

The NAV CANADA logo consists of the words "NAV CANADA" in a white, sans-serif font, centered within a white, horizontally-oriented oval shape. The background of the entire cover is a photograph of a sky filled with white, fluffy clouds, with a portion of an aircraft's wing visible in the bottom left corner.

NAV CANADA

Aviation Weather Services Guide

S E R V I N G A W O R L D I N M O T I O N

A stylized white graphic element at the bottom of the page, resembling a wing or a curved line, positioned centrally below the tagline.



Introduction

NAV CANADA produces the Aviation Weather Services Guide as a quick reference to assist pilots and dispatchers regarding the availability and use of aviation weather products and services.

NAV CANADA is the private non-share capital corporation responsible for the provision of civil air navigation services, including the aviation weather program 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 Manual (AIM); Manual of Standards and Procedures for Aviation Weather Forecasts (MANAIR), which is available through the NAV CANADA Aviation Weather Web Site; the Air Command Weather Manual (and supplement); and specific aerodrome information listed in the Canada Flight Supplement (CFS).

This guide is not intended as a comprehensive review of aviation weather services. For more information regarding aviation weather services or to order additional copies of the Aviation Weather Services Guide, contact NAV CANADA Customer Service.

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1. Aviation Weather Services

NAV CANADA provides aviation weather services in support of aircraft operations conducted in Canadian domestic airspace. Aviation weather information is available through either an interpretative Pilot Briefing Service (PBS) from Flight Information Centres (FIC) or via the Internet through the Aviation Weather Web Site (AWWS).

1.1 Pilot Briefing Service (PBS)

PBS is the provision of, or consultation on, meteorological and aeronautical information to assist pilots in pre-flight planning and includes a fully interpretive weather briefing service provided by specially trained Flight Service Specialists at Flight Information Centres (FIC). Interpretation of changing or complex weather situations, special user needs, consultation on specific weather problems and flight documentation are all available from the FIC. Refer to the FLT PLN section of the CFS Aerodrome Facility Directory for FIC contact information.

1.2 Aviation Weather Web Site (AWWS)



Internet access to Canadian aviation weather information is available through the NAV CANADA Aviation Weather Web Site (www.flightplanning.navcanada.ca). Canadian NOTAM and flight plan filing is also available. American (U.S.) weather information, while not directly available on the AWWS, is accessible through a link to the Aviation Digital Data Service (ADDS) website.

The AWWS provides access to coded and plain language surface weather observations (METAR) and aerodrome forecasts (TAF); pilot weather reports (PIREP); route specific alphanumeric information; weather charts; satellite and composite radar imagery; plotted wind and temperature charts; NOTAM; weather cameras; live RVR; and supplemental and reference information.

The AWWWS consists of 5 sections, each accessible by selecting the corresponding tab in the lower portion of the NAV CANADA banner at the top of the page.

My Web Data / Web Mail

Personal weather information page that allows the user to save up to 10 customized weather information folders; flight dispatchers can save up to 50. Saved weather information can be configured for email dissemination on a user-scheduled basis. 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 en-route 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.

1.3 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 Observations (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. PATWAS systems are 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:

- SIGMET, AIRMET and PIREP
- METAR and SPECI
- 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).

1.3.1 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

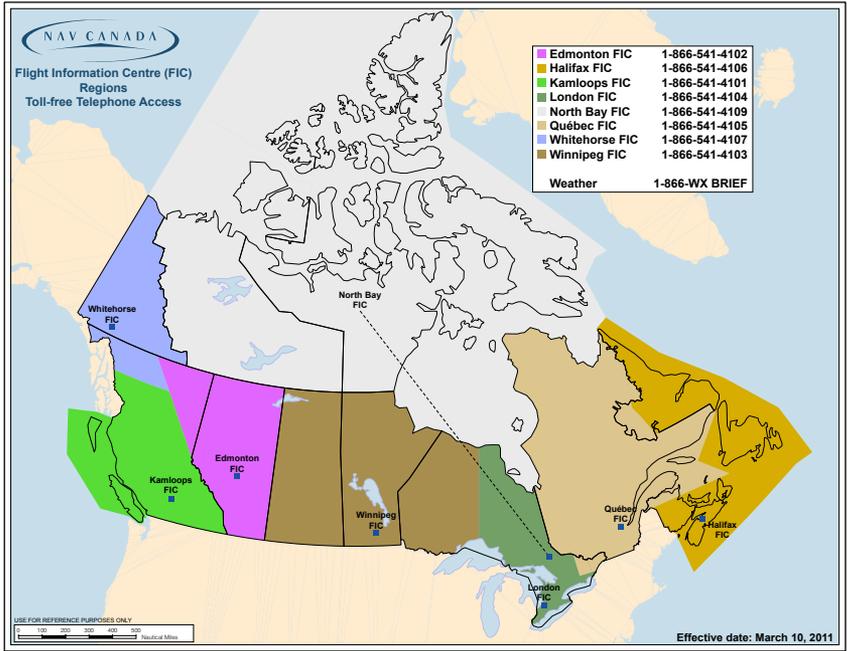
1.3.2 PATWAS Code Legend

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)

Flight Information Centres provide pre-flight and flight information services en-route (FISE). The services include the provision of, or consultation on, pilot weather briefings, meteorological information, aeronautical information, aeronautical broadcasts, flight planning and VFR alerting, flight regularity message service, and other associated information services.

For access to services provided by the FIC, the following telephone numbers are available toll-free within Canada only:

- 1-866-WXBRIEF (1-866-992-7433) – Calls to this number are routed to the FIC that serves the area from where the call originates.
- 1-866-GOMÉTÉO (1-866-466-3836) – All calls to this number are routed to Québec FIC. This number is intended for the provision of bilingual services.

Pilots calling an FIC can access the PATWAS by pressing the number three on the main menu to obtain weather information. The automated system has a fax-back function and speech recognition capability.

Should you experience problems connecting to an FIC via 1-866-WXBRIEF/GOMÉTÉO, the following list of unique telephone numbers will provides direct toll-free access from within Canada and the continental United States to a specific FIC.

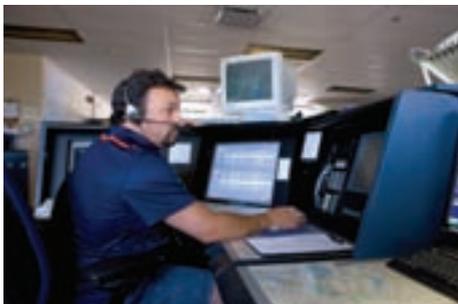
Kamloops FIC	1-866-541-4101
Edmonton FIC	1-866-541-4102
Winnipeg FIC	1-866-541-4103
London FIC	1-866-541-4104
Québec FIC (bilingual service)	1-866-541-4105
Halifax FIC	1-866-541-4106
Whitehorse FIC	1-866-541-4107
North Bay FIC	1-866-541-4109

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 (FSS) network.

3. How to Get a Weather Briefing

When calling for a briefing, advise the FIC 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 En-route (ETE); and
- Alternate (if applicable).



4. In-Flight Weather Availability

In-flight weather information provided to pilots is primarily intended to meet the need for brief updates of destination, alternate and en-route weather.

Air Traffic Control (ATC) – Air Traffic Control 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 pre-flight and in-flight weather briefing service for any area of Canada.

Automated Terminal Information Service (ATIS) – ATIS provides airport-specific information, including local weather to arriving and departing aircraft 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

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 some future time.

Weather Information	
Alphanumeric Weather Data	Graphic Weather Products
Current Weather <ul style="list-style-type: none">- Weather Observations (METAR/SPECI)- Pilot Weather Reports (PIREP)	Current Weather <ul style="list-style-type: none">- Analysis Charts (Surface & Upper Air)- Weather Radar- Satellite Imagery
Forecast Weather <ul style="list-style-type: none">- Aerodrome Forecast (TAF)- Upper Wind & Temperatures (FD)- Aviation Weather Advisory (AIRMET)- Aviation Weather Warning (SIGMET)	Forecast Weather <ul style="list-style-type: none">- Graphic Area Forecast (GFA)- Significant Weather Charts- Turbulence Charts- Upper Level Wind Charts- Volcanic Ash Charts

5.1 Weather Product Summary

The products described in the following tables are routinely available to pilots and dispatchers for pre-flight planning and weather monitoring purposes.

Alphanumeric Weather Data																	
Product	Issue Time / Validity Period	Coverage	Description														
SIGMET (WS – Routine SIGMET) (WC – Tropical Cyclone) (WV – Volcanic Ash)	Issued as required – valid up to 4 hours.	As specified in the body of the SIGMET.	Short-term weather warning of hazardous weather conditions; amends the GFA.														
AIRMET (WA)	Issued as required – valid until updated, cancelled or new GFA issued.	As specified in the body of the AIRMET – up to 24,000 ft.	Short-term weather advisory of hazardous weather conditions not requiring a SIGMET; amends the corresponding GFA.														
PIREP (UA/UUA)	Issued when received from a pilot.	As reported by a pilot.	Observations of flight conditions as reported by a pilot.														
Aviation Routine Weather Report (METAR)	Hourly on the hour, and when a special (SPECI) is required.	As observed from the ground.	Describes actual weather conditions as observed from the ground.														
Aerodrome Forecast (TAF)	Issue times and validity periods are listed in the Canada Flight Supplement (CFS). Normally updated every 6 hours; more frequently for larger airports.	Forecast of weather conditions for a specific aerodrome.	Provides a forecast of expected weather conditions for LANDING and TAKEOFF within 5nm of the aerodrome.														
Wind and Temperature Aloft Forecast (FD)	Issued twice daily, based on 00Z or 12Z data; valid for 24 hours.	<table border="0"> <tr> <td><u>Low</u></td> <td><u>High</u></td> </tr> <tr> <td>3,000 ft</td> <td>FL240</td> </tr> <tr> <td>6,000 ft</td> <td>FL300</td> </tr> <tr> <td>9,000 ft</td> <td>FL340</td> </tr> <tr> <td>12,000 ft</td> <td>FL390</td> </tr> <tr> <td>18,000 ft</td> <td>FL450</td> </tr> <tr> <td></td> <td>FL530</td> </tr> </table>	<u>Low</u>	<u>High</u>	3,000 ft	FL240	6,000 ft	FL300	9,000 ft	FL340	12,000 ft	FL390	18,000 ft	FL450		FL530	Alphanumeric (text) forecast, in tabular form, of temperatures and winds aloft for specific altitudes.
<u>Low</u>	<u>High</u>																
3,000 ft	FL240																
6,000 ft	FL300																
9,000 ft	FL340																
12,000 ft	FL390																
18,000 ft	FL450																
	FL530																

Weather Charts

Product	Issue Time / Validity Period	Coverage	Description
Surface Analysis Chart	Issued four times daily; valid 00Z, 06Z, 12Z, 18Z.	All of Canada, Alaska and the northern U.S.	Surface analysis of MSL pressure values, fronts and detailed station weather plots.
Upper Air Analysis Chart	Issued twice daily; valid 00Z and 12Z.	North American coverage; 850mb (5,000 ft) 700mb (10,000 ft) 500mb (18,000 ft) 250mb (34,000 ft)	Height of constant pressure levels, wind velocity, 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.	National coverage via seven regional charts: GFACN31 - Pacific GFACN32 - Prairies GFACN33 - Ont/Que GFACN34 - Atlantic GFACN35 - Yukon GFACN36 - Nunavut GFACN37 - Arctic	Forecast depiction of weather conditions below 24,000 ft; consists of three Clouds & Weather charts and three Icing, Turbulence & Freezing Level charts.
Local Graphic Forecast (LGF) Chart	Issued four times daily; 15Z, 18Z, 21Z, 00Z – valid for 6 hours. Last LGF includes Outlook for the next morning.	Local coverage of specific geographic areas (i.e. West Coast VFR LGF).	Forecast depiction of weather conditions below 10,000 ft, tailored to meet local needs. Supplements the GFA.
Significant Weather Prognosis Chart	Issued four times daily; valid 00Z, 06Z, 12Z, 18Z.	Coverage varies by product. High-level FL250-600 (400-70mb) Mid-level FL100-250 (700-400mb) N. Atlantic Sfc-FL250 (Sfc-400mb)	Forecast depiction of significant weather conditions (e.g. thunderstorms, icing, turbulence, etc.)
Volcanic Ash Forecast Chart	As required.	As required.	Forecast depiction of expected ash cloud dispersion (plume)
Upper Level Wind & Temperature Forecast Chart	Issued twice daily; valid 00Z, 06Z, 12Z, 18Z.	Coverage varies by product; available for FL240, FL340, FL390, FL450.	Forecast depiction of wind and temperatures aloft.
Turbulence Forecast Chart	Issued twice daily; valid 00Z, 12Z.	National and North Atlantic coverage.	Forecast depiction of MDT & SEV turbulence (jet stream / convective) between FL280-FL430.

Weather Imagery & Supplementary Products

Product	Issue Time / Validity Period	Coverage	Description
Weather Radar Imagery	Radar products updated every 10 minutes.	Line of site from radar within a limited horizontal range.	Composite or single-site display of either precipitation intensity or height of echo tops.
Satellite Imagery	GOES satellite images updated every 30 minutes; HRPT satellite images updated approx. every 6 hours.	Coverage varies with product chosen.	Geostationary (GOES) and Polar Orbiting (HRPT) satellites provide both Infrared (IR) and Visual (VIS) images
Weather Cameras	Images updated every 10 minutes.	Fixed viewing angles.	Provides a color picture of local weather conditions; date & time of each image is superimposed on it. Local METAR displayed, if available.

6. Aviation Weather Observation Products

6.1 Surface Weather Observations (METAR / SPECI / LWIS)

There are presently more than 250 surface weather observation sites in Canada. At each site, weather data is routinely collected by either a human observer or a suite of automated sensors, and then coded into weather observations for dissemination.

A routine surface weather observation, taken on-the-hour, will be disseminated as a METAR. A SPECI is a special weather observation, issued at times other than on-the-hour, as the result of a significant weather change. If a METAR or SPECI has been taken by a suite of automated sensors, it will be denoted as an “AUTO” observation in the body of the report.

There are two types of automated weather stations that are used for aviation purposes – the Automated Weather Observation System (AWOS) and the Limited Weather Information System (LWIS).

AWOS has a full suite of sensors capable of measuring cloud base height, sky cover, visibility, temperature, dewpoint, wind velocity, altimeter setting, precipitation occurrence, type, amount and intensity, and the occurrence of icing. LWIS is a more basic automated weather system, capable of measuring only wind, altimeter setting, temperature and dewpoint. Either system may be equipped with a Voice Generation.

The following table provides a detailed description of Canadian surface weather observations.

Surface Weather Observations		
Type	CFS (WX)	Description
METAR / SPECI	METAR	METAR and SPECI weather observations taken by a qualified human observer.
METAR AUTO / SPECI AUTO	AWOS	Automated Weather Observation SPECI AUTO System – METAR and SPECI weather observations taken by an enhanced stand-alone AWOS.
	AWOS (NO CLDN)	Automated Weather Observation System - METAR and SPECI weather observations taken by a stand-alone AWOS with noted enhancements (see*NOTE). AWOS <u>does not</u> receive Canadian Lightning Detection Network data and therefore is unable to report thunderstorm or lightning activity.
	Legacy AWOS	Automated Weather Observation System - METAR and SPECI weather observations taken by an older model of AWOS, approved for aviation use. Legacy AWOS units are currently being replaced with more advanced automated (AWOS) systems.
	AWOS (Pvt)	An Automated Weather Observation System that is not operated by NAV CANADA. NAV CANADA may not warrant the effectiveness or safety of this AWOS. Contact the Aerodrome Operator (OPR) for further information.
LWIS AUTO	LWIS	Limited Weather Information System (LWIS) – An enhanced automated on-the-hour weather observation system. The LWIS reports wind speed and direction, temperature, dew point and altimeter setting information only. SPECI are issued for wind shift only.
	Legacy LWIS	An older model of LWIS that provides an automated hourly weather observation of wind speed and direction, temperature, dew point and altimeter setting information only. The Legacy LWIS does not issue SPECI. The Legacy LWIS units are currently being replaced with more advanced systems.
	LWIS (Pvt)	A Limited Weather Information System that is not operated by NAV CANADA. NAV CANADA may not warrant the effectiveness or safety of this LWIS. Contact the Aerodrome Operator (OPR) for further information.

6.1.1 New AWOS & LWIS

NAV CANADA is replacing the existing automated weather systems with a more advanced, regulatory-compliant automated weather observation system. Because of the differences between the new and old automated systems, and to avoid any confusion, new systems are identified as "AWOS" or "LWIS" and the old systems are called "Legacy AWOS" or "Legacy LWIS".

The new AWOS and LWIS systems offer a number of significant enhancements as compared to the automated Legacy systems they are replacing.

New AWOS & LWIS		
Enhancement Description	AWOS	LWIS
Thunderstorms reported at sites lying within the domain of the Canadian Lightning Detection Network.		
TS - thunderstorm	✓	
VCTS - thunderstorm in the vicinity		
LTNG DIST - distant lightning (direction based on octants)		
Ice-resistant Anemometer technology employed.	✓	✓
Runway Visual Range (RVR) reported at sites equipped with RVR sensors.	✓	
Density Altitude reported.	✓	✓
Obstructions to Vision (limited) reported. (e.g. Haze - HZ; Mist - BR; Fog - FG; Freezing Fog - FZFG; and Blowing Snow - BLSN)	✓	
Laser Ceilometer can report cloud bases up to 25,000 feet.	✓	
25 0 (25 . -2 0 / 25 0 0 0 . 5 0 -2 0(0 0 5 . -2 0- 0 wind shift)	✓	
Specific remarks will be added whenever data is missing.		
CLD MISG - sky condition (cloud) data missing		
ICG MISG - icing data missing		
PCPN MISG - precipitation data missing		
PRES MISG - pressure (altimeter) data missing		
RVR MISG - RVR data missing	✓	
T MISG - temperature data missing		
TD - dew point temperature data missing		
TS/LTNG TEMPO UNAVBL - thunderstorm/lightning data missing		
VIS MISG - visibility data missing		
WND MISG - wind data missing		
WX MISG - weather data missing		

Additionally, digital weather camera systems (WxCam) with improved resolution are being installed at all stand-alone AWOS and LWIS locations.

Stand-alone AWOS and LWIS observations (locations where there is no other weather reporting) are available through normal meteorological information systems. At some sites a voice broadcast of the latest observation is available via VHF transmitter. In these cases, a telephone number may be included in the listing and/or the VHF frequency displayed in the Canada Flight Supplement as a note in the COMM box (e.g., COMM AWOS 124.7).

The hours of coverage for surface weather observations are listed in the CFS (e.g. METAR 09-21Z). Sites where aviation weather cameras are installed will have this service identified by the term "WxCam" under the "FLT PLN - WX" section of the aerodrome listing.

All aviation weather observations and aviation weather camera images are available on the NAV CANADA Aviation Weather Web Site (AWWS) at www.flightplanning.navcanada.ca.



6.1.2 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
W SLP134**

METAR	Type of Report - METAR Aviation Routine Weather Report (METAR) taken <i>on the hour</i> . SPECI indicates that the observation was taken <i>other than on the hour</i> because of a significant change to previously reported weather conditions. LWIS indicates that the observation has been derived from a limited suite of automated weather sensors.
CYXE	Station Identifier – Saskatoon, Saskatchewan The station identifier is indicated using the four-letter ICAO site code.
292000Z	Date/Time of Issue – 29th day of the month, 2000 UTC The first two numbers indicate the day of the month; the last four numbers indicate the time UTC when the observation was taken.
CCA	Report Modifier – Corrected weather observation The letter CCA is used to indicate the first correction, CCB for second, etc. AUTO indicates the observation was taken by an AWOS or LWIS.
30015G25KT	Surface Wind – 300° true at 15 knots gusting to 25 knots The two-minute mean wind direction (to the nearest 10° True) and wind speed (to the nearest knot). Calm winds are indicated as 0000KT. Peak gust speeds are preceded by the letter “G”; squalls by the letter “Q”.
3/4SM	Prevailing Visibility – 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 with 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 - Light snow and blowing snow. Present weather is comprised of weather phenomenon (precipitation, obscuration or others), which may be preceded by one or two qualifiers (intensify or proximity to the station and descriptor). The dominant weather phenomenon will be reported first.

BKN008 OVC040

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

Clouds are reported based on the summation amount of each cloud layer as observed from the surface up. The layer amounts are reported in eighths of sky coverage (oktas) as follows:

SKC: no cloud (AWOS reports CLR if no cloud below 10,000ft.)

FEW: >0 to 2 oktas of cloud

SCT: 3 to 4 oktas of cloud

BKN: 5 to 7 oktas of cloud

OVC: 8 oktas of cloud

Only CB and TCU clouds will be appended to a layer. An obscured sky is reported as vertical visibility (VV) in hundreds of feet.

M05/M08

Temperature - minus 5°C, dew point temperature is minus 8°C.

Temperature and dew point are reported to the nearest whole degree Celsius. The letter "M" will precede negative values.

A2992

Altimeter Setting - 29.92 inches of mercury.

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

REFZRA

Recent Weather - 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 dust-storm; volcanic ash; funnel cloud, tornado, and water-sprout.

WS RWY 33

Winds Shear - 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 (usually on takeoff or landing).

RMK SF5 SC3

Remarks - The lowest reported cloud layer type is stratus fractus at 5 oktas opacity; the next cloud layer is stratocumulus at 3 oktas opacity.

Where observed, the cloud type and opacity for each reported cloud layer will be included in remarks.

VIS 3/8 NW

Supplementary Remarks - Visibility is 3/8 statute mile to the northwest.

Other supplementary remarks of operational significance may be included using standard meteorological abbreviations.

SLP134

Mean Sea Level (MSL) Pressure - 1013.4 mb (hPa).

The MSL pressure, reported to the nearest tenth of a millibar, will always be the last field of the METAR report, prefixed with "SLP". The MSL pressure is reported in an abbreviated coded form.

If the coded MSL pressure value starts with a 9, 8 or 7, add the number "9" to the beginning (i.e. 880 becomes 988.0).

If the coded MSL pressure value starts with a 0, 1, 2 or 3, add the number "10" to the beginning (i.e. 134 becomes 1013.4).

6.1.3 Significant Present Weather Codes

Qualifier		Weather Phenomena		
Intensity or Proximity	Descriptor	Precipitation	Obscuration	Other
<p>Note: Precipitation Intensity refers to all forms combined.</p> <p>- Light</p> <p>Moderate (no qualifier)</p> <p>+ Heavy</p> <p>VC In the vicinity</p>	MI Shallow	DZ Drizzle	BR Mist (VIS ≥ 5/8 SM)	PO Dust/sand Whirls (Dust Devils)
	BC Patches	RA Rain	FG Fog (VIS < 5/8 SM)	SQ Squalls
	PR Partial	SN Snow	FU Smoke (VIS ≤ 6 SM)	+FC Tornado or Waterspout
	DR Drifting	SG Snow Grains	DU Dust (VIS ≤ 6 SM)	FC Funnel Cloud
	BL Blowing	IC Ice Crystals (VIS ≤ 6 SM)	SA Sand (VIS ≤ 6 SM)	SS Sandstorm (VIS < 5/8 SM)
	SH Shower(s)	PL Ice Pellets	HZ Haze (VIS ≤ 6 SM)	+SS Heavy Sandstorm (VIS < 5/16 SM)
	TS Thunderstorm	GR Hail	VA Volcanic Ash (with any visibility)	DS Duststorm (VIS < 5/8 SM)
	FZ Freezing	GS Snow Pellets	+DS Heavy Duststorm (VIS < 5/16 SM)	
		UP Unknown Precipitation (AWOS only)		

6.1.4 Cloud Type Abbreviations

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
		CF = cumulus fractus

6.2 PIREP (Pilot Report)

“When you get some weather information...give some back!”

PIREP are reports of weather conditions 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 11 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.

6.2.1 Turbulence Reporting Table

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

6.2.2 PIREP Decode and Description

UACN10 CYXU 032133

YZ

UA /OV YXU 090010 /TM 2120 /FL080 /TP PA31

/SK 020BKN040 1100VC /TA -12 /WV 030045 /TB MDT BLO 040

/IC LGT RIME 020-040 /RM NIL TURB CYYZ-CYHM

UACN10

PIREP Type – Regular Priority

Urgent PIREP are encoded as UACN01.

CYXU

Station Identifier – Issuing Office

PIREP issued by London Flight Information Centre (FIC).

032133

Date/Time of Issue (UTC)

PIREP was issued on the 3rd day of the month at 2133Z.

YZ

Flight Information Region (FIR)

Toronto FIR. If the PIREP extends into an adjacent FIR, both FIRs will be indicated.

UA

PIREP Designator

An urgent PIREP would be indicated using the designator UUA.

/OV YXU 090010

Location

London VOR 090° radial, 10 NM. PIREP location is reported with reference to a NAVAID, airport or geographic coordinates (latitude / longitude).

/TM 2120

Time of PIREP

PIREP was reported at 2120 UTC.

/FL080

Altitude

8,000 ft ASL. Altitude may also be reports as DURD (during descent), DURC (during climb) or UNKN (unknown).

/TP PA31

Aircraft Type

Piper Navajo (PA31). Designator of aircraft reporting the PIREP.

/SK 020BKN040 1100VC

Sky Cover

Two layers of cloud have been reported. First layer of cloud based at 2,000 ft with tops at 4,000 ft ASL. Second layer of cloud based at 11,000 ft ASL.

/TA -12

Air Temperature

The outside air temperature at 8,000 ft ASL is reported to be -12° Celsius.

/WV 030045

Wind Velocity

Wind direction 030° true; wind speed 45 knots. Wind direction reported in degrees magnetic will be converted to degrees true.

/TB MDT BLO 040

Turbulence

Moderate turbulence reported below 4,000 ft ASL.

/IC LGT RIME 020-040

Icing

Light rime icing (in cloud) reported between 2,000 ft ASL and 4,000 ft ASL.

/RM NIL TURB CYYZ-
CYHM

Remarks

No turbulence encountered between Toronto and Hamilton.

6.3 AIRMET (Aviation Weather Advisory)

AIRMET bulletins are short-term weather advisories intended to advise pilots of potentially hazardous weather conditions not described in the current graphic area forecast (GFA) and that do not warrant the issuance of a SIGMET. An AIRMET will be issued for the non forecast occurrence of, or the non-occurrence of the forecast of one of the following weather phenomena:

- IFR conditions (ceiling less than 1000 ft and/or visibility less than 3 miles)
- Freezing precipitation (not requiring a SIGMET)
- Moderate icing (not associated with convective clouds)
- Moderate turbulence (not associated with convective clouds)
- Thunderstorms (unorganized)
- Significant changes to wind velocity (not previously forecast)

6.3.1 AIRMET Decode and Description

WACN33 CWUL 181915

AIRMET A1 ISSUED AT 1915Z CWUL -

WTN AREA /4300N08106W/LONDON - /4342N-07936W/KINKARDINE - /4448N08106W/WIARTON

- /4300N08106W/LONDON . SCT TS EXPD TO DVLP BY 20Z. TS WILL DSIPT BY 23Z

END/LB

WACN33

AIRMET Type and GFA Area

AIRMET issued for GFACN area 33.

CWUL

Issuing Office

Issued by the Canadian Meteorological Aviation Centre (CMAC-E) in Montreal. CWEG indicates CMAC-W in Edmonton.

181915

Date/Time of Issue (UTC)

AIRMET issued on the 18th day of the month at 1915Z.

AIRMET A1

Bulletin Number

AIRMET A1 indicates this is the first AIRMET issued for this weather phenomenon within GFACN area 33.

WTN AREA

/4300N08106W /

LONDON -

/4342N07936W /

KINKARDINE -

/4448N08106W /

WIARTON -

/4300N08106W /

LONDON

Location

AIRMET area is from London (4300N/08106W) to Kinkardine (4342N/07936W) to Warton (4448N/08106W) to London (4300N/08106W).

SCT TS EXPD TO DVLP

BY 20Z. TS WILL

DSIPT BY 23Z

Weather Description

Scattered thunderstorms are expected to develop by 20Z. Thunderstorms will dissipate by 23Z.

END/LB

End of Bulletin

End of bulletin indicator and forecaster's initials.

6.4 SIGMET (Aviation Weather Warning)

SIGMET bulletins provide short term warnings of weather phenomena that are considered potentially hazardous to aircraft. Each SIGMET weather phenomenon is coded with a letter and number that is unique to the SIGMET issued by that regional weather forecast centre. The following is a list of SIGMET phenomenon.

- active thunderstorm areas
- lines of thunderstorms
- heavy hail
- severe turbulence or icing
- marked mountain waves
- hurricanes
- widespread sand or dust storms
- volcanic ash
- low level wind shear
- tornado or waterspout

6.4.1 SIGMET Decode and Description

WSCN33 CWUL 171805
SIGMET A5 VALID 171805/172205 CWUL
WTN 30 NM OF LN / 4622N 07925W / NORTH BAY / 4458N07918W / MUSKOKA
/ 4302N08109W / LONDON.
TS MAX TOPS 300 OBSD ON RADAR. LN MOVG EWD AT 20 KT. LTL CHG IN INTSTY.

WSCN33

SIGMET Type and Area

SIGMET issued for GFACN area 33. SIGMET types are as follows:
WVCN – Volcanic Ash SIGMET
WCCN – Tropical Cyclone SIGMET
WSCN – All other types of SIGMET

CWUL

Issuing Office

Issued by the Canadian Meteorological Aviation Centre (CMAC-E) in Montreal. CWEG indicates CMAC-W in Edmonton.

171805

Date/Time of Issue (UTC)

SIGMET issued on the 17th day of the month at 1805Z.

SIGMET A5

Bulletin Number

SIGMET A5 supersedes its predecessor A4, which was issued by the same weather centre to describe the same weather phenomenon within GFACN area 33.

VALID 171805/172205 CWUL

Validity Period

SIGMET is valid for four hours; from the 17th day of the month at 1805Z until the 17th day of the month at 2205Z.

WTN 30 NM OF LN / 4622N 07925W / NORTH BAY / 4458N07918W / MUSKOKA / 4302N08109W / LONDON.

Location

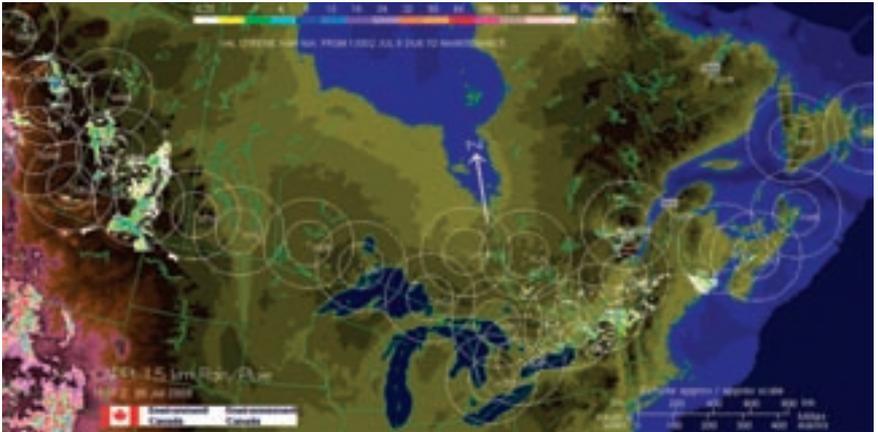
SIGMET area is within 30 nautical miles of a line from North Bay (4622N 07925W) to Muskoka (4458N07918W) to London (4302N08109W).

TS MAX TOPS 300 OBSD ON RADAR. LN MOVG EWD AT 20 KT. LTL CHG IN INTSTY

Weather Description

Thunderstorms with maximum tops of 30,000 ft have been observed on radar. The line is moving in an eastward direction at 20 knots. Little change in intensity is expected in the development of the thunderstorms during the valid period.

6.5 Weather Radar



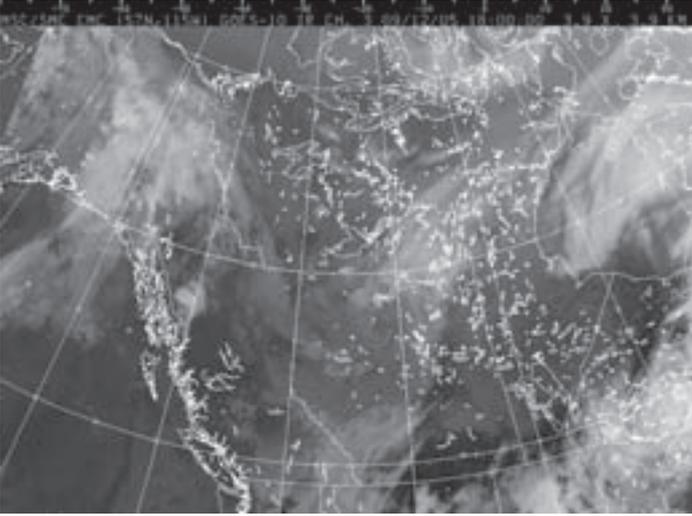
Weather radar is an important tool to assist in the identification of areas of precipitation. It is important to note that weather radar does not show cloud cover, just precipitation. It is recommended that pilots who are unfamiliar with interpreting weather radar products seek the assistance of a qualified FIC 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 rate of fall, 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 detection range of approximately 150 NM. Weather radar composite products integrate a number of individual radar images into a single product. The advantage of the composite product is that radar anomalies such as signal attenuation and masking are reduced since adjacent radar sites can “see” the precipitation area from other directions.

Weather radar composite products and individual radar site images are available in colour on the NAV CANADA Aviation Weather Web Site.

6.6 Satellite Imagery



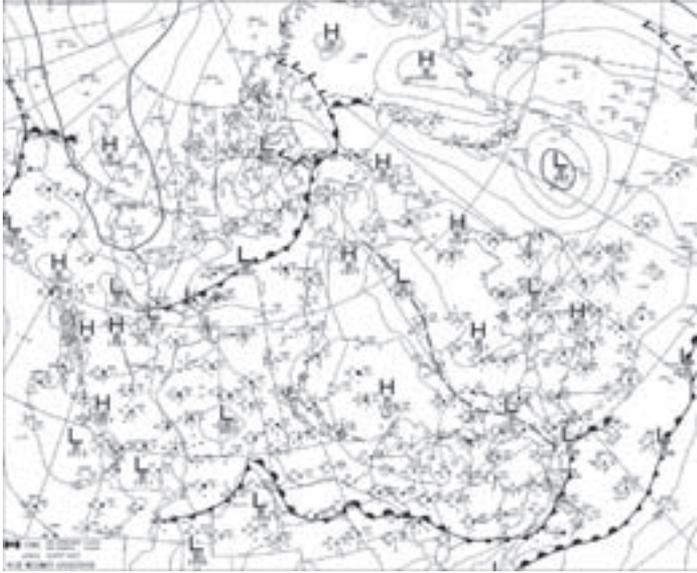
Two of the most common types of satellite imagery, **visible** (VIS) or **infrared** (IR), are made available on the NAV CANADA Aviation Weather Web Site. Satellite images are taken from either geostationary or polar orbiting weather satellites.

Geostationary satellites (GOES) orbit the Earth at about 36,000 km of altitude over the equator. They are called geostationary because their position does not change with respect to a point on the surface of the earth. **Polar orbiting** satellites (HRPT) orbit the earth at an altitude of approximately 850 km. Since they complete one orbit every 105 minutes, the satellites circle the earth 14 times a day. Because of the orbital shift resulting from the planet's rotation, they move west by approximately 2 time zones per orbit.

Visual	This is basically a photo of the clouds and is only available during daylight hours.
Infra-red	Measures the heat (thermal) footprint of areas of cloud or the earth's surface if clouds are thin or absent, and can be used both day and night.

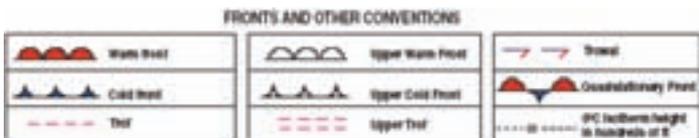
Owing to the complexity of interpreting satellite imagery, most pilots should consider consulting an FIC weather briefer when considering the use of Satellite products for flight planning purposes.

6.7 Surface Analysis Chart



The Meteorological Service of Canada produces a national surface analysis chart 4 times per day, valid at 00Z, 06Z, 12Z and 18Z. 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 from a 1000 millibar reference value;
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.



6.8 Upper Air Analysis Charts

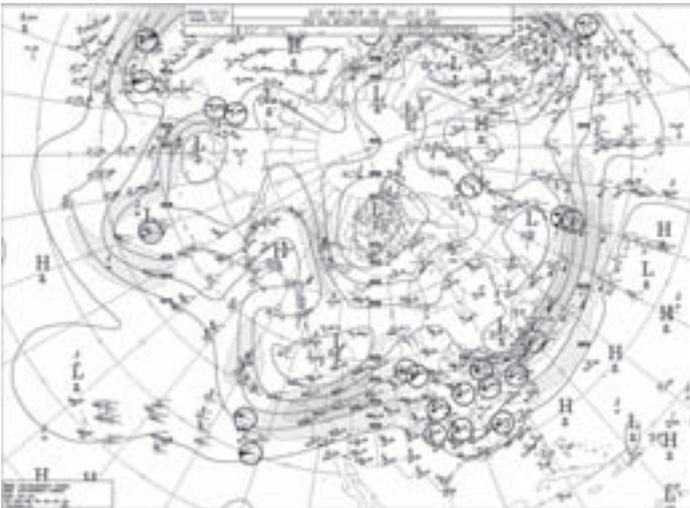
Upper air weather charts, also referred to as constant pressure charts, differ from surface weather charts, such as the surface analysis chart which displays weather information at the same geometric altitude. The altitude of the pressure level depends upon the density, and hence the temperature, of the intervening air column. Since air expands as it is heated, in regions where the air is cold and dense, the altitude of the pressure level will be lower than over a region where the air is warmer and less dense.

The depicted information on constant pressure charts is based on temperature, humidity and wind data gathered from radiosonde balloons and is supplemented with data from aircraft reports and satellite-derived wind data in the more remote regions.

On constant pressure charts the MSL pressure is the same everywhere on the chart, just as the name implies. What varies on these charts is the altitude of the specific pressure level. Each chart represents a constant pressure level, so it is analyzed for altitude or height in decameters above mean sea level. Lines, known as contours, are similar to isobars on surface weather charts; but these lines connect points of equal height for the particular pressure level. Contours are analyzed the same way as isobars; the closer the spacing of the contours, the stronger the wind speed.

Constant pressure charts are prepared by computers twice daily, at 00Z & 12Z for several mandatory pressure levels in the atmosphere. The approximately height of each constant pressure chart and the associated pressure level is listed below:

850mb chart	– 5,000 feet MSL
700mb chart	– 10,000 feet MSL
500mb chart	– 18,000 feet MSL
250mb chart	– 34,000 feet MSL.



7. Aviation Weather Forecast Products

7.1 Aerodrome Forecast (TAF)

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

Valid Period - In the Canadian TAF, a validity period that ends at midnight UTC is coded as 2400Z (2912/2924). A TAF validity period that begins at midnight UTC is coded as 0000Z (3000/3018).

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).

FM – FM230600Z

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

BECMG – BECMG 2906/2908

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 1306/1312

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 0806/0812

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).

7.1.1 TAF Decode and Description

TAF CYDN 291145Z 2912/3012 24010G25KT WS011/27050KT 3SM -SN BKN010
OVC040 TEMPO 2918/3001 1 1/2SM -SN BLSN BKN008 PROB30 2920/2922 1/2SM
SN VV005
FM300130 28010KT 5SM -SN BKN020
BECMG 3006/3008 00000KT P6SM SKC
RMK FCST BASED ON AUTO OBS NXT FCST BY 281800Z

TAF	Report Type – TAF Aerodrome Forecast. If the forecast is amended it will be indicated directly following the report type, i.e., “TAF AMD”.
CYDN	Station Identifier - Dauphin, Manitoba The station identifier is indicated using the four-letter ICAO site code.
291145Z	Date/Time of Issue – 29th day of the month, 1145 UTC The first two numbers indicate the day of the month; the last four numbers indicate the time UTC when the TAF was issued. If the TAF is based on off-site or incomplete observations, then the term “ADVISORY” is added after the date/time group “291145Z ADVISORY”.
2912/3012	Validity Period – From the 29th day at 1200Z to the 30th day at 1200Z The TAF validity period, up to a maximum of 30 hours for selected sites, is indicated by the start day/UTC hour, and the ending day/UTC hour. Within the body of the forecast, further subdivisions describing modified weather elements are indicated by the use of change groups.
24010G25KT	Surface Wind – 240° true at 10 knots gusting to 25 knots Surface wind is forecast in the TAF using criteria similar to that of the METAR. Winds of 3 knots or less may be forecast as VRB (variable) followed by the wind speed (e.g. VRB03).
WS011/27050KT	Wind Shear – Wind shear is forecast from the surface to 1,100 feet AGL. The wind at that height is forecast to be 270° true at 50 knots Forecasts of low level non-convective wind shear will be included whenever strong wind shear, which could adversely affect aircraft operation within 1,500 feet AGL, can be adequately predicted.
3SM	Prevailing Visibility – 3 statute miles Prevailing visibility is forecast as per the METAR criteria. Visibility values greater than 6 statute miles are coded as “P6SM”.
-SN	Significant Weather - Light snow A maximum of three significant weather groups, using the same weather codes as in the METAR, are allowed. Intensity and proximity qualifiers, descriptors, precipitation, obscuration and other phenomena will be included as required.

BKN010 OVC040

Sky Condition – Cloud layers are forecast to be 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 by appending it after the appropriate cloud layer height (BKN010CB). Cloud coverage is calculated using summation amounts as in the METAR.

**TEMPO 2918/3001 1 1/2SM
–SN BLSN BKN008**

TEMPO Change Group - The following weather elements are forecast to temporarily change between 1800Z on the 29th day and 0100Z on the 30th day.

Weather elements identified after a transitory change group code are those that are expected to change, while those elements not stated are expected to remain the same. During the indicated period of time, the visibility, significant weather and sky condition are expected to temporarily change whereas the wind and wind shear are forecast to remain the same.

**PROB30 2920/2922 1/2SM
SN VV005**

PROB Change Group - There is a 30% probability that the following weather elements may occur between 2000Z and 2200Z on the 29th day.

Between 2000Z and 2200Z, there is a 30% probability that the visibility, significant weather and sky condition may change. Because the wind and wind shear are not indicated, these weather elements are expected to remain as previously forecast.

**FM300130 28010KT 5SM
–SN BKN020**

FM Change Group - At 0130Z on the 30th day a permanent change is forecast to occur to the following weather elements.

A rapid change in the wind, visibility, significant weather and sky condition is forecast to occur at 0130Z on the 30th day. Since FM is a permanent change group, all weather elements that are forecast to occur must be indicated following the FM group.

**BECMG 3006/3008
00000KT P6SM SKC**

BECMG Change Group - Between 0600Z and 0800Z on the 30th day the following weather elements will gradually change to become as forecast.

In the two-hour period between 0600Z and 0800Z, a gradual change is forecast to occur to the wind, visibility, significant weather and sky condition. NSW (No Significant Weather) may also be used if the weather is forecast to improve to the point where there is no longer any significant weather expected.

**RMK FCST BASED ON
AUTO OBS NXT FCST BY
281800Z**

Remarks - The observation for this site is based primarily on AWOS sensor data. The next forecast for this site will be issued by 1800Z on the 28th day.

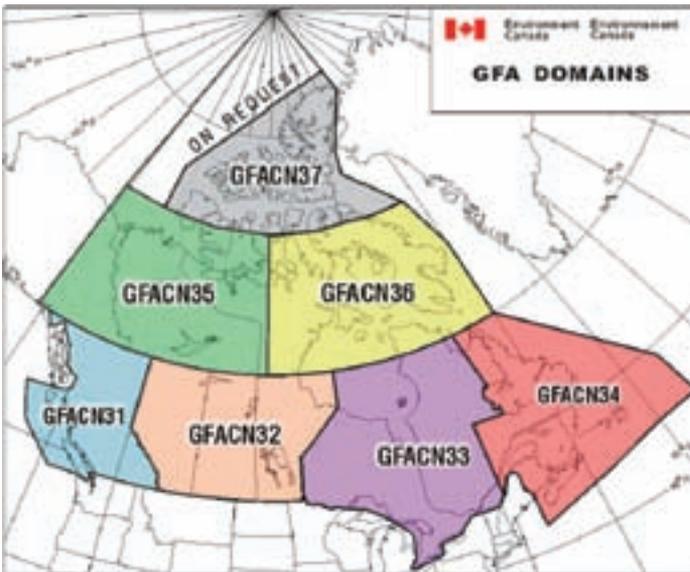
This remark format is unique to Canadian TAF. It brings to the attention of the users that the on-site observational data is AWOS-based (this remark will still appear for sites where there is human augmentation of the observation). Canada has staggered issue and update schedules for some TAF. Refer to the Canada Flight Supplement.

7.2 Graphic Area Forecast (GFA)

The **Graphic Area Forecast** consists of a series of weather charts that provide a 12-hour 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 AIM 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.



The GFA uses codes from TAF and METAR, and symbols and abbreviations are consistent with those found in the MET section of the AIM. All heights are shown above mean sea level (ASL) unless otherwise stated; cloud bases and tops are depicted; prevailing visibility is always included, and if expected to be greater than 6 statute miles is shown as P6SM; surface wind is included only if 20 KTS or more or gusts to 30 KTS or more.

Each GFA chart is made up of four distinct sections:

1. Title Box – includes the domain and issue/valid time.
2. Legend Box – includes symbols commonly used and a reference measurement scale in NM.
3. Comments Box – anything the forecaster deems important, and a 12 hour IFR Outlook on the last clouds and weather chart.
4. Weather Information Box – includes the graphic depiction of forecast weather conditions.

7.2.1. GFA Spatial Coverage Qualifiers

Convective Weather

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

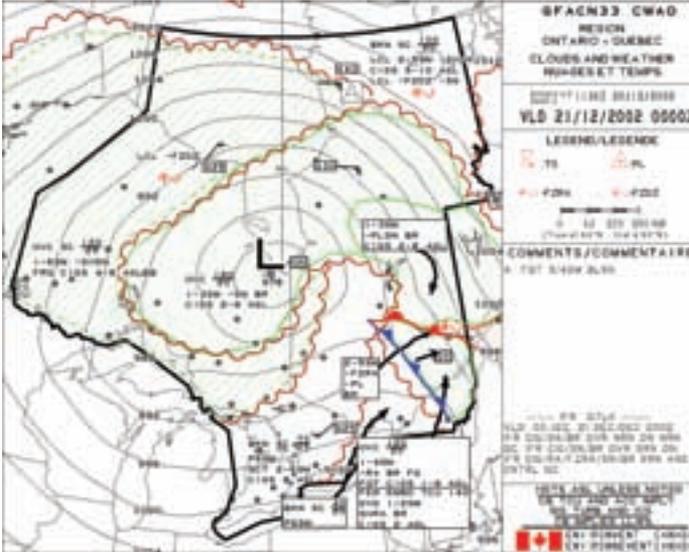
Abbreviation	Description	Spatial Coverage
ISOLD	Isolated	Less than 25%
SCT	Scattered	25 – 50% inclusive
NMRS	Numerous	Greater than 50%

Non-Convective Weather

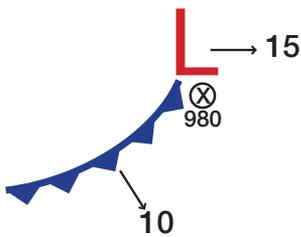
The following qualifiers regarding restriction to visibility, non-convective precipitation, precipitation ceilings and low stratus ceilings may be used in the GFA according to the spatial coverage definitions:

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

7.2.2. Clouds and Weather Chart



The **Clouds and Weather** GFA 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, the speed and direction of movement of relevant fronts and high / low pressure centres are depicted. When the speed of fronts or pressure systems is less than 5 KTS, the letters QS are used to indicate a quasi-stationary front.

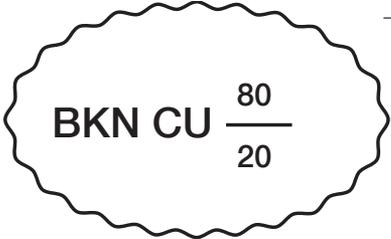


Fronts and lows as depicted on a GFA

- 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.

Clouds are depicted with along with their 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.

Unlike the METAR and TAF, summation amount is not used to assign coverage descriptors for clouds in the GFA. Each organized cloud layer is considered individually.



- 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.

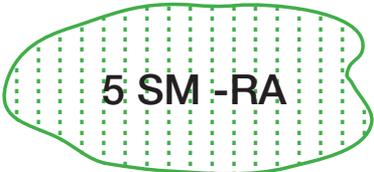
An area of organized clouds as depicted on a GFA

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 obscuration are often defined by borderlines.

- Continuous green border line** – enclose areas of continuous precipitation
- Dashed green border line** – enclose areas of intermittent or showery precipitation
- Dashed orange border line** – enclose areas of obscuring phenomena other than precipitation (e.g. haze).



Continuous precipitation



Showery precipitation/
Intermittent precipitation



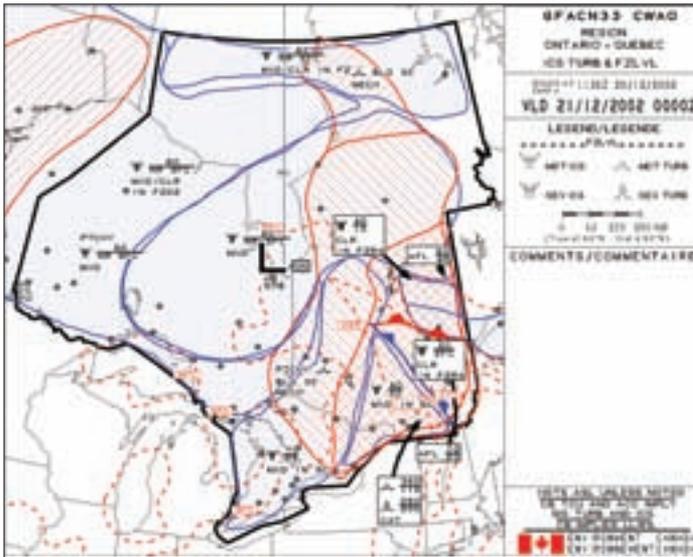
Obscuration

IFR Outlook:

The GFA **IFR Outlook** describes IFR weather only for an additional 12 hours beyond the GFA valid period. The description for IFR, marginal (M)VFR 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

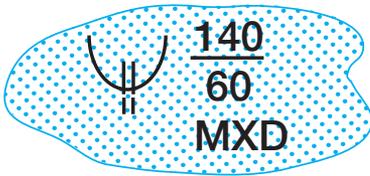
7.2.3 Icing, Turbulence and Freezing Level Chart



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.

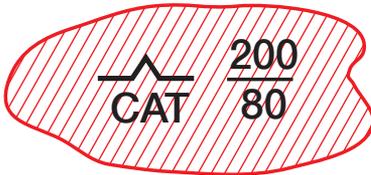
Icing: depicted whenever moderate or severe icing is forecast. Bases, tops and type of icing (RIME, MXD-mixed, CLR-clear) are all indicated. Light icing areas are described in the Comments Box Icing is indicated as an enclosed area with dots in blue.



– 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.



7.3 Upper Level Wind and Temperature Forecast (FD)

FD bulletins are alphanumeric forecasts of wind and temperature aloft at predetermined 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 FD bulletin 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° True at 23 KTS
9900 + 00	Wind at Winnipeg at 6,000 ft ASL light and variable, temperature 0° C
7503-25	Wind at Vancouver at 18,000 ft ASL 250° True (75 - 50 = 25) at 103 KTS (03 + 100 = 103), temperature -25° C
859950 (Generic Example)	Wind 350° True (85 - 50 = 35) at 199 KTS or greater, temperature - 50° C

7.4 Weather Charts – Prognosis vs. Analysis

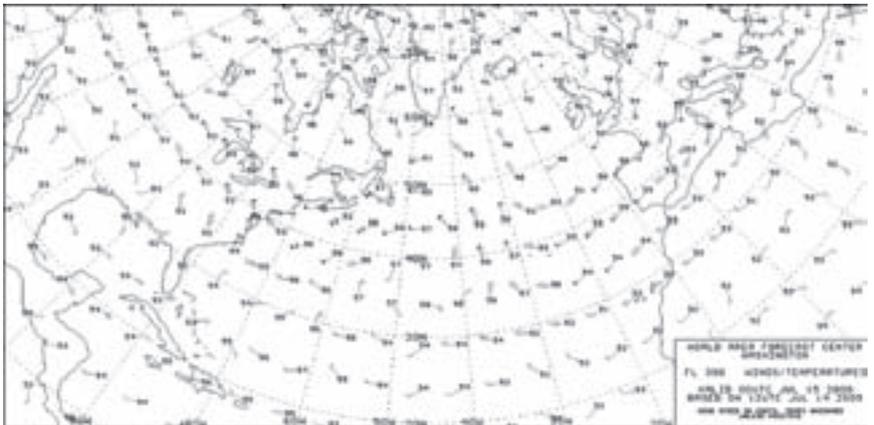
Prognosis charts and **Analysis** charts look the same so careful attention must be given to ensuring that the most appropriate chart (issue time/valid time) is selected for the intended flight time and route. Analysis charts show conditions as they actually were at a given time, while prognosis charts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

Analysis Charts - show conditions as they actually were at a given time

Prognosis Charts - provide a forecast of the most probable weather conditions for a specific time in the future.

7.5 Upper Level Wind and Temperature Prognosis Charts

Upper level wind and temperature prognosis charts, depicting the forecast winds and temperatures for FL240, FL340, FL390 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 velocity in tens of degrees. The temperature is indicated in whole degrees Celsius in a small circle at the end of the direction arrow.





7.6 Mid-Level and High-Level Significant Weather Prognosis Charts

Significant Weather (SIG WX) prognosis charts such as the Mid-Level FL100250 (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 meteorological symbols listed in the MET section of the AIM.

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 (-).

8. Meteorological Symbols

SIGNIFICANT WEATHER SYMBOLS			
	Boundary of an Area of Significant Weather		Boundary of an Area of Clear Air Turbulence
	Moderate Turbulence		Snow
	Severe Turbulence		Freezing Rain
	Moderate Icing		Freezing Drizzle
	Severe Icing		Rain
	Thunderstorm		Drizzle
	Hail		Shower (symbol for type placed above)
	Marked Mountain Waves		Hurricane
			Tropical Storm
			Dust or Sand Storm
			Severe Line Squall
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	250 XX
		3CB	cumulus base below chart level tops 25,000 feet

9. 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 AIM MET section. U.S. weather products are available on the Internet from NAV CANADA and from the National Weather Service (NWS).



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

Contractions	Plain Language	Contractions	Plain Language
CHG	CHANGE	E	EAST
CI	CIRRUS	EFCT	EFFECT
CIG	CEILING	ELEV	ELEVATION
CLD	CLOUD	ELSW	ELSEWHERE
CLDS & WX	CLOUDS AND WEATHER	EMBD	EMBEDDED
CLR	CLEAR	ENDG	ENDING
CNCL	CANCEL	ENRT	EN-ROUTE
CNTR	CENTRE	ENTR	ENTIRE
COND	CONDITION	ERLY	EARLY
CONTRAILS	CONDENSATION TRAILS	ESPLY	ESPECIALLY
CONTUS	CONTINUOUS	EST	ESTIMATE
CS	CIRROSTRATUS	EXC	EXCEPT
CU	CUMULUS	EXP	EXPECT
CF	CUMULUS FRACTUS	FAX	FACSIMILE
CVCTV	CONVECTIVE	+FC	TORNADO
CYC	CYCLONIC	FC	FUNNEL CLOUD
		FCST	FORECAST
DEG	DEGREE	FEW	FEW
DFUS	DIFFUSE	FG	FOG
DIST	DISTANT/DISTANCE	FIC	FLIGHT INFORMATION CENTRE
DNS	DENSE	FIR	FLIGHT INFORMATION REGION
DNSLP	DOWNSLOPE	FL	FLIGHT LEVEL (PIREP)
DPCTN	DEPICTION	FLO	FLOW
DRDU	DRIFTING DUST	FM	FROM
DRFT	DRIFT	FNT	FRONT
DRSN	DRIFTING SNOW	FROIN	FROST ON THE INDICATOR
DSIPT	DISSIPATE	FROPA	COLD FRONT PASSAGE
DU	DUST	FROPA	FRONTAL PASSAGE
DURG	DURING		
DURC	DURING CLIMB		
DURD	DURING DESCENT		
DVLP	DEVELOP		
DZ	DRIZZLE		

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

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

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

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



Notes

Notes





August 2011