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AIP CANADA

Part 2

Enroute (ENR)

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PART 2 – ENROUTE (ENR)
ENR 0.

ENR 0.1 Preface

See Part 1 GEN, section GEN 0.1, “Preface.”

ENR 0.2 Record of *AIP Canada* Amendments

See Part 1 GEN, section GEN 0.2, “Record of *AIP Canada* Amendments.”

ENR 0.3 Record of *AIP Canada* Supplements

See Part 1 GEN, section GEN 0.3, “Record of *AIP Canada* Supplements.”

ENR 0.4 Checklist of *AIP Canada* Pages

See Part 1 GEN, section GEN 0.4, “Checklist of *AIP Canada* Pages.”

ENR 0.5 List of Hand Amendments to *AIP Canada*

See Part 1 GEN, section GEN 0.5, “List of Hand Amendments to *AIP Canada*.”

ENR 0.6 Table of Contents to Part 2 (ENR)

ENR 1. GENERAL RULES AND PROCEDURES

ENR 1.1 General Rules

For information on the general rules applied within Canada, refer to Part VI – General Operating and Flight Rules of the *Canadian Aviation Regulations* (CARs) available at:

<http://www.tc.gc.ca/eng/acts-regulations/regulations-sor96-433.htm>

ENR 1.2 Visual Flight Rules

For information on the visual flight rules (VFR) applied within Canadian Domestic Airspace, refer to the following sections of the *Canadian Aviation Regulations* (CARs) that are listed in Table 1.2, "Visual Flight Rules."

Table 1.2, Visual Flight Rules

Section	Title
602.114	Minimum Visual Meteorological Conditions for VFR Flight in Controlled Airspace
602.115	Minimum Visual Meteorological Conditions for VFR Flight in Uncontrolled Airspace
602.116	VFR Over the Top
602.117	Special VFR Flight

ENR 1.3 Instrument Flight Rules

For information on the instrument flight rules (IFR) applied within Canadian Domestic Airspace, refer to the following sections of the *Canadian Aviation Regulations* (CARs) that are listed in Table 1.3, "Instrument Flight Rules."

Table 1.3, Instrument Flight Rules

Section	Title
602.121	General Requirements
602.122	Alternate Aerodrome Requirements
602.123	Alternate Aerodrome Weather Minima
602.124	Minimum Altitudes to Ensure Obstacle Clearance
602.125	Enroute IFR Position Reports
602.126	Takeoff Minima
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602.128	Landing Minima
602.129 700.10	Approach Ban – General Approach Bans – Non Precision, APV and CAT I Precision
602.130 700.11	Approach Ban – CAT III Precision Approach Bans – CAT II and CAT III Precision

ENR 1.4 Air Traffic Services (ATS) Airspace Classification and Description

1.4.1 ATS Airspace Classification

For information on the airspace structure in Canada, refer to "Part VI – General Operating and Flight Rules" of the *Canadian Aviation Regulations* (CARs), Section 601.01, "Division I – Airspace Structure, Classification and Use" available at:

<https://lois-laws.justice.gc.ca/eng/regulations/SOR-96-433/FullText.html#s-601.01>

1.4.2 ATS Airspace Description

For more detail on the description of Canadian Domestic airspace, refer to the *Designated Airspace Handbook* (TP 1820E), available in PDF on the Aeronautical Information Products section of the NAV CANADA website:

<www.navcanada.ca>
Aeronautical Information
Operational Guides
Canadian Airport Charts and Designated Airspace Handbook
Designated Airspace Handbook
Download current issue

To download a chart depicting Canada's airspace classification, refer to Transport Canada's publication *Canada's Airspace: Information on Airspace Classification and Structure* (TP 6010), available at:

<https://www.tc.gc.ca/Publications/BIL/TP6010/PDF/HR/TP6010B.PDF>

ENR 1.5 Holding, Approach and Departure Procedures

1.5.1 General

For general information on holding, approach and departure procedures, refer to the *Canada Air Pilot,* General (CAP GEN).

The instrument procedures published in the *Canada Air Pilot* (CAP), Volumes 1–7, and *Restricted Canada Air Pilot* (RCAP) are considered to be public procedures. However, the instrument procedures contained in the RCAP do not meet Transport Canada Civil Aviation design criteria. Accordingly, the use of RCAP procedures is restricted to pilots-in-command operating aircraft under an air operator certificate or a private operator certificate, including the appropriate RCAP special authorization. Authorization is required from Transport Canada Civil Aviation prior to the use of any *Restricted Canada Air Pilot* procedure.

These publications are available for purchase from NAV CANADA's e-commerce store at:

<www.navcanada.ca>
Aeronautical Information
Online Store

1.5.2 Arriving Flights

For information on the procedures for arriving flights, refer to the *Transport Canada Aeronautical Information Manual* (TC AIM) (TP14371E) Section RAC 9.0, "Instrument Flight Rules (IFR) — Arrival Procedures." This publication can be found on the Transport Canada website at:

<https://www.tc.gc.ca/en/services/aviation/publications/tc-aim.html>

For arrival procedures for VFR Traffic by aerodrome, refer to the PRO section in the *Canada Flight Supplement* (CFS), Section B, "Aerodrome/Facility Directory" or *Canada Water Aerodrome Supplement* (CWAS) Section B, "Aerodrome/Facility Directory."

Specific STAR procedures are depicted by aerodrome in the respective *Canada Air Pilot* (CAP).

These publications are available for purchase from NAV CANADA's e-commerce store at:

<www.navcanada.ca>
Aeronautical Information
Online Store

1.5.3 Departing Flights

For information on the procedures for departing flights, refer to the *Transport Canada Aeronautical Information Manual* (TC AIM) (TP14371E) Section RAC 7.0, "Instrument Flight Rules – Departure Procedures." This publication can be found on the Transport Canada website at:

<https://www.tc.gc.ca/en/services/aviation/publications/tc-aim.html>

For departure procedures for VFR Traffic by aerodrome, refer to the VFR Terminal Procedures Chart (VTPC) in the *Canada Flight Supplement* (CFS), Section B, "Aerodrome/Facility Directory" or *Canada Water Aerodrome Supplement* (CWAS) Section B, "Aerodrome/Facility Directory."

Specific SID procedures are depicted by aerodrome in the respective *Canada Air Pilot* (CAP).

These publications are available for purchase from NAV CANADA's e-commerce store at:

<www.navcanada.ca>
Aeronautical Information
Online Store

1.5.4 Other Relevant Information and Procedures

Nil

ENR 1.6 ATS Surveillance Services and Procedures

1.6.1 Primary Radar

Canada provides ATS surveillance services using surveillance data processing systems that fuse inputs from various surveillance sources and apply a weighting to each input to produce the best possible position. Because primary surveillance radar (PSR) weighting is low, PSR in Canada is not generally relied on for the provision of ATS surveillance services.

1. At select airports, PSR inputs may be included in surveillance data processing systems to support certain operations such as the use of PSR/PAR at military airports. For a list of PSR/PAR approach civil minima see the following publication:

   – *Canada Air Pilot*, General Pages

2. For information on PSR, refer to the *Transport Canada Aeronautical Information Manual* (TC AIM) (TP14371E), Communications (COM), Section 7.0, “Surveillance,” available on the Transport Canada website at: <https://tc.canada.ca/en/aviation/publications/transport-canada-aeronautical-information-manual-tc-aim-tp-14371>.

3. For information on ATS surveillance and radio failure procedures, refer to the following publications:

   – *Canada Air Pilot*, Volumes 1–7, or *Restricted Canada Air Pilot*

   – *Canada Flight Supplement*, Section F, “Emergency” or *Canada Water Aerodrome Supplement*, Section E, “Emergency”

4. For information on voice position reporting requirements, refer to the CFS, Section B “Aerodrome/Facility Directory” under procedures for each aerodrome, CFS, Section C, “Planning” and CFS, Section E, “Military Flight Data and Procedures.” To determine the location of compulsory and on-request reporting points In Canadian domestic airspace, refer to the VFR navigation charts (VNC), VFR terminal area charts (VTA) and Enroute Charts (LO and HI).

   These publications are available for purchase from NAV CANADA’s e-commerce store at:

   <www.navcanada.ca>
   Aeronautical Information
   Online Store

5. For a map of radar coverage in Canada, see Figure 1.6.2, “Secondary Surveillance Radar Coverage”.

1.6.2 Secondary Surveillance Radar (SSR)

1. For information on SSR and transponder operating procedures refer to the *Transport Canada Aeronautical Information Manual* (TC-AIM) (TP14371E) in) Communications (COM), Section 7.0, “Surveillance,” and Section 8.0, “Transponder Operation,” available on the Transport Canada website at: <https://tc.canada.ca/en/aviation/publications/transport-canada-aeronautical-information-manual-tc-aim-tp-14371>.

2. For information on radio communications failure, unlawful interference procedures, and other emergency procedures, refer to the following publications:

   – *Canada Air Pilot*, Volumes 1–7, or *Restricted Canada Air Pilot* under SID procedures

   – *Canada Flight Supplement*, Section F, “Emergency” or *Canada Water Aerodrome Supplement*, Section E, “Emergency”

3. For SSR code assignments specific to an aerodrome or terminal airspace, refer to the *Canada Flight Supplement* or the *Canada Water Aerodrome Supplement*, Section B, "Aerodrome/Facility Directory," the PRO section. For general SSR code assignments refer to the *Canada Flight Supplement* or *Canada Water Aerodrome Supplement*, Section C "Planning" under the paragraph entitled "Use of Transponder Codes."

   These publications are available for purchase from NAV CANADA's e-commerce store at:

   <www.navcanada.ca>
   Aeronautical Information
   Online Store

4. For information on CPDLC position reporting requirements, refer to GEN 3.4.4, "Requirements and Conditions" in the AIP under subsection 3.4.4.2, "Data Link Services."

5. For a map of SSR coverage in Canada, see Figure 1.6.2, "Secondary Surveillance Radar Coverage."

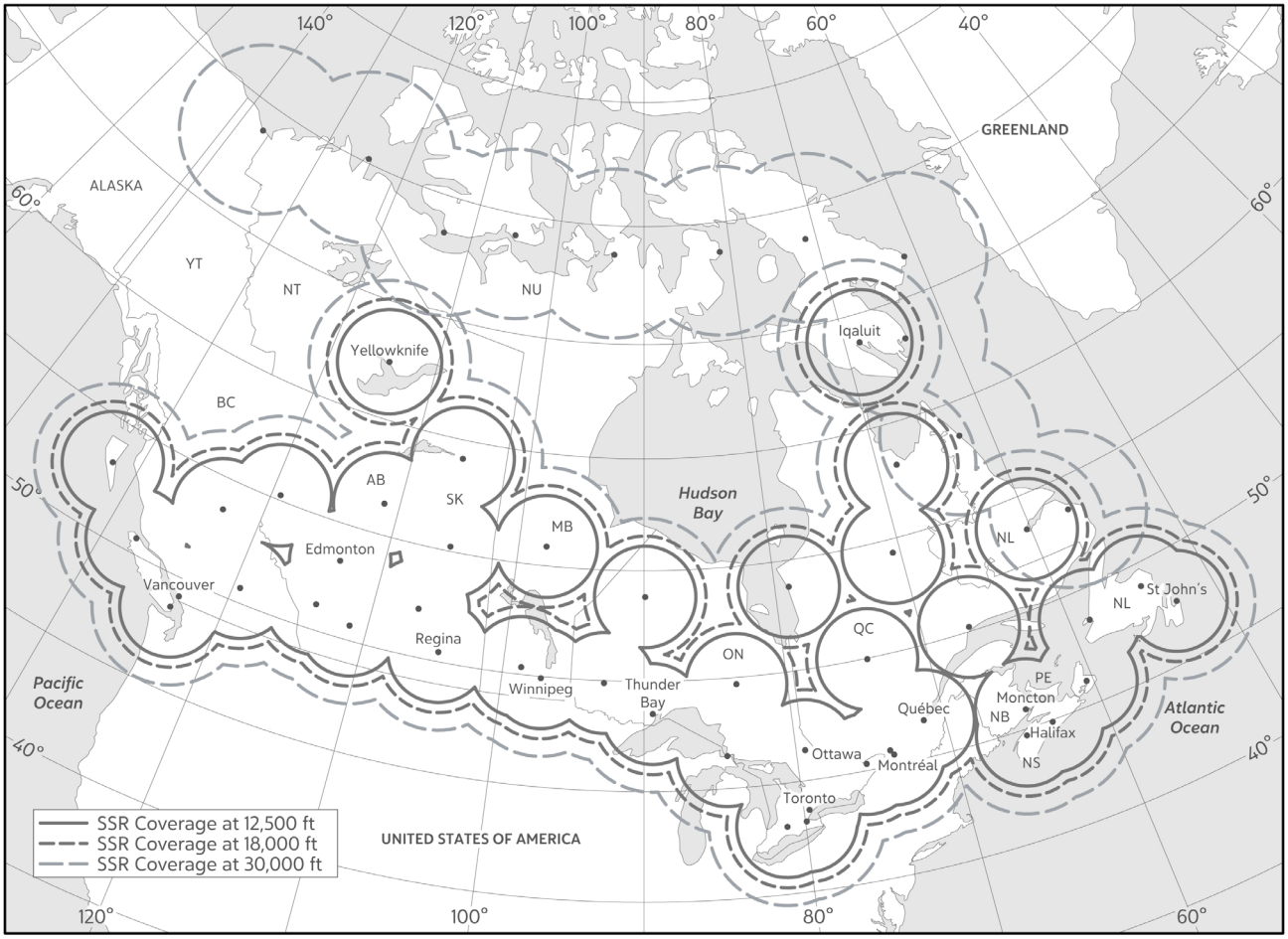

Figure 1.6.2, Secondary Surveillance Radar Coverage.

1.6.3 Automatic Dependent Surveillance–Broadcast (ADS-B)

ADS-B is mandatory in Canadian domestic Class A and Class B airspace, as described in the Designated Airspace Handbook available here: https://www.navcanada.ca/en/aeronautical-information/operational-guides.aspx

To demonstrate compliance with the Canadian ADS-B Out mandate, aircraft are required to:

- be equipped with an appropriate transponder with ADS-B Out capabilities that performs to the Minimum Operational Performance Standards of RTCA DO-260B, or newer; and
- have antenna capability for broadcast toward both ground-based as well as space-based ADS-B receivers. This requirement can be met either through antenna diversity (the use of a top and bottom antenna) or with a single antenna capable of transmitting both towards the ground and up towards satellites.

Aircraft equipment and installation requirements are defined in Airworthiness Chapter 551 - Aircraft Equipment and Installation - Canadian Aviation Regulations (CARs) section 551.103 - Transponder and Automatic Pressure Altitude Reporting Equipment available here: <https://tc.canada.ca/en/corporate-services/acts-regulations/list-regulations/canadian-aviation-regulations-sor-96-433/standards/airworthiness-chapter-551-aircraft-equipment-installation-canadian-aviation-regulations-cars#551_103:

Operators that do not meet the criteria will be added to an ADS-B Exclusion List (AEL). The AEL is used to manage ADS-B data that is received by a radar data processor (RDP). The AEL contains a list of aircraft and their ICAO 24-bit aircraft address. ADS-B data associated with any 24-bit aircraft address found on the AEL is discarded and not used in the surveillance picture. Radar and other non-ADS-B surveillance information is still available; only ADS-B sources are discarded. This AEL filtering is transparent to aircraft, as the ADS-B is still broadcasting and any receiver within range will still be able to detect the aircraft; only the RDP and its downstream systems are affected. Public aircraft tracking sites are also not affected by AEL filtering. In areas where ADS-B is the only available form of surveillance, ATS will not display the aircraft and it will not receive ADS-B surveillance services. There is no impact to surveillance service in areas where there is another form of surveillance available. As part of the ADS-B message, quality parameters are also transmitted. Any aircraft that has shown incorrect ADS-B position information associated with good ADS-B quality indicators is added to the AEL. Aircraft added for this reason are also shared among the ICAO North Atlantic (NAT) air navigation service providers (NAV CANADA, Isavia, NAV Portugal, UK NATS, and IAA) in accordance with ICAO Doc 7030. ADS-B messages contain many additional items besides the positional information. When these data items are misconfigured or incorrect, they may cause processing issues within the ATS systems. These types of issues may result in an aircraft being added to the AEL until the problem is rectified. The aircraft will remain on the AEL until the operator has corrected the problem, and NAV CANADA may instruct the air operator to include a specific entry in Item 18 of the flight plan to identify the affected aircraft for ATS planning purposes.

NAV CANADA has developed a Public ADS-B Performance Report that outlines the performance of ADS-B Out equipment installed on aircraft available here: https://www.navcanada.ca/en/air-traffic/space-based-ads-b/public-ads-b-performance-report.aspx

A Flight ID that is an exact replica of the Aircraft Identification entered in item 7 of the ICAO Flight Plan must be programmed into the transponder or flight management system (FMS).

Aircraft operators entering ADS-B mandatory airspace must file the following ADS-B equipage codes in item 10 of the International Civil Aviation Organization (ICAO) flight plan, as appropriate:

- B1 (ADS-B with dedicated 1,090 MHz ADS-B “Out” capability); or
- B2 (ADS-B with dedicated 1,090 MHz ADS-B “Out” and “In” capability).

In addition to the B1 or B2 code, aircraft equipped in accordance with the Canadian ADS-B mandate must also include CANMANDATE in item 18 of the flight plan following the SUR/ indicator, such as in the following two examples:

- SUR/CANMANDATE
- SUR/260B RSP180 A2 CANMANDATE

Including SUR/CANMANDATE in item 18 will identify that the aircraft is equipped in accordance with the Canadian ADS-B mandate. Aircraft operators will need to include the appropriate B1 or B2 codes in Item 10 and are encouraged to include this new SUR/CANMANDATE equipment identification in item 18 as soon as the aircraft is appropriately equipped, even if the flight does not plan to enter Canadian domestic Class A or Class B airspace where ADS-B has been mandated.

If an air operator identifies ADS-B is inoperative prior to dispatch, the air operator should contact the Air Traffic Flow Management/Air Traffic Operations Specialist office in the Area Control Centre that is anticipated to have first contact with the aircraft. That office will coordinate a last-minute ADS-B accommodation for the air operator and will identify what to file on the ATC flight plan in item 18 instead of the usual SUR/CANMANDATE. Air operators will only need to make this single call to NAV CANADA, as that first Area Control Centre will advise any other relevant downstream Canadian ATC units. IFR flight planning phone numbers for the Area Control Centers are listed in AIP CANADA ENR table 1.9 – Air Traffic Flow Management, available here: https://www.navcanada.ca/en/aeronautical-information/aip-canada.aspx

Due to supply-chain limitations experienced in the context of the global pandemic, some customers have identified that they may not be able to meet the equipage requirements in time for the mandate effective date and, in some cases, they may require additional time to comply. To help this small number of customers bridge the gap, so long as system capacity permits, NAV CANADA will strive to accommodate aircraft unable to transmit ADS-B in accordance with the Canadian ADSB mandate. The three principles NAV CANADA will apply for ADS-B accommodation requests will be: safety, type of ATC separation service available in a given airspace, and impacts to other airspace users. ADS-B accommodation requests need to be submitted online at least three business days in advance. ADS-B accommodation agreements for unequipped flights will generally be issued on a first-come first-served basis, although NAV CANADA will ensure that requests for unequipped priority flights (such as MEDEVAC, VIP, Rescue, etc) will be prioritized. In cases where the requested routes and/or altitudes are not conducive to accommodate unequipped aircraft, NAV CANADA may be able to propose alternative flight planning options for the pilot to consider. For cases where NAV CANADA has agreed to accommodate a flight that is unequipped, details of what to include in item 18 of the flight plan will be provided with the accommodation agreement. In-flight accommodation requests will not be considered and, if traffic conditions or other operational circumstances change, NAV CANADA may need to rescind already agreed upon ADS-B accommodations. ADS-B accommodation requests can be submitted here: https://aar.navcanada.ca

Unequipped foreign State aircraft not covered by a diplomatic note or formal agreement will be required to request accommodation in accordance with the procedure identified in the above section, whereas Canadian State aircraft, as well as foreign State aircraft covered by diplomatic note or formal agreement, will not be required to provide advance notice and will automatically be accommodated by NAV CANADA. For these flights, the following entry will be required in Item 18 of the flight plan:

- SUR/CANADSBX

ADS-B mandates in any Class C, D and E airspace will be determined no sooner than 2028 pending further assessment and through engagement with stakeholders in support of benefit realization. In advance of any future mandate effective dates, NAV CANADA will continue to expand the areas and altitudes where ADS-B surveillance services are available. Depending on aircraft equipage, aircraft operators who have suitably equipped for ADS-B may be offered surveillance separation services in airspace that has not yet been mandated.

For educational material related to ADS-B and transponder operating procedures refer to the Transport Canada Aeronautical Information Manual (TC-AIM) (TP14371E) in Communications (COM), Section 7.0, “Surveillance,” and Section 8.0, “Transponder Operation,” available on the Transport Canada website at: https://tc.canada.ca/en/aviation/publications/transport-canada-aeronautical-information-manual-tc-aim-tp-14371

1.6.3.1 ADS-B Services in the Edmonton FIR

As a result of expanded ADS-B surveillance capabilities, surveillance separation standards are available for eligible aircraft using both VHF and CPDLC in Northern Canadian Airspace in the Edmonton FIR.

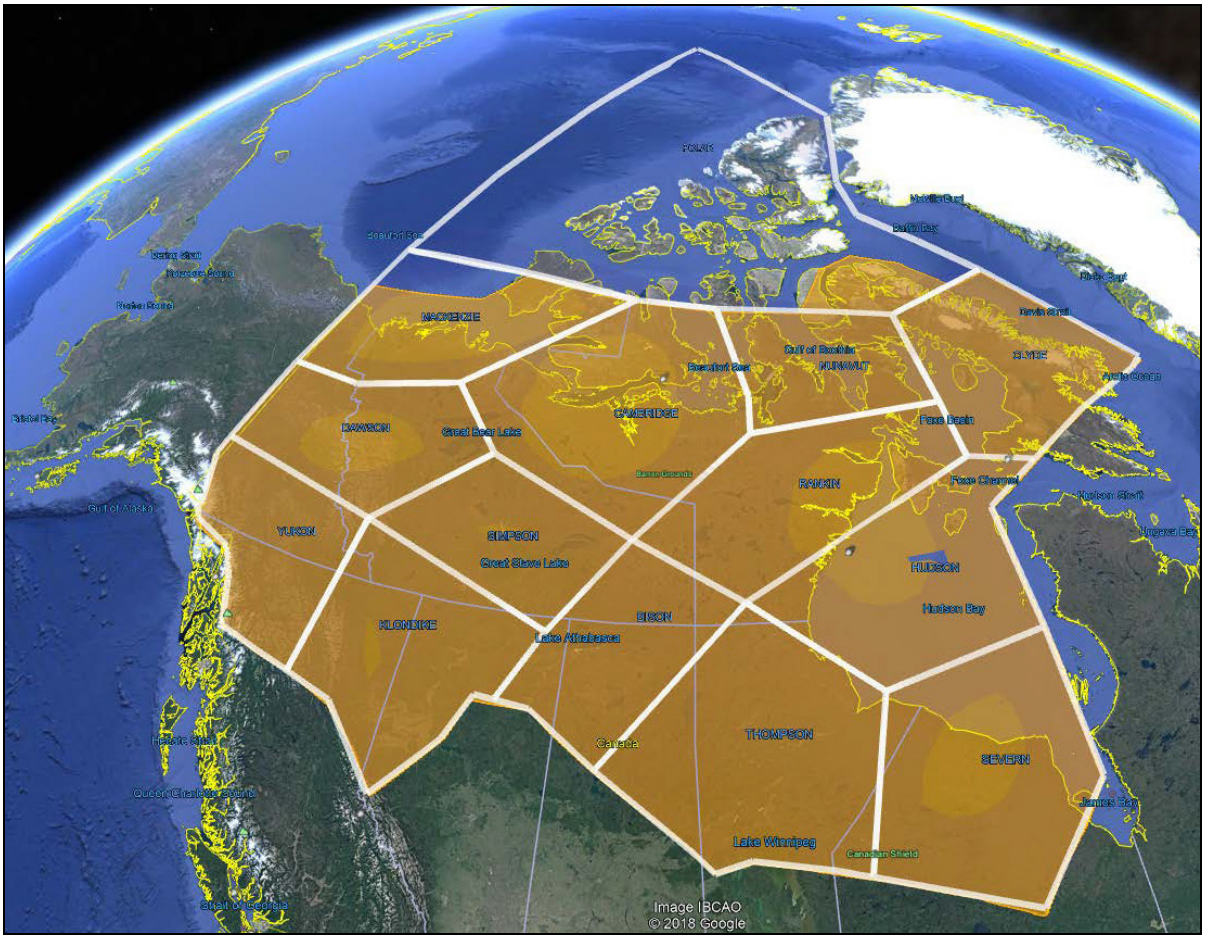

Figure 1.6.3.1-1, VHF Coverage

In areas where VHF voice communication is not available, surveillance separations are applied using CPDLC. To be eligible, aircraft must meet the following requirements:

- ADS-B equipped, in accordance with the Canadian ADS-B mandate (see ENR 1.6.3)
- Specifications for RNP 4
- Specifications of RCP 240

ATS systems use Field 10 (Equipment) of the standard ICAO flight plan to identify an aircraft’s data link and navigation capabilities. Operators should insert the following items into the ICAO flight plan (as per the 2012 flight plan format) for FANS 1/A or equivalent aircraft:

- Field 10a (Radio communication, navigation and approach aid equipment and capabilities);

- insert “J5” to indicate CPDLC FANS1/A SATCOM (Inmarsat) or “J7” to indicate CPDLC FANS1/A SATCOM (Iridium) data link equipment. To be eligible for the space-based ADS-B with CPDLC separations, flights must maintain an active J5/J7 connection. Edmonton ACC will monitor all active datalink connections to ensure compliance; and
- insert “P2” to indicate RCP 240 approval.

- Field 10b (Surveillance equipment and capabilities);
  - insert “D1” to indicate ADS with FANS1/A capabilities; and
  - B1 or B2 to indicate ADS-B.
- Field 18 (Other Information): insert the characters “PBN/L1” for RNP4.

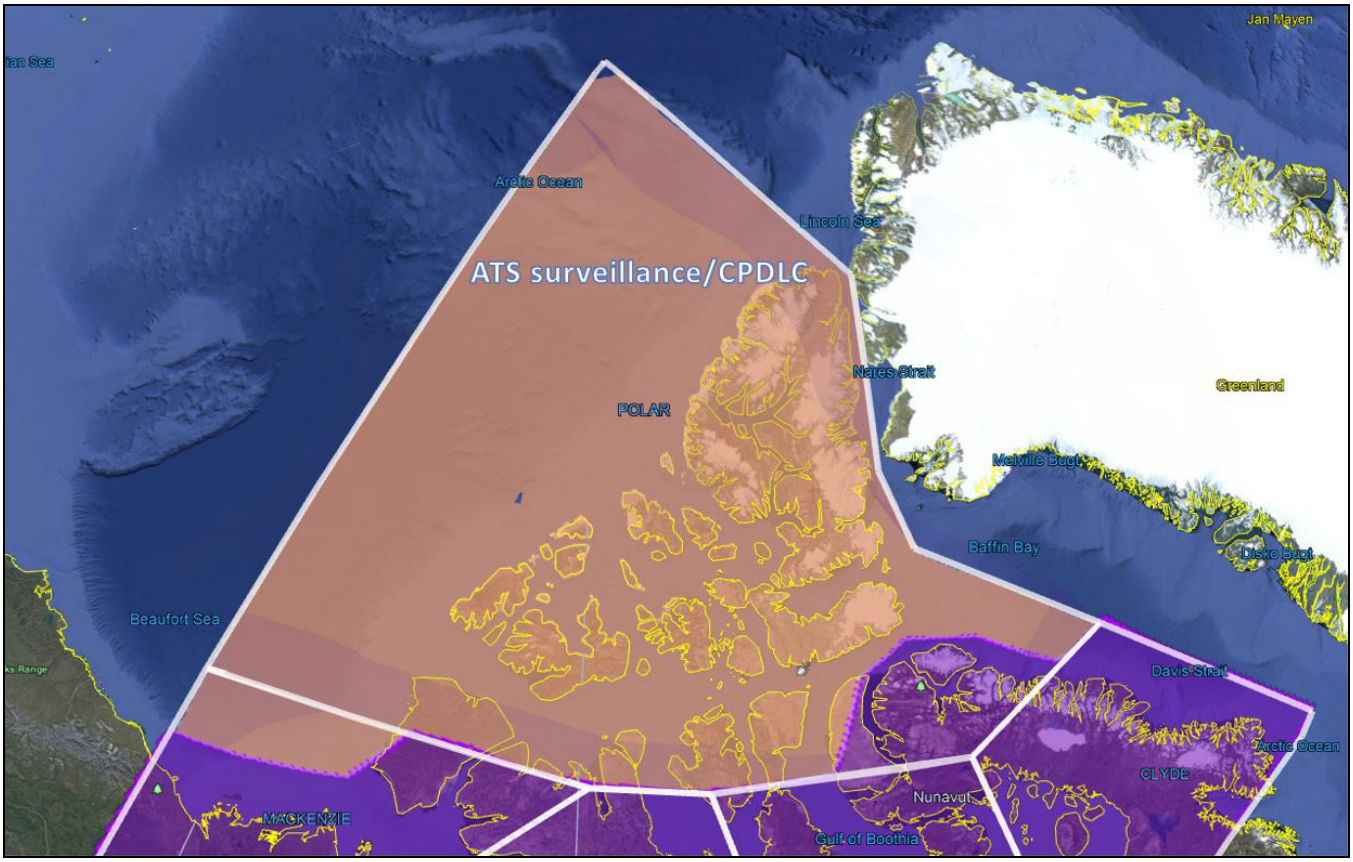

Figure 1.6.3.1-2, ATS Surveillance Without VHF Coverage (CPDLC)

Flight crews are expected to comply with normal non-surveillance procedures, which include position reports via voice or ADS-C, and all other operator-specific procedures currently used.

Service Limitations North of 72° North

In Edmonton FIR, Inmarsat satellite coverage has limitations in the north; flights operating only with Inmarsat equipment may experience unreliability north of 72° North (N). Also, there is no Inmarsat satellite coverage north of 80° N, so flights will be unable to use satellite voice communications (SATVOICE) services in this area using Inmarsat. Iridium SATVOICE services are available north of 80° N. Operators of aircraft that are equipped with both Inmarsat and Iridium modems should ensure that they switch to the Iridium system before operating north of 72° N.

Based on these service area limitations, operators are advised that Iridium-equipped flights (J7 in the ICAO flight plan) will be eligible for the space-based ADS-B with CPDLC separations in the entirety of the Edmonton FIR. For flights that are Inmarsat only (J5 in the ICAO flight plan), the separation would be available only within Inmarsat coverage.

1.6.4 Other relevant information and procedures

1.6.4.1 Multilateration

Multilateration (MLAT) services have been implemented at four international airports: CYYZ, CYYC, CYUL and CYVR. This surveillance is used in Canada to enhance surface movement and ground control.

For information on MLAT refer to the *Transport Canada Aeronautical Information Manual* (TC-AIM) (TP14371E) in Section COM 7.4, “Multilateration (MLAT)”, available on the Transport Canada website at:

<https://www.tc.gc.ca/en/services/aviation/publications/tc-aim.html>

ENR 1.7 Altimeter-setting Procedures

The altimeter setting procedures in use are based on *Criteria for the Development of Instrument Procedures* (TP 308E), a document developed and produced by Transport Canada, Aerodromes and Air Navigation Branch.

For information on basic altimeter-setting procedures and for altimeter-setting procedures applicable to operators (including pilots) within Canada, refer to the sections on Transport Canada’s CARs website that are listed in Table 1.7, “Altimeter-setting Procedures.”

Table 1.7, Altimeter-setting Procedures

Section	Title
602.35	Altimeter-setting and Operating Procedures in the Altimeter-Setting Region
602.36	Altimeter-setting and Operating Procedures in the Standard Pressure Region
602.37	Altimeter-setting and Operating Procedures in Transition between Regions

<http://www.tc.gc.ca/eng/acts-regulations/regulations-sor96-433.htm>
Part VI – General Operating and Flight Rules
Subpart 2 – Operating and Flight Rules
Division I – General

The altimeter setting region is an airspace of defined dimensions below 18 000 feet above sea level (ASL). For a map of the altimeter-setting region, refer to the following publications:

- *Canada Flight Supplement* or *Canada Water Aerodrome Supplement*, Section C, “Planning – Altimeter Setting and Designated Mountainous Regions”

For a table of cruising levels, refer to the following publications:

- *Canada Flight Supplement* or *Canada Water Aerodrome Supplement*, Section C, “Planning – Characteristics of Airspace – Cruising Altitudes and Flight Levels Appropriate to Aircraft Track”

Cold dry air masses can produce barometric pressures in excess of 31.00 inches of mercury. Because barometric readings of 31.00 inches of mercury or higher rarely occur, most standard altimeters do not permit the setting of barometric pressures above that level and are not calibrated to indicate accurate aircraft altitude above 31.00 inches of mercury. As a result, most altimeters cannot be set to provide accurate altitude readouts to the pilot in these situations.

ATC will issue actual altimeter settings and will confirm with the pilot that 31.00 inches of mercury is set on the pilot's altimeters for enroute operations below 18 000 feet ASL in the affected areas.

Aerodromes that are unable to accurately measure barometric pressures above 31.00 inches of mercury will report the barometric pressure as "in excess of 31.00 inches of mercury". Flight operations to and from those aerodromes are restricted to VFR weather conditions.

When the barometric pressure exceeds 31.00 inches of mercury, the following procedures take effect:

Altimeters of all IFR, controlled VFR flight (CVFR) and VFR aircraft are to be set to 31.00 inches of mercury for enroute operations below 18 000 feet ASL. All pilots are to maintain this setting until beyond the area affected by the extreme high pressure or until reaching the final approach segment of an instrument approach for IFR aircraft or the final approach for VFR aircraft. At the beginning of the final approach segment, the current altimeter setting will be set by those aircraft capable of such a setting. Aircraft that are unable to set altimeter settings above 31.00 inches of mercury will retain a 31.00 inches of mercury setting throughout the entire approach. Aircraft on departure or missed approach will set 31.00 inches of mercury prior to reaching any mandatory or fix crossing altitude, or 1 500 feet above ground level (AGL), whichever is lower.

For aircraft operating IFR that are unable to set the current altimeter setting, the following restrictions apply:

To determine the suitability of departure alternate aerodromes, destination aerodromes and destination alternate aerodromes, increase the ceiling requirements by 100 feet and visibility requirements by 1/4 statute mile (SM) for each 1/10 inch of mercury, or any portion thereof, over 31.00 inches of mercury. These adjusted values are then applied in accordance with the requirements of the applicable operating regulations and operations specifications.

Example: Destination altimeter setting is 31.28 inches, instrument landing system (ILS) decision height (DH) is 250 feet (200-1/2). When flight planning, add 300-3/4 to the weather requirements, which would now become 500-1 1/4.

During the instrument approach, 31.00 inches of mercury will remain set. DH or Minimum Descent Altitude (MDA) will be deemed to have been reached when the published altitude is displayed on the altimeter.

Note: Although visibility is normally the limiting factor on an approach, pilots should be aware that when reaching DH, the aircraft will be higher than indicated by the altimeter, which in some cases could be as much as 300 feet higher.

Authorized CAT II and III ILS operations are not affected by the above restrictions.

Night VFR pilots are advised that under conditions of altimeter settings above 31.00 inches of mercury and aircraft altimeters not capable of setting above 31.00 inches of mercury, the aircraft's true altitude will be higher than the indicated altitude; this must be taken into consideration. If an instrument approach procedure is to be flown, the night VFR pilot should follow the procedures described above for aircraft operating IFR.

For aircraft with the capability of setting the current altimeter setting and operating into aerodromes with the capability of measuring the current altimeter setting, no additional restrictions apply.

For aircraft operating VFR, no additional restrictions apply; however, extra diligence in flight planning and in operating in these conditions is essential.

ENR 1.8 Regional Supplementary Procedures

For information on regional supplementary procedures affecting the entire area of responsibility, refer to the following publications:

- *Canada Air Pilot*, General (CAP GEN)
- *Canada Air Pilot* (CAP) Volumes 1–7
- *Restricted Canada Air Pilot* (RCAP)
- *Canada Flight Supplement* (CFS) Section B, “Aerodrome/Facility Directory”
- *Canada Water Aerodrome Supplement* (CWAS), Section B, “Aerodrome/Facility Directory”

Note: In the *Canada Flight Supplement* (CFS) and the *Canada Water Aerodrome Supplement* (CWAS), the table for an aerodrome may have a VFR Terminal Procedures Chart or a subheading PRO, or both, and these may contain information on the procedures affecting the entire area of responsibility.

These publications are available for purchase from NAV CANADA’s e-commerce store at:

<www.navcanada.ca>
Aeronautical Information
Online Store

ENR 1.9 Air Traffic Flow Management

Air traffic flow management (ATFM) programs have been developed to ensure that national ATC systems are used to maximum capacity and that the need for excessive enroute airborne holding, especially at low altitude, is minimized. ATFM also distributes required delays more equitably among users.

ATFM initiatives in Canada include:

- the publication in the *Canada Air Pilot* and the *Restricted Canada Air Pilot* of standard instrument departure (SID) and standard terminal arrival (STAR) procedures;
- the rerouting of aircraft because of sector overloading and weather avoidance;
- flow-control metering of arriving aircraft into terminal control areas (TCAs); and
- the implementation of flow-control restrictions whereby aircraft are more economically held on the ground at departure airports to partially absorb calculated arrival delays at a destination airport.

In the *Canada Flight Supplement* and the *Canada Water Aerodrome Supplement*, Section B, “Aerodrome/Facility Directory,” the table for an aerodrome may have a subheading RESTRICTIONS that contains information affecting the flow of traffic at the aerodrome.

Additional information can be obtained by contacting NAV CANADA, National Operations Centre, at 1 866-651-9053 (Canada) or 1 866-651-9056 (US), or the shift manager or ATFM unit of the applicable area control center (ACC) through the telephone numbers provided in Table 1.9, “ACC Contact Numbers.”

Table 1.9, ACC Contact Numbers :

ACC	Shift Manager or ATFM unit Telephone Number	IFR Flight Planning Telephone Number
Gander ACC	+1 709-651-5207	+1 709-651-5225
Moncton ACC	+1 506-867-7173	+1 506-867-7177
Montréal ACC	+1 514-633-3028 or 3365	+1 514-633-3211
Toronto ACC	1-800-268-4831 (Canada)	+1 905-676-4590 or 4591 or 4592
	1-800-387-3801 (US)	+1 204-983-8337
	+1 905-676-3528 or 4509	+1 888-358-7526
Winnipeg ACC	+1 204-983-8338	+1 604-586-4590 or 4591
Edmonton ACC	+1 780-890-4714	+1 709-651-5225
Vancouver ACC	+1 604-586-4510 or 4500	+1 506-867-7177

1.9.1 Flow Control Procedures

To minimize delays, air traffic management will use the least restrictive methods:

- Altitude
- Miles-in-trail/Minutes-in-trail
- Speed control
- Fix balancing
- Airborne holding
- Sequencing programs

Departure sequencing program assigns a departure time to achieve a constant flow of traffic over a common point. Runway and departure procedures are considered for accurate projections.

Enroute sequencing program assigns a departure time that will facilitate integration into an enroute stream. Runway configuration and departure procedures will be considered for accurate projections.

Arrival sequencing program assigns meter fix times to aircraft destined to the same airport.

Ground delay program is an air traffic management process administered by the flow manager whereby aircraft are held on the ground. The purpose of the program is to support the air traffic management mission and limit airborne holding. It is a flexible program and may be implemented in various forms depending on the needs of the air traffic system. Ground delay programs provide for equitable assignment of delays to all system users.

Ground stop is a process whereby an immediate constraint can be placed on system demand. The constraint can be total or partial. The ground stop may be used when an area, centre, sector, or airport experiences a significant reduction in capacity. The reduced capacity may be the result of weather, runway closures, major component failures, or any other event that would render a facility unable to continue providing ATS.

This list is not inclusive and does not preclude the innovation and application of other procedures that result in improved customer service.

ENR 1.10 Flight Planning

The flight plan format used in Canada is in accordance with the ICAO Flight Plan 2012 format and Annex 2 of the Convention on International Civil Aviation, “Rules of the Air”, Chapter 3.

The rules associated with filing a flight plan in Canada are found in the *Canadian Aviation Regulations* (CARs) Part VI, “General Operating and Flight Rules,” Subpart 2, “Operating and Flight Rules,” Division III “Flight Preparation, Flight Plans and Flight Itineraries” as listed in Table 1.10, “Flight Planning.”

Table 1.10, Flight Planning

Section	Title
602.70	Interpretation
602.73	Requirement to File a Flight Plan or a Flight Itinerary
602.74	Contents of a Flight Plan or a Flight Itinerary
602.75	Filing of a Flight Plan or a Flight Itinerary
602.76	Changes in the Flight Plan

For more information on flight planning procedures, refer to the *Transport Canada Aeronautical Information Manual* (TC AIM) (TP14371E) Section RAC 3.0, “Flight Planning”. This publication can be found on the Transport Canada website at:

<https://www.tc.gc.ca/en/services/aviation/publications/tc-aim.html>

ENR 1.11 Addressing of Flight Plan Messages

Flight plans for aircraft flying under IFR in Canada are allocated according to flight information region (FIR) to the message addresses provided in GEN 3.4.4.2, “Data Link Services.”

Flight plans for aircraft flying under VFR are accepted and processed by flight information centres (FICs) in Canada. In the *Canada Flight Supplement* (CFS) and the *Canada Water Aerodrome Supplement* (CWAS), Section B, “Aerodrome/Facility Directory,” the table for each aerodrome has a subheading FLT PLN (Flight Planning) that may contain the appropriate FIC contact information under the entry FIC.

For more information about Canada’s FICs, refer to Airport Advisory and Flight Information Services on NAV CANADA’s website:

<www.navcanada.ca>
Corporate
About Us
What We Do
Air Traffic Services

ENR 1.12 Interception of Civil Aircraft

For information on interception procedures and visual signals, refer to the following publications:

- *Canada Flight Supplement*, Section F, “Emergency – Interception of Civil Aircraft,” and “Interception Signals;”
- *Canada Water Aerodrome Supplement*, Section E, “Emergency – Interception of Civil Aircraft,” and “Interception Signals;” or

- *Transport Canada Aeronautical Information Manual* (TC AIM) (TP14371E) SAR, Section 4.7, "Interception Procedures (Canadian Aviation Regulation (CAR) 602.144)."

  <https://www.tc.gc.ca/en/services/aviation/publications/tc-aim.html>

ENR 1.13 Unlawful Interference

For information on unlawful interference, refer to the following publications:

- *Canada Flight Supplement*, Section F, "Emergency – Interception of Civil Aircraft," and "Unlawful Interference (HIJACK);"
- *Canada Water Aerodrome Supplement*, Section E, "Emergency – Interception of Civil Aircraft," and "Unlawful Interference (HIJACK);" or
- *Transport Canada Aeronautical Information Manual* (TC AIM) (TP14371E) COM, Section 8.8, "Unlawful Interference."

  <https://www.tc.gc.ca/en/services/aviation/publications/tc-aim.html>

ENR 1.14 Air Traffic Incidents

The Aviation Operations Centre (AOC) is part of the Transport Canada Situation Centre, Emergency Management Branch. It is the focal point for providing services in the areas of operational response in support of the Civil Aviation emergency response mandate. In addition, the AOC participates in, or provides support to, the aviation-related activities of the North American Aerospace Defense Command (NORAD), the International Civil Aviation Organization (ICAO), the Federal Aviation Administration (FAA), and other foreign entities.

The AOC monitors the national civil air transportation system (NCATS) 24 hours a day, and responds to emergencies that require the attention or co-ordination of concerned functional branches of government, including regional offices and other government departments or agencies, as per contingency plans.

The AOC is the initial point of contact for all aviation-related occurrences. The AOC receives reports on accidents and any incidents that occur within the NCATS from various sources, including NAV CANADA, airport authorities, Public Safety Canada (PSC), law enforcement agencies, other government departments, foreign governments, and the general public. These reports are continuously monitored and then distributed to the appropriate functional areas of Transport Canada Civil Aviation for review, investigation (if necessary), and final inclusion in the Civil Aviation Daily Occurrence Reporting System (CADORS).

Reports requiring regional, modal, multi-modal, inter-departmental, or an outside agency's attention are immediately forwarded to that agency for further action.

An aircraft incident, as defined in the CADORS manual (TP 4044), is any occurrence involving an aircraft where:

1. An engine fails;
2. Smoke or fire occurs, other than an engine fire that is contained within the engine and does not result in engine failure or damage to other component parts of the aircraft;
3. Difficulties in controlling the aircraft in flight are encountered due to any aircraft system malfunction, weather phenomena, wake turbulence, operations outside the approved flight envelope or uncontrolled vibrations;
4. The aircraft fails to remain within the landing or takeoff area, lands with one or more landing gear retracted or drags a wing tip or engine pod;

5. Any crew member is unable to perform his or her flight duties as a result of incapacitation;
6. Decompression, explosive or otherwise, occurs that necessitates an emergency descent;
7. A fuel shortage occurs that necessitates a diversion or requires approach and landing priority at the destination of the aircraft;
8. The aircraft is refueled with the incorrect type of fuel or contaminated fuel;
9. A collision or risk of collision with any other aircraft or with any vehicle, terrain or obstacle occurs, including a collision or risk of collision that may be related to air traffic control procedures or equipment failures;
10. The aircraft receives a Traffic Alert and Collision Avoidance System (TCAS) Resolution Advisory;
11. A flight crew member declares an emergency or indicates any degree of emergency that requires priority handling by an air traffic control unit or the standing by of crash, firefighting or rescue services;
12. Toxic gases or corrosive materials leak from any area aboard the aircraft;
13. Unauthorized Incursion or operating irregularity involving vehicles, pedestrians or animals;
14. Failure of a navigational aid, approach aid, communications system, airport lighting, power failure or any other system breakdown which has an adverse effect upon flight safety or a major impact upon operations;
15. Criminal action – hijacking bomb threat, riot, sabotage, or a breach of aviation/airport security;
16. Unavailability of a runway due to snow, ice, flood, obstruction or foreign object that results in a major impact on airport operations;
17. Bird strikes, which result in aircraft damage or other operational impact;
18. Missing aircraft reports, Search and Rescue action (RCC launch and ELT activations);
19. Significant building and equipment fire or other major damage on airport property or TC remote sites;
20. Labour action affecting operational capability;
21. Item dropped from aircraft;
22. Regulatory infractions which have immediate safety implications, involve commercial carriers or may generate media attention;
23. Environment emergencies such as significant fuel spill, hazardous chemical or radioactive spill on airport property;
24. Accidental death or serious injury to employees or members of the public while on airport or TC property; or
25. Any occurrence which may generate a high degree of public interest or concern or could be of direct interest to specific foreign air authorities.

The Aviation Incident Report form is available on Transport Canada's website at:

<https://www.tc.gc.ca/eng/civilaviation/opssvs/emergencies-incidentreporting-menu.htm>

A pilot should proceed as follows regarding an incident in which they have been involved:

1. During flight, use the appropriate air-ground frequency for reporting an incident of major significance, particularly if it involves other aircraft, so as to permit the facts to be ascertained immediately; and
2. As promptly as possible after landing submit an Aviation Incident Report.

Aviation Incident Reports are used to provide initial information on occurrences involving any Canadian-registered aircraft, as well as events that occur at Canadian airports, in Canadian sovereign airspace, or international airspace for which Canada has accepted responsibility that includes events involving foreign registered aircraft.

To report an aircraft accident or incident, individuals can contact the AOC 24 hours a day using one of the options in Table 1.14, “Contact List for the AOC.”

Table 1.14, Contact List for the AOC

Tel.: 1-877-992-6853 (toll-free) or 613-992-6853	Fax: 1-866-993-7768 (toll-free) or 613 993 7768
Emergencies and Incident Reporting – Report an aviation incident (AVOPS) section of the Transport Canada website: <https://www.tc.gc.ca/eng/civilaviation/opssvs/emergencies-incidentreporting-menu.htm>	

1.14.1 ATS Reports

Under current regulation, ATS units are required to report to the Minister of Transport any aviation occurrence that may contravene the CARs.

Any investigation of the circumstances or subsequent decision on whether a breach has taken place is the responsibility of Transport Canada. Any necessary follow-up action will be conducted by Transport Canada Civil Aviation regulatory authorities.

1.14.2 Pilot Reports

Pilots are requested to make the following reports in the interests of national security, meteorite research and forest fire and pollution control.

1.14.2.1 CIRVIS Reports – Vital Intelligence Sightings

Communication Instructions for Reporting Vital Intelligence Sightings (CIRVIS) reports should be made immediately upon a vital intelligence sighting of any airborne and ground objects or activities that appear to be hostile, suspicious, unidentified or engaged in possible illegal smuggling activity. Examples of events requiring CIRVIS reports are: unidentified flying objects, submarines, or surface warships identified as being non-Canadian or non-American; violent explosions; unexplained or unusual activity, including the presence of unidentified or suspicious ground parties in Polar regions, at abandoned airstrips or other remote, sparsely populated areas.

These reports should be made to the nearest Canadian or U.S. ATS unit.

A report via air/ground communications should include the words “CIRVIS CIRVIS CIRVIS”, followed by:

- the identification of the reporting aircraft;

- a brief description of the sighting (number, size, shape, etc.);
- the position of the sighted object or activity;
- the date and time of sighting in UTC;
- the altitude of the object;
- the direction of movement of the object;
- the speed of the object; and
- any identification.

1.14.2.2 Fire Detection – Northern Areas

Indigenous and Northern Affairs Canada (INAC) has requested the co-operation of all persons connected with aviation in the prevention, detection and suppression of fires in the northern areas of Canada.

Reports should be made to the nearest ATS Unit immediately upon sighting and include:

- location of the fire;
- approximate size of the fire;
- colour of the smoke; and
- direction of the smoke.

This information will assist fire crews in getting to fires with minimum delay and with the right type of equipment.

1.14.2.3 Pollution Reports

Any aircraft, upon sighting any vessel discharging pollutants (oil) in Canadian waters, Fishing Zones or Arctic Shipping Control Zones, should inform the nearest ATS unit.

The pollution report should include the following information:

- Name of air operator or aircraft owner
- Pilot's name
- Destination of aircraft
- Aircraft's identification
- Date and time of sighting
- Heading of vessel and name, port of registry and type (if possible)
- Latitude and longitude of sighting
- Type and extent of pollution
- Current and wind direction (if possible)
- Sea state (height of waves, if possible)

The ATS unit will forward any pollution reports to the Coast Guard Marine Communications and Traffic Services (MCTS) Centre. For more information refer to their website:

<https://www.ccg-gcc.gc.ca/contact/emergency-urgence/marine-pollution-marine-eng.html>

ENR 2. ATS AIRSPACE

ENR 2.1 FIR, UIR, TMA and CTA

2.1.1 Name, Limits, and Class of Airspace

The Canadian Domestic Airspace (CDA) is divided into 7 FIRSs: Vancouver, Edmonton, Winnipeg, Toronto, Montréal, Moncton and Gander. Gander Oceanic is an additional FIR allocated to Canada by ICAO over the high seas.

Canadian FIRs are described in the *Designated Airspace Handbook* (TP 1820E), this publication is available on the NAV CANADA website:

<www.navcanada.ca>
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Operational Guides
Canadian Airport Charts and Designated Airspace Handbook
Designated Airspace Handbook
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To download a chart depicting Canada's airspace classification refer to Transport Canada's publication *Canada's Airspace: Information on Airspace Classification and Structure* (TP 6010), available at:

<https://www.tc.gc.ca/Publications/BIL/TP6010/PDF/HR/TP6010B.PDF>

Upper flight information regions (UIR) are not used in Canada.

2.1.2 Units Providing Service

There is an ACC providing air traffic services for each FIR, using the same name as the FIR (e.g. Vancouver ACC provides ATS for Vancouver FIR). The telephone numbers for the ACCs are provided in Table 3.4.4.1, "ATS Units, Short Codes and PSTN Number" in Section GEN 3.4.4, "Requirements and Conditions."

2.1.3 Languages Used

English and French are the official languages used for radio communications in Canada. For a list of which language service is provided where, refer to GEN 3.4.3.5, "Language Services" or refer to the *Canadian Aviation Regulations* sections listed in Table 3.4.3.5, "Languages Used," under Section GEN 3.4.3.5.

2.1.4 Frequencies and SATVOICE Numbers

For frequencies used by the ATS units within the FIRs, refer to the appropriate enroute chart. For SATVOICE numbers and datalink addresses refer to Table 3.4.4.1, "ATS Units. Short Codes and PSTN Numbers" in Section GEN 3.4.4, "Requirements and Conditions."

2.1.5 Remarks

For information on control zones around military air bases, refer to the following publications:

- *Canada Flight Supplement* or
- *Canada Water Aerodrome Supplement*, Section B, "Aerodrome/Facility Directory" and
- *Canada Flight Supplement*, Section E, "Military Flight Data and Procedures"

These publications are available for purchase from NAV CANADA's e-commerce store at:

<www.navcanada.ca>
Aeronautical Information
Online Store

For information on emergency locator transmitter (ELT) requirements, refer to GEN 1.5.3, "Emergency Locator Transmitter."

2.1.6 Control Zones Around Military Air Bases

For information on control zones around military air bases, refer to the following publications:

- *Canada Flight Supplement* or
- *Canada Water Aerodrome Supplement*, Section B, "Aerodrome/Facility Directory," and
- *Canada Flight Supplement*, Section E, "Military Flight Data and Procedures"

ENR 2.2 Other Regulated Airspace

2.2.1 Required Navigation Performance Capability Airspace

Required navigation performance capability (RNPC) airspace is defined as a controlled airspace within the Canadian Domestic Airspace (CDA) in the *Designated Airspace Handbook* (TP 1820E; see Figure 2.2.2, "RNPC, CMNPS and CMNPS Transition Airspace"). RNPC airspace accommodates area navigation (RNAV) operations and is contained within the Southern Domestic Airspace (SDA) and Northern Control Area (NCA). The latest version of the *Designated Airspace Handbook* (TP 1820E) is available on the NAV CANADA website:

<www.navcanada.ca>
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Operational Guides
Canadian Airport Charts and Designated Airspace Handbook
Designated Airspace Handbook
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Reduced air traffic control (ATC) separation criteria can be applied in RNPC airspace. To conduct RNAV operations (fixed or random routes) in the RNPC airspace, the required aircraft navigation equipment must be certified as capable of navigating within specified tolerances. Aircraft that have the required navigation equipment for operations in Canadian minimum navigation performance specifications (CMNPS) airspace and the North Atlantic High Level Airspace (NAT HLA) authorization (previously referred to as MNPS authorization) will satisfy all requirements for RNPC.

Separation in accordance with RNPC may be applied for flights within those portions of the Gander Oceanic and New York Oceanic flight information regions (FIRs) that are designated as being part of the Gander Domestic or Moncton Domestic control area (CTA).

RNAV operations require the following additional certifications:

- The aircraft must be certified by the State of Registry or the State of the Operator as meeting the RNPC permitted to conduct RNAV operations.
- Long-range RNAV systems must be certified and capable of navigation performance that permits position determination within ±4 NM. Such navigation performance capability must be verified by the State of Registry or the State of the Operator, as appropriate.

- One long-range RNAV system, plus a short-range navigation system (VHF omnidirectional range (VOR)/distance measuring equipment (DME), or automatic direction finder (ADF)), must be certified to meet the minimum navigation equipment requirement for RNPC operation.

2.2.2 Canadian Minimum Navigation Performance Specifications Airspace

CMNPS airspace is defined as a controlled airspace within CDA, between flight levels (FL) 330 and FL 410 in the *Designated Airspace Handbook* (TP 1820E) (see Figure 2.2.2, “RNPC, CMNPS and CMNPS Transition Airspace”). This airspace is contained for the most part in the Arctic Control Area (ACA) and the NCA, with a small portion in the Southern Control Area (SCA). The *Designated Airspace Handbook* (TP 1820E) is available on the NAV CANADA website:

<www.navcanada.ca>
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Canadian Airport Charts and Designated Airspace Handbook
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Reduced ATC separation criteria can be applied in the CMNPS airspace. To conduct RNAV operations in CMNPS airspace, aircraft must be certified as being capable of navigating within specified tolerances. A transition area underlying the lateral limits of CMNPS airspace exists from FL 270 to below FL 330 to permit both CMNPS-certified and non-certified aircraft to operate above FL 270.

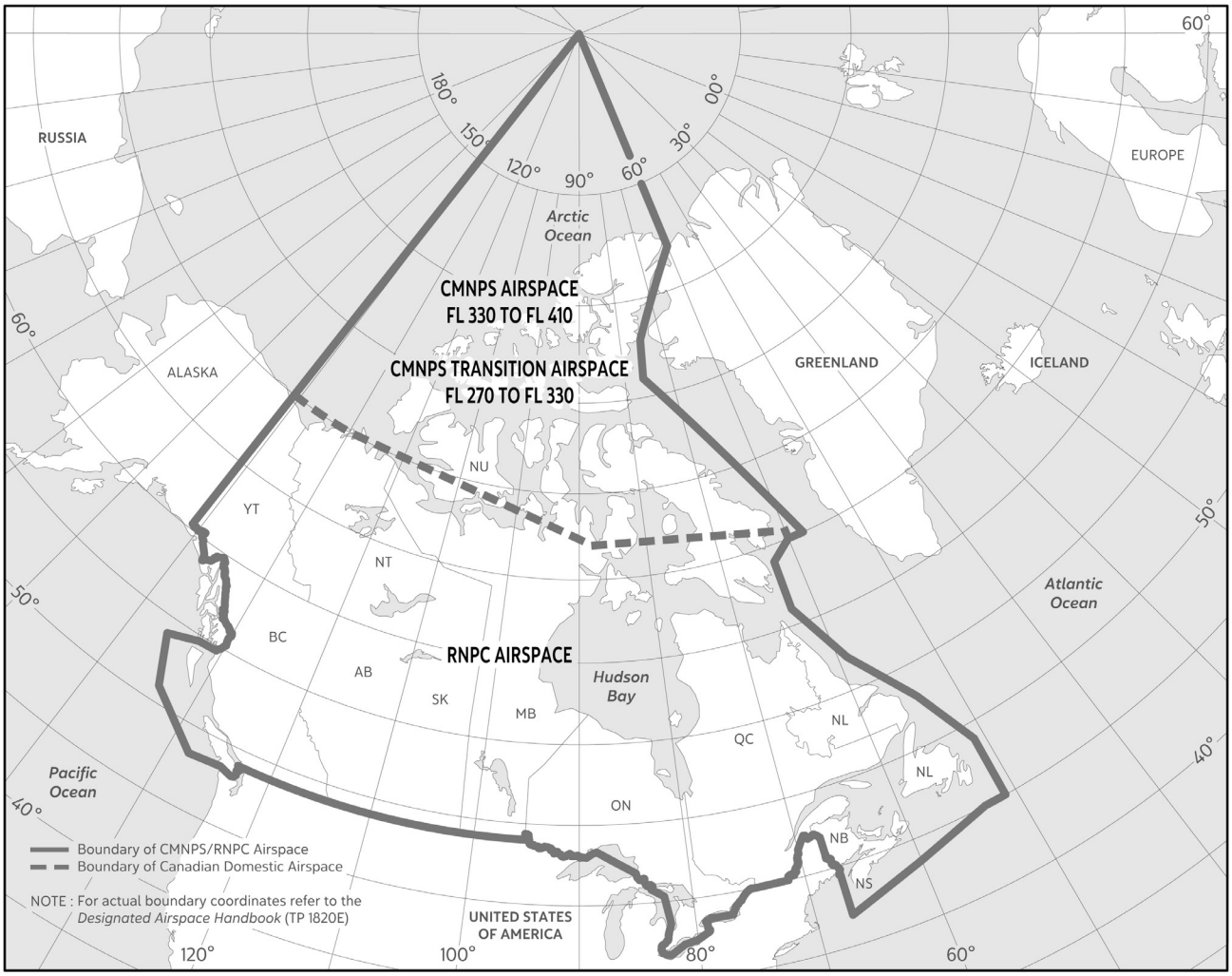

Figure 2.2.2, RNPC, CMNPS and CMNPS Transition Airspace

Aircraft navigation equipment for flights in CMNPS airspace must meet the following conditions and certifications:

- Navigation equipment must be certified by the State of Registry or the State of the Operator as meeting the NAT HLA minimum requirements (previously referred to as MNPS) to operate within CMNPS airspace, unless the ATC unit concerned indicates that the non-certified aircraft can be accommodated without penalty to certified aircraft.
- Required long-range RNAV systems must be certified and shown capable of navigation performance within the following specifications:
  - The standard deviation of lateral track errors is less than 6.3 NM;
  - The proportion of total flight time spent by aircraft 30 NM or more off the cleared track is less than 5.3×10^{-4} (i.e., less than 1 hr in about 2,000 flight hours); and
  - The proportion of total flight time spent by aircraft between 50 and 70 NM off the cleared track is less than 13×10^{-5} (i.e., less than 1 hr in about 8,000 flight hours).

- Navigation performance capability must be verified by the State of Registry or the State of the Operator, as appropriate. Aircraft that operate within designated airways and company-approved routes, which are completely in signal coverage of ground-based navigation aids, satisfy CMNPS requirements when operating within the protected airspace for airways and company-approved routes.
- At a minimum, aircraft are required to use the following navigation systems in the CMNPS airspace, depending on the route operated:
  - Aircraft transiting CDA to or from another continent must be equipped with two long-range RNAV systems or one navigation system using the inputs from one or more sensor systems, plus one short-range navigation system (ADF, VOR/DME).
  - Aircraft operating within North America on routes that lie within reception of ground-based navigation aids must be equipped with a single long-range RNAV system plus a short-range navigation system (ADF, VOR/DME).
  - Aircraft operating on high-level airways or company-approved routes must be equipped with dual short-range navigation systems (ADF, VOR/DME).

For a description of other types of regulated airspace and airspace classification, refer to the *Designated Airspace Handbook* (TP 1820E), this publication is available on the NAV CANADA website:

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ENR 3. ATS ROUTES

For ATS routes, distances are in nautical miles and tracks are magnetic, except in the Northern Domestic Airspace (NDA) where tracks are referenced to true north.

ENR 3.1 Conventional Navigation Routes

3.1.1 Route Designators

Refer to Section GEN 3.4 “Communication Services” for more details on CPDLC, PBCS and the associated RCP 240 and RSP 180 performance requirements.

For a list of route designators, names, and geographical coordinates of all significant points including compulsory or on-request reporting points, refer to the CFS, Section C, “Planning.”

For a graphical portrayal of the routes and significant points, refer to the appropriate low level enroute charts (VNC, LO) and high level enroute charts (HI) (see Figure 3.1.1-1, “Index to Low Altitude Charts” and Figure 3.1.1-2, “Index to High Altitude Charts”).

These publications are available for purchase from NAV CANADA’s e-commerce store at:

<www.navcanada.ca>
Aeronautical Information
Online Store

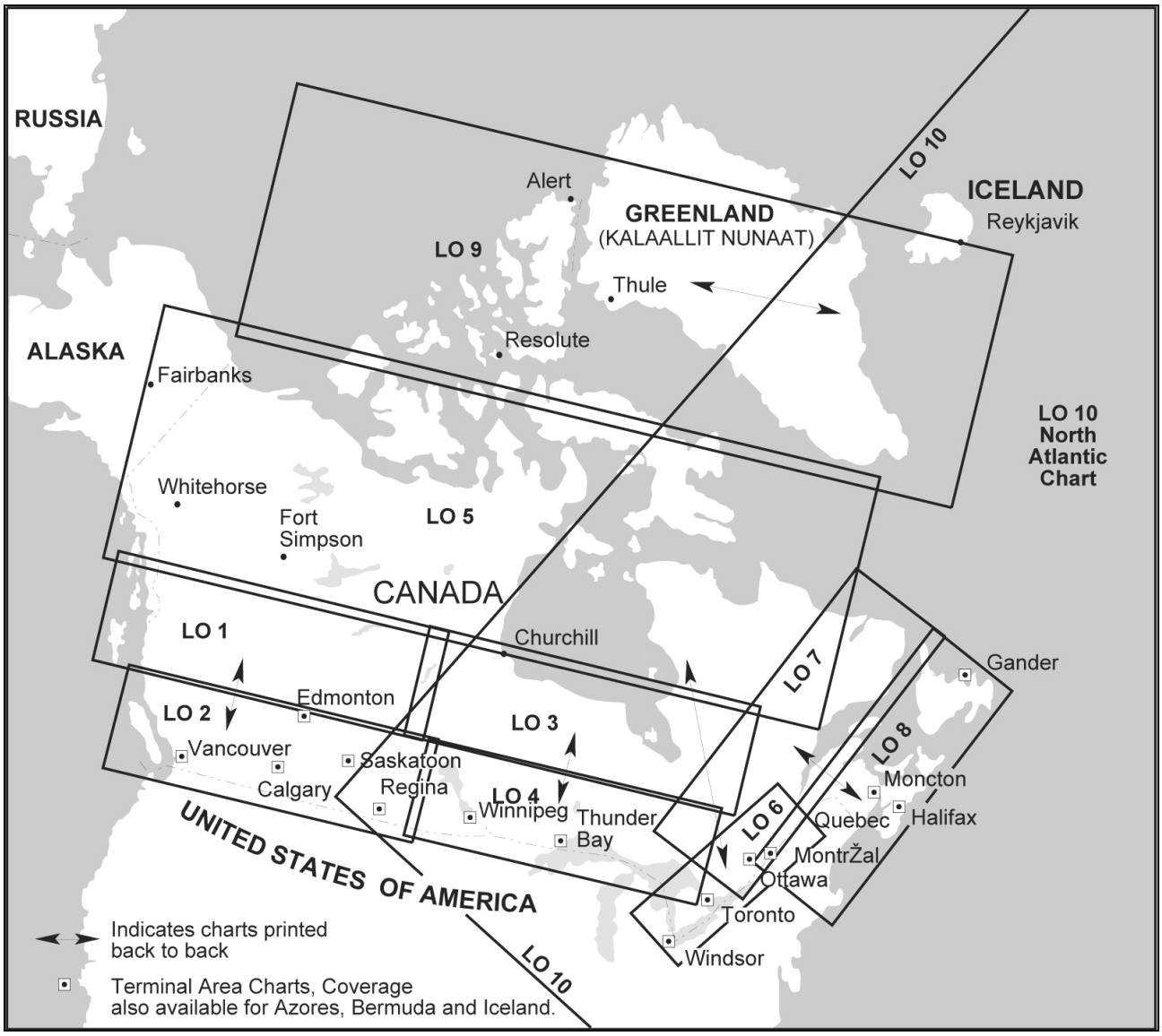


Figure 3.1.1-1, Index to Low Altitude Charts

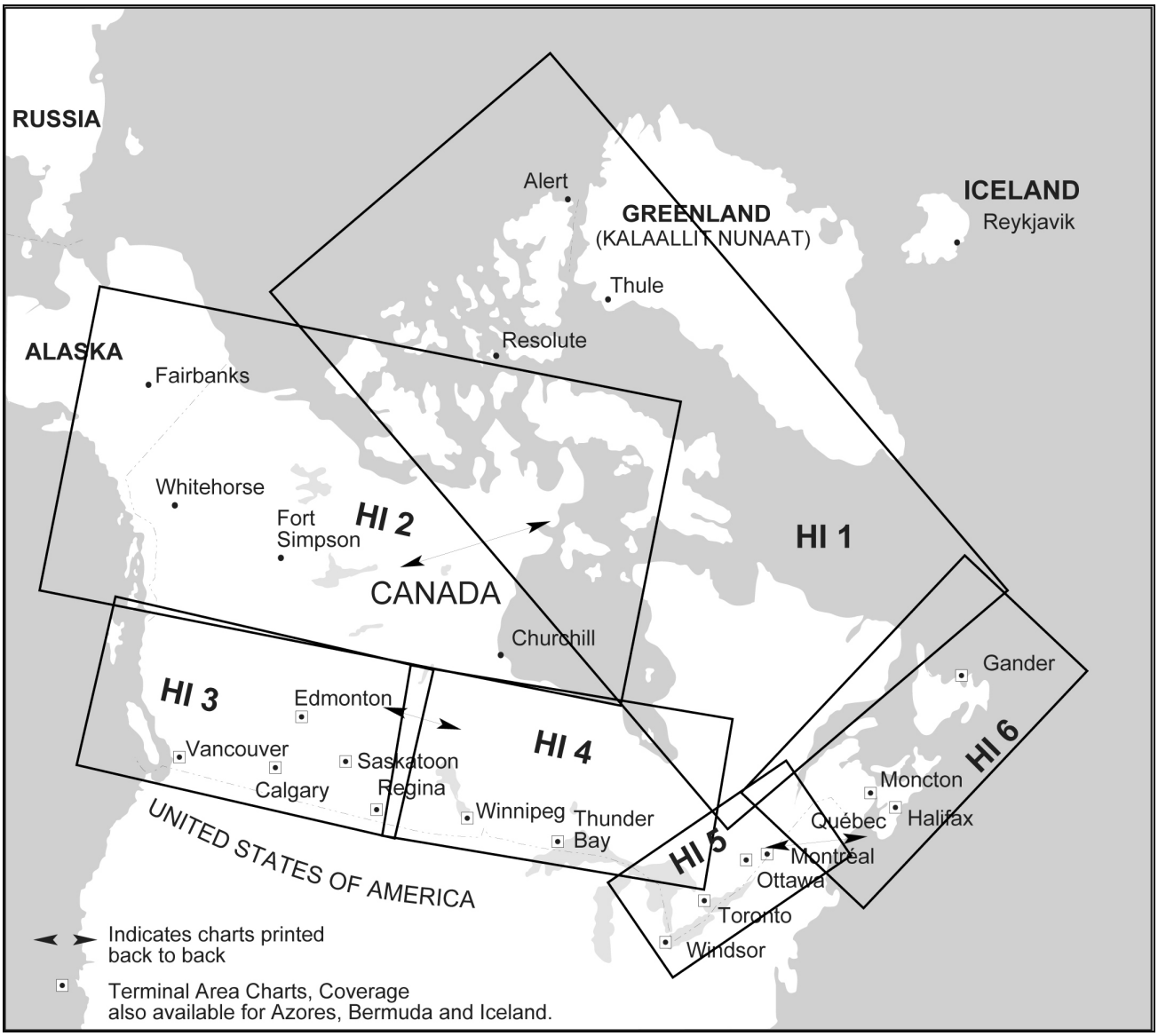


Figure 3.1.1-2, Index to High Altitude Charts

3.1.2 Tracks or VOR Radials

For information on tracks or very high frequency (VHF) omnidirectional range (VOR) radials, including changeover points, for conventional navigation routes, see the appropriate enroute low or high altitude charts.

3.1.3 Upper and Lower Limits of Routes and Airspace Classification

The airspace within CDA and that airspace over international waters and foreign territory in which Canada accepts responsibility for the provision of ATC services is for use by conventional navigation routes.

For information on the upper and lower limits of low altitude ATS routes and airspace classification, see the appropriate enroute low or high altitude charts.

3.1.4 Lateral Limits and Minimum Obstacle Clearance Altitudes (MOCAs)

For information on the lateral limits of low altitude conventional navigation routes and the minimum obstacle clearance altitudes (MOCAs), see the appropriate enroute low altitude charts.

3.1.5 Direction of Cruising Levels

For information on the direction of cruising levels for conventional navigation routes, see the appropriate enroute charts and refer to the following publications:

> *Canada Flight Supplement* or *Canada Water Aerodrome Supplement*, Section C, “Planning – Characteristics of Airspace – Cruising Altitudes and Flight Levels Appropriate to Aircraft Track”

3.1.6 Navigation Accuracy for each Conventional Navigation Route Segment

To determine if a route has any specific navigation requirements, see the appropriate enroute charts and refer to the following publications:

> *Canada Flight Supplement* or *Canada Water Aerodrome Supplement*, Section C, “Planning – Characteristics of Airspace – Cruising Altitudes and Flight Levels Appropriate to Aircraft Track”

3.1.7 Remarks

Nil

ENR 3.2 Area Navigation Routes

3.2.1 Route Designators

For a list of area navigation (RNAV) routes, refer to the *Canada Flight Supplement*, Section C, “Planning – Mandatory IFR Routes – Fixed RNAV Routes” and Section E, “Military Flight Data and Procedures.”

3.2.2 Waypoints Defining VOR/DME Area Navigation Routes

For station identification of the reference VOR/distance measuring equipment (DME) defining an RNAV route, refer to the following publications:

- *Canada Flight Supplement*, Section D, “Radio Navigation and Communications – Radio Navigation Aids by Location,” or
- *Canada Flight Supplement* and *Canada Water Aerodrome Supplement*, Section D, “Radio Navigation Aids by Indicator”

For bearing and distance from the reference VOR/DME, if the waypoint defining an RNAV route is not collocated with it, refer to the following publication:

- *Canada Flight Supplement*, Section C, “Planning – Mandatory IFR Routes – Fixed RNAV Routes”

For elevation of the transmitting antenna of the DME defining an RNAV route, refer to the following publications:

- *Canada Flight Supplement*, Section D, “Radio Navigation and Communications – Radio Navigation Aids by Location,” or
- *Canada Flight Supplement* and *Canada Water Aerodrome Supplement*, Section D, “Radio Navigation Aids by Indicator”

3.2.3 Magnetic Bearing, Geodesic Distance and Distance Between Defined End Points and Designated Significant Points

For geodesic distance between defined end points and distance between each successive designated significant point for RNAV routes, refer to the *Canada Flight Supplement*, Section C, “Planning – Mandatory IFR Routes – Fixed RNAV Routes”

3.2.4 Upper and Lower Limits of Routes and Airspace Classification

For information on the upper and lower limits of RNAV routes and airspace classification, see the appropriate enroute low altitude chart, enroute high altitude or terminal area chart (see Figure 3.1.1-1, “Index to Low Altitude Charts,” and Figure 3.1.1-2, “Index to High Altitude Charts”).

3.2.5 Direction of Cruising Levels

For information on the direction of cruising levels for RNAV routes, see the appropriate enroute low altitude chart, enroute high altitude or terminal area chart.

3.2.6 Navigation Accuracy for PBN Route Segments

Canada has not assigned a navigation specification to any PBN routes. High-level fixed RNAV routes require an onboard system with performance capabilities that are only met by GNSS or distance measuring equipment/inertial reference unit (DME/DME/IRU) systems. DME/DME/IRU navigation may be limited in some parts of Canada owing to navigational facility coverage. In such cases, the high level fixed RNAV routes will be annotated with “GNSS only” on the appropriate enroute chart. All low level fixed RNAV routes require the use of GNSS.

3.2.7 Remarks

Nil

ENR 3.3 Other Routes

For information on other routes in Canada, refer to current editions of the following publications:

- *Designated Airspace Handbook* (TP 1820E), this publication is available on the NAV CANADA website:

  <www.navcanada.ca>
  Aeronautical Information
  Operational Guides
  Canadian Airport Charts and Designated Airspace Handbook
  Designated Airspace Handbook
  Download current issue

- *Canada Air Pilot*, Volumes 1–7, or *Restricted Canada Air Pilot*

- *Canada Flight Supplement*, Section C, “Planning”

- The appropriate enroute low altitude, enroute high altitude or terminal area chart (see Figure 3.1.1-1, “Index to Low Altitude Charts,” and Figure 3.1.1-2, “Index to High Altitude Charts”)

ENR 3.4 Enroute Holding

3.4.1 Holding Identification and Holding Fix

For the holding identification and the holding fix for enroute holding patterns, see current editions of the following publications:

- The appropriate enroute low altitude, enroute high altitude or terminal area chart (see Figure 3.1.1-1, “Index to Low Altitude Charts,” and Figure 3.1.1-2, “Index to High Altitude Charts”)
- *Canada Air Pilot*, Volumes 1–7, or *Restricted Canada Air Pilot*

3.4.2 Inbound Track

For the inbound track for enroute holding patterns, see current editions of the following publications:

- The appropriate enroute low altitude, enroute high altitude or terminal area chart (see Figure 3.1.1-1, “Index to Low Altitude Charts,” and Figure 3.1.1-2, “Index to High Altitude Charts”)
- *Canada Air Pilot*, Volumes 1–7, or *Restricted Canada Air Pilot*

3.4.3 Direction of Procedure Turn

For the direction of the procedure turn for enroute holding patterns, see current editions of the following publications:

- The appropriate enroute low altitude, enroute high altitude or terminal area chart (see Figure 3.1.1-1, “Index to Low Altitude Charts,” and Figure 3.1.1-2, “Index to High Altitude Charts”)
- *Canada Air Pilot*, Volumes 1–7, or *Restricted Canada Air Pilot*

3.4.4 Maximum Indicated Airspeed

The size of the airspace that must be protected for a holding pattern is directly proportional to the speed of the aircraft. In order to limit the amount of airspace that must be protected, maximum holding speeds in knots indicated airspeed (KIAS) have been designated for specific altitude ranges. Unless otherwise noted on the chart or when a climb in the hold is specified, holding patterns must be entered and flown at or below the following airspeeds:

Table 3.4.4, Maximum Indicated Airspeeds for Holding Patterns

Altitude (ASL)	Maximum Holding Airspeed (KIAS)
At or below 6000 feet	200
Above 6000 feet up to and including 14000 feet	230
Above 14000 feet	265
Shuttle climbs (all altitudes)	310 (subject to CAR 602.32)

Note 1: At Canadian Military airfields, the size of the protected airspace is for a maximum of 310 KIAS, unless otherwise noted.

Note 2: For Copter procedures, the maximum airspeed is 90 KIAS for all altitudes, unless otherwise noted.

When a climb in the hold (shuttle climb) procedure is specified on a chart, an additional protected area has been provided to allow for greater airspeeds in the climb for those aircraft requiring them. This extra protected area is for a maximum of 310 KIAS, unless a maximum holding airspeed is noted on the chart, in which case that maximum airspeed is applicable.

In areas where turbulence is known to exist, the protected airspace is based on a maximum of 280 KIAS and will be noted on the chart.

Pilots are to advise ATC immediately if airspeeds in excess of those specified become necessary for any reason, including turbulence, or if they are unable to accomplish any part of the holding procedure.

3.4.5 Minimum and Maximum Holding Level

For minimum and maximum holding levels for enroute holding patterns, see current editions of the following publications:

The appropriate enroute low altitude, enroute high altitude or terminal area chart

3.4.6 Time and Distance Outbound

The still air time for flying the outbound leg of a holding pattern should not exceed one minute if at or below 14,000 feet ASL, or one and a half minutes if above 14,000 feet ASL. However, the pilot should make due allowance in both heading and timing to compensate for the wind effect.

After the initial circuit of the holding pattern, timing should begin abeam the holding fix or on attaining the outbound heading, whichever occurs later. The pilot should increase or decrease outbound times, in recognition of winds, to effect one minute or one and a half minutes still air time (appropriate to altitude) inbound to the holding fix.

When the pilot receives ATC clearance specifying the time of departure from the holding fix, adjustments should be made to the flight pattern within the limits of the established holding pattern to leave the holding fix as near as possible to the time specified.

3.4.7 Controlling Unit and Operating Frequency

For indication of the controlling unit and its operating frequency for enroute holding patterns, see current editions of the following publications:

The appropriate enroute low altitude, enroute high altitude or terminal area chart

ENR 4. RADIO NAVIGATION AIDS/SYSTEMS

ENR 4.1 Radio Navigation Aids — Enroute

For a list of stations providing radio navigation services for enroute purposes in Canada, refer to the *Canada Flight Supplement*, Section D, “Radio Navigation and Communications.” This section includes information on the identification, frequency/channel, geographical coordinates and elevation of associated DME antennae.

In the *Canada Flight Supplement* and the *Canada Water Aerodrome Supplement*, Section B, “Aerodrome/Facility Directory,” the table for each aerodrome may have a subheading NAV (navigation) that contains information on radio navigation and landing aids associated with the instrument approach and the terminal area procedures at the aerodrome.

ENR 4.2 Special Navigation Systems

Nil

ENR 4.3 Global Navigation Satellite System (GNSS)

The Global Navigation Satellite System (GNSS) indicated in Table 4.3, “Global Navigation Satellite System,” may be used for enroute, terminal and approach operations in Canada. The systems in Table 4.3 also meet the requirements of ICAO Annex 10.

Table 4.3, Global Navigation Satellite System

Element	Name	Nominal Service Area	Operating Authority	Remarks
Constellation	BeiDou Navigation Satellite System (BDS)	Canadian Domestic Airspace	China	Enroute, terminal, and non-precision approaches (NPA).
Constellation	Galileo	Canadian Domestic Airspace	European Union	Enroute, terminal, and non-precision approaches (NPA).
Constellation	Global Orbiting Navigation Satellite System (GLONASS)	Canadian Domestic Airspace	Russian Federation	Enroute, terminal, and non-precision approaches (NPA).
Constellation	Global Positioning System (GPS)	Canadian Domestic Airspace	United States	Enroute, terminal, and non-precision approaches (NPA).
Satellite Based Augmentation System	European Geostationary Navigation Overlay Service (EGNOS)	Eastern Canada: Thunder Bay to St. John’s to approximately N50°	European Space Agency (ESA)	Augmentation to GNSS for enroute, terminal, and NPA.
Satellite Based Augmentation System	Wide Area Augmentation System (WAAS)	Canadian Domestic Airspace to approximately N70° (subject to visibility of at least one WAAS geostationary satellite (GEO))	US Federal Aviation Administration (FAA)	Augmentation to GNSS for enroute, terminal, NPA, lateral and vertical navigation (LNAV/VNAV), localizer performance (LP) and localizer performance with vertical guidance (LPV) approaches.

The acceptable GNSS equipment standards are identified in AIP Canada ENR 4.3.1 “GNSS Equipment Requirements”. The GNSS equipment installation on Canadian registered aircraft must be approved in accordance with the appropriate sections of the *Canadian Aviation Regulations* (CARs), Part V – Airworthiness, and installed for use in accordance with AC20-130A and/or AC20-138() as applicable.

Equipment and installations approved by other Aviation Authorities (AAs) to equivalent requirements are also deemed acceptable for operations within Canada.

The pilot-in-command (PIC) must also ensure that the available equipment can satisfy the requirements of CAR 605.18(j) — Power-driven Aircraft–IFR.

Aircraft using non-WAAS/SBAS based augmentation systems to support GPS installations (TSO-C129, TSO-C129a or TSO-C196 All Revisions (AR)) for navigation under IFR must be equipped with an alternate approved and operational means of navigation suitable for the proposed flight. Provided that RAIM is available, monitoring of the alternative navigation equipment is not required. Procedures must be established for use in the event that the loss of RAIM capability is predicted to occur. In situations where RAIM is predicted to be unavailable, the flight must rely on other approved navigation equipment, re-route to where RAIM is available, delay departure, or cancel the flight.

If TSO−C145/C146 equipment is used to satisfy the RNAV requirement, the pilot/operator need not perform the RAIM prediction if WAAS coverage is confirmed to be available along the entire route of flight. In areas where WAAS coverage is not available, operators using TSO−C145/C146 receivers are required to check GPS RAIM availability.

Subject to aircraft operating limitations specified in the *Aircraft Flight Manual* or *Flight Manual Supplement*, Aircraft equipped with TSO-C145 or TSO-C146 GNSS based Navigation Sensors may not need to carry a non-GNSS alternate means of navigation. However, certain operations may require dual installation as necessary to fulfill availability and/or continuity requirements.

In the event of loss of GNSS navigation performance accuracy or integrity which results in the inability to support the planned flight operation, the pilot-in-command must advise air traffic services as soon as practical, stating “unable RNAV [DUE TO (REASON, E.G. LOSS OF GNSS)].”

GNSS-based approaches are charted as “RNAV (GNSS) RWY XX”, denoting that GNSS navigation shall be used for approach guidance, and the prefix “RNAV” is used in radio communications. Approaches flown using GNSS must be retrieved from a current navigation database. The PIC is responsible for ensuring the on-board navigation data is current, appropriate for the region of intended operation and includes the appropriate navigation aids, waypoints, and relevant coded terminal airspace procedures for the departure, arrival, and alternate airfields.

Navigation databases must be current for the duration of the flight. If the AIRAC cycle is due to change during flight, operators and pilots must have established procedures to ensure the accuracy of the navigation data, including the suitability of navigation facilities, routes and procedures for safe flight operations.

For flight within Canadian minimum navigation performance specifications (CMNPS) airspace or required navigation performance capability (RNPC) airspace see AIP Part 2 Enroute Section 2.2.1. GNSS equipment identified in ENR 4.3.1 “GNSS Equipment Requirements”, can serve as the long range navigation system when in CMNPS or RNPC airspace.

4.3.1 GNSS Equipment Requirements

The acceptable GNSS equipment Minimum Operational Performance Specifications (MOPS) as identified by the FAA Technical Standard Orders, are defined in Table 4.3.1 “GNSS Equipment Requirements”. These TSOs are published by the U.S. Federal Aviation Administration (FAA) and adopted by reference by Transport Canada. TSOs or equipment approvals issued by other Aviation Authorities based on the same or equivalent underlying MOPS are also acceptable. For ease of readability only the FAA TSO has been referenced in this document.

Table 4.3.1, GNSS Equipment Requirements

Phase of Flight	Equipment Requirements[1]	
	GNSS Stand Alone	**GNSS In Multi Sensor System**
Enroute & Terminal	TSO-C129a[2] Class A	TSO-C129(AR)[2] Class B or C
	TSO-C146 (AR)	TSO-C196 All Revision (AR)[2]
		TSO-C145 (AR) Class 1, 2 or 3
Approaches ***LNAV Minima***	TSO-C129a Class A1	TSO-C129(AR), Class, B1, B3, C1 or C3
	TSO-C146 (AR) Class 1, 2 or 3	TSO-C196 (AR)
		TSO-C145 (AR) Class 1, 2 or 3
Approaches ***LNAV/VNAV Minima***	TSO-C146 (AR) Class 2 or 3	TSO-C129(AR)[3], Class, B1, B3, C1 or C3
		TSO-C196 (AR)[3]
		TSO-C145 (AR) Class 2 or 3
Approaches ***LP[4] or LPV Minima***	TSO-C146 (AR) Class 3 or 4	TSO-C145 (AR) Class 3 or 4
		TSO-C146 (AR) Class Delta 4

Note 1: The GNSS equipment installation on Canadian registered aircraft must be approved in accordance with the appropriate sections of the *Canadian Aviation Regulations* (CARs), Part V – Airworthiness, and installed for use in accordance with AC20-130A and/or AC20-138() as applicable. Equipment and installations approved by other Aviation Authorities (AAs) to equivalent requirements are also deemed acceptable for operations within Canada.

Note 2: TSO-C129(AR) and TSO-C196(AR) GNSS equipment are supplemental Navigation systems and use aircraft based augmentation; they have performance limitations that requires other positioning and navigation systems, appropriate to the operation, to be on-board the aircraft. Per AC20-138A, TSO-129(AR) defines different classes of equipment to support different equipment configurations. These classes are defined in paragraph (a)(2) of TSO-C129(AR). Additional guidance regarding the RNAV and RNP operations that TSO-C129(AR) and TSO-C196(AR) GNSS equipment may support is provided in AC20-138( ). Further guidance is provided in the ICAO PBN Manual Doc 9613.

Note 3: Acceptable when integrated with a multi-sensor flight management systems (FMS) (TSO-C115b or later) with barometric vertical navigation (BARO VNAV) capability, certified in accordance with FAA AC 20-129 or equivalent.

Note 4: WAAS receivers certified prior to TSO−C145b and TSO−C146b, even if they have LPV capability, do not contain LP capability unless the receiver has been upgraded. Receivers capable of flying LP procedures must contain a statement in the Aircraft Flight Manual (AFM), AFM Supplement, or Approved Supplemental Flight Manual stating that the receiver has LP capability, as well as the capability for the other WAAS and GNSS approach procedure types.

4.3.2 Use of GNSS in Lieu of Ground-Based Aids (GNSS Substitution)

GNSS may be used in lieu of DME during departure/enroute/terminal/approach operations; it may be used in lieu of conventional (VOR and NDB) for departure/enroute/terminal operations provided the following conditions are met:

- an integrity alert is not displayed;
- fixes that are part of a terminal instrument procedure are named, charted and retrieved from a current navigation database; and
- when ATS requests a position based on a distance from a DME facility for separation purposes, reported GNSS distance from the same DME facility may be used by stating the distance in miles and the DME facility name (e.g. “30 miles from Sumspot VOR,” vice “30 DME from Sumspot VOR”).

GNSS may be used in lieu of DME or VOR or NDB during missed approach operations, but may not be used in lieu of ground-based aids for:

- VOR and NDB final approach segment LNAV guidance on VOR- or NDB- instrument approach procedures (see Table 4.3.2 for GNSS substitution examples); or
- LOC LNAV guidance (see Table 4.3.2 for GNSS substitution examples).

Table 4.3.2, GNSS Substitution Examples

Approach Type	Failed Item	GNSS Substitution Allowed
NDB RWY 08	Aircraft ADF* or approach NDB	No
NDB/DME RWY 08	Aircraft DME or approach DME	Yes
VOR RWY 09	Aircraft VHF Navigation or approach VOR	No
VOR/DME RWY 09	Aircraft DME or approach DME	Yes
ILS RWY 16	Aircraft DME or approach DME or missed approach NAVAID	Yes

*ADF = automatic direction finder

4.3.3 GNSS Anomaly Reports

GNSS Anomaly reports should be submitted using the Post Flight Reports, available on the NAV CANADA website. https://www.navcanada.ca/en/gnss-anomaly-report-form.pdf

<www.navcanada.ca>
Flight Planning and Reporting
Post-Flight Reporting
Global Navigation Satellite System (GNSS) Anomaly Report

Note: For aircraft experiencing GNSS interference before entering, or while flying through the NAT Region, refer to ENR 7.4.3.6.

ENR 4.4 Name-Code Designators for Significant Points

4.4.1 Name-Code Designator

For an alphabetical list of name-code designators for significant points in Canada, including the geographical coordinates and province information, refer to the current issue of the CFS, Section C, PLANNING, “Intersections and reporting point coordinates”.

4.4.2 Geographical Coordinates

For the intersections or fixes used in low level airways and fixed area navigation routes, refer to the *Designated Airspace Handbook* (TP 1820E), available in PDF on the Aeronautical Information Products section of the NAV CANADA website:

<www.navcanada.ca>
Aeronautical Information
Operational Guides
Canadian Airport Charts and Designated Airspace Handbook
Designated Airspace Handbook
Download current issue

4.4.3 Reference to ATS or Other Routes

For the ATS routes where the points are located, refer to the appropriate enroute low and high altitude charts, as well as the appropriate terminal area charts.

ENR 4.5 Aeronautical Ground Lights — Enroute

Aeronautical ground lights are found in *Canada Flight Supplement* under the aerodrome they serve or on VFR navigational charts.

ENR 5. NAVIGATION WARNINGS

ENR 5.1 Prohibited, Restricted and Danger Areas

For information on prohibited, restricted, and danger areas, refer to the *Designated Airspace Handbook* (TP 1820E), Part 5, "Designation of Class F Airspace." This publication is available on the NAV CANADA website:

<www.navcanada.ca>
Aeronautical Information
Operational Guides
Canadian Airport Charts and Designated Airspace Handbook
Designated Airspace Handbook
Download current issue

ENR 5.2 Military Exercise and Training Areas and Air Defence Identification Zone (ADIZ)

For information on military operations areas (MOA) and air defence identification zones (ADIZs), refer to the *Designated Airspace Handbook* (TP 1820E), Section 1.3 – "Glossary of Aeronautical Terms and Designations of Miscellaneous Airspace." This publication is available on the NAV CANADA website:

<www.navcanada.ca>
Aeronautical Information
Operational Guides
Canadian Airport Charts and Designated Airspace Handbook
Designated Airspace Handbook
Download current issue

ENR 5.3 Other Activities of a Dangerous Nature and Other Potential Hazards

5.3.1 Other Activities of a Dangerous Nature

Nil

5.3.2 Other Potential Hazards

Nil

ENR 5.4 Air Navigation Obstacles

For information on obstacles affecting air navigation in Canada, see current editions of the following publications:

- The appropriate current VFR navigation chart
- *Canada Flight Supplement* or *Canada Water Aerodrome Supplement*, Section C, "Planning"

ENR 5.5 Aerial Sporting and Recreational Activities

For information on aerial sporting and recreational activities, refer to current editions of the following publications:

- *Designated Airspace Handbook* (TP 1820E), this publication is available on the NAV CANADA website:

  <www.navcanada.ca>
  Aeronautical Information
  Operational Guides
  Canadian Airport Charts and Designated Airspace Handbook
  Designated Airspace Handbook
  Download current issue

- The appropriate enroute low altitude, enroute high altitude or terminal area chart (see Figure 3.1.1-1, “Index to Low Altitude Charts,” and Figure 3.1.1-2, “Index to High Altitude Charts”)

- The appropriate VFR navigation chart

5.5.1 Formation Flights

Formation flight is considered to be more than one aircraft that, by prior arrangement between each of the pilots involved within the formation, operate as a single aircraft with regard to navigation and ATC procedures. Separation between aircraft within the formation is the responsibility of the flight leader and the pilots of the other aircraft within the formation. This includes transition periods when aircraft within the formation are manoeuvring to attain separation from each other to effect individual control, and during join-up and breakaway.

IFR and VFR flight planning procedures for formation flights are essentially the same as for a single aircraft with the following exceptions:

- a single flight plan may be filed for all aircraft within the formation;
- the flight lead will file an arrival report and close the flight plan for the formation;
- the Canadian flight plan/itinerary form is to be completed as follows:
  - Item 7, AIRCRAFT IDENTIFICATION: indicate the formation call sign,
  - Item 9, NUMBER AND TYPE OF AIRCRAFT AND WAKE TURBULENCE CATEGORY: indicate the number of aircraft, followed by the type of aircraft designator or, in the case of formation flights comprising more than one type of aircraft, insert ZZZZ,
  - Item 10, the letter “W” is not to be used for formation flights, regardless of the reduced vertical separation minimum (RVSM) status of aircraft within the flight, and
  - Item 18, OTHER INFORMATION: if ZZZZ is included in Item 9, insert TYP/ followed by the number and type(s) of aircraft in the formation; and
- if the formation is to be non-standard, the formation leader should insert the words “non-standard” and should indicate the parameters to be used in the *OTHER INFORMATION* section of the Canadian flight plan/itinerary form.

ATC will clear a formation flight as if it is a single aircraft. Airspace will be protected based on the assumption that, unless otherwise indicated in the flight plan, the formation will conform to the standard formation flight criteria. It is the formation leader's responsibility to indicate in the flight plan and to coordinate with ATC if the formation will not operate in accordance with the following standard formation flight criteria:

- the formation leader will operate at the assigned altitude, and the other formation aircraft will be within 100 feet vertically of the altitude of the formation leader;
- the formation will occupy a maximum frontal width of 1 NM; and
- the formation will occupy a maximum longitudinal length of 1 NM between the first and the last aircraft.

The formation leader is responsible for separation between aircraft within the formation and for ensuring that all the formation aircraft remain within these parameters unless otherwise coordinated with ATC. Although IFR formation flights are expected to take off and land in formation, unforeseen conditions may preclude the formation from completing an IFR approach and landing. If it becomes necessary for a formation to break into individual elements or single aircraft, the formation leader should advise the controlling agency of the destination as soon as possible to allow ATC sufficient time to provide separation for each element or aircraft. In such instances, the formation leader will retain responsibility for separation between elements or aircraft until ATC separation has been achieved.

All formation flights will be considered as non RVSM certified flights, regardless of the RVSM certification status of the individual aircraft within the formation.

5.5.2 Photographic Survey Flights

CAR 602.34 – *Cruising Altitudes and Cruising Flight Levels*, exempts aircraft operated for the purpose of aerial survey or mapping from the cruising altitude for direction of flight requirement if certain conditions are met.

Photographic survey flights are exempt from the requirement to be RVSM certified to operate in RVSM airspace to conduct aerial survey or mapping operations. This exemption is not applicable for that portion of flight transiting to/from the area of operation.

Pilots intending to conduct aerial survey or mapping operations should refer to CAR 602.34 and obtain the publication, *Pilot Procedures Photographic Survey Flights* from:

NAV CANADA
Customer Service
151 Slater Street, Suite 120
Ottawa, ON K1P 5H3

Tel.: 800-876-4693
Fax: 877-663-6656
E-mail: service@navcanada.ca

This publication describes flight requirements for pilots and operators conducting survey operations in Canadian airspace. It is published so that the ATC system can better accommodate the special demands and the unique operational requirements of aircraft on photographic survey missions.

ENR 5.6 Bird Migration and Areas with Sensitive Fauna

5.6.1 Wildlife Hazards

Trends indicate that there is a growing risk of collisions between wildlife and aircraft. This risk is due largely to corresponding increases in the populations of some hazardous species—such as deer, geese and gulls—and the numbers of aircraft operations across Canada.

All aviation stakeholders have a role to play in reducing the risks of wildlife strikes. Pilots can take three simple steps to help improve safety:

- Increase awareness of wildlife and the hazards they pose to aviation.
- Learn what risk-reduction and communication measures are in place at frequented airports.
- Become familiar with the bird/wildlife strike report form, and be sure to file a report in the event of any wildlife encounter.

This section provides information to help pilots gain a better appreciation of:

- measures airports must take to identify and control wildlife hazards, and to communicate with pilots about these hazards;
- bird/wildlife-strike reporting procedures; and
- migratory bird activity.

5.6.2 Airport Wildlife Management

In force since 16 May 2006, a new CAR recognizes that lands on and around airports often provide food and shelter for wildlife species that can be hazardous to air travel. Division III of CAR 302—*Airport Wildlife Planning and Management*, requires most Canadian certified airports to minimize risks, primarily by identifying and countering potentially hazardous species. Airports that are subject to the regulation must develop, implement and maintain plans for the management of these species.

The process of identifying wildlife hazards and measuring the risks they pose is called risk analysis. Under CAR 302, an airport operator must conduct a risk analysis as one of the first steps in creating an airport wildlife management plan. Pilots should be aware that these analyses must include consultations with representative samples of airport users, such as flight schools, airlines and pilots.

5.6.3 Communication of Wildlife Hazards

Provisions of CAR 302 also require airport operators to put in place effective communication and alerting procedures to quickly notify pilots of wildlife hazards.

Pilots should monitor ATIS and air-ground communications for information concerning wildlife hazards, particularly during spring and autumn migration periods when bird activity is at its peak. In unusual circumstances, a NOTAM may be used to identify these hazards.

Pilots who encounter wildlife on an airport are asked to immediately notify ATS, and take appropriate steps to minimize the risk associated with their flight.

Pilots who frequent Canadian certified airports are encouraged to ask about measures in place to ensure effective communication and to counter wildlife hazards.

5.6.4 Bird/Wildlife-Strike Reporting Procedures

To comply with CAR 302, airport wildlife management plans must be based on current wildlife-strike data, which is compiled by, and made available through, Transport Canada. Airports must report all bird/wildlife strikes to Transport Canada and keep records of these events; however, bird/wildlife strike reports can be filed by anyone, including airline personnel, ground crews and pilots.

Strike reporting is one of the most valuable contributions members of the aviation community can make in an effort to reduce wildlife risks. The data is vital to national and international airport wildlife management efforts, and one of the most important tools in tracking wildlife trends and determining hazards at locations across Canada.

Pilots are asked to report any knowledge of bird/wildlife strikes, no matter how inconsequential the event may seem. Even information about a near miss can help authorities learn more about the presence of potentially hazardous species, and the nuances of encounters between aircraft and wildlife.

In cases of bird strikes, reports should include the species whenever possible. Species identification provides airport operators with important data that enables them to effectively focus risk mitigation efforts. If the species is unknown, but bird remains are available from the incident, pilots may consult with airport wildlife management personnel for help identifying the species. Airport personnel may also decide to submit the remains for DNA analysis if they are unable to identify them.

CAR 302 requires an airport operator to amend its wildlife management plan, and submit it to Transport Canada for review within 30 days of the amendment, if a turbine-powered aircraft:

- suffers damage as a result of a collision with wildlife other than a bird;
- collides with more than one bird; or
- ingests a bird through an engine.

This process of review and amendment helps ensure wildlife management plans are as current as possible, addressing continual fluctuations in the wildlife hazards at airports. The review-and-amendment process is also set in motion when a variation in the presence of wildlife hazards is observed in an airport's flight pattern or movement area. Pilots can help mitigate risk by reporting to Transport Canada any significant changes in the numbers or behaviour of hazardous wildlife at airports that are visited regularly.

5.6.4.1 Bird/wildlife strike report form

To complete and submit a bird/wildlife strike report online:

<www.tc.gc.ca>
Transport and infrastructure
Aviation
Operating airports and aerodromes
Report a Bird or Wildlife Strike

For further information, contact the Wildlife Control office at: WildlifeControl-Controledelafaune@tc.gc.ca.

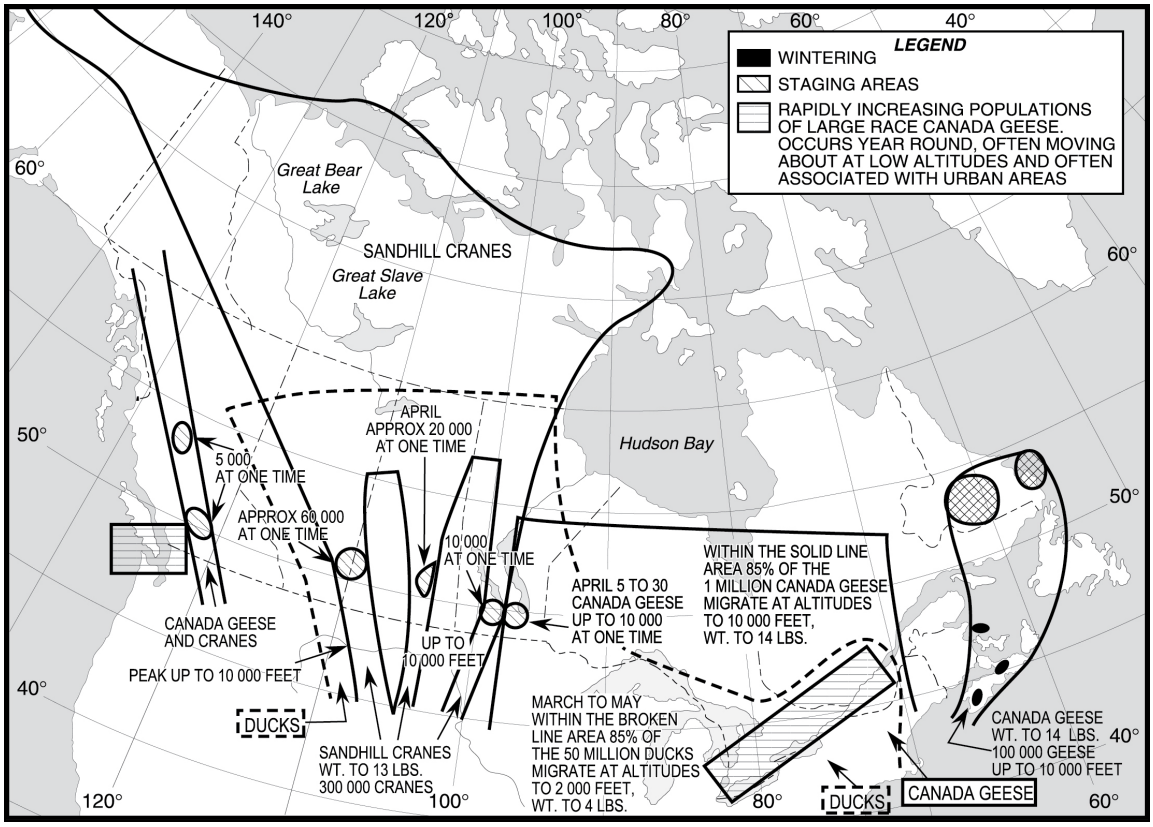


Figure 5.6.4–a: Spring Migration Routes – Cranes, Ducks and Canada Geese

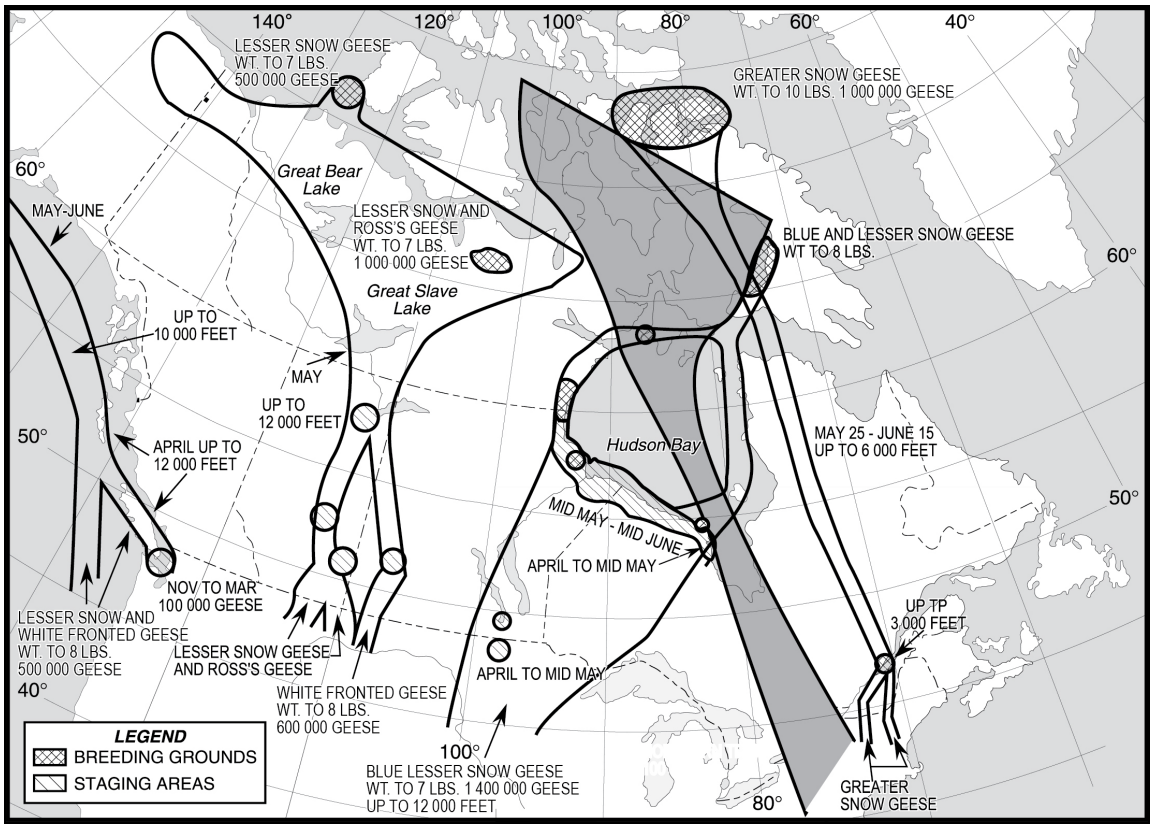


Figure 5.6.4–b: Spring Migration Routes – Other Geese

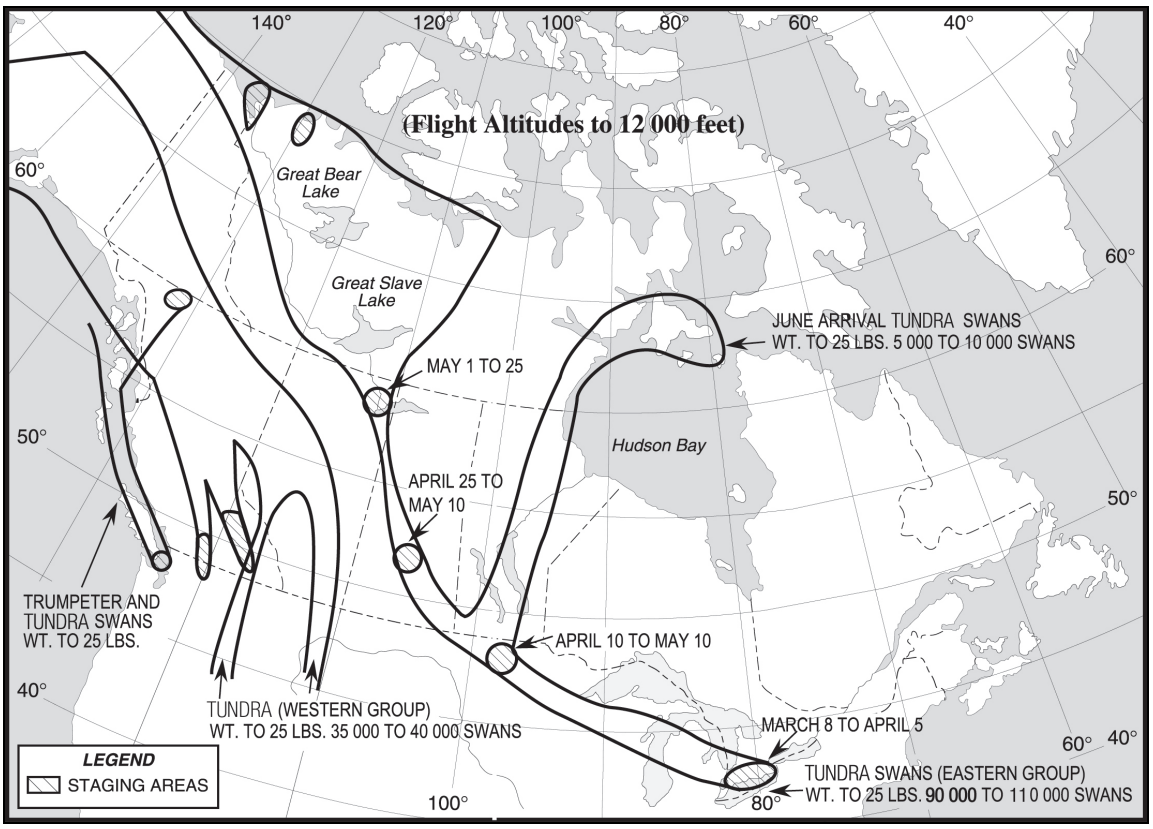


Figure 5.6.4–c: Spring Migration Routes – Swans (Flight Altitudes to 12 000 feet)

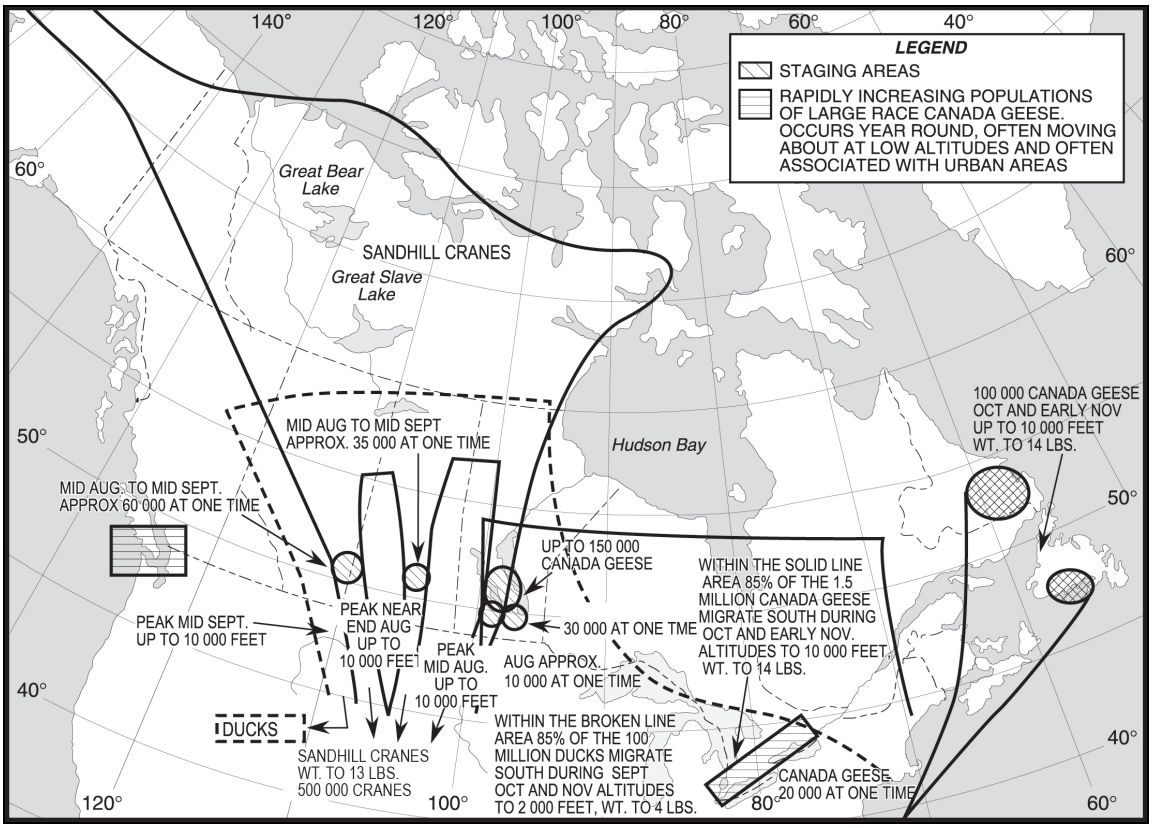


Figure 5.6.4–d: Autumn Migration Routes – Cranes, Ducks and Canada Geese)

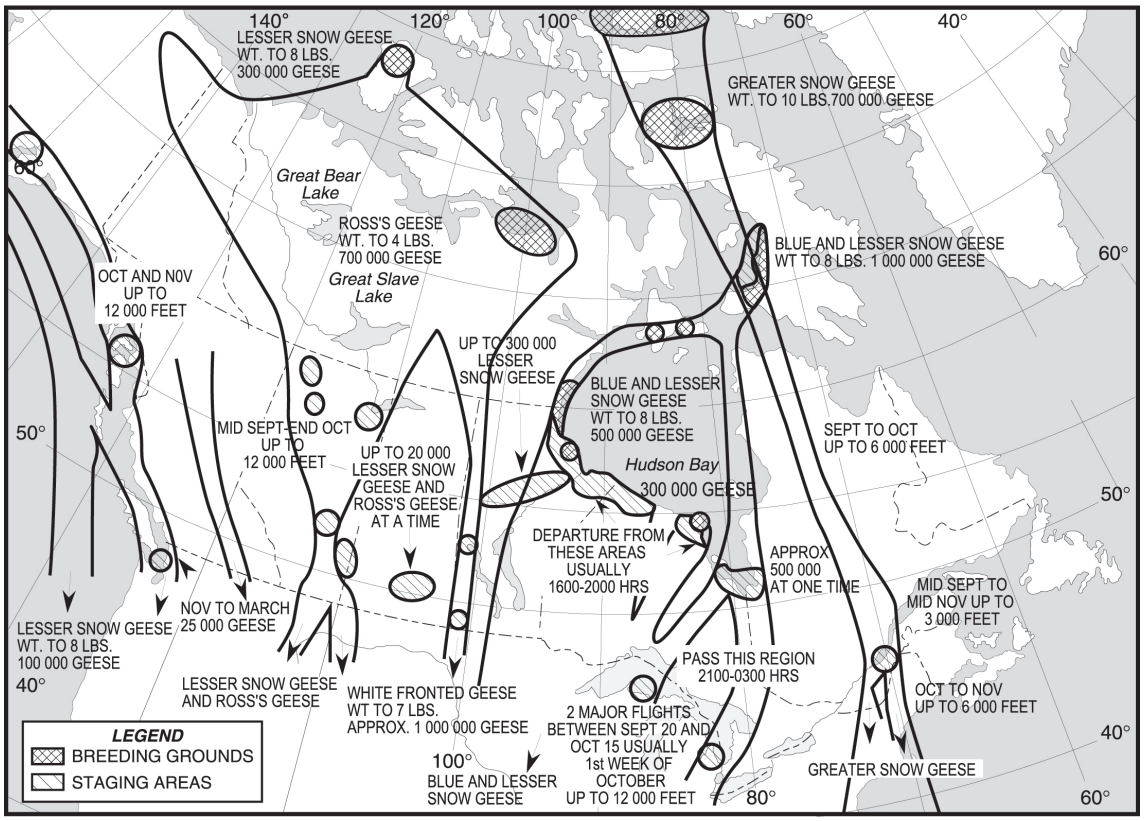


Figure 5.6.4–e: Autumn Migration Routes – Other Geese)

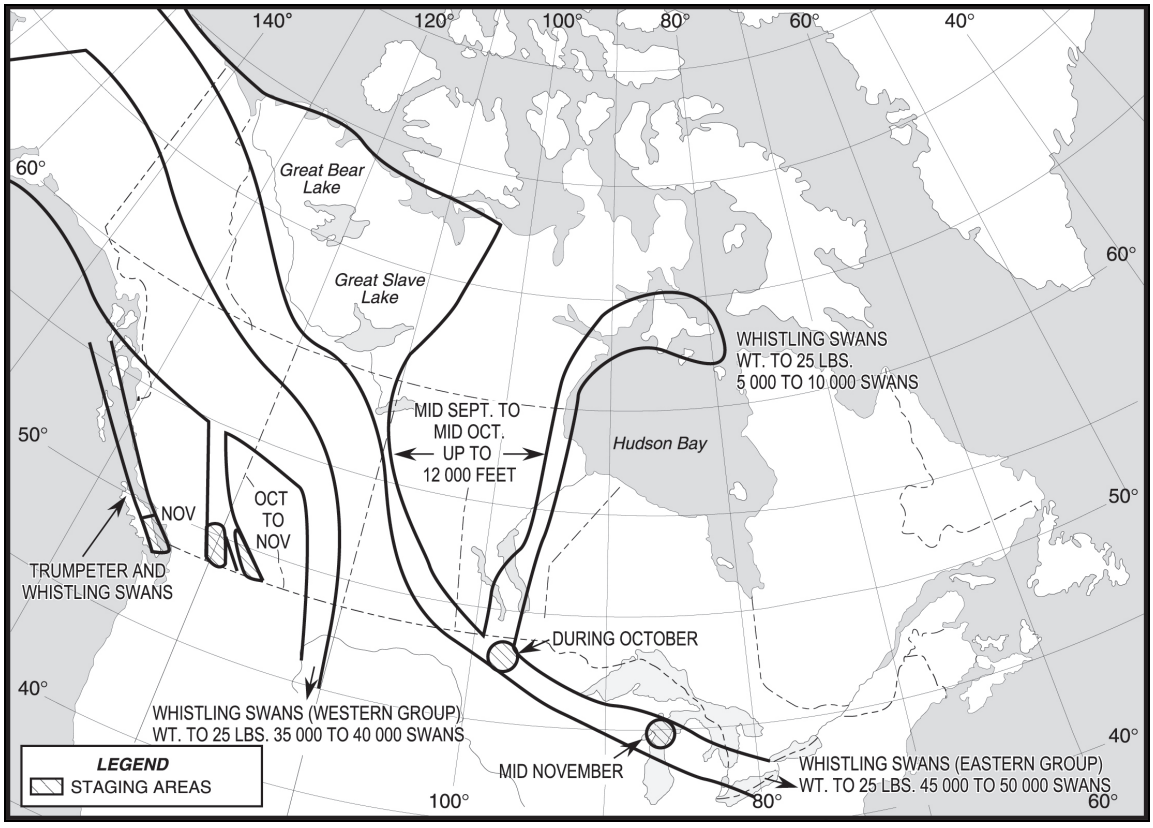


Figure 5.6.4–f : Autumn Migration Routes – Swans

5.6.5 Fur and Poultry Farms

Experience has shown that aviation noise caused by rotary wing and fixed wing aircraft flying at low altitudes can cause serious economic losses to the farming industry. The classes of livestock particularly sensitive are poultry (including ostriches and emus), because of the crowding syndrome and stampeding behaviour they exhibit when irritated and frightened, and foxes who, when excited, will eat or abandon their young. Avoid overflying these farms below 2,000 feet AGL.

Fur farms display watch towers or 20-foot-high pylons painted chrome yellow and black, with a red flag flying from a low mast during the months of February, March, April and May, that should be avoided below 2,000 feet AGL.

Pilots are, therefore, warned that any locations so marked should be avoided and that during the months of February, March, April and May, special vigilance should be maintained.

5.6.6 Protection of Wildlife

All pilots should recognize the importance of wildlife conservation. They are urged to become familiar with the game laws in force in the various provinces and to co-operate with all game officers to see that violations of game laws do not occur.

Pilots should be aware that flying low over herds of wild animals such as reindeer, caribou, moose. or muskoxen may result in reducing the animal population. Accidents resulting in broken bones may increase. Exhausted and disorganized animals are more susceptible to attacks from wolves; feeding is interrupted; and normal herd movement and reproductive functions may be seriously disrupted.

Serious damage can also be done to migratory birds due to low flying aircraft. The migratory bird regulations prohibit the killing of game birds using an aircraft. Geese in particular have great fear of aircraft; and their movements may be seriously disorganized by such interference. These birds are a valuable asset to Canada, and as several species are nearing extinction, it is felt that every effort should be made to preserve them.

In the interest of conserving wildlife, pilots must not fly at an altitude of less than 2,000 feet AGL, unless otherwise indicated, when in the vicinity of herds of wild animals or above wildlife refuges/bird sanctuaries depicted on affected aeronautical charts.

The landing or takeoff of aircraft in areas designated as bird sanctuaries may require a permit. Additional information can be found on the Environment and Climate Change Canada website:

<https://www.ec.gc.ca/>.

The following is a list of addresses where provincial and territorial game officers may be contacted in Canada. To obtain information on the preservation of wildlife within the various provinces, please contact a game officer at one of the locations shown below. Information pertaining to migratory bird regulations may be obtained directly from the Director General, Canadian Wildlife Service, Environment Canada, Ottawa ON K1A 0H3.

Fish and Wildlife Division Alberta Environment and Sustainable Resource Development Main Floor, Great West Life Building 9920 108 Street Edmonton AB T5K 2M4 Tel.: 780-944-0313 Fax: 780-427-4407	Fish and Wildlife Branch Natural Resources and Energy Development Province of New Brunswick P.O. Box 6000 Fredericton NB E3B 5HI Tel.: 506-453-3826 Fax: 506-453-6699

Environment and Natural Resources Government of the Northwest Territories P.O. Box 1320 Yellowknife NT X1A 2L9 Tel.: 867-767-9055 Fax: 867-873-0638	Conservation Officer Service Ministry of Forests, Lands and Natural Resources Operations Province of British Columbia P.O. Box 9391, STN PROV GOVT Victoria BC V8W 9M8 Tel.: 877-952-7277 ext. 1 (urgent) ext. 4 (non urgent) Fax: 250-387-0239
Wildlife Branch Conservation and Climate Province of Manitoba P.O. Box 24 200 Saulteaux Crescent Winnipeg MB R3J 3W3 Tel.: 204-945-7775 Fax: 204-945-3077	Wildlife Division Department of Environment and Wildlife Province of Newfoundland and Labrador 117 Riverside Drive Corner Brook NL A2H 7S1 Tel.: 709-637-2025 Fax: 709-637-2032
Wildlife Division Department of Lands and Forestry Province of Nova Scotia 136 Exhibition Street Kentville NS B4N 4E5 Tel.: 902-679-6091 Fax: 902-679-6176	Fish and Wildlife Ministry of Natural Resources and Forestry Province of Ontario 300 Water Street Peterborough ON K9J 8M5 Tel.: 705-755-2000 Fax: 705-755-1677
Forests, Fish and Wildlife Division Department of Agriculture and Land Province of Prince Edward Island P.O. Box 2000 183 Upton Road Charlottetown PE C1A 7N8 Tel: 902-368-4700 Fax: 902-368-4713	Ministry of Forests, Wildlife and Parks Province of Québec 880, chemin Sainte-Foy, RC-80 Québec QC G1S 4X4 Tel.: 418-627-8688 (French only) Fax: 418-646-4223 Toll free: 1-866-248-6936 (FR or EN) E-mail: services.clientele@mrnf.gouv.qc.ca
Fish and Wildlife Branch Ministry of Energy and Resources Government of Saskatchewan 3211 Albert Street Regina SK S4S 5W6 Tel.: 306-787-7196 Fax: 306-787-9544	Fish and Wildlife Branch Department of Environment Government of Yukon P.O. Box 2703 10 Burns Road Whitehorse YT Y1A 2C6 Tel.: 867-667-5652 Toll free (in Yukon): 1-800-661-0408, ext. 5652 TIP line: 1-800-661-0525 (wildlife conflict or afterhours) Fax: 867-393-7197

Wildlife Management Department of Environment Government of Nunavut Igloolik NU X0A 0L0 Tel.: 867-934-2183 Fax: 867-934-2190	

5.6.7 National, Provincial and Municipal Parks, Reserves and Refuges

To preserve the natural environment of parks, reserves and refuges and to minimize the disturbance to the natural habitat, overflights should not be conducted below 2,000 feet AGL. To assist pilots in observing this, boundaries are depicted on the affected charts.

The landing or takeoff of aircraft in the national parks and national park reserves may take place at prescribed locations. Contact information for each location can be found on the Parks Canada website here: <http://www.pc.gc.ca>.

Additional details can be found in the *National Parks Aircraft Access Regulations* available here:

<http://laws-lois.justice.gc.ca/eng/regulations/SOR-97-150/page-1.html>

ENR 6. ENROUTE CHARTS

For information about enroute charts, refer to Aeronautical Charts – Enroute Charts on NAV CANADA's website:

<www.navcanada.ca>
Aeronautical Information
IFR Publications
Enroute Charts High & Low Altitude (HI/LO)

ENR 7. NORTH ATLANTIC (NAT) OPERATIONS

ENR 7.1 Rules and Procedures

7.1.1 Regulations

Canadian Aviation Regulations (CAR) 602.38 requires pilots of Canadian aircraft, when flying over the high seas, to comply with the applicable rules of the air set out in ICAO Annex 2, and with the applicable regional supplementary procedures set out in ICAO Doc 7030.

7.1.2 NAT documentation

The following documents are applicable to operations in the NAT region:

(a) ICAO Annex 2—*Rules of the Air*;

(b) ICAO Annex 11—*Air Traffic Services*;

(c) ICAO Doc 4444—*Procedures for Air Navigation Services—Air Traffic Management*;

(d) ICAO Doc 7030—*Regional Supplementary Procedures*;

(e) ICAO NAT Doc 001—*NAT SPG Handbook*;

(f) ICAO NAT Doc 006—*Air Traffic Management Operational Contingency Plan—North Atlantic Region*;

(g) ICAO NAT Doc 007—*North Atlantic Operations and Airspace Manual*; and

(h) NAT Ops Bulletin 2023_001 – *NAT Oceanic Clearance Removal*

7.1.3 General Aviation Aircraft

Canadian Aviation Regulations (CAR) 602.39 specifies the following:

> "No pilot-in-command of a single-engined aircraft, or of a multi-engined aircraft that would be unable to maintain flight in the event of the failure of any engine, shall commence a flight that will leave Canadian Domestic Airspace and enter airspace over the high seas unless:
>
> (a) the pilot-in-command holds a pilot license endorsed with an instrument rating;
>
> (b) the aircraft is equipped with
>
> (i) the equipment referred to in section 605.18,
>
> (ii) a high frequency radio capable of transmitting and receiving on a minimum of two appropriate international air-ground general purpose frequencies, and
>
> (iii) hypothermia protection for each person on board; and
>
> (c) the aircraft carries sufficient fuel to meet the requirements of section 602.88 and, in addition, carries contingency fuel equal to at least 10 per cent of the fuel required pursuant to section 602.88 to complete the flight to the aerodrome of destination."

7.1.4 Flight Rules

Over the high seas, the lower limit of all North Atlantic (NAT) oceanic control areas (OCA) is FL 055; there is no upper limit. Throughout the NAT region, airspace at and above FL 055 is Class A controlled airspace, and below FL 055 is Class G uncontrolled airspace.

At or above FL 060, flights shall be conducted under instrument flight rules (IFR) even when aircraft are not operating in instrument meteorological conditions (IMC).

Air traffic control (ATC) clearances to climb or descend while maintaining one's own separation and remaining in visual meteorological conditions (VMC) shall not be issued to aircraft.

7.1.5 Time Keeping Procedures

Prior to entry into the NAT HLA, the time reference system(s) to be used during the flight for calculation of waypoint ETAs and waypoint ATAs should be synchronized to UTC. Refer to section 7.2.2 for more information on the NAT HLA.

All ETAs and ATAs passed to ATC should be based on a time reference that has been synchronized to UTC or equivalent. Acceptable sources of UTC include the following:

(a) The United States National Institute of Standards and Technology (NIST) HF radio station near Fort Collins, Colorado, (call sign WWV), which operates 24 hours a day on 2 500, 5 000, 10 000, 15 000, and 20 000 kHz (AM/SSB) and announces UTC time at the top of each minute.

(b) Approved (TSO-C129) GPS equipment on board (corrected to UTC) that allows pilots to access UTC time 24 hours a day.

(c) The National Research Council of Canada HF radio station in Ottawa (call sign CHU), which is available 24 hours a day on 3 330, 7 850, and 14 670 kHz (SSB). In the final ten-second period of each minute, it makes a bilingual station identification and time announcement in UTC.

(d) The British Broadcasting Corporation (BBC), which transmits the Greenwich time signal once every hour on a number of domestic and worldwide frequencies.

(e) Any other source shown to the state of registry or state of the operator (as appropriate) to be an equivalent source of UTC.

7.1.6 Flight Planning Procedures

7.1.6.1 Routes

For eastbound and westbound traffic:

(a) south of 70N, the planned tracks shall be defined by significant points formed by the intersection of half or whole degrees of latitude at each 10 degrees of longitude (060°W, 050°W, 040°W). For flights operating north of 70°N, significant points are defined by the parallels of latitude expressed in degrees and minutes with longitudes at 20 degrees intervals; the distance between significant points shall, as far as possible, not exceed one hour of flight time. Additional significant points should be established when required because of aircraft speed or the angle at which meridians are crossed. When the flight time between successive significant points is less than 30 minutes, one of the points may be omitted.

(b) oceanic traffic transitioning through the Gander oceanic transition area (GOTA) from FL 290 to FL 600 shall flight plan an oceanic entry point (OEP), a 050°W coordinate, and a 040°W coordinate.

(c) Oceanic entry points AVPUT, CLAVY, EMBOK, KETLA, LIBOR, MAXAR, NIFTY, PIDSO, RADUN, SAVRY, TOXIT, URTAK, VESMI, AVUTI, BOKTO, CUDDY, DORYY, and ENNSO are restricted to flights conducted from FL 290 and above.

(d) Oceanic entry points HOIST, IRLOK, JANJO, KODIK, LOMSI, MELDI, NEEKO, PELTU, RIKAL, SAXAN, TUDEP, UMESI, ALLRY, BUDAR, ELSIR, IBERG, JOOPY, MUSAK, NICSO, OMSAT, PORTI, RELIC, SUPRY, and RAFIN shall be flight planned by all aircraft entering or exiting Gander oceanic airspace, regardless of altitude.

For northbound and southbound traffic, the planned tracks shall be defined by significant points formed by the intersection of whole degrees of longitude with parallels of latitude spaced at 5 degrees (65N, 60N, 55N).

For aircraft planning to fly within the Organized Track System (OTS) from the oceanic entry point to the oceanic exit point as detailed in the daily NAT track message, the track shall be defined in Item 15 of the flight plan by the abbreviation “NAT” followed by the code letter assigned to the track. (Refer to section 7.3.2 for more detail on OTS.)

For eastbound NAT flights planning to operate on the OTS, the second and third route options should be indicated at the end of Item 18 of the flight plan. Those operators who do not have the capability to provide this information in Item 18 of the flight plan should send the information by a separate Aeronautical Fixed Telecommunication Network (AFTN) message to Gander ACC (CYQXZQZX).

Examples:

RMKS/ … O2.X370 O3. V350 (Option 2 is Track X at FL 370; option 3 is Track V at FL 350).

RMKS/ … O2.RS390 O3.Z370 (Option 2 is random track south at FL 390; option 3 is Track Z at FL 370).

Note: In the preceding examples, options 2 and 3 are indicated by the letter “O” and not by the number zero.

ATS requires flights entering or exiting the Gander Oceanic Control Area (OCA) to flight plan in accordance with the published NAT OTS or, if exiting by way of 51°N 050°W and south thereof, via the following OEPs (compulsory reporting points) and associated 050°W coordinates. (See Table 7.1.6.1, “OEPs and Associated Coordinates”.)

Table 7.1.6.1, OEPs and Associated Coordinates

OEP	Coordinates	OEP	Coordinates
ALLRY	5100N 05000W	NICSO	4800N 05000W
BUDAR	5030N 05000W	OMSAT	4730N 05000W
ELSIR	5000N 05000W	PORTI	4700N 05000W
IBERG	4930N 05000W	RELIC	4630N 05000W
JOOPY	4900N 05000W	SUPRY	4600N 05000W
MUSAK	4830N 05000W	RAFIN	4500N 05000W

ATS requires flights entering or exiting the New York Oceanic Control Area (OCA) through Canadian Domestic Airspace (CDA) to flight plan over one of the following compulsory reporting points: NOVOK, JEBBY, BOBTU, or

TALGO; or via ELERI or MUSPO, for flights arriving at or departing from Halifax airport (CYHZ). Eastbound flights that exit the New York OCA via CDA and subsequently enter the Gander OCA are required to flight plan in accordance with the published NAT OTS or over an oceanic entry point and a 050°W coordinate.

Flights exiting the New York OCA via BOBTU should contact Gander ACC five minutes prior to BOBTU on frequency 134.7 MHz. Operators should be aware that if the NAT OTS includes tracks that are at or south of SUPRY 46°N 050°W (or 46°N 050°W SUPRY), optimal flight levels and routes may not be available.

To facilitate effective coordination for flights entering or exiting the Gander domestic control area (CTA) and the New York OCA via 44°N 050°W or south thereof:

(a) eastbound flights exiting the Gander domestic CTA directly into the New York OCA are required to flight plan via LOMPI direct JAROM direct TALGO direct 44°N 050°W or south thereof;

(b) eastbound flights exiting the New York OCA directly into the Gander domestic CTA are required to flight plan via BOBTU;

– When the eastbound OTS are anchored at RAFIN and/or TALGO, BOBTU will be unavailable for eastbound NAT traffic flight planning FL300 to FL400 inclusive

(c) westbound flights exiting the New York OCA directly into the Gander domestic CTA are required to flight plan via BOBTU direct JAROM direct LOMPI.

Note: TALGO is not to be used for westbound flights.

ATS system parameters require all westbound flights in Gander OCA transiting to the Montréal FIR/CTA, to flight plan:

Below FL290

- Via 060°W followed by both a Montréal boundary reporting point and an inland fix contained in Montreal CTA.
- Montreal boundary reporting fixes: NALDI, MUSVA, KAGLY, BERUS, IKMAN, GRIBS, MIBNO, MUSLO, PEPKI, or SINGA.
- Montreal inland fixes: BEZED, DUTUM, TEFFO, FEDDY, JELCO, RODBO, LOPVI or LAKES.
- KENKI and IRBIM are not to be used as boundary reporting points.

FL 290 up to and including FL 600,

- via an oceanic entry point followed by a Montréal inland fix.

Flights operating below FL290 into Gander FIR north of HOIST must route via 050°W followed by a Gander CTA boundary fix (MOATT, PRAWN or PORGY) and an inland fix contained in Gander CTA.

Flights operating from FL 290 and above may flight plan a North American Route (NAR) to or from an oceanic entry point.

7.1.6.2 Airspeed

The TAS or Mach number is to be entered in Item 15 of the flight plan.

7.1.6.3 Altitude

The planned cruising level(s) for the oceanic portion of the flight should be included in Item 15 of the flight plan.

Note: Pilots planning to conduct a flight wholly or partly outside the OTS should indicate in a flight plan a cruising level(s) appropriate to the direction of flight and in accordance with the flight levels as described in the NAT Flight Level Allocation Scheme (FLAS). (Refer to section 7.3.2.1 for more details on FLAS.).

Requests for a suitable alternative flight level may be indicated in Item 18 of the flight plan.

7.1.6.4 Estimated times

For NAT flights, the accumulated elapsed time only to the first oceanic FIR boundary (Gander accepts elapsed time to OEPs) is to be entered in Item 18 of the flight plan.

For flights conducted wholly or partly on the OTS, accumulated estimated times to significant points enroute are to be entered in Item 18 of the flight plan.

7.1.6.5 Aircraft Approval Status and Registration

For an aircraft certified as being in compliance with operations within NAT HLA,the approval status shall be indicated in Item 10a by entering the letter “X”. It is the pilot’s responsibility to ensure that specific approval has been given for NAT HLA operations. (Refer to section 7.2.2.3 for more information on approval for the NAT HLA.)

For an aircraft certified as being in compliance with RVSM MASPS, RVSM approval shall be indicated in Item10a by entering the letter “W”. It is the pilot’s responsibility to ensure that specific approval has been given for RVSM operations. Refer to section 7.2.3.3 for more information on RVSM MASPS.

If the aircraft registration is not included in Item 7, it shall be indicated in Item 18.

7.1.6.6 Filing

NAT operators shall forward all flight plans for eastbound NAT flights to the Canadian ACCs whose FIR or CTA the flights will traverse. These flight plans shall include the EET for each CTA boundary in Item 18 of the flight plan. The AFTN addresses for Canadian ACCs are listed in Table 7.1.6.6.

Table 7.1.6.6, AFTN Addresses for Canadian ACCs

AFTN Addresses	Canadian ACCs	AFTN Addresses	Canadian ACCs
CZQXZQZX	Gander	CZWGZQZX	Winnipeg
CZQMZQZX	Moncton	CZEGZQZX	Edmonton
CZULZQZX	Montréal	CZVRZQZX	Vancouver
CZYZZQZX	Toronto	—	—

Where possible, operators are to file eastbound NAT flight plans at least four hours prior to the ETA at the oceanic entry point specified in the flight plan.

7.1.7 Preferred Route Message (PRM)

North Atlantic (NAT) operators shall send preferred route messages (PRMs) for eastbound flights to the following Gander aeronautical fixed telecommunication network (AFTN) address:

(a) CZQXZQZX (Gander ACC)

(b) CZULZQZX (Montréal ACC)

The following format is to be used for eastbound PRMs:

[PRIORITY] [DEST ADDRESS] [DEST ADDRESS]
[DATE TIME OF ORIGIN] [ORIGIN ADDRESS]
[MESSAGE TYPE]-[COMPANY]-[EB]-[YYMMDD AT 030°W] –
[(DEP/ DEST) (INLAND FIX) (OEP) (OCA RPS) (LANDFALL) (LAST UK POINT) (NUMBER OF FLT 01-99)]

Example:

FF CZQXZQZX
130502 KJFKSWRW
PRM-SWR-E-200113
CYUL/LSZH JOOPY 49/50 49/40 49/30 49/20 BEDRA NASBA 02
KJFK/LSZH PORTI 47/50 48/40 49/30 50/20 SOMAX ATSUR 03

Note 1: If there is no inland navigation fix (INF), the latitude crossing 080°W is to be used.

Note 2: PRMs for eastbound flights are to be sent no later than 1000 UTC.

7.1.8 Clearances

Oceanic clearances were introduced in the NAT Region to allow for safe and efficient handling of air traffic within a large volume of procedural airspace, using HF Voice communications and large separation standards. In recent years, there have been significant advancements in CNS technology, enabling NAT ANSPs to improve the safety and services in the NAT Region while further reducing separation minima. Therefore, effective 21 March 2024, oceanic clearances ceased to be issued by Reykjavik, and Santa Maria OACs; and by 4 December 2024 by Gander, Shanwick and Bodo. Any necessary changes to an aircraft's flight plan before the Oceanic Entry Point will be addressed by specific ATC clearances as required.

7.1.8.1 Operations in Gander Oceanic Control Area

Pilots intending to operate aircraft in the Gander OCA should note the following:

(a) Clearances for VFR climb, or descent will not be granted.

(b) ATC will assign a fixed Mach number if required due to traffic. If no Mach number is assigned, fly cost index FMS (ECON) based on flight planned Mach.

(c) ATC will not issue route details for flights operating on flight planned route.

(d) In the case of a reroute other than on an organized track ATC will issue a clearance specifying the full route details . The pilot is to read back the full details of the clearance.

(e) In the case of a reroute on a published organized track, ATC will issue a clearance referencing the track letter. The pilot is to read back the track letter including the Track Message Identification (TMI) number. ATC will confirm the accuracy of the readback and the TMI number.

Note: The OTS is identified by a TMI number (refer to section 7.3.2 for more information on OTS), which is determined by using the Julian calendar for the day on which the tracks are effective. The TMI number is contained in the Remarks section on the NAT track message. Amendments to tracks that are already published are indicated by appending a letter to the Julian date, (e.g., TMI 320A). A revised TMI will be issued for changes to:

(i) any track coordinate(s), including named points;

(ii) published track levels; or

(iii) named points within European routes west.

7.1.8.2 Domestic Clearances – NAT Westbound Traffic

Pilots proceeding westbound across the NAT and entering CDA within the Gander, Moncton, and Montréal FIRs should comply with the following procedures:

(a) Flights whose current route clearance contains their flight planned oceanic exit point (OXP) will not be issued enroute clearances upon entering the airspace and are to follow the flight planned route as cleared. Domestic enroute clearances will be issued:

(i) for flights that have been rerouted and exit oceanic airspace at a point other than the flight planned OXP; or

(ii) at a pilot's request for another routing; or

(iii) if a flight plan has not been received by the ACC.

(b) Flights that have been rerouted from the flight planned route and enter CDA within 120 NM of the flight planned oceanic exit point can anticipate a clearance to regain the flight planned route by the INF unless the pilot requests a different routing. For flights entering CDA more than 120 NM from the flight planned oceanic exit point, a clearance will be issued following consultation with the pilot.

(c) ATC will use the latest flight plan received before a flight departs. Subsequent changes to the flight plan route, including any changes received by the pilot from flight operations or dispatch, must be requested directly by the pilot on initial contact with the appropriate domestic ACC. Direct requests from flight operations or dispatch to ATC to re-clear aircraft will only be considered under exceptional circumstances and are not an acceptable alternative to a pilot-initiated request for a re-clearance.

(d) Domestic re-clearances by ATC may contain either the route specified in full detail or a NAR.

If an aircraft enters CDA via the Edmonton FIR, the onward domestic routing will have been established in coordination between the Reykjavik and Edmonton ACCs, and additional domestic clearance is not required. If there has been a change in route from the filed flight plan, clarification of the onward routing may be obtained from Edmonton ACC on request.

Westbound aircraft that have proceeded across the NAT and have entered the Gander Oceanic Transition Area (GOTA) or CDA shall maintain either the flight plan speed if none assigned or the last oceanic Mach setting assigned by ATC:

(a) unless approval is obtained from ATC to make a change; or

(b) until the pilot receives an initial descent clearance approaching destination.

Note: Pilots should request changes to their oceanic Mach setting once communication has been established within the GOTA or CDA.

7.1.9 Position Reports

Unless otherwise requested by ATC, flights shall make position reports at all points in their route clearance.

Position reports shall include the reported position, including the time it is reached, the current flight level or passing flight level, and final level if either climbing or descending; the next reporting point and estimated time; and the succeeding reporting point per the cleared route. If the estimated time over the next reporting point is found to be in error by three minutes or more, a revised estimated time shall be transmitted as soon as possible to the appropriate ATC unit. Revisions to forward estimates are not required for flights with established ADS-C contracts.

When making position reports, all times shall be expressed in hours and minutes UTC.

If an aircraft in the Gander OCA is unable to communicate with Gander oceanic, the pilot shall endeavour to relay position reports through:

(a) another oceanic centre with which communication has been established;

(b) another aircraft in the NAT region (when out of range of VHF ground stations, aircraft may use 123.45 MHz for air-to-air communications, including the relaying of position reports); or

(c) another aircraft on emergency frequencies 121.5 or 243.0 MHz, if no other means is available.

7.1.10 Communications with ATC

All aircraft operating in the Gander OCA must be capable of conducting two-way radio communication with ATC. The radio communication equipment shall consist of at least one HF and one other long-range communication system (HF, CPDLC or SATVOICE). Carriage of HF radio and the additional long-range communication system is mandatory with the exception of operations on routes covered by VHF facilities. (refer to CFS Planning Section C for a list of VHF facilities)

Flights planning to operate outside VHF coverage may request waivers from the HF requirement provided the flight falls into one of the following categories:

- Air carriers with HF unserviceable wishing to return to base for repairs, or
- Ferry or delivery flights, or
- Special event flights

Relief from the HF requirement may be granted with at least 24 hours prior coordination with Gander Area Control Centre Duty Manager or Supervisor (qxaccshiftmngrs@navcanada.ca) provided the aircraft has two other long-range communication systems appropriate for the route of flight.

See CARs 602.38 and 602.39 for Canadian registered aircraft or for aircraft entering the NAT via CDA.

For more details on equipage requirements in NAT HLA, refer to ICAO Annex 2 Flight Operating Rules and ICAO Doc 7030 Regional Procedures – North Atlantic Region, ICAO NAT Doc 007 Chapter 5, as well as national AIPs for the states concerned.

All flights operating in the Gander OCA should check-in on international air-ground frequencies.

7.1.11 Adherence to Mach Setting

While operating in Gander OCA and Canadian domestic airspace (CDA), aircraft shall adhere to the Mach setting assigned by air traffic control (ATC) unless approval is obtained from ATC to make a change, or until the pilot receives an initial descent clearance approaching destination. If it is essential to make an immediate

temporary change in Mach setting (e.g., as a result of turbulence), ATC shall be notified as soon as possible that such a change has been made.

Pilots shall advise ATC at the time of the climb/descent request if it is not possible to maintain the last assigned Mach setting during enroute climbs and descents because of aircraft performance.

7.1.11.1 Operations Without Assigned Fixed Speed (OWAFS)

In 2019, OWAFS were implemented, removing the requirement for a fixed Mach speed on every flight crossing the NAT. However, flight planning requirements have not changed, and the requested Mach speed for NAT crossings must still be filed.

Operators are expected to fly a variable Mach (normal speed) based on filed Mach speed in the flight plan. ECON (Boeing) / Managed Speed (Airbus)/Normal Speed.

During operations without an assigned fixed speed, the last assigned speed will be the basis for ICAO Annex 2, “Rules of the Air” flight crew procedures. Operators shall inform ATC if the speed varies by plus or minus Mach 0.02 or more from the last assigned speed (or flight planned speed if no speed assigned).

ATC may assign a fixed speed at any time as required for traffic management.

7.1.12 Operation of Transponders

Transponders must be operated at all times on Mode A or Mode C on Code 2000, while operating in the North Atlantic (NAT) region. However, the last air traffic control (ATC) assigned code must be retained for a period of 10 min after entry into NAT airspace unless otherwise directed by ATC.

Note: This procedure does not affect the use of the special purpose codes 7500, 7600, and 7700.

7.1.13 Meteorological Reports

Aircraft must make, record, and report meteorological observations at each designated reporting point on a routine basis. However, aircraft cleared on an organized track should be required to make, record, and report meteorological observations only upon a specific request by air traffic control (ATC). The International Civil Aviation Organization (ICAO) air report (AIREP) form, as contained in Appendix 1 of the *Procedures for Air Navigation Services—Air Traffic Management* (Doc 4444), should be used for this purpose.

7.1.14 Altitude Reports

Aircraft cleared for climb or descent should report their level to the nearest 100 ft.

For all altitude changes, whether they are climbs or descents, pilots should report reaching the new level/cruising altitude to air traffic control (ATC).

7.1.15 Strategic Lateral Offset Procedures (SLOPs)

The strategic lateral offset procedure (SLOP) is now a standard operating procedure throughout the North Atlantic (NAT) region. This procedure mitigates collision risk and wake turbulence encounters. Pilots conducting oceanic flights within the NAT region with automatic offset programming capability are recommended to fly lateral offsets up to 2 NM right of centreline.

The introduction of very accurate aircraft navigation systems, along with sophisticated FMSs, has drastically reduced the number of risk-bearing lateral navigation (LNAV) errors reported in NAT airspace.

Paradoxically, the capability of aircraft to navigate to such a high level of accuracy has led to a situation where aircraft on the same track, but at different levels, are increasingly likely to be in lateral overlap. This results in an increased risk of collision if an aircraft departs from its cleared level for any reason.

SLOP reduces risk by distributing aircraft laterally. It is applicable within the New York Oceanic, Gander Oceanic, Shanwick Oceanic, Santa Maria Oceanic, Nuuk, and Reykjavik FIRs, and within the Bodø Oceanic FIR when flights are operated more than 185 km (100 NM) seaward from the shoreline. SLOP conforms to direction in the International Civil Aviation Organization's (ICAO) *Procedures for Air Navigation Services–Air Traffic Management* (PANS-ATM) (Doc 4444) and is subject to the following guidelines:

(a) Aircraft without automatic offset programming capability must fly the route centreline.

(b) Operators capable of programming automatic offsets may fly the centreline or an offset up to a maximum of 2 NM right of centerline.

(c) Offsets to the left of centreline are not permitted.

(d) An aircraft overtaking another aircraft should offset within the confines of this procedure, if capable, so as to minimize the amount of wake turbulence for the aircraft being overtaken. The pilot should take into account wind and estimated wake vortex drift and time to descend. (Nominal descent rates for wakes are 300–600 feet/min.)

(e) Pilots should use whatever means are available (e.g., traffic alert and collision avoidance system [TCAS], communications, visual acquisition) to determine the best flight path to fly. Pilots may contact other aircraft on frequency 123.45 MHz, as necessary, to coordinate the best wake turbulence offset option.

(f) Pilots may apply an offset outbound after the oceanic entry point and must return to the centreline before the oceanic exit point. Position reports transmitted via voice should be based on the waypoints of the current ATC clearance and not the offset positions.

(g) There is no ATC clearance required for this procedure and it is not necessary that ATC be advised.

7.1.16 Gander Oceanic Flight Level Initiative (GO-FLI)

NAT operators have indicated that the ability to conduct mid-ocean step climbs enable more fuel-efficient flight profiles. Ongoing analysis supports the potential for fuel savings and reduced greenhouse gas emissions while suggesting operators may not be making full use of the flexibility of mid ocean requests for climb made available as a result of reduced separation standards supported by ADS-B surveillance services.

GO FLI represents a proactive controller approach for providing information to flight crews that could aid in flight deck decision making resulting in fuel savings and reductions in greenhouse gas emissions: crews transiting the Gander Oceanic Control Area (OCA) in NAT HLA will be advised if higher flight levels become available.

Gander's Flight Data Processor (Gander Automated Air Traffic System (GAATS+)) routinely interrogates a flight's vertical profile to determine if higher flight levels have become available. In addition, GAATS+ will parse out and retain level requests from flight plans, RCLs, CPDLC and voice requests. Should flight levels as identified from either of those venues become available. GAATS+ creates a message for presentation to the responsible controller.

Flight crews will receive, by voice or CPLDC, "(FLIGHT IDENT) GANDER ATC ADVISES (AIRCRAFT) A LEVEL CHANGE MAY BE AVAILABLE IF REQUESTED".

If a climb would be beneficial to the flight, use CPDLC downlink message "REQUEST CLIMB TO [level]" or request higher with Gander Radio via HF voice. If a higher flight level is not requested, use CPDLC "ROGER" or advise Gander Radio via HF voice.

7.1.17 RCL Procedures

Flight crews must send the ACARS RCL message 90 to 60 minutes prior to the OEP and include.

- Oceanic Entry Point (OEP)
- ETA for the OEP
- Mach Number (based on FMS cost index (ECON))
- Requested Flight Level
- The highest acceptable Flight Level which can be attained at the OEP (via free text)
  - provide the highest acceptable Flight Level as MAX FL
    - Example: Requesting FL360 - enter free text MAX F380
  - If requested Flight Level is the highest acceptable; provide the requested Flight Level as MAX FL
    - Example: Requesting FL360 - enter free text MAX F360

Note: Flights departing from airports less than 45 minutes flying time from the OEP should send RCL 10 minutes prior to start up.

Examples of a response message to the RCL that include, but are not limited to, the following, and will be generated automatically and delivered to the aircraft via ACARS or voice as appropriate:

- RCL RECEIVED BY [ANSP].
- RCL REJECTED

Route

Gander will issue any required route amendment either by voice or CPDLC loadable route clearance uplink.

Speed

Gander will use the RCL requested Mach speed information as the reference speed for Cost Index (ECON) operations. Fly cost index FMS (ECON) unless otherwise cleared. ATC will assign a fixed Mach number if required due to traffic.

Level

Gander will consider both the requested Flight Level and the Max Flight Level information. Any changes to current flight level must be via ATC clearance; do not change Flight Level unless cleared by ATC.

Note: If ATC cannot accept the requested OEP Flight Level, the closest available oceanic Flight Level to the one requested (RCL) will be determined and, if required, a clearance to climb or descend issued prior to the OEP. The “MAX FL” will not be exceeded without coordination.

Voice shall be used to submit an RCL message if:

- Aircraft is not ACARS / ARINC 623 Data Link equipped
- ACARS Data Link is not operational
- REVERT TO VOICE is received by aircraft
- No response to RCL is received within 15 minutes of sending RCL

When an RCL is rejected, the message is sent in three parts:

1. RCL Rejected

2. Reason for rejection, which can include, but is not limited to:
   - Flight Plan Not Held
   - Error in Message
   - Invalid Callsign
   - Invalid Entry Point
   - Invalid Entry Time
   - Invalid Mach Number
   - Invalid Flight Level
   - Invalid Remarks Field
   - Invalid Registration
   - Callsign Already in Use
   - RCL Sent Too Early
   - RCL Sent Too Late
   - Network Congestion
   - Ground System Error
3. Action, which can include, but is not limited to:
   - RESUBMIT YOUR REQUEST
   - REVERT TO VOICE FOR RCL SUBMISSION
   - REQUEST AGAIN Sixty to Ninety Minutes Prior to Oceanic Entry Point (response to RCL Too Early)

Note: Refer to NAT OPS Bulletin 2023_001 Revision 5 NAT Oceanic Clearance Removal for more details.

7.1.18 ARINC 424 Identifiers for Half-Degree Waypoints in the Gander Oceanic Control Area

Manual entry of latitude/longitude waypoints using short codes derived from the ARINC 424 paragraph 7.2.5 standard (5050N = 50°N/50°W, N5050 =50°30'N/50°W) has been directly associated as a causal factor contributing to many of the occurrences of gross navigation errors within the NAT Region.

The use of the entire latitude/longitude coordinates to enter waypoints, using procedures that provide for adequate mitigation of display ambiguity, is strongly advocated to avoid FMC insertion errors.

If full latitude and longitude coordinates are not used to enter waypoints:

- Aircraft navigation data bases should NOT contain waypoints in the Gander Oceanic Control Area in the ARINC-424 paragraph 7.2.5 format of "Nxxxx".

- If an aircraft operator or flight planning service has an operational need to populate data bases with half-degree waypoints in the Gander Oceanic Control Area, they are advised to use an alternate format, such as "Hxxxx".

Flight crew procedures should require each pilot to independently display and verify the DEGREES and MINUTES loaded into the FMC for the latitude/longitude waypoints defining the route contained in the clearance.

ENR 7.2 NAT Airspace

7.2.1 Gander Oceanic Transition Area (GOTA)

The implementation of additional surveillance and communication sites along the north-east coast of Canada allowed for the provision of enhanced services and led to the creation of the Gander oceanic transition area (GOTA).

The lower limit of the GOTA is FL 290; the upper limit is FL 600. The GOTA is Class A controlled airspace.

The GOTA consists of:

6523N 06238W - 6530N 06000W - 654236N 0582356W - 6500N 05745W - 6330N 05540W - 6330N 05500W - 5352N 05458W - 5700N 05900W - 582816N 0602104W - 6100N 06300W - 6519N 06300W - 6523N 06238W (see Figure 7.2.1, “Gander OCA” for reference)

Surveillance services are provided by Gander ACC throughout the GOTA to suitably equipped aircraft using ADS-B.

Direct controller-pilot VHF communication is available in addition to automated ADS-C/CPLDC communications. The ADS-C/CPDLC log on address for aircraft in GOTA airspace is CDQX.

Provided aircraft transit the GOTA and route directly into Reykjavik airspace, the GOTA services available support conditions (a) and (b) in section ENR 7.2.3.2 **Aircraft without NAT HLA (or MNPS) Approval.**

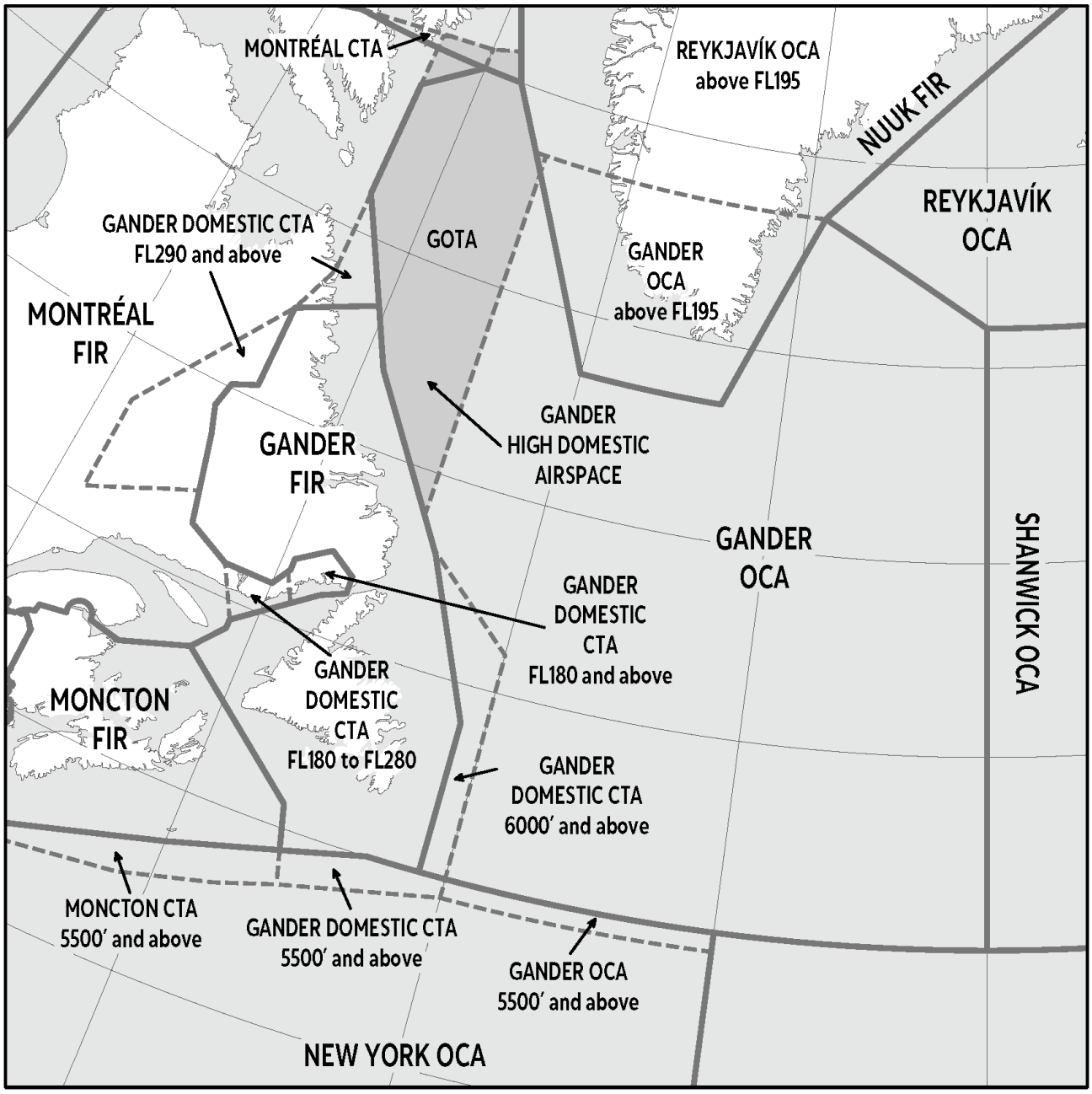


Figure 7.2.1, Gander OCA

7.2.2 Airspace Delegated by New York ARTCC to Gander Domestic

When operating within the airspace which has been as defined below, operators are to use CPDLC address CDQX. This airspace has been delegated to Gander domestic by New York Air Route Traffic Control Center (New York ARTCC). (See Figure 7.2.1, “Gander OCA” for reference).

The portion of the New York Oceanic FIR at and above FL 055 bounded by a line beginning at:

450000N	500000W	to
443000N	500000W	to
433500N	554500W	to
442648N	560306W	thence
northeast along the New York Oceanic FIR boundary		to point of beginning.

7.2.3 North Atlantic High Level Airspace (NAT HLA)

The NAT HLA is that volume of airspace between FL 285 and FL 420 within the OCAs of Bodo Oceanic, Gander Oceanic, New York Oceanic East, Reykjavik, Santa Maria, and Shanwick excluding the Brest Oceanic Transition Area (BOTA) and the Shannon Oceanic Transition Area (SOTA).

Operators of Canadian-registered aircraft intending to fly in the NAT HLA will be required to show that they meet all the applicable standards. Information on the measures necessary to gain approval may be obtained from the following:

(See GEN 1, “National Regulations and Requirements” for the appropriate regional office.)

Note: Prior to February 2016, NAT HLA was referred to as minimum navigation performance specifications (MNPS) airspace. As of January 2022, ICAO removed all references to MNPS in the documentation, starting with NAT Doc 007. The *Canadian Aviation Regulations* (CARs) still refer to MNPS airspace and MNPS requirements. Therefore, the replacement of MNPS with NAT HLA is a transition in progress, which means both terms can be considered interchangeable until the removal is complete. Furthermore, Filing X in Field 10a of the flight plan is still required to indicate authorization to operate in the NAT HLA (refer to Section ENR 7.2.3.3, “Minimum requirements for operations within the NAT HLA” for more information.

Equipment Installation Approval:

Transport Canada Civil Aviation

Regional Airworthiness Engineer

(See AIM GEN 1.0 or AIP Canada GEN 1.1 for the appropriate regional office.)

Commercial Flight Standards:

Transport Canada Civil Aviation 330 Sparks Street
Ottawa ON K1A 0N8

Tel.: 1-800-305-2059
Fax: 613-990-6215

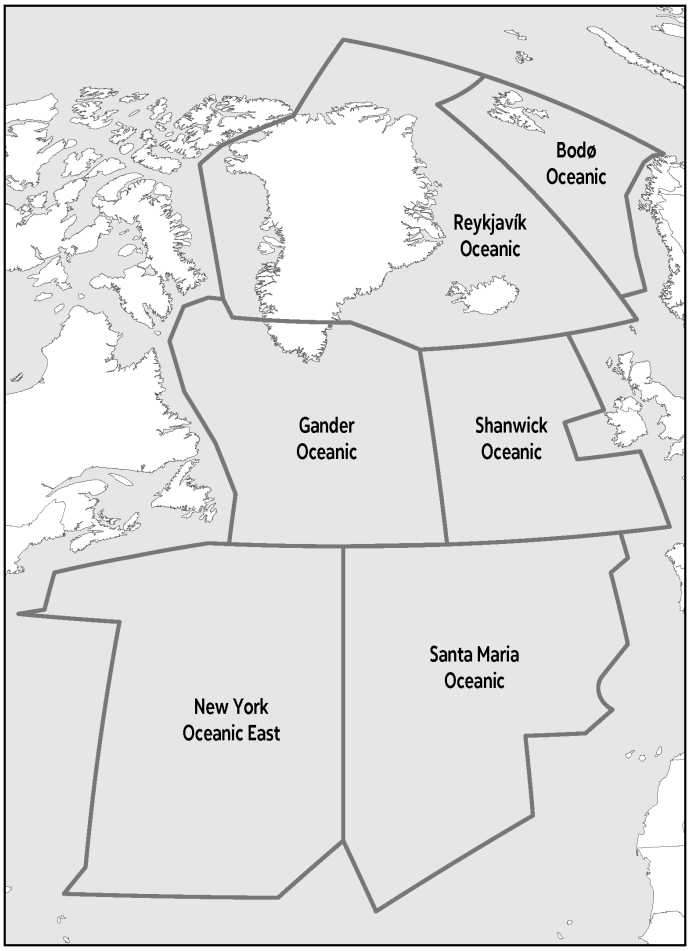


Figure 7.2.3.1, NAT HLA Between FL 285 and FL 420 see map

7.2.3.1 Monitoring Gross Navigation Errors

To ensure that the required navigation standards are being observed within the NAT HLA, continuous monitoring of the navigation accuracy of aircraft in this airspace takes place using surveillance systems in Canada, Ireland, France, Iceland, and the United Kingdom. In cases of a gross navigation error, the pilot will normally be notified by the ATC unit observing the error. The subsequent investigation to determine the error will involve the ATC unit, the operator, and the State of Registry.

If there is a serious increase in the number of large errors, it may become necessary to increase separation standards until remedial action has been determined. Alternatively, if rapid corrective action cannot be achieved, it may be necessary for the State of Registry or the State of the Operator to temporarily exclude offending aircraft types or operators from the NAT HLA.

7.2.3.2 Minimum requirements for operations within the NAT HLA

All operators are to ensure that aircraft used to conduct flights within the North Atlantic High Level Airspace (NAT HLA) have the minimum equipment requirements:

NAT HLA entry requires the following:

- RVSM approval (refer to Section ENR 7.2.4.3)
- CPDLC (refer to Section GEN 3.4.4.2)
- ADS-C (refer to Section GEN 3.4.4.2)

- HLA approval by the State of the Operator (formerly referred to MNPS)
- RNAV 10 and / or RNP 4 navigation specification approval

For more detailed requirements, refer to the following documents:

(a) International Civil Aviation Organization (ICAO) Doc 7030—*Regional Supplementary Procedures North Atlantic Regional Supplementary Procedures*;

(b) ICAO NAT Doc 001—*NAT SPG Handbook*;

(c) ICAO NAT Doc 007—*North Atlantic Operations and Airspace Manual*;

(d) ICAO Doc 4444 (PANS-ATM) Appendix 2 *Flight Plan;* and

(e) Parts VI and VII of the *Canadian Aviation Regulations* (CARs).

When filing a flight plan for operations in the NAT HLA, operators must provide the following information:

- Equipment and capability (Field 10):
  - J5 or J7 (CPDLC over SATCOM)
  - D1 (ADS-C)
  - W (RVSM approved)
  - X (MNPS (or NAT HLA) approved)
  - R (PBN approved)
- Other information (Field 18):
  - PBN/ followed by navigation specification (A1 for RNAV 10 and L1 for RNP 4)

Example:

Field 10
SADE3GHIJ1J4J5M1P2RWXYZ/LB1D1

Field 18
PBN/A1B1C1D1L1O1S2T1

Aircraft without NAT HLA (or MNPS) Approval

An aircraft that does not meet the NAT HLA requirements may be allowed to operate in the NAT HLA if the following conditions are satisfied:

(a) The aircraft is being provided with ATS surveillance services;

(b) Direct controller-pilot VHF communication is maintained; and

(c) The aircraft has a certified installation of equipment providing it with the ability to navigate along the cleared track.

Note: Pilots operating aircraft in the NAT HLA under these provisions should familiarize themselves with NAT HLA operations and procedures. They should also have a current copy of the OTS message that is in effect for the time of their flight for situational awareness.

Refer to section ENR 7.2.1 Gander Oceanic Transition Area (GOTA) for airspace that offers surveillance and Direct Controller-Pilot VHF communication services.

Aircraft that are not approved to operate in the NAT HLA and do not meet the above provisions may be cleared to climb or descend through the NAT HLA, traffic permitting.

7.2.4 Reduced Vertical Separation Minimum (RVSM)

7.2.4.1 Geographic boundaries

In the NAT, RVSM airspace is airspace within the geographic extent of the NAT region from FL 290 to FL 410 inclusive.

7.2.4.2 Details and Procedures

For RVSM details and procedures applicable to both the NAT and CDA, see Section RAC 11.7, “Reduced Vertical Separation Minimum (RVSM)”, available on the Transport Canada website at:

<https://www.tc.gc.ca/en/services/aviation/publications/tc-aim.html>

7.2.4.3 Minimum Aircraft System Performance Specifications (MASPS)

All operators of aircraft used to conduct flights within the North Atlantic high-level airspace (NAT HLA) where reduced vertical separation minimum (RVSM) is applied are to ensure that they meet the minimum aircraft system performance specifications (MASPS). For detailed requirements, refer to the following publications:

(a) International Civil Aviation Organization (ICAO) Doc 7030—*Regional Supplementary Procedures*;

(b) ICAO NAT Doc 001—*NAT SPG Handbook*;

(c) ICAO NAT Doc 007—*North Atlantic Operations and Airspace Manual*; and

(d) Parts VI and VII of the *Canadian Aviation Regulations* (CARs).

Since the NAT HLA is considered RVSM airspace at all levels, air operators that have not indicated both RVSM and NAT HLA (or MNPS) approval on their flight plans as depicted above, will be required to fly their aircraft outside the NAT HLA (below FL 285 or above FL 420).

Flights that flight plan to operate in NAT HLA but fail to file RVSM may be asked to confirm equipage.

7.2.4.4 Aircraft Approvals

Operators of Canadian-registered aircraft intending to fly in NAT RVSM airspace will be required to show that they meet all of the applicable standards. Further information on the measures necessary to gain approval may be obtained from the following:

Airworthiness Approvals

RVSM Maintenance Programs Director, Standards (AART)
Transport Canada, Civil Aviation
330 Sparks Street
Ottawa ON K1A 0N8

Tel.: 1-800-305-2059
Fax: 613-952-3298

Commercial Flight Standards (AARTF)

Transport Canada, Civil Aviation
330 Sparks Street
Ottawa ON K1A 0N8

Tel: 1-800-305-2059
Fax: 613-990-6215

RVSM Maintenance Programs

Director, Standards (AART)
Transport Canada, Civil Aviation
330 Sparks Street
Ottawa ON K1A 0N8

Tel: 1-800-305-2059
Fax: 613-952-3298

Central Monitoring Agency (CMA)

The Regional Monitoring Agency for the NAT is the CMA located in Prestwick, UK, and it may be contacted at the following address:

North Atlantic Central Monitoring Agency c/o National Air Traffic Services
Room G41, Scottish & Oceanic Area Control Centre, Sherwood Road,
Prestwick, Ayrshire KA9 2NR United Kingdom

Tel.: +44 1292 692412

E-mail: natcma@nats.co.uk

Information on the responsibilities of the CMA and the procedures applicable to it are contained in ICAO NAT Doc 001—*NAT SPG Handbook*, available at the following address:

www.icao.int/EURNAT/Pages/EUR-and-NAT-Document.aspx

For further information, refer to the NAT CMA website:

https://natcma.com/height-monitoring-2/

7.2.5 Data Link Mandate (DLM) Airspace

7.2.5.1 General Information

The objectives of the NAT Data Link Mandate are to enhance communication, surveillance, and air traffic control (ATC) intervention capabilities in the NAT region. ADS-C provides conformance monitoring of aircraft adherence to cleared route and flight level significantly enhancing safety. ADS-C also facilitates search and rescue operations including the capability to locate the site of an accident in oceanic airspace. CPDLC substantially improves air/ground communications capability and therefore controller intervention capability.

7.2.5.2 DLM Flight levels

DLM airspace encompasses FL290 to FL410 inclusive throughout the NAT region, except the following:

(a) Airspace north of 80° North

(b) New York Oceanic East flight information region (FIR)

(c) Airspace where an ATS surveillance service is provided by means of radar, multilateration and/or ADS-B, coupled with VHF voice communications), provided the aircraft is suitably equipped (transponder/ADS-B extended squitter transmitter).

7.2.5.3 Flights Permitted to Operate within NAT DLM airspace

The following flights may flight plan to operate in NAT DLM airspace:

1. Flights equipped with and prepared to operate FANS 1/A (or equivalent) CPDLC and ADS-C data link systems (refer to ICAO Doc 7030 Regional Supplementary Procedures for the NAT Region, sections 3.3 CPDLC and 5.4 ADS-C).

   (a) The appropriate equipage to be indicated in Item 10 of the ICAO flight plan is:

   - D1; and
   - J5 or J7

2. Non -equipped flights that file STS/FFR, HOSP, HUM, MEDEVAC, SAR or STATE in item 18 of the flight plan.

Note: Such flights may receive an ATC clearance that does not match flight planned requests depending on tactical situations.

7.2.5.4 Operational Policies

Non-equipped aircraft may request to climb or descend through NAT DLM airspace. Such requests will be considered on a tactical basis.

Altitude reservation requests will be considered on a case-by-case basis irrespective of the equipage status of the requesting aircraft.

7.2.5.5 Equipment Failure of either ADS-C or CPDLC systems

- Prior to departure
  - Resubmit flight plan to remain clear of NAT DLM airspace
- After Departure but prior to entering DLM airspace:
  - ATC must be notified prior to entering DLM airspace.
  - Requests to operate in DLM airspace will be considered on a tactical basis.
- After entering NAT DLM airspace:
  - ATC must be notified immediately.
  - Tactical consideration will be given to allow the flight to continue in NAT DLM airspace. Flights may be required to exit NAT DLM airspace if traffic warrants.

7.2.6 ADS-B Services in the Gander Oceanic Control Area

ADS-B service has expanded into oceanic and remote areas facilitated by a constellation of Low Earth Orbit (LEO) satellites hosting ADS-B receivers. A satellite receives ADS-B data including position, velocity and altitude from aircraft, which is then routed through other satellites and down-linked to a satellite operations ground station. The expanded surveillance system will permit uninterrupted ATS surveillance for equipped aircraft before, during and after entry into the North Atlantic (NAT) Region.

As a result of the expanded surveillance coverage, reduced separation standards are available for eligible aircraft. In order to be eligible for the reduced standards, aircraft must meet the following requirements:

- RVSM/HLA approval
- ADS-B equipped, with dedicated 1,090 MHz out capability

- Specifications for RNP 4
- Specifications of RCP 240 and RSP 180

ATS systems use Field 10 (Equipment) of the standard ICAO flight plan to identify an aircraft's data link and navigation capabilities. To be eligible for the reduced separations, operators should insert the following items into the ICAO flight plan (as per the 2012 flight plan format) for FANS 1/A or equivalent aircraft:

- Field 10a (Radio communication, navigation and approach aid equipment and capabilities);
  - insert "J5" to indicate CPDLC FANS1/A SATCOM (Inmarsat) or "J7" to indicate CPDLC FANS1/A SATCOM (Iridium) data link equipment; and
  - insert "P2" to indicate RCP 240 approval.
- Field 10b (Surveillance equipment and capabilities);
  - insert "D1" to indicate ADS with FANS1/A capabilities; and
  - B1 or B2 to indicate ADS-B.
- Field 18 (Other Information); insert the characters "PBN/" followed by "L1" for RNP4 and SUR/RSP180

Prior to entering the NAT Region, flights are generally provided air traffic control service using ATS surveillance, combined with VHF Direct Controller-Pilot Communications (DCPC).

The expansion of ATS surveillance services in the NAT Region will not normally constitute an interruption in identification. Therefore, for flights where the ADS-B equipment B1 or B2 has been filed in item 10b of the flight plan, aircraft are considered identified while operating in Gander's oceanic airspace and will attain ATS surveillance services specific to the NAT Region. The controller will, however, inform pilots if the aircraft has not been identified.

7.2.7 Airspace Within Which ATS is Delegated to Gander OCA

When operating within Gander's Oceanic airspace or airspace delegated to Gander OCA as defined below, operators are to use CPDLC address CZQX.

7.2.7.1 Airspace Delegated by Edmonton ACC

That portion of the Edmonton FIR at and above FL 290 bounded by a line beginning at:

651900N	630000W	to
652300N	623800W	to
653000N	600000W	to
650000N	600000W	to
650000N	630000W	to point of beginning.

and

That portion of the Edmonton FIR bounded by a line beginning at:

650000N	600000W	to
653000N	600000W	to
654236N	582356W	to
650000N	574500W	to point of beginning.

7.2.7.2 Airspace Delegated by Montreal ACC

That portion of the Montreal FIR from FL 180 to FL 280 bounded by a line beginning at:

640000N	630000W	to
650000N	630000W	to
650000N	600000W	to point of beginning.

7.2.7.3 Airspace Delegated by New York ARTCC

The portion of the New York Oceanic FIR at and above FL 055 bounded by a line beginning at:

450000N	500000W	to
450000N	400000W	to
443000N	400000W	to
443000N	500000W	to point of beginning.

7.2.7.4 Airspace Delegated by Nuuk FIC

The portion of the Sondrestrom FIR above FL 195 bounded by a line beginning at:

633000N	554000W	to
633000N	390000W	thence
southwest along the Gander Oceanic/Nuuk FIR boundary		to point of beginning.

ENR 7.3 NAT Routes

7.3.1 North American Routes (NARs)

The North American route (NAR) system interfaces with North Atlantic (NAT) oceanic, the oceanic transition area, and domestic airspace and is used by air traffic transiting the NAT. NARs consist of a series of pre-planned routes to and from established oceanic entry/exit points and major identified airports throughout Canada and the United States.

NARs and their associated procedures are published in the Planning section of the *Canada Flight Supplement* (CFS) and in the Federal Aviation Administration's (FAA) Airport Facility/Directory—Northeast.

7.3.2 Organized Track System (OTS)

Organized tracks are formulated and published in a North Atlantic (NAT) track message via the automatic fixed telecommunications network (AFTN) and sent to all interested operators. The daytime structure is published by Shanwick area control centre (ACC) and the night-time structure is published by Gander ACC.

Flight levels are allocated for use within the OTS and, in most cases, details of domestic entry and exit routings associated with individual tracks are provided in the NAT track message.

To permit an orderly changeover between successive OTS, a period of several hours is interposed between the termination of one system and the commencement of the next. During these periods, operators are expected to file random routes or use the coordinates of a track in the system that is about to come into effect.

Eastbound traffic crossing 030˚W at 1030 UTC or later and westbound traffic crossing 030˚W at 0000 UTC or later should plan to avoid the OTS at the published levels.

Westbound

(a) The westbound OTS message is designed and published by Shanwick daily.

(b) The most northerly track of a day OTS is designated as NAT Track Alpha; the adjacent track to the south, as NAT Track Bravo; and so on.

(c) The valid times are 1130 to 1900 UTC at 30°W.

(d) The flight level profiles normally published are FL 340 to FL 390 inclusive

(e) Tracks that landfall at or north of AVUTI FL 340 will not be published.

(i) FL 340 may be omitted from these tracks to allow profiles for aircraft originating in the Reykjavik OCA.

Eastbound

(a) The eastbound OTS message is designed and published by Gander daily.

(b) The most southerly track is designated as Track Zulu; the adjacent track to the north, as Track Yankee; and so on.

(c) The valid times are 0100 to 0800 UTC at 30°W.

(d) The flight level profiles normally published are FL 310 to FL 400 inclusive.

(e) Eastbound traffic routing, south of both the night datum line and the main OTS, should flight plan using, FL 340, or FL 380.

(f) New York Tracks entering Shanwick OCA that cross, or route south of, the night datum line may be any combination of FL 340, FL 360, or FL 380, or as otherwise agreed between Santa Maria and New York. Additional levels will be allocated to New York Tracks if the core OTS is located in that area.

Note: For this procedure “New York Tracks” are any eastbound OTS Tracks that originate in the New York area and enter Gander or Shanwick OCAs.

7.3.2.1 Flight Level Allocation Scheme (FLAS)

As with procedures in CDA, aircraft flight planning in oceanic airspace should normally plan for a flight level appropriate to the direction of flight, particularly when they are operating outside of the OTS structure and valid times.

In an effort to provide efficient and economic profiles, NAT ANSPs, through consultation, have designed the FLAS.

The FLAS standardizes flight levels available for traffic routing on and outside of the OTS as well as during transition times (times between valid OTS).

Aircraft operators are advised to flight plan using the flight levels specified in this document, relative to their particular flight(s).

7.3.2.2 FLAS Procedures

FLAS procedures entail:

(a) the establishment of flight level profiles normally available during OTS valid times;

(b) the establishment of flight level profiles during OTS changeover periods;

(c) the establishment of a night datum line, with the area south of the line reserved principally for traffic originating in New York/Santa Maria; and

(d) the establishment of a north datum line, with the area on or north of the line reserved for late-running westbound traffic from Reykjavik to Gander

7.3.2.3 OTS Changeover Periods

(a) Basic Principles:

(i) The time period between the expiration of one OTS and the commencement of another set is known as the OTS changeover period.

(ii) All times relate to 030°W.

(iii) OTS changeover rules apply from 0801 to 1129 UTC and from 1901 to 0059 UTC.

(iv) During these times, flight levels shall be applied in accordance with the direction of flight except as stated below.

(b) Guidelines

(i) Westbound traffic crossing 030°W from 2230 to 0059 UTC:

- Remain clear of the incoming OTS; and
- Do not plan delegated ODLs (FL 340 and FL 380).

After 2230 UTC, the published OTS flight levels and ODLs are released to Gander for the use of eastbound traffic.

(ii) Eastbound traffic crossing 030°W from 1000 to 1129 UTC:

- Remain clear of the incoming OTS at FL 350; and
- Do not plan the delegated ODL (FL 330).

After 1000 UTC, the OTS (at FL 330 and FL 350) and ODL (FL 330) are released to Shanwick for the use of westbound traffic.

(iii) Eastbound traffic crossing 30°W from 1030 to 1129 UTC at FL 370 and FL 390:

- Remain clear of the incoming OTS.

After 1030 UTC, the OTS (at FL 370 and FL 390) is released to Shanwick for the use of westbound traffic.

(iv) At the end of westbound (daytime) OTS:

- Westbound aircraft crossing 030°W until 1900 UTC at the ODL (FL 330) or on the OTS shall have priority over eastbound aircraft.

During the westbound OTS hours of validity, Gander delegates FL 330 to Shanwick for use by westbound traffic.

(v) At the end of eastbound (night-time) OTS:

- Eastbound aircraft crossing 030°W until 0800 UTC at the ODLs (FL 340 and FL 380) or on the OTS shall have priority over westbound aircraft.

The table below provides a summary:

Table 7.3.2.2, OTS Changeover Periods

Level	Time (UTC)	Direction
FL 430	24 hrs	Westbound. May be flight planned as eastbound by non-RVSM aircraft.
FL 410	24 hrs	Eastbound.
FL 400	0801–2229 2230–0059 0100–0800	Westbound. Westbound (avoiding OTS). Eastbound OTS (subject to westbounds). Westbound (avoiding OTS). Eastbound (OTS).
FL 390	1901–1029 1030–1129 1130–1900	Eastbound. Eastbound (avoiding OTS). Westbound OTS (subject to eastbounds). Eastbound (avoiding OTS). Westbound (OTS).
FL 380	0300–0700 0801–2229 2230–0059 0100–0800	Westbound (ODL, on and to the North of the North datum line). Westbound. Eastbound (subject to westbounds). Eastbound (OTS and ODL).
FL 370	1901–1029 1030–1129 1130–1900	Eastbound. Eastbound (avoiding OTS). Westbound OTS (subject to eastbounds). Eastbound (avoiding OTS). Westbound (OTS).
FL 360	0801–2229 2230–0059 0100–0800	Westbound. Westbound (avoiding OTS). Eastbound OTS (subject to westbounds). Westbound (avoiding OTS). Eastbound (OTS).
FL 350	1901–0959 1000–1129 1130–2000	Eastbound. Eastbound (avoiding OTS). Westbound OTS (subject to eastbounds). Eastbound (avoiding OTS). Westbound (OTS).

Level	Time (UTC)	Direction
FL 340	0801–2229 2230–0059 0100–0800	Westbound. Eastbound (subject to wesbounds). Eastbound OTS (subject to westbounds). Eastbound (OTS and ODL).
FL 330	1901–0959 1000–1129 1130–1900	Eastbound. Westbound (subject to eastbounds). Westbound (OTS and ODL).
FL 320	0801–2229 2230–0059 0100–0800	Westbound. Westbound (avoiding OTS). Eastbound OTS (subject to westbounds). Westbound (avoiding OTS). Eastbound (OTS).
FL 310	24 hrs	Westbound (ODL).
FL 300	24 hrs	Westbound.
FL 290	24 hrs	Eastbound.

7.3.2.4 Night Datum Line

During the eastbound OTS hours of validity, a static datum line, known as the night datum line, is established with the following coordinates:

45°N 030°W – 49°N 020°W – SOMAX – ATSUR

FL 340 and FL 380 are delegated to Gander for eastbound traffic on and to the north of the night datum line.

FL 340 will not be used for Gander eastbound traffic to the south of the night datum line.

FL 380 will not be used for Gander eastbound traffic to the south of either the night datum line or the eastbound OTS, whichever is further south.

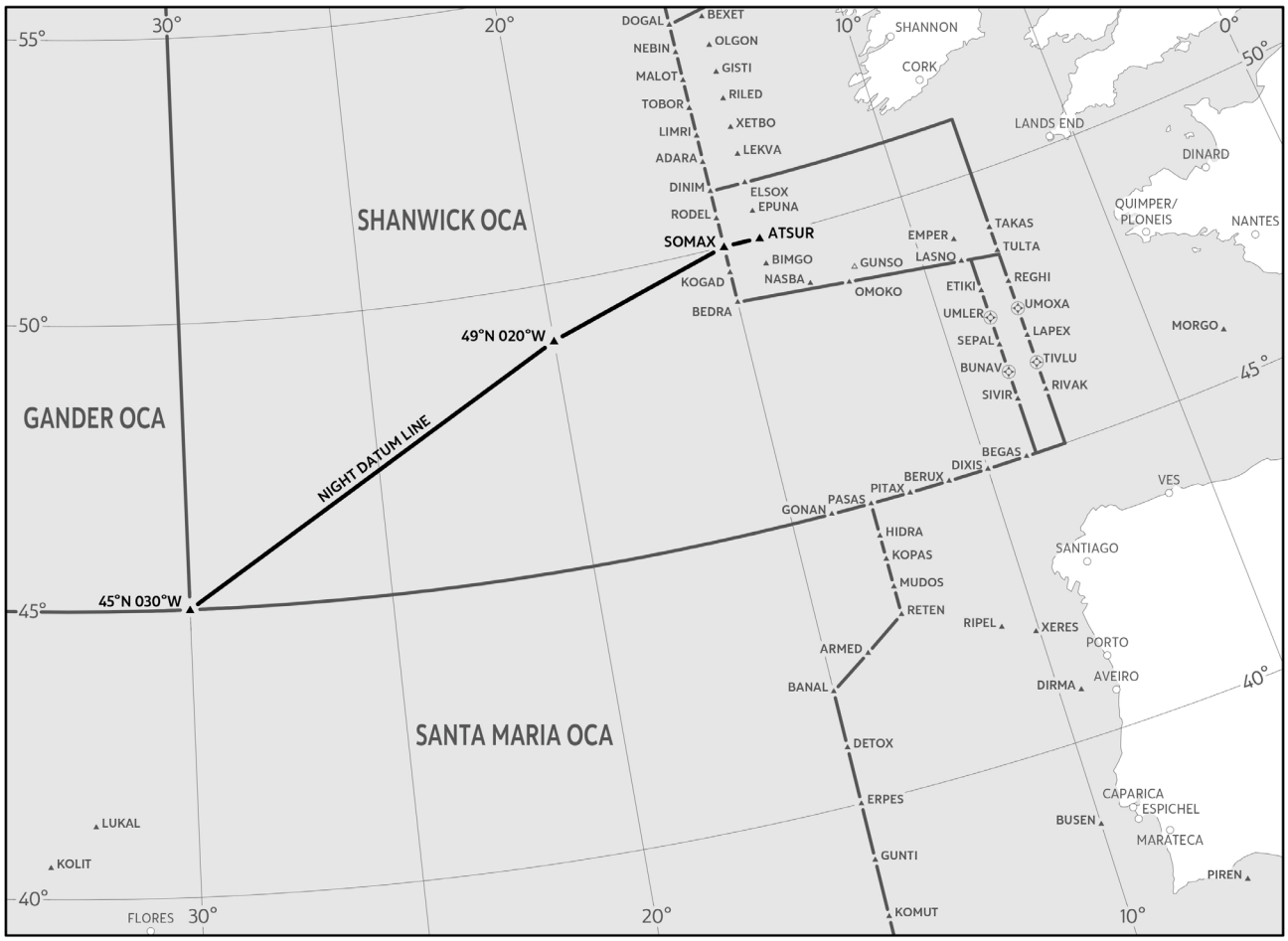


Figure 7.3.2.4, Night Datum Line

7.3.2.5 North Datum Line

Between 0300 and 0700 UTC, a static datum line, known as the north datum line, is established with the following coordinates:

URTAK – 60°N 050°W – 62°N 040°W – 63°N 030°W

On and to the north of the north datum line, FL 380 is delegated to Reykjavik for use by westbound traffic.

In the event of a high volume of north random flights or OTS tracks, the north datum line may be suspended to accommodate the anticipated eastbound traffic.

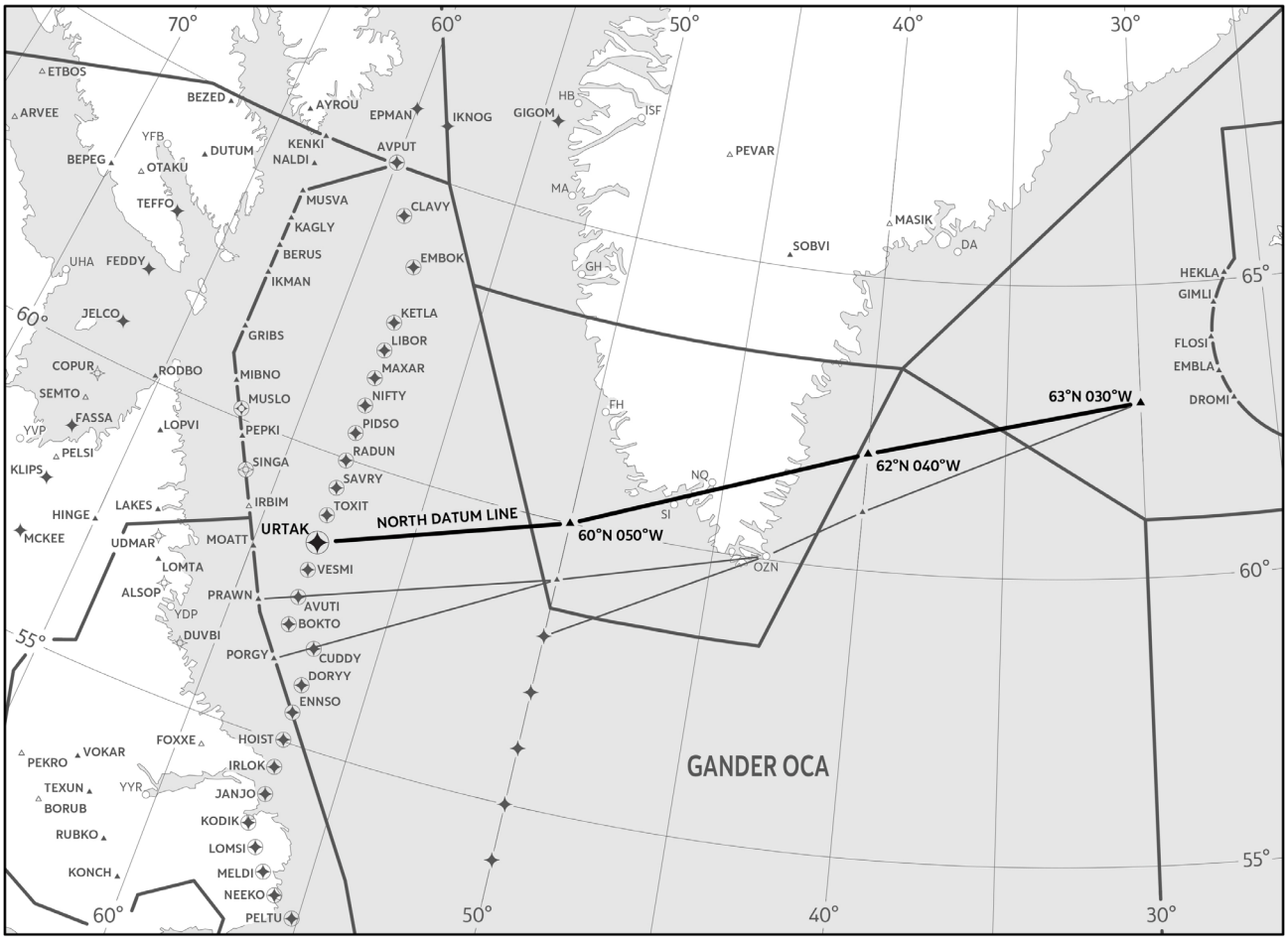


Figure 7.3.2.5, North Datum Line

ENR 7.4 Contingency and Emergency Procedures

7.4.1 In-Flight Contingencies

All pilots transiting the North Atlantic (NAT) should be thoroughly familiar with the in-flight contingency procedures for situations of rapid descent, turnback, diversion, and reduction of navigation capability.

In-flight contingency procedures are published in the following documents:

(a) International Civil Aviation Organization (ICAO) Doc 4444—*Procedures for Air Navigation Services—Air Traffic Management*;

(b) ICAO Doc 7030—*Regional Supplementary Procedures*;

(c) ICAO NAT Doc 001—*NAT SPG Handbook*;

(d) ICAO NAT Doc 007—*North Atlantic Operations and Airspace Manual*; and

(e) *NAT OPS Bulletins*.

7.4.2 Contingency Procedures for Oceanic Traffic in the Event of an Evacuation of Gander ACC

NOTE: Gander Oceanic control, Gander Domestic control and Gander IFSS are situated in the same building. Emergency evacuation of Gander ACC will result in impacts to all three.

An emergency evacuation message will be broadcast:

"Emergency evacuation of Gander Centre and Gander Radio in progress. No IFR control, CPDLC or HF communication service will be provided by Gander, I repeat, no IFR Control, CPDLC or HF communication service will be provided by Gander. Use extreme caution and monitor this frequency, emergency frequencies and air to air frequencies. Flights that have not yet entered Gander OCA are not permitted to continue transiting and must avoid Gander OCA/FIR or land at an appropriate aerodrome. All flights within the Gander OCA must contact next agency as soon as possible and report current position, cleared flight level, next position and estimate. Flights must revert to voice position report procedures. Flights must monitor 121.5, 243.0, and 123.45. When able rebroadcast this information on 123.45, 121.5 and 243.0. Further details will be provided via NOTAM."

1. AIRCRAFT PROCEDURES – Westbound	
1.1	**Aircraft that have already entered Gander oceanic airspace**
1.1.1	In the event that Gander ACC must be evacuated, only aircraft that have already entered the Gander OCA are permitted to continue transiting and are asked to contact the next ATC agency as soon as possible and report current position, cleared flight level, next position and estimate.
1.1.2	Flights should not request changes in altitude, speed or route except for reasons of flight safety.
1.2	**Aircraft that have not yet entered Gander oceanic airspace**
1.2.1	Flights that have not yet entered Gander OCA should plan to re-route around the Gander OCA or to land at an appropriate aerodrome and are asked to contact their current or previous ATC agency with their intentions.
1.3	**Contact Procedures**
1.3.1	On receipt of an emergency evacuation message, pilots are requested to broadcast to other flights on 121.5, 243.0 and 123.45. A listening watch on these frequencies and the current frequency should be maintained until the flight exits the Gander OCA and FIR.
1.3.2	All flights within the Gander OCA should transmit position reports on any available HF or VHF frequency to Shanwick Radio either directly or through another agency or flight.
1.3.3	Flights should establish communication with the next agency at the earliest opportunity stating current position, cleared flight level, next position and estimate, and subsequent position. This also applies to flights using automated position reports (ADS/FMC) because those reports may not have been received by the next agency.
1.3.4	Flights within Gander FIR should contact Montreal Centre or Moncton Centre, depending on their oceanic exit point as described in 1.3.7
1.3.5	If unable to establish radio contact, flights may use SATVOICE voice or satellite telephone to provide position reports.

1. AIRCRAFT PROCEDURES – Westbound

Oceanic Centre	Public Switched Telephone Network (PTSN) Number	Short Code
Gander Duty Manager	001 709 651 5207	N/A
New York	+1 631 468 1413	436623
Reykjavik, via Iceland Radio	+354 568 4600	425105
Bodø	+47 755 42900	425702
Ballygirreen (Shanwick Radio)	+353 61 368241 Ground/Air Ops	425002
Santa Maria	+351 296 820 438 +351 296 886 042 (satellite link)	426305

1.3.6 Flights may request their flight dispatch offices to forward position reports, if sending position reports to multiple ATS Units or if otherwise unable to forward position reports.

1.3.7 Based on where they exit oceanic airspace, flights shall proceed in accordance with the following table, until communication is established with, and a re-clearance issued by the next agency.

Flights operating FL290 and above.

1. AIRCRAFT PROCEDURES – Westbound

Flight is routed over:	The flight shall proceed:	Next control agency and frequency:
AVPUT	NALDI DUTUM	Montreal ACC 134.85
CLAVY	KAGLY TEFFO	Montreal ACC 134.85
EMBOK	IKMAN FEDDY	Montreal ACC 134.85
KETLA	GRIBS JELCO	Montreal ACC 134.80
LIBOR	6101N 06241W	Montreal ACC 134.80
MAXAR	MIBNO RODBO	Montreal ACC 133.20
NIFTY	MUSLO	Montreal ACC 133.20
PIDSO	PEPKI LOPVI	Montreal ACC 135.80
RADUN	SINGA	Montreal ACC 135.80
SAVRY	LAKES MCKEE	Montreal ACC 132.45
TOXIT	UDMAR	Montreal ACC 132.45
URTAK	TEALS VANSI	Montreal ACC 119.40
VESMI	ALSOP	Montreal ACC 119.40

1. AIRCRAFT PROCEDURES – Westbound

Flight is routed over:	The flight shall proceed:	Next control agency and frequency:
AVUTI	PUVOK ROUND	Montreal ACC 119.40
BOKTO	VOKET DUVBI	Montreal ACC 119.40
CUDDY	YWK MT	Montreal ACC 132.90 @ 63W
DORYY	YBC ANCER	Moncton ACC 132.95
HOIST	ANATI	Moncton ACC 118.875
IRLOK	5031N 06500W	Moncton ACC 118.875
JANJO	CEFOU	Moncton ACC 118.875
KODIK	4941N 06500W	Moncton ACC 132.52
LOMSI	QUBIS	Moncton ACC 132.52
MELDI	4853N 06500W	Moncton ACC 132.52
NEEKO	TAFFY	Moncton ACC 124.975
PELTU	4813N 06500W	Moncton ACC 135.77
RIKAL	MIILS	Moncton ACC 135.77
SAXAN	4718N 06500W	Moncton ACC 133.55
TUDEP	TOPPS	Moncton ACC 133.55
UMESI	4618N 06500W	Moncton ACC 133.55
ALLRY	EBONY	Moncton ACC 132.8
BUDAR	4536N 06500W	Moncton ACC 132.8
ELSIR	ALLEX	Moncton ACC 132.8
IBERG	4451N 06500W	Moncton ACC 132.75
JOOPY	TUSKY	Moncton ACC 132.75
MUSAK	4409N 06500W	Moncton ACC 132.75
NICSO	BRADD	Moncton ACC 132.75
OMSAT	4336N 06500W	Moncton ACC 133.3
PORTI	KANNI	Moncton ACC 133.3
RELIC	4303N 06500W	Moncton ACC 133.7
SUPRY	WHALE	Moncton ACC 133.7
VODOR	NANSO VITOL	Moncton ACC 125.25
BOBTU	JAROM GAYBL	Moncton ACC 125.25

Flights operating FL280 and below. Routes HOIST and south are the same as for flights operating FL290 and above.

Flight is routed over:	The flight shall proceed:	Next control agency and frequency:
NALDI	DUTUM	Montreal ACC 134.55
KAGLY	TEFFO	Montreal ACC 134.55
IKMAN	FEDDY	Montreal ACC 134.55

1. AIRCRAFT PROCEDURES – Westbound			
	GRIBS	JELCO	Montreal ACC 128.25
	MIBNO	RODBO	Montreal ACC 128.25
	PEPKI	LOPVI	Montreal ACC 135.1
	5900N 06000W	LAKES MCKEE	Montreal ACC 135.1
	MOATT	LOMTA TEALS VANSI	Montreal ACC 132.9
	PRAWN	YDP PUVOK ROUND	Montreal ACC 132.25 @ 65W
	PORGY	YWK MT	Montreal ACC 132.25 @ 63W

2. AIRCRAFT PROCEDURES – Eastbound	
2.1	**Aircraft that have not yet entered Gander Oceanic airspace**
2.1.1	In the event that Gander ACC must be evacuated, only aircraft that have already entered Gander OCA will be permitted to transit.
2.1.2	Flights that have not yet entered Gander OCA should plan to re-route around the Gander OCA or to land at an appropriate aerodrome and are asked to contact either the current or previous ATC agency as soon as possible.
2.2	**Aircraft that have already entered Gander Oceanic airspace**
2.2.1	Flights that have already entered the Gander OCA are permitted to continue transiting and are asked to contact the next ATC agency as soon as possible. Flight crew should not request changes in altitude, speed or route except for reasons of flight safety.
2.2.2	Flights should establish communication with the next agency at the earliest opportunity stating current position, cleared flight level, next position and estimate, and subsequent position. This also applies to flights using automated position reports (ADS/FMC) because those reports may not have been received by the next agency.
2.2.3	The following communications procedures have been developed in accordance with the Traffic Information Broadcast by Aircraft (TIBA) procedures recommended by ICAO (Annex 11 – Air Traffic Services, Attachment C). These procedures should be applied, unless otherwise instructed by Moncton or Montreal Centre when completing an altitude change. At least 3 minutes prior to the commencement of a climb or descent the flight should broadcast on the last assigned frequency, 121.5, 243.0 and 123.45 the following: ALL STATIONS (call sign) (direction) DIRECT FROM (landfall fix) TO (oceanic entry point) LEAVING FLIGHT LEVEL (number) FOR FLIGHT LEVEL (number) AT (distance)(direction) FROM (oceanic entry point) AT (time) When the level change begins, the flight should make the following broadcast: ALL STATIONS (call sign) (direction)

2. AIRCRAFT PROCEDURES – Eastbound	
	DIRECT FROM (landfall fix) TO (oceanic entry point) LEAVING FLIGHT LEVEL (number) NOW FOR FLIGHT LEVEL (number) When level, the flight should make the following broadcast: ALL STATIONS (call sign) MAINTAINING FLIGHT LEVEL (number)
2.2.4	When ADS-equipped flights are notified of a Gander evacuation they must revert to voice position reporting until clear of Gander OCA, or notified otherwise. Pilots should note that they may be asked to log-on to another agency; they should not initiate this action until instructed to do so.

7.4.3 Communications/Navigation System Failure – North Atlantic (NAT) Traffic

The following procedures are intended to provide general guidance for North Atlantic (NAT) aircraft experiencing a communications failure. It is impossible to provide guidance for all possible situations associated with a communications failure.

7.4.3.1 General

If the aircraft is so equipped, a pilot experiencing a two-way radio communications failure shall operate the transponder in Mode C and squawk Code 7600.

The pilot shall attempt to contact any ATC facility, inform controllers of the difficulty, and request that information be relayed to the intended ATC facility.

7.4.3.2 Communication Failure Prior to Entering NAT Oceanic Airspace

If loss of communications is encountered before entering the NAT then the pilot should:

a) follow the radio communication failure procedures of the airspace in which the aircraft is operating.

b) if the pilot elects to continue the flight, then enter oceanic airspace at the oceanic entry point at the level and speed resulting from the execution of the adjacent airspace RCF procedures; then

c) follow the procedures in 7.4.3.3 below.

7.4.3.3 Communication Failure After Entering Oceanic Airspace

If loss of communications is encountered after entering the NAT then:

a) The pilot shall maintain the currently cleared route, flight level and speed until reaching the Oceanic Exit Point.

b) No route, flight level or speed change shall be made before the Oceanic Exit Point unless a change is deemed necessary by the pilot in command to ensure the safety of the aircraft.

Note: a) and b) are NAT specific rules while c) is a globally applicable rule in accordance with PANS-ATM 15.3.3 b)3).

7.4.3.4 Aircraft with a Destination Within the NAT Region

Aircraft with a destination within the NAT region should follow the procedures in 7.4.3.3 above until reaching the top of decent point and should thereafter follow globally applicable procedures in accordance with PANS-ATM 15.3.3 b) 4) – 7) supplemented by local AIPs.

7.4.3.5 Communication Failure after Exiting Oceanic Airspace

In all cases, after the NAT oceanic exit point, follow the radio communication failure procedures of the airspace in which the aircraft is operating.

7.4.3.6 Aircraft experiencing GNSS Interference

Although the majority of GNSS jamming and/or spoofing activities take place outside the NAT Region, the inability of the aircraft to recover in-flight, leads to increased workload for both flight crews and air traffic controllers in the NAT.

The primary impact to the NAT is the ability to apply performance-based separations that rely on RNP 4, RNAV/RNP 10, a working CPDLC connection, receipt of valid ADS-C data and reliable ADS-B surveillance data.

Flight crews that experience or suspect GNSS interference enroute to the NAT Region shall notify the initial NAT ANSP in the RCL, prior to oceanic entry.

Notification should be included in the RCL message via ACARS or voice, confirming degradation of navigation status and detail of ongoing loss/impacts to the aircraft systems and capabilities.

Examples include:

- ‘ATC REMARKS/ GNSS INTERFERENCE RNP10 ONLY’
- ‘ATC REMARKS/ NO DATA LINK’
- ‘ATC REMARKS/ DEGRADED NAVIGATION NO GNSS’

In addition, operators can also make the ANSP aware when one of their flights has been impacted by GNSS interference through direct contact.

Canadian air operators should also report the GNSS interference in the post-flight GNSS Anomaly Report (ENR 4.3.3 refers)

Note: for further details, refer to NAT OPS Bulletin 2025_001 NAT GNSS Interference Procedures.

ENR 7.5 Air-Ground Communications

Gander international flight service station (IFSS) is the only Canadian aeronautical station that provides international aeronautical telecommunication services. The defined hours of service for Gander IFSS can be found in Section GEN 3.4, “Communication Services.”

7.5.1 High Frequency (HF) Operations in the North Atlantic (NAT)

All North Atlantic (NAT) high frequencies (HF) are organized into groups, known as families. The families are identified as NAT family A, B, C, D, E and F. Initial contact with Gander international flight service station (IFSS) on HF radio should be made on families B, C, D or F. When an aircraft fails to establish contact with

Gander IFSS on the designated frequency, it shall attempt to establish contact on another frequency appropriate to the route.

Table 7.5.1, Families of NAT HF Frequencies Monitored by Gander IFSS

NAT Family	Frequencies
A*	3,016 kHz
B	2,899 kHz
	5,616 kHz
	8,864 kHz
	13,291 kHz
C	2,872 kHz
	5,649 kHz
	8,879 kHz
	11,336 kHz
	13,306 kHz
D	2,971 kHz
	4,675 kHz
	8,891 kHz
	11,279 kHz
	13,291 kHz
F	3,476 kHz
	6,622 kHz
	8,831 kHz
	13,291 kHz

*** Note:** The NAT Family A of frequencies is not routinely monitored by Gander IFSS; however, they are available for use in unusual circumstances, such as an adjacent ATS Unit evacuation or loss of communications.

For information about hours of service, refer to the *AIP Canada* Section GEN 3.4, “Communication Services” under subsection GEN 3.4.3, “Types of Service – HF”. For further details regarding Gander Radio Station Information, refer to the International Civil Aviation Organization (ICAO) NAT Doc 003 – *High Frequency Management Guidance Material for the North Atlantic Region*, Appendix B-2.

In the event that the overloading of a family occurs or is anticipated, aircraft of one or more operators may be offloaded from that family to another appropriate family for the expected duration of the condition. The offloading may be requested by any station, but Shannon and Gander will be responsible for making a decision after coordination with all NAT stations concerned.

When making initial contact with Gander Radio:

1. Westbound Datalink flights:

   (a) Proceeding into Gander domestic airspace:

   - Identify flight and request SELCAL check. No additional information is required.

     e.g., Gander Radio, ABC123, Request SELCAL

   (b) Proceeding into airspace other than Gander domestic:

   - Identify flight, advise next CTA and request SELCAL check.

     e.g., Gander Radio, ABC123, New York next, Request SELCAL

2. Westbound Non-Datalink flights:

   (a) Exiting another OCA proceeding into Gander Oceanic airspace:

   - Identify flight, e.g., Gander Radio, ABC123
   - Once two-way communication has been established, proceed with your estimated position or position report.

3. Eastbound Datalink flights:

   (a) Proceeding into Gander Oceanic airspace followed by another Oceanic CTA:

   - Initial call on VHF: Identify flight, state next CTA and request HF.

     e.g., Gander Radio, ABC123, Santa Maria next, Request HF

   - Subsequent call on HF: Request SELCAL check

     e.g., Gander Radio, ABC123 request SELCAL

4. Eastbound Non-Datalink flights:

   (a) Exiting Gander domestic airspace proceeding into Gander Oceanic airspace:

   - Initial call on VHF: Identify flight

     e.g., Gander Radio, ABC123

   - Once two-way communication has been established, proceed with your estimated position or position report.

   - Subsequent call on HF: Request SELCAL check

     e.g., Gander Radio, ABC123, request SELCAL

7.5.2 High Frequency (HF) Operations— Anchorage Arctic

Aircraft operating in the Anchorage Arctic control area (CTA)/flight information region (FIR) beyond the line-of-sight range of remote control very high frequency (VHF) air-ground facilities operated from the Anchorage area control centre (ACC) shall maintain communications with Gander Radio and a listening or selective calling system (SELCAL) watch on North Atlantic Delta (NAT D) network high frequencies (HF) 2,971 kHz, 4,675 kHz, 8,891 kHz, and 11,279 kHz. Primary daytime frequency is 11,279 kHz with primary nighttime frequency 8,891 kHz. Additionally, and in view of reported marginal reception of Honolulu Pacific in-flight

meteorological information (VOLMET) broadcast in and adjacent to Canadian airspace, Gander Radio can provide, on request, Anchorage and Fairbanks surface observations and aerodrome forecasts to flight crews.

7.5.3 Availability of Single Sideband (SSB)

All international high frequency (HF) equipment is operated on single sideband (SSB) J3E emission. In all cases, the upper sideband (USB) is employed.

7.5.4 Selective Calling System (SELCAL)

The selective calling system (SELCAL) is installed on all international frequencies at Gander Radio. SELCAL provides an automatic and selective method of calling any aircraft. Voice calling is replaced by the transmission of code tones to the aircraft over the international radiotelephoney channels. A single selective call consists of a combination of four pre- selected audio tones requiring approximately two seconds of transmission time. The tones are generated in the ground station coder and are received by a decoder connected to the audio output of the airborne receiver. Receipt of the assigned tone code (SELCAL code) activates a light or chime signal in the cockpit of the aircraft.

It is the responsibility of the flight crew to ensure that Gander Radio is informed of the SELCAL code available based on the airborne equipment, if they intend to communicate with Gander Radio. This may be done in connection with the off- ground report or when they are transferring in flight from one network to another.

In any case, operators must indicate SELCAL codes in field 18 of the flight plan as follows:

SEL/XXXX

SELCAL Procedures for Air Navigation Services (PANS) are found in the International Civil Aviation Organization's (ICAO) Annex 10, Volume II, Chapter 5. SELCAL equipment standards, including the list of codes available, are found in ICAO Annex 10, "Aeronautical Telecommunications" Volume III, "Communication Systems", Chapter 3, "SELCAL system." The worldwide administration of SELCAL code assignments has been delegated to Aviation Spectrum Resources, Inc. (ASRI). SELCAL code application forms may be obtained at: <www.asri.aero/selcal>.

7.5.5 Gander Controller-Pilot Data Link Communications (CPDLC)

Approximately 5 minutes after entering Gander Oceanic airspace, in lieu of the standard welcome message, equipped flights will receive a message advising them to set the latency timer: "SET MAX UPLINK DELAY VALUE TO 300 SECONDS".

This message serves two purposes; to confirm two-way communications and to ensure that flight crews set the latency timer so that any message delayed in the network is identified to flight crews or not delivered at all after expiration. Delayed messages may contain clearances that are no longer valid and should not be actioned by flight crews.

When the pilot receives the uplink CPDLC message "SET MAX UPLINK DELAY VALUE TO 300 SECONDS" he/she shall:

(a) Send a positive response to ATC as prompted by the avionics "(ACCEPT [ROGER])" regardless of whether the aircraft supports the latency monitor

(b) If the aircraft is equipped with a correctly functioning message latency monitor, enter the specified uplink delay into the avionics in accordance with the aircraft procedures. Some avionics will automatically set the delay value in accordance with the uplink message and do not allow for a manual input.

Note 1: It is important for pilots to respond to the SET MAX UPLINK DELAY VALUE message to avoid unanswered CPDLC messages in the system.

Note 2: The GOLD Manual specifies that the pilot should append the response downlink with the free text message “TIMER NOT AVAILABLE” when the message latency monitor function is not available on the aircraft (GOLD Manual, Table 4-1)

When a pilot receives a CPDLC uplink message with an indication that the message has been delayed the pilot shall:

a) Revert to voice communications to notify the ATS unit of the delayed message received and to request clarification of the intent of the CPDLC message; and

b) Respond appropriately to close the message as per the instructions of the controller.

c) The pilot must not act on the delayed uplink message until clarification has been received from the controller

In Gander Oceanic airspace, this message will not be sent if the crew has sent a downlink, since the downlink confirms the connection.

Note: For information on initial CPDLC messages from the other ACCs in Canada, refer to Section GEN 3.4.4.2, “Data Link Services.”

7.5.6 North Atlantic (NAT) and Anchorage Arctic Regions—Satellite Voice Communications (SATVOICE) Use

SATVOICE may be used to contact Gander Radio for non-routine flight safety calls or during periods of poor HF propagation. Gander Radio may be contacted on 1-709-651-5298 or using Inmarsat short code 431613.

Table 7.5.6, North Atlantic (NAT) Region- Very High Frequency (VHF) Coverage

VHF Frequencies	Coordinates/Named Fixes
122.375	45N 050W – 54N 050W
135.35	45N 050W – 48N 050W
126.9	48N 050W – 51N 050W
127.1	48N 050W – 51N 050W
119.85	51N 050W – 54N 050W
120.55	LOMSI – AVUIT
123.75	PIDSO – BOKTO
124.82	NIFTY – AVPUT
127.9	57N 040W – 63N 040W – 61N 050W – 57N 050W
126.9 (CYFB)	61N 070W – 67N 070W

Note: SELCAL is used on all air-ground frequencies.

General purpose VHF communications facilities have been provided by Canada, Denmark and Iceland in order to supplement HF radio coverage in the NAT region. General purpose VHF coverage is shown on the following charts. It should be noted that:

(a) charts depict approximate coverage areas only;

(b) coverage at lower altitudes will be less than depicted; and

(c) the minimum altitude for continuous VHF coverage across the NAT is considered to be 30,000 ft (see the following charts).

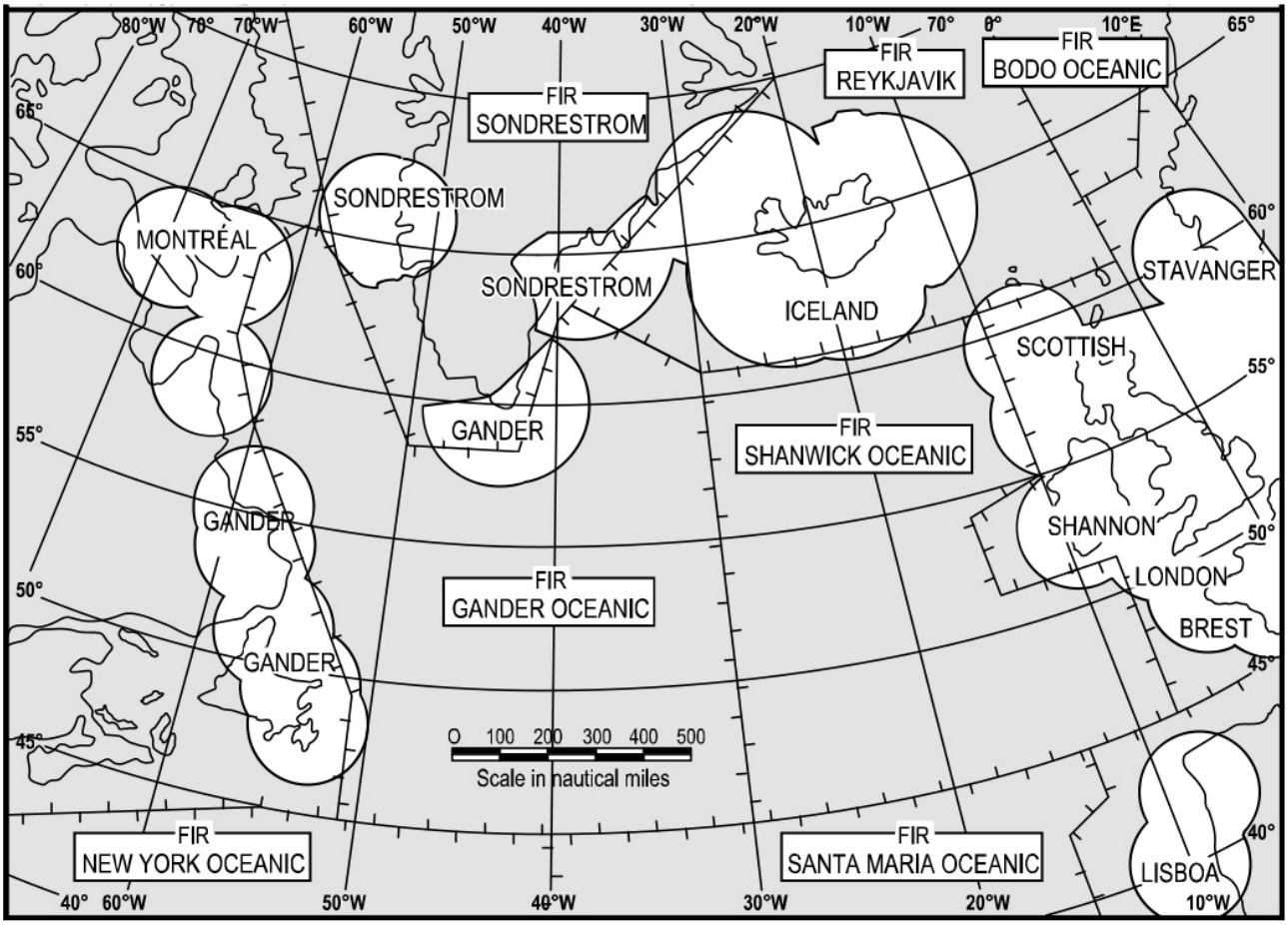


Figure 7.5.6-1, NAT VHF Coverage at 10,000 ft

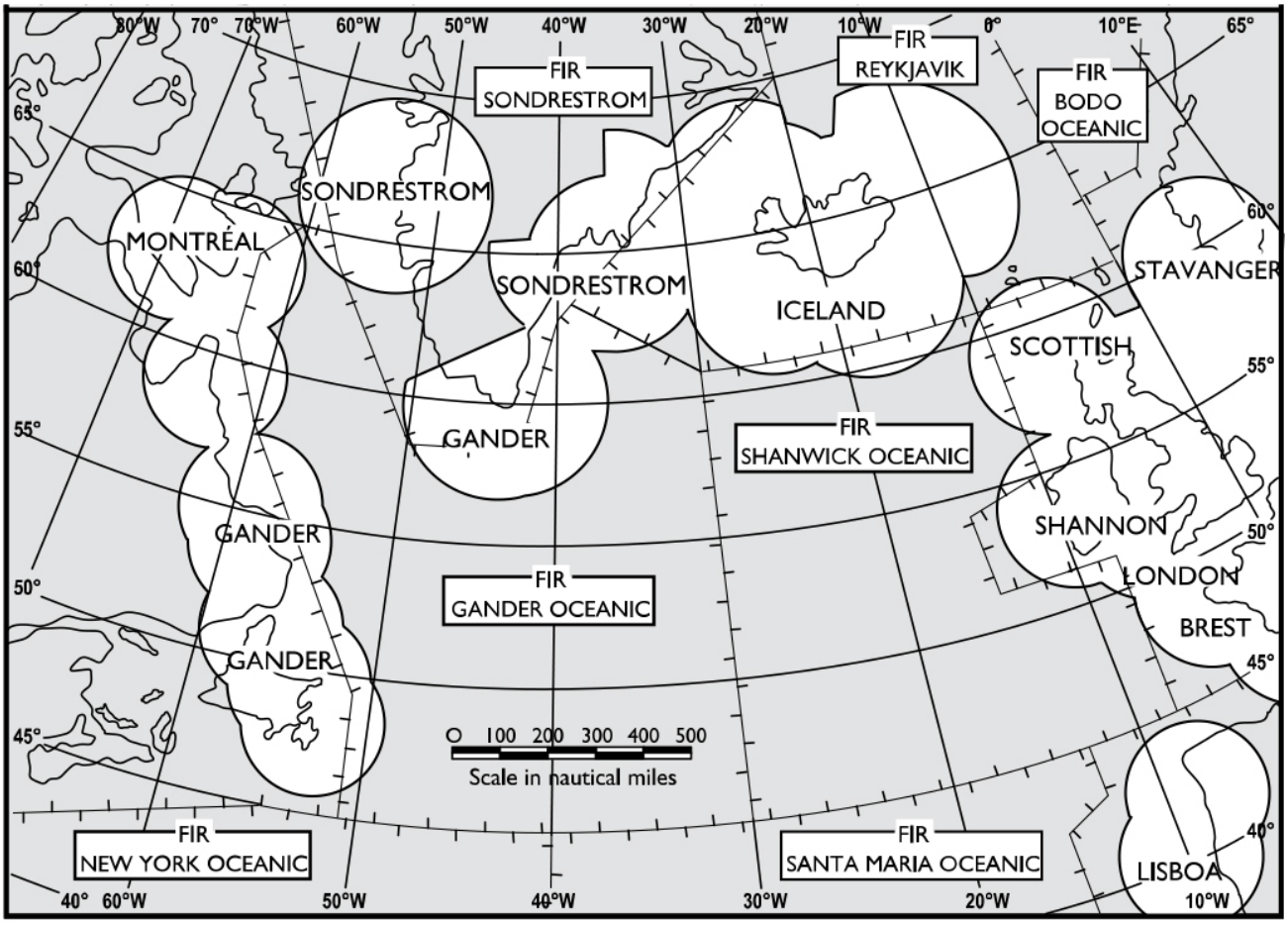
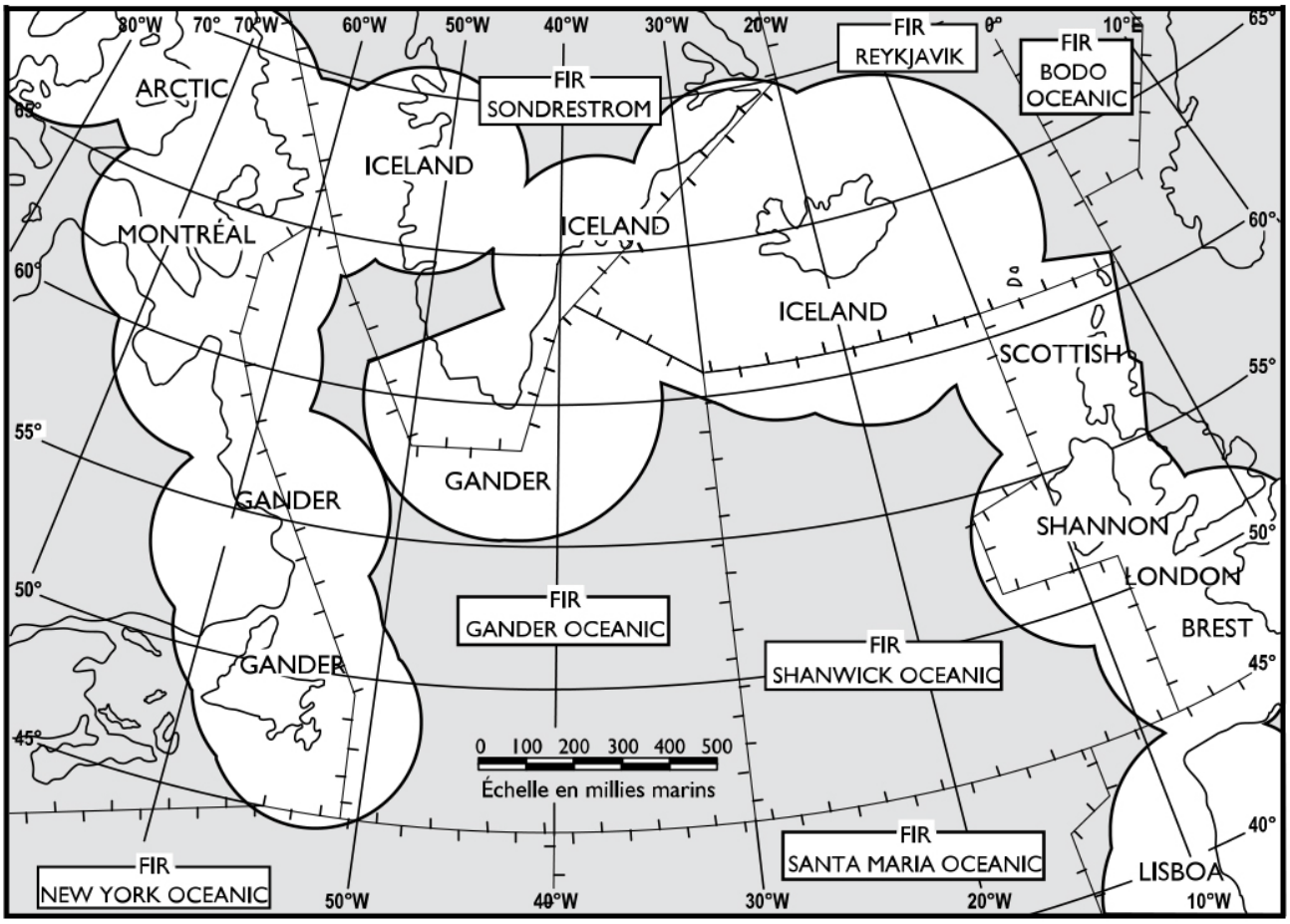


Figure 7.5.6-2, NAT VHF Coverage at 20,000 ft



NOTE : Minimum altitude for continuous VHF coverage across the North Atlantic is considered to be 30 000 feet

Figure 7.5.6-3, NAT VHF Coverage at 30,000 ft

Several attempts to establish communication may be necessary upon entry into the fringe area of reception. Aircraft should maintain SELCAL watch on HF when in fringe areas of VHF coverage. Upon exiting, communication should be re-established on HF channels before flying beyond normal VHF coverage.

Because VHF coverage is limited, aircraft must be equipped with an approved and serviceable HF radio capable of two-way radio communication with ATS from any point along the route of flight.

Note: Because of VHF coverage, aircraft may proceed across the Atlantic without HF radio subject to the following restrictions:

a) below FL 195, routing YFB – SF– KFV; and

b) FL 250 or above, routing YYR – OZN (or NA) – KFV.