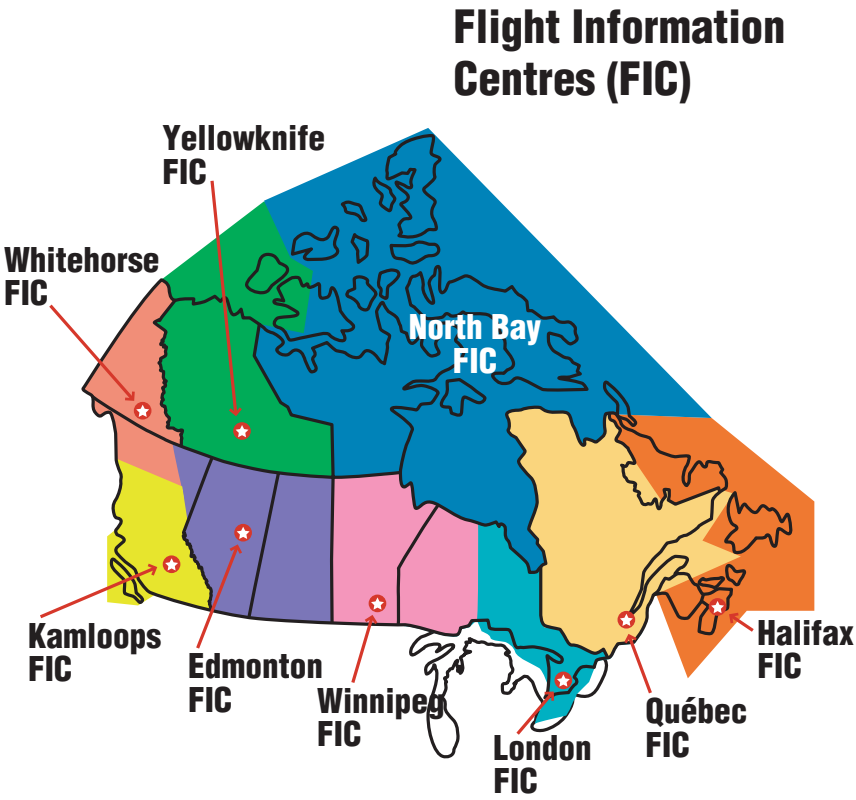
Weather Information	Route	Local Airport	Multiple Airports	To receive info by FAX	Help & Instructions (anytime)	Return to Main Menu (anytime)	Return to Previous Menu	Speak to a FS Specialist (anytime)
Press Key:	1	2	3	4	5	#	*	0

PATWAS Code Legend

To enter an airport identifier on the telephone keypad, callers must press two keys for each letter. The first key press is the letter's position on the telephone keypad (e.g. the keypad number [2] represents the letters "A", "B" and "C", the keypad number [3] represents "D", "E" and "F", etc.) The second key press is either [1], [2] or [3] and corresponds to the first, second or third letter on the key (e.g. "C" is the third letter on the [2] key, so the key sequence for "C" is [2] [3]). Letters "Q" and "Z" are assigned [7] [7] and [9] [9] respectively, as they do not appear on the keypad.

All alphabetized codes are indicated below:

A = 21	**G = 41**	**M = 61**	**S = 73**	**Y = 93**
B = 22	**H = 42**	**N = 62**	**T = 81**	**Z = 99**
C = 23	**I = 43**	**O = 63**	**U = 82**	
D = 31	**J = 51**	**P = 71**	**V = 83**	
E = 32	**K = 52**	**Q = 77**	**W = 91**	
F = 33	**L = 53**	**R = 72**	**X = 92**	



2. Flight Information Centres (FIC)

Weather briefing, flight planning and enroute flight information services are being consolidated into nine Flight Information Centres across Canada.

1. Halifax FIC
2. Québec FIC
3. London FIC
4. North Bay FIC
5. Winnipeg FIC
6. Edmonton FIC
7. Kamloops FIC
8. Yellowknife FIC
9. Whitehorse FIC

Each FIC will be capable of providing fully interpretive preflight and enroute weather briefing services via toll-free telephone access and air/ground radio communications. FICs will be equipped with a full suite of weather products, including satellite and radar imagery.

Once the FIC becomes operational for its area of responsibility, pilots in Canada will be able to access the FIC with a common toll-free number **1-866-WXBRIEF (992-7433)**. This telephone number will automatically route your call to the FIC serving the area from which the call is being made. An additional toll free number **1-866-GOMÉTÉO (466-3836)** will also be available anywhere in Canada, routing the call to the Québec FIC for service in French. Additional toll-free numbers, operational in both Canada and the United States, will allow pilots to contact a specific FIC of their choice.

Kamloops FIC	1-866-541-4101
Edmonton FIC	1-866-541-4102
Winnipeg FIC	1-866-541-4103
London FIC	1-866-541-4104
Quebec FIC	1-866-541-4105
Halifax FIC	1-866-541-4106

Individual toll-free phone numbers for Whitehorse, Yellowknife and North Bay are expected to be available in 2006.

Services that are specific to an aerodrome – such as airport advisory, vehicle control and local weather observations – will continue to be provided locally through the existing NAV CANADA Flight Service Station network.

3. How to Get a Weather Briefing

When calling for a briefing, advise the briefer that you are a pilot and be prepared to provide the following information:

- Aircraft/Flight ID;
- Type of operation (VFR, IFR, etc.);
- Aircraft type;
- Point of departure;
- Planned altitude;
- Route of flight;
- Destination;
- Estimated Time of Departure (ETD);
- Estimated Time Enroute (ETE); and
- Alternate (if applicable).

4. In-Flight Weather Availability

Call FIC/FSS on 126.7 Mhz – Best used for short updates of destination, alternate and enroute weather.

Air Traffic Control (ATC) – Air Traffic Controllers may provide local weather information, if time permits, to aircraft in the affected airspace.

Flight Service Station (FSS) – Flight Service Stations provide services that are specific to an aerodrome. Local weather information is available to assist arriving and departing aircraft.

Flight Information Centre (FIC) – Flight Information Centres are staffed and equipped to provide a fully interpretive preflight and in-flight weather briefing service.

Automated Terminal Information Service (ATIS) – ATIS provides arriving and departing aircraft with airport-specific information, including local weather, by means of a recorded continuous and repetitive broadcast. Refer to the CFS for ATIS availability at specific airports.

Voice Generator Module (VGM) – Automated Weather Observation Systems (AWOS) and Limited Weather Information Systems (LWIS) may transmit weather information on a designated VHF frequency and, at some sites, through a telephone dial-up.

5. Aviation Weather Information

Current and forecast weather information is disseminated as either alphanumeric data or graphic weather products. Current weather information describes weather conditions that have already occurred, whereas forecast weather products depict the most likely weather conditions at a future time.

Current Weather Information	
Weather Data (text)	**Weather Products (graphics)**
• Aviation Routine Weather Report (METAR/SPECI) • Pilot Report (PIREP)	• Analysis Charts • Weather Radar • Satellite Imagery

Forecast Weather Information	
Weather Data (text)	**Weather Products (graphics)**
• Aerodrome Forecast (TAF) • Upper Winds & Temperatures (FD) • Weather Warning (SIGMET) • Weather Advisory (AIRMET)	• Graphic Area Forecast • Significant Weather Chart • Upper Level Wind Chart • Volcanic Ash Chart

6. Canadian Weather Information Summary

The products on the chart below are routinely available to pilots and dispatchers for pre-flight planning and weather monitoring purposes.

Weather Data (text)			
Item	**Times and Coverage Period**	**Flight Level**	**Description**
SIGMET (WS)	When required – valid up to 4 hours maximum	As required	Short-term weather warning of hazardous weather conditions; amends the corresponding GFA.
AIRMET (WA)	When required – valid until updated, cancelled or new GFA issued	Below 24,000 ft	Short term advisory of hazardous weather conditions not requiring a SIGMET; amends the corresponding GFA.
PIREP (UA/UUA)	As reported	As reported	Observations of flight conditions as reported by a pilot
Aviation Weather Report (METAR)	Hourly on the hour, and when a special (SPECI) is required	As observed from the surface.	Describes actual weather conditions as observed from the ground
Aerodrome Forecast (TAF)	Usually issued every 6 hours (00Z, 06Z, 12Z, 18Z). Normally valid from 12 to 24 hours; but not always produced on this fixed schedule	A forecast of clouds and visible weather from surface	Provides expected conditions for LANDING and TAKEOFF within 5NM of the aerodrome
Wind and Temperature Aloft Forecast (FD)	Issued several times daily; valid for a specific period, usually from 4 to 9 hours	3,000 FL240 6,000 FL300 9,000 FL340 12,000 FL390 18,000 FL450 FL530	An alphanumeric product that predicts winds and temperatures aloft

Weather Charts			
Item	**Times and Coverage Period**	**Flight Level**	**Description**
Surface Analysis Chart	Issued four times daily valid 00Z, 06Z, 12Z, 18Z	Surface	Analysis of MSL pressure pattern, fronts and pressure centres
Upper Level Analysis Charts	Issued twice daily (00Z, 12Z)	850mb (5,000 ft); 700mb (10,000 ft); 500mb (18,000 ft); 250mb (34,000 ft)	Height of constant pressure levels, wind speed/ direction, temperature and moisture
Graphic Area Forecast (GFA) Chart	Issued four times daily (00Z, 06Z, 12Z, 18Z); valid for 12 hours with an additional 12-hour IFR Outlook.	Below 24,000 ft except for convective tops expected to extend above this level	Forecast depiction of weather elements for a given time period over a designated geographical area (domain)
Significant Weather Prognosis Chart	Issued four times daily; valid 00Z, 06Z, 12Z, 18Z	Mid-Level: FL100-250 (700-400mb) High-Level: FL250-600 (400-70mb)	Forecast depiction of significant weather conditions (e.g. thunder-storms, icing, turbulence, mountain waves, etc.)
Volcanic Ash Forecast Chart	As required	As required	Forecast depiction of expected ash cloud dispersion (plume)
Upper Level Forecast Chart	Issued twice daily; valid 00Z, 06Z, 12Z, 18Z	FL240, FL340, FL450	Forecast depiction of winds and temperatures aloft
Canadian Turbulence Forecast	Issued twice daily; valid 00Z, 12Z	FL280-430	Forecast depiction of turbulence over Canada and the North Atlantic

Weather Imagery			
Item	**Times and Coverage Period**	**Flight Level**	**Description**
Weather Radar Imagery	Frequently	Line of sight from radar; and specific altitudes may be selected	Composite or single-site radar image of precipitation echo intensity and heights of echo tops
Satellite Imagery	At least every hour for Southern Canada. Normally every 6 hours for Northern Canada.	As viewed from the satellite	Infra-red, water vapour or visual satellite images

7. Aviation Weather Observation Products

7.1 Aviation Routine Weather Report (METAR/SPECI)

METAR is a surface weather observation issued on the hour, while **SPECI** is a special observation, issued at times other than on the hour, as the result of a significant weather change. Data is collected by human observers or automated stations, or a combination thereof, and then coded into METAR by computer software. There are two types of **automated stations** used - Automated Weather Observation System **(AWOS)** and Limited Weather Information System **(LWIS)**. See the CFS for their locations.

AWOS has a full suite of sensors capable of measuring cloud base height (up to 10,000 ft AGL), sky cover, visibility, temperature, dewpoint, wind velocity, altimeter setting, precipitation occurrence, type, amount and intensity and the occurrence of icing. LWIS is the more basic system, capable of measuring only wind, altimeter setting, temperature and dewpoint. Either of these systems may be equipped with a Voice Generation Module (VGM) permitting pilot access to observed weather by VHF radio and/or telephone. Refer to the CFS.

There are some significant differences between the human and automated reports of which pilots should be aware. The following table identifies the *major* differences:

Human and AWOS Observation Differences		
Weather Parameter	**Human Observation**	**AWOS Observation**
AWOS Indicator	——	AUTO
Visibility	Prevailing visibility in SM and fractions up to 3 miles, then whole miles	In SM up to 9 miles; measured using fixed, unidirectional forward scatter techniques; tends to be higher than human observations during precipitation and at night
RVR	Runway direction, visual range and trend	Not reported; however voice generator may broadcast RVR
Weather Group	Codes used for precipitation and obstructions to vision	Obstructions not identified; will report RA, DZ, FZRA, FZDZ, GR, SN, UP (unknown precipitation); does not report "in the vicinity (VC)" phenomena; has no method to identify thunderstorms
Cloud Amount and Sky Condition	Observer records cloud bases, amounts and opacities if any, and vertical visibility (VV) into surface based layers if applicable; SKC for sky clear	Can report multiple overcast cloud layers. Laser ceilometer views and calculates cloud heights and amounts directly over instrument only up to 10,000 ft; CLR BLO 100 recorded if no cloud detected below 10,000 ft; not always accurate for ceilings during precipitation, ice crystals and inversions.
Recent Weather	Operationally significant recent weather	Not reported
Wind Shear	Reported below 1,600 ft AGL	Not reported
Remarks	Codes for cloud type, opacity and obscuring phenomena, significant weather if not reported elsewhere	No remarks for clouds and obscuring phenomena; remarks for variable visibility, icing, precipitation amount, and rapid pressure changes may appear; remarks may be augmented by human observers

Some pointers for reading **METAR** are listed below:

- Report modifier – AUTO for AWOS or CCA for corrected report. The first corrected report is identified by the modifier CCA, the second by CCB, etc.;

- RVR where available, is included if visibility is 1 SM or less and/or RVR is 6000 ft or less;

- Can have 2 qualifiers of present weather – intensity or proximity, and descriptor;

- The predominant type of precipitation is reported first;

- Obstructions to vision are reported if the visibility is 6 SM or less;

- FEW means either 1/8 or 2/8 summation amount of cloud;

- Only CB and TCU cloud types are reported in the body of the METAR – all observed clouds and their opacities are reported in remarks;

- Winshear included if below 1,600 ft AGL and reported in the takeoff or approach path of the designated runway.

Smithers FSS *Photo courtesy of Eric Dupuis*

SIGNIFICANT PRESENT WEATHER CODES

QUALIFIER		WEATHER PHENOMENA		
INTENSITY OR PROXIMITY	DESCRIPTOR	PRECIPITATION	OBSCURATION	OTHER
Note: Precipitation intensity refers to <u>all</u> forms combined.	**MI** Shallow	**DZ** Drizzle	**BR** Mist (Vis ≥ 5/8 SM)	**PO** Dust/sand Whirls (Dust Devils)
- Light	**BC** Patches	**RA** Rain	**FG** Fog (Vis < 5/8 SM)	**SQ** Squalls
Moderate (no qualifier)	**PR** Partial	**SN** Snow	**FU** Smoke (Vis ≤ 6 SM)	**+FC** Tornado or Waterspout
+ Heavy	**DR** Drifting	**SG** Snow Grains	**DU** Dust (Vis ≤ 6 SM)	**FC** Funnel Cloud
VC In the vicinity	**BL** Blowing	**IC** Ice Crystals (Vis ≤ 6 SM)	**SA** Sand (Vis ≤ 6 SM)	**SS** Sandstorm (Vis < 5/8 SM) (+SS Vis < 5/16 SM)
	SH Shower(s)	**PL** Ice Pellets	**HZ** Haze (Vis ≤ 6 SM)	**DS** Duststorm (Vis< 5/8 SM) (+DS Vis < 5/16 SM)
	TS Thunderstorm	**GR** Hail	**VA** Volcanic Ash (with any visibility)	
	FZ Freezing	**GS** Snow Pellets		
		UP Unknown precipitation (AWOS Only)		

Abbreviations for cloud types found in RMK section of METAR:

High Clouds	Middle Clouds	Low clouds
CI = cirrus	AS = altostratus	CB = cumulonimbus
CS = cirrostratus	AC = altocumulus	TCU = towering cumulus
CC = cirrocumulus	ACC = altocumulus castellanus	CU = cumulus
		SC = stratocumulus
		NS = nimbostratus
		ST = stratus
		SF = stratus fractus
		CUFRA = cumulus fractus

7.2 Pilot Report (PIREP)

"When you get some weather information… give some back!"

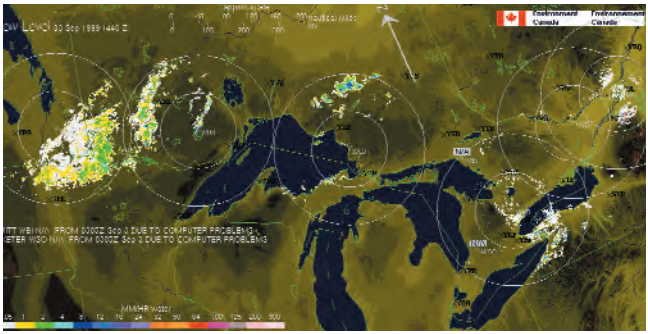
PIREP are observations of weather by pilots in flight and are extremely useful to forecasters, weather briefers and other pilots. Often no other weather data is available and the PIREP provides the only information. Even on good weather days, PIREP are helpful for validating forecasts and assisting other pilots to make flight planning decisions. PIREP are distributed using standard meteorological abbreviations (See Section 10 of this guide). Recent PIREP that contain weather elements which could be hazardous for other aircraft, are broadcast immediately by air traffic services. PIREP are available in both coded form and plain language on the NAV CANADA Aviation Weather Web Site.

It is highly recommended to pass PIREP to the Flight Service Specialist whenever possible during flight or as soon as practicable after landing via telephone. Use 126.7 MHz or the discrete frequency. Flight Service Specialists will accept pilot reports as provided by the pilot, however, additional information may at times be requested by the Specialist.

Turbulence Reporting Table

Intensity	Aircraft Reaction	Inside Aircraft
Light	Slight erratic changes = turbulence Slight rhythmic changes = chop	Slight strain against seat belts; Little or no difficulty walking
Moderate	Changes to altitude/attitude but aircraft remains in control; Rapid bumps or jolts = chop	Definite strain against seat belts; Objects are dislodged; Difficulty walking
Severe	Large, abrupt changes in altitude/attitude and airspeed; Momentarily out of control	Forced violently against seat belts; Walking is impossible; Unsecured objects thrown about

7.3 Weather Radar



Weather radar composite

Weather radar is an important tool to assist in the identification of areas of precipitation. It is important to note that weather radar **does not** show cloud cover. It is recommended that pilots who are unfamiliar with interpreting weather radar products seek the assistance of a qualified FSS weather briefer.

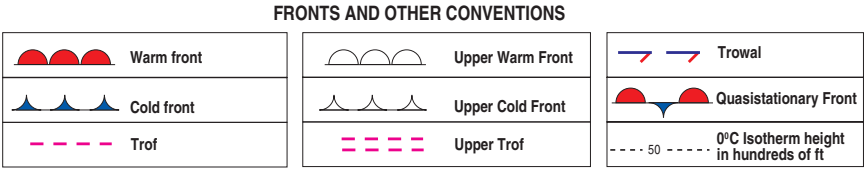
Weather radar imagery is disseminated in two formats: a precipitation intensity product and an echo tops product. The precipitation intensity (CAPPI) radar product provides an indication of precipitation intensity, measured in mm/hr, at a specific altitude (e.g. 1.5 km). The echo tops radar product provides an indication of the vertical extent of the precipitation area. **Cloud tops could extend much higher.**

Each weather radar site has a range of approximately 150NM. Weather radar composite products integrate a number of individual radar images into a single product. The advantage of the composite is that attenuation and masking are reduced as adjacent radar sites can "see" the precipitation from other directions. Weather radar composite products are available in colour on the NAV CANADA Aviation Weather Web Site.

7.4 Surface Analysis Charts

A few points to remember when using surface analysis weather charts:

1. Isobars, curving lines joining points of equal mean sea level (MSL) pressure, are drawn at 4 millibar intervals starting at 1000 millibars;
2. Winds tend to veer and increase the higher you go. Above 3,000 ft AGL, winds tend to blow roughly parallel to the isobars. When the isobars are spaced closer together, winds are stronger;
3. Fronts indicate the transition zone between two air masses and are depicted by either blue lines with barbs (cold front) or red lines with half circles (warm front);
4. Fronts advance in the direction of their pointed barbs (cold front) or half circle (warm front) symbols. A front that is not advancing, is said to be quasistationary. A TROWAL is a trough of warm air aloft.



Cold front *Photo courtesy of Michael Masek*

7.5 Satellite Imagery

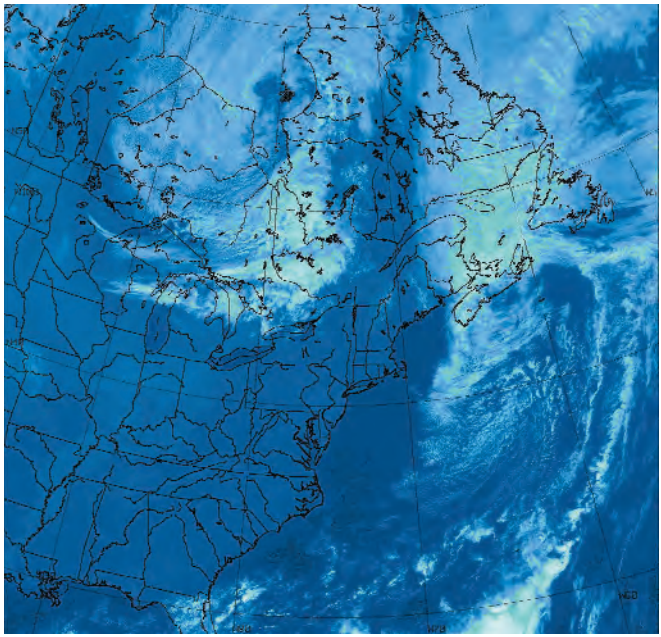
There are three types of satellite images: visual (VIS), infra-red (IR) and water vapour (WV).

Visual - This is basically a photo of the clouds and is available only during daylight hours.

Infra-red - Measures the heat (thermal) footprint of areas of cloud or the earth's surface if clouds are thin or the sky clear, and can be used both day and night.

Water Vapour - Displays water vapour distribution in the atmosphere.

Owing to the complexity of interpreting satellite imagery, most pilots should consider getting a weather briefing from an FIC when using satellite information for flight planning purposes.



Visual satellite image

8. Aviation Weather Forecasts

8.1 Aerodrome Forecasts (TAF)

Aerodrome Forecasts (TAF) are produced for approximately 180 sites across Canada. See AIP MET for locations. Abbreviations and codes are the same as those used in METAR.

Change groups are used to indicate the time of an expected weather change. They are FM, BECMG, TEMPO, and PROB30/40. A permanent change group such as FM or BECMG is definite; while a temporary change group like TEMPO is transitory. PROB indicates there is a probability that a weather event may occur (not that a weather event will occur for a percentage of the time).
A brief explanation of each follows:

FM - FM0600Z
Means FROM 0600Z, and is used when a permanent change ot the forecast will occur rapidly. Any forecast conditions given before FM are superseded.

BECMG - BECMG 0608
Means BECOMING during the period 06Z to 08Z, and is indicated when a permanent change is expected to occur over 1-4 hours. Normally this is used when only one or two weather groups are expected to change with the others remaining the same.

TEMPO - TEMPO 0612
Means TEMPORARY FLUCTUATION between 06Z and 12Z, and is indicated when a transitory change in some or all weather elements is expected during a specified time period. Only used when condition is forecast to last less than one hour at a time, and will not cover more than half the indicated forecast period.

PROB30/40 - PROB30 0612
Means PROBABILITY 30% (or 40%) between 06Z and 12Z that a given weather condition **may** occur. In the example above, it means there is a 30% chance that the condition will occur between 06Z and 12Z not that a given weather condition will occur 30% of the time.

IFR Alternate Selection Criteria - When selecting an alternate, a TAF with BECMG or TEMPO must meet alternate minima, while a TAF with PROB conditions need only meet landing minima. When using BECMG, the most conservative time period must be used (i.e. if conditions are deteriorating, use the start of the BECMG period).

Weather observation equipment *Photo courtesy of Jeff Vey*

De Havilland Otter on skis *Photo courtesy of Michael Shaw*

Turbo Beaver on floats *Photo courtesy of Jean-Pierre Seguin*

TAF Decode and Description

TAF CYDN 291145Z 291212 24010G25KT WS011/27050KT 3SM -SN BKN010 OVC040 TEMPO 1801 11/2SM -SN BLSN BKN008 PROB30 2022 1/2SM SN VV005 FM0130Z 28010KT 5SM -SN BKN020 BECMG 0608 00000KT P6SM SKC RMK FCST BASED ON AUTO OBS NXT FCST BY 18Z

TAF - Aerodrome Forecast in TAF Code.
This indicates the type of report. If the forecast is amended it will be indicated directly following the report type, i.e., "TAF AMD".

CYDN - Dauphin, Manitoba.
Station indicators will be 4-letter ICAO indicators.

291145Z - Forecast issued on the 29th day of the month, 1145Z.
As in the METAR, the issue day of the month and UTC time will be included in all reports. If the TAF is based on off-site or partial observations, then the term "ADVISORY" is added after the date/time group indicating an Aerodrome Advisory Forecast.

291212 - Forecast covers the period from 1200Z on the 29th to 1200Z the following day.
The forecast period contains the start day, UTC hour, and ending UTC hour. Within the forecast there may be further subdivisions by change groups which will include modified elements.

24010G25KT - Forecast surface wind is 240° True at 10 knots gusting to 25 knots.
Wind is forecast in the TAF using criteria similar to that of the METAR. Wind of 3 KTS or less can be forecast as VRB (variable) with a speed (e.g. VRB03).

WS011/27050KT - There is a wind shear forecast to exist in the layer from the surface to 1,100 feet AGL. The wind at that height is 270° True at 50 knots.
Canada and the U.S. have adopted this format of forecasting low level non-convective wind shear. Low level wind shear forecasts shall be included whenever strong wind shear, which could adversely affect aircraft operation within 1,500 feet AGL, can be adequately predicted.

3SM -SN - Forecast prevailing visibility is 3 statute miles in light snow.
Prevailing visibility is forecast as per the METAR criteria. Visibilities greater than 6 SM are coded as "P6SM".

BKN010 OVC040 - Forecast cloud layers are broken at 1,000 feet AGL and overcast at 4,000 feet AGL.
Cloud layers are forecast as per the METAR criteria. Only cumulonimbus (CB) cloud type will be identified in the forecast. It will be appended following the cloud layer height (BKN010CB). Summation amounts are used as in METAR.

TEMPO 1801 - The following weather elements are forecast to temporarily change between 1800 and 0100Z.
There are a number of change group codes. Canada has adopted a unique format to delineate the hour grouping in the "FM" change group with the letter "Z" to avoid any confusion which may arise between hour and minute groupings. Elements identified after a change group code are those that are expected to change, while those not stated remain the same.

11/2SM -SN BLSN BKN008 - The prevailing visibility is forecast at 11/2 statute miles in light snow and blowing snow with a broken cloud layer at 800 feet.

PROB30 2022 - There is a 30% probability that the given weather event may occur between 2000 and 2200Z.

1/2SM SN VV005 - The prevailing visibility is forecast at 1/2 statute mile in moderate snow which is the obscuring phenomena creating a vertical visibility of 500 feet.

FM0130Z - A permanent change to the following elements will occur beginning at 0130Z.

28010KT 5SM -SN BKN020 - The wind is forecast at 280° True at 10 knots with a prevailing visibility of 5 statute miles in light snow and a broken cloud layer at 2,000 feet.

BECMG 0608 - Between 0600Z and 0800Z the following weather elements will gradually change to become as forecast.

00000KT P6SM SKC - The wind is forecast to be calm, the forecast visibility is greater than 6 statute miles ("P" for plus), and the sky will be clear (SKC). NSW (No Significant Weather) may also be used if the weather improves to the point where there is no longer any significant weather.

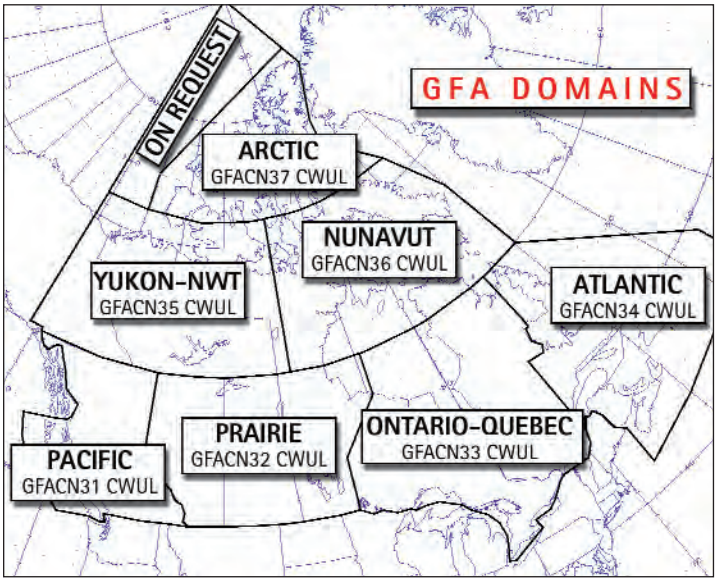
RMK FCST BASED ON AUTO OBS NXT FCST BY 18Z - The observation for this site is based primarily on AWOS sensor data. The next forecast for this site will be issued by 1800Z.
This remark format is unique to Canadian TAF. It brings to the attention of the users that the on-site observational data is AWOS-based (this remark will still appear for sites where there is human augmentation of the observation). Canada has staggered issue and update schedules for some TAF.

FSS Weather Briefer *NAV CANADA archives*

8.2 Graphic Area Forecast (GFA)

The **Graphic Area Forecast** consists of a series of weather charts that provide a graphic depiction of the most probable meteorological conditions expected to occur between the surface and 24,000 feet over a given area at a specified time. The GFA, which is designed primarily to satisfy general aviation and regional air carrier requirements for pre-flight route planning in Canada, also meets the regulatory requirements for an area forecast as stated in the Canadian Aviation Regulations (CARs). See the AIP for a more detailed description of the GFA.

There are seven distinct GFA areas, or **domains**, covering the entire Canadian domestic airspace. A GFA is issued for each domain, and consists of six weather charts: two valid at the beginning of the forecast period; two valid six hours into the forecast period; and two valid twelve hours into the forecast period. Of the two charts valid at each time, one chart depicts clouds and weather information; the other chart depicts icing, turbulence and freezing level information for the same area and valid time.



GFA domains

The GFA uses **codes** from TAF and METAR, and symbols and abbreviations are consistent with those found in the MET section of the AIP. All heights are ASL unless indicated; cloud bases and tops are indicated; visibility is always included, and if expected to be greater than 6 miles is shown as P6SM; wind is included only if 20 KTS or more or gusts to 30 KTS or more.

The GFA chart is made up of four distinct sections:

- **Title Box –** provides the domain and valid time.

- **Legend Box –** provides symbols used on the chart and a scale in NM.

- **Comments Box –** anything the forecaster deems important, and a 12 hour IFR Outlook on the last clouds and weather chart.

- **Weather Information Box –** this is the graphic part of the chart.

8.2.1 GFA Spatial Coverage Qualifiers

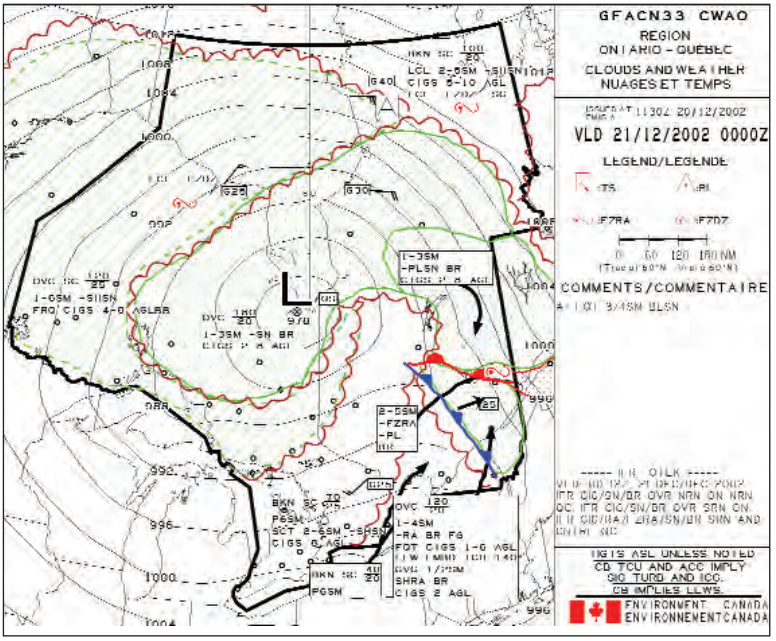
For convective cloud and showers
The following qualifiers regarding convective clouds and showers may be used in GFAs according to the following spatial coverage definitions:

Abbreviation	Description	Spatial Coverage
ISOLD	Isolated	Less than 25%
SCT	Scattered	25 - 50% inclusive
NMRS	Numerous	Greater than 50%

For icing, turbulence, restriction to VIS, non-convective precipitation, low stratus ceilings and precipitation ceilings
The following qualifiers regarding restriction to visibility, non-convective precipitation, precipitation ceilings and low stratus ceilings may be used in GFAs according to the following spatial coverage definitions:

Abbreviation	Description	Spatial Coverage
LCL	Local	Less than 25%
PTCHY	Patchy	25 - 50% inclusive
XTNSV	Extensive	Greater than 50%

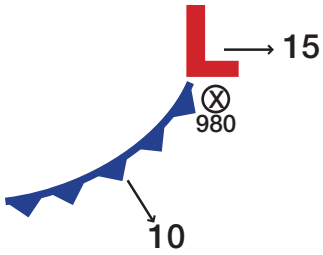
8.2.2 Clouds and Weather Chart



Clouds and Weather GFA chart

This chart provides a forecast of cloud layers and/or surface-based phenomena, visibility, weather and obstructions to vision at the valid time. Isobars are depicted at 4mb intervals. In addition, relevant fronts, highs and lows are included. For speeds of fronts or pressure systems less than 5 KTS, the letter QS are used to indicate a quasistationnary front.

Glider *Photo courtesy of Mark Bucken*

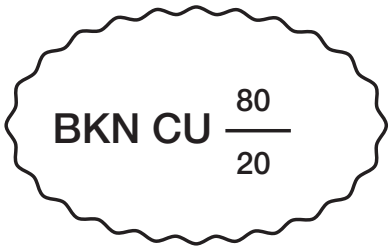


- Low pressure system with a central pressure of 980 millibars moving to the east at 15 KTS.

- Cold front moving to the southeast at 10 KTS.

Fronts and lows as depicted on a GFA

Clouds are displayed with bases and tops, including convective clouds with tops extending above 24,000 ft. **Convective-type clouds** (CU, TCU, ACC and CB) are always specified if forecast. In areas where **organized clouds** are not forecast, and the visibility is expected to be greater than 6 SM, no scalloped area is used. No summation amount for cloud is used in the GFA.



- Scalloped area indicates organized clouds.

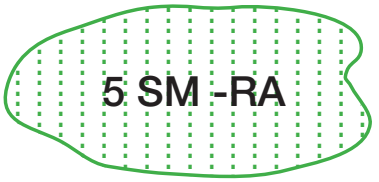
- Area of BKN cumulus cloud with a base at 2,000 feet ASL and tops at 8,000 feet ASL.

An area of organized clouds as depicted on a GFA

Surface-based layers are described using standard meteorological abbreviations including the term OBSCD. LCL OBSCD CIG 3-5AGL means: local obscured ceilings between 300 and 500 ft AGL.

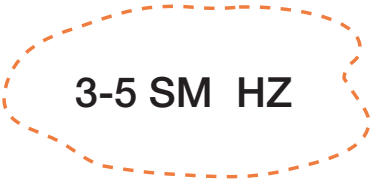
Obstructions to vision are only mentioned when the visibility is forecast to be 6 SM or less. Visibility is indicated the same as in the METAR/TAF except a range may be specified e.g. 2-4 SM – SHRA.

Areas of precipitation and obscurations are often defined by borderlines. Continuous green lines enclose areas of continuous precipitation, dashed green lines enclose areas of intermittent or showery precipitation, and dashed orange lines enclose areas of obscuring phenomena other than precipitation (e.g. haze).



Continuous precipitation

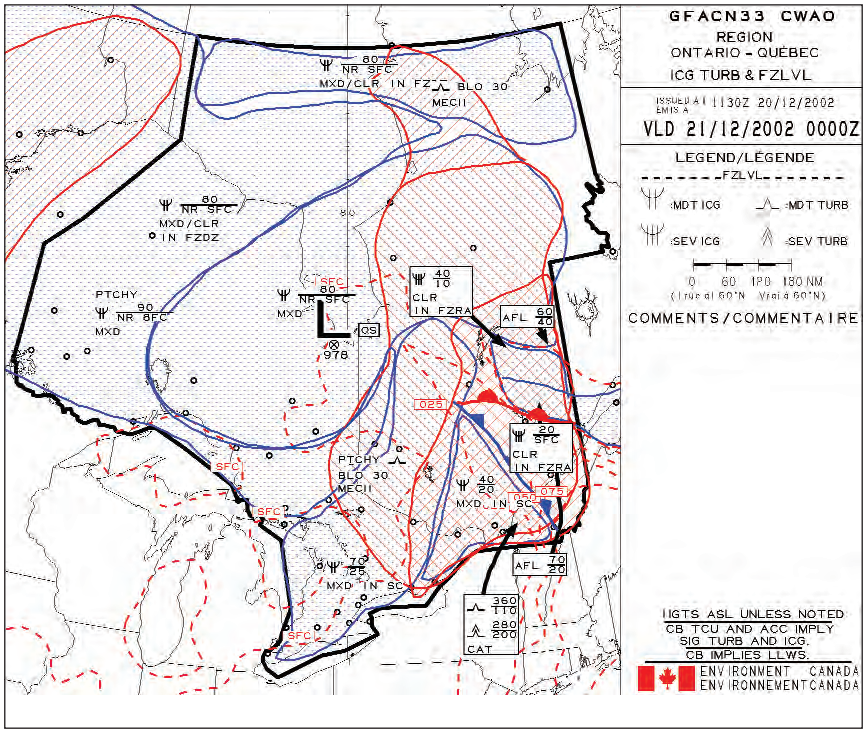
Showery precipitation/
Intermittent precipitation



Obscuration

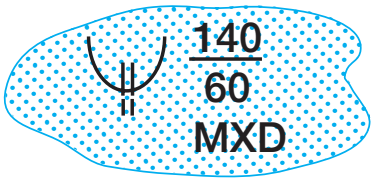
Taxiing for takeoff *Photo courtesy of Michael Shaw*

8.2.3 Icing, Turbulence and Freezing Level Chart



The GFA Icing, Turbulence and Freezing Level chart depicts forecast areas of icing and turbulence as well as the expected freezing level at a specific time. Included on the chart are the type, intensity, bases and tops for each icing and turbulence area. Surface synoptic features such as fronts and pressure centres are also shown. **This chart is to be used in conjunction with the associated GFA Clouds and Weather chart issued for the same valid time.**

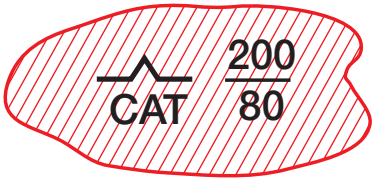
Icing: depicted whenever **moderate or severe** icing is forecast. Bases, tops and type of icing (RIME, MXD-mixed, CLR-clear are all indicated. **Light** icing areas are described in the Comments Box. Icing is indicated as an enclosed area with dots in blue.



- Area of moderate mixed icing based at 6,000 feet ASL topped at 14,000 feet ASL.

Icing area on a GFA

Turbulence: Depicted whenever **moderate or severe** turbulence is expected. If the turbulence is due to mechanical turbulence, low level wind shear, lee/mountain waves, a significant low level jet or in clear air, an abbreviation indicating the cause of the turbulence will be included (e.g. MECH, LLWS, LEE WV, LLJ or CAT).



- Area of moderate CAT based at 8,000 feet ASL topped at FL200

Turbulence area on a GFA

Freezing Level:
Contours are indicated on the chart by **red dashed lines**, starting at the surface (SFC) and **at 2,500 ft intervals**. Any modifications are explained in the Comments Box.

The GFA **IFR Outlook** describes IFR weather only, but the descriptions for marginal VFR(MVFR) and VFR are included here as these terms are often used in briefings.

Category	Ceiling		Visibility
IFR	Less than 1000 ft AGL,	or	Less than 3 SM
MVFR	1000 to 3000 ft AGL,	or	3 to 5 SM
VFR	Greater than 3000 ft AGL,	and	Greater than 5 SM

8.3 Upper Level Wind and Temperature Forecast (FD)

FD are alphanumeric **forecasts of wind and temperature aloft** at various altitudes. They are produced for approximately 140 sites across Canada. FD forecasts are available on the NAV CANADA Aviation Weather Web Site in both alphanumeric and plotted versions, grouped by area for ease of reference. The example below shows winds and temperatures in the lower levels, and the table explains the various codes used and how to decode them:

FCST BASED ON 051200 DATA VALID 060000 FOR USE 21-06

	3000	6000	9000	12000	18000
YVR	**2523**	2631-02	2536-09	2560-14	**7503-25**
YVV	0224	3609-05	2811-08	2769-14	2789-26
YWG	2610	**9900+00**	2612-03	2525-10	2562-23

FD Coded	FD Decoded
2523	Wind at Vancouver at 3,000 ft ASL 250^0 True at 23 KTS
9900 + 00	Wind at Winnipeg at 6,000 ft ASL light and variable, temperature 0^0 C
7503-25	Wind at Vancouver at 18,000 ft ASL 250^0 True (75 - 50 = 25) at 103 KTS (03 + 100 = 103), temperature -25^0 C
859950 (Generic Example)	Wind 350^0 True (85 - 50 = 35) at 199 KTS or greater, temperature - 50^0 C

8.4 SIGMET/AIRMET

SIGMET - amends the corresponding GFA. A SIGMET is a short-term weather warning issued when hazardous conditions occur or are expected to occur. They are numbered sequentially, i.e. A1, A2. SIGMET are in force until updated or cancelled.

AIRMET - amends the corresponding GFA. An AIRMET is a short-term weather advisory issued when hazardous weather conditions occur or are expected to occur during the GFA valid period that are not covered in the GFA and do not warrant the issuance of a SIGMET. AIRMET are numbered sequentially (i.e. A1, A2,…) and remain in force until updated or a new GFA is issued.

Hazardous weather conditions include:

- IFR weather (broken or overcast cloud condition at less than 1,000 ft AGL and/or visibility less than 3 SM);
- Freezing precipitation (not requiring a SIGMET);
- Moderate icing (not associated with convective clouds);
- Moderate turbulence (not associated with convective clouds);
- Thunderstorms (unorganized);
- The surface mean wind speed, over a large area, increases to 20 KTS or more, or gusts increase to 30 KTS or more, when lighter winds were originally forecast; or
- The difference between the forecast and observed wind direction is greater than 60^0.

SIGMET and AIRMET bulletins are produced in abbreviated plain language using standard meteorological abbreviations listed in the Manual of Abbreviations (MANAB) which is available on the Meteorological Service of Canada web site.

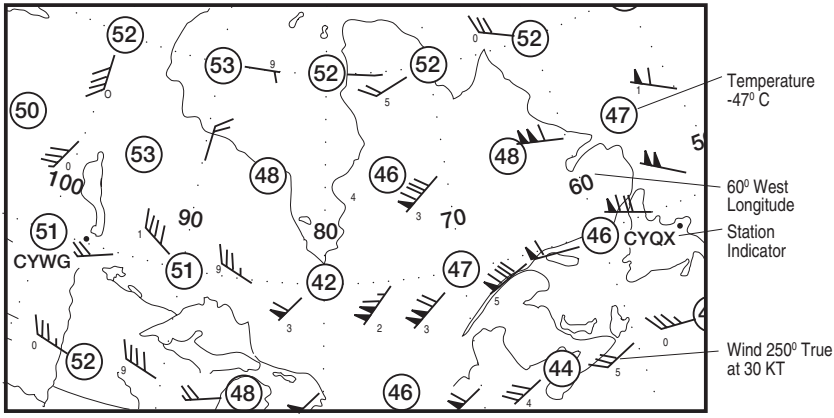
8.5 Weather Charts – Prognosis vs Analysis

Prognosis charts and analysis charts look the same so careful attention must be given to ensuring that the most appropriate chart (issue time/valid time) is selected for the intended flight time and route. Analysis charts show conditions as they actually were at a given time, while prognosis charts provide a forecast of the most probable weather conditions for a specific time in the future.

8.6 Upper Level Wind and Temperature Prognosis Charts

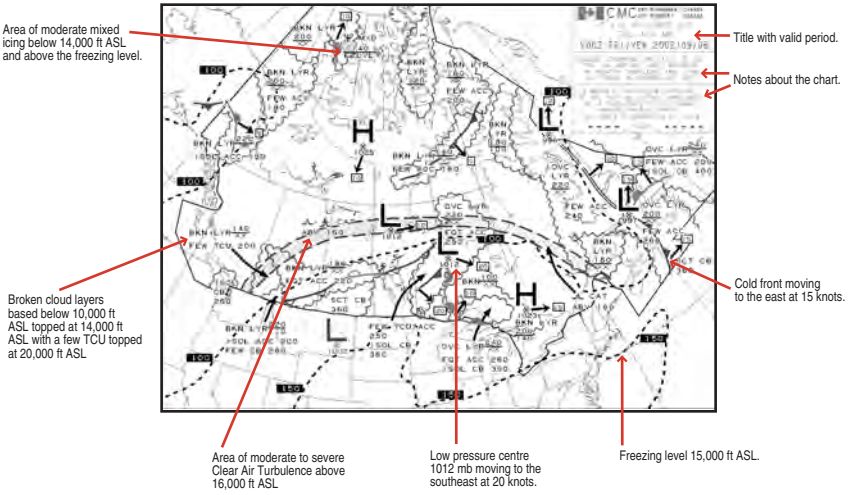
Upper level wind and temperature prognosis charts, depicting forecast winds and temperatures for FL240, FL340 and FL450 are issued twice daily and are valid 00Z, 06Z, 12Z and 18Z. Wind direction and speed is graphically depicted. Pennants (50 KTS), full feathers (10 KTS) and half feather (5 KTS) at the base of the arrow shaft indicate the true wind direction in tens of degrees. The temperature is indicated in whole degrees Celsius in a small circle at the end of the direction arrow.

FL340 24HR PROG of winds and temperatures



FL340 24HR PROG WINDS/TEMPS VALID 12Z

On approach *Photo courtesy of Jean-Claude Provost*



8.7 Mid-Level and High-Level Significant Weather Prognosis (PROG) Charts

Significant Weather (SIG WX) prognosis charts such as the **Mid-Level FL100-250 (700-400mb),** the **Upper Level FL250-600 (400-70mb)** and the **North Atlantic SIG WX Prog (surface-FL250)** provide a virtual display of forecast hazardous weather conditions. These charts use many of the meterological symbols listed in the MET section of the AIP.

The **Jet Stream,** which is depicted on the **Upper Level SIG WX** prognosis includes two numbers. The first number is a forecast of the vertical depth above the depicted jet maximum and is preceded by a plus sign (+). The second number is a forecast of the vertical depth below the depicted jet maximum and is preceded by a minus sign (-).

9. Meteorological Symbols

SIGNIFICANT WEATHER SYMBOLS

Boundary of an Area of Significant Weather	Boundary of an Area of Clear Air Turbulence

Moderate Turbulence	Snow	Hurricane
Severe Turbulence	Freezing Rain	Tropical Storm
Moderate Icing	Freezing Drizzle	Dust or Sand Storm
Severe Icing	Rain	Severe Line Squall
Thunderstorm	Drizzle	
Hail	Shower (symbol for type placed above)	
Marked Mountain Waves		

CLOUD

Cloud types are represented by the conventional abbreviation, cloud amount in oktas (eighths) and height of base and tops by the convention illustrated:

3CU $\frac{250}{XX}$

3/8 cumulus base below chart level tops 25,000 feet

10. Meteorological Abbreviations

A complete list of meteorological abbreviations can be found in the Manual of Abbreviations (MANAB), which is accessible through the NAV CANADA Aviation Weather Web Site, (publications/links for non-kiosk users/MANAB). A condensed list of commonly used meteorological abbreviations is included in this section. A similar list is also contained in the MET section of the AIP.

Contractions	Plain Language	Contractions	Plain Language
ABV	ABOVE	BCFG	FOG PATCHES
AC	ALTOCUMULUS	BDRY	BOUNDARY
ACC	ALTOCUMULUS CASTELLANUS	BECM	BECOME
		BECMG	BECOMING
ACRS	ACROSS	BFR	BEFORE
ACYC	ANTICYCLONIC	BGN	BEGIN, BEGAN
AFL	ABOVE FREEZING LAYER	BHND	BEHIND
		BKN	BROKEN
AFT	AFTER	BL	BLOWING
AFTN	AFTERNOON	BLDU	BLOWING DUST
AGL	ABOVE GROUND LEVEL	BLDUP	BUILDUP
		BLO	BELOW
AHD	AHEAD	BLSA	BLOWING SAND
AIRMET	AVIATION WEATHER ADVISORY	BLSN	BLOWING SNOW
		BR	MIST
AIRMS	AIR MASS	BRF	BRIEF
ALF	ALOFT	BRK	BREAK
ALG	ALONG	BTL	BETWEEN LAYERS
ALQDS	ALL QUADRANTS	BTN	BETWEEN
AMD	AMEND	BYD	BEYOND
ANAL	ANALYSE, ANALYSIS		
ARTC	ARCTIC		
AS	ALTOSTRATUS	CAT	CLEAR AIR TURBULENCE
ASL	ABOVE SEA LEVEL		
ATLC	ATLANTIC	CB	CUMULONIMBUS
AVBL	AVAILABLE	CC	CIRROCUMULUS

Contractions	Plain Language
CHG	CHANGE
CI	CIRRUS
CIG	CEILING
CLD	CLOUD
CLDS & WX	CLOUDS AND WEATHER
CLR	CLEAR
CNCL	CANCEL
CNTR	CENTRE
COND	CONDITION
CONTRAILS	CONDENSATION TRAILS
CONTUS	CONTINUOUS
CS	CIRROSTRATUS
CU	CUMULUS
CUFRA	CUMULUS FRACTUS
CVCTV	CONVECTIVE
CYC	CYCLONIC
DEG	DEGREE
DFUS	DIFFUSE
DIST	DISTANT/DISTANCE
DNS	DENSE
DNSLP	DOWNSLOPE
DPCTN	DEPICTION
DRDU	DRIFTING DUST
DRFT	DRIFT
DRSN	DRIFTING SNOW
DSIPT	DISSIPATE
DU	DUST
DURG	DURING
DURC	DURING CLIMB
DURD	DURING DESCENT
DVLP	DEVELOP
DZ	DRIZZLE

Contractions	Plain Language
E	EAST
EFCT	EFFECT
ELEV	ELEVATION
ELSW	ELSEWHERE
EMBD	EMBEDDED
ENDG	ENDING
ENRT	EN-ROUTE
ENTR	ENTIRE
ERLY	EARLY
ESPLY	ESPECIALLY
EST	ESTIMATE
EXC	EXCEPT
EXP	EXPECT
FAX	FACSIMILE
+FC	TORNADO
FC	FUNNEL CLOUD
FCST	FORECAST
FEW	FEW
FG	FOG
FIC	FLIGHT INFORMATION CENTRE
FIR	FLIGHT INFORMATION REGION
FL	FLIGHT LEVEL (PIREP)
FLO	FLOW
FM	FROM
FNT	FRONT
FROIN	FROST ON THE INDICATOR
FROPA	COLD FRONT PASSAGE
FROPA	FRONTAL PASSAGE

Contractions	Plain Language
FRQ	FREQUENT
FSS	FLIGHT SERVICE STATION
FT	FEET, FOOT
FU	SMOKE
FZ	FREEZE, FREEZING
FZDZ	FREEZING DRIZZLE
FZFG	ICE FOG
FZLVL	FREEZING LEVEL
FZRA	FREEZING RAIN
G	GUST(METAR, TAF)
GENOT	GENERAL NOTICE
GFA	GRAPHIC AREA FORECAST
GND	GROUND
GR	HAIL
GRAD	GRADIENT
GRDL	GRADUAL
GRTLKS	GREAT LAKES
GS	SNOW PELLETS
GSTY	GUSTY
HGT	HEIGHT
HI	HIGH
HIER	HIGHER
HLTP	HILL TOP
HND	HUNDRED
HPA	HECTOPASCAL
HR	HOUR
HSNBA	HUDSON BAY
HVY	HEAVY
HZ	HAZE
ICG	ICING
ICGIC	ICING IN CLOUD
IMDT	IMMEDIATE
IMPRG	IMPROVING
INCR	INCREASE
INSTBY	INSTABILITY
INTMT	INTERMITTENT
INTSFY	INTENSIFY
INTSTY	INTENSITY
INVOF	IN VICINITY OF
IR	INFRARED
ISOL	ISOLATE
JMSBA	JAMES BAY
JTSTR	JETSTREAM
KM	KILOMETRE
KPA	KILOPASCAL
KT	KNOT
L/V	LIGHT AND VARIABLE
LAT	LATITUDE
LCL	LOCAL
LGT	LIGHT
LK	LAKE
LKLY	LIKELY
LLJ	LOW LEVEL JET
LLWS	LOW LEVEL WIND SHEAR
LN	LINE
LO	LOW
LONG	LONGITUDE
LTGCC	LIGHTNING CLOUD TO CLOUD
LTGCG	LIGHTNING CLOUD TO GROUND
LTGIC	LIGHTNING IN CLOUD

Contractions	Plain Language
LTL	LITTLE
LTNG	LIGHTNING
LVL	LEVEL
LWR	LOWER
LYR	LAYER
MAX	MAXIMUM
MB	MILLIBAR
MDT	MODERATE
MECH	MECHANICAL
METAR	AVIATION ROUTINE WEATHER
MIFG	SHALLOW FOG
MIN	MINIMUM
MOV	MOVE
MRNG	MORNING
MRTM	MARITIME
MSL	MEAN SEA LEVEL
MST	MOIST
MSTLY	MOSTLY
MSTR	MOISTURE
MTW	MOUNTAIN WAVES
MVFR	MARGINAL VISUAL FLIGHT RULES
MXD	MIXED
N	NORTH
NC	NO CHANGE
NE	NORTHEAST
NEG	NEGATIVE
NGT	NIGHT
NGTM	NIGHTIME
NM	NAUTICAL MILE
NMRS	NUMEROUS
NR	NEAR
NS	NIMBOSTRATUS
NSW	NIL SIG WEATHER
NW	NORTHWEST
NXT	NEXT
OBSC	OBSCURE
OCLD	OCCLUDE
OCLN	OCCLUSION
OCNL	OCCASIONAL
OFSHR	OFFSHORE
ONSHR	ONSHORE
ORGPHC	OROGRAPHIC
ORGZ	ORGANISE
OTLK	OUTLOOK
OTWZ	OTHERWISE
OVC	OVERCAST
OVR	OVER
OVRHD	OVERHEAD
PCPN	PRECIPITATION
PD	PERIOD
PIREP	PILOT REPORT
PL	ICE PELLETS
POS	POSITIVE
PRES	PRESSURE
PRESFR	PRESSURE FALLING RAPIDLY
PRESRR	PRESSURE RISING RAPIDLY
PROB	PROBABILITY
PROG	PROGNOSIS, PROGNOSTIC
PRST	PERSIST
PSBL	POSSIBLE
PSN	POSITION
PTCH	PATCH
PTLY	PARTLY

Contractions	Plain Language
QS	QUASI-STATIONARY
RA	RAIN
RDG	RIDGE
RE	RECENT
RGN	REGION
RMK	REMARK
RPD	RAPID
RVR	RUNWAY VISUAL RANGE
S	SOUTH
SC	STRATOCUMULUS
SCT	SCATTERED, SCATTER
SE	SOUTHEAST
SEV	SEVERE
SF	STRATUS FRACTUS
SFC	SURFACE
SG	SNOW GRAINS
SH	SHOWER
SHGS	SNOW PELLET SHOWER
SHLW	SHALLOW
SHPL	ICE PELLET SHOWER
SHRA	RAIN SHOWER
SHSG	SNOW GRAIN SHOWER
SHSN	SNOW SHOWER
SIGMET	AVIATION WEATHER WARNING
SIGWX	SIGNIFICANT WEATHER
SKC	SKY CLEAR
SLP	SEA LEVEL PRESSURE (METAR)
SN	SNOW
SNFL	SNOWFALL
SNSQ	SNOW SQUALL
SPD	SPEED
SPECI	SPECIAL
SQ	SQUALLS
SQLN	SQUALL LINE
SRC	SOURCE
ST	STRATUS
STBL	STABLE
STDY	STEADY
STG	STRONG
SVRL	SEVERAL
SW	SOUTHWEST
T	TEMPERATURE
TAF	AERODROME FORECAST
TC	TROPICAL CYCLONE
TCU	TOWERING CUMULUS
TD	DEW POINT
TEMPO	TEMPORARY
THK	THICK
THN	THIN
THRU	THROUGH
THRUT	THROUGHOUT
THSD	THOUSAND
TILL	TILL
TILL	UNTIL
TNDCY	TENDENCY
TR	TRACE
TROF	TROUGH
TROP	TROPOPAUSE
TROWAL	TROUGH OF WARM AIR ALOFT

Contractions	Plain Language
TRRN	TERRAIN
TS	THUNDERSTORM
TURB	TURBULENCE
TWD	TOWARD
UA	ROUTINE PIREP
UNSTBL	UNSTABLE
UPR	UPPER
UPSLP	UPSLOPE
UPSTRM	UPSTREAM
UTC	UNIVERSAL TIME CO-ORDINATED
VA	VOLCANIC ASH
VC	VICINITY
VCBLSN	BLOWING SNOW IN VICINITY
VCFG	FOG (ANY TYPE) IN VICINITY
VCSH	SHOWER (ANY TYPE) IN VICINITY
VFR	VISUAL FLIGHT RULES
VIS	VISIBILITY
VISBL	VISIBLE
VLD	VALID
VLY	VALLEY
VRB	VARIABLE
VRY	VERY
W	WEST
WDLY	WIDELY
WDSPRD	WIDESPREAD
WK	WEAK
WKN	WEAKEN
WND	WIND
WRM	WARM
WS	WIND SHEAR
WSHFT	WIND SHIFT
XTNSV	EXTENSIVE
XTRM	EXTREME
ZULU (Z)	UNIVERSAL TIME CO-ORDINATED

11. U.S. Differences

Since many Canadian pilots fly to the U.S., it is important to know the differences between Canadian aviation weather products and those in the U.S. Listed below are the important changes which you might notice when flying in the U.S.:

- Always use light setting 5 for RVR observations, and RVR tendency not reported in METAR;
- Extensive use of TWEB (Transcribed Weather Broadcasts);
- Produce CONVECTIVE SIGMET and Centre Weather Advisories;
- LIFR (Low IFR – ceilings < 500 ft; visibility < 1 SM) category used in FA;
- FA is valid for 12 hours with an additional 6-hour outlook;
- Supplementary data may be added to METAR;
- Alphanumeric radar reports are available;
- VRB (variable) used in METAR for winds of 6 KTS or less.

For more information concerning differences and standards for aviation weather products and services outside Canada, contact **ICAO** or the **American Meteorology Society** which are listed in the AIP MET section. U.S. weather products are available on the Internet from NAV CANADA and from the National Weather Service (NWS).

Whitehorse airport *Photo courtesy of Bob Miller*

12. Aviation Weather References

The NAV CANADA Aviation Weather Web Site at www.navcanada.ca contains most of the aviation weather information pilots will need to plan a flight, as well as links to other aviation weather products and publications from the Meteorological Service of Canada and the U.S. National Weather Service (NWS).

To obtain additional aviation weather information, use the Meteorological Service of Canada website at www.weatheroffice.ec.gc.ca, and the U.S. National Weather Service at www.nws.noaa.gov.

Toll-free access to weather briefing and flight planning services is available from NAV CANADA. Telephone numbers are listed in the CFS in the FLT PLN section of the airport/facility directory.

To contact NAV CANADA with questions or suggestions regarding aviation weather products or services, use the e-mail address: service@navcanada.ca; or contact the Eastern or Western Canada Regional Office, or Head Office as appropriate. The telephone numbers and addresses are listed in the AIP.

FSS Weather Briefing	Local Number	_____
	Toll-free Number	_____
PATWAS	Telephone Number	_____
Local Airport	Telephone Number	_____
NAV CANADA Contact	Name and Number	_____
Other weather information		_____

METAR Decode and Description

METAR CYXE 292000Z CCA 30015G25KT 3/4SM R33/4000FT/D -SN BLSN BKN008 OVC040 M05/M08 A2992 REFZRA WS RWY33 RMK SF5 SC3 VIS 3/8 TO NW SLP134

METAR – Aviation Routine Weather Report
Type of report. A special is indicated by SPECI.

CYXE – Saskatoon, Saskatchewan
Station indicators will be 4-letter ICAO indicators.

292000Z – 29th day of the month, 2000 co-ordinated universal time (UTC).

CCA – Corrected Report
Report Modifier. Letter CCA for first correction, CCB for second, etc. AUTO is used when data for the primary report is gathered by an AWOS.

30015G25KT – Wind is from 300° True at 15 knots gusting to 25 knots.

3/4SM – Prevailing visibility is 3/4 statute miles.
Statute Miles (SM) and fractions of SM with no maximum visibility value is reported. AWOS sites will report a "sensor equivalent visibility".

R33/4000FT/D – RVR for Runway 33 is 4,000 feet and has a downward tendency.
The 10-minute mean RVR will be reported for the touchdown zone when the prevailing visibility is 1 mile or less and/or the RVR is 6,000 feet or less. When the RVR varies significantly prior to the reporting period, the 1-minute mean maximum or minimum value will be reported prefixed by a "V". The following suffixes will be used to indicate the RVR tendency: /U – to indicate an upward trend, /D – to indicate a downward trend, /N – to indicate no change.

-SN BLSN – Present weather is light snow and blowing snow.
Present weather is comprised of weather phenomenon (precipitation, obscuration or others) preceded by one or two qualifiers (intensify or proximity to the station and descriptor). The dominant weather will be reported first.

BKN008 OVC040 – The cloud layer at 800 feet AGL is broken, covering from 5/8 to 7/8 of the observed sky. The next layer at 4,000 feet AGL is overcast covering, combined with the lower layer, 8/8 of the sky, as observed from the ground.

Layers are reported based on the summation of the layer amounts as observed from the surface up. The layer amounts are reported in eighths of sky coverage (oktas) as follows: FEW: >0 to 2, SCT: 3 to 4, BKN: 5 to 7, OVC: 8. Only CB and TCU will be reported as cloud types in this area of the report. Where observed, cloud type and the layer opacity is reported in the remarks. Obscured sky is indicated by vertical visibility (VV) and is reported in hundreds of feet. Clear (CLR) will be reported by AWOS when no cloud is detected below 10,000 feet.

M05/M08 – Temperature is -5°C, dew point is -8°C.
Temperature and dew point are reported to the nearest whole degree C. The letter "M" will precede negative values.

A2992 – The altimeter setting is 29.92 inches of mercury.
The letter "A" prefixing the 4-digit number group indicates inches of mercury for altimeter setting.

REFZRA – Freezing rain has been observed during the hour since the last report, but not at the time of the report.
Recent weather since the last observation is reported, to include: freezing precipitation; moderate or heavy rain, snow, blowing snow, snow pellets, hail, or ice pellets; thunderstorm, sandstorm, or duststorm; volcanic ash; funnel cloud, tornado, and waterspout.

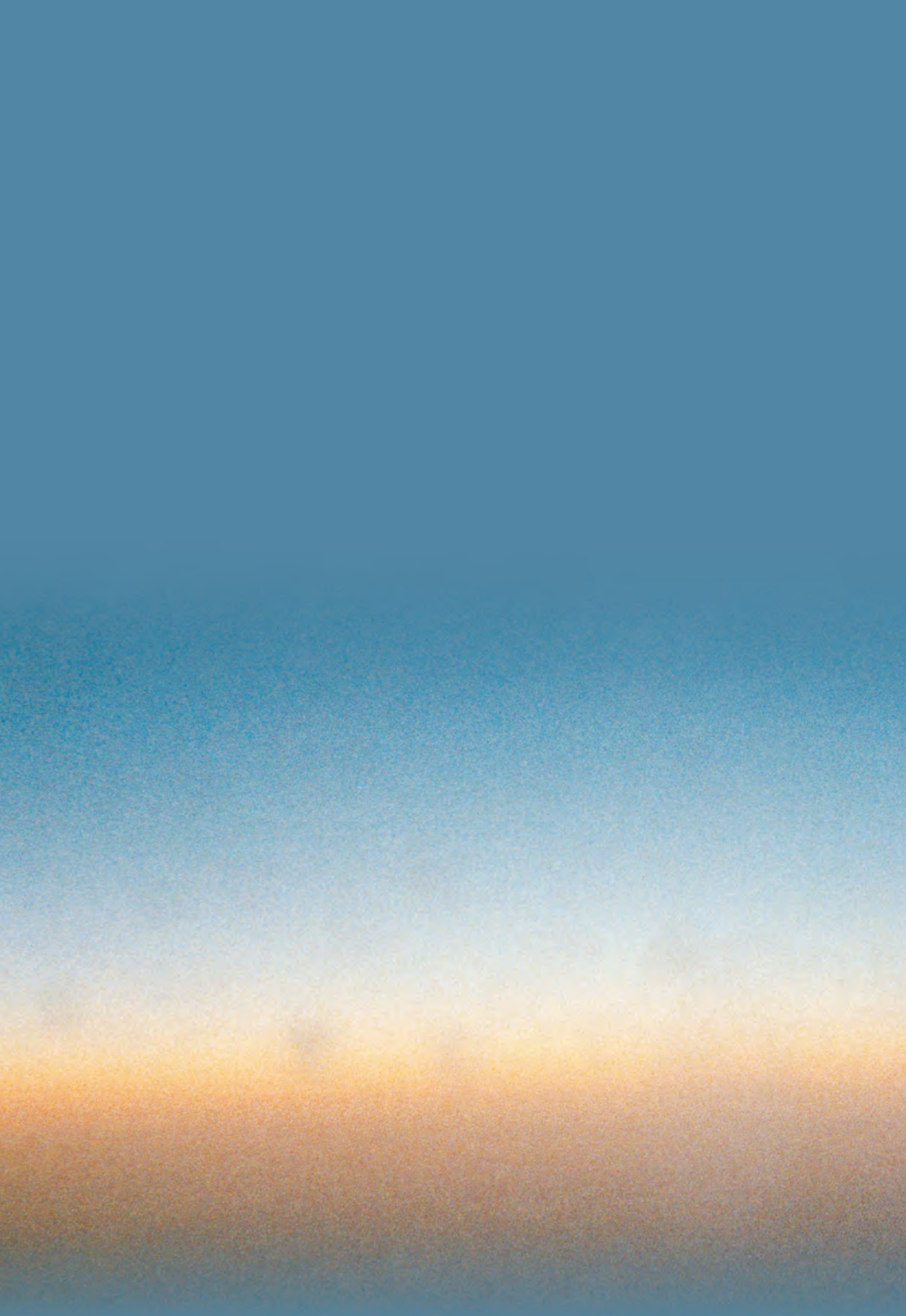
WS RWY 33 – Recent wind shear existed in the takeoff or landing path of Runway 33 below 1,600 feet AGL.
Recent wind shear information below 1,600 feet AGL will be provided when reported by an aircraft on takeoff or landing.

RMK SF5 SC3 – The lowest reported cloud layer type is stratus fractus at 5/8 opacity.
The next layer type is stratocumulus at 3/8 opacity. Where observed, the cloud types and opacity will be included in remarks.

VIS 3/8 NW – Visibility is 3/8 statute mile to the northwest.
Other supplementary remarks of operational significance may be included using standard meteorological abbreviations.

SLP134 – The mean sea level pressure is 1013.4 mb (hPa).
The mean sea level pressure, indicated in millibars, will always be the last field of the METAR report, prefixed with "SLP".

January 2005



Cover photo courtesy of Amelia Bucken