Transport Canada Transports Canada

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Transport Canada

Aeronautical Information Manual

(TC AIM)

NAT—NORTH ATLANTIC (NAT) OPERATIONS

MARCH 21, 2024

Canada

TRANSPORT CANADA AERONAUTICAL INFORMATION MANUAL (TC AIM)

EXPLANATION OF CHANGES

EFFECTIVE—MARCH 21, 2024

NOTES:

1. Editorial and format changes were made throughout the TC AIM where necessary, and those that were deemed insignificant in nature were not included in the "Explanation of Changes."
2. Effective March 31, 2016, licence differences with ICAO Annex 1 Standards and Recommended Practices, previously located in LRA 1.8 of the TC AIM, have been removed and can now be found in *AIP Canada* GEN 1.7.
3. The blue highlights in the manual represent the changes described in this section.

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NOTE:
Refer to *AIP Canada* Enroute (ENR) 7 for the most up-to-date navigation information and procedures available at <https://www.navcanada .ca/en/aeronautical-information/aip-canada.aspx>.

1.0 NORTH ATLANTIC (NAT) OPERATIONS

1.1 REGULATION, REFERENCE DOCUMENTS AND GUIDANCE MATERIAL

1.1.1 Regulation

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

1.1.2 North Atlantic (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) *Gander Data Link Oceanic Clearance Delivery (OCD) Crew Procedures*.

1.2 GENERAL AVIATION AIRCRAFT

Canadian Aviation Regulation (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 licence 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 percent of the fuel required pursuant to section 602.88 to complete the flight to the aerodrome of destination."

1.3 NORTH AMERICAN ROUTES (NAR)

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 (OEP) 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*.

1.4 GANDER OCEANIC TRANSITION AREA (GOTA)

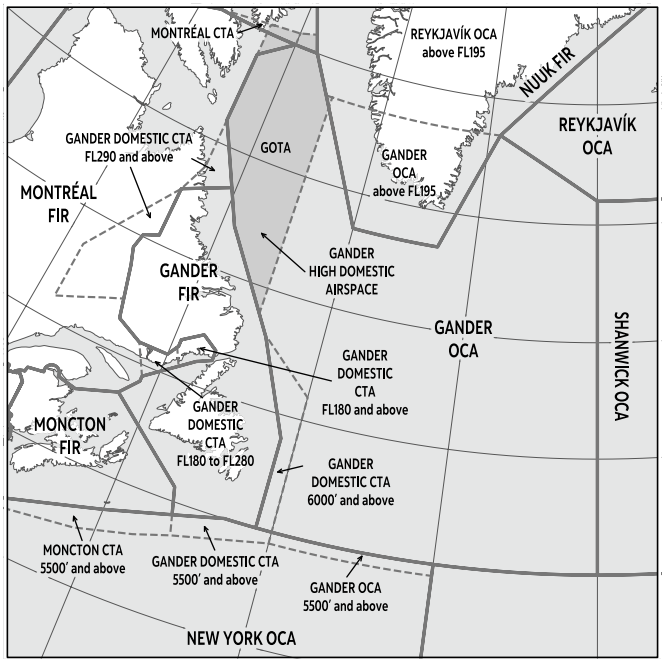
The implementation of additional surveillance and communication sites along the north-east coast of Canada allowed for the provision of enhanced services and led to the creation of the Gander oceanic transition area (GOTA).

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 airspace FL 290 and above, from 6530N 060W, east to the Reykjavik area control centre (ACC) boundary, south to 6330N 055W, south along 055W to the Gander domestic boundary, north along the Gander/Montreal domestic boundaries, north to the Edmonton boundary, and then back to the point of origin (see Figure 1.1).

Surveillance services are provided by Gander ACC. The automatic dependence surveillance - contract/controller-pilot data link communications (ADS-C/CPDLC) log on address for aircraft in GOTA airspace is CDQX.

Figure 1.1—Gander OCA



1.5 NORTH ATLANTIC (NAT) ORGANIZED TRACK SYSTEM (OTS)

Organized tracks are formulated and published in a North Atlantic (NAT) track message via the Aeronautical 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 organized track system (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 OTSs, 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.

Further information on available flight level profiles can be found in NAT 1.20.3.

1.6 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.

1.7 FLIGHT PLANNING PROCEDURES

1.7.1 Routes

For eastbound and westbound traffic:

(a) South of 70°N, the planned tracks shall be defined by significant points formed by the intersection of half or whole degrees of latitude at each 10° 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° 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 min, one of the points may be omitted.

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

(c) The following OEPs are limited to flights conducted from FL 290 and above: AVPUT, CLAVY, EMBOK, KETLA, LIBOR, MAXAR, NIFTY, PIDSO, RADUN, SAVRY, TOXIT, URTAK, VESMI, AVUTI, BOKTO, CUDDY, DORYY, and ENNSO.

(d) The following OEPs shall be flight planned by all aircraft entering or exiting Gander oceanic airspace, regardless of altitude: 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.

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° (65°N, 60°N, 55°N).

For aircraft planning to fly within the 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 subsection 1.20.3.2 for more details on the 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 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 OCA to flight plan in accordance with the published NAT OTS or, if exiting by way of 58°N 050°W and south thereof, via the following OEPs (compulsory reporting points) and associated 050°W coordinates (see Table 1.1).

Table 1.1—OEPs and Associated Coordinates

OEP	Coordinates	OEP	Coordinates
CUDDY or DORYY	5800N 05000W	UMESI	5130N 05000W
ENNSO	5730N 05000W	ALLRY	5100N 05000W
HOIST	5700N 05000W	BUDAR	5030N 05000W
IRLOK	5630N 05000W	ELSIR	5000N 05000W
JANJO	5600N 05000W	IBERG	4930N 05000W
KODIK	5530N 05000W	JOOPY	4900N 05000W
LOMSI	5500N 05000W	MUSAK	4830N 05000W
MELDI	5430N 05000W	NICSO	4800N 05000W
NEEKO	5400N 05000W	OMSAT	4730N 05000W
PELTU	5330N 05000W	PORTI	4700N 05000W
RIKAL	5300N 05000W	RELIC	4630N 05000W
SAXAN	5230N 05000W	SUPRY	4600N 05000W
TUDEP	5200N 05000W	RAFIN	4500N 05000W

ATS requires flights entering or exiting the New York OCA through 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 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.

  (i) When the eastbound OTSs are anchored at RAFIN and/or TALGO, BOBTU will be unavailable for eastbound NAT traffic flight planning between FL 300 and FL 400, 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 transiting from the Gander OCA or the GOTA to the Montréal FIR/CTA to flight plan via 060°W below FL 290 and via an oceanic entry point if operating from FL 290 up to and including FL 600, followed by both a boundary reporting point and then one of the following inland reporting points: LAKES, LOPVI, RODBO, JELCO, FEDDY, TEFFO, DUTUM, or BEZED. KENKI and IRBIM are not to be used as boundary reporting points. Flights operating from FL 290 and above may flight plan a NAR to or from an oceanic entry point.

1.7.2 Airspeed

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

1.7.3 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, cruising level(s) appropriate to the direction of flight and in accordance with the flight levels as described in the NAT FLAS. Refer to section 1.20.3 for more details on FLAS.

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

1.7.4 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.

1.7.5 Aircraft Approval Status and Registration

For an aircraft certified as being in compliance with operations within the NAT HLA, the approval status (MNPS) shall be indicated in Item 10 by entering the letter "X". It is the pilot's responsibility to ensure that specific approval has been given for the NAT HLA operations. Refer to subpart 1.11 for more information on MNPS in the NAT HLA.

For an aircraft certified as being in compliance with RVSM MASPS, RVSM approval shall be indicated in Item 10 by entering the letter "W". It is the pilot's responsibility to ensure that specific approval has been given for RVSM operations. Refer to subpart 1.12 for more information on RVSM MASPS.

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

1.7.6 Height Monitoring Unit (HMU)

An aircraft that requires HMU monitoring shall include in Item 18 of the flight plan the remarks "RMK/HMU FLT STU".

1.7.7 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 1.2.

Table 1.2—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.

1.8 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) addresses:

(a) CZQXZQZX (Gander ACC)

(b) CZULZQZX (Montreal 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

NOTES:

1. If there is no inland navigation fix (INF), the latitude crossing 080°W is to be used.
2. PRMs for eastbound flights are to be sent no later than 1000 Coordinated Universal Time (UTC).

1.9 CLEARANCES

1.9.1 Oceanic Clearances

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) The Mach number to be maintained will be specified.

(c) ATC will specify the full route details for aircraft cleared on a route other than an organized track or flight planned route. The pilot is to read back the full details of the clearance including the cleared track or details of the flight planned route.

(d) ATC will issue an abbreviated oceanic clearance to aircraft that will be operated along one of the NAT organized tracks. The abbreviated clearance will include the track letter, the flight level, and the Mach number or speed in knots to be maintained. The pilot is to read back the clearance including the TMI number. ATC will confirm the accuracy of the readback and the TMI number.

NOTE:
The OTS is identified by a TMI number, which is determined by using the Julian calendar for the day on which the tracks are effective. (Refer to subsection 1.20.3.2 for more information on OTS.) 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.

A TMI revision will not be issued for changes to other items such as NARs.

(e) Whether received via data link or voice, the oceanic clearance to enter the Gander OCA has the following meaning:

(i) the clearance is valid only within oceanic airspace, and details the route, altitude and speed at which the flight is to enter oceanic airspace;

(ii) the flight crew is not immediately authorized to change the route, altitude or speed in order to comply with the oceanic clearance;

(iii) the flight crew is required to obtain a subsequent clearance in order to comply with the oceanic clearance; and

(iv) if unable to obtain a subsequent clearance, the flight crew should revert to the procedures for radio communications failure detailed in the CFS and in the NAT section of ICAO's *Regional Supplementary Procedures* (Doc 7030) in order to manoeuvre as necessary to comply with the oceanic clearance.

(f) If the aircraft is designated to report meteorological information, the pilot will be advised by the inclusion of the phrase "SEND MET REPORTS" in the clearance.

1.9.2 Domestic Clearances—North Atlantic (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 oceanic clearance contains their flight planned oceanic exit point will not be issued en route clearances upon entering the airspace and are to follow the flight planned route as cleared. Domestic en route clearances will be issued:

(i) for flights that have been rerouted and exit oceanic airspace at a point other than the flight planned exit fix; 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 reclear aircraft will only be considered under exceptional circumstances and are not an acceptable alternative to a pilot-initiated request for a reclearance.

(d) Domestic reclearances 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 GOTA or CDA shall maintain 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.

1.9.3 Oceanic Clearance Delivery

Unless otherwise advised by ATC, the following oceanic clearance delivery procedures are in effect daily between 2330 and 0730 UTC (DST 2230 and 0630 UTC) for all eastbound oceanic flights that transit the Gander domestic FIR/CTA:

(a) Clearance delivery frequencies are published daily in the Remarks section on the eastbound NAT track message. During published clearance delivery hours, pilots are to contact Gander Clearance Delivery on the frequency designated for their oceanic entry point. Pilots should contact Clearance Delivery when they are within 200 NM of the specified clearance delivery frequency location. In the event that contact cannot be established, pilots are to advise ATC on the assigned control frequency. The following frequencies and frequency locations will normally be used:

Table 1.3—Oceanic Clearance Delivery Frequencies

Frequency Locations	Frequencies
Natashquan (YNA) (50°11'N 061°47'W)	135.45 MHz
Allan's Island (46°50'N 055°47'W)	128.45 MHz
Churchill Falls (UM) (53°35'N 064°14'W)	128.7 MHz
Stephenville (YJT) (48°34'N 058°40'W)	135.05 MHz
Sydney (YQY) (46°09'N 060°03'W)	119.42 MHz
Brevoort (63°20'N 064°08'W)	132.025 MHz
Kuujjuaq (YVP) (58°05'N 068°25'W)	134.2 MHz

(b) Operators who do not receive the NAT track message are to contact Gander Clearance Delivery when they are within 200 NM of the frequency location. In the event that contact cannot be established, pilots are to advise ATC on the assigned control frequency.

Pilots are to maintain a continuous listening watch on the assigned control frequency while obtaining the oceanic clearance.

Flights that are equipped to request and receive solicited electronic oceanic clearances are not required to contact Clearance Delivery if an electronic clearance is received and confirmed successfully. Confirmation is the receipt of the following message: CLA RECEIVED CLEARANCE CONFIRMED END OF MESSAGE.

If the above message is not received, data link oceanic clearances must be verified, either with Gander Clearance Delivery, during published hours, or on the control frequency, outside of published hours.

ATC will not normally advise pilots to contact Gander Clearance Delivery. There is no requirement for pilots to confirm receipt of an oceanic clearance (including a data link oceanic clearance) from Gander Clearance Delivery with the assigned control frequency. Due to frequency congestion on both the clearance delivery and control frequencies, pilots should refrain from unnecessary lengthy discussions with respect to oceanic clearances and procedures. Constructive comments and complaints should be processed post-flight through company operations.

Procedures and further information for flights intending to receive oceanic clearances via data link are published in *Gander Data Link Oceanic Clearance Delivery (OCD) Crew Procedures*.

1.10 POSITION REPORTS

1.10.1 Requirements

Unless otherwise requested by ATC, flights shall make position reports at all points contained in their oceanic 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 the aircraft is 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 control 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.

1.10.2 Communications With Air Traffic Control (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). Carrying HF radio and the additional long-range communication system is mandatory, except for operations on routes covered by VHF facilities. (Refer to Planning Section C in the CFS for a list of VHF facilities.)

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 the NAT HLA, refer to ICAO Annex 2 and to the NAT section in ICAO's *Regional*

Supplementary Procedures (Doc 7030), as well as national AIPs for the States concerned.

All flights operating in the Gander OCA should check in on international air-ground frequencies. Refer to *AIP Canada* ENR 7.1.10 for detailed procedures on making initial contact upon entering Gander OCA.

1.11 MINIMUM NAVIGATION PERFORMANCE SPECIFICATIONS (MNPS) FOR OPERATIONS WITHIN THE NORTH ATLANTIC HIGH-LEVEL AIRSPACE (NAT HLA)

1.11.1 General

All operators are to ensure that aircraft used to conduct flights within the NAT HLA have the minimum navigation equipment. For detailed requirements, refer to the following documents:

(a) 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 CARs.

Eastbound aircraft requesting an oceanic clearance from Gander ACC to enter the NAT HLA may be asked by ATC to confirm that they are approved for MNPS operations. Pilots/operators unable to provide such confirmation will be issued an oceanic clearance to operate their aircraft outside the NAT HLA (below FL 285 or above FL 420).

1.11.2 Aircraft Without Minimum Navigation Performance Specifications (MNPS) for the North-Atlantic High-Level Airspace (NAT HLA) Operations

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.

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.

1.12 REDUCED VERTICAL SEPARATION MINIMUM (RVSM)—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).

Eastbound aircraft requesting an oceanic clearance from Gander area control centre (ACC) to enter the NAT HLA at designated RVSM altitudes may be asked by air traffic control (ATC) to confirm that they are approved for minimum navigation performance specifications (MNPS) and/or RVSM operations. Pilots/operators unable to provide such confirmation will be issued an oceanic clearance to operate their aircraft outside designated RVSM altitudes.

1.13 ADHERENCE TO MACH SETTING

While operating in the Gander oceanic control area (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 en route climbs and descents because of aircraft performance.

Fixed speed is no longer required for every flight crossing the North Atlantic (NAT). NAT operations without an assigned fixed speed (OWAFS) are now possible. Refer to *AIP Canada* ENR paragraph 7.1.11 for more details.

1.14 OPERATION OF TRANSPONDERS

Transponders must be operated at all times on Mode A or Mode C on Code 2000 while the aircraft is operated in the North Atlantic (NAT) region. However, the last air traffic control (ATC) assigned code must be retained for a period of 30 min after entry into NAT airspace unless the pilot is otherwise directed by ATC.

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

1.15 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). Such requests will be included in the oceanic clearance using the phrase "SEND MET REPORTS". 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.

1.16 ALTITUDE REPORTS

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

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

1.17 CONTINGENCY AND EMERGENCY PROCEDURES

1.17.1 In-Flight Contingencies

All pilots transiting the 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) 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.

1.17.2 Contingency Procedures for Oceanic Traffic in the Event of an Evacuation of Gander Area Control Centre (ACC)

1.17.2.1 AIRCRAFT PROCEDURES—Westbound	
(a)	Aircraft that do not receive an oceanic clearance
(i)	In the event that Gander ACC must be evacuated, only aircraft with received and acknowledged oceanic clearances will be permitted to transit the Gander OCA.
(ii)	If unable to obtain or acknowledge an oceanic clearance, flights should plan to reroute around the Gander OCA or land at an appropriate aerodrome. Request the appropriate reclearance on the current frequency. Frequency congestion is likely.
(b)	Aircraft that receive an acknowledged oceanic clearance
(i)	Aircraft operating with a received and acknowledged oceanic clearance should proceed in accordance with the clearance. Flights should not request changes in altitude, speed, or route except for flight safety reasons.
(ii)	Any flights involved in level changes should complete the manoeuvre as soon as possible in accordance with any restrictions provided with the clearance.
(c)	Contact Procedures
(i)	Upon 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.
(ii)	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.
(iii)	Flights should establish communication with the next agency at the earliest opportunity, stating their 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.
(iv)	Flights within the Gander OCA should initially establish contact with Shanwick Radio. Flights within the Gander FIR should contact Montreal Centre or Moncton Centre, depending on their oceanic exit point as described in subparagraph (vii) below. Flights about to exit the Gander OCA into the New York OCA, the Reykjavik Oceanic CTA, the Santa Maria OCA, or the Nuuk FIR should contact New York Radio, Iceland Radio, Santa Maria Radio, or Nuuk Radio as appropriate.
(v)	If unable to establish radio contact, flights may use SATVOICE to provide position reports.
(vi)	Aircraft may request that their flight dispatch offices forward position reports, if these aircraft are sending position reports to multiple ATS Units or if they are otherwise unable to forward position reports.

Oceanic Centre	Public Switched Telephone Network (PSTN) Number	Short Code
Gander Shift Manager	001-709-651-5207	N/A

1.17.2.1 AIRCRAFT PROCEDURES—Westbound

(vii) Based on where they exit oceanic airspace, flights shall proceed in accordance with the following table until communication is established with the next agency and this agency issues a reclearance.
For flights operating at FL 290 and above:

Flight is routed over:	The flight shall proceed to:	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
AVUTI	YKL 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	YRI	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

1.17.2.1 AIRCRAFT PROCEDURES—Westbound

Flight is routed over:	The flight shall proceed to:	Next control agency and frequency:
SUPRY	WHALE	Moncton ACC 133.7
VODOR	NANSO VITOL	Moncton ACC 125.25
BOBTU	JAROM GAYBL	Moncton ACC 125.25

For flights operating at FL 280 and below:

NOTE:
Routes HOIST and south are the same as for flights operating at FL 290 and above.

Flight is routed over:	The flight shall proceed to:	Next control agency and frequency:
NALDI	DUTUM	Montreal ACC 134.55
KAGLY	TEFFO	Montreal ACC 134.55
IKMAN	FEDDY	Montreal ACC 134.55
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 YKL ROUND	Montreal ACC 132.25 @ 65W
PORGY	YWK MT	Montreal ACC 132.25 @ 63W

1.17.2.2 AIRCRAFT PROCEDURES—Eastbound

(a)	Aircraft that do **not** receive an oceanic clearance
(i)	In the event that Gander ACC must be evacuated, only aircraft with received and acknowledged oceanic clearances will be permitted to transit the Gander OCA.
(ii)	If unable to obtain or acknowledge an oceanic clearance, flights should plan to reroute around the Gander OCA or land at an appropriate aerodrome. Flights may be required to reroute around the Gander FIR as well. Flights should request the appropriate reclearance from Montreal or Moncton Centre. Frequency congestion is likely.
(b)	Aircraft that receive an acknowledged oceanic clearance
(i)	Aircraft operating with a received and acknowledged oceanic clearance should proceed in accordance with the clearance. Flights should not request changes in altitude, speed, or route except for flight safety reasons or to comply with the oceanic clearance.
(ii)	Flights west of 50°W longitude should contact either Montreal or Moncton Centre, depending on which of the two was the previous agency, using the previous assigned frequency.
(iii)	If a level change is required to comply with the oceanic clearance, the flight should request clearance from Montreal or Moncton Centre. If unable to obtain an ATC clearance, the aircraft should climb or descend so as to cross the oceanic entry point at the cleared oceanic flight level.

1.17.2.2 AIRCRAFT PROCEDURES—Eastbound

(iv) The Eastbound OTS will be extended to begin at fixes on or near the western boundary between the Gander FIR and the Moncton and Montreal FIRs as follows:

INLAND CONTINGENCY FIX	INTERMEDIATE FIX	OCEANIC ENTRY POINT
KENKI		AVPUT
MUSVA		CLAVY
BERUS		EMBOK
GRIBS		KETLA
6101N 06241W		LIBOR
MIBNO		MAXAR
MUSLO		NIFTY
PEPKI		PIDSO
SINGA		RADUN
LAKES	5900N 06000W	SAVRY
UDMAR		TOXIT
YKL	LOMTA	URTAK
ALSOP		VESMI
YWK	YDP	AVUTI
DUVBI	VOKET	BOKTO
MUNBO		CUDDY
BORUB		DORYY
TEXUN		ENNSO
TASTI	YYR	HOIST
5222N 06106W		IRLOK
SERBO		JANJO
KONCH		KODIK
VERTU		LOMSI
5111N 05929W		MELDI
PIKNA		NEEKO
5052N 05859W		PELTU
NAPLO	YAY	RIKAL
4950N 05828W		SAXAN
MIGLI		TUDEP
4904N 05754W		UMESI
LOPRO		ALLRY
4818N 05730W		BUDAR
VINSI	YQX	ELSIR
4734N 05712W		IBERG
TAGRA		JOOPY
4649N 05654W		MUSAK
SUTKO	YYT	NICSO
4610N 05639W		OMSAT
RUBDA		PORTI
4521N 05621W		RELIC
PEPRA		SUPRY

1.17.2.2 AIRCRAFT PROCEDURES—Eastbound

	INLAND CONTINGENCY FIX / **INTERMEDIATE FIX** / **OCEANIC ENTRY POINT**
	NANSO / — / RAFIN
	LOMPI / JAROM / TALGO
(v)	Flights at or east of 50°W longitude should initially contact Shanwick Radio. Flights about to exit the Gander OCA should contact New York Radio, Santa Maria Radio, Iceland Radio, or Nuuk Radio as appropriate. The following information should be provided: (A) call sign; (B) current position; (C) current flight level and cleared oceanic flight level (if different from the current level); (D) assigned Mach or speed; (E) next waypoint and estimate; and (F) subsequent waypoint.
(vi)	The following communications procedures have been developed in accordance with the traffic information broadcast by aircraft (TIBA) procedures recommended by ICAO Annex 11, Attachment C. Unless otherwise instructed by Moncton or Montreal Centre, aircraft should apply these procedures when completing an altitude change to comply with the oceanic clearance. At least 3 min prior to initiating a climb or descent, the flight should broadcast the following on the last assigned frequency, 121.5, 243.0, or 123.45: 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) 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)
(vii)	When ADS-equipped flights are notified of a Gander evacuation, they must revert to voice position reporting until they are either clear of Gander OCA or notified otherwise. Pilots should note that they may be asked to log on to EGGX when within the Gander OCA; they should not initiate this action until instructed to do so.

1.18 COMMUNICATIONS 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.

1.18.1 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.

1.18.2 Communications Failure Prior to Entering the North Atlantic (NAT) Oceanic Airspace

If operating with a received and acknowledged oceanic clearance, the pilot should enter oceanic airspace at the cleared oceanic entry point, flight level, and speed, and proceed in accordance with the received and acknowledged oceanic clearance. Any flight level or speed changes required to comply with the oceanic clearance should be completed within the vicinity of the oceanic entry point. The cleared oceanic flight level is the flight level contained in the oceanic clearance.

If operating without a received and acknowledged oceanic clearance, the pilot should enter oceanic airspace at the first oceanic entry point, flight level, and speed contained in the filed flight plan, and proceed via the filed flight plan route to landfall. The first oceanic flight level and speed should be maintained to landfall.

1.18.3 Communications Failure Prior to Exiting the North Atlantic (NAT) Oceanic Airspace

If the oceanic clearance includes the flight planned oceanic exit point, the pilot should proceed in accordance with the last received and acknowledged oceanic clearance, including flight level and speed, to the last specified oceanic exit point. The pilot should continue on the flight plan route and, after passing the last specified oceanic exit point, conform to the relevant state procedures and regulations.

If cleared on a route that contains an oceanic exit point other than the one contained in the flight plan, the pilot should proceed in accordance with the last received and acknowledged oceanic clearance, including flight level and speed, to the last specified oceanic route point. After passing this point, the pilot should conform to the relevant state procedures and regulations, rejoining the filed flight plan route by proceeding, via published ATS routes where possible, to the next significant point west of the last oceanic route point contained in the filed flight plan.

1.19 NORTH ATLANTIC HIGH-LEVEL AIRSPACE (NAT HLA)

1.19.1 General

The MNPS shall be applicable in 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:

Equipment Installation Approval:

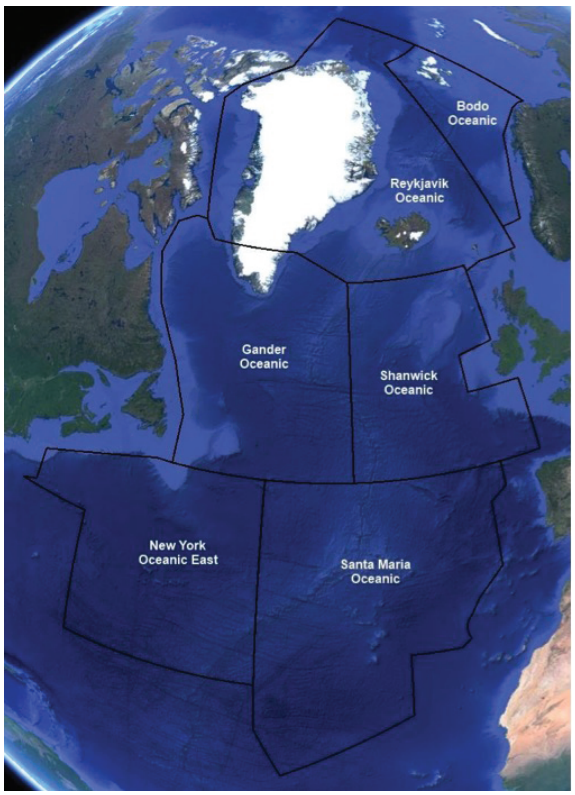
Transport Canada Civil Aviation
Regional Airworthiness Engineer
(See GEN 1.0 for the appropriate regional office.)

Commercial Flight Standards:

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

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

Figure 1.2—NAT HLA Between FL 285 and FL 420



1.19.2 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. 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, Colo., (call sign WWV), which operates 24 hr 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 hr a day.

(c) The National Research Council of Canada HF radio station in Ottawa (call sign CHU), which is available 24 hr 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.

1.19.3 Provisions for Partial Loss of Navigation Capability

If an aircraft suffers partial loss of navigation capability (in which only one long-range navigation system is serviceable) prior to entry into oceanic airspace, the following routes should be considered:

(a) STN – 6000N 01000W (ATSIX) – 6100N 01234W – ALDAN KFV;

(b) BEN – 6100N 01000W (RATSU) – ALDAN – KFV;

(c) MAC – BEL – GOW – SHA – 5700N 01000W (GOMUP) – 6000N 01500W – 6100N 01630W BREKI KFV;

(d) KFV – SOPEN – DA – SF – YFB;

(e) KFV – EPENI – 6300N 03000W – 6100N 04000W – OZN;

(f) OZN – 5900N 05000W – AVUTI (FL 290-FL 600) – PRAWN – YDP;

(g) OZN – 5900N 05000W – CUDDY (FL 290-FL 600) – PORGY;

(h) OZN – 5800N 05000W – HOIST – YYR;

(i) SF – 6700N 06000W (DARUB) – YXP; and

(j) RE – 6930N 02240W – CP.

These routes are subject to the following conditions:

(a) sufficient navigation capability remains to meet the MNPS, and the requirements in ICAO Annex 6, Part I, Section 7.3 and ICAO Annex 6, Part II, Section 3.7.2 can be met by relying on the use of short-range NAVAIDs;

(b) a revised flight plan is filed with the appropriate ATS unit; and

(c) an ATC clearance is obtained.

NOTES:

1. A revised oceanic clearance will be issued after coordination between all oceanic ACCs concerned.
2. If the OTS extends to the northern part of the NAT region, the aircraft concerned may be required to accept a lower than optimum flight level in the revised oceanic clearance, especially during peak traffic periods.
3. This guidance material does not relieve the pilot from the requirement to take the best possible course of action in light of the prevailing circumstances.

1.19.4 Special Routes for Aircraft Fitted With a Single Long-Range Navigation System

In order to be considered capable of meeting the MNPS while operating along the routes listed below, aircraft must have State approval to operate in the NAT HLA, be equipped with normal short-range navigation equipment (VOR/DME, ADF), and have at least one fully operational set of one of the following navigation equipment:

(a) Doppler with computer;

(b) INS;

(c) GPS approved in accordance with the requirements specified in TSO C-129 (Class A1, A2, B1, B2, C1, or C2); or

(d) FMS or IRS.

The aforementioned routes are known as Blue Spruce routes and are as follows:

(a) STN or BEN – 60N 010W (ATSIX) – 61N 01234W – ALDAN – KFV (HF required on this route);

(b) STN or BEN – 61N 010W (RATSU) – ALDAN – KFV (VHF coverage exists and, subject to prior coordination with Scottish Airways and Prestwick [Shanwick OAC], this route may be used by non-HF equipped aircraft);

(c) MAC, BEL, GOW, SGA – 57N 010W (GOMUP) – 60N 015W – 61N 01630W – BREKI KFV (HF required on this route)

(d) Tango Nine (T9) – 483554N 0090000W (LASNO) – 45N 009W (BEGAS) –STG (HF required on this route);

(e) Tango Sixteen (T16) – 485020N 0120000W (OMOKO) – 4500N 01600W (GONAN) – 4000N 01600W – NAVIX (HF required on this route);

(f) Tango Two One Three (T213) – 484343N 0102950W (TAMEL) – 4500N 01300W (BERUX) (HF required on this route);

(g) KFV – SOPEN – DA – SF – YFB;

(h) KFV – EPENI – 6300N 03000W – 6100N 04000W – OZN;

(i) OZN – 5900N 05000W – AVUTI (FL 290-FL 600) – PRAWN – YDP;

(j) OZN – 5900N 05000W – CUDDY (FL 290-FL 600) – PORGY;

(k) OZN – 5800N 05000W – HOIST – YYR;

(l) SF – 6700N 06000W (DARUB) – YXP;

(m) RE – 6930N 02240W – CP;

(n) Funchal/Porto Santo – Santa Maria/Ponta Delgada; and

(o) Lisboa Porto Faro – Ponta Delgada/Santa Maria/Lajes.

1.19.5 Aircraft Without Minimum Navigation Performance Specifications (MNPS) Capability

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.

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.

1.19.6 Monitoring of Gross Navigation Errors

In order to ensure that the required navigation standards are being observed within the NAT HLA, a 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.

1.20 NORTH ATLANTIC (NAT) REDUCED VERTICAL SEPARATION MINIMUM (RVSM)

1.20.1 Geographic Boundaries

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

1.20.2 Reduced Vertical Separation Minimum (RVSM) Details and Procedures

For RVSM details and procedures applicable to both the NAT and CDA, see RAC 11.7.

1.20.3 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).

1.20.3.1 Flight Level Allocation Scheme (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.

1.20.3.2 Organized Track System (OTS)

(a) Westbound

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

(ii) 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.

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

(iv) The flight level profiles normally published are FL 310 to FL 390 inclusive

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

(A) FL 340 is omitted from these tracks to allow profiles for aircraft originating in the Reykjavik OCA.

(b) Eastbound

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

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

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

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

(v) FL 310 is available on New York tracks only.

(vi) Eastbound traffic routing, south of both the night datum line and the main OTS, should flight plan using FL 310, FL 340, FL 360, or FL 380.

(vii) New York Tracks entering Shanwick OCA that cross, or route south of, the night datum line may be any combination of FL 310, 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.

1.20.3.3 Organized Track System (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:

(A) Remain clear of the incoming OTS; and

(B) Do not plan delegated ODLs (FL 340 and FL 380).

(I) 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:

(A) Remain clear of the incoming OTS at FL 350; and

(B) Do not plan the delegated ODL (FL 330).

(I) 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:

(A) Remain clear of the incoming OTS.

(I) 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:

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

(I) 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:

(A) 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 1.4—OTS Changeover Periods

Level	Time (UTC)	Direction
FL 430	24 hr	Westbound. May be flight planned as eastbound by non-RVSM aircraft.
FL 410	24 hr	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).
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 hr	Westbound (ODL).
FL 300	24 hr	Westbound.
FL 290	24 hr	Eastbound.

1.20.3.4 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:

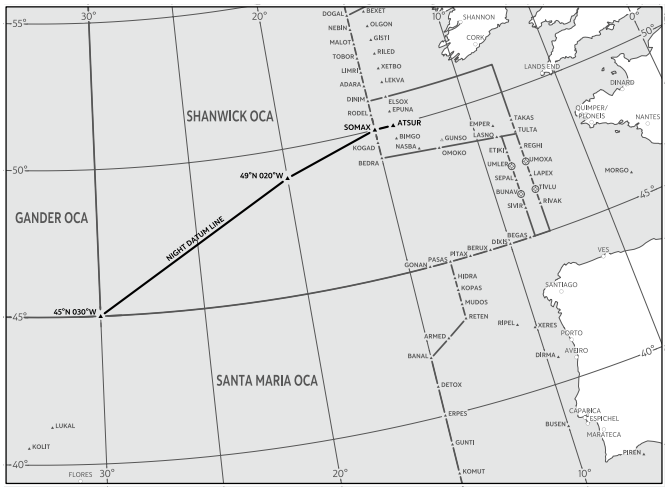
45°N 030°W – 49°N 020°W – SOMAX – ATSUR

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 1.3—Night Datum Line



1.20.3.5 North Datum Line

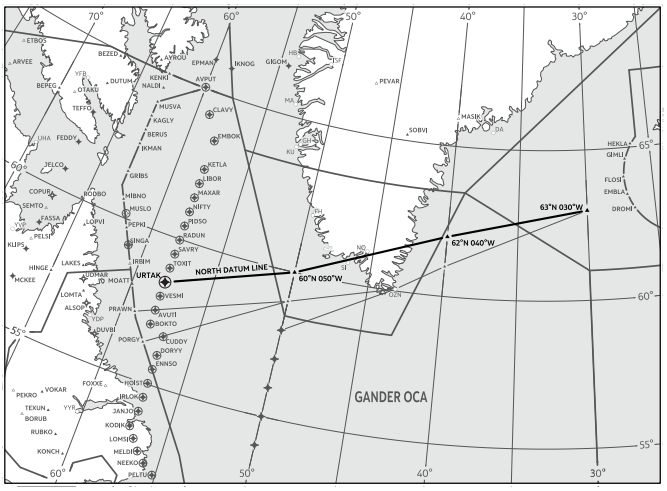
Between 0300 and 0700 UTC, a static datum line, known as the north datum line, is established with the following coordinates:

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 1.4—North Datum Line



1.20.4 North Atlantic (NAT) Reduced Vertical Separation Mininum (RVSM) Aircraft Approvals

Operators of Canadian-registered aircraft intending to fly in NAT MNPS/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
Tél.....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

1.20.5 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
Strumble HMU status
(recorded message) ..... +44 1292 692760
Fax: .....+44 1292 692754
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>.

1.20.6 Data Link Mandate (DLM) Airspace

1.20.6.1 General Information

The objectives of the NAT Data Link Mandate are to enhance communication, surveillance, and ATC intervention capabilities in the NAT region. ADS-C provides conformance monitoring of aircraft adherence to cleared routes and flight levels, significantly enhancing safety. ADS-C also facilitates SAR 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.

1.20.6.2 Data Link Mandate (DLM) Flight Levels

DLM airspace encompasses FL 290 to FL 410, inclusive, throughout the NAT region.

1.20.6.3 Flights Permitted to Operate Within NAT DLM Airspace

The following flights are permitted in NAT DLM airspace:

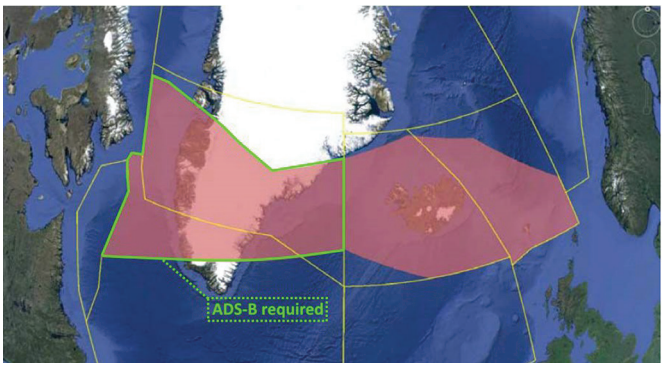
(a) Flights equipped with and prepared to operate FANS 1/A (or equivalent) CPDLC and ADS-C data link systems (see ICAO Doc 7030 3.3.2 and 5.4.2);

  (i) The appropriate equipage to be indicated in Item 10 of the ICAO flight plan is:
    (A) D1; and
    (B) One of the following: J2, J5, or J7.

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

NOTE: Such flights may not receive an ATC clearance that matches flight-planned requests, depending on tactical situations.

Figure 1.5—ADS-B Required Airspace



1.20.6.4 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.

1.20.6.5 Equipment Failure of Either ADS-C or CPLDC Systems

(a) Prior to departure:

(i) Resubmit the flight plan to remain clear of NAT DLM airspace.

(b) After departure but prior to entering DLM airspace:

(i) Notify ATC prior to entering DLM airspace.

(ii) Requests to operate in DLM airspace will be considered on a tactical basis.

(c) After entering NAT DLM airspace:

(i) Notify ATC immediately.

(ii) 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 this is warranted due to traffic.

1.20.7 Height Monitoring

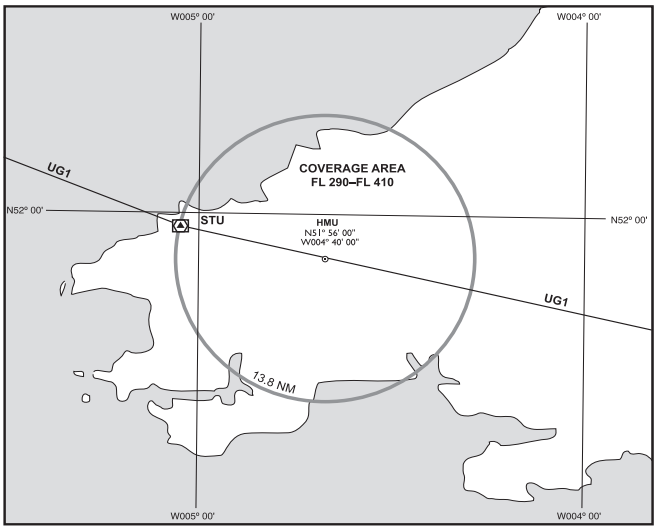
For the NAT, height monitoring is carried out using a hybrid system composed of a fixed ground-based HMU and a GPS-based monitoring system that consists of portable GMUs.

1.20.8 Height Monitoring Unit (HMU)

The HMU site is located at Strumble, UK, 15 NM east of the Strumble VOR/DME (STU), beneath upper ATS UG1, at coordinates 51°56'00"N 004°40'00"W (see Figure 1.6).

The coverage area for the Strumble HMU is a 13.8-NM radius circle from FL 290 to FL 410, inclusive.

Figure 1.6—Strumble HMU



1.20.8.1 Pre-flight Procedures

Operators proposing to divert from an optimum route in order to fly over the Strumble HMU should check the HMU status at +44 1292 692760 (UK) for serviceability information. Every effort will be made to ensure that the promulgated information is accurate, but operators should note that the equipment may become unserviceable on short notice.

Piltos of aircraft that must be monitored should flight plan their route over STU. Item 18 of the flight plan must include both the aircraft registration (if not included in Item 7) and the remarks "RMK/HMU FLT STU".

1.20.8.2 In-flight Procedures

Prior to an overflight of the Strumble HMU, pilots are requested to transmit "for HMU flight" to London Control on initial contact and, if they are not RVSM approved, a request for a level between FL2 90 and FL 410 (inclusive) should be made. The controller will endeavour to allow the aircraft to route through the HMU coverage area in straight and level flight, if operational requirements so permit.

1.20.8.3 Post-flight Procedures

ATC is not aware of whether an aircraft has been successfully monitored by the HMU. Operators wishing to ascertain this information may send a fax to the NAT CMA or complete and submit the HMU request form, which is available at <http://natcma.com/height-monitoring-2/strumble-hmu/>. Please note that operators are encouraged to use the NAT CMA Web site.

Operator queries for specific overflights may be made to the NAT CMA. Such queries should include the Mode S or A codes and approximate time of overflight.

1.21 STRATEGIC LATERAL OFFSET PROCEDURE (SLOP)

The strategic lateral offset procedure (SLOP) is now a standard operating procedure (SOP) 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 flight management systems (FMS), 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 in which 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 flight information regions (FIRs), and within the Bodø oceanic FIR when flights are conducted 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* (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 centreline.

(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, estimated wake vortex drift, and time to descend. (Nominal descent rates for wakes are 300-600 ft/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 air traffic control (ATC) clearance and not on the offset positions.

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

2.0 INTERNATIONAL AIR-GROUND SERVICE

Gander international flight service station (IFSS) is the only Canadian aeronautical station that provides international aeronautical telecommunication services.

2.1 HIGH FREQUENCY (HF) AEROMOBILE 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 2.1—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 communications.

For information about hours of service, refer to the AIP GEN section 3.4 *Communication Services* under 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.

2.2 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 a primary nighttime frequency of 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.

2.3 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.

2.4 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 radiotelephone 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.

SELCAL standards and procedures are found in the International Civil Aviation Organization's (ICAO) Annex 10, Volume II. The worldwide administration of SELCAL code assignments has been delegated to Aviation Spectrum Resources, Inc. SELCAL code application forms may be obtained at: <www.asri.aero/selcal>.

2.5 USE OF GENERAL PURPOSE VERY HIGH FREQUENCY (VHF) OR SATELLITE VOICE COMMUNICATIONS (SATVOICE) IN LIEU OF INTERNATIONAL HIGH FREQUENCY (HF) AIR-GROUND FREQUENCIES

2.5.1 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 at 1-709-651-5298 or using Inmarsat short code 431613.

2.5.2 North Atlantic (NAT) Region—Very High Frequency (VHF) Coverage

Table 2.2—NAT Region VHF Frequencies

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
134.47	58N 050W – 65N 050W
134.95	57N 040W – 63N 040W
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 2.1—NAT VHF Coverage at 10 000 ft

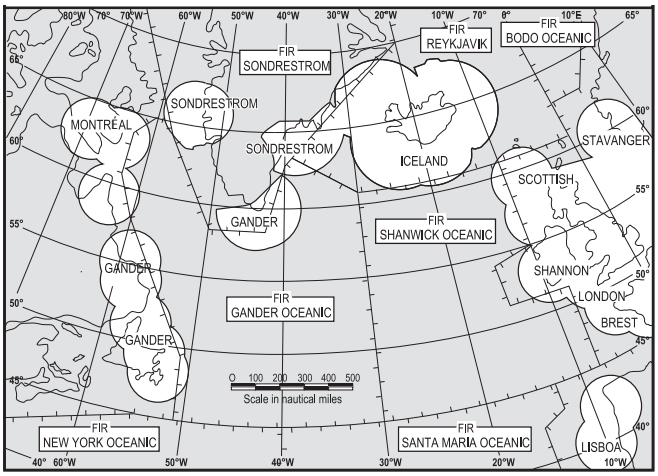


Figure 2.2—NAT VHF Coverage at 20 000 ft

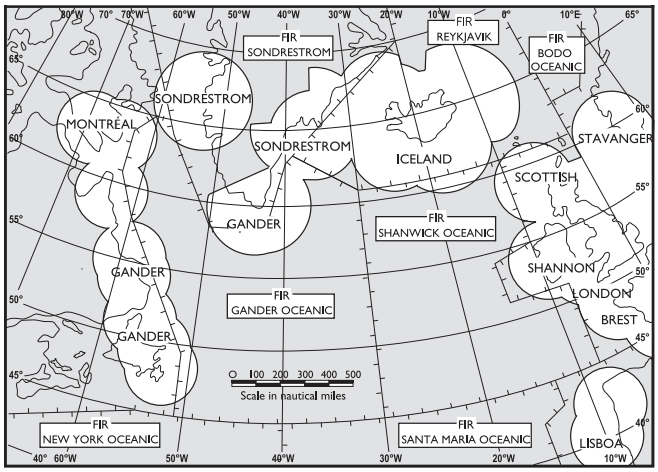
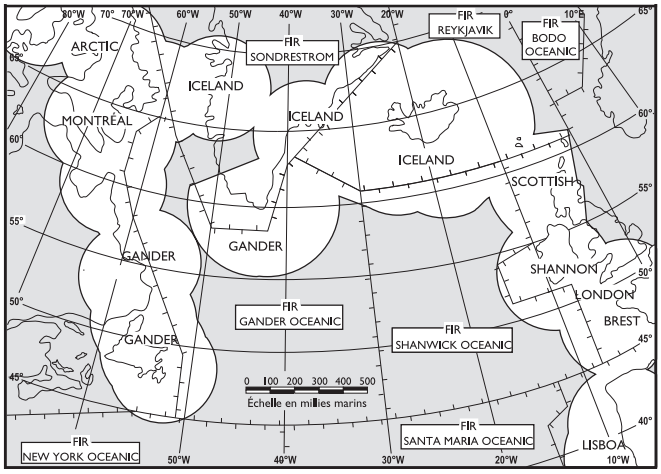


Figure 2.3—NAT VHF Coverage at 30 000 ft



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

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, preferably 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.

2.6 ARINC 424 IDENTIFIERS FOR HALF-DEGREE WAYPOINTS IN THE GANDER OCEANIC CONTROL AREA (OCA)

The manual entry of latitude/longitude waypoints using short codes derived from the *ARINC Specification 424*, paragraph 7.2.5 ("Reporting Positions Defined by Coordinates") standard (5050N = 50°N/50°W, N5050 =50°30'N/50°W) has been directly identified as a causal factor in many of the occurrences of gross navigation errors within the North Atlantic (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 flight management computer (FMC) insertion errors.

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

(a) Aircraft navigation databases should NOT contain waypoints in the Gander oceanic control area (OCA) in the format of "Nxxxx", according to ARINC-424 paragraph 7.2.5.

(b) If an aircraft operator or flight planning service has an operational need to populate databases with half-degree waypoints in the Gander OCA, 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 NAT oceanic clearance.