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MANAIR

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DEFINITIONS

The following terms are defined in accordance with their use in this manual. These definitions may not be appropriate for general use.

ABBREVIATED ENGLISH - Abbreviated English language using abbreviations authorized in MANAB. (**LANGAGE ABRÉGÉ**)

AERODROME - A defined area on land, ice, or water (including any buildings, installations or equipment) intended to be used either wholly or partially for the arrival, departure, movement, or servicing of aircraft. (**AÉRODROME**)

AERODROME ADVISORY - Special type of forecast issued for aerodromes which do not fully meet Environment Canada 's (EC) weather reporting standard which are based on observations not fully representative of the conditions at the aerodrome proper. (AVIS D'AÉRODROME)

AERODROME FORECAST (TAF) - A forecast, in TAF code, usually issued on a routine basis by a designated environmental services centre, for a given aerodrome. (**PRÉVISION D'AÉRODROME**)

AIRMET - The Airman's Meteorological Advisory is a short term weather advisory intended for aircraft in flight to notify pilots of potentially hazardous weather conditions not described in the current Area Forecast (FA) and not requiring a SIGMET (it automatically amends the GFA). (**AIRMET**)

AIR TRAFFIC CONTROL UNIT (ATCU) - A generic term variously meaning Area Control Centre (ACC), Approach Control Office (ACO) or Aerodrome Control Tower (ACT). (**ORGANE DE CONTRÔLE DE LA CIRCULATION AÉRIENNE**)

ALTERNATE AERODROME (ALTERNATE) - An aerodrome specified in the flight plan to which a flight may proceed when it becomes inadvisable to land at the aerodrome of intended landing. (**AÉRODROME DE DÉGAGEMENT**)

ALTITUDE - The vertical distance of a level, a point or an object considered as a point, measured from mean sea level. (**ALTITUDE**)

AREA CONTROL CENTRE - An organization established to provide air traffic control service to controlled flights in areas under its jurisdiction. (CENTRE DE CONTRÔLE RÉGIONAL)

AREA OF RESPONSIBILITY - The geographical area assigned to an environmental services centre over which it is responsible for preparing routine forecasts. (**ZONE DE RESPONSABILITÉ**)

AVIATION WEATHER REPORT (METAR) - A statement of weather conditions as observed from the earth's surface at a specified time and place in a format designed primarily to meet the requirements of aviation.. (**MESSAGE D'OBSERVATION MÉTÉOROLOGIQUE POUR L'AVIATION**)

AVIATION WEATHER SERVICE - The provision of weather information intended primarily for the safe, regular and efficient conduct of aviation operations. (**SERVICE MÉTÉOROLOGIQUE À L'AVIATION**)

AWOS - Automated Weather Observing System - is a generic term for an automated observing system. (**SYSTÈME D'OBSERVATION MÉTÉO AUTOMATIQUE**)

BRIEFING - An explanation with the aid of relevant charts, reports and documents of the existing and expected meteorological conditions over an area, along air routes and at aerodromes, in relation to general flight operations or an individual flight. (**EXPOSÉ**)

CANADIAN FORCES WEATHER OFFICE (CFWO) - A weather office operating under the administration of, and providing service to, the Canadian Forces. CWFOs take aviation weather observations and provide weather briefing and interpretation services to Canadian Forces air-crew and other CF/DND**.(BUREAU MÉTÉOROLOGIQUE DES FORCES CANADIENNES or BMFC**)

CANADIAN FORCES WEATHER AND OCEANOGRAPHIC SERVICE (CFWOS) - The component of the Department of National Defense responsible for providing or arranging meteorological and oceanographic services to the Canadian Forces with support from EC. (**SERVICE MÉTÉOROLOGIQUE ET OCEANIQUE DES FORCES CANADIENNES or SMOFC**)

CANADIAN METEOROLOGICAL AERONAUTICAL CENTRE (CMAC) – An office that maintains a watch over meteorological conditions affecting flight operations within its specific area of responsibility. Such an office is responsible for issuing information on the occurrence or expected occurrence of specified en-route weather phenomena, which could be hazardous to aviation (e.g. SIGMET). **(CENTRE MÉTÉOROLOGIQUE AÉRONAUTIQUE DU CANADA)**

CANADIAN METEOROLOGICAL CENTRE (CMC) - The component of the AES responsible for the assimilation of weather data for objective and/or subjective analyses and forecasts, and for generating numerical weather prediction products and providing them to regional environmental/weather service centres as guidance or support to forecast production. (**CENTRE MÉTÉOROLOGIQUE CANADIEN**)

CEILING - The lowest height above ground at which five oktas or more of the sky is covered by cloud, or the vertical visibility in a surface-based layer which completely obscures the sky. (**PLAFOND**)

DEPARTMENT OF NATIONAL DEFENCE (DND) - Federal government department with the authority and responsibility to provide and arrange the provision of meteorological services to support the safe, efficient conduct of military aviation operations and training (**DÉPARTEMENT DE LA DÉFENCE NATIONAL - DDN**)

DOMESTIC AVIATION - All aviation operations taking place solely within Canada or between Canada and the United States. It specifically excludes all other international air transport operations. (**AVIATION INTÉRIEURE**)

ENVIRONMENTAL SERVICE CENTRE - A generic term given to a component of EC that has a responsibility for preparing and issuing forecasts for a specified area of responsibility. (**CENTRE DE SERVICES ENVIRONNEMENTAUX)**

ENVIRONMENT CANADA (EC) - Federal government department with the authority and responsibility for providing meteorological services to ensure the safety of all Canadians and the security of their property, to contribute to the efficiency of the economy, and to help safeguard environmental quality. (**ENVIRONNEMENT CANADA**)

FLIGHT DISPATCHER - A ground official authorized by an airline company to be responsible for the dispatch of its aircraft and for the safety of the aircraft in flight. The flight dispatcher may or may not be an employee of the airline company. (**RÉPARTITEUR DE VOLS**)

FLIGHT LEVEL (FL) - A surface of constant atmospheric pressure which is related to a specific pressure datum (1013.2 hecto Pascals) and is separated from other such surfaces by specific pressure intervals. (NIVEAU DE VOL)

FLIGHT SERVICE STATION (FSS) - An aeronautical facility operated by NAV CANADA providing mobile and fixed communications, flight information, search, and rescue alerting, broadcasting aviation weather information, maintaining aviation weather displays and providing other weather services to pilots and other users. A FSS may also take weather observations. (**STATION D'INFORMATION DE VOL or SIV)**

FORECAST - A statement of the most probable meteorological conditions expected for a specified time or period, and for a specified area or portion of airspace. (**PRÉVISION**)

FORECASTER - A meteorologist responsible for the preparation of aviation forecasts. (**PRÉVISSIONNISTE**)

FORECAST REGION - A subdivision of an Area of Responsibility. Each Area of Responsibility is normally divided into several Forecast Regions for convenience in forecast preparation and scheduling. (**RÉGION DE PRÉVISION**)

GFA - GRAPHIC AREA FORECAST - A forecast in chart format normally issued on a routine basis by a designated environmental services centre for a prescribed geographical area. (**PRÉVISION DE ZONE SOUS FORME GRAPHIQUE - GFA**)

HEIGHT - The vertical distance of a level, a point or an object considered as a point, measured from a specified datum, e.g. above ground. (**HAUTEUR**)

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) - A specialized agency of the United Nations which sets international standards and regulations necessary for the safety, efficiency and regularity of air transport. (**ORGANISATION DE L'AVIATION CIVILE INTERNATIONALE (OACI**)

METEOROLOGICAL SERVICE OF CANADA (MSC) - The component of Environment Canada that leads, serves as the national focus, provides science, policy and service support to EC. MSC also provides ice services, including research, systematic observations and forecasts directly to clients. MSC coordinates nationally the standards for the delivery of the aviation weather program as required by Transport Canada i (TC) and NAV CANADA. Furthermore, MSC prepares and delivers aviation and other forecast products required by the Department of National Defence. Most of the aviation weather products are produced and delivered by the EC Regions. (**SERVICE MÉTÉOROLOGIQUE DU CANADA)**

METEOROLOGICAL WATCH OFFICE (MWO) – An office that maintains a watch over meteorological conditions affecting flight operations within its specified area of responsibility. Such an office is responsible for issuing information on the occurrence or expected occurrence of specified en-route weather phenomena, which could be hazardous to aviation (e.g. SIGMETs). (**CENTRE DE VIELLE METEOROLOGIQUE)**

NATIONAL DEFENCE HEADQUARTERS (NDHQ) - The headquarters of the Department of National Defense. (**QUARTIER GÉNÉRAL DE LA DÉFENCE NATIONAL - QGDN**).

NAV CANADA - A private, non profit corporation, with the responsibility for the provision of aviation weather services in Canadian airspace and any airspace in respect of which Canada has the responsibility for the provision of air traffic control services. NAV CANADA also specifies the location and frequency of aviation weather observations and forecasts, and is responsible for the dissemination of this information for aviation purposes. (**NAV CANADA)**

PART-PERIOD - A portion or a segment of the period of coverage of a forecast. (**SOUS-PÉRIODE**)

PERIOD OF COVERAGE, PERIOD OF VALIDITY - The span of time which a forecast encompasses. Also called "valid period". It must, however, be kept in mind that a forecast is only valid until another forecast (regular, amended or corrected) for the same area of responsibility or the same aerodrome is issued. (**PÉRIODE DE COUVERTURE, PÉRIODE DE VALIDITÉ**)

PILOT REPORT (PIREP) - Any report by a pilot of meteorological conditions encountered in flight. (**COMPTE RENDU DE PILOTE**)

PLAIN ENGLISH - As used in this manual, the expression "Plain English" is intended to mean non-abbreviated English language in a telegraphic type format intended to convey meteorological information to the aviation community as effectively and as efficiently as possible. (**LANGAGE CLAIR**)

PROGNOSTIC CHART - A forecast of one or several specified meteorological element for a specified time or period and a specified surface or portion of airspace, depicted graphically on a chart. **(CARTE PRÉVUE or CARTE PRONOSTIQUE)**

REGIONAL AREA FORECAST CENTRE (RAFC) - An international meteorological facility designated by ICAO to prepare and supply area forecasts for flights departing from aerodromes within its service area and to supply grid point data in digital form for up to worldwide coverage. **(CENTRE RÉGIONAL DE PRÉVISIONS DE ZONE or CRPZ)**

REGIONAL OFFICE - The office responsible for administrative control and direction of meteorological facilities and services in one of the five EC Regions in Canada. Each office is managed by a Regional Director General. **(BUREAU RÉGIONAL)**

ROUTE FORECAST - A statement specifying the most probable meteorological conditions expected to exist along an air route during a specified period of time with reference to a particular flight or area. A route forecast will normally include one aerodrome forecast or more. **(PRÉVISION DE ROUTE)**

SIGMET - A message prepared by designated EC environmental services centres regarding the occurrence or expected occurrence of one or more of the following phenomena: **(SIGMET**)

- Area or line of active thunderstorms
- Severe squall line
- Hurricanes or tropical storms
- Moderate or heavy hail (diameter greater than 20 mm)
- Severe turbulence (not associated with convective clouds)
- Severe icing (not associated with convective clouds)
- Marked mountain waves
- Widespread sandstorm or duststorm
- Volcanic ash
- Low level wind shear
- Tornadoes and waterspouts

TRANSCRIBED WEATHER BROADCAST (TWB) - A continuous broadcast of meteorological information in English for aircraft in flight and for those air crew who do not have ready access to weather information. TWBs are also issued in French within the province of Quebec. **(BULLETIN MÉTÉOROLOGIQUE TRANSCRIT or BMT)**

TRANSPORT CANADA (TC) - The federal government department responsible for the development and regulation of aeronautics and the supervision of all matters connected to aeronautics in Canada. (See also NC**). (TRANSPORTS CANADA)**

UPPER-AIR CHART - A meteorological chart relating to a specified surface or layer of the atmosphere at any level above sea level**. (CARTE EN ALTITUDE)**

VALID PERIOD - Alternate term for PERIOD OF COVERAGE or PERIOD OF VALIDITY. **(PÉRIODE DE COUVERTURE, PÉRIODE DE VALIDITÉ)**

WEATHER SERVICE CENTRE (WSC) - A term to describe a component of MSC responsible for preparing and issuing forecasts in support of the Canadian Forces within a specified area of responsibility and for providing support to CFWOs in this same area**. (CENTRE DE SERVICE MÉTÉOROLOGIQUE - CSM)**

WEATHER STATION (WS) - An establishment primarily responsible for taking weather observations. Weather Station staff may provide limited aviation weather services when this does not conflict with their primary duties. **(STATION MÉTÉOROLOGIQUE or SM)**

WORLD AREA FORECAST CENTRE (WAFC) - An international meteorological facility designated to prepare and supply upper-air forecasts in digital and/or chart form on a global basis. (CENTRE MONDIAL DE PRÈVISION DE ZONE or CMPZ)

WORLD AREA FORECAST SYSTEM (WAFS) - A worldwide satellite broadcast system by which WAFCs and RAFCs provide aeronautical meteorological forecasts in uniform standardized formats. **(SYSTÈME MONDIAL DE PRÉVISION DE ZONE or SMPZ)**

CHAPTER 1
INTRODUCTION

1.1 Purpose of Manual

This manual specifies procedures, practices and formats to be used in the preparation of aviation weather forecasts. It shall serve as a precise standard for the operational meteorologist who produces aviation weather forecasts. It shall also provide necessary information for those who deliver aviation weather services.

1.2 Applicability

This manual shall be used by people involved in the production of aviation weather forecasts as well as by NAV CANADA's employees involved in serving all categories of aviation: civil or military, domestic or international. In addition, this manual has been produced in conjunction with the Director, Meteorology and Oceanography (DMetOc), NDHQ, and, consequently, is applicable to Canadian Meteorological Aeronautical Centres (CMAC) of the Meteorological Service of Canada (MSC) supporting DND and Canadian Forces Weather Offices (CFWO) with the following exception:

- Specific exemptions may be authorized by DmetOc NDHQ in special circumstances when it is essential to conform to the standards or procedures of DND or an allied command (e.g NORAD or NATO).

1.3 Word Meaning

The word "**shall**" is used in this manual to indicate that an instruction is mandatory. The word "**should**" is used to denote a recommended practice or the preferred way of doing something.

1.4 Responsibility for the Aviation Weather Program

The Minister of Transport is responsible for the development and regulation of aeronautics and the supervision of all matters connected with aeronautics.

The responsibility for the provision of aviation weather services in Canadian airspace and any other airspace in respect of which Canada has the responsibility for the provision of air traffic control services, has been delegated by the Ministry of Transport to NAV CANADA. NAV CANADA also specifies the location and frequency of aviation weather observations and forecasts, and is responsible for the dissemination of this information for aviation purposes.

Under a contract with NAV CANADA, Environment Canada (EC) is responsible for the collection of weather observations and production of aviation weather forecasts. In addition, EC/MSC, under the provisions of the Memorandum of Understanding (MOU) with DND, provides similar services to DND, specifically the Canadian Forces.

The International Civil Aviation Organization has designed the World Area Forecast System (WAFS) to provide forecasts of en-route meteorological conditions of the greatest possible accuracy and in a standardized form for international civil flight operations. The United States National Weather Service (NWS) has been designated as both a World Area Forecast Centre (WAFC) and a Regional Area Forecast Centre (RAFC). The RAFC in Washington is responsible for providing, via the WAFS, high-level significant weather charts for all of North America while the Canadian Meteorological Centre is responsible for producing low-level significant weather charts for Canada and the North Atlantic (Chapter 7).

1.5 Aviation Forecast Production Centres

Aviation weather forecasts are produced by four categories of offices in Canada:

- The Canadian Meteorological Centre;
- Canadian Meteorological Aeronautical Centres of MSC;
- Weather Service Centres of the MSC; and
- Any private company authorized by TC/DND to issue aviation forecast for specific aerodromes.

The Canadian Meteorological Centre (CMC) in Montreal employs advanced computer techniques and sophisticated mathematical models to generate analyses, prognoses and weather element forecasts, mainly at the synoptic scale. The CMC prepares and distributes by facsimile chart significant en-route weather forecasts for aircraft operating between 700 and 400 hPa in Canadian airspace and between the surface and 400 hPa in North Atlantic airspace. The CMC also issues digital forecasts of wind and temperature for aircraft operating below 24,000 feet in both Canadian and North Atlantic airspace.

Canadian Meteorological Aeronautical Centres (CMAC) and MSC Weather Service Centres shall issue

routine and supplementary aviation forecasts, in accordance with the specifications of this manual, for their designated areas of responsibility (Appendix A). These forecasts are distributed, in whole or in part, for use by another CMAC, Environmental Service Centres, Weather Service Centres, Canadian Forces Weather Offices (CFWO), Flight Service Stations (FSS) and aircraft operators. Where appropriate, they are also distributed internationally.

1.6 Form of Forecasts

Forecasts may be issued in one of three different forms designed to satisfy the particular requirements of aircraft operations or communication facilities available, or internationally agreed upon requirements. The three designated forms are the following:

1.6.1 Abbreviated English

Forecasts in abbreviated English may be transmitted by teletype, radio, telephone or computer data link, to describe expected conditions over a specified period of time. Their formats and rather strict specifications are given in Chapters 5, and 6.

1.6.2 Chart or pictorial form

Forecasts in chart or pictorial form depict forecast conditions over large areas with greater clarity than forecasts in verbal or numerical form. However, forecasts in this form must be transmitted by facsimile and, since they are for a fixed time, are not capable of showing temporal variations. In addition, the scale of charts does not readily permit the depiction of small-scale details. Specifications of this form are given in Chapter 4 and 7.

1.6.3 Alphanumeric code

Forecasts in alphanumeric code are used when chart forms are unsuitable (e.g. aerodrome forecasts in TAF code). Specifications of this form are given in Chapter 2.

1.7 Components and Types of Routine Aviation Forecasts

Because of differing requirements for detail and accuracy, aviation forecasts are separated into forecasts of aerodrome conditions and forecasts of en-route conditions. Each of these forecasts may be issued in one or more of the forms detailed in paragraph 1.6 above resulting in the following types:

1.7.1 Aerodrome forecasts

These are normally issued for periods of 12, 18, 24 or 30 hours by designated CMAC at regular intervals

(normally every six hours). These forecasts are issued for specified aerodromes within an assigned area of responsibility. Aerodrome forecasts shall be issued in alphanumeric code (TAF).

1.7.2 Forecasts of en-route weather

The following types of forecasts of en-route weather shall be issued:

a. Graphic Area Forecasts (GFAs). For aircraft operating over short or medium ranges (less than 1,000 nautical miles) and at altitudes below 24,000 feet, area or regional forecasts are issued by designated CMAC at regular intervals (normally every six hours) for regions within their own assigned Area of Responsibility. Detailed specifications of GFAs are given in Chapter 4.

b. Significant Weather Forecasts. For planning operations of aircraft over longer ranges and at altitudes between 700 and 400 hPa (10 000 to 24 000 feet), routine forecasts of weather of significance to such operations are produced by the CMC in chart form as described in Chapter 7.

c. SIGMETs. For aircraft in flight warnings in abbreviated English. SIGMETs are issued to notify pilots of certain specified weather phenomena that are hazardous to **all** types of aircraft. Details of specifications of SIGMETs are given in Chapter 5.

d. AIRMETs. For aircraft in flight and for flight planning in abbreviated English. AIRMETs are issued to notify pilots of potentially hazardous weather conditions not described in the current GFA and not requiring a SIGMET. Details of specifications of AIRMETs are given in Chapter 6.

e. Upper Winds and Temperatures (FDs). Forecasts of upper winds and temperatures are produced by the CMC at twelve-hour intervals in numerical form for levels below 24,000 feet. Details of FD specifications are provided in Chapter 3.

f. Route Forecast - For planning operations of aircraft. It is a statement specifying the most probable meteorological conditions expected to exist along an air route during a specified period of time with reference to a particular flight or area. A route forecast will normally include one aerodrome forecast or more.

NOTE: Forecasts of upper winds and temperatures are produced by NWS (National Weather Service in Washington) for levels from 24,000 feet to 53,000 feet, inclusive, over Canada.

CHAPTER 2

AERODROME FORECAST (TAF)

2.1 Definition

The aerodrome forecast (TAF) is the forecaster's best judgment of the most probable weather conditions expected to occur at an aerodrome together with their most probable time of occurrence. It is designed to meet the preflight and in-flight requirements of flight operations. Aerodrome forecasts are intended to relate to weather conditions for flight operations within 5 nautical miles of the centre of the runway complex depending on local terrain.

2.2 Environment Canada Responsibility

The Meteorological Service of Canada (MSC) is responsible for the production of aviation weather forecasts. MSC produces individual TAF at aviation forecasting centres based upon a centre's area of responsibility.

NOTE: The (EC-MSC)/DND Memorandum of Understanding specifies that the MS will provide for the production of weather forecasts, including aviation forecasts to support Canadian Forces operations. . Also, a private company may be given the authorization by TC/DND to issue TAFs for some sites. In such cases, the company involved must abide by the same standards governing the quality of weather observations as well as forecaster's qualification for issuing aerodrome forecasts.

2.3 Observational Requirements

Aerodrome forecasts are issued for aerodromes for which regular hourly and special weather reports meeting standards for observations, as stated in MANOBS, are available. Aerodrome forecasts based on automated observations shall be issued only for acceptable AWOS sites. They are recognizable by the label "AUTO" in the corresponding METAR or SPECI report.

2.3.1 Parameters required to establish a TAF service

The meteorological parameters required to establish a TAF service are the following:

a. sky condition;
b. visibility;
c. present weather and obstructions to vision;
d. air temperature;
e. dew point temperature;
f. wind speed, direction and character; and
g. mean sea level (MSL) pressure.

Regular hourly and special weather observations are only one of the data sources available to forecasters. Therefore, when it comes to maintaining an already established aerodrome forecast, no single element is necessarily critical.

After analyzing available data from other sources (e.g. satellite imagery, radar pictures, profiler data), if, in the forecaster's judgment, one missing observation or a missing element will have no impact on the quality of the aerodrome forecast, the forecast can be maintained.

2.4 Time References

All time references shall be stated in Universal Coordinated Time (UTC).

2.4.1 Issue time

The issue time of an aerodrome forecast is the time that it is released to the telecommunication system. To facilitate flight planning, aerodrome forecasts issued by the MSC shall be transmitted on the EC telecommunication network and on the ADIS (Automated Data Interchange System) circuit as close as possible to, but not later than 20 minutes prior to their period of coverage.

For those aerodromes which do not have a 24-h observing program, two (2) consecutive hourly observations immediately prior to the issue time of the forecast are required before issuing a forecast. Depending on forecast coverage, the above situation can be dealt with in two different ways:

a. after receiving the second hourly observation, the TAF is issued as soon as possible, i.e., 15 minutes after the second observation is received. The period of coverage of such a TAF is back dated to begin on the whole hour prior to the issue time of the forecast. The forecast, however, is valid from the time that it is received. For example, after receiving the 13Z and 14Z observations for CZFA, the TAF is issued as: TAF CZFA 201415Z 2014/2101 …

b. after receiving the second hourly observation, the TAF is issued approximately 40 minutes after the hour of the observation. In this case, the period of coverage of such a TAF is post dated to begin on the whole hour following the issue time of the forecast. For example, after receiving the 10Z and 11Z observation for Muskoka, a TAF is issued as: TAF CYQA 201140Z 2012/2024 …

If two consecutive hourly observations are not available immediately prior to the issue time of a TAF, a nil TAF shall be issued (e.g. TAF CYTS 051635Z 0517/0605 FCST NOT AVBL DUE NO OBS, Alternatively, if only one observation is available, the nil TAF would read TAF CYTS 051635Z 0517/0605 FCST NOT AVBL DUE INSUFFICIENT OBS).

In exceptional circumstances (e.g. where there is a nearby weather station providing routine hourly weather reports) forecasts may be issued after receipt of the first hourly report subject to approval by the appropriate Regional Director of the MSC. In addition, unless specified by the Regional Director of MSC, a new TAF shall not be scheduled more than seven (7) hours after the previous issue time.

Once a TAF for an aerodrome has been canceled due to unavailable or insufficient observations, the TAF for that aerodrome shall not be re-issued until a minimum of one hourly observation (in VFR situations) is received or a maximum of two consecutive hourly observations (in below VFR situations) representative of the aerodrome are received. The two observations must be consecutive and must be not more than one hour apart (e.g. two regular hourly observations). In both cases, the forecast shall be issued within 20 minutes after the appropriate observation is received.

2.4.2 Time of validity

An aerodrome forecast shall be valid from the moment it is issued (e.g. a TAF with an indicated period of coverage from 11 to 23Z issued at 1040Z is considered to be valid from 1040Z) until it is amended, or until the next scheduled TAF for the same aerodrome is issued, or until the valid period is ended with no new TAFs issued.. This avoids amending the old TAF 10 to 15 minutes before the valid time of the new one.

NOTE: When a new TAF is issued, it automatically cancels the previous one

2.5 Format of the Canadian Aerodrome Forecast (TAF)

The information included in a Canadian aerodrome forecast (TAF) is presented in a fixed order as described in sections 2.5.1 and, 2.5.2. For a description of the WMO international TAF code, refer to the WMO Manual on Codes, Volume I.1, Part A, WMO-No. 306.

2.5.1 Telecommunication header

TAF bulletins begin with a WMO abbreviated telecommunication header (as required by WMO No. 386, Manual on Global Telecommunication System). The normal source input header for a TAF bulletin is of the following form:

a. FT ddhh00 (BBB), where:

- ddhh00 is the date and time of the forecast, in whole hours UTC, that precedes the time of entry to the collection circuit, as required by the Global Telecommunication System (GTS) of the WMO (e.g. FT 101500);

- BBB is an indicator used for amendments, corrections, or delayed bulletins and will be added automatically by the national bulletin preparation software to all TAFs scheduled for transmission to the Global Telecommunication System (GTS). The inclusion of this term is required by international protocol (WMO No. 386, Manual on the Global Telecommunication System, Volume I, Attachment II-12) BBB will take the form AA(x) for amendments, CC(x) for corrections, and RR(x) for delayed bulletins. The letter (x) will take the value of “A” for the first amendment, correction or delayed bulletin, the value “B” for the second and so on (e.g. FT 201800 AAA, FT182100 CCA, etc.).

NOTE: The time that appears in the telecommunication header shall always be in whole hours UTC, even for amended, corrected or delayed bulletins. This rule is outlined in the WMO Publication no. 386, Manual on the Global Telecommunication System, 1992 Edition, Article 2.3.2.2 of Part II.

2.5.2 Symbolic form

The symbolic form of a Canadian aerodrome forecast in TAF code is:

TAF bbb CCCC YYGGggZ $Y_1Y_1G_1G_1/Y_2Y_2G_2G_2$ ddd ff G f_mf_m KT
WS h_xh_x/ddfffKT VVVV [w'w' or NSW] {$N_SN_SN_Sh_Sh_Sh_S$ or VV$h_Sh_Sh_S$ or SKC }
PROBC_2C_2 $Y_bY_bG_bG_b$ /$Y_eY_eG_eG_e$
TEMPO $Y_bY_bG_bG_b$ /$Y_eY_eG_eG_e$
{BECMG $Y_bY_bG_bG_b$ /$Y_eY_eG_eG_e$} or {FMYYGGgg}
RMK

NOTES: Groups included in braces { } and separated by the word "or" represent mutually exclusive options.

Each individual time period beginning with FMYYGGgg shall start a new line and indented 4 spaces, while continuation lines shall be indented 5 spaces.

The length of a line shall not exceed 69 characters. A period is not required at the end of every TAF. An equal "=" sign, to indicate the end of the message to comply with the Global Telecommunication System (GTS) rules.

2.5.2.1 Partial program format

For an aerodrome operating a partial observing program (e.g. no nighttime observations), an appropriate remark from the list below shall be included in the last regular issue of the TAF as follows:

a. NO FCST COVERAGE $d_1d_1h_1h_1m_1m_1$- $d_2d_2h_2h_2m_2m_2$Z (e.g. NO FCST COVERAGE 130500-131000Z);

b. NXT FCST WILL BE ISSUED AT ddhhmmZ (e.g. NXT FCST WILL BE ISSUED AT 181000Z);

c. NO F CST ISSUED UFN;

Where:

- $d_1d_1h_1h_1m_1m_1$ is the time (UTC, date, hour and minutes) the observing program is no longer available;
- $d_2d_2h_2h_2$ m_2m_2 is the time (UTC, date, hour and minutes) at which the TAF will be available;
- dd is the date in which the next TAF will be issued,
- hhmm is the time (UTC, hour and minutes) at which the next TAF will be issued

NOTE: The above list is not meant to be exhaustive, forecasters may utilize other expressions which properly describe the situation. If, for unexpected reasons, the observing program should end earlier or start later than expected, an amended TAF shall be issued as described in section 2.10.1.1.

2.5.3 Definition of symbols

Only a broad overview of the terms description is provided in this section. More details regarding the preparation and the coding of aerodrome forecast are provided in section 2.6.

TAF	Bulletin identifier (sec.2.6.1)
bbb	Amendment/Correction/Delayed bulletins (sec.2.6.2)
CCCC	International aerodrome identifier (sec 2.6.3)
YYGGggZ	Date/time (UTC) of origin of the TAF (sec. 2.6.4)
$Y_1Y_1G_1G_1/Y_2Y_2G_2G_2$	Date and period of **coverage** of the forecast (sec. 2.6.5)
$dddffGf_mf_mKT$	Surface **wind** speed and direction with gusts (sec. 2.6.6)
$WSh_Xh_Xh_X/dddffKT$	Low level **wind shear** group (sec. 2.6.7)
VVVV	Horizontal **prevailing** visibility at the surface (sec. 2.6.8)
w'w'	Significant forecast weather (sec. 2.6.9)
NSW	Abbreviation for **No Significant Weather** (sec. 2.6.10)
$N_SN_SN_Sh_Sh_Sh_S$	Cloud group (sec. 2.6.11.1&2)
$VVh_Sh_Sh_S$	Vertical **visibility** (sec. 2.6.11.3)
SKC	Abbreviation for **Sky Clear** (sec. 2.6.11.4)
$PROBC_2C_2$ $Y_bY_bG_bG_b/Y_eY_eG_eG_e$	**Probability** group (sec. 2.6.12)
TEMPO $Y_bY_bG_bG_b/Y_eY_eG_eG_e$	**Temporary change** group indicator (sec.2.6.13)
FMYYGGgg	**Rapid and permanent change** group indicator (sec.2.6.14.1)
BECMG $Y_bY_bG_bG_b/Y_eY_eG_eG_e$	**Gradual but permanent change** group indicator (sec. 2.6.14.2)
RMK	Remarks (sec. 2.6.15)

2.6 TAF Forecast Preparation and Coding

The description of forecast conditions shall always contain, as a minimum, information about the following elements:

- wind;
- visibility;
- weather; and
- cloud.

2.6.1 Aerodrome forecast message identifier (TAF)

The code name "TAF" (Aerodrome Forecast) shall be included at the beginning of each TAF (e.g. **TAF** CYUL 191635Z 1917/2017 …).

2.6.2 Amendment/Correction indicator (bbb)

The indicator "bbb" takes the form of "AMD" and is used for both amendments and corrections and is placed after the term TAF followed by one space (e.g. TAF **AMD** CYUL…).

2.6.3 Location identifier group (CCCC)

The group "CCCC" is the international four-letter aerodrome identifier (for a full list of international identifiers, see ICAO DOC. 7910 Location Identifiers). For Canadian TAFs the first letter of this group is always a "C" (e.g. TAF **CYUL** …).

2.6.4 Date/Time group (YYGGggZ)

The day/time group "YYGGggZ" is the date and time of origin of the forecast (e.g. TAF CYUL **191635Z** …). This term is considered optional by WMO; however, Canada and the USA have agreed to include it. This group will be inserted automatically by the national bulletin preparation software after the forecaster sends the forecast.

2.6.5 Date and period of coverage group ($Y_1Y_1G_1G_1$ /$Y_2Y_2G_2G_2$)

The group "$Y_1Y_1G_1G_1/Y_2Y_2G_2G_2$" represents the period of coverage of the forecast; where:

- Y_1Y_1 G_1G_1 is the date and hour (UTC) of the beginning of the period of coverage ; and
- $Y_2Y_2G_2G_2$ is the date and hour (UTC) of the end of the period of coverage

  (e.g. TAF CYUL 191640Z 1917/2017)

2.6.6 Wind group (dddffG$f_m f_m$KT)

The mean direction and speed of the forecast wind shall be indicated by dddff, where ddd is the wind direction given to the nearest 10 degrees true, and ff is the wind speed given in knots. Except as stated below, the group dddff is immediately followed, without a space, by the letter code indicator KT to indicate the wind speed unit (knots).

When it is forecast that the maximum wind speed (gust, symbol G) will exceed the mean speed by 10 knots or more, the maximum wind speed shall be indicated by adding G$f_m f_m$ between dddff and KT. There is no space either before or after G$f_m f_m$ (e.g. 32020G30KT).

ddd shall normally be encoded as variable (VRB) only when the mean wind speed is 3 knots or less (e.g. VRB03KT). A variable wind at higher speeds may also be indicated during strong convective activity (e.g. when a thunderstorm passes over an aerodrome).

A north wind of 20 knots shall be indicated as 36020KT, while a calm wind shall be indicated as 00000KT.

For wind speeds (mean and/or maximum gust) of 100 knots or greater, the exact value of the speed shall be given using three digits, instead of two (e.g. 320105G130KT).

2.6.7 Low level wind shear group (WS$h_X h_X h_X$/dddffKT)

While the main effect of turbulence is related to erratic changes in altitude and/or attitude of the aircraft, the main effect of wind shear is the rapid gain or, more critical, loss of air speed. Therefore, for forecasting purposes, any cases of strong, non-convective low level wind shear within 1,500 feet AGL will be labeled as WS. This group is not part of the international code but it will be used in North American TAFs (this difference has been filed with ICAO by Canada).

The low level wind shear group shall be included in a TAF whenever the forecaster has strong evidence to expect significant, non-convective wind shear which could adversely affect aircraft operation within 1,500 feet AGL

To a large extent, wind shear is an element which, for the time being, cannot be satisfactorily observed from the ground. As a result, aircraft observations and radiosonde reports represent the only available evidence. However, the following guidelines could be used at the forecaster's discretion to establish whether significant non-convective wind shear hazardous to aircraft exists:

a. Vector magnitude exceeding 25 knots within 500 feet AGL;

b. Vector magnitude exceeding 40 knots within 1,000 feet AGL;

c. Vector magnitude exceeding 50 knots within 1,500 feet AGL;

d. A pilot report of loss or gain of indicated air speed of 20 knots or more within 1,500 feet AGL.

The low level wind shear group, when included, shall be encoded as "WS$h_Xh_Xh_X$/dddffKT"; where:

- WS means low level wind shear;
- $h_Xh_Xh_X$ represents the height (above ground) of the layer in which the low level wind shear is expected (e.g. 015 means 1500 feet above ground);
- ddd is the wind direction at level $h_Xh_Xh_X$ (e.g. 240 means 240 degrees); and
- ffKT is the wind speed, in knots (KT), at level $h_Xh_Xh_X$(e.g. 45KT means 45 knots).

NOTE: When the wind speeds at $h_Xh_Xh_X$ is expected to be 100 knots or higher, a three-digit figure shall be used (e.g. 120KT). Wind gusts are not allowed in this group.

2.6.8 Visibility group (VVVV)

The horizontal prevailing visibility group "VVVV" shall always be indicated in statute miles and fractions up to 3 miles, then in whole miles up to 6 miles (e.g. 21/2SM -SHSN: meaning visibility two and a half statute miles in light snow shower). The letters SM (statute miles) shall be added without a space to each forecast visibility to identify the unit.

Visibility values allowed are the followings:

a. zero to 3/4SM (in increments of 1/8 statute mile);

b. 3/4SM to 21/2SM (in increments of ¼ statute mile);

c. 3SM to 6SM (in increments of 1 statute mile); and

d. P6SM (for visibility greater than 6SM).

When whole miles and fraction of a mile are used in combination, no space shall be placed between the whole mile and the fraction (e.g. 11/2SM; 21/2SM).

2.6.9 Significant weather group (w'w')

The significant weather group w'w' is comprised of weather phenomena which may contain one or more forms of precipitation, obscuration or other (Table 2.6.1, column 3 to 5). Weather phenomena are preceded by one or more qualifiers, one of which describes the intensity or the proximity to the station of the phenomena. The other qualifier is a descriptor and describes the quality of the weather phenomena (see Table 2.6.1, column 1 to 2).

Table 2.6.1 Significant Present and Forecast Weather

QUALIFIER		WEATHER PHENOMENA		
INTENSITY OR PROXIMITY 1	**DESCRIPTOR 2**	**PRECIPITATION 3**	**OBSCURATION 4**	**OTHER 5**
- Light	MI Shallow	DZ Drizzle	BR Mist.	PO dust/sand whirls
	PR Partial			
Moderate (no qualifier)	BC Patches	RA Rain	FG Fog	SQ Squalls
+ Heavy	DR Low drifting	SN Snow	FU Smoke	FC Funnel cloud(s) (tornado or water spout)
VC In the vicinity	BL Blowing	SG Snow grains	VA Volcanic ash	SS Sandstorm
	SH Shower(s)	IC Ice crystals	DU Widespread dust	DS Duststorm
	TS Thunderstorm	PL Ice pellets	SA Sand	
	FZ Supercooled (freezing on contact)	GR Hail	HZ Haze	
		GS snow pellets		

NOTE: The forecast w'w' group(s) shall be indicated by considering columns 1-5 in the table above in sequence, that is, intensity followed by weather phenomena (e.g. + SHRA for heavy shower of rain).

A w'w' group shall be indicated by selecting appropriate items from column 1 to 5 of Table 2.6.1 (in sequence) which describe the forecast weather. The w'w' group shall be ordered as follows:

- first, if appropriate, the qualifier for intensity or proximity followed without a space by;
- if appropriate, the abbreviation for the descriptor followed without a space by;
- the abbreviation for the forecast weather phenomenon or combination thereof.

The w'w' group shall be omitted if no significant weather is expected. The w'w' group shall also be omitted after a change group of the form TEMPO/BECMG $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ when it is not expected to differ from the preceding value. For example …3SM BR SKC BECMG 0815/0816 …BKN020 …This implies that the visibility/weather group 3SM BR remains

unchanged after the BECMG.

When two or three weather elements are indicated, the combined weather group will be considered as one entity. When one element is expected to change, the entire group shall be repeated. For example …4SM BR … TEMPO …4SM -RA BR. The BR is repeated because another element, namely -RA, is introduced. In addition, the visibility is also repeated because is considered to be an integral part of the weather group.

In case of a significant change in visibility, the entire weather group shall also be repeated. By a significant change (visibility, weather, cloud amounts, etc.) is meant a change for which, under normal circumstances, an amendment would be required.

For example**...3SM -RA BR TEMPO 2108/2112 1SM -RA BR...** with -RA and BR indicated before and after the change group TEMPO because a significant change in visibility is forecast.

Likewise, in the case of **...5SM -RA BR TEMPO 2108/2112 4SM -SN BR ...**, the BR is repeated because a significant change in precipitation is forecast.

2.6.9.1 Qualifiers and descriptors

a. **The intensity qualifier (Table 2.6.1 column 1)** refers to the total precipitation of the weather group and is coded as "+" or "-", meaning heavy or light as described in MANOBS. When the intensity of the phenomena is expected to be moderate, no indicator sign shall be indicated in the group.

b. In precipitation types where the intensity is not applicable such as ice crystals (IC), no intensity shall be included in the TAF. The intensity qualifier shall be indicated only with the following:

- precipitation;
- blowing dust/sand/snow (BLDU/BLSA/BLSN), shall be forecast only when the intensity is moderate or heavy; and
- duststorm or sandstorm (DS/SS)

NOTE: When associated with the Proximity (VC) indicator, the intensity of precipitation shall not be specified.

c. **The proximity (VC) qualifier (Table 2.6.1, column 1)** is used only when the following phenomena are expected to occur within 5 to 10 nautical miles from the centre of the runway complex:

- duststorm (DS);
- sandstorm (SS);
- fog (FG);
- funnel cloud(s), tornadoes or waterspouts (FC);
- thunderstorm (TS);
- shower (SH);
- dust/sand whirls (PO); and
- blowing dust/sand/snow (BLDU/BLSA/BLSN).

d. Descriptors (Table 2.6.1, column 2). Not more than one descriptor (Table 2.6.1, column 2) shall be included in any w'w' group (e.g. -FZDZ). When more than one group is indicated, only one descriptor per group may be used (e.g. -FZDZ, SHSNRA, +BLSN, etc.).

- the descriptors shallow (MI), and patches (BC), and partial (PR) shall be used only to forecast fog (FG). For example:
- the term MIFG is used when the visibility within the fog layer between the ground and 2 metres above the ground level is expected to be less than 5/8 SM while the visibility above that layer is greater than 5/8 SM;
- the term BCFG is used to forecast fog patches covering only part of the aerodrome and the visibility in the fog patch is expected to be less than 5/8 SM with the fog layer extending at least to 2 meters above ground level;
- the term PRFG shall be used to forecast fog covering a substantial part of the aerodrome while the remainder of the aerodrome is expected to be free of fog PRFG (fog bank).
- The descriptors low drifting (DR) shall be used only in combination with dust (DU), sand (SA) or snow (SN) when these are raised by the wind to less than two meters above the ground.
- The descriptor BL (blowing) shall be used only in combination with DU, SA or SN to forecast dust, sand or snow raised by the wind to a height of two meters or more above the ground.

NOTE: When SN and BLSN are expected together, they shall be indicated in separate w'w' groups (e.g. 5SM -SN BLSN).

- Shower (SH) shall be used only in combination with one or more of the precipitation types, rain (RA), snow (SN), ice pellets (PL), snow pellets (GS), and/or hail (GR).
- Thunderstorm (TS) must either be stated alone or in combination with one or more of the precipitation types RA, SN, PL, GS, and GR.
- Super-cooled, freezing (FZ) is used in combination with the weather types FG (e.g. FZFG when the visibility is expected to be less than 5/8 of a mile and the temperature is expected to be below freezing, except when the fog is composed entirely of ice crystals), drizzle (DZ), and RA (e.g. -FZRA).

NOTE: For a more detailed description of the above terms see MANOBS.

2.6.9.2 Weather phenomena (table 2.6.1, column 3 to 5)

a. Precipitation

Precipitation types (Table 2.6.1, column 3) which are allowed in the TAF are the following:

- drizzle (DZ);
- rain (RA);
- snow (SN);
- snow grains (SG);
- ice crystals or diamond dust (IC) when the visibility is expected to be 6 SM or less;
- ice pellets (PL);
- hail (GR); and
- snow pellets (GS).

When more than one type of precipitation (Table 2.6.1, column 3) is forecast, the appropriate abbreviations shall be combined in a single group, according to regulations stated in this section, with the most significant type of precipitation being stated first. Not all precipitation types can be combined. Only RA, SN, SG, PL, GR, and GS (e.g. SGPL, SNRA, PLSN, etc.) can be combined, while DZ and IC cannot (e.g. RADZ, SNIC, etc. are not allowed). In such a single group, the intensity shall refer to the total precipitation (e.g. -SHSNRA) where SN is the most significant type of precipitation.

When more than one significant weather phenomenon other than a precipitation combination mentioned above is forecast, separate w'w' groups, but not more than three, shall be included in the forecast in accordance with Table 2.6.1 (e.g. -FZDZ -SGSN BR, etc).

b. Obscuration

Obscuring phenomena (Table 2.6.1, column 4) are forecast whenever the prevailing visibility is expected to be 6 statute miles or less. The only exception is volcanic ash (VA) which, when expected, shall always be indicated regardless of visibility.

c. Other

Other weather phenomena (Table 2.6.1, column 5) are classified as:

- dust/sand whirls (PO);
- squalls (SQ);
- funnel clouds(s) (tornadoes or waterspouts) (FC);
- sandstorm (SS);
- duststorm (DS).

2.6.10 Alternative term NSW

The abbreviation "NSW" (no significant weather) is an alternate term for w'w'. It is used to replace the w'w' group after a change group of the form TEMPO/BECMG $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ to indicate the end of significant weather phenomena indicated in the w'w' group prior to the change. The term NSW shall not be used in the initial forecast period.

2.6.11 Cloud and obscuration groups ($N_SN_SN_Sh_Sh_Sh_S$ and $VVh_sh_sh_s$)

The cloud or obscuration group ($N_SN_SN_Sh_Sh_Sh_S$ or $VVh_Sh_Sh_S$) shall be used in the initial time period and in any subsequent FM group(s) to indicate cumulative cloud amounts ($N_SN_SN_S$) and the height above ground ($h_Sh_Sh_S$) of the base of cloud layers in units of 100 feet. When the sky is totally obscured, the cloud group is replaced with the vertical visibility group $VVh_Sh_Sh_S$. In the absence of clouds, the term SKC (sky clear) shall be used.

2.6.11.1 Cloud amount ($N_SN_SN_S$)

The cloud amount "$N_sN_sN_s$ "shall be given as: SKC, FEW, SCT, BKN, and OVC as indicated in Table 2.6.2 below.

$N_sN_sN_s$ represents the total (cumulative) amount of cloud that the forecaster expects to occur at the level up to and including $h_sh_sh_s$.

The group $N_sN_sN_sh_sh_sh_s$ is limited to a maximum of three significant layers of cloud. The only exception is for CBs, which shall always be indicated when expected.

In case of a significant change in a cloud layer, the entire cloud group, including those cloud layers not expected to change, shall be repeated. A significant change in the clouds is intended to mean a change for which an amendment would be required.

Table 2.6.2 Sky cover terms - Abbreviations and descriptions:

Code Figure	Cloud Amount in Oktas
SKC	**No Cloud**
FEW	**Trace to 2 Inclusive**
SCT	**3 to 4 Inclusive**
BKN	**5 to 7 Inclusive**
OVC	**8**

Towering Cumulus (TCU) and Altocumulus Castellanus (ACC) shall not be forecast. Only Cumulonimbus (CB) shall be forecast. CB cloud, when expected, shall be indicated by adding the letter abbreviations (CB) to the cloud group without a space (e.g. ...BKN020CB...)

2.6.11.2 Cloud height (hshshs)

$h_sh_sh_s$ represents the height of the base of the cloud layers, or the vertical visibility in a surface based layer in hundreds of feet above the ground. Cloud height ($h_sh_sh_s$) shall be forecast according to the following intervals:

a. 100-foot increments from the surface to 1,500 feet;

b. 500-foot increments from 1,500 to 3,000 feet; and

c. 1,000-foot increments above 3,000 feet.

2.6.11.3 Vertical visibility group ($VVh_Sh_Sh_S$)

When the sky is expected to be obscured, the group "$VVh_sh_sh_s$" shall be used in lieu of "$N_sN_sN_sh_sh_sh_s$". In this case, VV is the indicator for vertical visibility and $h_sh_sh_s$ is the value of the vertical visibility in units of 100 feet (e.g. VV005; meaning vertical visibility is 5 hundred feet or obscured ceiling at 5 hundred feet AGL).

NOTE: There is no provision in the TAF code for partial obscuration.

2.6.11.4 Alternative term SKC

The term sky clear (SKC) shall be used in Canada to forecast the absence of cloud or obscuration at the beginning of any self contained part period. The reason for this practice is to avoid giving the impression that the group was inadvertently left out. In addition the term SKC shall be used to replace the cloud or vertical visibility group after a change of the form TEMPO/BECMG $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ to indicate that the cloud or the obscuration is no longer expected.

2.6.12 Probability Group ($PROBC_2C_2$ $Y_bY_bG_bG_b/Y_eY_eG_eG_e$)

In order to indicate the probability of occurrence of an alternative value(s) of a forecast condition, the group "$PROBC_2C_2$ $Y_bY_bG_bG_b/Y_eY_eG_eG_e$" will be stated immediately before the alternative value(s).

C_2C_2 represents the numerical probability, in percent, of the alternative value of the weather condition. There is no space between PROB and C_2C_2. Only the values 30 and 40 shall be allowed to indicate the probability 30% and 40% respectively.

A probability of less than 30% of actual values deviating from those forecasts is not considered to justify the use of the group $PROBC_2C_2$. When the probability of an alternative value is 50% or more, this shall be indicated by the use of BECMG, TEMPO, or FM as appropriate.

The probability group shall be used to forecast weather phenomena that may adversely affect aircraft operation. These include the following:

- thunderstorm;
- freezing precipitation, ice pellets, and snow grains;
- low level wind shear (below 1500 feet AGL);
- ceiling and visibility values important to aircraft operations (e.g. thresholds such as alternate and lowest approach limits).

Only one PROBC_2C_2 group is allowed per self contained part period. The probability group PROBC_2C_2 shall not be used as a direct modifier of BECMG or TEMPO $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ (e.g. …PROB40 TEMPO 0915/0918 … or …PROB30 BECMG 0915/0916 …is not allowed).

The combination FM (condition A) PROB (condition B) BECMG (condition C) is allowed, provided that the time period of the PROB group ends on or before the time the BECMG group begins [e.g. (condition A) PROB40 0918/0922 (condition B) BECMG 0922/0923 (condition C). The combination FM (condition A) PROB (condition B) TEMPO (condition C) is not allowed.

The time period of the PROB group cannot cross two self contained part periods, i.e., the combination … FM271900 (condition A) PROB 2719/2723 (condition B) FM272200Z (condition C)… is **not** allowed.

An exception to this rule, however, is allowed when hours and fraction of one-hour are used in the FM group. For example, the combination ….(condition A) PROB 2718/2720 (condition B) FM271930 (condition C) … is allowed to indicate that the fluctuation in the weather condition stated in the PROB group will last until the beginning of the next self contained part period, in this case, 271930Z.

Similarly, the combination … FM271930 (condition A) PROB 2719/2723 (condition B) … is allowed to indicate that the fluctuation in the weather condition stated in the PROB group is expected to start at the beginning of the self contained part period, in this case, 271930Z.

NOTE: The reason for the above exceptions is that in a PROB group only whole hours are allowed to identify the period during which the possibility of some weather event may occur. In both the above cases, the overlap shall be less than one hour. This practice will give forecasters greater flexibility in the use of PROB in conjunction with a FM group not starting on a whole hour.

In any of the above and following examples, the ending of a group is to be understood as one minute prior to the time stated [e.g. (condition A) PROB30 2718/2721 (condition B) BECMG 2723/2724 (condition C) is to be understood as a 30% probability of condition B existing from 271800Z to 272059Z] and a permanent change from condition A to condition C between 272300Z and 272359Z.

2.6.13 Transitory change groups TEMPO $Y_bY_bG_bG_b/Y_eY_eG_eG_e$

The transitory change group "TEMPO $Y_bY_bG_bG_b/Y_eY_eG_eG_e$" shall be used when a temporary fluctuation in some or all of the elements forecast is expected to occur during the period $Y_bY_bG_bG_b$ to $Y_eY_eG_eG_e$. This group shall be used only when the modified forecast condition is expected, in each instance, to last less than one hour and, if expected to recur, will not in the aggregate cover more than half of the forecast period during which the modified condition is expected to occur, i.e. the period indicated by $Y_bY_bG_bG_b/Y_eY_eG_eG_e$. When the modified forecast condition is expected to last more than one hour, a new change group of the form FM or BECMG must be used. This transitory group shall be followed by a description of only those elements for which a change is forecast to occur. In other words, when an element is not indicated after TEMPO $Y_bY_bG_bG_b/Y_eY_eG_eG_e$, it shall be considered to be the same as it was prior to $Y_bY_bG_bG_b$.

Example:

...FM271100 VRB03KT 3SM -RA BR OVC020 TEMPO 2712/2715 1SM -RA BR FM271500

In the above example, the cloud group "OVC020" is not repeated after TEMPO because it is forecast to remain unchanged. On the other hand, the weather group "-RA BR" is repeated after TEMPO because a significant change in the visibility is forecast.

The time period $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ shall always be stated following TEMPO, even in those cases where it spans the same time period as the self contained part period .(e.g. …FM271500 (condition A) TEMPO 2715/2720 (condition B) FM272000 …)

The time period of the TEMPO group cannot cross two self contained part periods, i.e., the combination … FM271900 (condition A) TEMPO 2721/2801 (condition B) FM272300 (condition C)… is not allowed.

An exception to this rule, however, is allowed when hours and fraction of one-hour are used in the FM group. For example, the combination ….(condition A) TEMPO 2718/2720 (condition B) FM271930 (condition C) … is allowed to indicate that the fluctuation in the weather condition stated in the TEMPO group will last until the beginning of the next self contained part period, in this case, 271930Z.

Similarly, the combination … FM271930 (condition A) TEMPO 2719/2723 (condition B) … is allowed to indicate that the fluctuation in the weather condition stated in the TEMPO group is expected to start at the beginning of the self contained part period, in this case, 271930Z.

NOTE: The reason for the above exceptions is that in a TEMPO group only whole hours are allowed to identify the period during which some weather fluctuations are expected. In both the above cases, the overlap shall be less than one hour. This practice will give forecasters greater flexibility in the use of TEMPO in conjunction with a FM group not starting on a whole hour.

The combination FM (condition A) TEMPO (condition B) PROB (condition C) is allowed, provided that the time period specified in the PROB group is the same as or a subset of the time

period specified in the TEMPO group [e.g. FM (condition A) TEMPO 2719/2723 (condition B) PROB30 2720/2723 (condition C)…], or the PROB group begins at the same time or after the TEMPO group ends [e.g. FM(condition A) TEMPO 2715/2720 (condition B) PROB30 2720/2723 (condition C). Only one such combination per self contained part period is allowed.

The combination FM (condition A) TEMPO (condition B) BECMG (condition C) is allowed, provided that the weather condition specified in the BECMG group is forecast to occurs after the time period specified in the TEMPO group [e.g. (condition A) TEMPO 2718/2722 (condition B) BECMG 2723/2724 (condition C)].

An exception to the above rule is allowed when a change in wind speed and/or direction is the only change expected. In such cases, a BECMG group embedded in a larger TEMPO group can be used. For example, the combination: FM (condition A) TEMPO 2714/2721 (condition B) BECMG 2719/2720 30015KT …is allowed. Only one combination of TEMPO and BECMG is allowed per self contained part period. In the TEMPO/BECMG combination the TEMPO group must come first. In other words, the combination … (condition B) BECMG (condition C) TEMPO (condition D) is **not** allowed.

Normally, only one TEMPO group should be used per self contained part period. A maximum of two TEMPO groups may be used when neither of them are used in combination with the BECMG or PROB group and only one weather element at a time is changing [e.g. FM271000 (condition A) TEMPO 2714/2717 OVC010 TEMPO 2717/2720 4SM -SHSN]. In this case the visibility and the weather are considered only one element because when the visibility changes, the weather responsible for the change must also be stated even if it remained the same.

The triple combination of the groups TEMPO…PROB … BECMG is not allowed [e.g. FM (condition A) TEMPO 2715/2720 (condition B) PROB30 2717/2720 (condition C) BECMG 2721/2722 (condition C) is not allowed]. This type of combination confuses the end users of the product.

2.6.14 Change groups FMYYGGgg and BECMG $Y_bY_bG_bG_b/Y_eY_eG_eG_e$

These groups shall be used when, during the entire period of the forecast ($Y_1Y_1G_1G_1$ to $Y_2Y_2G_2G_2$), a change in some or all of the elements forecast is expected to occur at some intermediate time YYGGgg or during the period $Y_bY_bG_bG_b$ to $Y_eY_eG_eG_e$.

2.6.14.1 FMYYGGgg

The period of coverage of a TAF may be divided into two or more self contained part periods. Such divisions, when required, shall be done with the use of the group “FMYYGGgg”; where:

- FM is the abbreviation for “from”; and
- YYGGgg is the date, hour and minutes in UTC at which the permanent change is expected.

Most often, the “gg” will take the form “00”, indicating a whole hour. However, the timing of changes should be as detailed as supporting data and forecaster knowledge allow. If a forecaster can determine a change and/or events to a finer resolution, particularly in the early hours of the forecast period, then the use of the “gg” to indicate timing to some fraction of an hour is encouraged (e.g. FM271830, FM081215).

The group FMYYGGgg is used to indicate a rapid and permanent change (typically over a period of one hour or less) of meteorological conditions expected to occur at time GGggZ on day YY.

When the group FMYYGGgg is used, all forecast conditions given before this group are superseded by the conditions indicated after the group. In other words, a complete forecast will follow and all weather elements must be indicated.

When hours and minutes are used to begin a new self contained part period (e.g. FM261930), any group of the form PROB/TEMPO used after the FM group and intended to start at the same time as the FM group, shall be indicated as starting on the whole hour before the fraction of the hour stated in the FM group [e.g. FM081230 (condition A) TEMPO 0812/0816 (condition B)…meaning that the group TEMPO starts at 1230Z rather than 1200Z]. Similarly, a group of the form PROB/TEMPO used before such a FM group and intended to end with the beginning of the new FM group shall be indicated as ending on the whole hour after the fraction of the hour stated in the new FM group [e.g. ... (condition A) TEMPO 0818/0820 (condition B) FM081930 (condition C)… meaning that the group TEMPO ends at 1930Z rather than 2000Z]. The same reasoning applies to the PROB group.

For the sake of clarity, each FM group will start a new forecast line with the proper indentation. This is done automatically by the national bulletin preparation software.

NOTE: Forecasters are encouraged to sub-divide the valid period of the TAF using FMYYGGgg as often as possible rather than using the forecast change indicator BECMG. The rational behind this is that a FMYYGGgg group is a more complete and, therefore, more effective forecast. As such, it is more useful and much preferred by users.

2.6.14.2 BECMG $Y_bY_bG_bG_b/Y_eY_eG_eG_e$

The change group BECMG $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ shall indicate a gradual evolution of meteorological conditions between time $Y_bY_bG_bG_b$ and time $Y_eY_eG_eG_e$. The duration of the period from $Y_bY_bG_bG_b$ to $Y_eY_eG_eG_e$ shall normally not exceed two hours and in any case not exceed four (e.g. …BECMG 1721/1722 …or … BECMG 1722/1724 …)

The permanent change group shall be followed by a description of only those weather elements for which a change is forecast to occur. In other words, if a weather element is not indicated after BECMG $Y_bY_bG_bG_b/Y_eY_eG_eG_e$, it shall be considered to be the same as it was prior to $Y_bY_bG_bG_b$.

NOTE: The forecaster should exert his/her judgment when to use FMYYGGgg or BECMG $Y_bY_bG_bG_b/Y_eY_eG_eG_e$. As a general rule, to keep the forecast clear and unambiguous, the use of the change group BECMG $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ should be kept at a minimum and confined to those cases where only one or at most two weather elements are expected to change while all the others stay the same. In those cases where more than two weather elements are expected to change, the permanent change group FMYYGGgg should be used to start a new self contained part period.

Normally, only one BECMG group should be used in the same self contained part period. A maximum of two BECMG groups are allowed in a self contained part period when only one weather element at a time is changing [e.g. ..(condition A) BECMG 1713/1715 1SM BR BECMG 1715/1717 4SM BR …] or [(condition A) BECMG 1714/1715 34015KT BECMG 1717/1718 4SM -SHSN) …]. In this case the visibility and the weather are considered only one element because when the visibility changes the weather responsible for the change must always be stated even if it remained the same.

The combination BECMG/PROB and BECMG/TEMPO are not allowed (e.g. FM (condition A) BECMG (condition (B) PROB/TEMPO (condition C) are not allowed). See Section 2.6.12 and 2.6.13 for the use of BECMG when it follows a PROB or TEMPO group respectively.

2.6.15 Remarks (RMK)

Some remarks may be included at the end of a TAF preceded by the designator "RMK" The following remarks are authorized for use as appropriate:

a. FCST BASED ON AUTO OBS;

b. NXT FCST BY YYGGggZ; where YY is the date and GGgg is the hour and minutes UTC of issue of the regular TAF (GG is the whole hour and gg is '00' minutes); any remarks associated with partial program notices as described in section 2.5.2.1;

c. remarks explaining possible discrepancies between AWOS observations and aerodrome forecasts when forecasters have reasons to believe that the AWOS observations are non-representative of the actual weather at the aerodrome:

- RMK AUTO OBS RPRTG NON-REPRESENTATIVE WND SPD;
- RMK AUTO OBS RPRTG NON-REPRESENTATIVE WND DRCTN;
- RMK AUTO OBS RPRTG NON-REPRESENTATIVE WND;
- RMK AUTO OBS RPRTG NON-REPRESENTATIVE VIS;
- RMK AUTO OBS RPRTG NON-REPRESENTATIVE CLD HGT;
- RMK AUTO OBS RPRTG NON-REPRESENTATIVE TEMP;
- RMK AUTO OBS RPRTG NON-REPRESENTATIVE DEW POINT TEMP;
- RMK AUTO OBS RPRTG NON-REPRESENTATIVE PCPN TYPE;

- RMK AUTO OBS RPRTG NON-REPRESENTATIVE PCPN INTSTY;
- RMK AUTO OBS RPRTG NON-REPRESENTATIVE PCPN;
- RMK AUTO OBS NON-REPRESENTATIVE OF CURRENT WX.

d. When one or more sensors are inoperative but you have other means of obtaining the pertinent weather information, you can leave the TAF running by adding the proper remark from the list below:

- WND SPEED SENSOR INOPV
- WND DRCTN SENSOR INOPV
- WND SENSORS INOPV
- VIS SENSOR INOPV
- CLD SENSOR INOPV
- PCPN TYPE SENSOR INOPV
- PCPN INTSTY SENSOR INOPV
- PCPN SENSORS INOPV

NOTE: The above remarks can be included when a regularly scheduled TAF is issued or when amending an existing TAF. Remarks of this nature should only be included when forecasters are confident of the weather condition at the aerodrome and that it is safe not to cancel the TAF for that aerodrome. The last remark could be used when more than two sensors are reporting non-representative observations.

If forecasters are not confident of the actual weather condition at the aerodrome, they should cancel the TAF according to the procedure described in Section 2.10.1.2.

2.7 Aerodrome Advisories

Aerodrome advisories may be issued, in place of aerodrome forecasts, for the following reasons:

2.7.1 Offsite (OFFSITE)

To be used when the forecast is based on observations that are not always considered to be representative of weather conditions at the airport. In normal situations, an observation shall be considered representative of the weather conditions at the aerodrome if it is taken within 1.6 NM (3 km) of the geometric centre of the runway complex.

In cases where the 1.6 NM (3 km) criteria does not apply because of local characteristics, the representativeness of an observation shall be determined and approved by the Regional Director of MSC, for site controlled by EC or, by the Director of Meteorology and Oceanography, for sites controlled by DND.

The word ADVISORY shall appear after the period of coverage group. The word OFFSITE shall be added, followed by one space, after the word ADVISORY (e.g. TAF CCCC 151040Z 1511/1523 ADVISORY OFFSITE …). This is intended to indicate to the users that the observations do not necessarily reflect the actual conditions at the aerodrome.

2.7.2 Observation incomplete (OBS INCOMPLETE)

The term “OBS INCOMPLETE” is to be used when the forecast is based on observations with missing or incomplete data on a regular basis (e.g. MSL pressure not reported).

The word ADVISORY shall appear after the period of coverage group. The words OBS INCOMPLETE shall be added immediately after the word ADVISORY (e.g. TAF CCCC 201640Z 2017/2105 ADVISORY OBS INCOMPLETE …).

2.7.3 No specials (NO SPECI)

The term “NO SPECI” is to be used when the forecast is based on observations from a station with a limited observing program that does not issue special weather observations.

The word ADVISORY shall appear after the period of coverage group. The words NO SPECI shall be added immediately after the word ADVISORY (e.g. TAF CCCC 252240Z 2523/2612 ADVISORY NO SPECI …).

2.8 Updated Forecasts

An updated forecast is a forecast issued on a scheduled basis which replaces the previous TAF without extending its period of coverage. Updated forecasts are issued at the request of NC usually for major, high traffic aerodromes. Normally, updated TAFs are issued for aerodromes whose regular TAFs have a period of coverage of 24 or 30 hours; however, this is not a necessary condition. Updated TAFs, since they are more recent forecasts, are intended to provide more accurate information than their predecessors, especially in the short range, and will normally be scheduled for issuance 3 hours following each regular TAF issue. In some cases NC may decide that at certain times of the day, due to low traffic volume, the issuance of updated TAFs is not required (e.g. overnight).

An updated TAF does not extend the period of coverage of the TAF that it supersedes. For example, if a 24-hour TAF covering a period from 041100Z to 051100Z is updated at 041340Z, the updated TAF shall indicate a period of coverage as 0414/0511(i.e. 041400-051100Z). As with other TAFs, an updated TAF is valid from the time it is issued until it is amended or until it is superseded by the next issue of the regular TAF for the same aerodrome.

In preparing both regular and updated TAFs, forecasters should attempt to provide as much precision as supporting data will allow to the first 3 hours of its period of coverage. In particular, forecasters are encouraged to time the start of new part-periods as precisely as possible (i.e. using hours and minutes as described in section 2.6.14.1)

2.9 Amended TAFs

A TAF shall be amended when the forecast conditions are no longer representative of the actual or expected conditions according to the criteria listed in section 2.9.5.

The response time for amending TAFs shall be such that 90 percent of **mandatory** amendments should be issued within 20 minutes of receipt of the relevant observation.

As in a regular TAF, the time in the telecommunication header of an amended TAF shall indicate the whole hour (UTC) that precedes the time of entry to the collection circuit (see sec. 2.5.1.c).

The date/time group YYGGggZ in the bulletin, however, shall indicate the date and time of origin of the amended TAF. For example, a first amendment of a regular TAF for CYYZ issued at 1845Z on the 21 of the month shall be issued as:

FT 211800 AAA
TAF AMD CYYZ 211845Z 2118/2224...

An amended forecast covers the remaining period of the original forecast and is identified by AA(X) in the telecommunication header (see 2.5.1.d) and by the prefix TAF AMD in place of TAF on the following line.

NOTE: Amended TAFs with a different (X) in the AA(X) group shall be issued in separate bulletins.

2.9.1 Responsibility for issuing amended TAFs

A forecaster must use initiative, discretion, and good judgment in determining when amendments should be issued. It must be emphasized that both the responsibility and the authority for issuing amendments rest with the forecaster and the supervising meteorologist.

TAFs should be amended whenever they become, in the forecaster's judgment, unrepresentative of existing or expected weather conditions. Furthermore, forecasters should strive to issue amended TAFs proactively rather than reactively.

2.9.2 Amendments based on PROBC_2C_2 $Y_bY_bG_bG_b/Y_eY_eG_eG_e$

The group "PROBC_2C_2 $Y_bY_bG_bG_b/Y_eY_eG_eG_e$" may be used to state the probability of occurrence of a weather phenomenon significant to aviation. If the condition introduced by this probability group is observed and is considered to be a short lived phenomenon that will last for less than one-half hour and is not expected to recur, it is not necessary to amend the TAF. In those cases when the same phenomenon is expected to last for a longer period or to recur, an amended TAF is required. The only exception is for TS, GR, FC, FZRA, FZDZ, PL and SG for which an amendment is always required irrespective of their duration

2.9.3 Amendments based on human/machine mix

There is no requirement to amend or update a TAF solely due to a change in the type of

observations. If, however, a scheduled TAF (based on manned observations) needs to be amended and the amendment is triggered by an observation generated from an automated station, such amendment shall include the phrase FCST BASED ON AUTO OBS in the remark section of the TAF. The converse is also true, i.e., if a TAF based on automated observations needs to be amended and the amendment is triggered by a manned observation, such amendment shall not include the phrase FCST BASED ON AUTO OBS in the remark section of the TAF.

2.9.4 Amendments to aerodrome advisories

Aerodrome advisories are to be amended according to the amendment criteria set out in section. 2.9.5.

2.9.5 Amendment criteria

An amendment shall be issued when the actual or expected weather condition is in a different category than the forecast condition.

A weather category is defined by the lower of either the ceiling or the visibility. A ceiling is defined as the lowest (above ground) cloud layer summation amount of broken (BKN) or overcast (OVC).

2.9.5.1 Cloud and visibility

The principal weather categories are delineated by the following thresholds:

- ceiling 2,500 feet and visibility 6 miles (generally representative of non-alternate IFR threshold);
- ceiling 1,000 feet and visibility 3 miles (threshold between VFR and IFR);
- TC approved alternate limit for the aerodrome;
- TC approved IFR approach limit for the aerodrome;
- additional limits as determined regionally.

A list of these additional limits shall be prepared by each MWO in agreement with TC authorities and published in Appendix C of this manual.

For amendment purposes, each of the above thresholds is always part of and included in the category immediately above the threshold. This means that, for deteriorating conditions, a change in category occurs when either the ceiling or the visibility crosses the threshold value leading to the next lower category. On the other hand, for improving conditions, both ceiling and visibility must cross the threshold values leading to the next higher category.

NOTE: A TAF need not be amended for changes in ceiling or visibility when both the forecast and observed values are less than the lowest published landing minima for the aerodrome. This rule is valid provided that the lowest approach limits for the aerodrome are not higher than the IFR threshold (1000 feet/3statute miles). In such cases, an amendment is required when the weather condition crosses the IFR threshold. For example, if the lowest approach limit of an aerodrome is 1500/4 and the TAF calls for 1200/3, an amendment is needed if the weather condition lowers to below 1000/3.

2.9.5.2 Weather and visibility:

a. Thunderstorms, hail, tornado, funnel clouds, and water spouts:

An amendment shall be issued when thunderstorms, hail, tornado, funnel clouds or water spouts are observed or expected to occur and were not forecast or when they were forecast and subsequently no longer expected to occur. These rules apply with no exception, regardless of the value of the visibility and the duration of the phenomenon.

b. Freezing precipitation, ice pellets, and snow grains:

An amendment shall be issued when freezing precipitation, ice pellets, or snow grains at the surface are observed or expected to occur and are not forecast or when they are forecast and subsequently no longer expected to occur. These rules apply with no exception, regardless of the value of the visibility and the duration of the phenomenon.

c. Rain, snow, snow pellets, and moderate or heavy drizzle:

An amendment shall be issued when rain, snow, snow pellets, or moderate or heavy drizzle, lowering visibility to less than 6 statute miles, is observed or is expected to occur and is not forecast. Similarly, an amendment shall also be issued when the same type of precipitation, lowering visibility to less than 6 statute miles, is forecast and subsequently is no longer expected to occur. When the visibility remains 6 statute miles or greater before and after the onset of precipitation, there is no need to amend a TAF for the onset or cessation of rain, snow, snow pellets, or moderate or heavy drizzle.

d. Precipitation state change

When precipitation listed in **c** above] is observed and the state of the precipitation (liquid or solid) is not the same as forecast, then an amended forecast is required provided that the visibility due to precipitation is reduced to less than 6 statute miles. Similarly, when precipitation of the forecast state is not occurring and is no longer expected to occur, then an amended forecast is required provided that the visibility was originally forecast to be less than 6 statute miles.

e. Obscuration, light drizzle and ice crystals

When a change in visibility due to an obscuring phenomenon, to light drizzle, or to ice crystals is observed or is expected to occur and is not forecast, a TAF amendment is required only if the visibility lowers to less than 6 statute miles. Similarly, when such a change is forecast and subsequently is no longer expected to occur, an amended TAF is required provided that the visibility was originally forecast to be less than 6 statute miles. The only exception is volcanic ash which requires and amendment, when not forecast, regardless of the value of the visibility.

2.9.5.3 Winds:

An amendment shall be issued when:

a. speed:

- The observed speed is double or more, or half or less of the forecast value and either the observed or forecast value is greater than 15 knots; or
- the difference between the observed and forecast speed is 20 knots or more.

b. direction:

The observed direction differs by at least 45 degrees from the forecast value for all observed speeds greater than 15 knots.

2.9.5.4 Low level wind shear

An amendment shall be issued when a strong wind shear (as defined in sec 2.6.7) was not forecast but subsequently occurs or is expected to occur or when it was forecast but subsequently is no longer expected to occur. In addition, if the forecast wind speed, direction, or height of the wind shear layer are not representative of the actual condition, the forecaster can amend the TAF at his/her discretion.

2.10 Cancellation of TAFs

When a TAF must be canceled, it shall be done by the issuance of an amended TAF. The format and reasons for canceling TAFs are stated in section 2.10.1 and 2.10.2 below.

2.10.1 Cancellation for missing observations

In the event that scheduled hourly observations are not received, the forecaster shall determine the reason for the missing observations.

If the observations were not received because of a telecommunication problem, the forecaster shall make every reasonable effort to obtain them, whenever possible, by alternative means. If two consecutive hourly observations from an aerodrome cannot be obtained, the TAF for that aerodrome shall be canceled by sending an amended TAF.

a. An existing TAF must be canceled:

When an existing TAF must be canceled because of a lack of weather observations for that aerodrome, an amended TAF to cancel the existing one must be issued according to the following format:

FT 051935 AAA
TAF AMD CYQG 051935Z 0518/0618 FCST CNCLD DUE TO NO OBS
RMK NXT FCST BY 060000Z=

b. The first TAF of the day for an aerodrome with a partial program is not issued because weather observations are not available:

When weather observations are not available or are insufficient for issuing the first TAF of the day for an aerodrome operating under a partial program (less than 24 hours per day), the first regular TAF of the day indicating that the forecast is not available must be issued according to the following format:

FT 101140
TAF CYPQ 101140Z 1012/1020 FCST NOT AVBL DUE INSUFFICIENT OBS
RMK NXT FCST BY 101800Z=

Once a TAF for an aerodrome has been canceled due to missing observations, the TAF for that aerodrome shall not be re-issued until a minimum of one hourly observation (in VFR situations) is received or a maximum of two consecutive hourly observations (in below VFR situations) representative of the aerodrome are received.

The two observations must be consecutive and must be not more than one hour apart (e.g. two regular hourly observations). In both cases, the forecast shall be issued within 20 minutes after the appropriate observation is received.

2.10.2 Cancellation due to unreliable or missing AWOS observation element(s)

A forecaster may cancel a TAF for an aerodrome equipped with a stand-alone AWOS site when:

a. the observation of any critical element (e.g. ceiling) is missing or believed to be incorrect or affected by a mechanical malfunction for two hours; and

b. all attempts have failed to determine a reasonable inferred value(s) based on sound meteorological knowledge and techniques.

In the above circumstances, the TAF shall contain a brief explanation for its cancellation according to the following:

i. Forecast canceled due to missing element(s) and forecaster's inability to infer a reasonable value.

When this occurs, the TAF shall be canceled using one of the following phrases:

- "FCST CNCLD DUE CLD HGT SENSOR INOPV";
- "FCST CNCLD DUE VIS SENSOR INOPV";
- "FCST CNCLD DUE PCPN TYPE SENSOR INOPV";

- "FCST CNCLD DUE PCPN INTSTY SENSOR INOPV";
- "FCST CNCLD DUE PCPN SENSORS INOPV";
- "FCST CNCLD DUE TEMP SENSOR INOPV";
- "FCST CNCLD DUE DEW POINT SENSOR INOPV";
- "FCST CNCLD DUE WND SPEED SENSOR INOPV";
- "FCST CNCLD DUE WND DCTN SENSOR INOPV";
- "FCST CNCLD DUE WND SENSORS INOPV";
- "FCST CNCLD DUE SENSORS INOPV";
- "FCST CNCLD DUE INSUFFICIENT DATA".

NOTE: The last two statements in the above list shall be used when more than one of the sensors is inoperative.

For example:
FT 202000 AAA
TAF AMD CYTL 202030Z 2018/2102 FCST CNCLD DUE CLD HGT SENSOR INOPV
RMK NXT FCST BY 210000Z=

ii. Forecast canceled due to sensor malfunction or incorrect observation element(s) and forecaster inability to infer a reasonable value. When this occurs, the TAF shall be canceled using one of the following phrases:

- "FCST CNCLD DUE CLD HGT SENSOR MALFUNCTION";
- "FCST CNCLD DUE VIS SENSOR MALFUNCTION";
- "FCST CNCLD DUE PCPN TYPE SENSOR MALFUNCTION';
- "FCST CNCLD DUE PCPN INTSTY SENSOR MALFUNCTION",
- "FCST CNCLD DUE PCPNP SENSORS MALFUNCTION";
- "FCST CNCLD DUE TEMP SENSOR MALFUNCTION";
- "FCST CNCLD DUE DEW POINT SENSOR MALFUNCTION";
- "FCST CNCLD DUE WND SPEED SENSOR MALFUNCTION";
- "FCST CNCLD DUE WND DRCTN SENSOR MALFUNCTION";
- "FCST CNCLD DUE WND SENSORS MALFUNCTION";
- "FCST CNCLD DUE SENSORS MALFUNCTION".
- "FCST CNCLD DUE INSUFFICIENT DATA".

NOTE: The last two phrases in the above list shall be used when more than one of the sensors are malfunctioning or more than one of the elements are deemed to be incorrect.

For example:

FT 281500 AAC
TAF AMD CYTL 281515Z 2812/2902 FCST CNCLD DUE VIS SENSOR MALFUNCTION
RMK NXT FCST BY 281800Z=

If a forecaster is capable of inferring a reasonable value for the current weather, and this is in agreement with the current TAF but differs from the AWOS observation, the forecaster does not have to cancel the TAF. In such a situation, the forecaster shall amend the TAF including an explanatory note in the remark section justifying the difference between the AWOS observation and the TAF as indicated in Section 2.6.15.

2.11 Corrections

A TAF shall be corrected when typographical errors and/or forecast text omissions are made in the original TAF and are such that the information content on the TAF is unclear or subject to misinterpretation.

The abbreviation “AMD” shall be used in the body of a forecast when a corrected TAF is issued. In the bulletin header, however, the term CC(X), indicating a correction, shall be placed by the national bulletin preparation software. The issue time added to the body of the TAF indicates which TAF is the latest.

NOTE: Corrected TAFs must not be transmitted in the same bulletin as amended TAFs because the bulletin header for corrected TAFs is CC(X), while the header for amended TAFs is AA(X).

2.12 Examples of TAFs

2.12.1

FT 101100
TAF CYTL 101140Z 1012/1024 24010KT P6SM BKN030 TEMPO 1018/1020 5SM -SHRA BR
FM102000 24005KT P6SM SKC
RMK FCST BASED ON AUTO OBS. NXT FCST BY 101800Z=

2.12.1a

FT 101530 AAA
TAF AMD CYTL 101530Z 1012/1024 FCST CNCLD DUE VIS SENSOR MALFUNCTION
RMK FCST BASED ON AUTO OBS. NXT FCST BY 101800Z=

2.12.2

FT 011700
TAF CYWG 011740Z 0118/0218 28015KT P6SM -SNRA SCT015 OVC040 TEMPO
0118/0124 2SM -SNRA BR OVC015
FM020000 28015KT P6SM BKN030 BKN250 TEMPO 0200/0203 P6SM -SHRA
FM021000 30015KT P6SM SKC
RMK NXT FCST BY 020000Z=

NOTE: If an updated TAF were scheduled for CYWG, then the remark in the above example would say: NXT FCST BY 012100Z.

2.12.3

FT 021700
TAF CYYZ 021740Z 0218/0324 30015G25KT P6SM BKN015 OVC025CB PROB30
0218/0223 3SM -TSRA
FM022300 30010G20KT P6SM SKC
FM031000 VRB03KT 4SM BR SKC TEMPO 0310/0313 3/4SM BR BECMG
0314/0316 P6SM NSW
RMK NXT FCST BY 022100Z=

2.12.4

FT 021100
TAF CYYR 021140Z 0212/0312 VRB03KT 2SM BR BKN025
FM021230 27015KT P6SM SKC
RMK NXT FCST BY 021800Z=

2.12.5

FT 020500Z
TAF CYQX 020540Z 0206/0306 13005KT 1SM -DZ BR OVC005 TEMPO 0206/0210
1/4SM DZ FG VV002
FM021300 31005KT 4SM BR SKC TEMPO 0302/0305 3/4SM BR SCT005
RMK NXT FCST BY 021200Z=

2.12.6

FT 151900 AAA
TAF AMD CYEG 151912Z 1519/1618 27015G35KT 3SM -TSRA SCT008 OVC015CB
TEMPO 1520/1523 VRB25G45KT 1SM TSRAGS OVC008CB PROB30 1520/1523
1/2SM +TSRAGR
FM160000 33015G25KT P6SM SKC BECMG 1609/1610 33005KT
RMK NXT FCST BY 152100Z=

2.12.7

FT 231500 AAA
TAF AMD CYUL 231515Z 2315/2412 30015KT 2SM -SHSN OVC010
FM231615 27015KT P6SM BKN030 OVC060 TEMPO 2321/2405 4SM -SHSN
FM240500 27015KT P6SM SKC
BECMG 2409/2411 00000KT
RMK NXT FCST BY 231800Z=

NOTE: The above example represents the first amendment since the last regular forecast update.

2.12.8

FT 051100
TAF CYFB 051140Z 0512/0612 04025G45KT WS015/12060KT P6SM SKC
FM051330 36010G20KT P6SM SCT030 TEMPO 0518/0522 3SM -SHSN BKN030
FM060000 36005KT P6SM SKC
RMK NXT FCST BY 051800Z=

2.12.9

FT 090500
TAF CYOW 090535Z 0906/1006 04015KT 1SM -FZRA -SN OVC010
FM090730 27015G25KT P6SM SCT010 OVC025 TEMPO 0913/1005 P6SM -SHRA
RMK NXT FCST BY 090900Z=

2.12.10

FT 171100 CCA
TAF AMD CYZX 171152Z 1712/1812 00000KT 1SM BR SKC
FM171315 VRB03KT 3SM BR SKC BECMG 1713/1715 P6SM NSW SCT020
FM180600 VRB03KT 2SM BR SKC TEMPO 1809/1811 1/4SM FG VV001
RMK NXT FCST BY 171800Z=

NOTE: The above example represents the first correction issued since the last regular issue of the forecast. "AMD" is used in the body of the forecast.

2.12.11

FT 151100
TAF CYDL 151140Z 1512/1521 ADVISORY OFFSITE 32010KT P6SM SKC
FM151721 32015G25KT P6SM FEW025 TEMPO 1517/1522 BKN025
RMK NXT FCST BY 151800Z=

2.12.12

FT 181700
TAF CYYZ 181740Z 1818/1924 24010KT 6SM HZ BKN250
FM181930 32015G25KT P6SM SKC BECMG 1822/1823 30005KT BKN025
RMK NXT FCST BY 182100Z=

2.12.13

FT 101200 CCA
TAF AMD CYHM 101215Z 1012/1024 20010KT 6SM HZ BKN250
FM101700 22015KT 6SM HZ BKN030 TEMPO 1017/1020 5SM -SHRA HZ
FM102100 23005KT P6SM SKC
RMK NXT FCST BY 101800Z=

2.12.14

FT 192000
TAF CYVR 192040Z 1921/2024 26015KT 3SM BR BKN020 TEMPO 1921/1923 1SM
–SHRA BR
FM200300 24005KT 3SM BR SCT020
FM200700 VRB03KT 1SM BR SCT004 TEMPO 2009/2011 1/2SM FG BKN004
BECMG 2013/2015 5SM BR
FM201600 24010KT P6SM SKC
RMK NXT FCST BY 200000Z=

NOTE: The above TAF is an updated forecast.

2.12.15

FT 151700
TAF CYVV 151740Z 1518/1606 24045G70KT P6SM SQ BKN030
FM151930 32020G40KT P6SM BKN030 TEMPO 1520/1523 P6SM -SHRA
RMK NXT FCST BY 160000Z=

2.12.16

FT 171100
TAF CYQG 171140Z 1712/1812 26015KT 6SM -FZRA BR SCT010CB OVC020 TEMPO
1712/1715 4SM TS -FZRA BR
FM171500 34010G20KT P6SM OVC015 TEMPO 1717/1722 4SM –SHSN OVC025
FM172300 34005KT P6SM SKC
RMK NXT FCST BY 171800Z=

2.12.17

FT 202300
TAF CYHM 202340Z 2000/2003 26010KT 5SM HZ FEW030
BECMG 2001/2002 P6SM NSW SKC
RMK NO FCST COVERAGE 200300-201100Z=

2.12.18

FT 201135 AAA
TAF AMD CYPQ 201135Z 2012/2020 FCST NOT AVBL DUE INSUFFICIENT OBS
RMK NXT FCST BY 201800Z=

CHAPTER 3

FORECASTS IN DIGITAL FORM OF THE WIND AND TEMPERATURE ALOFT

3.1 PURPOSE

Forecasts in digital form of the winds and the temperatures aloft (FDs) are prepared to meet aeronautical requirements for flight planning and to prepare documentation for flights in Canada and between Canada and the United States, Greenland, Mexico and the Caribbean.

3.2 CONTENT AND ISSUING OFFICES

Objective forecasts of upper wind and temperature are issued by the Canadian Meteorological Centre (CMC) for 142 locations. These locations are listed in Appendix D; they are also shown on AES map number 0062-9411, in the same appendix.

The CMC, in Montreal, issues the FDCN01, FDCN02 and FDCN03 CWAO messages for the 3,000, 6,000, 9,000, 12,000 and 18,000-foot levels above sea level (ASL). The 3000-foot level is omitted when the terrain elevation is greater than 1,500 feet. In addition, temperatures are not forecast for the 3,000-foot level.

The National Weather Service (NWS), in Washington, issues objective forecasts of upper winds and temperatures for, to a few exceptions, the same locations as the CMC (139 locations in all; see Appendix D), but for the 24,000; 30,000; 34,000; 39,000; 45,000 and 53,000-foot levels. These forecasts are transmitted under the headers FDCN1, FDCN2 and FDCN3 KWBC.

3.3 ISSUE TIMES AND PERIODS OF USE

Wind and temperature forecasts in digital form (FDs) are prepared twice daily and are based on 0000 UTC and 1200 UTC data, respectively.

When FDs are generated, 6, 12, 18, 24, 30, 36 and 48-hour forecasts are created. The 6, 12 and 24-hour forecasts become respectively the FDCN01, FDCN02 and FDCN03 messages, and are transmitted via the EC telecommunications network.

The 18, 24 and 36-hour forecasts are kept as back-ups in case of computer problems in the subsequent forecast cycle. The 30, 36 and 48-hour forecasts are also kept as back-ups; they are used when computer problems occur in two consecutive forecast cycles.

Each of the 6, 12 and 24-hour forecasts (or their back-ups when applicable), though for a particular time (denoted as "Valid Time"), applies to a specific period, called "Period of Use." The following table gives the times of issue, the valid times and the periods of use of each forecast.

HEADER	OBSERVATION TIME (UTC)	APPROXIMATE ISSUE TIME (UTC)	VALID TIME (UTC)	PERIOD OF USE (UTC)
FDCN01 CWAO	0000	0320	0600	0300-0900
FDCN02 CWAO	0000	0330	1200	0600-1800
FDCN03 CWAO	0000	0330	0000	1800-0500
FDCN01 CWAO	1200	1520	1800	1700-2100
FDCN02 CWAO	1200	1530	0000	2100-0600
FDCN03 CWAO	1200	1530	1200	0600-1700

NOTE 1: Although their headers indicate a later time, the FDCN01, FDCN02 and FDCN03 CWAO forecasts are normally available on EC circuits towards 0300 UTC (forecasts based on 0000 UTC data) and 1500 UTC (forecasts based on 1200 UTC data).
NOTE 2: The FDCN01, FDCN02 and FDCN03 KWBC forecasts (from the NMC) that are based on 0000 UTC observations are normally issued towards 0215 UTC and their headers show 0214 UTC . Forecasts based on 1200 UTC observations are normally issued towards 1415 UTC and their headers show 1411 UTC .

3.4 FORMAT

The symbolic form of the forecast is ddfftt where dd is the wind direction in tens of degrees with respect to true north, ff is the wind speed in knots, and tt is the temperature in degrees Celsius.

Wind speeds from 100-199 knots are indicated by subtracting 100 from the speed and adding 50 to the direction (e.g. 240 degrees at 130 knots is coded 7430). Speeds in excess of 199 knots are coded as if they were of 199 knots (e.g. winds from 90 degrees at 210 knots are coded 5999, as would winds of 199 knots). Finally, wind speeds less than 5 knots are indicated by 9900.

The sign of the temperature is not indicated for levels above 24,000 feet.

The CMC issues its regular FDCN bulletins in the format of the following example:

FDCN01 CWAO 090320
BASED ON 090000 DATA VALID 090600 FOR USE 0300-0900
3000 6000 9000 12000 18000
FCST YVR 2118 2322+04 2435+01 2447-08 2456-18
YYF 1818 2125+03 2136+01 2129-07 2134-19

The NMC issues its FDCN bulletins in the format of the following example:

FDCN01 KWBC 240440
DATA BASED ON 240000Z
VALID 240600Z FOR USE 0300-0900Z. TEMPS NEG ABV 24000 FT
24000 30000 34000 39000 45000 53000
YVR 0815-28 092043 081848 051249 331449 340653
YYF 1315-27 132043 132050 121151 280750 280652

When FDs are issued based on back-up forecasts (section 3.3), the first line of the FD is modified by adding the remark "COMPUTER INOPERATIVE ON DDTTTT DATA", where DDTTTT represents the date and time of the data on which the FDCN01, FDCN02 and FDCN03 bulletins would have been based under normal circumstances (refer to the table in section 3.3).

Consequently, when a bulletin is based on back-up forecasts, the CMC indicates the situation as in the following example:

FDCN01 CWAO 150320
COMPUTER INOPERATIVE ON 150000 DATA
FCST BASED ON 141200 DATA VALID 150600 FOR USE 0300-0900
3000 6000 9000 12000 18000
YVR 0608 0710-05 0419-07 0227-11 3641-18
YYF 0308 0411-07 0316-12 0225-15 0130-21

3.5 AMENDMENTS

3.5.1 Responsibility

The CMC is responsible for preparing and issuing amendments to the FDCN01, FDCN02 and FDCN03 CWAO forecasts for the levels 18,000 feet and below.

There are no amendments to the FDCN01, FDCN02 and FDCN03 KWBC messages, but the FXNA1 KWBC messages should be consulted for changes.

3.5.2 Format of Amended FDs

The date/time group of the communication header shall indicate the time of the amendment. For automatic amendments (section 3.5.4), this time is normally 0215, 0815, 1415 or 2015 UTC, as these amendments are normally issued within 2 hours and 15 minutes after each synoptic hour.

The abbreviation "AMD" is added to the communication header to increase the priority for distribution by communication computers, and to ensure the replacement of the original forecast for the amended location(s).

3.5.3 Content of Amended FDs

Each amended forecast shall include the wind direction and speed, as well as the temperature, for all levels at each of the amended locations, and not just for the level actually being amended.

3.5.4 Automatic Amendments

Amendments to the FDCN02 CWAO forecasts from CMC are normally automatically issued by the computer when the differences between the valid forecast and observed (or newly forecast - see below) values of the winds and/or temperatures are significant for aircraft operations.

NOTE: Only the FDCN02 CWAO messages can be amended automatically.

Automatic amendments to the FDCN02 CWAO messages are issued at T+12 (i.e. 12 hours after the "observation time" of the original message) by comparing the forecasts valid for T+12 with the objective analysis valid at the same time (T+12).

At T+6 (i.e. 6 hours after the "observation time" of the original message), however, automatic amendments to the FDCN02 CWAO messages are issued by comparing the forecasts valid for T+12 with the trial field also valid at T+12. This trial field is a 6-hour prognosis, run a short time after T+6, which takes into account observations taken at T+6.

3.5.5 Manual Amendments

It is also possible, and sometimes even necessary, to manually issue amendments to FDs.

When a MWO believes there should be an amendment to the FD for a given location, the shift supervisor at CMC shall be notified, and the source and nature of the information suggesting that an amendment is needed shall be stated.

If he concurs with the amendment request, the CMC shift supervisor will then ensure that an amendment is indeed issued.

Each region shall determine an internal procedure to be used to inform CMC of requirements for amendments to FDCN forecasts (for example: field sites may call CMC directly).

3.5.6 Amendment Criteria

For automatic amendments, the CMC uses the following criteria:

3.5.6.1 WIND

a If the forecast speed is less than 25 knots:

- direction: difference of 35 degrees or greater between the direction taken

from the objective analysis or the trial field, as applicable (section 3.5.4), and the forecast direction.

- speed: difference of 15 knots or greater between the speed taken from the objective analysis or the trial field, as applicable (section 3.5.4), and the forecast speed.

b If the forecast speed is greater than or equal to 25 knots but less than or equal to 70 knots:

- direction: difference of 25 degrees or greater
- speed: difference of 20 knots or greater.

c If the forecast speed is greater than 70 knots:

- direction: difference of 25 degrees or greater
- speed: difference of 30 knots or greater.

3.5.6.2 TEMPERATURE

Difference between the forecast temperature and the observed or newly expected temperature of at least 5 degrees Celsius.

For manual amendments, the criteria above are also used. However, the CMC shift supervisor always has the option of amending any FD—even if the conditions above are not quite met—if he thinks that the FD will no longer reflect the meteorological situation in the near future.

3.5.7 Example of Amended FD

FDCN02 CWAO 240815 AMD
FCST BASED ON 240600 DATA VALID 241200 FOR USE 0600-1800

	3000	6000	9000	12000	18000
YEG		0615+13	9900+05	9900-01	3205-12
VBI	2309	2408+12	9900+04	9900-02	3406-12
YQT	2806	3306+08	3608+03	0109-03	0111-13

CHAPTER 4
GRAPHIC AREA FORECAST (GFA)

4.1 The Graphic Area Forecast (GFA)

A graphic area forecast (GFA) consists of six charts: two valid at T_0 (the beginning of the forecast period); two valid at T_0+6hr (six hours into the forecast period); and two valid at T_0+12hr (the end of the forecast period). Of the two charts valid at each time, one shows the clouds and weather portion; the other shows the icing, turbulence and freezing level for the same time and area.

In addition, the clouds and weather chart of the last set also contains a worded instrument flight rules (IFR) outlook extending over the next 12-hour period. For a full description of these charts, see section 4.9.

4.2 Purpose

Ascent and descent planning information for higher performance aircraft is an important but secondary function of the GFA. The GFA is designed primarily to meet general aviation and regional air carrier requirements for pre-flight route planning in Canada. Providing Each panel graphically describes the most probable meteorological conditions expected to occur between the surface and 24,000 feet over a given area at a specified time.

4.3 Issue and Valid Times

The GFA is issued to reach users approximately half an hour before the beginning of the forecast period—that is, half an hour before T_0.

GFAs are issued at 2330, 0530, 1130 and 1730 UTC, and are valid at 0000, 0600, 1200 and 1800 UTC respectively. Each GFA covers a period of 12 hours with an IFR outlook for the next 12.

4.4 Area Coverage

The area coverage of each GFA is such that seven domains cover the entire domestic airspace for which Canada has the responsibility for the provision of air traffic control services. See Appendix A2 for details.

4.5 Units

Speeds are always expressed in knots (KT) and heights in hundreds of feet. Horizontal visibility is in statute miles (SM) and horizontal distances are in nautical miles (NM). Times are in UTC.

4.6 GFA Map Background and Scale

For clarity, the map background contains at least the following features:

- provincial, federal and territorial boundaries;
- oceans, coastlines and major lakes.

The scale of the map is chosen to allow the map to fit in the appropriate space on the chart. All charts include a scale bar in their corresponding legend box to help users determine approximate distances on the map.

4.7 Characters, Abbreviations and Symbols

The number and type of characters, abbreviations and symbols allowed in the GFA are limited to those familiar to and fully understood by all users of the product. These are described in the *Aeronautical Information Publication* (A.I.P.) of Transport Canada, and they are already used in other graphical products (such as SIG WX prognoses) currently issued for the aviation industry.

4.7.1 Characters

Only characters from the ASCIII character set are allowed in GFAs.

4.7.2 Abbreviations

Only abbreviations specified in the *Manual of Word Abbreviations* (MANAB) are allowed in GFAs.

4.7.3 Symbols

As a guideline, all symbols used in surface weather analyses, which are well documented in the A.I.P., are acceptable in a GFA. Users should be able to clearly read and understand them.

4.8 Page Layout

The page layout displays the title box, the legend box and the comments box in a column along the right-hand side of the chart. The remainder of the page depicts significant clouds and weather or icing, turbulence and freezing level.

4.8.1 Title Box

The title box must include the chart name; the four-letter ID of the issuing office; the date and time of issue; the name of the GFA region; the chart type; and the valid date and time of the chart. This box must be placed in the upper right-hand corner of the chart.

4.8.2 Legend Box

The legend box includes the less common symbols used in the depiction itself. In addition, this box must include a scale bar to help users determine distances on the chart. This box is as wide as the title box and is located immediately below it.

4.8.3 Comments Box

The comments box provides any information that forecasters consider important (such as formation or dissipation of fog that decreases or increases the visibility from one category to another).
The box may also be used to describe elements that, if added to the depiction, would clutter the chart. In addition, this box must include the following standard phrases: HGTS ASL UNLESS NOTED and TCU, ACC AND CB IMPLY SIG TURBC AND ICG. CB IMPLIES LLWS. Furthermore, the comments box of the T0+12hr clouds and weather chart also includes a worded 12-hour IFR outlook.

4.9 Content of the GFA

The GFA contains the following information.

4.9.1 Clouds and Weather Chart

The clouds and weather chart includes clear and concise information on cloud layers and surface-based phenomena, visibility, weather and obstructions to vision at the valid time of the chart. In addition, this chart includes all relevant synoptic features present and responsible for the weather, indicating their speed and direction of motion at the valid time.
This chart must contain the following:

a. title box;

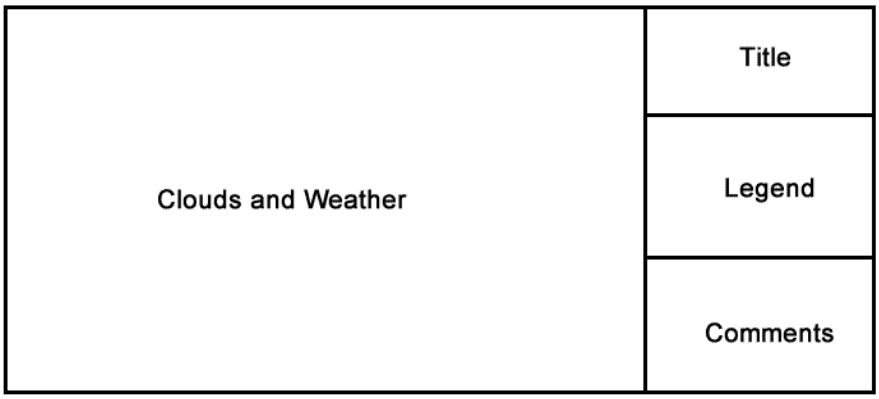
b. legend box;

c. comments box, which includes the IFR outlook in the T_0+12hr depiction;

d. CLDS and WX indicating:

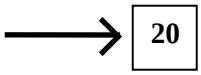
- synoptic features;
- areas of clouds;
- visibility, weather and obstructions to vision;
- speed and direction of motion of main synoptic features at the valid time;
- isobars;
- strong surface winds and gusts;
- IFR outlook.

Figure 1. GFA Clouds and Weather Chart



4.9.1.1 Synoptic Features

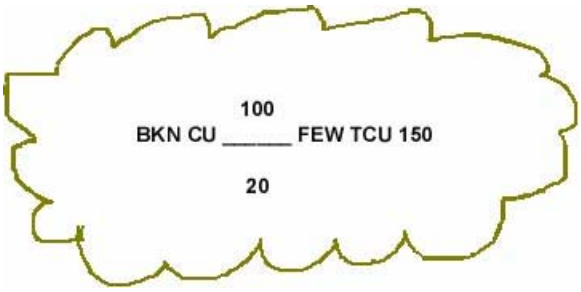
Synoptic features, such as fronts, troughs and ridges, are indicated with the corresponding symbolic representation used in surface analyses. When the motion of a main synoptic feature is expected to be 5 knots or more, it is indicated by an arrow for the direction, with the speed in knots enclosed in a box as follows:



When the motion of a main synoptic feature is expected to be slower than 5 knots, the term QS, for quasi-stationary, is used.

4.9.1.2 Clouds

A scalloped border encloses organized areas of broken (BKN) or overcast (OVC) cloud between the surface and 24,000 feet. However, when convective clouds are expected (such as TCU, ACC and CB), tops should be stated, when known, even if they extend above the 24,000-foot level. Cirrus clouds do not have to be mentioned in the GFA.



In areas where there are no organized clouds and the visibility is expected to be greater than 6 statute miles (P6SM), the terms SKC, FEW or SCT—whichever one is appropriate—are also used.

Significant cloud layers are based on the amount at each level, not on the summation amount. They are stated using the abbreviations allowed by MANAB. Altitudes of bases and tops of all layers are given, together with the amount, using the arrangement indicated above.

Amounts are those expected to be the most representative of the layers for major portions of the regions. It is imperative to minimize the usage of the terms OCNL and VRBL, because each chart is valid at a specific time. Special attention should be given to features most significant to general aviation and regional air carriers.

Cloud types CU, TCU, CB and ACC are always stated. However, the composition of other layers may be stated when it is considered necessary to ensure clarity, or when the forecaster believes it to be significant to aircraft operations.

All heights are stated in hundreds of feet (for example, 2 means 200 feet, 45 means 4,500 feet). Unless otherwise specified, all heights in the depiction are the vertical distances above sea level (altitudes). This rule is defined on all graphic charts by including the note HGTS ASL UNLESS NOTED in the comments box.

When, in a particular case, heights are given with respect to ground level instead of sea level, this situation is clearly stated by using the ceiling designator CIG with the indicator AGL (above ground level). For example:

In mountainous areas, the ceiling designator should be used with caution, except for snow ceilings.
Instead, when low layers of cloud are expected to obscure portions of mountainous terrain, statements such as MTS OBSCD ABV 35, MT TOPS OBSCD and ALL PASSES CLSD may be added to emphasize the expected conditions.

Ranges of variability in the altitudes of cloud bases should not be stated when the bases are expected to be 2,500 feet or more above the highest terrain in the area.

Bases and tops are stated for all cloud layers, provided there is a minimum spacing of 2,000 feet between cloud layers.

Tops of building CU, TCU, ACC and CB are usually quite variable. It is recommended that only the upper limit of the convective clouds be forecast, as well as the most likely time for significant development to start—for instance, CB300.

4.9.1.3 Surface-based Layers

Surface-based layers are described in abbreviated plain English. Vertical visibility is described in hundreds of feet, when appropriate.

The abbreviation OBSCD (obscured) is used to describe surface-based layers. It should be used only when both the ceiling and visibility are given, as in the following example:
OBSCD CIGS ZERO WITH 0SM +SN BLSN
Well-defined tops of surface-based layers are stated in hundreds of feet—for example, HZ TOPS 80.

4.9.1.4 Visibility

The visibility, in statute miles, is always included. When the visibility is expected to be greater than 6 miles, it is indicated as P6SM.

4.9.1.5 Weather and Obstructions to Vision

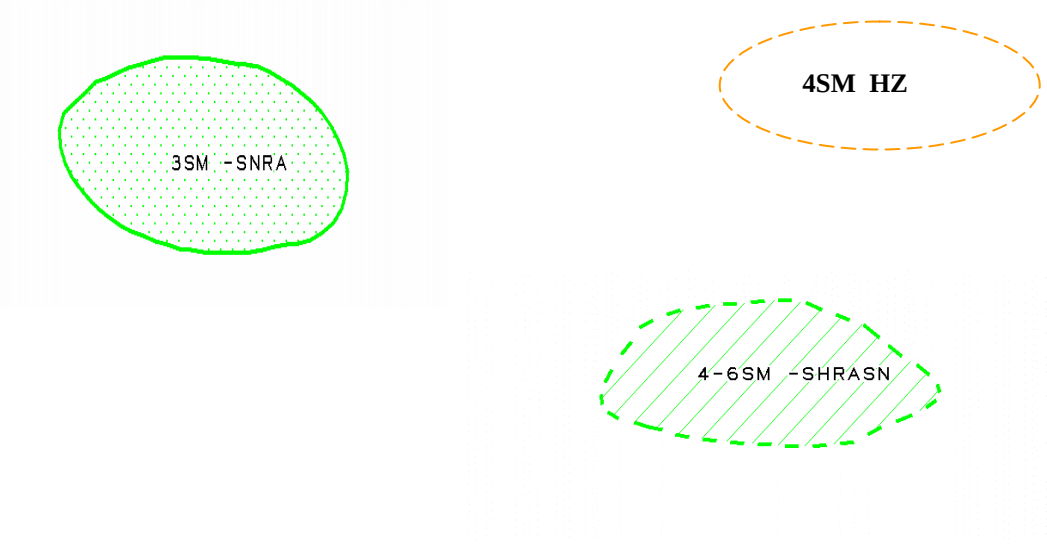
Weather, when expected, is always included immediately after the visibility. On the other hand, obstructions to vision are mentioned only when the visibility is forecast to be 6 statute miles or less. When a visibility of 6 miles or less is forecast, the weather and/or obstructions to vision responsible are

always stated. The visibility is placed immediately before the weather or obstructions to vision (for example, 2-4SM -RA BR).

A general indication of the horizontal visibility at flight altitudes for surface-based phenomena is included whenever possible—for instance, VIS 1-2SM HZ SFC-80.

Weather and obstructions to vision are indicated using MANAB abbreviations (such as SN and -DZ).

If the weather and/or obstructions to vision do not cover the entire area within the cloud shield, the sub-area is defined by border lines. Continuous green lines are used to enclose areas of continuous precipitation, dashed green lines are used to enclose areas of intermittent precipitation and dashed orange lines are used to enclosed areas of obscuring phenomena other than precipitation (e.g. haze) as follows:



Note: In case of freezing precipitation, the line encompassing the area is red continuous or dashed depending whether the freezing precipitation is expected to be continuous or intermittent. In addition, the enclosed area must be stippled in red.

4.9.1.6 Isobars

Isobars are included in the clouds and weather chart only. They are depicted as solid lines and labelled in millibars.

4.9.1.7 Strong Surface Winds

The direction and speed of strong surface winds are indicated by using wind barbs for wind speed and direction for all areas where winds are expected to have a mean sustained speed of at least 20 knots. Wind gusts are indicated when speeds of at least 10 knots greater than the mean sustained winds are forecast. The gusts are indicated by the letter G, followed by the gust speed in knots, enclosed in a box, as indicated below.

When accompanied by strong gusts, mean sustained winds of less than 20 knots may also be indicated in the GFA, at the forecaster's discretion, if moderate mechanical turbulence is expected to occur as a result of the wind gusts.

4.9.1.8 IFR Outlook

The outlook is included in the comments box as part of the T_0+12hr clouds and weather chart. It should be fairly general and indicate the main areas where IFR weather is expected. In addition, it should state the cause of the IFR weather, along with weather hazards, if any. For example, if IFR ceilings were expected within 150 NM east of a cold front, the IFR outlook would say CIG WTN 150 NM E COLD FNT.

4.9.2 Icing, Turbulence and Freezing Level Chart

The icing, turbulence and freezing level chart is used to depict areas where icing and turbulence are expected to occur, along with the type, intensity, and base and top of layers where they are expected to occur. This chart must contain the following:

a. title box;
b. legend box;
c. comment box, which describes the low level jet, when present;
d. ICG, TURB and FZLVL indicating:

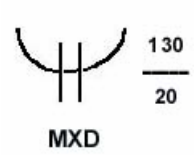
- main synoptic features described in the clouds and weather chart;
- areas of icing;
- areas of turbulence and low level wind shear;
- freezing level contours;
- speed and direction of motion at chart time of main synoptic features indicated in the chart.

Figure 2. GFA Icing, Turbulence and Freezing Level Chart

ICG – TURB - FZLVL	**Title**
	Legend
	Comments

4.9.2.1 Icing (ICG)

Icing is included in the icing, turbulence and freezing level chart when moderate or severe icing is forecast. Light icing, when expected, must be indicated in the comment box. The intensity is represented by the symbols used in SIG WX prognoses, as indicated below:



Icing intensity is indicated according to the rate of ice accretion. Since no satisfactory instrument has been installed on commercial aircraft to directly measure the rate of ice accretion on an airframe, the following expressions must be interpreted qualitatively, according to the effect of ice formation on the flying characteristics of the aircraft, as described below.

Light (LGT) icing: The rate of ice accretion is such that flying for prolonged periods (over one hour) without using de-icing equipment may create a problem. Occasional use of de-icing or anti-icing equipment removes or prevents ice accretion. If de-icing or anti-icing equipment is used, no problem occurs.

Moderate (MDT) icing: The rate of ice accretion is such that even short encounters become potentially hazardous. De-icing or anti-icing equipment must be used or a diversion is necessary.

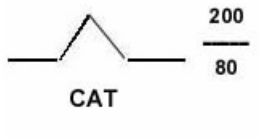
Severe (SEV) icing: The rate of ice accretion is such that de-icing or anti-icing equipment fails to reduce or control the hazard. Immediate diversion is necessary.

The bases and tops of each icing layer are included and are indicated in hundreds of feet above mean sea level. The bases and tops of the icing layers associated with freezing precipitation are given when they are known. Icing type is indicated by RIME, MXD (mixed) and CLR (clear).

If icing is forecast to occur during only part of the GFA period, the predicted time of occurrence of the icing is indicated in the comments box of the appropriate chart.

4.9.2.2 Turbulence (TURB)

Turbulence is included in the icing, turbulence and freezing level chart when moderate or severe turbulence is forecast. Light turbulence, when expected, must be included in the comment box. The intensity is represented by the symbols used in SIG WX prognoses, as indicated below:



The intensity of the turbulence is defined according to its effects on flying, as follows:

Light (LGT) turbulence: Such turbulence momentarily causes slight erratic changes in altitude and/or attitude (pitch, roll, yaw).

Moderate (MDT) turbulence: Such turbulence is similar to light turbulence but of greater intensity. Changes in altitude and/or attitude occur, but the aircraft remains in positive control at all times. This turbulence usually causes changes in indicated air speed.

Severe (SEV) turbulence: Such turbulence causes large abrupt changes in altitude and/or attitude. It usually causes large variations in indicated air speed and the aircraft may be momentarily out of control.

The bases and tops of each turbulence layer are included and are indicated in hundreds of feet above mean sea level. If the turbulence is due to gusty surface winds, low level wind shear, lee waves or a significant low level jet, or is in clear air, one of the following abbreviations, respectively, is placed beneath the turbulence symbol: MECH, LLWS, LEE WV, LLJ or CAT.

4.9.2.3 Freezing Level (FZLVL)

Freezing level contours are indicated on GFAs by dashed lines. The height of the freezing

level is indicated using the standard heights in hundreds of feet above sea level (.e.g. SFC, 25, 50, 75, 100, etc., meaning, surface, 2,500, 5,000, 7,500, 10,000, etc.).

When more than one freezing level is forecast in the vertical, only the lowest level needs to be indicated, unless meteorological conditions are expected to be relevant to aviation safety (for example, freezing precipitation aloft). In such cases, the other levels are stated in the comments box on the appropriate chart. Temporal changes in the freezing level, when significant, should be indicated in the comments box of the chart, as in the following example:

FZLVL 20 LWRG TO SFC AFT 03Z

4.10 Amended GFA

When a non-forecast weather condition occurs, or a forecast weather condition fails to occur, an airman's meteorological information notice (AIRMET) is issued. This issue automatically amends relevant GFAs; the body of the AIRMET indicates which GFA it amends.
In addition, significant meteorological information notices (SIGMETs) automatically amend GFAs. Whenever a SIGMET is issued, it also amends the GFA, even though the body of the SIGMET does not say so explicitly.

4.11 Corrected GFA

A GFA is re-issued when a significant error was made in an original GFA chart. A significant error is one which, if uncorrected, would result in an erroneous interpretation of the GFA and create a potential hazard to aviation. In such a situation, only the erroneous chart needs to be corrected and re-issued, with an explanation for the correction in the comments box.

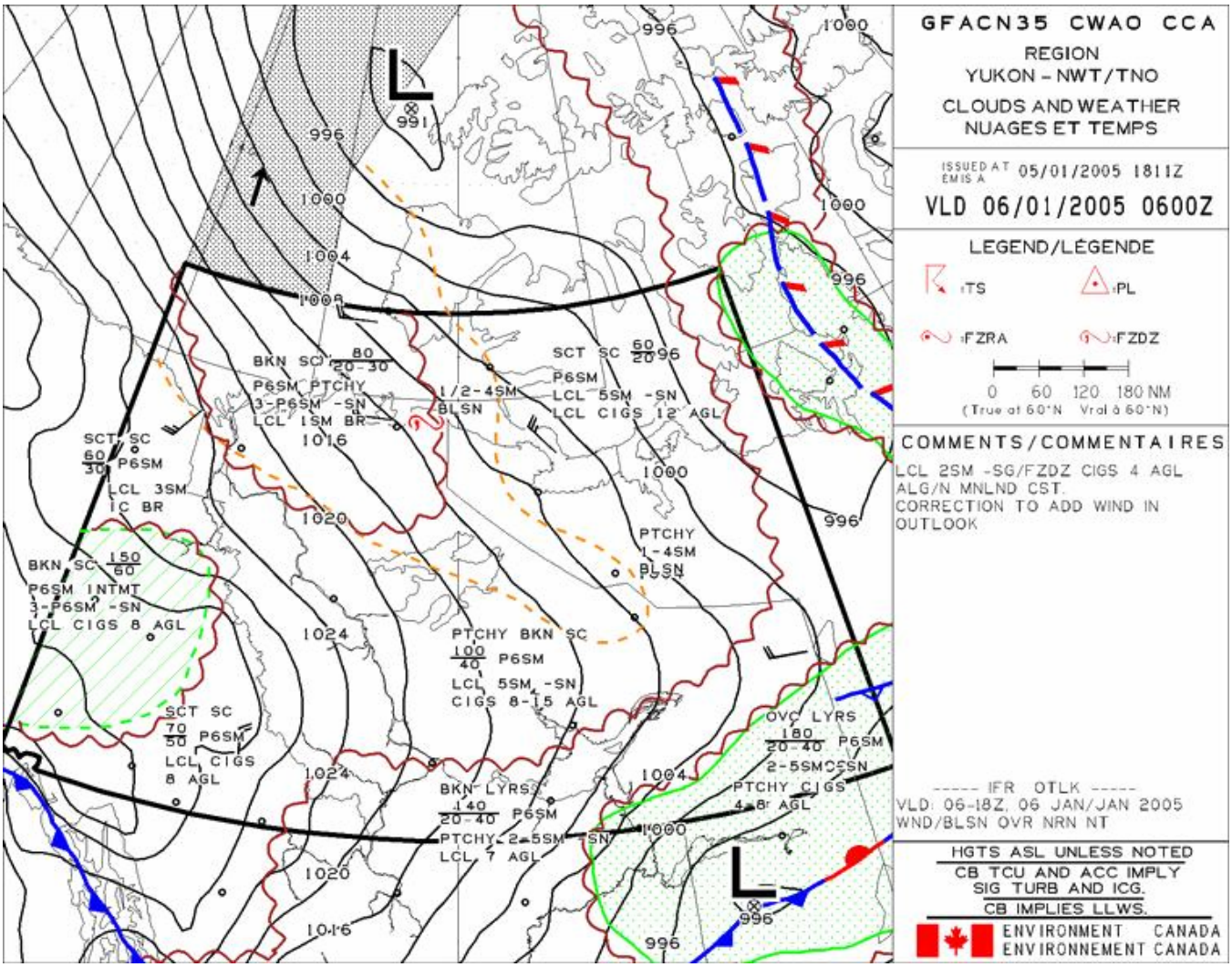
Corrections are issued with the term CCX at the end of the first line of the title box, as in the following example:

GFACN31 CWUL CCX

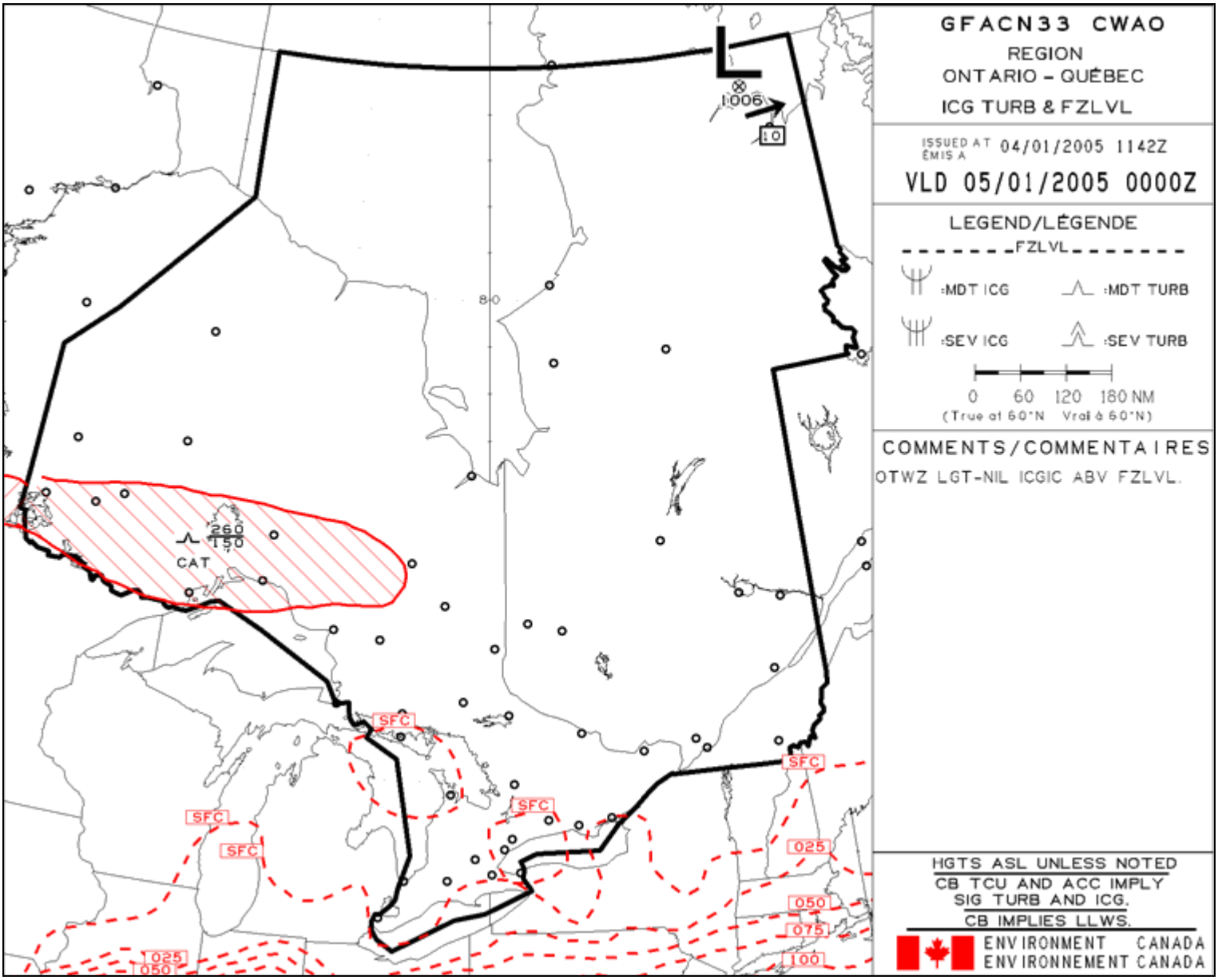
In the above, X is a letter that may range from A to Z. The first correction would be CCA, the second CCB, the third CCC and so on.

4.12 Examples of GFA

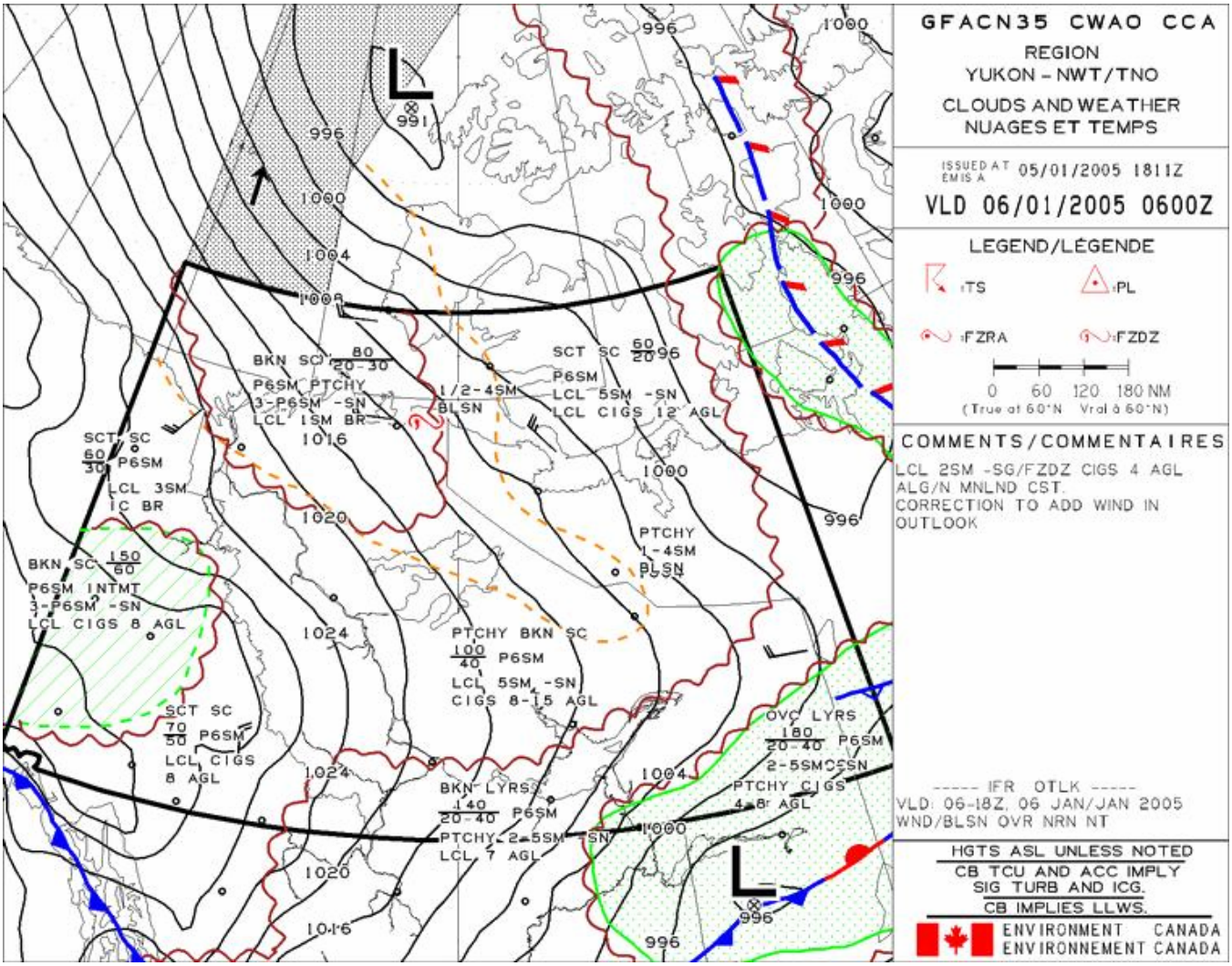
4.12.1 Cloud and weather Chart Valid at T+12 H



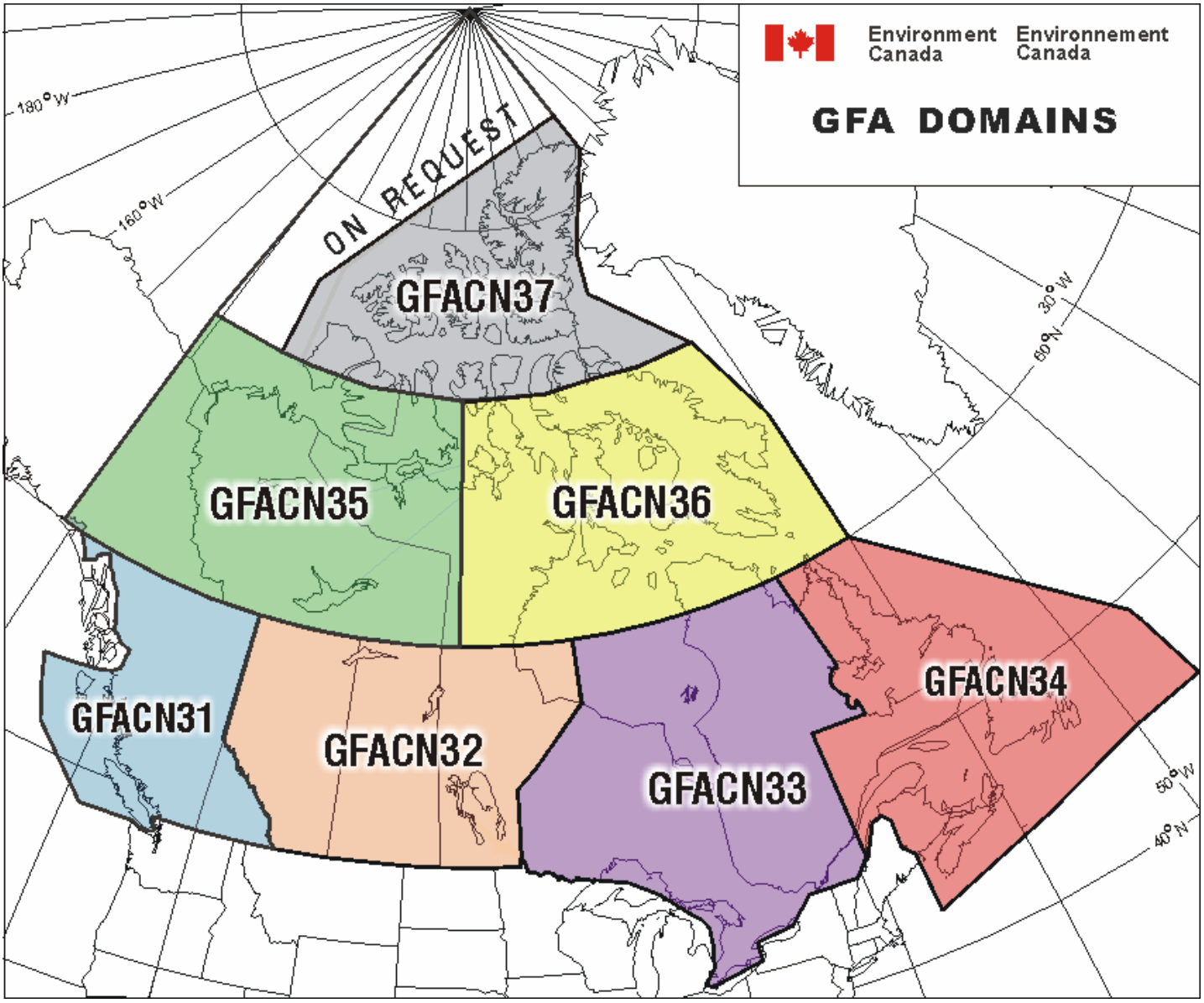
4.12.2 Icing, Turbulence and Freezing Level Chart Valid at T+12 H



4.12.3 Corrected Cloud and Weather Chart Valid at T+12H



Appendix A: GFA Domains



The names of the above domains are the following:

GFACN31 - PACIFIC REGION
GFACN32 - PRAIRIE REGION
GFACN33 - ONTARIO-QUEBEC REGION
GFACN34 - ATLANTIC REGION
GFACN35 - YUKON-NORTHWEST TERRITORIES REGION
GFACN36 - NUNAVUT REGION
GFACN37 - ARCTIC REGION

CHAPTER 5

SIGMET MESSAGES

5.1 DEFINITION AND PURPOSE

SIGMET messages are mainly short-term weather warnings, intended for aircraft in flight, to notify pilots of potentially hazardous weather phenomena. These messages shall describe designated hazardous weather conditions up to and including 60,000 feet (70 hPa, FL600) regardless of the height of the base of the phenomenon.

5.2 USAGE

SIGMETs are primarily intended for ground-to-air communication. Most pilots receive SIGMETs via radio communication while at the command of an aircraft in flight with engine noise in the background. Most pilots hear SIGMETs; they do not read them. Clarity and brevity are therefore essential for the understanding of the message.

5.3 ISSUING CENTRES

Each CMAC prepares and transmits SIGMETs for its area of responsibility. (see Appendix A1).

5.4 WEATHER PHENOMENA FOR WHICH SIGMETS ARE ISSUED

By international agreement, the list of phenomena requiring SIGMETs is limited to the most serious hazards which are of vital importance to all types of aircraft. As a result, the list does not include phenomena which are significant only to light aircraft or to VFR operations. The following phenomena require a SIGMET:

- Area of active thunderstorms (Note 1)
- Line of thunderstorms (Note 1)
- Severe squall line (Note 2)
- Hurricane/tropical storm
- Moderate or heavy hail (Note 3)
- Severe turbulence (not associated with convective cloud)
- Severe icing (not associated with convective cloud)
- Marked mountain waves
- Widespread sand or dust storm
- Volcanic ash cloud
- Radioactive cloud (see examples in section 5.13.7a & 5.13.7b)
- Low-level wind shear
- Tornado or waterspout

NOTE 1: SIGMETs are not required for scattered, unorganized thunderstorms. However, if there is doubt as to the extent of the storm area, a SIGMET should be issued.

NOTE 2: The word "severe" is the term adopted by ICAO. When applied to a squall line, it implies that the squall line poses a hazard to aviation (e.g. squalls 40 knots). The forecaster must always exercise good judgment in determining what consists a hazard to aviation.

NOTE 3: The term "moderate/heavy hail", though defined in MANOBS requires subjective interpretation. A SIGMET for moderate or heavy hail will likely be issued very rarely. However, if moderate or heavy hail is the striking feature associated with a certain phenomenon, the forecaster should use initiative, discretion and good judgment in determining whether or when a SIGMET for moderate or heavy hail should be issued.

5.5 ISSUING PROCEDURES

5.5.1 Lead Time

A SIGMET shall be issued whenever at least one of the phenomena listed in section 5.4 has been reported or is expected to occur within the next four hours.

However, a SIGMET concerning volcanic ash cloud should be issued, whenever possible, up to 12 hours before the beginning of its period of coverage (ref.: ICAO Annex 3, paragraph 7.2.8).

5.5.2 Period of Coverage

The period of coverage of a SIGMET shall not exceed four hours including those for volcanic ash. This rule is not identical to the one stated by ICAO in Annex 3 paragraph 7.2.5, but it does not violate it.

5.5.3 International Coordination

When volcanic ash approaches within 60 nautical miles of the Canada - USA border, the regional forecast office issuing the SIGMET is required to initiate a telephone call to the Aviation Weather Centre (AWC) in Kansas City or Anchorage in Alaska to coordinate the content of the volcanic ash SIGMET.

5.5.4 Language

SIGMETs for Canadian domestic aerospace shall be worded in abbreviated English language using the standard abbreviations authorized in the Manual of Word Abbreviations (MANAB) and those allowed by the Manual of Surface Weather Observations (MANOBS).

SIGMETs for the Gander Oceanic FIR (WSCN02, WVCN02 and WCCN02) are worded in either abbreviated English language, using standard ICAO abbreviations from PANS-ABC (Doc. 8400), or in non-abbreviated English.

5.5.5 Units

Except for heights, units must be stated explicitly. All distances must be given in nautical miles (NM), visibility in statute miles (SM), times in UTC (Z), and speeds in knots (KT). Heights, however, are stated in hundreds of feet without specifying the units "FT" and wind directions are given in degrees true using three digits. In SIGMETs for the Gander Oceanic FIR, flight level (FL), rather than hundreds of feet, shall be used to denote heights (see e.g. 5.13.5).

In hilly or rough terrain where the surface wind direction may vary considerably, qualitative directional terms may be used. For example, SFC WNDS SLY30KT, NELY 25G40KT, etc.

5.5.6 Transmission

CMACs are responsible for inputting SIGMETs to the Environment Canada (EC) national communication system, while NAV CANADA is responsible for disseminating them to pilots.

5.6 FORMAT

5.6.1 Domestic SIGMETs

The general format of domestic SIGMETs is as follows:

W(Z)CN3(#) CZZZ ddGGgg
SIGMET (XY) VALID $ddG_1G_1g_1g_1/ddG_2G_2g_2g_2$ CZZZ-
(text)
END/(Forecaster's Initials)

NOTE: Since this message is short, no blank lines shall be inserted in the SIGMET message.

5.6.2 Telecommunication Header

The first line of a SIGMET bulletin is the telecommunication header and contains the following:

W(Z)CN3(#) CZZZ ddGGgg (e.g. WSCN31 CWEG 201730)**;** where: W(Z)CN3(#) - stands for Canadian SIGMET; where: the letter (Z) takes the value "V" for volcanic ash SIGMETs; "C" for tropical cyclone SIGMETs; and "S" for all other type of SIGMETs. The number 3(#) is the telecommunication header series number as required by WMO. The symbol # is a one-digit number ranging from 1 to 7 which may vary from issuing centre to issuing centre (e.g. WVCN31 , WCCN32 , WSCN33). For all domestic SIGMETs, this number must be identical to the number in the title box of the GFA which is automatically amended by the SIGMET;

ddGGgg - is the six-figure group representing the date and time (UTC) of issue.

CZZZ - is the four-letter identifier of the issuing centre (e.g. CWEG);

NOTE: The above groups are separated from each other by a blank space (e.g. WSCN31 CWEG 151430).

5.6.3 SIGMET Heading

The second line of a domestic SIGMET is the SIGMET heading and contains the following:

SIGMET (XY) VALID $d_1d_1G_1G_1g_1g_1/d_2d_2G_2G_2g_2g_2$ CZZZ- (e.g. SIGMET B1 VALID 271415/271815 CWEG)**;** where:

SIGMET - is the message identifier;

(XY) - is the SIGMET sequence number (e.g. SIGMET A2);

$d_1d_1G_1G_1g_1g_1/d_2d_2G_2G_2g_2g_2$ - represents the dates and times of the beginning and ending of the period of coverage of the SIGMET, respectively;

CZZZ - is the location identifier of the issuing centre, immediately followed by a hyphen (ref.: ICAO Annex 3, paragraph 7.2.1).

5.6.4 Text

The third and subsequent lines (except the last) contain the actual text of the message.

5.6.4.1 Order of Content

The content of SIGMETs may vary according to the meteorological phenomena for which they are issued. However, SIGMETs shall contain , as appropriate, the following information and structured according to the following order:

a. area coverage (see section 5.6.4.2);
b. meteorological phenomenon (see list in section 5.4);
c. forecast or observed, if applicable;
d. height of layers affected, if applicable;
e. type of aircraft reporting the phenomenon, if applicable (see e.g. 5.13.1);
f. expected movement;
g. expected development, if applicable (e.g. INTSFYG, WKNG, NO CHNG);
h. tendency beyond the period of coverage, if applicable.

5.6.4.2 Area Coverage

The area coverage shall always be stated first to improve the utility of the bulletin and to allow for the generation of a graphical display of the message by users. In addition, the area coverage shall be specified according to the following:

a. using location's names allowed by the latest Meteorological Reference Map as published in the A.I.P. Canada (See Appendix A5);

b. using a position relative to a location in the latest Meteorological Reference Map as published in the A.I.P. Canada using only eight points of the compass for the direction (e.g. /5614N11826W/60 NM W PEACE RIVER).

c. using latitude/longitude points in degrees and minutes with a resolution of 30 minutes

in remote areas. In addition, latitude shall be stated in four digits (e.g. 5300N for 53° north) and longitude in five digits (e.g. 08200W for 82° west). This practice shall be followed only in those cases where the use of a geographical location is not available (e.g. over a large body of water far away from any land location stated in the A.I.P. Canada;

d. adding latitude and longitude coordinates in degrees and minutes to all location used. These will be enclosed in forward slashes immediately preceding the location selected. In addition, latitude shall be stated in four digits (e.g. 5300N for 53 degrees north) and longitude in five digits (e.g. 08230W for 82 degrees and 30 minutes west). For example, Kelowna will be indicated as /4958N11923W/KELOWNA. Similarly, a point 60 nautical miles east of Inukjuak will be indicated as /5828N07705W/60 NM E INUKJUAK.

To describe a circular area centred around one location, the description shall be of the form:

WTN 60 NM OF /4458N07918W/MUSKOKA.

To describe a line using two or more points, the description shall be of the form:
WTN 50 NM OF LN /5106N10003W/DAUPHIN - /5351N09439W/ISLAND LAKE or
WTN 80 NM SE OF LN /5844N09404W/CHURCHILL - /5548N09752W/THOMPSON - / 5358N10106W/THE PAS.

To describe an irregular area using three (3) or more points, the description shall be of the form:

WTN AREA BOUNDED BY /5319N11335W/EDMONTON - /5614N11727W/PEACE RIVER - /5253N11804W/JASPER - /5319N11335W/EDMONTON.

NOTE: All area coverage descriptions shall end with a period.

5.6.4.3 Description of Meteorological Phenomenon

It must be re-emphasized that SIGMETs are intended primarily for ground-to-air communication. Therefore, forecasters must keep in mind that most pilots receive SIGMETs via radio communication while at the command of an aircraft in flight with engine noise in the background. As a result, to be effective, SIGMETs must be worded clearly and concisely.

SIGMET information concerning thunderstorms, tornadoes, water spouts or tropical cyclones should not include references to associated turbulence, icing or hail unless the associated phenomena warrant special attention.

The weather condition described in a SIGMET does not have to be related to a weather system (front, jet, trough, etc.).

When a phenomenon is expected to last beyond the period of coverage of the SIGMET, this situation shall be mentioned in a brief statement at the end of the SIGMET message.

For example, if a SIGMET for freezing rain is valid from 191812Z to 192212Z, and the freezing rain is expected to last beyond 2212Z, a statement like "FZRA CONTG BYD 2212Z" shall be added at the end of the SIGMET message. See example 5.13.4 .

5.6.4.4 End Line

The last line of a SIGMET shall contain the word END followed, separated by a solidus, by the forecaster's initials (e.g. END/BGL). See also examples in section 5.13 .

5.6.5 Format of International SIGMETs

International SIGMETs issued by a CMAC for the Gander Oceanic Flight Information Region (FIR) include the international ID of the FIR at the beginning of the second line of the SIGMET and the name of the FIR spelled out in full on the third line of the SIGMET. This is required by ICAO.

In the case of Gander Oceanic, the FIR identifier is CZQX. Consequently, the format of such a SIMET is similar to the following:

WSCN02 CWUL 151018
CZQX SIGMET A2 VALID 151018/151418 CWUL -
CZQX GANDER OCEANIC FIR.
(TEXT)
END/FI

See also examples 5.13.5.

5.7 NUMBERING SIGMETS

SIGMETs shall be alphanumerically numbered (e.g. A1). Subsequent SIGMETs dealing with the same phenomenon and within the same GFA area keep the same letter and are numbered sequentially (e.g. A2, A3) until the phenomenon ends or moves out of the GFA area.

When two or more weather phenomena requiring separate SIGMETs occur simultaneously within the same area of responsibility, the responsible CMAC will deal with individual phenomenon separately. This is done by issuing separate SIGMETs identified by different alphanumeric signatures (e.g. A2, B1, C1).

When a single weather phenomenon meeting SIGMET criteria occurs or is expected to occur over two different GFA areas (e.g. GFACN32 and GFACN33), two separate SIGMETs shall be issued. These

shall also be identified by a different telecommunication header (e.g. WSCN32 and WSCN33) each amending its corresponding GFA area (in this case GFACN32 and GFACN33) and different alphanumeric signature (e.g. A1, B1, etc.). These SIGMETs shall also be updated and canceled within their corresponding GFA areas.

When a weather phenomenon for which a SIGMET was issued moves out of one GFA area into another, the latest SIGMET issued for the former GFA area must be canceled and a new SIGMET for the other GFA area being affected shall be issued. The telecommunication header of the new SIGMET shall match the one in the title box of the new GFA area affected and bear a different alphanumeric signature. For example, if A1, A2, A3, etc. were used for WSCN32 affecting GFACN32, the new SIGMET affecting GFACN33 shall be WSCN33 with signature B1, B2, B3, etc.

NOTE: To avid possible confusion, the same letter should not be used for different phenomena occurring less than 24 hours apart.

5.8 UPDATING SIGMETS

An updated SIGMET, when issued, shall automatically cancel the previous SIGMET in the same series (i.e. the previous SIGMET with the same letter). Since SIGMETs are labeled by series and number, the cancellation phrase (e.g. "CANCEL SIGMET C2.") becomes redundant and shall not be included. A SIGMET shall be updated at least one hour before the end of its period of coverage. However, a forecaster may update a SIGMET at any time if he/she considers it necessary.

5.9 CORRECTING SIGMETS

If an error is made in a SIGMET and, as a result, a correction is required, the ensuing correction shall be issued as an update using the standard format and numbering scheme.

5.10 CANCELING SIGMETS

If the weather phenomenon covered by a currently valid SIGMET does not occur, or has dissipated, the SIGMET shall be canceled according to the following format:

a. Domestic SIGMETs

W(Z)CN3(#) CZZZ ddGGgg
SIGMET (XY) CNCLD AT (ddGGgg) CZZZ-
(Statement of explanation)
END/(Forecaster's Initials)

b. International SIGMETs

W(Z)CN02 CZZZ ddGGgg
CZQX SIGMET (XY) CNCLD AT (ddGGgg) CZZZ-
GANDER OCEANIC FIR.

(Statement of explanation)
END/(Forecaster's Initials)

where:

(Z) is the letter that specifies the SIGMET type. "S" for generic SIGMETs, "C" for tropical cyclones and "V" for volcanic ash;

(XY) is the alpha-numerical SIGMET number (e.g. A3);

(ddGGgg) is the date and time (UTC) of issue (e.g. 101530); and

CZZZ is the identifier of the issuing office (e.g. CWEG).

The statement of explanation should state the reason for the cancellation. This should be very brief and to the point (e.g. FZRA CHNGD TO RA). See also example 5.13.2 .

To avoid any misunderstanding, the last SIGMET of any series shall be ended or canceled by a statement. No SIGMET shall be left to expire by itself.

5.11 RELATIONSHIP TO GFA

As domestic SIGMETs are intended for aircraft in flight which may not have received the most recent GFAs, a domestic SIGMET shall be issued even if the responsible phenomenon (section 5.4) was forecast in the GFA.

During its period of coverage, a domestic SIGMET automatically amends the current GFA.

NOTE: Because a domestic SIGMET may be valid for a greater vertical extent than a GFA, it automatically amends also the high level SIGWX Prognostic Chart.

Domestic SIGMETs, as AIRMETs, shall have a one to one correspondence with GFA areas. For example, WSCN31, WVCN31 and WCCN31 correspond to GFACN31. The complete GFA/WA/WS/WV/WC matrix is shown in appendix A4).

5.12 RELATIONSHIP TO AIRMET

As stated in Section 5.1, a SIGMET is mainly a short-term weather warning intended for aircraft in flight, to notify pilots of hazardous weather phenomena.

An AIRMET, on the other hand, is also intended for aircraft in flight, but to notify pilots of non forecast potentially hazardous weather situations in which the level of danger is not great enough to require the issuance of a SIGMET, but requires an amendment to the GFA if not originally forecast.

In situations where the same weather conditions (same phenomenon occurring over the same area) as described in a SIGMET decreases in intensity to reach AIRMET criteria (e.g. TURB from SEV becomes MDT), the SIGMET shall then be canceled. An AIRMET shall be issued, if and only if, the weather situation for which the AIRMET is required was not forecast in the current GFA. If the weather situation was forecast in the currently valid GFA, no AIRMET shall be issued.

On the other hand, a situation may arise in which a hazardous weather condition increases in intensity from AIRMET to SIGMET criteria. In this situation, the AIRMET shall be canceled according to rules of section 6.10 and a SIGMET shall be issued to replace the AIRMET,

A weather condition may require both a SIGMET and an AIRMET. This situation arises when the weather element for which a SIGMET is required covers an area which is a subset of the area covered by an AIRMET (e.g. an area of SEV TURB covered by a SIGMET) occurring within a larger area of MDT TURB covered by an AIRMET.

5.13 EXAMPLES OF SIGMETS

5.13.1

WSCN32 CWEG 161520
SIGMET A3 VALID 161520/161920 CWEG-
WTN 100 NM OF /4955N09714W/WINNIPEG. SVR CAT RPRTD BTN 300 AND 330 BY DC9 AT 1520Z. CAT EXPD TO DSIPT BY 1830Z.
END/AHB

5.13.2

WSCN33 CWUL 051915
SIGMET B5 CNCLD AT 051915 CWUL-
TS DSIPTD EARLIER THAN EXPD.
END/AP5.13.3

5.13.3

WVCN33 CWUL 192145
SIGMET B3 VALID 192145/200145 CWUL-
WTN 100 NM OF LN /4300N08219W/SARNIA - /4458N07918W/MUSKOKA - /4557N07719W/PETAWAWA. PIREPS SAT PIX AND SFC OBS AT 2100Z INDC PLUME OF VA CLD BASED AT 300 TOPPED AT 450 WAS RPRTD. LN MVG SSE AT 15 KT SLGTLY BRDNG AND DMNSHG IN CONCENTRATION. PIREPS OR OTHER INFO RQSTD. SIGMET WILL BE UPDATED AS INFO ALLOWS.
END/JJ

5.13.4

WSCN33 CWUL 161220
SIGMET A1 VALID 161220/161620 CWUL-
WTN AREA BOUNDED BY /4528N07345W/MONTREAL - /4302N07607W/SYRACUSE - /4333N07147W/CONCORD - /4528N07345W/MONTREAL.
SEV CLR ICG IN FZRA BLO 30. AREA MOVG NEWD AT 10 KT. FZRA CONTG BYD 1620Z.

END/GHR

5.13.5

WSCN02 CWUL 100135
CZQX SIGMET A5 VALID 100135/100535 CWUL-
CZQX GANDER OCEANIC FIR
AREA BOUNDED BY 4830N4200W - 6030N4200W - 6000N3030W - 5030N3000W.
MODERATE TO SEVERE TURBULENCE OBSERVED BETWEEN FL300 AND FL360. AREA MOVING NORTHEASTWARD 20 KT. LITTLE CHANGE IN INTENSITY.
END/MK

5.13.6

WCCN34 CWUL 111000
SIGMET A1 VALID 111000/111400 CWUL-
WTN 120 NM OF 4030N7030W.
TC FRED OBSD AT 10Z IS FCST TO MOV NEWD TO 4330N6700W BY 14Z. MAX TOPS 380
WTN 120 NM OF CNTR.
END/AF

5.13.7a (first SIGMET Issued)

WSCN33 CWUL 301342
SIGMET K1 VALID 301340/301740 CWUL-
WTN 100 NM OF /4359N07854W/30 NE TORONTO.
NUCLEAR ACCIDENT HAS BEEN REPD AT 4352N07848W/PICKERING AT 301341Z. RDOACT CLD WAS DTCTD. EXTENT AND MOTN OF RDOACT CLD STILL UNKN. SIGMET WILL BE UPDATED AS NEW INFO BECMS AVBL.
END/GFA33/CMAC-E/FCSTR/SUPERVISOR

5.13.7b (first update of the above SIGMET)

WSCN33 CWUL 301346
SIGMET K2 VALID 301345/301745 CWUL-
WTN AREA BOUNDED BY /4359N07953W/30 NW TORONTO - /4557N07719W/PETAWAWA - /4438N07539W/40 S OTTAWA - /4355N07859W/25 NE TORONTO - /4359N07953W/30 NW TORONTO.
NUCLEAR ACCIDENT HAS BEEN REPD AT PICKERING AT 4352N07848W AT 301341Z. RDOACT CLD FCST BTN SFC AND 200. RDOACT CLD XPNDG EWD AT 20 KTS. SIGMET WILL BE UPDATED AS NEW INFO BECMS AVBL.
END/GFA33/CMAC-E/FCSTR/SUPERVISOR

CHAPTER 6
AIRMETS MESSAGES

6.1 DEFINITION AND PURPOSE

The AIRMET is a short-term weather advisory intended for aircraft in flight, to notify pilots of potentially hazardous weather conditions not described in the current GFA and not requiring a SIGMET.

AIRMETs shall describe, in abbreviated English, designated potential hazardous weather conditions below 24,000 feet. As with the GFA, however, the top of a weather phenomenon above 24,000 feet may be stated, when appropriate, provided that the base of such phenomenon is below 24,000 feet.
Its purpose is to ensure dissemination of significant meteorological changes to pilots after departure. In addition, the AIRMET is used as a tool to amend the GFA for the non-occurrence of a forecast condition and for the occurrence of a non-forecast condition significant to aviation. See example 6.13.4.

6.2 USAGE

AIRMETs are primarily intended for ground-to-air communication. Most pilots receive AIRMETs via radio communication while at the command of an aircraft in flight with engine noise in the background. Clarity and brevity are, therefore, essential for the understanding of the message.

6.3 ISSUING CENTRE

Each CMAC shall prepare and transmit AIRMETs for its area of responsibility. (see appendix A1).

6.4 WEATHER CONDITIONS FOR WHICH AIRMETS ARE ISSUED

An AIRMET shall be issued whenever weather conditions change or are expected to change significantly enough to warrant an amendment to the GFA.
The criteria for issuing an AIRMET are the non forecast occurrence of, or the non-occurrence of the forecast of one of the following:

- IFR conditions (less than 1000 FT and/or 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);
- The surface mean wind speed, over a large area (at the discretion of the supervisor), increases to 20 knots or more, or gusts increase to 30 knots or more, when lighter winds were originally forecast;e difference between observed and forecast wind speed is greater than 20 KT if winds were mentioned in the original forecast.
- The difference between the forecast and observed wind direction is greater than 60 degrees

NOTE: The above list is not intended to be exhaustive. Forecasters should use initiative and good judgment in determining when an AIRMET is required.

6.5 ISSUING PROCEDURE

6.5.1 Lead Time

AIRMETs shall be issued as soon as at least one of the criteria listed in 6.4 is reported or expected to occur during the period of coverage of the current GFA.

6.5.2 Period of Validity

An AIRMET is valid until it is updated or canceled, or until the next regular GFA is issued, whichever comes first.

All AIRMETs are automatically canceled when the new regular GFA for the same area is issued.

NOTE: According to NAV CANADA , pilots in flight have the responsibility to call the nearest FSS when the new GFA is issued to obtain any new relevant weather information.

6.5.3 Language

AIRMETs shall be worded in abbreviated English language using standard abbreviations authorized in the Manual of Word Abbreviations (MANAB).

6.5.4 Units

Except for height, units must be stated explicitly. All distances must be given in nautical miles (NM), visibility in statute miles (SM), times in UTC (Z), and speeds in knots (KT). Heights, however, are stated in hundreds of feet without specifying the unit "FT" and wind directions are stated in degrees true using three digits.

In hilly or rough terrain where the surface wind direction may vary considerably, qualitative directional terms may be used; for example, SFC WNDS SLY 30KT, NELY 25G40KT, etc.).

6.5.5 Transmission

Issuing centres are responsible for inputting AIRMETs to the Environment Canada (EC) national communication system, while NAV CANADA is responsible for disseminating them to pilots.

6.6 FORMAT

The general format of an AIRMET is the following:
WACN3(#) CZZZ ddGGgg
AIRMET(XY) ISSUED at GGggZ CZZZ-
AMEND GFACN3(#) CZZZ $d_1d_1G_1G_1g_1g_1$ ISSUE
(Text)
END/ (Forecaster initials)

NOTE: Since the message is short, no blank lines are required.

6.6.1 Telecommunication Header

The first line of an AIRMET bulletin is the telecommunication header and contains the following:

WACN3(#) CZZZ ddGGgg (e.g. WACN31 CWEG 121045;
where:

WACN3(#) - stands for Canadian AIRMETs; where: the number 3 is the telecommunication header series for aviation weather products required by WMO. The symbol (#) is a one-digit number ranging from 1 to 7 which may differ from issuing centre to issuing centre (e.g. WACN31, WACN32). This number must be identical to the number in the title box of the GFA which is amended by the AIRMET.

ddGGgg - is the six-figure group representing the date and time (UTC) of issue;

CZZZ - the four-letter identifier of the issuing centre (e.g. CWUL).

NOTE: All the above groups shall be separated by a blank space (e. g. WACN33 201430 CWUL).

6.6.2 AIRMET Heading

The second line of an AIRMET is the AIRMET heading and contains the following:

AIRMET (XY) ISSUED AT GGggZ CZZZ-

where:

AIRMET (XY) - is the message identifier and (XY) is the sequence number (e.g. AIRMET B1);

GGggZ - is the issue time in UTC; and

CZZZ - is the four-letter identifier of the issuing centre followed immediately by a hyphen (e.g. CWUL -)**.** For example: AIRMET A1 ISSUED AT 1415Z CWUL -.

6.6.3 GFA Reference

The third line of an AIRMET is the GFA reference and contains the following**:**

AMEND GFACN3(#) CZZZ $d_1d_1G_1G_1g_1g_1$ ISSUE (e.g. AMEND GFACN33 CWUL 251730 ISSUE)

where:

GFACN3(#) - is the specific area forecast that is amended by the AIRMET and the symbol (#) is a one-digit number which may differ from issuing centre to issuing centre ;

CZZZ - is the four-letter location identifier of the issuing centre;

$d_1d_1G_1G_1g_1g_1$ - is the date and time of issue of the original GFA now amended by the AIRMET

6.6.4 Text

The fourth and subsequent lines, except the last, contain the actual text of the message.

6.6.4.1 Order of Content

The content of AIRMETs may vary according to the meteorological phenomena for which they are issued. However, AIRMETs shall contain, as appropriate, the following information structured in the following order:

1. area coverage (see section 6.6.4.2);
2. the meteorological phenomenon (see list in section. 6.4);
3. forecast or observed, if applicable;
4. flight levels or layers affected, if applicable;
5. Type of aircraft reporting the phenomenon, if applicable;
6. Expected movement or duration, if applicable;
7. Expected development or dissipation, if applicable.

NOTE: The area coverage is the only term that does not allow for flexibility in the position it occupies in the AIRMET, all the other terms may be arranged according to the discretion of the forecaster.

6.6.4.2 Area Coverage

The area coverage shall always be stated first to improve the utility of the bulletin and to allow for the generation of a graphical display of the message by users. In addition, the area coverage shall be specified according to the following:

1. using location names allowed by the latest Meteorological Reference Map as published in the A.I.P. CANADA (See Appendix A5);
2. using a position relative to a location in the latest Meteorological Reference Map as published in the A.I.P. Canada using only eight (8) points of the compass for the direction (e.g. 80 NM NW Baie-Comeau);

3. using latitude/longitude points in degrees and minutes with a resolution of 30 minutes in remote areas. In addition, latitude shall be stated in four (4) digits (e.g. 5200N for 52° north) and longitude in five (5) digits (e.g. 08300W for 83° west). This practice shall be followed only in those cases where the use of a geographical location is not available (e.g. over a large body of water far away from any land location stated in the A.I.P. Canada);

4. adding latitude and longitude coordinates in degrees and minutes to all locations used. These will be enclosed in forward slashes immediately preceding the locations selected. In addition, latitude shall be stated in four digits (e.g. 5315N for 53 degrees and 15 minutes north) and longitude in five digits (e.g. 08200W for 82 degrees west). For example, Kelowna will be indicated as /4958N11923W/KELOWNA. Similarly, a point 60 nautical miles east of Inukjuak will be indicated as /5828N07705W/60 NM E INUKJUAK;

5. Using well known geographical locations (e.g. Hudson Bay, Rocky mountains, etc.). When these are used, latitude and longitude coordinates are not added.

To describe a circular area centred around one location, the description shall be of the form:

WTN 60 NM OF /4458N07918W/MUSKOKA.

To describe a line using two or more locations, the description shall be of the form:

WTN 50 NM OF LN /5358N10106W/THE PAS - /5622N09442W/GILLAM; or WTN 70 NM OF LN /5358N10106W/THE PAS - /5622N09442W/GILLAM - /5844N09404W/CHURCHILL.

To describe a closed area using three or more locations, the description shall be of the form:

AREA BOUNDED BY /5319N11335W/EDMONTON - /5614N11727W/PEACE RIVER - /5253N11804W/JASPER - /5319N11335W/EDMONTON.

To describe an area using well known geographical locations, the description shall be of the form:

TO THE LEE OF THE ROCKIES; or OVR ERN LAKE SUPERIOR, or WTN 80 NM E OF JMSBA.

NOTE: All area coverage descriptions shall end with a period.

6.6.4.3 Description of Meteorological Phenomena

It must be re-emphasized that AIRMETs besides being tools for amending GFAs, may also be used for ground-to-air communication. Therefore, forecasters must keep in mind that most pilots in flight may receive AIRMETs via radio communication while at the command of an aircraft in flight with engine noise in the background. As a result, to be effective, AIRMETs must be worded clearly and concisely.

The weather condition described in the AIRMET does not have to be related to a meteorological system (e.g. front, wave, trough, etc.). This type of information lengthens the message and may confuse the listener.

When a PIREP is the only evidence on which an AIRMET is issued, and when, in the judgment of the forecaster, this information adds to the value of the AIRMET, the type of aircraft that sent the PIREP shall be specified in the AIRMET (see example 6.13.2).

6.6.4.4 End Line

The last line of an AIRMET shall start with the word END followed, separated by a solidus, by the forecaster's initials (e.g. END/LB). See also examples in section 6.13).

6.7 NUMBERING AIRMETS

AIRMETs shall be alpha-numerically numbered (e.g. A1) similar to SIGMETs described in 5.7. AIRMETs issued by the same office for different phenomena shall be labeled with different letters (e.g. A1, B1, C1**,** etc.).

When two or more weather phenomena requiring separate AIRMETs occur or are expected to occur simultaneously within the same area of responsibility, the responsible environmental service centre will deal with individual phenomenon separately. This is done by issuing separate AIRMETs identified by different alphanumeric signatures (e.g. A1. B1, C1, etc.).

When two or more criteria requiring the issuance of an AIRMET are met and they are produced by the same weather phenomenon (e.g. freezing drizzle and widespread stratus) and occurring within the same GFA area (e.g. GFACN32), then one single AIRMET summarizing the situation will be sufficient. The forecaster and/or supervisor should use his/her judgment to decide when the situation is suitable and whether or not one AIRMET will suffice.

When a single weather phenomenon meeting AIRMET criteria occurs or is expected to occur over two different GFA areas (e.g. GFACN32 and GFACN33), two separate AIRMETs shall be issued. These shall also be identified by a different telecommunication header (e.g. WACN32 and WACN33) each amending its corresponding GFA area (in this case GFACN32 and GFACN33) and different alphanumeric signature (e.g. A1, B1, etc.).

These AIRMETs shall also be updated and canceled within their corresponding GFA areas.

When a weather phenomenon for which an AIRMET was issued moves out of one GFA area into another in which the same phenomenon was not forecast and prior to the issuance of the next regular GFA, the first AIRMET must be canceled and another one be issued for the new GFA area being affected. In this case, the telecommunication header of the new AIRMET must match the new GFA area affected and bear a different alphanumeric signature.

For example, if WACN31 affecting GFACN31 was issued with signature A1, a new AIRMET affecting GFACN33 shall be labeled WACN33 with signature B1.

NOTE: To avoid possible confusion, the same letter shall not be used for different AIRMETs issued less than 24 hours apart in the same GFA area or for AIRMETs issued less than 24 hours apart over different GFA areas under the responsibility of the same environmental service centre.

6.8 UPDATING AIRMETS

AIRMETs are not updated on a regular basis as SIGMETs are. Under normal circumstances, AIRMETs are updated automatically with the issuance of a new regular GFA. However, in special circumstances, AIRMETs may have to be updated. This occurs when a weather situation, as described in an AIRMET, is no longer valid or is expected to change significantly from forecast before the next regular GFA is issued. This implies that, AIRMETs are updated only if and when required.

6.9 CORRECTING AIRMETS

If an error was made in the AIRMET and, as a result, a correction is required, the ensuing correction will be issued as an update using the standard format and numbering scheme.

6.10 CANCELING AIRMETS

Under normal circumstances, all AIRMETs are automatically canceled and no longer broadcast when the next regular GFA is issued.

When a weather condition as described in an AIRMET does not occur, or ends significantly earlier than forecast and before the issue of the next regular GFA, the AIRMET shall be canceled. However, if the weather condition was forecast to end before the issuance of the next regular GFA, then no cancelation is necessary (see e.g. 6.13.4).

When an AIRMET needs to be canceled, it shall be done according to the following format:

WACN3(#) CZZZ ddGGgg
AIRMET (XY) CNCLD AT GGggZ CZZZ-
(Statement of explanation)
END/(Forecaster's initials)

Where:

ddGGgg - is the date and time the message is sent (e.g. 101348);
XY - is the alphanumeric AIRMET number (e.g. A1);
GGggZ - is the issue time of the cancellation (e.g. 1530Z);
CZZZ - is the identifier of the issuing centre (e.g. CWEG).

The statement of explanation should provide the reason for the cancellation. This should be very brief and to the point (e.g. -FZDZ CHGD TO -DZ**)**.
In addition, an AIRMET is also canceled when the same weather situation which triggered the issuance of the AIRMET becomes hazardous enough to warrant a SIGMET. In this situation, a cancellation message shall be sent stating also that a SIGMET was issued (see e.g. 6.13.3b).

6.11 RELATIONSHIP WITH GRAPHIC AREA FORECAST (GFA)

An AIRMET is the only tool for amending GFAs.
AIRMETs, as do SIGMETs, shall have a one to one correspondence with the GFA area. For Example, WACN31 correspond to GFACN31. This is a strict rule and does not allow the amendment of two GFA areas (e.g. GFACN32 and GFACN33) with a single AIRMET (The complete GFA/WA/WS/WV/WC matrix is shown in appendix A4).

6.12 RELATIONSHIP WITH SIGMET

As stated in Chapter 5, a SIGMET is mainly a short-term weather warning intended for aircraft in flight, to notify pilots of hazardous weather phenomena.

An AIRMET, on the other hand, is also intended for aircraft in flight, but to notify pilots of non forecast potentially hazardous weather situations in which the level of danger is not great enough to require the issuance of a SIGMET, but requires an amendment to the GFA if not originally forecast.

In situations where the same weather conditions (same phenomenon occurring over the same area) as

described in an AIRMET increases in intensity to reach SIGMET criteria (e.g. TURB from MDT becomes SEV), a SIGMET shall be issued. The AIRMET shall then be canceled by a separate statement. See example 6.13.3b.

On the other hand, a situation may arise in which a hazardous weather condition decreases in intensity from SIGMET to AIRMET criteria. In this situation, the SIGMET shall be canceled according to rules of section 5.10. In addition, an AIRMET shall be issued to replace the SIGMET, if and only if, the weather situation for which the AIRMET is required was not forecast in the current GFA. If the weather situation was forecast in the currently valid GFA, no AIRMET shall be issued.

A weather condition may require both an AIRMET and a SIGMET. This situation arises when the weather element for which a SIGMET is required covers an area that is a subset of the area covered by an AIRMET (e.g. an area of SEV TURB covered by a SIGMET) occurring within a larger area of MDT TURB covered by an AIRMET.

6.13 EXAMPLES OF AIRMETS

6.13.1a

WACN33 CWUL 120730
AIRMET B1 ISSUED AT 0730Z CWUL-
AMEND GFACN33 CWUL 120530 ISSUE
WTN AREA 100 NM E JMSBA . XTNSV OVC ST 6-10 HND AG ALG THE E SHR OF JMSBA DRFTG SLOLY INLD. ST DSIPTG BY 10Z.
END/SY

6.13.1b

The following example is intended to be an update to AIRMET 6.13.1a.

WACN33 CWUL 121025
AIRMET B2 ISSUED AT 1025Z CWUL-
AMEND GFACN33 CWUL 120530 ISSUE
WTN 100 NM E JMSBA. XTNSV OVC ST 6-10 HND AG ALG THE E SHR OF JMSBA PRSTG LGR THN EXPD. ST DSIPTG BY 12Z.
END/SY

6.13.2

WACN34 CWUL 200720
AIRMET A1 ISSUED AT 0720Z CWUL-
AMEND GFACN34 CWUL 200530 ISSUE
WTN AREA /4607N06441W/MONCTON - /4428N06831W/BANGOR - /4459N06455W/GREENWOOD - /4607N06441W/MONCTON. DC9 RPRTD MDT CLR ICG IN FZDZ ALG THE S CST OF NB AT 07Z. FZDZ EXPD TO CONT UNCHGD.
END/FU

6.13.3a

WACN33 CWUL 181915
AIRMET A1 ISSUED AT 1915Z CWUL-
AMEND GFACN33 CWUL 181730 ISSUE
WTN AREA /4300N08106W/LONDON - /4342N07936W/KINKARDINE - /4448N08106W/WIARTON - /4300N08106W/LONDON. SCT TS EXPD TO DVLP BY 20Z. TS WILL DSIPT BY 23Z.
END/LB

6.13.3b

The following example is a cancellation of AIRMET 6.13.3a above. The weather situation which triggered the AIRMET becomes severe enough to warrant a SIGMET.

WACN33 CWUL 182115
AIRMET A1 CNCLD AT 2115Z CWUL-
WTN AREA /4300N08106W/LONDON - /4342N07936W/KINKARDINE - /4448N08106W/WIARTON - /4300N08106W/LONDON. TS HAVE BECM MORE NMRS AND INTS. AS A RESULT SIGMET B1 WAS ISSUED AND AIRMET A1 IS NOW CNCLD.
END/LB

6.13.4

The following example illustrates the amendment of a GFA due to the non-occurrence of a forecast condition significant to aviation:

WACN32 CWEG 171900
AIRMET A1 ISSUED AT 1900Z CWEG -
AMEND GFACN32 CWUL 171730 ISSUE
WTN AREA BOUNDED BY /5639N11113W/FORT MCMURRAY - /5614N11727W/PEACE RIVER - /5335N11628W/EDSON - /5319N11004W/LLOYDMINSTER - /5639N11113W/ FORT MCMURRAY.
SCT TS PREVLY FCST OVR THE ABOVE AREA ARE NO LGER EXPD.
END/AA

CHAPTER 7

FORECASTS IN CHART FORM

7.1 PURPOSE

Forecasts in chart or pictorial form depict, with greater clarity than verbal forecasts (for instance, FAs), the most probable forecast conditions over large areas. These forecasts are primarily designed to meet requirements for preflight planning.

7.2 ISSUING CENTRES

7.2.1 Canadian Meteorological Aeronautical Centre (CMAC)

CMACs routinely issue graphic area forecasts in chart form as described in chapter 4. 7.2.2 Canadian Meteorological Centre

The Canadian Meteorological Centre (CMC) routinely issues forecasts of significant weather in chart form for the Canadian airspace and for the North Atlantic. These are detailed in section 7.3.

7.2.2 National Weather Service

With the implementation of the World Area Forecast System (WAFS), the National Weather Service (NWS) of the United States has been assigned the responsibility for producing high-level significant weather charts over Canada and the North Atlantic and Arctic oceans. Section 7.4 gives more details about these charts.

7.3 CMC FORECAST CHARTS

7.3.1 Significant Weather Prognostic Chart (700-400 hPa): North America

7.3.1.1 Description

The significant weather prognostic charts for North America are prognoses of mid-level (700 to 400 hPa) significant weather, intended for aviation.

These prognoses are prepared by CMC using FUCN01 messages provided by CMACs in alphanumeric format.

7.3.1.2 Times of issue and valid times

The CMC issues these charts four times a day and prepares them using the latest FUCN messages from CMACs . The charts are transmitted at approximately 0210, 0815, 1425 and 1940 UTC, and are valid at 12, 18, 00 and 06 UTC respectively.

In other words, transmission of a given chart occurs 8 to 11 hours before its valid time.

7.3.1.3 Content

The significant weather charts show forecast surface positions of pressure centres and fronts, forecast areas of significant cloud, turbulence and icing, as well as forecast freezing levels. When applicable, surface positions of tropical storms and hurricanes are also indicated.

7.3.1.4 Scale

A polar stereographic projection on a 1:20 M scale, true at 60° N, is used.

7.3.1.5 Area of Coverage

The charts cover Canada, the Arctic Archipelago, and the northern United States, as shown in the first example in section 7.5.

7.3.1.6 Depiction

a. Areas of Clouds

Areas of clouds are indicated by scalloped lines. Cloud type, amount and thickness are indicated by NCC hh/hh, where:

- N gives the cloud cover as BKN or OVC;
- CC gives the type of cloud or may be replaced by LYR in cases of multiple vertical layers; and
- hh/hh gives the heights, in hundreds of feet ASL, of the top and of the base of the cloud. XX indicates a base below the 700-hPa level.

b. Turbulence

Turbulence is indicated by a symbol (see below) shown within a given area. A forecast of turbulence implies a greater than 50% chance of encountering turbulence somewhere within the area to which the symbol applies.

-  indicates moderate turbulence;
-  indicates severe turbulence;
- hh/hh gives the heights of the top and of the base of the turbulent layer, in hundreds of feet ASL. XX indicates a base below the 700-hPa level.

NOTE: A forecast of CB, thunderstorms, TCU, or ACC automatically implies moderate or severe turbulence; in this case, no turbulence symbol is used.

c. Icing

Icing is indicated by a symbol (see below) appearing within a given area.

-  indicates moderate icing;
-  indicates severe icing;
- hh/hh gives the heights of the top and of the base of the icing layer, in hundreds of feet ASL. XX indicates a base below the 700-hPa level.

NOTE: A forecast of CB, thunderstorms, TCU, or ACC automatically implies moderate or severe icing; in this case, no icing symbol is used.

d. Freezing Levels

The freezing levels are depicted by dashed lines drawn at intervals of 5000 feet and labeled in hundreds of feet ASL.

e. Surface Fronts

Surface Fronts are depicted in the standard monochromatic fashion.

f. Pressure Centres

Low and high pressure centres are marked "L" or "H", as applicable, and values of the central pressure are labeled in hPa.

g. Tropical Storms and Hurricanes

They are indicated using the appropriate symbols ( or ) and their official names.

NOTE: The forecast mean direction and speed of motion (in knots) of surface pressure centres, fronts and trowals are added if the speed is greater than 5 knots. The direction and speed are six-hour means centred at the valid time of the chart.

7.3.2 Significant Weather Prognostic Chart (Surface-400

hPa) - North Atlantic

Under the WAFS, following an agreement with the United States, Canada has assumed the responsibility of producing significant weather charts for the North Atlantic.

7.3.2.1 Description

The significant weather prognostic charts for North Atlantic are prognoses of significant weather between the surface and 400 hPa.

7.3.2.2 Times of issue and valid times

Each day, the CMC produces two low and mid-level (surface to 400 hPa) significant weather charts for the North Atlantic. These charts are valid at 00 and 12 UTC and are transmitted at approximately 1410 and 0235 UTC respectively.

7.3.2.3 Content and scale

Except for the larger vertical layer (from the surface instead of 700 hPa) that they cover, these charts contain the same meteorological information as the significant weather prognostic charts for North America (described in 7.3.1) and use the same scale. Likewise, the weather elements depiction on these charts is similar to that described in paragraph 7.3.1.

The second map among the examples of section 7.5 shows the area of coverage and the format of these charts.

Because the new numerical prognoses are not available when the charts are prepared, the significant weather chart transmitted near 1410 UTC is based on the 24-hour numerical prognosis produced from 0000 UTC data. Similarly, the chart transmitted near 0225 UTC is based on the 24-hour numerical prognosis produced from 1200 UTC data. In addition, of course, both maps make use of the latest analyses and imagery available.

7.3.2.4 Area of coverage

The chart covers eastern North America, the North Atlantic Ocean, and Western Europe (see e.g. 2 in section 7.5).

7.4 NWS HIGH-LEVEL SIGNIFICANT WEATHER

CHARTS

Under the WAFS, the National Meteorological Center (NWS) of the United States has been designated as the Regional Area Forecast Centre (RAFC) responsible for producing high-level significant weather charts for all of North America and for the North Atlantic.

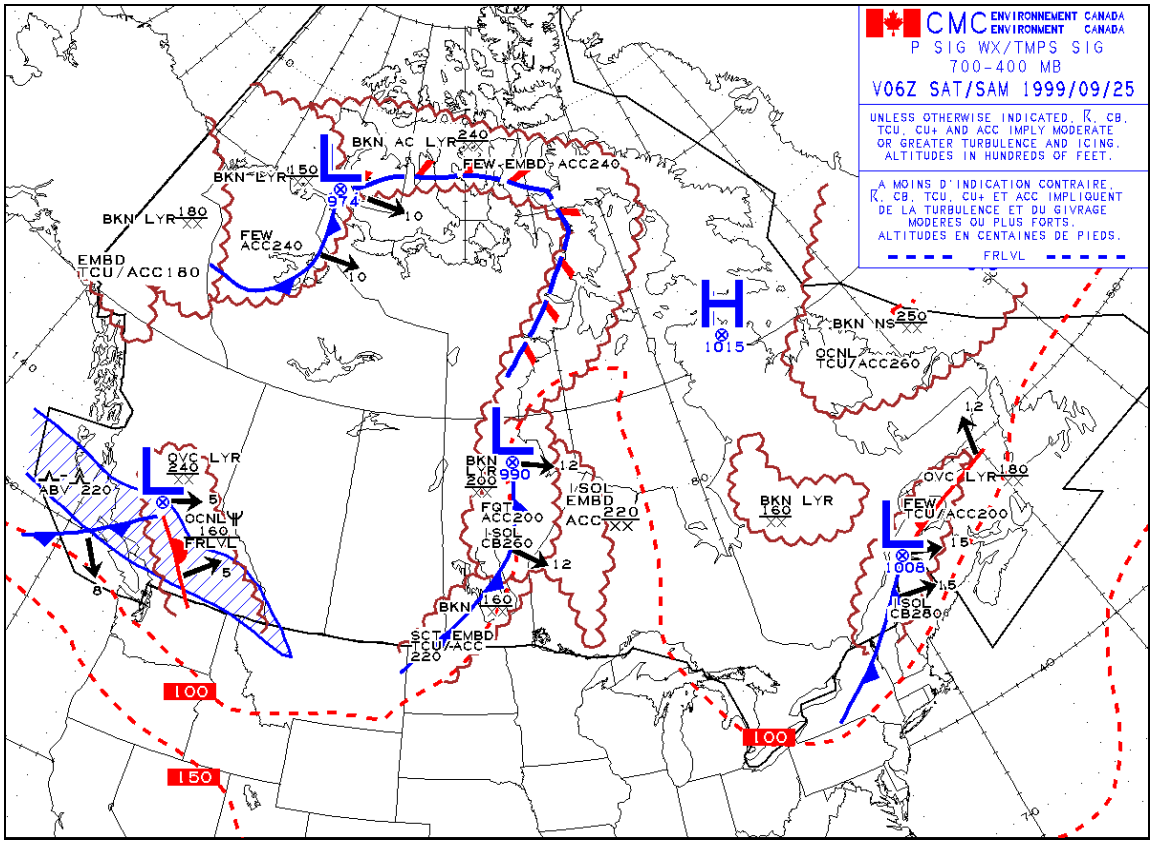
The NWS produces two charts every twelve hours. One shows significant weather conditions over Canada, the eastern United States and the North Atlantic; the other shows these conditions over the mainland United States and Central America.

The NWS produces its significant weather charts in accordance with the criteria and formats specified by ICAO. The charts cover the atmospheric envelope from flight level 250 (FL 250) to flight level 600 (FL 600).

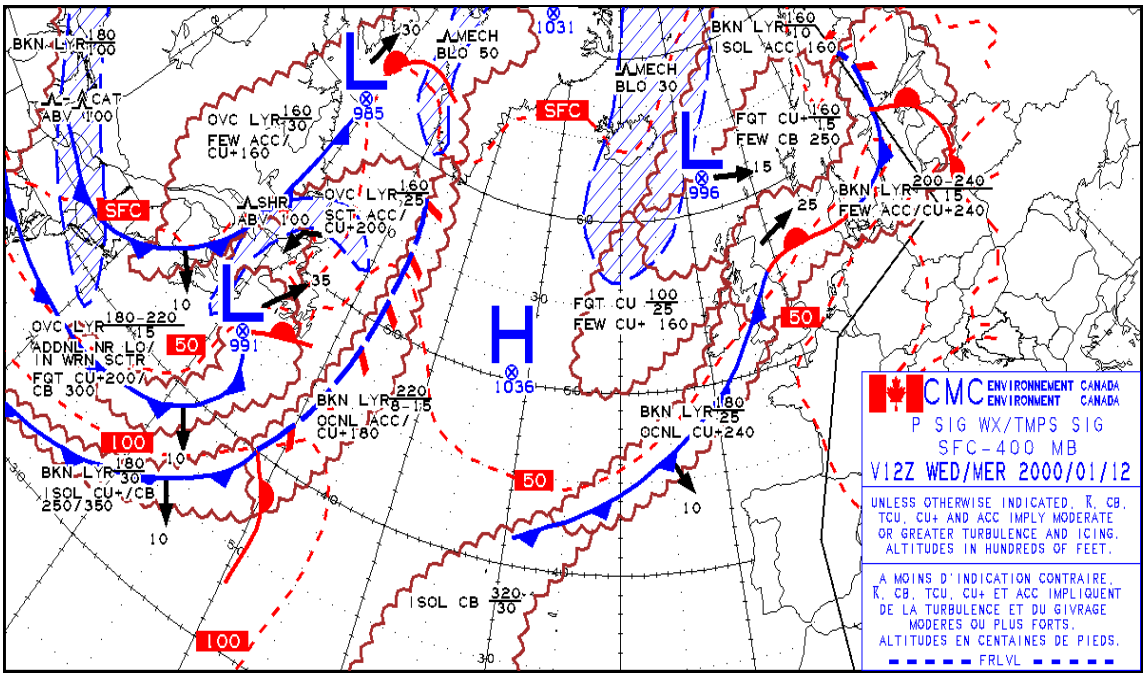
Examples of the NWS charts showing the format and area of coverage are given at the end of this chapter.

7.5 EXAMPLES OF FORECASTS IN CHART FORM

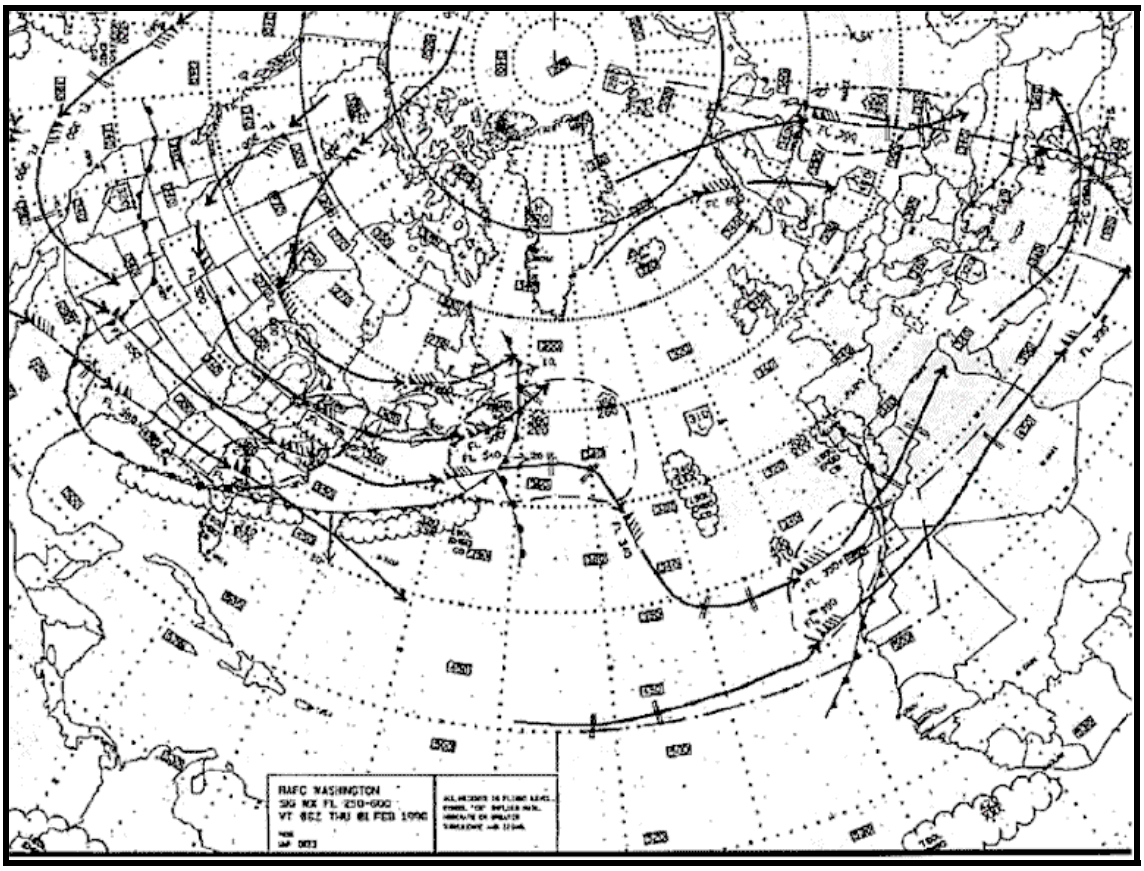
7.5.1 CMC SIGNIFICANT WEATHER PROGNOSTIC CHART (FL100-FL240; 700-400 hPa) - NORTH AMERICA



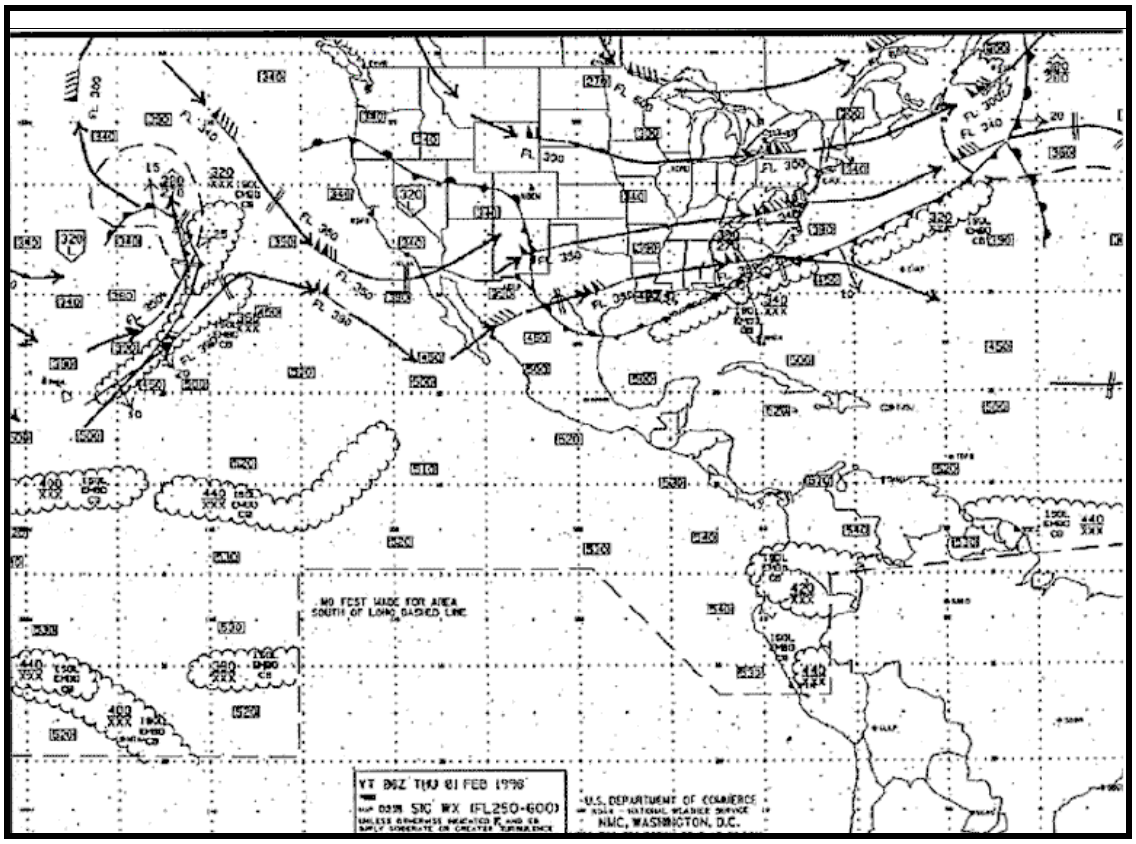
7.5.2 CMC SIGNIFICANT WEATHER PROGNOSTIC CHART (SURFACE-FL240/400 hPa) - NORTH ATLANTIC



7.5.3 NMC HIGH LEVEL SIGNIFICANT WEATHER CHART (FL250-FL600, 400-100 hPa) - NORTH ATLANTIC

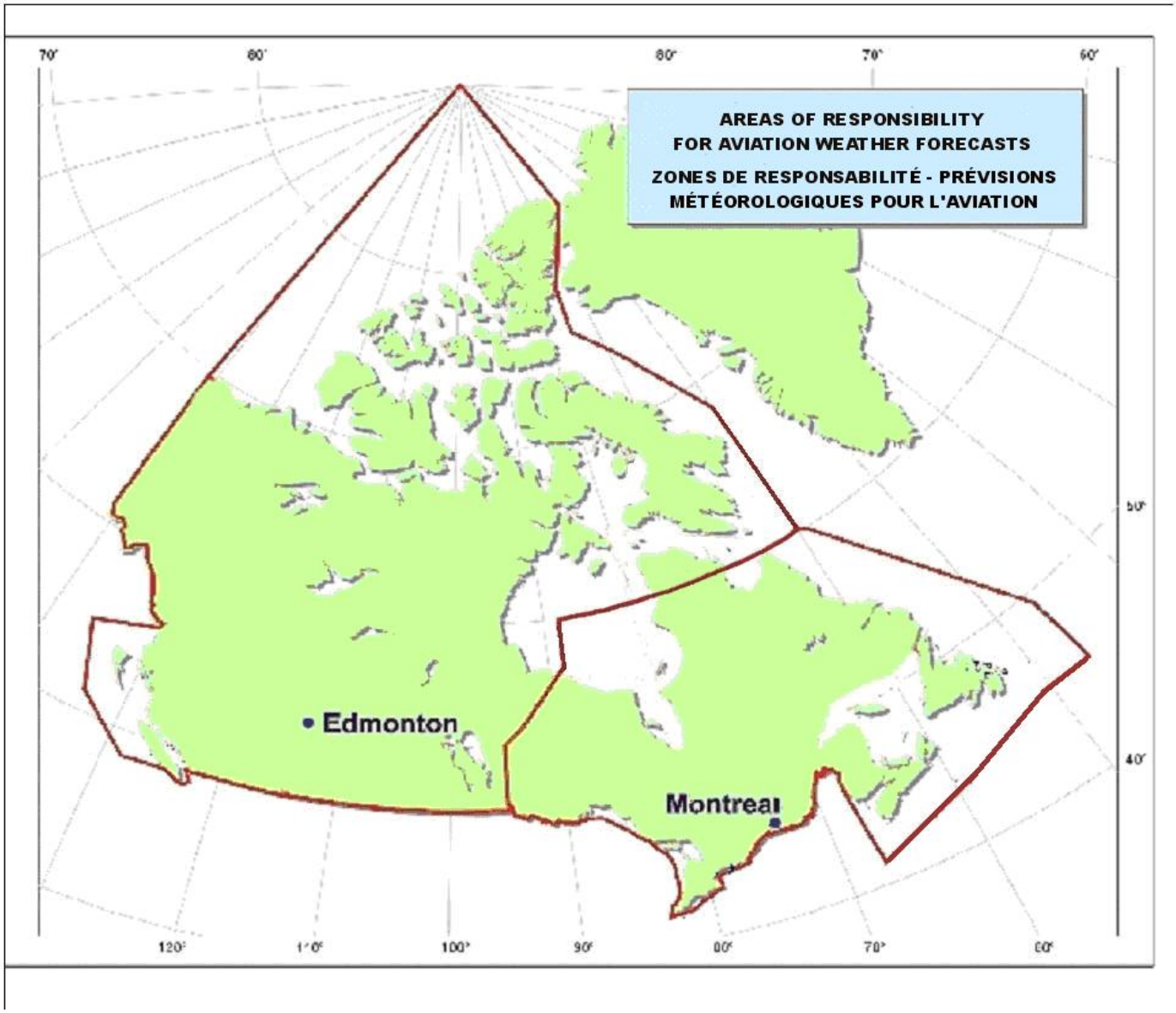


7.5.4 NMC HIGH LEVEL SIGNIFICANT WEATHER CHART (FL250-FL600; 400-100 hPa) - MAINLAND USA AND CENTRAL AMERICA



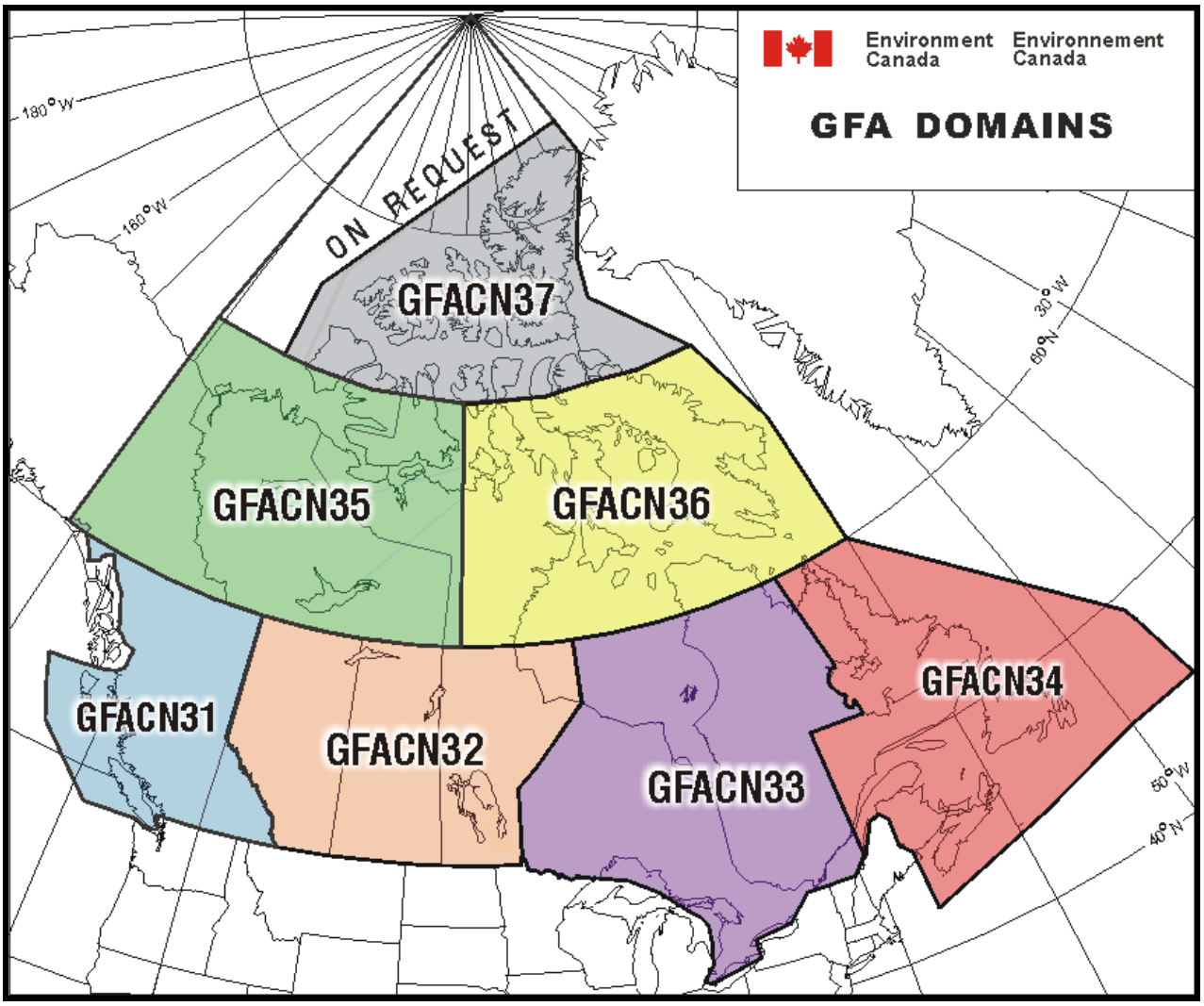
APPENDIX A1

CMACs Areas of Responsibility for Aviation Weather Forecasts



APPENDIX A2

GFA Domains

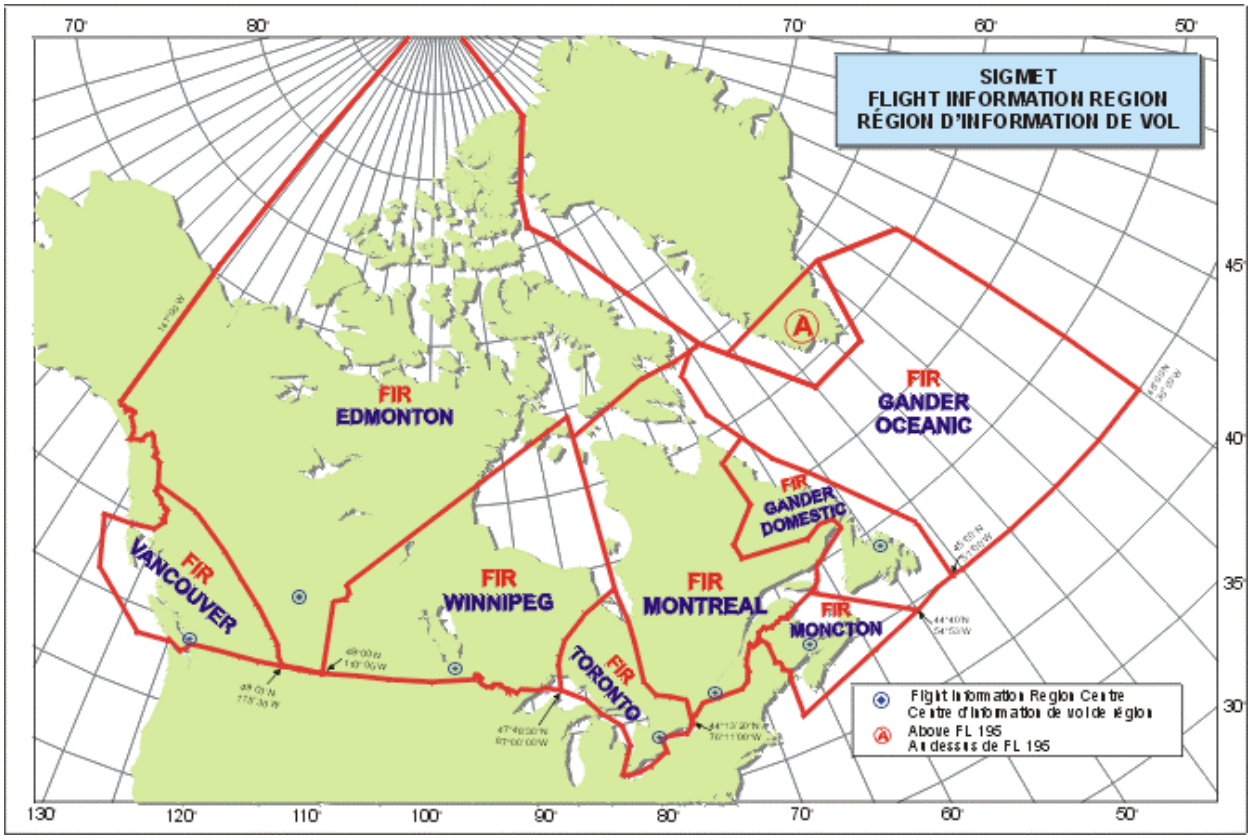


The names of the above domains are the following:

GFACN31 - PACIFIC REGION
GFACN32 - PRAIRIE REGION
GFACN33 - ONTARIO-QUEBEC REGION
GFACN34 - ATLANTIC REGION
GFACN35 - YUKON-NORTHWEST TERRITORIES REGION
GFACN36 - NUNAVUT REGION
GFACN37 - ARCTIC REGION

APPENDIX A3

Flight Information Regions (FIRs)



APPENDIX A4

Graphic Area Forecasts & associated SIGMETs/AIRMETs

GRAPHIC AREA FORECAST	ASSOCIATED SIGMETs /AIRMETs
PACIFIC REGION	
GFACN31 CWAO	WSCN31/WACN31/WVCN31/WCCN31 CWEG
PRAIRIE REGION	
GFACN32 CWAO	WSCN32/WACN32/WVCN32 CWEG
ONTARIO-QUEBEC REGION	
GFACN33 CWAO	WSCN33/WACN33/WVCN33/WCCN33 CWUL
ATLANTIC REGION	
Reserved for Gander Oceanic FIR	WSCN02/WCCN02 CWUL WVCN02 CWEG
GFACN34 CWAO	WSCN34/WACN34/WCCN34/WVCN34 CWUL
YUKON-NORTHWEST TERRITORIES REGION	
GFACN35 CWAO	WSCN35/WACN35/WVCN35 CWEG
NUNAVUT REGION	
GFACN36 CWAO	WSCN36/WACN36/WVCN36 CWEG
ARCTIC REGION	
GFACN37 CWAO	WSCN37/WACN37/WVCN37 CWEG

APPENDIX A5

Meteorological Reference Map

APPENDIX B

LIST OF AERODROMES WITH TAF OR ADVISORY PROGRAM

NOTE: Regular amending procedure does not apply to this appendix as it requires frequent changes to be kept up-to-date. The appendix will be updated once a year.

Aerodrome ID tagged with a * indicate a Department of National Defense (DND) site.

Vancouver FIR

STN. ID	WMO No.	AERODROME NAME	LAT	LONG	ELEV (FT)	ELEV (M)
CYXX	71108	ABBOTSFORD, BC	49° 02'	122° 22'	190	57.9
CBBC	71757	BELLA BELLA, BC	52° 11'	128° 09'	141	43.0
CYBL		CAMPBELL RIVER, BC	49° 57'	125° 16'	346	105.5
CYCG	71884	CASTLEGAR, BC	49° 18'	117° 38'	1624	495.0
CYQQ*	71893	COMOX, BC	49° 43'	124° 54'	80	24.4
CYXC	71880	CRANBROOK, BC	49° 37'	115° 47'	3079	939.0
CYKA	71887	KAMLOOPS, BC	50° 42'	120° 27'	1134	345.6
CYLW	71203	KELOWNA, BC	49° 58'	119° 23'	1409	429.5
CYZY	71944	MACKENZIE, BC	55° 18'	123° 08'	2264	690.1
CZMT		MASSET, BC	54° 02'	132° 08'	25.0	7.5
CYCD	71890	NANAIMO, BC	49° 03'	123° 52'	93	28.3
CYYF	71889	PENTICTON, BC	49° 28'	119° 36'	1129	344.1
CYZT	71109	PORT HARDY, BC	50° 41'	127° 22'	71	21.6
CYXS	71896	PRINCE GEORGE, BC	53° 53'	122° 41'	2268	691.3
CYPR	71898	PRINCE RUPERT, BC	54° 18'	130° 26'	111	33.8
CYQZ	71103	QUESNEL, BC	53° 02'	122° 31'	1789	545.3
CYZP	71101	SANDSPIT, BC	53° 15'	131° 49'	21	6.4
CYYD	71950	SMITHERS, BC	54° 49'	127° 11'	1717	523.3
CYXT	71951	TERRACE, BC	54° 28'	128° 35'	713	217.3
CYAZ	71106	TOFINO, BC	49° 05'	125° 46'	79	24.1
CYVR	71892	VANCOUVER INTL, BC	49° 11'	123° 10'	8	2.4
CYYJ	71799	VICTORIA INTL, BC	48° 39'	123° 26'	63	19.2
CYWH		VICTORIA HARBOUR, BC	48° 25'	123° 23'	0	0
CYWL	71104	WILLIAMS LAKE, BC	52° 11'	122° 03'	3085	940.3

Edmonton FIR

STN. ID	WMO No.	AERODROME NAME	LAT	LONG	ELEV (FT)	ELEV (M)
CYLT*		ALERT, NU	82° 31'	062° 17'	100	30.5
CYEK	71812	ARVIAT, NU	61° 06'	094° 04'	32	9.9
CYBK	71926	BAKER LAKE, NU	64° 18'	096° 05'	60	18.3
CYVT	71077	BUFFALO NARROWS, SK	55° 50'	108° 26'	1423.9	434
CYDB		BURWASH, YK	61° 22'	139° 03'	2647	806.8
CYYC	71877	CALGARY INTL, AB	51° 07'	114° 01'	3557	1084.2
CYBW	71860	CALGARY/SPRINGBANK, AB	51° 06'	114° 22'	3936	1200
CYCB	71925	CAMBRIDGE BAY, NU	69° 06'	105° 07'	90	27.4
CYTE	71910	CAPE DORSET, NU	64° 13'	076° 32'	164	50.0
CYCY	71090	CLYDE RIVER, NU	70° 29'	068° 31'	86	26.3
CYOD*	71120	COLD LAKE, AB	54° 25'	110° 17'	1775	541.0
CYZS	71915	CORAL HARBOUR, NU	64° 12'	083° 22'	210	64.0
CYDA	71966	DAWSON, YK	64° 03'	139° 08'	1211	369.1
CYDQ	71471	DAWSON CREEK, BC	55° 45'	120° 11'	2148	654.7
CYDL	71958	DEASE LAKE, BC	58° 25'	130° 00'	2678	816.3
CYWJ		DELINE, NT	65° 13'	123° 26'	698	209.4
CYXD	71879	EDMONTON CITY CENTRE, AB	53° 34'	113° 31'	2200	670.6
CYEG	71123	EDMONTON INTL, AB	53° 18'	113° 35'	2373	723.3
CYED*	71121	EDMONTON/NAMAO, AB	53° 40'	113° 29'	2257	687.9
CYOA		EKATI, NT	64° 42'	110° 37'	1537	468.5
CYEU	71917	EUREKA, NU	79° 59'	085° 56'	34	10.4
CZFA		FARO A, YK	62° 13'	133° 22'	2351	716.6
CYPY	71933	FORT CHIPEWYAN, AB	58° 46'	111° 07'	761	232.1
CYGH		FORT GOOD HOPE, NT	66° 14'	128° 39'	269	80.7
CYMM	71932	FORT MCMURRAY, AB	56° 39'	111° 13'	1211	369.1
CZFM		FORT MCPHERSON, NT	67° 24'	134° 51'	141	43
CYYE	71945	FORT NELSON, BC	58° 50'	122° 35'	1253	381.9
CYXJ	71943	FORT ST JOHN, BC	56° 14'	120° 44'	2280	694.9
CYFS	71946	FORT SIMPSON, NT	61° 45'	121° 14'	555	169.2
CYSM	71934	FORT SMITH, NT	60° 01'	111° 57'	673	205.1
CYHK		GJOA HAVEN, NU	68° 38'	095° 51'	152	46.2
CYQU	71940	GRANDE PRAIRIE, AB	55° 11'	118° 53'	2195	669.0
CYUX	71081	HALL BEACH, NU	68° 47'	081° 15'	27	8.1
CYHY	71935	HAY RIVER, NT	60° 50'	115° 47'	543	165.5
CYOJ	71066	HIGH LEVEL, AB	58° 37'	117° 10'	1110	338.3
CYGT		IGLOOLIK, NU	69° 22'	081° 49'	173	52.7
CYEV	71957	INUVIK, NT	68° 18'	133° 29'	223	68.0

CYBB		KUGAARUK, NU	68° 32’	089° 49’	50	15.2
CYCO	71938	KUGLUKTUK, NU	67° 49’	115° 08’	73	22.3
CYQL	71874	LETHBRIDGE, AB	49° 38’	112° 48’	3047	928.7
CYLL	71871	LLOYDMINSTER, AB	53° 19’	110° 04’	2194	668.7
CYMA	71965	MAYO, YK	63° 37’	135° 52’	1653	503.8
CYXH	71872	MEDICINE HAT, AB	50° 01’	110° 43’	2352	716.9
CYSR		NANISIVIK, NU	72° 59’	084° 37’	2129	648.9
CYVQ	71043	NORMAN WELLS, NT	65° 17’	126° 48’	241	73.5
CYOC		OLD CROW, YK	67° 35’	139° 50’	824	251.2
CYXP		PANGNIRTUNG, NU	66° 08’	065° 42’	75	22.9
CYPC		PAULATUK, NT	69° 21’	124° 03’	21	6.3
CYPE	71068	PEACE RIVER, AB	56° 14’	117° 26’	1873	570.9
CYIO	71095	POND INLET, NU	72° 42’	077° 58’	181	55.2
CYVM	71338	QIKIQTARJUAQ, NU	67° 33’	064° 02’	21	6.4
CYRT	71083	RANKIN INLET, NU	62° 49’	092° 07’	106	32.3
CYQF	71878	RED DEER REGIONAL, AB	52° 11’	113° 54’	2968	904.6
CYUT		REPULSE BAY, NU	66° 32’	086° 15’	80	24.4
CYRB	71924	RESOLUTE, NU	74° 43’	094° 59’	221	67.4
CYSY		SACHS HARBOUR, NT	72° 00’	125° 16’	281	85.6
CYZH	71069	SLAVE LAKE, AB	55° 18’	114° 47’	1905	580.6
CYSF	71132	STONY RAPIDS, SK	59° 15’	105° 50’	820	250.0
CYYH	71580	TALOYOAK, NU	69° 33’	093° 35’	91	27.7
CYZW		TESLIN, YK	60° 10’	132° 45’	2313	705.0
CYUB		TUKTOYAKTUK, NT	69° 26’	133° 02’	15	4.6
CYHI		ULUKHAKTOK/HOLMAN, NT	70° 46’	117° 48’	117	35.7
CYQH	71953	WATSON LAKE, YK	60° 07’	128° 49’	2262	689.5
CYZU	71930	WHITECOURT	54° 09’	115° 47’	2567	782.9
CYXY	71964	WHITEHORSE, YK	60° 43’	135° 04’	2305	702.6
CYZF	71936	YELLOWKNIFE, NT	62° 28’	114° 27’	675	205.7

Winnipeg FIR

STN. ID	WMO No.	AERODROME NAME	LAT	LONG	ELEV (FT)	ELEV (M)
CYTL	71848	BIG TROUT LAKE, ON	53° 50'	089° 52'	735	224.1
CYBR	71140	BRANDON, MB	49° 55'	099° 57'	1342	409.0
CYYQ	71913	CHURCHILL, MB	58° 44'	094° 04'	94	28.7
CYDN	71855	DAUPHIN, MB	51° 06'	100° 03'	999	304.5
CYHD	71582	DRYDEN REGIONAL, ON	49° 50'	092° 45'	1354	412.7
CYGQ	71834	GERALDTON, ON	49° 47'	086° 56'	1143	348.4
CYGX	71912	GILLAM, MB	56° 21'	094° 42'	475	144.8
CYIV	71145	ISLAND LAKE, MB	53° 51'	094° 39'	776	236.5
CYQK	71850	KENORA, ON	49° 47'	094° 22'	1344	409.7
CYVC	71922	LA RONGE, SK	55° 09'	105° 16'	1243	378.9
CYYL	71078	LYNN LAKE, MB	56° 52'	101° 05'	1170	356.6
CYMJ*	71864	MOOSE JAW, SK	50° 20'	105° 33'	1892	576.7
CYQW	71876	NORTH BATTLEFORD, SK	52° 46'	108° 15'	1798	548.0
CYNE	71141	NORWAY HOUSE, MB	53° 58'	097° 50'	730	222.5
CYPL	71845	PICKLE LAKE, ON	51° 27'	090° 12'	1267	386.2
CYPG*	71851	PORTAGE, MB	49° 54'	098° 16'	885	270.0
CYPA	71869	PRINCE ALBERT, SK	53° 13'	105° 41'	1405	428.2
CYRL	71854	RED LAKE, ON	51° 04'	093° 48'	1257	383.1
CYQR	71863	REGINA, SK	50° 26'	104° 40'	1894	577.3
CYXE	71866	SASKATOON, SK	52° 10'	106° 41'	1653	503.8
CYXL	71842	SIOUX LOOKOUT, ON	50° 07'	091° 54'	1280	390.1
CYYN	71870	SWIFT CURRENT, SK	50° 17'	107° 41'	2682	817.5
CYQD	71867	THE PAS, MB	53° 58'	101° 06'	889	271.0
CYTH	71079	THOMPSON, MB	55° 48'	097° 52'	729	222.2
CYQT	71749	THUNDER BAY, ON	48° 22'	089° 19'	653	199.0
CYWG	71852	WINNIPEG INTL, MB	49° 54'	097° 14'	783	238.7
CYQV	71138	YORKTON, SK	51° 16'	102° 28'	1635	498.3

Toronto FIR

STN. ID	WMO No.	AERODROME NAME	LAT	LONG.	ELEV (FT)	ELEV (M)
CYBN*	71534	BORDEN, ON	44° 15’	079° 55’	732	223.0
CYLD	71642	CHAPLEAU, ON	47° 49’	083° 21’	1465	446.5
CYXR	71735	EARLTON, ON	47° 42’	079° 51’	798	243.2
CYZE	71733	GORE BAY-MANITOULIN ON	45° 53’	082° 34’	634	193.2
CYHM	71263	HAMILTON, ON	43° 10’	079° 56’	776	236.5
CYYU	71831	KAPUSKASING, ON	49° 25’	082° 28’	743	226.5
CYGK	71620	KINGSTON, ON	44° 13’	076° 36’	305	93.0
CYKF	71368	KITCHENER/WATERLOO, ON	43° 27’	080° 23’	1040	316.9
CYXU	71623	LONDON, ON	43° 02’	081° 09’	912	278.0
CYSP		MARATHON, ON	48° 45’	086° 21’	1035	315.0
CYMO	71836	MOOSONEE, ON	51° 17’	080° 36’	28	8.5
CYQA	71630	MUSKOKA, ON	44° 58’	079° 18’	925	281.9
CYYB	71731	NORTH BAY, ON	46° 21’	079° 26’	1216	370.6
CYWA*	71625	PETAWAWA, ON	45° 57’	077° 19’	427	130.1
CYPQ	71629	PETERBOROUGH, ON	44° 14’	078° 21’	628	191.4
CYSN	71262	ST CATHARINES, ON	43° 12’	079° 10’	321	97.8
CYZR	71634	SARNIA, ON	43° 00’	082° 18’	594	181.1
CYAM	71260	SAULT STE MARIE, ON	46° 29’	084° 30’	630	192.0
CYSB	71730	SUDBURY, ON	46° 37’	080° 48’	1140	347.5
CYTS	71739	TIMMINS, ON	48° 34’	081° 22’	967	294.7
CYKZ	71639	TORONTO/BUTTONVILLE, ON	43° 52’	079° 22’	649	198.0
CYTZ	71265	TORONTO/CITY CENTRE, ON	43° 38’	079° 24’	251	76.5
CYYZ	71624	TORONTO/PEARSON INTL, ON	43° 40’	079° 38’	569	173.4
CYTR*	71621	TRENTON, ON	44° 07’	077° 32’	283	86.3
CYXZ	71738	WAWA, ON	47° 58’	084° 47’	942	287.1
CYVV	71633	WIARTON, ON	44° 45’	081° 06’	729	222.2
CYQG	71538	WINDSOR, ON	42° 16’	082° 58’	622	189.6

Montreal FIR

STN. ID	WMO No.	AERODROME NAME	LAT	LONG.	ELEV (FT)	ELEV (M)
CYBG*	71727	BAGOTVILLE, QC	48° 20’	071° 00’	521	158.8
CYBC	71187	BAIE-COMEAU, QC	49° 08’	068° 12’	71	21.6
CYBX	71808	LOURDES-DE-BLANC-SABLON, QC	51° 27’	057° 11’	121	36.9
CYMT	71822	CHIBOUGAMAU-CHAPAIS, QC	49° 46’	074° 32’	1270	387.1
CYGP	71188	GASPÉ, QC	48° 47’	064° 28’	108	32.9
CYND		GATINEAU, QC	45° 31’	075° 34’	211	64.3
CYGV	71313	HAVRE-ST-PIERRE, QC	50° 17’	063° 37’	425	129.5
CYPH	71907	INUKJUAK, QC	58° 28’	078° 05’	83	25.3
CYFB	71909	IQALUIT, NU	63° 45’	068° 32’	110	33.5
CYIK		IVUJIVIK, QC	62° 25’	077° 57’	139	42.4
CYVP	71906	KUUJJUAQ, QC	58° 06’	068° 25’	122	37.2
CYGW	71905	KUUJJURRAPIK, QC	55° 17’	077° 46’	34	10.4
CYAH	71823	LA GRANDE IV, QC	53° 45’	073° 40’	1027	312.9
CYGL	71827	LA GRANDE RIVIÈRE, QC	53° 38’	077° 42’	639	194.7
CYYY	71718	MONT-JOLI, QC	48° 36’	068° 13’	172	52.4
CYMX	71626	MONTREAL/MIRABEL INTL, QC	45° 40’	074° 02’	270	82.3
CYUL	71627	MONTREAL/TRUDEAU INTL, QC	45° 28’	073° 45’	117	35.6
CYHU	71371	MONTREAL/ST-HUBERT, QC	45° 31’	073° 25’	90	27.4
CYNA	71813	NATASHQUAN, QC	50° 11’	061° 47’	35	10.7
CYOW	71628	OTTAWA/M.C. INTL, ON	45° 19’	075° 40’	374	114.0
CYPX		PUVIRNITUQ, QC	60° 03’	077° 13’	76	23.2
CYHA		QUAQTAQ, QC	61° 03’	069° 38’	104	31.6
CYQB	71714	QUÉBEC/J. LESAGE INTL, QC	46° 48’	071° 23’	243	74.1
CYRJ	71728	ROBERVAL, QC	48° 31’	072° 16’	586	178.6
CYUY		ROUYN -NORANDA, QC	48° 13’	078° 50’	988	301.1
CYKL	71828	SCHEFFERVILLE, QC	54° 48’	066° 49’	1713	522.1
CYZV	71811	SEPT-ÎLES, QC	50° 13’	066° 16’	180	54.9
CYSC	71610	SHERBROOKE, QC	45° 26’	071° 41’	792	241.4
CYTQ		TASIUJAQ, QC	58° 40’	069° 57’	122	37.2
CYOY*	71716	VALCARTIER, QC	46° 54’	071° 30’	551	168.0
CYVO	71725	VAL D’OR, QC	48° 04’	077° 47’	1106	337.1
CYWK	71825	WABUSH, NL	52° 56’	066° 52’	1806	550.5
CYKQ		WASKAGANISH, QC	51° 29’	078° 45’	79	24.1

Moncton FIR

STN. ID	WMO No.	AERODROME NAME	LAT	LONG	ELEV (FT)	ELEV (M)
CZBF	71574	BATHURST, NB	47° 38’	065° 45’	193	59.0
CYYG	71706	CHARLOTTETOWN, PE	46° 17’	063° 08’	178	54.3
CYFC	71700	FREDERICTON INTL, NB	45° 52’	066° 32’	67	20.4
CYCX*	71701	GAGETOWN, NB	45° 50’	066° 26’	166	51.0
CYZX*	71397	GREENWOOD, NS	44° 59’	064° 55’	91	27.7
CYHZ	71395	HALIFAX/STANFIELD INTL, NS	44° 53’	063° 31’	477	145.4
CYGR	71709	ILES DE LA MADELEINE, QC	47° 25’	061° 47’	30	10.0
CYQM	71705	MONCTON INTL, NB	46° 07’	064° 41’	237	72.2
CWSA	71600	SABLE ISLAND, NS	43° 56’	060° 01’	13	4.0
CYSJ	71609	SAINT JOHN, NB	45° 20’	065° 53’	356	108.5
CYAW*	71601	SHEARWATER, NS	44° 38’	063° 30’	167	50.9
CYQY	71707	SYDNEY, NS	46° 10’	060° 03’	203	61.9
CYQI	71603	YARMOUTH, NS	43° 50’	066° 05’	140	42.7

Gander Domestic FIR

STN. ID	WMO No.	AERODROME NAME	LAT	LONG	ELEV (FT)	ELEV (M)
CYCA	71818	CARTWRIGHT, NL	53° 42’	057° 02’	46	14.0
CZUM	71182	CHURCHILL FALLS, NL	53° 33’	064° 06’	1442	439.5
CYDF	71809	DEER LAKE, NL	49° 13’	057° 24’	72	21.9
CYQX	71803	GANDER INTL, NL	48° 57’	054° 34’	496	151.2
CYYR*	71816	GOOSE BAY, NL	53° 19’	060° 25’	160	48.8
CWWU		LONG POND, NL	47° 31’	052° 59’	20	6.1
CYMH	71817	MARY’S HARBOUR, NL	52° 18’	055° 50"	32.8	10.0
CYDP	71902	NAIN, NL	56° 33’	061° 41’	22	6.7
CYAY	71819	ST ANTHONY, NL	51° 23’	056° 06’	92	28.0
CYJT	71815	STEPHENVILLE, NL	48° 32’	058° 33’	86	26.2
CYYT	71801	ST JOHN’S INTL, NL	47° 37’	052° 44’	460	140.2

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STN. ID	WMO No.	AERODROME NAME	LAT	LONG.	ELEV (FT)	ELEV (M)
CYLT		ALERT, NU	82° 31’	062° 17’	100	30.5
CYCX	71701	GAGETOWN, NB	45° 50’	066° 26’	166	51.0
CYZX	71397	GREENWOOD, NS	44° 59’	064° 55’	91	27.7
CYAW	71601	SHEARWATER, NS	44° 38’	063° 30’	167	50.9
CYBG	71727	BAGOTVILLE, QC	48° 20’	071° 00’	521	158.8
CYBN	71534	BORDEN, ON	44° 15’	079° 55’	732	223.0
CYOD	71120	COLD LAKE, AB	54° 25	110° 17’	1775	541.0
CYYR	71816	GOOSE BAY, NL	53° 19’	060° 25’	160	48.8
CYMJ	71864	MOOSE JAW, SK	50° 20’	105° 33’	1892	576.7
CYED	71121	EDMONTON/NAMAO, AB	53° 40’	113° 29’	2257	687.9
CYWA	71625	PETAWAWA, ON	45° 57’	077° 19’	427	130.1
CYPG	71851	PORTAGE, MB	49° 54’	098° 16’	885	270.0
CYTR	71621	TRENTON, ON	44° 07’	077° 32’	283	86.3
CYOY	71716	VALCARTIER, QC	46° 54’	071° 30’	551	168.0
CYQQ	71893	COMOX, BC	49° 43’	124° 54’	80	24.4

Map of Aerodromes for Which TAFs Are Issued

APPENDIX C

NOTE: Regular amending procedures will not apply to this Appendix as it may require frequent changes to be kept up-to-date. The Appendix will however be updated once a year as scheduled by Nav Canada.

IFR Approach and Alternate Limits for Canadian Aerodromes

ID	Aerodrome's Name	PR	FIR	GFA rgn	Issuing Centre	IFR Apch		Altn		Notes
						CIG	VIS	CIG	VIS	
CYXX	Abbotsford	BC	CZVR	31	CMAC-W	200	1/2	600	2	1 ILS RVR
CYLT	Alert	NU	CZEG	31	CMAC-W	300	1	800	2	B
CYAB	Arctic Bay	NU	CZEG	37	CMAC-W	1300	3	1600	3	NPA (no navaids)
CYEK	Arviat	NU	CZEG	37	CMAC-W	500	1 ½	800	2 ½	NPA
CYBG	Bagotville	QC	CZUL	36	CMAC-E	200	1/2	600	2	
CYBC	Baie-Comeau	QC	CZUL	33	CMAC-E	200	½	600	2	1 ILS RVR
CYBK	Baker Lake	NU	CZEG	34	CMAC-W	500	1 ½	800	2 ½	NPA
CZBF	Bathurst	NB	CZQM	36	CMAC-E	400	1 ¼	800	2 ¼	NPA
CBBC	Bella Bella (Campbell Island)	BC	CZVR	34	CMAC-W	1200	3	1500	3	NPA
CYTL	Big Trout Lake	ON	CZWG	31	CMAC-E	500	1 1/2	900	2 1/2	NPA
CYBN	Borden (Heli)	ON	CZYZ	33	DWS	500	1	800	2	A
CYBR	Brandon Muni	MB	CZWG	33	CMAC-W	200	3/4	600	2	1 ILS
CYVT	Buffalo Narrows	SK	CZEG	32	CMAC-W	500	1 3/4	900	2 3/4	NPA
CYDB	Burwash	YT	CZEG	32	CMAC-W	2300	3	2600	3	NPA
CYYC	Calgary Intl	AB	CZEG	35	CMAC-W	200	3/4	600	2	1 ILS
CYBW	Calgary/Springbank	AB	CZEG	32	CMAC-W	200	½	400	1	2 ILS RVR
CYCB	Cambridge Bay	NU	CZEG	32	CMAC-W	300	1	800	2	NPA
CYBL	Campbell River	BC	CZVR	35	CMAC-W	300	1/2	600	2	1 ILS RVR
CYTE	Cape Dorset	NU	CZEG	31	CMAC-W	600	2	1000	3	NPA
CYCA	Cartwright	NL	CZQX	36	CMAC-W	800	2 1/4	1100	3	NPA
CYCG	Castlegar/West Kootenay Regional	BC	CZVR	34	CMAC-W	2900	3	3200	3	NPA
CYLD	Chapleau	ON	CZYZ	31	CMAC-E	700	2	1000	3	NPA
CYYG	Charlottetown	PE	CZQM	33	CMAC-E	200	½	600	2	1 ILS RVR
CYMT	Chibougamau/Chapais	ON	CZUL	34	CMAC-E	400	1 ¼	800	2 ¼	NPA
CZUM	Chuchill Falls	NL	CZQX	33	CMAC-E	400	1 ¼	800	2 ¼	NPA
CYYQ	Churchill	MB	CZWG	34	CMAC-W	200	¾	600	2	1 ILS
CYCY	Clyde River	NU	CZEG	32	CMAC-W	500	1 ¾	900	2 ¾	NPA
CYOD	Cold Lake/Group Captain R.W. McNair	AB	CZEG	36	DWS	200	1/2	600	2	
CYQQ	Comox	BC	CZVR	32	DWS	200	1/2	600	2	
CYZS	Coral Harbour	NU	CZEG	31	CMAC-W	400	1 1/4	800	2 1/4	NPA
CYXC	Cranbrook/Canadian Rockies Intl	BC	CZVR	36	CMAC-W	200	1/2	600	2	1 ILS
CYDN	Dauphin (Lt. Col W.G. (Billy) Barker VC Aprt)	MB	CZWG	31	CMAC-W	400	1 ¼	800	2 ¼	NPA
CYDA	Dawson City	YT	CZEG	32	CMAC-W	1600	3	2000	3	NPA
CYDQ	Dawson Creek	BC	CZEG	35	CMAC-W	500	1 1/2	800	2 1/2	NPA
CYDL	Dease Lake	BC	CZEG	31	CMAC-W	2000	3	2400	3	NPA
CYDF	Deer Lake	NL	CZQX	31	CMAC-E	200	½	600	2	1 ILS
CYWJ	Déline	NT	CZEG	34	CMAC-W	500	1 1/2	800	2 1/2	NPA
CYHD	Dryden Regional	ON	CZWG	35	CMAC-E	200	1	600	2	1 ILS
CYXR	Earlton (Timiscaming Regional)	ON	CZYZ	33	CMAC-E	500	1 ½	800	2 ½	NPA
CYXD	Edmonton City Centre (Blatchford Field)	AB	CZEG	33	CMAC-W	300	1	800	2	NPA
CYEG	Edmonton Intl	AB	CZEG	32	CMAC-W	200	½	400	1	2 ILS RVR
CYED	Edmonton/Namao (Heli)	AB	CZEG	32	DWS	600	2	900	3	A
CYOA	Ekati	NT	CZEG	32	CMAC-W	300	1	800	2	RCAP
CYEU	Eureka	NU	CZEG	35	CMAC-W	500	1 1/2	800	2 1/2	NPA

CZFA	Faro	YT	CZEG	37	CMAC-W	2300	3	2700	3	NPA
CYPY	Fort Chipewyan	AB	CZEG	35	CMAC-W	500	1 ½	800	2 ½	NPA
CYGH	Fort Good Hope	NT	CZEG	32	CMAC-W	400	1 1/4	800	2 1/4	NPA
CYMM	Fort McMurray	AB	CZEG	35	CMAC-W	200	½	600	2	1 ILS
CZFM	Fort McPherson	NT	CZEG	32	CMAC-W	500	1 3/4	900	2 3/4	NPA
CYYE	Fort Nelson	BC	CZEG	35	CMAC-W	200	1/2	600	2	1 ILS
CYFS	Fort Simpson	NT	CZEG	31	CMAC-W	300	1	800	2	NPA
CYSM	Fort Smith	NT	CZEG	35	CMAC-W	300	1	800	2	NPA
CYXJ	Fort St. John	BC	CZEG	35	CMAC-W	200	1/2	600	2	1 ILS RVR
CYFC	Fredericton Intl	NB	CZQM	31	CMAC-E	200	1/2	600	2	1 ILS
CYCX	Gagetown (Heli)	NB	CZQM	34	DWS	500	1/2	-	-	A
CYRA	Gamèti/Rae Lakes	NT	CZEG	34	CMAC-W	500	1	800	2	NPA
CYQX	Gander Intl	NL	CZQX	35	CMAC-E	200	½	400	1	2 ILS
CYGP	Gaspé	QC	CZUL	34	CMAC-E	500	1 1/2	800	2 1/2	NPA
CYGQ	Geraldton (Greenstone Regional)	ON	CZWG	34	CMAC-E	400	1 ¼	800	2 ¼	NPA
CYGX	Gillam	MB	CZWG	33	CMAC-W	400	1	800	2	NPA
CYHK	Gjoa Haven	NU	CZEG	32	CMAC-W	500	1 ½	800	2 ½	NPA
CYYR	Goose Bay	NL	CZQX	36	DWS	200	1/2	600	2	
CYZE	Gore Bay-Manitoulin	ON	CZYZ	34	CMAC-E	400	1 1/4	800	2 1/4	NPA
CYQU	Grande Prairie	AB	CZEG	33	CMAC-W	200	½	600	2	1 ILS
CYZX	Greenwood	NS	CZQM	32	DWS	200	1/2	600	2	
CYAW	Halifax/Shearwater (Heli)	NS	CZQM	34	DWS	200	1/2	600	2	A
CYHZ	Halifax/Stanfield Intl	NS	CZQM	34	CMAC-E	100	1/4	400	1	3 ILS CAT II
CYUX	Hall Beach	NU	CZEG	34	CMAC-W	400	1 1/4	800	2 1/4	NPA
CYHM	Hamilton	ON	CZYZ	36	CMAC-E	100	1/4	600	2	1 ILS RVR
CYGV	Havre St-Pierre	QC	CZUL	33	CMAC-E	300	1	800	2	NPA
CYHY	Hay River	NT	CZEG	34	CMAC-W	200	½	600	2	1 ILS
CYOJ	High Level	AB	CZEG	35	CMAC-W	400	1 1/4	800	2 1/4	NPA
CYGT	Igloolik	NU	CZEG	32	CMAC-W	600	2	900	3	NPA
CYGR	Îles-de-la-Madeleine	QC	CZQM	36	CMAC-E	300	1	800	2	NPA
CYPH	Inukjuak	QC	CZUL	34	CMAC-E	400	1 1/4	800	2 ¼	NPA
CYEV	Inuvik (Mike Zubko)	NT	CZEG	33	CMAC-W	200	½	600	2	1 ILS RVR
CYFB	Iqaluit	NU	CZUL	35	CMAC-W	200	¾	600	2	1 ILS
CYIV	Island Lake	MB	CZWG	36	CMAC-W	400	1 ¼	800	2	NPA
CYIK	Ivujivik	QC	CZUL	32	CMAC-E	500	1 ½	800	2 ½	NPA
CYKA	Kamloops	BC	CZVR	36	CMAC-W	2200	3	2500	3	NPA
CYYU	Kapuskasing	ON	CZYZ	31	CMAC-E	400	1 ¼	800	2 ¼	NPA
CYLW	Kelowna	BC	CZVR	33	CMAC-W	700	1 1/2	1000	3	1 ILS
CYQK	Kenora	ON	CZWG	31	CMAC-E	300	1	800	2	NPA
CYGK	Kingston	ON	CYZY	33	CMAC-E	200	1	600	2	1 ILS
CYKF	Kitchener/Waterloo	ON	CYZY	33	CMAC-E	200	¾	600	2	1 ILS
CYBB	Kugaaruk	NU	CZEG	33	CMAC-W	600	1 ¾	900	2 ¾	NPA
CYCO	Kugluktuk	NU	CZEG	36	CMAC-W	500	1 1/2	800	2 1/2	NPA
CYVP	Kuujjuaq	QC	CZUL	35	CMAC-E	200	½	600	2	1 ILS RVR
CYGW	Kuujjuarapik	QC	CZUL	33	CMAC-E	400	1 1/4	800	2 1/4	NPA
CYGL	La Grande Rivière	QC	CZUL	33	CMAC-E	400	1 ¼	800	2 ¼	NPA
CYAH	La Grande-4	QC	CZUL	33	CMAC-E	500	1 ½	800	2 ½	NPA
CYVC	La Ronge (Barber Field)	SK	CZWG	33	CMAC-W	400	1 ½	800	2 ½	NPA
CYQL	Lethbridge County	AB	CZEG	32	CMAC-W	200	½	600	2	1 ILS
CYLL	Lloydminster	AB	CZEG	32	CMAC-W	400	1 1/4	800	2 1/4	NPA
CYXU	London	ON	CYZY	32	CMAC-E	200	½	600	2	1 ILS RVR
CYBX	Lourdes-de-Blanc-Sablon	QC	CZUL	33	CMAC-E	400	1	800	2	NPA
CYLK	Lutselk'e	NT	CZEG	34	CMAC-W	600	1 3/4	900	2 3/4	NPA
CYYL	Lynn Lake	MB	CZWG	35	CMAC-W	400	1 ¼	800	2 ¼	NPA
CYZY	MacKenzie	BC	CZVR	32	CMAC-W	700	2 1/4	1000	3	NPA
CYSP	Marathon	ON	CZYZ	31	CMAC-E	700	2	1000	3	NPA
CYMH	Mary's Harbour	NL	CZQX	33	CMAC-E	500	1 ½	800	2 1/2	NPA
CZMT	Masset	BC	CZVR	34	CMAC-W	500	1 ¾	800	2 ¾	NPA
CYMA	Mayo	YT	CZEG	31	CMAC-W	2100	3	2400	3	NPA
CYXH	Medicine Hat	AB	CZEG	35	CMAC-W	400	1 ¼	800	2 ¼	NPA
CYQM	Moncton/Greater Moncton Intl	NB	CZQM	32	CMAC-E	200	½	400	1	2 ILS RVR
CYYY	Mont-Joli	QC	CZUL	34	CMAC-E	300	1	800	2	NPA

CYMX	Montréal Intl (Mirabel)	QC	CZUL	34	CMAC-E	100	1/4	400	1	2 ILS CAT II
CYUL	Montréal/Pierre Elliott Trudeau Intl	QC	CZUL	33	CMAC-E	100	1/4	400	1	2 ILS CAT II
CYHU	Montréal/St-Hubert	QC	CZUL	33	CMAC-E	200	½	600	2	1 ILS RVR
CYMJ	Moose Jaw/R Vice Marshal C.M. McEwen	SK	CZWG	33	DWS	200	1/2	600	2	
CYMO	Moosonee	ON	CZYZ	32	CMAC-E	300	1	800	2	NPA
CYQA	Muskoka	ON	CZYZ	33	CMAC-E	500	1 ½	800	2 ½	NPA
CYDP	Nain	NL	CZQX	33	CMAC-E	1500	3	1800	3	NPA
CYCD	Nanaimo	BC	CZVR	34	CMAC-W	500	1 3/4	800	2 3/4	NPA
CYNA	Natashquan	QC	CZUL	31	CMAC-E	300	1	800	2	NPA
CYVQ	Norman Wells	NT	CZEG	34	CMAC-W	500	1 3/4	900	2 ¾	NPA
CYQW	North Battleford (Cameron McIntosh)	SK	CZWG	35	CMAC-W	500	1 ½	800	2 ½	NPA
CYYB	North Bay	ON	CZYZ	32	CMAC-E	200	½	600	2	1 ILS RVR
CYNE	Norway House	MB	CZWG	33	CMAC-W	500	1 ½	800	2 ½	NPA
CYOC	Old Crow	YT	CZEG	32	CMAC-W	1100	3	1400	3	NPA
CYND	Ottawa/Gatineau	QC	CZUL	35	CMAC-E	400	1 1/4	800	2 1/4	NPA
CYOW	Ottawa/MacDonald-Cartier Intl	ON	CZUL	33	CMAC-E	200	½	400	1	2 ILS RVR
CYXP	Pangnirtung	NU	CZEG	33	CMAC-W	2500	3	2800	3	NPA
CYPC	Paulatuk	NT	CZEG	36	CMAC-W	300	1	800	2	NPA
CYPE	Peace River	AB	CZEG	35	CMAC-W	300	1	800	2	NPA
CYYF	Penticton	BC	CZVR	32	CMAC-W	2500	3	2800	3	NPA
CYWA	Petawawa	ON	CZYZ	31	DWS	700	2	1000	3	
CYPQ	Peterborough	ON	CZYZ	33	CMAC-E	500	1 1/2	800	2 1/2	NPA
CYPL	Pickle Lake	ON	CZWG	33	CMAC-E	500	1 ½	800	2 ½	NPA
CYIO	Pond Inlet	NU	CZEG	33	CMAC-W	600	2	900	3	NPA
CYZT	Port Hardy	BC	CZVR	36	CMAC-W	200	1	600	2	1 ILS
CYPG	Portage La Prairie/Southport	MB	CZWG	31	DWS	200	1/2	800	2	
CYPA	Prince Albert (Glassfield)	SK	CZWG	32	CMAC-W	200	½	600	2	1 ILS RVR
CYXS	Prince George	BC	CZVR	32	CMAC-W	200	½	600	2	1 ILS RVR
CYPR	Prince Rupert	BC	CZVR	31	CMAC-W	200	½	600	2	1 ILS
CYPX	Puvirnituk	QC	CZUL	31	CMAC-E	400	1 1/4	800	2 1/4	NPA
CYVM	Qikiqtarjuaq	NU	CZEG	36	CMAC-W	2000	3	2300	3	NPA
CYHA	Quaqtaq	QC	CZUL	36	CMAC-E	400	1 ¼	800	2 ¼	NPA
CYQB	Québec/Jean Lesage Intl	QC	CZUL	36	CMAC-E	200	½	600	2	1 ILS RVR
CYQZ	Quesnel	BC	CZVR	33	CMAC-W	800	2 1/4	1100	3	NPA
CYRT	Rankin Inlet	NU	CZEG	31	CMAC-W	300	1	800	2	NPA
CYQF	Red Deer Regional	AB	CZEG	36	CMAC-W	300	1	800	2	NPA
CYRL	Red lake	ON	CZWG	32	CMAC-E	400	1 ½	800	2 ½	NPA
CYQR	Regina Intl	SK	CZWG	33	CMAC-W	200	½	600	2	1 ILS RVR
CYUT	Repulse Bay	NU	CZEG	32	CMAC-W	600	2	900	3	NPA
CYRB	Resolute Bay	NU	CZEG	36	CMAC-W	200	½	600	2	1 ILS
CYRJ	Roberval	QC	CZUL	37	CMAC-E	300	1	800	2	NPA
CYUY	Rouyn-Noranda	QC	CZUL	33	CMAC-E	400	1 ¼	800	2 ¼	NPA
CWSA	Sable Island	NS	CZQM	33	CMAC-E	500	1	1000	3	No Pub. Appch
CYSY	Sachs Harbour	NT	CZEG	34	CMAC-W	300	1	800	2	NPA
CYSJ	Saint John	NB	CZQM	35	CMAC-E	200	½	400	1	2 ILS RVR
CYZP	Sandspit	BC	CZVR	34	CMAC-W	200	1	600	2	1 ILS
CYZR	Sarnia (Chris Hadfield)	ON	CZYZ	31	CMAC-E	200	½	600	2	1 ILS RVR
CYXE	Saskatoon/John G. Diefenbaker Intl	SK	CZWG	33	CMAC-W	200	½	600	2	1 ILS RVR
CYAM	Sault Ste. Marie	ON	CZYZ	32	CMAC-E	200	½	600	2	1 ILS RVR
CYKL	Schefferville	QC	CZUL	33	CMAC-E	300	1	800	2	NPA
CYZV	Sept-Îles	QC	CZUL	34	CMAC-E	200	½	600	2	1 ILS RVR
CYSC	Sherbrooke	QC	CZUL	34	CMAC-E	300	1	800	2	NPA
CYXL	Sioux Lookout	ON	CZWG	33	CMAC-E	300	1	800	2	NPA
CYZH	Slave Lake	AB	CZEG	33	CMAC-W	500	1 1/2	800	2 1/2	NPA
CYYD	Smithers	BC	CZVR	32	CMAC-W	700	2	1000	3	NPA
CYSN	St Catharines/Niagara District)	ON	CZYZ	31	CMAC-E	500	1 1/2	800	2 1/2	NPA
CYAY	St. Anthony	NL	CZQX	33	CMAC-E	300	1	800	2	NPA
CYYT	St. John's Intl	NL	CZQX	34	CMAC-E	100	1/4	400	1	4 ILS CAT II

CYJT	Stephenville	NL	CZQX	34	CMAC-E	300	¾	600	2	1 ILS
CYSF	Stony Rapids	SK	CZEG	34	CMAC-W	500	1 ½	800	2 ½	NPA
CYSB	Sudbury	ON	CZYZ	32	CMAC-E	200	½	600	2	1 ILS RVR
CYYN	Swift Current	SK	CZWG	33	CMAC-W	300	1 ¼	800	2 ¼	NPA
CYQY	Sydney/J.A. Douglas McCurdy	NS	CZQM	32	CMAC-E	200	½	600	2	1 ILS RVR
CYYH	Taloyoak	NU	CZEG	34	CMAC-W	500	1 ½	800	2 ½	NPA
CYTQ	Tasiujaq	QC	CZUL	36	CMAC-E	400	1 ¼	800	2 ¼	NPA
CYXT	Terrace	BC	CZVR	33	CMAC-W	300	1	600	2	1 ILS
CYZW	Teslin	YT	CZEG	31	CMAC-W	1700	3	2000	3	NPA
CYQD	The Pas	MB	CZWG	35	CMAC-W	400	1 ¼	800	2 ¼	NPA
CYTH	Thompson	MB	CZWG	32	CMAC-W	200	½	600	2	1 ILS RVR
CYQT	Thunder Bay	ON	CZWG	32	CMAC-E	200	½	600	2	1 ILS RVR
CYTS	Timmins/Victor M. Power	ON	CZYZ	33	CMAC-E	200	½	600	2	1 ILS RVR
CYAZ	Tofino	BC	CZVR	33	CMAC-W	500	1 ½	800	2 ½	NPA
CYTZ	Toronto/Billy Bishop Toronto City Airport	ON	CZYZ	31	CMAC-E	300	1	600	2	1 ILS
CYKZ	Toronto/Buttonville Muni	ON	CZYZ	33	CMAC-E	400	1 ¼	800	2 ¼	NPA
CYYZ	Toronto/Lester B. Pearson Intl	ON	CYZY	33	CMAC-E	100	1/4	400	1	ILS CAT III
CYTR	Trenton	ON	CZYZ	33	DWS	200	1/2	600	2	
CYUB	Tuktoyaktuk/James Gruben	NT	CZEG	33	CMAC-W	500	1 ½	800	2 ½	NPA
CYHI	Ulukhaktok/Holman	NT	CZEG	35	CMAC-W	500	1 ½	800	2 ½	NPA
CYOY	Valcartier (W/C J.H.L. (Joe) Lecomte) (Heli)	QC	CZUL	35	DWS	-	-	-	-	A
CYVO	Val-d'Or	QC	CZUL	33	CMAC-E	200	½	600	2	1 ILS RVR
CYVR	Vancouver Intl	BC	CZVR	33	CMAC-W	100	1/4	400	1	2 ILS CAT III
CYWH	Victoria Harbour (Water Aerodrome)	BC	CZVR	31	CMAC-W	600	3/4	800	1	NPA
CYYJ	Victoria Intl	BC	CZVR	31	CMAC-W	200	½	400	1	2 ILS RVR
CYWK	Wabush	QC	CZUL	31	CMAC-E	200	½	600	2	1 ILS
CYKQ	Waskaganish	QC	CZUL	34	CMAC-E	500	1 ½	800	2 ½	NPA
CYQH	Watson Lake	YT	CZEG	33	CMAC-W	200	¾	600	2	1 ILS
CYXZ	Wawa	ON	CZYZ	35	CMAC-E	800	2 ¼	1100	3	NPA
CYZU	Whitecourt	AB	CZEG	33	CMAC-W	300	1	800	2	NPA
CYXY	Whitehorse Intl	YT	CZEG	32	CMAC-W	200	½	600	2	1 ILS RVR
CYVV	Wiarton	ON	CZYZ	35	CMAC-E	400	1 ¼	800	2 ¼	NPA
CYWL	Williams Lake	BC	CZVR	33	CMAC-W	500	1 ¾	900	2 3/4	NPA
CYQG	Windsor	ON	CYZY	31	CMAC-E	200	½	600	2	1 ILS RVR
CYWG	Winnipeg/James Armstrong Richardson Intl	MB	CZWG	33	CMAC-W	100	1/4	400	1	2 ILS CAT II
CYQI	Yarmouth	NS	CZQM	32	CMAC-E	200	½	600	2	1 ILS RVR
CYZF	Yellowknife	YT	CZEG	34	CMAC-W	200	½	600	2	1 ILS RVR
CYQV	Yorkton Muni	SK	CZWG	35	CMAC-W	300	1	800	2	NPA

Notes:
CMAC-W = Canadian Meteorological Aviation Centre – West
CMAC-E = Canadian Meteorological Aviation Centre – East
DWS = Defense Weather Services
NPA = Non Precision Approach
RVR = Runway Visual Range
CAP = Canada Air Pilot
ILS = Instrument Landing System;
CAT (I, II or III) = ILS Categories I, II or III
A = Landing limits at heliports are best IFR approach limits. Gagetown CYCX, Borden CYBN, Namao CYED, Petawawa CYWA, and Valcartier CYOY are not IFR aerodromes.
B = DND aerodrome with TAF issued by CMAC-W

APPENDIX D

Sites for Which FDs are Issued

Std ID	Station's Name	Province, Territory or Nation	Altitude (m)	Altitude (ft)	Lat. (N)	Long. (W)
FVP	**ST-PIERRE**	France	3	10	46° 46’	56° 10’
UHA	**QUAQTAQ**	Quebec	32	105	61° 03’	69° 37’
VBI	**4928N 9403W**	Ontario	361	1184	49° 28’	94° 03’
WCK	**7400N 13500W**	NWT	0	0	74° 00’	135° 00’
WCM	**7000N 11500W**	NWT	254	833	70° 00’	115° 00’
WDG	**8000N 11500W**	N.W.T	0	0	80° 00’	115° 00’
WFA	**6200N 5600W**	Greenland	0	0	62° 00’	56° 00’
WFB	**7200N 6200W**	Greenland	0	0	72° 00’	62° 00’
WFC	**6600N 5400W**	Greenland	0	0	66° 00’	54° 00’
WFK	**8900N7500W**	Nunavut	0	0	89° 00’	75° 00’
WJQ	**7600N14000W**	NWT	0	0	76° 00’	140° 00’
WKJ	**6300N 10700W**	NWT	380	1247	63° 00’	107° 00’
WKQ	**8500N 07000W**	Nunavut	0	0	85° 00’	70° 00’
WKZ	**5700N 08900W**	Nunavut	0	0	57° 00’	89° 00’
WLL	**8200N 14000W**	NWT	0	0	82° 00’	140° 00’
WLR	**6100N 08000W**	Nunavut	0	0	61° 00’	80° 00’
WOM	**5800N 06000W**	Newfoundland	0	0	58° 00’	60° 00’
WOP	**6700N 05000W**	Greenland	309	1014	67° 00’	50° 00’
WOX	**5900N 05000W**	Greenland	0	0	59° 00’	50° 00’
WPM	**4700N 04900W**	Newfoundland	0	0	47° 00’	49° 00’
WPV	**6700N 06000W**	Nunavut	0	0	67° 00’	60° 00’
WRS	**7800N 13000W**	NWT	0	0	78° 00’	130° 00
WUA	**7300N 11000W**	Nunavut	0	0	73° 00’	110° 00’
WUB	**6500N 10500W**	Nunavut	244	801	65° 00’	105° 00’
WUC	**5500N 09500W**	Manitoba	176	577	55° 00’	95° 00’
WUD	**6000N 08500W**	Nunavut	0	0	60° 00’	85° 00’

Std ID	Station's Name	Province, Territory or Nation	Altitude (m)	Altitude (ft)	Lat. (N)	Long. (W)
WUE	**5500N 08500W**	Ontario	65	213	55° 00’	85° 00’
WUF	**5100N 07500W**	Quebec	402	1319	51° 00’	75° 00’
WUG	**5700N 07300W**	Quebec	293	961	57° 00’	73° 00’
WUI	**5200N 10100W**	Manitoba	526	1726	52° 00’	101° 00’
WUJ	**5300N 09736W**	Manitoba	217	712	53° 00’	97° 36’
WZJ	**8106N 07018W**	Nunavut	1281	4203	81° 06’	70° 18’
XAA	**8500N 14000W**	NWT	0	0	85° 00’	140° 00’
XAB	**8500N 12000W**	NWT	0	0	85° 00’	120° 00’
XAD	**85.0N 90.0W**	Nunavut	0	0	85° 00’	90° 00’
XAE	**8500N 06000W**	Greenland	0	0	85° 00’	60° 00’
XBA	**8000N 14000W**	NWT	0	0	80° 00’	140° 00’
XBB	**8000N 12000W**	NWT	0	0	80° 00’	120° 00’
XBM	**8000N 10000W**	Nunavut	1	3	80° 00’	100° 00’
XBS	**8000N 06000W**	Greenland	307	1007	80° 00’	60° 00’
XBT	**8400N10000W**	Nunavut	0	0	84° 00’	100° 00’
XCB	**7730N 13000W**	NWT	0	0	77° 30’	130° 00’
XCC	**7730N 11000W**	Nunavut	0	0	77° 30’	110° 00’
XCE	**7730N 09000W**	Nunavut	20	66	77° 30’	90° 00’
XCF	**7730N 07500W**	Greenland	0	0	77° 30’	75° 00’
XCN	**7630N 06850W**	Greenland	158	518	76° 30’	68° 50’
XDA	**7500N 14000W**	NWT	0	0	75° 00’	140° 00’
XDB	**7500N 13000W**	NWT	0	0	75° 00’	130° 00’
XDC	**7500N 12000W**	NWT	0	0	75° 00’	120° 00’
XDD	**7500N 11000W**	Nunavut	141	463	75° 00’	110° 00’
XDF	**7500N 07000W**	Greenland	0	0	75° 00’	70° 00’
XDH	**7430N 08230W**	Nunavut	0	0	74° 50’	82° 30’
XDJ	**8900N 14000W**	NWT	0	0	89° 00’	140° 00’
XEE	**7000N 14000W**	NWT	0	0	70° 00’	140° 00’
XEF	**7000N 13000W**	NWT	1	3	70° 00’	130° 00’
XEH	**7000N 12000W**	NWT	0	0	70° 00’	120° 00’
XEJ	**7000N 09000W**	Nunavut	0	0	70° 00’	90° 00’

Std ID	Station's Name	Province, Territory or Nation	Altitude (m)	Altitude (ft)	Lat. (N)	Long. (W)
XEK	7000N 6000W	Greenland	0	0	70° 00'	60° 00'
XUH	4800N 07500W	Quebec	609	1998	48° 00'	75° 00'
YAB	7300N 8530W	Nunavut	10	33	73° 00'	85° 30'
YAH	LA GRANDE IV	Quebec	313	1027	53° 45'	73° 41'
YAM	SAULT STE-MARIE	Ontario	192	630	46° 29'	84° 31'
YAY	ST. ANTHONY	Newfoundland	28	92	51° 24	56° 05'
YBK	BAKER LAKE	Nunavut	18	59	64° 18'	96° 05'
YBR	BRANDON	Manitoba	409	1342	49° 55'	99° 57'
YCB	CAMBRIDGE BAY	Nunavut	27	89	69° 06'	105° 08'
YCO	KUGLUKTUK	Nunavut	22	72	67° 49'	115° 09'
YDB	BURWASH,	Yukon	807	2648	61° 22'	139° 02'
YDL	DEASE LAKE	British Columbia	816	2677	58° 25'	130° 02'
YEA	EMPRESS	Alberta	676	2218	50° 56'	110° 01'
YEG	EDMONTON	Alberta	723	2372	53° 19'	113° 35'
YEI	6108N 10055W	Nunavut	353	1158	61° 08'	100° 55'
YEO	5151N 6317W	Quebec	589	1933	51° 51'	63° 17'
YEU	EUREKA	Nunavut	10	33	80° 00'	85° 49'
YEV	INUVIK	NWT	68	223	68° 18'	133° 29'
YFB	IQALUIT	Nunavut	34	112	63° 45'	68° 33'
YFC	FREDERICTON	New Brunswick	20	66	45° 52'	66° 32'
YFN	5722N 10708W	Saskatchewan	484	1588	57° 22'	107° 08'
YFS	FORT SIMPSON	NWT	169	554	61° 46'	121° 14'
YGP	GASPE	Quebec	33	108	48° 47'	64° 29'
YGR	ÎLES DE LA MADELEINE	Quebec	10	33	47° 25'	61° 47'
YGW	KUUJJUARAPIK	Quebec	10	33	55° 17'	77° 46'
YHO	HOPEDALE	Newfoundland	8	26	55° 27'	60° 14'
YHZ	HALIFAX	Nova Scotia	145	476	44° 53'	63° 31'
YIC	7847N 10333W	Nunavut	58	190	78° 47'	103° 33'
YIF	ST-AUGUSTIN	Quebec	305	1001	51° 13'	58° 39'
YIX	6606N 11756W	NWT	156	512	66° 06'	117° 56'

Std ID	Station's Name	Province, Territory or Nation	Altitude (m)	Altitude (ft)	Lat. (N)	Long. (W)
YJA	**JASPER**	Alberta	1020	3347	53° 00’	118° .04’
YJT	**STEPHENVILLE**	Newfoundland	26	85	48° 33’	58° 33’
YKA	**KAMLOOPS**	British Columbia	346	1135	50° 42’	120° 27’
YKL	**SCHEFFERVILLE**	Quebec	522.1	1713	54° 48’	66° 48’
YLT	**ALERT**	Nunavut	31	102	82° 31’	62° 17’
YMA	**MAYO**	Yukon	504	1654	63° 37’	135° 52’
YMD	**7614N 11919W**	NWT	12	39	76° 14’	119° 19’
YMM	**FORT MCMURRAY**	Alberta	369	1211	56° 39’	111° 13’
YMO	**MOOSONEE**	Ontario	9	30	51° 17’	80° 36’
YMT	**CHIBOUGAMAU**	Quebec	387	1270	49° 46’	74° 32’
YMV	**5040N 6850W**	Quebec	399	1309	50° 40’	68° 50’
YMW	**MANIWAKI**	Quebec	201	659	46° 16’	75° 59’
YNA	**NATASHQUAN**	Quebec	117	36	50° 11’	61° 47’
YNC	**WEMINDJI**	Quebec	14	46	53° 01’	78° 50’
YNI	**5317N 7054W**	Quebec	489	1604	53° 17’	70° 54’
YNM	**MATAGAMI**	Quebec	281	922	49° 46’	77° 48’
YOC	**OLD CROW**	Yukon	251	824	67° 34’	139° 50’
YOD	**COLD LAKE**	Alberta	541	1775	54° 24’	110° 17’
YOJ	**HIGH LEVEL**	Alberta	338	1109	58° 37’	117° 10’
YOW	**OTTAWA**	Ontario	116	381	45° 19’	75° 40’
YPH	**INUKJUAK**	Quebec	25	83	58° 28’	78° 05’
YPU	**PUNZI MOUNTAIN**	British Columbia	1214	3983	52° 07’	124° 09’
YQB	**QUEBEC**	Quebec	74	243	46° 47’	71° 24’
YQD	**THE PAS**	Manitoba	271	889	53° 58’	101° 05’
YQG	**WINDSOR**	Ontario	190	623	42° 17’	82° 57’
YQH	**WATSON LAKE**	Yukon	690	2264	60° 07’	128° 49’
YQI	**YARMOUTH**	Nova Scotia	43	141	43° 50’	66° 05’
YQL	**LETHBRIDGE**	Alberta	929	3048	49° 38’	112° 48’
YQM	**MONCTON**	New Brunswick	72	236	46° 07’	64° 41’
YQR	**REGINA**	Saskatchewan	577	1893	50° 26’	104° 40’

Std ID	Station's Name	Province, Territory or Nation	Altitude (m)	Altitude (ft)	Lat. (N)	Long. (W)
YQT	**THUNDER BAY**	Ontario	199	653	48° 22’	89° 19’
YQX	**GANDER**	Newfoundland	151	495	48° 56’	54° 34’
YQY	**SYDNEY**	Nova Scotia	62	203	46° 10’	60° 03’
YRB	**RESOLUTE BAY**	Nunavut	67	220	74° 43’	94.58’
YRI	**RIVIERE DU LOUP**	Quebec	148	486	47° 46’	69° 35’
YRL	**RED LAKE**	Ontario	383	1257	51° 04’	93° 48’
YRT	**RANKIN INLET**	Nunavut	32	105	62° 49’	92° 07’
YSA	**4356N 6000W**	Nova Scotia	4	13	43° 56’	60° 00’
YSC	**SHERBROOKE**	Quebec	241	791	45° 26’	71° 41’
YSM	**FORT SMITH**	NWT	205	673	60° 01’	111° 58’
YSV	**5828N 6239W**	Newfoundland	501	1644	58° 28’	62° 39’
YSY	**SACHS HARBOUR**	NWT	86	282	72°.00’	125° 15’
YTE	**CAPE DORSET**	Nunavut	50	164	64° 14’	76° 32’
YTF	**ALMA**	Quebec	99	325	48° 31’	71° 39’
YTL	**BIG TROUT LAKE**	Ontario	224	735	53° 49’	89° 54’
YUL	**MONTREAL/DORVAL**	Quebec	366	118	45° 28’	73° 44’
YUW	**6838N 7108W**	Nunavut	527	1729	68° 38’	71° 08’
YUX	**HALL BEACH**	Nunavut	8	26	68° 47’	81° 15’
YVC	**LA RONGE**	Saskatchewan	379	1243	55° 09’	105° 16’
YVN	**6636N 6134W**	Nunavut	722	2369	66° 36’	61° 34’
YVO	**VAL D'OR**	Quebec	337	1106	48° 03’	77° 47’
YVP	**KUUJJUAQ**	Quebec	37	121	58° 06’	68° 26’
YVQ	**NORMAN WELLS**	NWT	74	243	65° 17’	126° 48’
YVR	**VANCOUVER**	British Columbia	2	7	49° 12’	123° 11’
YVV	**WIARTON**	Ontario	222	728	44° 45’	81° 06’
YWG	**WINNIPEG**	Manitoba	239	784	49° 55’	97° 14’
YWK	**WABUSH**	Newfoundland	551	1808	52° 55’	66° 52’
YXC	**CRANBROOK**	British Columbia	939	3081	49° 37’	115° 47’
YXE	**SASKATOON**	Saskatchewan	504	1654	52° 10’	106° 42’
YXJ	**FORT ST. JOHN**	British Columbia	695	2280	56° 14’	120° 44’

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YXS	**PRINCE GEORGE**	British Columbia	691	2267	53° 53’	122° 41’
YXY	**WHITEHORSE**	Yukon	703	2307	60° 43’	135° 04’
YYB	**NORTH BAY**	Ontario	371	1217	46° 22’	79° 25’
YYC	**CALGARY**	Alberta	1084	3557	51° 07’	114° 01’
YYD	**SMITHERS**	British Columbia	523	1716	54° 49’	127° 11’
YYE	**FORT NELSON**	British Columbia	382	1253	58° 50’	122° 36’
YYF	**PENTICTON**	British Columbia	344	1129	49° 28’	119° 36’
YYH	**TOLOYOAK**	Nunavut	28	92	69° 33’	93° 35’
YYL	**LYNN LAKE**	Manitoba	3567	1171	56° 52’	101° 05’
YYQ	**CHURCHILL**	Manitoba	29	95	58° 44’	94° 04’
YYR	**GOOSE BAY**	Newfoundland	49	161	53° 19’	60° 26’
YYT	**ST. JOHN'S**	Newfoundland	140	459	47° 37’	52° 45’
YYU	**KAPUSKASING**	Ontario	227	745	49° 25’	82° 28’
YYW	**ARMSTRONG**	Ontario	323	1060	50° 17’	88° 55’
YYY	**MONT JOLI**	Quebec	52	171	48° 37’	68° 12’
YYZ	**TORONTO**	Ontario	173	568	43° 41’	79° 38’
YZF	**YELLOWKNIFE**	NWT	206	676	62° 28’	114° 26’
YZG	**SALLUIT**	Quebec	226	742	62° 11’	75° 40’
YZH	**SLAVE LAKE**	Alberta	581	1906	55° 18’	114° 47’
YZP	**SANDSPIT**	British Columbia	6	20	53° 15’	131° 49’
YZS	**CORAL HARBOUR**	Nunavut	57	187	64° 12’	83° 22’
YZT	**PORT HARDY**	British Columbia	22	72	50° 41’	127° 22’
YZV	**SEPT-ILES**	Quebec	55	180	50° 13’	66° 16’

Map of Sites for Which FDs Are Issued