NORTH ATLANTIC OPERATIONS AND AIRSPACE MANUAL

V.2021-2 (Applicable from July 2021) V.2022-1 (Applicable from January 2022)

Prepared by the ICAO European and North Atlantic Office on behalf of the North Atlantic Systems Planning Group (NAT SPG)
Figure 1 – The North Atlantic High Level Airspace (NAT HLA)

(Prior to February 2016 designated as “NAT MNPS Airspace”.)
EXPLANATION OF CHANGES

Edition 2020-v1 - Content Modifications/Additions Incorporated

This modification includes changes to Foreword, Definitions, paragraphs 1.5, 1.8, 1.11, 2.2, 3.2, 3.4, 4.1, 6.1, 6.8, 8.5, 10.1, 10.2, 10.3, 13.4 and 16.2 and Attachment 6, Attachment 10.

Edition 2020-v2 - Content Modifications/Additions Incorporated

This modification includes changes to sections 3.2.1.b and 6.8.1 concerning operation of transponders and HLA approvals in the Shanwick OCA South East Corner.

2020-v2.1: Section 10.2.1 Note 2: Correction of waypoint name, LASNO replaced by GELPO.

Edition 2021-v1 - Content Modifications/Additions Incorporated

This modification includes changes to:
- sections 3.2.1.a), Figure 3-1, 4.2.11, 16.3.10, 16.6.6, 7.1.1, 7.3.1 concerning removal of HO NDB, NOROTS and NCA and deletion of “turbojet” in PANS- ATM with reference to Mach number technique; and
- sections 4.2.12, 6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 6.1.27, 6.1.28, 6.1.31, 6.6.17, 16.2.5, 16.6.16, 16.6.19 concerning clarifications on the NAT Region HF requirements.

Edition 2021-v2 - Content Modifications/Additions Incorporated

This modification includes changes to:
- sections 1.8.3 to 1.8.5 data link requirements – updated with information from discontinued NAT OPS Bulletin 2017_001 [NAT common DLM AIC – Revision 4];
- section 1.10.1 to 1.10.2 PBCS operations – updated;
- section 1.10.5 PBCS operations – new text regarding the uplink message latency monitor function;
- section 8.2.15 service applied in Gander and Shanwick airspace for provision of climbs – updated with information from discontinued NAT OPS Bulletin 2013_005 [New Service Notification for Gander Oceanic Control Area];
- section 8.5.20 to 8.5.22 Uplink Message Latency Monitor Function – updated with information from discontinued NAT OPS Bulletin 2018_002 [CPDLC Uplink Message Latency Monitor Function – Revision 1];
- section 13.4 Weather Deviation Procedures – new Figure 13-2 Visual aid for understanding and applying the weather contingency procedures guidance;
- Attachment 8 Charts for ATS surveillance coverage in NAT – updated with information from discontinued NAT OPS Bulletin 2017_001 NAT common DLM AIC – Revision 4;
- Attachment 10 Checklist for dispatchers, under Mandatory ADS-B Carriage, Northern Boundary coordinates corrected; and
- ICAO EUR/NAT email address and public website url updated whenever mentioned in document.

Edition 2022-v1 - Content Modifications/Additions Incorporated

This modification includes:
- Deletion of historical reference on p. iii, as “MNPS Airspace” which does not exist anymore;
- Insertion of “OWAFS” in list of Abbreviations on p. xii;
- Insertion of “OWAFS” and “RESUME NORMAL SPEED” in list of Definitions on p. xiii;
- Chapter 1: amendments/deletions in 1.1.1, 1.3.4, 1.11.2 and 1.11.3 to delete references to “MNPSA” or “MNPS Airspace”, insert new para 1.3.2 regarding OWAFS, 1.3.4 and 1.3.5 deleted, 1.3.6 b) language update, 1.10.2 amended;
- Chapter 2: amendment to 2.1.4, 2.5 updated Track Message examples and new Figure 2-0-2;
- Chapter 3: amendment to 3.2.1 c);
- Chapter 5: insert new para 5.1.12 regarding OWAFS;
- Chapter 6: amendments to 6.1.1, 6.1.10, 6.1.22, 6.1.30, 6.1.34, 6.1.35, name of Figure 6-1 inserted, language of 6.3.1 and 6.8.1;
- Chapter 7: insert new para 7.1.2 regarding OWAFS, amendments to 7.2.1, 7.3.1, 7.3.2, 7.3.4 and 7.3.5;
- Chapter 8: insert new paras 8.4.14 to 8.4.18 regarding OWAFS;
- Chapter 10: language update in 10.2.1 and Notes 1-2;
- Chapter 16: amendments to 16.4.2 regarding OWAFS, 16.6.6 clarification on DLM, insert new para 16.6.31 on Dispatcher/pilot considerations for en-route diversions, clarification to definition of NAT RVSM Airspace under “Dispatcher guidance for NAT RVSM operations” para 16.6.32;
- Chapter 17: amendments to 17.11.4, 17.11.5, 17.11.7, and Note;
- Attachment 7: deletion of section 8 which is outdated;
- Attachment 8: insert new Note below Chart Att 8-1;
- Attachment 10: Checklist for Flight Dispatcher para 1, update to “Datalink Mandate Compliance” and para 2, reference to “MNPS” deleted.
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<td>NAT</td>
<td>North Atlantic</td>
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<tr>
<td>NAT HLA</td>
<td>North Atlantic High Level Airspace</td>
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<td>NAT SPG</td>
<td>North Atlantic Systems Planning Group</td>
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<tr>
<td>NDB</td>
<td>Non Directional Beacon</td>
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<td>NM</td>
<td>Nautical Mile</td>
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<tr>
<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
</tr>
<tr>
<td>NOTA</td>
<td>Northern Oceanic Transition Area</td>
</tr>
<tr>
<td>NOTAM</td>
<td>Notice to Airmen</td>
</tr>
<tr>
<td>OACC</td>
<td>Oceanic Area Control Centre</td>
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<td>OCA</td>
<td>Oceanic Control Area</td>
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<tr>
<td>OESB</td>
<td>Oceanic Errors Safety Bulletin</td>
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<td>OTS</td>
<td>Organized Track System</td>
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<td>OWAFS</td>
<td>Operations Without an Assigned Fixed Speed</td>
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<td>PBCS</td>
<td>Performance-Based Communication and Surveillance</td>
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<td>PDC</td>
<td>Pre Departure Clearance</td>
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<td>PRM</td>
<td>Preferred Route Message</td>
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<tr>
<td>RA</td>
<td>Resolution Advisory (per ACAS/TCAS)</td>
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<td>RAIM</td>
<td>Receiver Autonomous Integrity Monitoring</td>
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<tr>
<td>RMI</td>
<td>Radio Magnetic Indicator</td>
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<td>RNP</td>
<td>Required Navigation Performance</td>
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<tr>
<td>R/T</td>
<td>Radio Telephony</td>
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<tr>
<td>RVSM</td>
<td>Reduced Vertical Separation Minimum</td>
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<td>SAM</td>
<td>South America</td>
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<tr>
<td>SELCAL</td>
<td>Selective Calling</td>
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<td>SID</td>
<td>Standard Instrument Departure</td>
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<td>SLOP</td>
<td>Strategic Lateral Offset Procedures</td>
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<td>SMS</td>
<td>Safety Management System</td>
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<tr>
<td>SOTA</td>
<td>Shannon Oceanic Transition Area</td>
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<tr>
<td>SSB</td>
<td>Single Sideband</td>
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<td>SSR</td>
<td>Secondary Surveillance Radar</td>
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<td>TAS</td>
<td>True Airspeed</td>
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<td>TCAS</td>
<td>Traffic (Alert and) Collision Avoidance System</td>
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<tr>
<td>TLS</td>
<td>Target Level of Safety</td>
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<tr>
<td>TMI</td>
<td>Track Message Identification</td>
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<tr>
<td>UTC</td>
<td>Co-ordinated Universal Time</td>
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<tr>
<td>VHF</td>
<td>Very High Frequency</td>
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<tr>
<td>VOR</td>
<td>VHF Omni-directional Range</td>
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DEFINITIONS

ATS Surveillance service  Term used to indicate a service provided directly by means of an ATS Surveillance system.

ATS Surveillance system  Generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.

Conflict  A situation that occurs when it is predicted that the spacing between aircraft, an aircraft and a defined airspace, or an aircraft and terrain, may or will reduce below the prescribed minimum.

Doc 7030  North Atlantic (NAT) Regional Supplementary Procedures (AKA NAT Supps)

Multilateration  A group of equipment configured to provide position derived from the secondary surveillance radar (SSR) transponder signals (replies or squitters) primarily using time difference of arrival (TDOA) techniques. Additional information, including identification, can be extracted from the received signals.

North Atlantic Operations Bulletin (NAT OPS Bulletin)  NAT Ops Bulletins are used to distribute information on behalf of the North Atlantic Systems Planning Group (NAT SPG) for the purpose of providing guidance to North Atlantic (NAT) operators on material relevant to their operations.

Oceanic Entry Point  The Oceanic Entry point is generally a “named” waypoint, on or close to the FIR boundary where the aircraft enters an oceanic control area.

Note: For aircraft entering the Reykjavik CTA from Edmonton, at or north of 82N, the Oceanic Entry Point can be a Lat/Long position on the boundary.

Oceanic Exit Point  The Oceanic Exit point is generally a “named” waypoint, on or close to the FIR boundary where the aircraft leaves the last oceanic control area.

Note: Routes involving more than one OCA may result in multiple Oceanic Entry and Exit Points.

OWAFS  The requirement to issue an assigned fixed Mach number to flights in the NAT has been removed. All aircraft are eligible for the application of cost index (ECON) with an ATC clearance of RESUME NORMAL SPEED in both ATS surveillance and non-surveillance airspace. Oceanic clearance procedures will remain unchanged and a fixed Mach number will continue to be part of the oceanic clearance.

Procedural Control  Term used to indicate that information derived from an ATS Surveillance system is not required for the provision of air traffic control service. (PANS-ATM)

RESUME NORMAL SPEED  An ATC clearance that allows the flight crew to select cost index (ECON) speed instead of the assigned fixed Mach number with the condition that ATC must be advised if the speed changes by plus or minus Mach .02 or more from the last assigned Mach number.
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CHAPTER 1

OPERATIONAL APPROVAL AND AIRCRAFT SYSTEM REQUIREMENTS FOR FLIGHT IN THE NAT HLA

Flight crews may fly across the North Atlantic within NAT High Level Airspace (HLA) only if they are in possession of the appropriate NAT HLA and RVSM approvals issued by the State of Registry of the aircraft or by the State of the operator. The Minimum Equipment List (MEL) for operations must be strictly observed.

1.1 GENERAL

1.1.1 With effect from 04 February 2016 the airspace previously designated as NAT MNPSA was re-designated as NAT HLA. NAT HLA is that volume of airspace between flight level (FL) 285 and FL420 within the oceanic control areas of Bodo Oceanic, Gander Oceanic, New York Oceanic East, Reykjavik, Santa Maria and Shanwick, excluding the Shannon and Brest Ocean Transition Areas. State approvals for NAT MNPSA operations granted prior to that date will be valid for NAT HLA operations. Except that those approvals issued prior to 01 January 2015 and based upon the earlier “6.3 NMs” MNPS standard will not be valid beyond January 2020. Any NAT MNPS approvals granted using PBN specifications for navigation equipment performance will continue to be valid beyond that date.

1.1.2 It is implicit in the concept of the NAT HLA that all flights within the airspace achieve the highest standards of horizontal and vertical navigation performance and accuracy. Formal monitoring programmes are undertaken to quantify the achieved performances and to compare them with standards required to ensure that established Target Levels of Safety (TLS) are met.

Note: Collision Risk Modelling is used to estimate risk in each of the three dimensions (i.e. lateral, longitudinal and vertical). Target maxima set for these estimates are expressed in terms of potential collisions per flight hour and are known as “Target Levels of Safety (TLSs)”.

1.1.3 Aircraft operating within the NAT HLA are required to meet specified navigation performance in the horizontal plane through the carriage and proper use of navigation equipment that meets identified standards and has been approved as such by the State of Registry or State of the operator for the purpose. Such approvals encompass all aspects affecting the expected navigation performance of the aircraft, including the designation of appropriate cockpit/flight deck operating procedures.

1.1.4 All aircraft intending to operate within the NAT HLA must be equipped with altimetry and height-keeping systems which meet RVSM Minimum Aircraft System Performance Specifications (MASPS). RVSM MASPS are contained in ICAO Doc 9574 and detailed in designated FAA document, AC91-85 (latest edition). These documents can be downloaded from: www.faa.gov/air_traffic/separation_standards/rvsm/documents/AC_91-85A_7-21-2016.pdf and www.skybrary.aero/bookshelf/books/157.pdf respectively.

1.1.5 The ultimate responsibility for checking that a NAT HLA/RVSM flight has the necessary approval(s) rests with the pilot in command. In the case of most regular scheduled flights this check is a matter of simple routine but flight crews of special charter flights, private flights, ferry and delivery flights are advised to pay particular attention to this matter. Routine monitoring of NAT traffic regularly reveals examples of flight crews of non-approved flights, from within these user groups, flight planning or requesting clearance within the NAT HLA. All such instances are prejudicial to safety and are referred to relevant State Authorities for further action.
While not a specific element of NAT HLA approval, flight crews and operators are reminded that for flights over the NAT, ICAO SARPS in Annex 6 (Operation of Aircraft), Part I, Chapter 6 and Part II, Chapter 2 requires carriage of Emergency Locator Transmitters (ELTs) by all commercial and IGA aircraft, respectively.

**Exceptions - Special Operations**

1.1.7 NAT ATS providers may approve moving or stationary temporary airspace reservations within the NAT HLA, for the benefit of State or Military Aircraft Operating Agencies to accommodate Military Exercises, Formation Flights, Missile Firing or UAV Activities. Procedures are established in respect of the requests for and management of such reservations. Whenever such reservations might impinge upon other flights in the NAT region, relevant AIS is published, including, if appropriate, annotations on the NAT track message.

1.1.8 Manned Balloon flights can be operated in or through the NAT region. They are, however, required to avoid the NAT HLA and must be meticulously co-ordinated with affected ATS Authorities in advance allowing sufficient time for all parties involved to properly plan for the flight.

**1.2 APPROVAL**

1.2.1 All flights within the NAT HLA must have the approval of either the State of Registry of the aircraft, or the State of the operator. Aircraft operating in RVSM airspace are required to be compliant with the altimetry Minimum Aircraft System Performance Specifications (MASPS) and hold an issued approval. Approval for NAT HLA operations will require the checking by the State of Registry or State of the operator, of various aspects affecting navigation performance. These aspects include: the navigation equipment used, together with its installation and maintenance procedures; plus the flight crew navigation procedures employed and the flight crew training requirements.

1.2.2 Since the NAT HLA is now designated as RVSM airspace at all levels, all NAT flight crews/operators must be State approved specifically for NAT RVSM operations and each aircraft intended to be flown in the NAT HLA must have State RVSM Airworthiness approval.

1.2.3 There are times when NAT HLA and/or RVSM approval documentation may need to be shown to “suitably authorised persons”, e.g. during a ramp inspection or on similar occasions.

1.2.4 In order to adequately monitor the NAT HLA, State aviation authorities should maintain a database of all NAT HLA and RVSM approvals that they have granted. States must also provide data on RVSM approved airframes to the North Atlantic Regional Monitoring Agency (RMA), which is maintained by the North Atlantic Central Monitoring Agency (NAT CMA). The CMA database facilitates the tactical monitoring of aircraft approval status and the exclusion of non-approved users.

1.2.5 In the case of approvals for IGA operations, the following points are emphasised:

   a) aircraft NAT HLA and RVSM approvals constitute a package covering equipment standards, installation, maintenance procedures and flight crew training;

   b) State aviation authorities should consider limiting the validity period of approvals; and

   c) State aviation authorities should maintain detailed records of all NAT HLA and RVSM approvals.
1.3 HORIZONTAL NAVIGATION REQUIREMENTS FOR UNRESTRICTED NAT HLA OPERATIONS

Longitudinal Navigation

1.3.1 Time-based longitudinal separations between subsequent aircraft following the same track (in-trail) and between aircraft on intersecting tracks in the NAT HLA are assessed in terms of differences in ATAs/ETAs at common points. The time-based longitudinal separation minima currently used in the NAT HLA are thus expressed in clock minutes. The maintenance of in-trail separations is aided by the application of the Mach Number Technique (MNT) (See Chapter 7). However, aircraft clock errors resulting in waypoint ATA errors in position reports can lead to an erosion of actual longitudinal separations between aircraft. It is thus vitally important that the time-keeping device intended to be used to indicate waypoint passing times is accurate, and is synchronised to an acceptable UTC time signal before commencing flight in the NAT HLA.

In many modern aircraft, the Master Clock can only be reset while the aircraft is on the ground. Thus the pre-flight procedures for any NAT HLA operation must include a UTC time check and resynchronisation of the aircraft Master Clock (typically the FMS). Lists of acceptable time sources for this purpose have been promulgated by NAT ATS provider States. A non-exhaustive list is shown in Chapter 8 of this Document.

Operations without an assigned fixed speed (OWAFS) were implemented in July 2019. This implementation allows ATC to issue the clearance RESUME NORMAL SPEED after oceanic entry that allows the flight crew to select a cost index (ECON) speed instead of a fixed Mach number with the condition that ATC must be advised if the speed changes by plus or minus Mach .02 or more from the last assigned Mach number.

Lateral Navigation

Equipment

1.3.3.3 There are two navigational equipment requirements for aircraft planning to operate in the NAT HLA. One refers to the navigation performance that should be achieved, in terms of accuracy. The second refers to the need to carry standby equipment with comparable performance characteristics (ICAO Annex 6 (Operation of Aircraft) refers).

1.3.3.4 The navigation system accuracy requirements for NAT MNPSA/HLA operation should only be based on the PBN specifications, RNP 10 (PBN application of RNAV 10) or RNP 4. Although when granting consequent approval for operations in MNPSA/NAT HLA, States should take account of the RNP 10 time limits for aircraft equipped with dual INS or inertial reference unit (IRU) systems. All approvals issued after 04 February 2016 must be designated as “NAT HLA” approvals.

Note 1: With respect to RNAV 10/RNP 10 operations and approvals the nomenclature “RNAV 10 (RNP 10)” is now used throughout this document for consistency with ICAO PBN Manual Doc.9613. As indicated in the PBN Manual RNAV 10 has, and is being, designated and authorized as “RNP 10” irrespective of the fact that such “RNP 10” designation is inconsistent with formal PBN RNP and RNAV specifications, since “RNP 10” already issued operational approvals and “RNP 10” currently designated airspaces in fact do not include any requirements for on-board performance monitoring and alerting. The justification for continuing to use this “RNP 10” nomenclature being that renaming current “RNP 10” routes and/or operational approvals, etc., to an “RNAV 10” designation would be an extensive and expensive task, which is not cost-effective. Consequently, any existing or new RNAV 10 operational approvals will continue to be designated “RNP 10”, and any charting annotations will be depicted as “RNP 10”.

Note 2: RNP 10 time limits are discussed in (Doc 9613) Part B, Volume II Chapter 1.
1.3.4 Additionally, in order for the 50 NM lateral separation minimum to be utilized in the New York Oceanic East the following navigation performance criteria must also be met by aircraft with RNAV 10 (RNP 10) approvals:

a) the proportion of the total flight time spent by aircraft 46 km (25 NM) or more off the cleared track shall be less than $9.11 \times 10^{-5}$; and

b) the proportion of the total flight time spent by aircraft between 74 and 111 km (40 and 60 NM) off the cleared track shall be less than $1.68 \times 10^{-5}$.

1.3.5 And similarly the additional criteria which must be met by aircraft approved as RNP 4 are as follows:

a) the proportion of the total flight time spent by aircraft 28 km (15 NM) or more off the cleared track shall be less than $5.44 \times 10^{-5}$; and

b) the proportion of the total flight time spent by aircraft between 44 and 67 km (24 and 36 NM) off the cleared track shall be less than $1.01 \times 10^{-5}$.

4.3.6 When granting approval for operations in the NAT HLA, States of Registry should also ensure that in-flight operating drills are approved which include mandatory navigation cross-checking procedures aimed at identifying navigation errors in sufficient time to prevent the aircraft inadvertently deviating from the ATC-cleared route.

4.3.7 Long Range Navigation Systems, namely INS, IRS or GNSS, have demonstrated the requisite navigation accuracy required for operations in the NAT HLA. Consequently, State approval of unrestricted operation in the NAT HLA may presently be granted to an aircraft equipped as follows:

a) with at least two fully serviceable Long Range Navigation Systems (LRNSs). A LRNS may be one of the following:

- one Inertial Navigation System (INS);
- one Global Navigation Satellite System (GNSS); or
- one navigation system using the inputs from one or more Inertial Reference System (IRS) or any other sensor system complying with the NAT HLA requirement.

Note 1: Currently the only GNSS system fully operational and for which approval material is available, is GPS.

Note 2: In USA, FAA Advisory Circular (AC) 20-138 provides guidance on airworthiness approval for positioning and navigation systems, to include GPS. AC 90-105 provides guidance on operational approval for RNP operations in oceanic airspace, to include the requirements for RNP 10 (RNAV 10) applicable to NAT HLA operations.

Note 3: Currently equivalent approval material for GLONASS is not under development but it will need to be available prior to approval of any GLONASS equipped aircraft for NAT HLA operations.

b) each LRNS must be capable of providing to the flight crew a continuous indication of the aircraft position relative to desired track.

c) it is also highly desirable that the navigation system employed for the provision of steering guidance is capable of being coupled to the autopilot.
Note: Some aircraft may carry two independent LRNS but only one FMCS. Such an arrangement may meet track keeping parameters but does not provide the required redundancy (in terms of continuous indication of position relative to track or of automatic steering guidance) should the FMCS fail; therefore, in order to obtain NAT HLA certification, dual FMCS is required to be carried. For example: a single INS is considered to be one LRNS; and an FMCS with inputs from one or more IRS/ISS is also considered to be a single LRNS.

**Flight Crew Training**

1.3.7 It is essential that flight crews obtain proper training for NAT HLA and RVSM operations in line with procedures described in other chapters of this document.

### 1.4 ROUTES FOR USE BY AIRCRAFT NOT EQUIPPED WITH TWO LRNS

**Routes for Aircraft with Only One LRNS**

1.4.1 A number of special routes have been developed for aircraft equipped with only one LRNS and carrying normal short-range navigation equipment (VOR, DME, ADF), which require to cross the North Atlantic between Europe and North America (or vice versa). It should be recognised that these routes are within the NAT HLA, and that State approval must be obtained prior to flying along them. These routes are also available for interim use by aircraft normally approved for unrestricted NAT HLA operations that have suffered a partial loss of navigation capability and have only a single remaining functional LRNS. Detailed descriptions of the special routes known as ‘Blue Spruce Routes’ are included in Chapter 3 of this Document. Other routes also exist within the NAT HLA that may be flown by aircraft equipped with only a single functioning LRNS. These include routings between the Azores and the Portuguese mainland and/or the Madeira Archipelago and also routes between Northern Europe and Spain/Canaries/Lisbon FIR to the east of longitude 009° 01′ W (viz.T9). Other routes available for single LRNS use are also established in the NAT HLA, including a route between Iceland and the east coast of Greenland and two routes between Kook Islands on the west coast of Greenland and Canada.

1.4.2 If this single LRNS is a GPS it must be approved in accordance with FAA TSO-C129 or later standard as Class A1, A2, B1, B2, C1 or C2, or with equivalent EASA documentation ETSO-C129a. Some States may have additional requirements regarding the carriage and use of GPS (e.g. a requirement for FDE RAIM) and flight crews should check with their own State of Registry to ascertain what, if any, they are. These above mentioned documents can be found at:


**Routes for Aircraft with Short-Range Navigation Equipment Only**

1.4.3 Aircraft that are equipped only with short-range navigation equipment (VOR, DME, ADF) may operate through the NAT HLA but only along routes G3 or G11. However, once again formal State approval must be obtained. (See Chapter 3 for details of these routes.)

1.4.4 The letter ‘X’ shall be inserted in Item 10 of the ATS flight plan to denote that a flight is approved to operate in NAT HLA. The filed ATS flight plan does not convey information to the controller on any NAT HLA approval limitations. Therefore, it is the responsibility of the pilot in command to take account of aircraft or flight crew limitations and if appropriate, decline any unsanctioned ATC clearances.
consult the AIS of relevant NAT Provider States for the detailed application of these separation minima in each of the NAT OCAs. To benefit from these separations Operators must obtain State Approvals in accordance with Annex 6 to file in the flight plan RCP/RSP capabilities including aircraft equipage where RCP and/or RSP specifications are prescribed for the communications and/or surveillance capabilities supporting this ATS provision. Guidance material for implementation of communication and surveillance capability supporting these separation minima is contained in the Performance Based Communication and Surveillance (PBCS) Manual (Doc 9869) and the Global Operational Data Link (GOLD) Manual (Doc 10037).

1.10.2 Within the OTS the 42.6km (23NM) lateral separation minimum is implemented by applying 42.6km (23 NM) lateral spacing through whole and half degrees of latitude between PBCS designated NAT OTS Tracks between flight levels FL 350-390 inclusive, except when the OTS occurs in the New York OCA East. In the OTS this PBCS-based separation implementation supersedes and replaces the previous trials of RLatSM. In addition to requiring RNP-4 Approval, Operators must appreciate that unlike the filing criteria for the half degree spaced RLatSM Tracks, the simple equipage and operation of CPDLC and ADS-C will not be a sufficient criteria for planning and flying on the designated PBCS-based OTS Tracks. To utilize these tracks the aircraft must have formal State Authorization for filing RCP 240 and RSP180.

1.10.3 Application of the reduced lateral and longitudinal separation minima in the NAT Region is dependent on a smooth functioning FANS 1/A data link system. Various known data link related deficiencies in aircraft systems and poor data link performance have a detrimental effect on the air traffic control system and impede aircraft operator’s efforts to obtain performance-based communication and surveillance (PBCS) authorizations. Many of these known deficiencies have already been fixed by aircraft manufacturers and software upgrades are available. To ensure the best possible functioning of the NAT air traffic control system, it is of utmost importance that aircraft operators always operate the latest available FANS 1/A related software version in aircraft that fly in the NAT high level airspace (HLA) and that the aircraft systems are configured in an optimal manner. Meanwhile, implementation of improvements and corrections is also a priority undertaking for the ground and network segments of the overall FANS 1/A system.

1.10.4 NAT OPS Bulletin 2019_003 provides a list of recommended data link performance improvement options and recommended software versions for NAT data link operations. Aircraft operators are advised to review this OPS Bulletin to identify if some of the issues identified in the Bulletin apply to their operations. The bulletin will be updated on regular basis.

1.10.5 Some NAT ANSPs have implemented the message latency monitor function which is designed to prevent pilots from acting on a CPDLC uplink message that has been delayed in the network. The most serious of such cases would be the pilot executing a clearance that was no longer valid. Because aircraft implementations are varied, it is impossible for ATC to tailor the uplink of the message SET MAX UPLINK DELAY VALUE TO 300 SEC to different aircraft types. It has therefore been decided among the NAT ANSPs to uplink this message to all CPDLC connected aircraft immediately after they enter each control area. An aircraft may therefore receive this message multiple times during a flight. Refer to section 8.5.20 for pilot procedures concerning this function.

Note: When operating in the NAT airspace, aircraft operators can expect a value of 300 seconds for the delayed message parameter which had been agreed by the NAT ANSPs on a trial basis.

1.11 TRIALS AND FUTURE DEVELOPMENTS

1.11.1 The ICAO North Atlantic Systems Planning Group undertakes a continuous programme of monitoring the safety and efficiency of flight operations throughout the NAT region. Plans are thereby developed to ensure the maintenance and further enhancement of the safety and traffic capacity of the airspace. The NAT SPG has produced a document providing a comprehensive overview of expected development of North Atlantic flight operations. This document, “Future ATM Concept of Operations for the North Atlantic Region” (NAT Doc 005) is available at www.icao.int/EURNAT/, following “EUR & NAT Documents”, then “NAT Documents”, in folder “NAT Doc 005”.

Operational Approval and Aircraft System Requirements for flight in the NAT HLA
NAT Doc 007 V.2022-1 (Applicable from January 2022)
Presently such plans include a gradual transition to a PBN system of navigation performance specification. The detailed transition plan is available on the ICAO EUR/NAT website where updates are reflected. In preparation, from January 2015 onward, any new approvals to operate in MNPS airspace have been based on RNP10 or RNP4 navigation specifications and in support, MNPS airspace was redesigned and renamed in February 2016 to NAT High Level Airspace (HLA).

The evolution of MNPS airspace to NAT HLA in conjunction with the Data Link Mandate and the PBN based navigational requirements will improve flight safety allowing for the use of reduced lateral and longitudinal separation standards. This will enhance airspace capacity and provide more fuel efficient profiles for operators.

All planned or anticipated changes will involve consultation and coordination with the airspace users. Advanced notification of any changes will be provided by the appropriate ANSP(s).

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CHAPTER 2
THE ORGANISED TRACK SYSTEM (OTS)

2.1 GENERAL

2.1.1 As a result of passenger demand, time zone differences and airport noise restrictions, much of the North Atlantic (NAT) air traffic contributes to two major alternating flows: a westbound flow departing Europe in the morning, and an eastbound flow departing North America in the evening. The effect of these flows is to concentrate most of the traffic uni-directionally, with peak westbound traffic crossing the 30W longitude between 1130 UTC and 1900 UTC and peak eastbound traffic crossing the 30W longitude between 0100 UTC and 0800 UTC.

2.1.2 The flight levels normally associated with the OTS are FL310 to FL400 inclusive. These flight levels, and their use have been negotiated and agreed by the NATS ATS providers and are published as the Flight Level Allocation Scheme (FLAS). (See Attachment 5). The FLAS also determines flight levels available for traffic routing partly or wholly outside of the OTS as well as flights operating outside of the valid time periods of the OTS; often referred to as “transition times”.

2.1.3 The hours of validity of the two Organised Track Systems (OTS) are as follows:

| (Westbound) Day-time OTS | 1130 UTC to 1900 UTC at 30°W |
| (Eastbound) Night-time OTS | 0100 UTC to 0800 UTC at 30°W |

Note: Changes to these times can be negotiated between Gander and Shanwick OACCs and the specific hours of validity for each OTS are indicated in the NAT track message. For flight planning, operators should take account of the times as specified in the relevant NAT track message(s). Tactical extensions to OTS validity times can also be agreed between OACCs when required, but these should normally be transparent to operators.

2.1.4 Use of the OTS tracks is not mandatory. Aircraft may flight plan on random routes which remain clear of the OTS or may fly on any route that joins, leaves, or crosses the OTS. Operators must be aware that while ATC will make every effort to clear random traffic across the OTS at requested levels, re-routes or significant changes in flight level from those planned are very likely to be necessary during most of the OTS traffic periods. A comprehensive understanding of the OTS and the FLAS may assist flight planners in determining the feasibility of flight profiles.

2.2 CONSTRUCTION OF THE ORGANISED TRACK SYSTEM (OTS)

General processes

2.2.1 The appropriate OACC constructs the OTS after determination of basic minimum time tracks; with due consideration of airlines’ preferred routes and taking into account airspace restrictions such as danger areas and military airspace reservations. The night-time OTS is produced by Gander OACC and the day-time OTS by Shanwick OACC (Prestwick), each incorporating any requirement for tracks within the New York, Reykjavik, Bodø and Santa Maria Oceanic Control Areas (OCAs). OACC planners co-ordinate with adjacent OACCs and domestic ATC agencies to ensure that the proposed system is viable. They also take into account the requirements of opposite direction traffic and ensure that sufficient track/flight level profiles are provided to satisfy anticipated traffic demand. The impact on domestic route structures and the serviceability of transition area radars and nav aids are checked before the system is finalised. Random routes and OTS tracks eastbound typically start with a “named” oceanic entry point, followed by Lat/Long waypoints, and typically end with 2 “named” waypoints, the first being the oceanic exit point, and the second being a “named” waypoint.
2.5 EXAMPLES OF DAY-TIME WESTBOUND AND NIGHT-TIME EASTBOUND NAT TRACK MESSAGES AND ASSOCIATED TRACK SYSTEMS

Example 1 — Example of Westbound NAT Track Message

TZA179 082009
FF BIRDQZQZ BIKFYXYX
082009 EGGXZOZX
(NAT-1/3 TRACKS FLS 310/390 INCLUSIVE APR 09/1130Z TO APR 09/1900Z PART ONE OF THREE PARTS-
A ERAKA 60/20 62/30 63/40 63/50 MAXAR
EAST LVLS NIL
WEST LVLS 310 320 330 350 360
EUR RTS WEST ETSOM
NAR-
B GOMUP 59/20 61/30 62/40 63/50 PIDSO
EAST LVLS NIL
WEST LVLS 310 320 330 350 360
EUR RTS WEST GINGA
NAR-
C SUNOT 58/20 60/30 61/40 61/50 SAVRY
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360
EUR RTS WEST NIL
NAR-
END OF PART ONE OF THREE PARTS)

TZA181 082010
FF BIRDQZQZ BIKFYXYX
082009 EGGXZOZX
(NAT-2/3 TRACKS FLS 310/390 INCLUSIVE APR 09/1130Z TO APR 09/1900Z PART TWO OF THREE PARTS-
D PIKIL 57/20 57/30 56/40 NEEKO
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360
EUR RTS WEST NIL
NAR-
E RESNO 56/20 56/30 55/40 53/50 RIKAL
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360
EUR RTS WEST NIL
NAR-
END OF PART TWO OF THREE PARTS)

TZA179 082009
FF EGGZOWXX EGZZOXXX BIRDQZQZ BIKFYXYX
082009 202019 EGGXZOZX
(NAT-1/3 TRACKS FLS 310/390 INCLUSIVE APR 09/1130Z TO APR 09/1900Z PART ONE OF THREE PARTS-
A ERAKA 60/20 62/30 63/40 63/50 MAXAR
EAST LVLS NIL
WEST LVLS 310 320 330 350 360
EUR RTS WEST ETSOM
NAR-
B GOMUP 59/20 61/30 62/40 63/50 PIDSO
EAST LVLS NIL WEST LVLS 310 320 330 350 360
EUR RTS WEST GINGA
NAR-
C SUNOT 58/20 60/30 61/40 61/50 SAVRY
EAST LVLS NIL WEST LVLS 310 320 330 340 360
EUR RTS WEST NIL
NAR-
END OF PART ONE OF THREE PART(S)

ZCZC OLG070 202020 TZA181 082010
FF BIRDQZQZ BIKFYXYX EGZZOWXX EGZZOXXX
082009 202020 EGGXZOZX
(NAT-2/3 TRACKS FLS 310/390 INCLUSIVE APR 09/1130Z TO APR 09/1900Z PART TWO OF THREE PARTS-
D PIKIL 57/20 57/30 56/40 NEEKO
EAST LVLS NIL WEST LVLS 310 320 330 340 350 360
EUR RTS WEST NIL
NAR-
E RESNO 56/20 56/30 55/40 53/50 RIKAL
EAST LVLS NIL WEST LVLS 310 320 330 340 350 360
EUR RTS WEST NIL
NAR-
END OF PART TWO OF THREE PART(S)

ZCZC OLG070 202020 TZA179 082009
FF EGGZOWXX EGZZOXXX BIRDQZQZ BIKFYXYX
082009 202019 EGGXZOZX
(NAT-1/3 TRACKS FLS 310/390 INCLUSIVE APR 09/1130Z TO APR 09/1900Z PART ONE OF THREE PARTS-
A ERAKA 60/20 62/30 63/40 63/50 MAXAR
EAST LVLS NIL
WEST LVLS 310 320 330 350 360
EUR RTS WEST ETSOM
NAR-
B GOMUP 59/20 61/30 62/40 63/50 PIDSO
EAST LVLS NIL WEST LVLS 310 320 330 350 360
EUR RTS WEST GINGA
NAR-
C SUNOT 58/20 60/30 61/40 61/50 SAVRY
EAST LVLS NIL WEST LVLS 310 320 330 340 360
EUR RTS WEST NIL
NAR-
END OF PART ONE OF THREE PART(S)
The Organised Track System (OTS)

COORDINATION WEBSITE
WWW.ICAO.INT/EURNAT/-NAR NIL –
F VENER 5530/20 5530/30 5430/40 5230/50 SAXAN
EAST LVLS NIL
WEST LVLS 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL –
G DOGAL 55/20 55/30 54/40 52/50 TUDEP
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL –
END OF PART TWO OF THREE PARTS

ZCZC OLG072 202021 TZA182 082010
FF EGZOWXX EGZOWXXX BIRDZQZZ BIKFYXYZ
082010 202021 EGGXZOZX
(NAT-3/3 TRACKS FLS 310/390 INCLUSIVE
APR 09/1130Z TO APR 09/1900Z
PART THREE OF THREE PARTS
H MALOT 54/20 54/30 53/40 51/50 ALLRY
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL –
REMARKS.
1. TMI IS 099 AND OPERATORS ARE REMINDED TO INCLUDE THE TMI NUMBER AS PART OF THE OCEANIC CLEARANCE READ BACK.
2. OPERATORS ARE REMINDED THAT ADS-C AND CPDLC IS MANDATED FOR LEVELS 350-390 IN NAT AIRSPACE.
3. PBCS OTS LEVELS 350-390. PBCS TRACKS AS FOLLOWS
TRACK E
TRACK F
TRACK G
END OF PBCS OTS
4. FOR STRATEGIC LATERAL OFFSET AND CONTINGENCY PROCEDURES FOR OPS IN NAT FLOW REFER TO NAT PROGRAMME COORDINATION WEBSITE WWW.PARIS.ICAO.INT/EURNAT.
SLOP SHOULD BE STANDARD PROCEDURE, NOT JUST FOR AVOIDING WX/TURB.
5. 80 PERCENT OF GROSS NAVIGATION ERRORS RESULT FROM POOR COCKPIT
PROCEDURES. CONDUCT EFFECTIVE WAYPOINT CHECKS.

6. OPERATORS ARE REMINDED THAT CLEARANCES MAY DIFFER FROM THE FLIGHT PLAN, FLY THE CLEARANCE.

7. UK AIP. ENR 2.2.4.2 PARA 5.2 STATES THAT NAT OPERATORS SHALL FILE PRM'S.

8. FLIGHTS REQUESTING WESTBOUND OCEANIC CLEARANCE VIA ORCA DATALINK SHALL INCLUDE IN RMK/ FIELD THE HIGHEST ACCEPTABLE FLIGHT LEVEL WHICH CAN BE MAINTAINED AT OAC ENTRY POINT.

9. ALL ADSC CPDLC EQUIPPED FLIGHTS NOT LOGGED ON TO A DOMESTIC ATSU PRIOR TO ENTERING THE SHANWICK OCA MUST INITIATE A LOGON TO EGGX BETWEEN 10 AND 25 MINUTES PRIOR TO OCA ENTRY.

SLOP SHOULD BE STANDARD PROCEDURE, NOT JUST FOR AVOIDING WX/TURB.

5. 80 PERCENT OF GROSS NAVIGATION ERRORS RESULT FROM POOR COCKPIT PROCEDURES. CONDUCT EFFECTIVE WAYPOINT CHECKS.

6. OPERATORS ARE REMINDED THAT CLEARANCES MAY DIFFER FROM THE FLIGHT PLAN, FLY THE CLEARANCE.

7. UK AIP. ENR 2.2.4.2 PARA 5.2 STATES THAT NAT OPERATORS SHALL FILE PRM'S.

8. FLIGHTS REQUESTING WESTBOUND OCEANIC CLEARANCE VIA ORCA DATALINK SHALL INCLUDE IN RMK/ FIELD THE HIGHEST ACCEPTABLE FLIGHT LEVEL WHICH CAN BE MAINTAINED AT OAC ENTRY POINT.

9. ALL ADSC CPDLC EQUIPPED FLIGHTS NOT LOGGED ON TO A DOMESTIC ATSU PRIOR TO ENTERING THE SHANWICK OCA MUST INITIATE A LOGON TO EGGX BETWEEN 10 AND 25 MINUTES PRIOR TO OCA ENTRY.
Example 2 — Example of Eastbound NAT Track Message

```
DD CYZKENAT
021302 CZQXZQZX
(NAT - 1 / 3 TRACKS FLS 320 / 400 INCLUSIVE
NOV 03/0100Z TO NOV 03/0800Z
PART ONE OF THREE PARTS -
U JANJO 56/50 58/40 59/30 58/20 SUNOT KESIX
EAST LVLS 320 330 340 350 360 370 380 390 400
WEST LVLS NIL
EUR RTS EAST NIL
NAR N685A N683A-
V LOMSI 55/50 57/40 58/30 57/20 PIKIL SOVED
EAST LVLS 320 330 340 350 360 370 380 390 400
WEST LVLS NIL
EUR RTS EAST NIL
NAR N625A N621A-
END OF PART ONE OF THREE PARTS)
TZA466 241302
FF BIRDZQZZ
241302 CZQXZQZX
(NAT - 1 / 3 TRACKS FLS 320 / 400 INCLUSIVE
APR 25/0100Z TO APR 25/0800Z
PART ONE OF THREE PARTS -
R ALLRY 51/50 52/40 52/30 51/20 MALOT GISTI
EAST LVLS 320 330 340 350 360 370 380 390 400
WEST LVLS NIL
EUR RTS EAST NIL
NAR N511A N495C-
S BUDAR 5030/50 5130/40 5130/30 5230/20 TOBOR RILED
EAST LVLS 320 330 340 350 360 370 380 390 400
WEST LVLS NIL
EUR RTS EAST NIL
NAR N269A N261A-
END OF PART TWO OF THREE PARTS)TZA468 241302
FF BIRDZQZZ
021302 CZQXZQZX
(NAT - 2 / 3 TRACKS FLS 320 / 400 INCLUSIVE
NOV 03/0100Z TO NOV 03/0800Z
PART TWO OF THREE PARTS -
W MELDI 5430/50 5630/40 5730/30 5630/20 ETARI MOGLO
EAST LVLS 320 330 340 350 360 370 380 390 400
WEST LVLS NIL
EUR RTS EAST NIL
NAR N597A N587A-
X NEEKO 54/50 56/40 57/30 56/20 RESNO NETKI
EAST LVLS 320 330 340 350 360 370 380 390 400
WEST LVLS NIL
EUR RTS EAST NIL
NAR N561A N555A-
Y RIKAL 53/50 55/40 56/30 55/20 DOGAL BEXET
EAST LVLS 320 330 340 350 360 370 380 390 400
WEST LVLS NIL
EUR RTS EAST NIL
NAR N211E N197A-
Z PORTI 47/50 48/40 48/30 49/20 BEDRA NERTU
EAST LVLS 320 330 340 350 360 370 380 390 400
WEST LVLS NIL
EUR RTS EAST NIL
NAR N495C N495C-
END OF PART TWO OF THREE PARTS)
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The Organised Track System (OTS) | Chapter 2

NAR N155A N139A -
X SUPRY 46/50 47/40 47/30 48/20 48/15 OMOKO GUNSO
EAST LVLS 320 330 350 360 380 390 400
WEST LVLS NIL
EUR RTS EAST NIL
NAR N93A N75A -
Y RAFIN 45/50 46/40 47/30 47/15 ETIKI REGHI
EAST LVLS 320 330 350 360 380 390 400
WEST LVLS NIL
EUR RTS EAST NIL
NAR N59C N45D -
END OF PART TWO OF THREE PARTS

END OF PART TWO OF THREE PARTS

REMARKS:
1. TMI IS 307 OPERATORS ARE TO INCLUDE TMI NUMBER IN OCEANIC CLEARANCE READ BACK.
2. ADS-C AND CPDLC ARE MANDATED FOR LEVELS 290-410 IN NAT AIRSPACE.
3. PBCS OTS LEVELS 350-390. PBCS TRACKS AS FOLLOWS
   TRACK R
   TRACK S
   TRACK T
   END OF PBCS TRACKS.
4. CLEARANCE DELIVERY FREQUENCY ASSIGNMENTS FOR AIRCRAFT OPERATING FROM AVPUT TO TALGO INCLUSIVE: AVPUT TO LIBOR 132.02, MAXAR TO VESMI 135.05, JOOPY TO MUSAK 128.45, RAFIN TO TALGO 119.42.
5. 80 PERCENT OF NAVIGATIONAL ERRORS RESULT FROM POOR COCKPIT PROCEDURES.
6. EASTBOUND AIRCRAFT OPERATING IN THE OTS MUST COMPLY WITH NAR FLIGHT PLANNING RULES IN CANADA FLIGHT SUPPLEMENT OR DAILY BOSTON ADVISORY.

7. AIRCRAFT EXITING THE NAT INTO A DOMESTIC AGENCY SHOULD CONTINUE TO OPERATE TRANSPONDERS ON CODE 2000 UNTIL OTHERWISE ADVISED BY ATC.
8. SEE ICAO NAT DOC 007.6.8 FOR MORE INFO.

END OF PART THREE OF THREE PARTS

END OF PART THREE OF THREE PARTS

REMARKS:
1. TMI IS 115 AND OPERATORS ARE REMINDED TO INCLUDE THE TMI NUMBER AS PART OF THE OCEANIC CLEARANCE READ BACK.
2. OPERATORS ARE REMINDED THAT ADS-C AND CPDLC ARE MANDATED FOR LEVELS 350-390 IN NAT AIRSPACE.
3. PBCS OTS LEVELS 350-390. PBCS TRACKS AS FOLLOWS
   TRACK R
   TRACK S
   TRACK T
   END OF PBCS TRACKS.
4. CLEARANCE DELIVERY FREQUENCY ASSIGNMENTS FOR AIRCRAFT OPERATING FROM AVPUT TO TALGO INCLUSIVE: AVPUT TO LIBOR 132.02, MAXAR TO VESMI 135.05, JOOPY TO MUSAK 128.45, RAFIN TO TALGO 119.42.
5. 80 PERCENT OF NAVIGATIONAL ERRORS RESULT FROM POOR COCKPIT PROCEDURES.
6. OPERATORS ARE ADVISED THAT VERSION 24 OF THE GANDER DATA
The Organised Track System (OTS)
Figure 2-0-2 — Example of Night-Time Eastbound NAT Organised Track System
CHAPTER 3

ROUTES, ROUTE STRUCTURES, AND TRANSITION AREAS WITHIN OR ADJACENT TO THE NAT HLA

3.1 GENERAL

3.1.1 Routes, route structures, and transition areas within and adjacent to the NAT HLA are detailed below.

3.2 ROUTES WITHIN THE NAT HLA

3.2.1 Routes within the NAT HLA (illustrated in Figure 3-1) are as follows:

a) *Blue Spruce Routes require state approval for NAT HLA operations, and are listed below:

   - MOXAL – RATSU (for flights departing Reykjavik Airport)
     (VHF coverage exists. Non HF equipped aircraft can use this route)
   - OSKUM – RATSU (for flights departing Keflavik Airport)
     (VHF coverage exists. Non HF equipped aircraft can use this route)
   - RATSU – ALDAN – KFV (Keflavik)
     (VHF coverage exists. Non HF equipped aircraft can use this route)
   - ATSIX – 61°N 12°34'W – ALDAN – KFV
     (HF is required on this route)
   - GOMUP – 60°N 15°W – 61°N 16°30'W – BREKI – KFV
     (HF is required on this route)
     (VHF coverage exists. Non HF equipped aircraft can use this route)
   - KFV – SOPEN – DA (Kulusuk) – SF (Kangerlussuaq) – YFB
     (VHF coverage exists. Non HF equipped aircraft can use this route)
   - SF (Kangerlussuaq) – DARUB – YXP
     (VHF coverage exists. Non HF equipped aircraft can use this route)
   - OZN – 59°N 50°W – AVUTI (FL290 to FL600) - PRAWN – YDP
     (VHF coverage exists. Non HF equipped aircraft can use this route)
   - OZN – 59°N 50°W – CUDDY (FL290 to FL600) - PORGY
     (VHF coverage exists. Non HF equipped aircraft can use this route)
   - OZN – 58°N 50°W – HOIST – YYR
     (VHF coverage exists. Non HF equipped aircraft can use this route)

   State approval for NAT HLA operations is required for operations along Blue Spruce routes.

b) routes between Northern Europe and Spain/Canaries/Lisbon FIR. (T9*, T290*, T13, T213 and T16. State approval for NAT HLA operations is required.);

c) *routings between the Azores and the Portuguese mainland (T25 or random) and between the Azores and the Madeira Archipelago;
made without prior ATC clearance, except in an urgency situation. (e.g. encountering unanticipated severe turbulence).

5.1.12 With the implementation of OWAFS, flight crews can expect ATC to issue the clearance RESUME NORMAL SPEED when traffic permits after oceanic entry. This clearance allows the flight crew to select a cost index (ECON) speed instead of a fixed Mach number with the condition that ATC must be advised if the speed changes by plus or minus Mach .02 or more from the last assigned Mach number.

5.2 CONTENTS OF CLEARANCES

5.2.1 An abbreviated clearance is issued by Air Traffic Services when clearing an aircraft to fly along the whole length of an organised track. The flight crew should confirm the current NAT track message by using the TMI number (including any appropriate alpha suffix) in the readback. There is no requirement for the flight crew to read back the NAT track coordinates. If any doubt exists as to the TMI or the NAT track coordinates, the flight crew should request the complete track coordinates. Similarly, if the flight crew cannot correctly state the TMI, confirmation will include NAT track coordinates in full and a full read back of those coordinates will be required.

5.2.2 If the term, “via flight plan route” is used when issuing an oceanic clearance, the flight crew is required to readback the full coordinates of the flight plan route, from the oceanic entry point to the exit point.

5.2.3 Attachment 6 provides examples and explanations of clearances and instructions possible in the NAT region. Operators and flight crews, especially those new to NAT operations, are encouraged to review the examples.

5.3 OCEANIC CLEARANCES FOR WESTBOUND FLIGHTS ROUTING VIA 61°N 010°W

5.3.1 The provision of air traffic service at RATSU (61°N 010°W) has been delegated by Shanwick to Reykjavik. Flights intending to enter NAT oceanic airspace via RATSU (61°N 010°W) should not call Shanwick for an oceanic clearance. The required oceanic clearance will be issued by Reykjavik Control. There are three points established at the boundary of delegated airspace from Scottish to Reykjavik, BESGA, DEVBI and BARKU on routes to RATSU. Reykjavik will issue oceanic clearances from those points. Aircraft that have not received their oceanic clearance prior to those points shall enter Reykjavik airspace at the domestic cleared flight level while awaiting such oceanic clearance.

5.4 OCEANIC FLIGHTS ORIGINATING FROM THE NAM, CAR OR SAM REGIONS AND ENTERING THE NAT HLA VIA THE NEW YORK OCA EAST

5.4.1 For flights planning to enter the NAT directly from the New York Oceanic East FIR, the IFR clearance to destination received at the departure aerodrome constitutes the route portion of the oceanic clearance. Once airborne, and prior to entry into the NAT, aircraft will be assigned an altitude and a speed (if required) by New York Center. The receipt of all three elements of an oceanic clearance: route, flight level, and speed constitutes the complete oceanic clearance. A subsequent change to any element(s) of the oceanic clearance does not alter the others.

Example: Flight from Santo Domingo to Madrid:

*The route portion of the clearance received via PDC or DCL from Santo Domingo should be flown unless amended. San Juan ACC will confirm requested altitude and speed prior to issuing the remainder of the oceanic clearance. All three required elements of an oceanic clearance have been received.*

Example: Flight from New York (KFKJ) to Madrid (LEMD):
CHAPTER 6
COMMUNICATIONS AND POSITION REPORTING PROCEDURES

6.1 ATS COMMUNICATIONS

Equipage Requirements

6.1.1 Operations in the NAT outside VHF coverage require the carriage of two long range communication systems, one of which must be HF. SATVOICE and/or CPDLC (appropriate to route of flight) may satisfy the requirement of the second-long range communication system. Due to coverage limitations, an Inmarsat CPDLC or SATVOICE system does not qualify as a long range communication system when operating north of 80N. Aircraft that are equipped with both Inmarsat (J5) and Iridium (J7) data link capability should use Iridium when north of 80N.

6.1.2 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

6.1.3 Relief from the HF requirement in accordance with 6.1.2 may be granted by the Air Traffic Control Centers serving the route of flight provided the aircraft has at least two other long-range communication systems appropriate for route of flight.

Note: See State AIPs for details.

HF Voice Communications

6.1.4 It is important that flight crews appreciate that routine* air/ground ATS voice communications in the NAT region are conducted via aeronautical radio stations (hereafter referred to as radio stations) staffed by radio operators who have no executive ATC authority. Messages are relayed by the ground station to/from the air traffic controllers in the relevant OACC. This is the case, whether communications are via HF, GP/VHF or SATVOICE.

6.1.5 There are six radio stations in the NAT: Bodø Radio (Norway), Gander Radio (Canada), Iceland Radio (Iceland), New York Radio (USA), Santa Maria Radio (Portugal) and Shanwick Radio (Ireland).

6.1.6 Even with the growing use of data link communications a significant volume of NAT air/ground communications are conducted using voice on SSB HF frequencies and GP VHF frequencies. To support air/ground ATC communications in the North Atlantic region, twenty-four HF frequencies have been allocated, in bands ranging from 2.8 to 18 MHz. Additionally, Shanwick Radio, Santa Maria Radio, and Iceland Radio operate a number of Regional and Domestic Air Route Area (RDARA) frequencies in accordance with operating requirements and agreements between the stations.

6.1.7 There are a number of factors which affect the optimum frequency for communications over a specific path. The most significant is the diurnal variation in intensity of the ionisation of the refractive layers of the ionosphere. Hence frequencies from the lower HF bands tend to be used for communications during night-time and those from the higher bands during day-time. Generally, in the North Atlantic frequencies of less than 6 MHz are utilised at night and frequencies of greater than 5 MHz during the day.

* See 6.1.11 c) and 6.1.24
Communications and Position Reporting Procedures

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6.1.8 The 24 NAT frequencies are organized into six groups known as Families. The families are identified as NAT Family A, B, C, D, E and F. Each family contains a range of frequencies from each of the HF frequency bands. A number of stations share families of frequencies and co-operate as a network to provide the required geographical and time of day coverage. A full listing of the frequencies operated by each NAT radio station is contained in the “HF Management Guidance Material for the North Atlantic Region” (NAT Doc 003), available at www.icao.int/EURNAT/, following “EUR & NAT Documents”, then “NAT Documents”, in folder “NAT Doc 003”.

6.1.9 Each individual flight may be allocated a primary and a secondary HF frequency before the oceanic boundary.

6.1.10 Radio operators usually maintain a listening continuous air-ground communication watch on more than one single frequency therefore it is useful for flight crews to state the frequency used when placing the initial call to the radio station.

**HF Phraseology applicable when using data link**

6.1.11 The integrity of the ATC service remains wholly dependent on establishing and maintaining HF or VHF voice communications with each ATS unit along the route of flight. The procedures in this section are applicable only in NAT airspace and pertain only to ATS data link operations.

6.1.12 Prior to or upon entering each NAT oceanic CTA, the flight crew should contact the appropriate aeronautical radio station.

6.1.13 If the flight enters an oceanic CTA followed by another oceanic CTA, the flight crew should, on initial contact:

   a) not include a position report;
   b) after the radio operator responds, request a SELCAL check and state the next CTA;
   c) The radio operator will assign primary and secondary frequencies, perform the SELCAL check and designate the position and frequencies to contact the aeronautical radio station serving the next oceanic CTA. If the communications instructions are not issued at this stage, the crew should assume that the frequencies to use prior or upon entering the next CTA will be delivered at a later time by CPDLC or voice.

   Example (Initial contact from an eastbound flight entering GANDER Oceanic)
   GANDER RADIO, AIRLINE 123, SELCAL CHECK, SHANWICK NEXT
   AIRLINE 123, GANDER RADIO, HF PRIMARY 5616 SECONDARY 2899, AT 30 WEST CONTACT SHANWICK RADIO HF PRIMARY 8891 SECONDARY 4675, (SELCAL TRANSMITTED)
   GANDER RADIO, AIRLINE 123, SELCAL OKAY, HF PRIMARY 5616 SECONDARY 2899, AT 30 WEST CONTACT SHANWICK RADIO, HF PRIMARY 8891 SECONDARY 4675

6.1.14 If the flight will exit an oceanic CTA into continental airspace or airspace where the primary means of communication is VHF voice and an ATS surveillance service is available, on initial contact with the oceanic CTA, the flight crew should:

   a) not include a position report;
   b) after the radio operator responds, request a SELCAL check;

   Example (Initial contact from an eastbound flight about to enter SHANWICK Oceanic)
   SHANWICK RADIO, AIRLINE 123, SELCAL CHECK
   AIRLINE 123, SHANWICK RADIO HF PRIMARY 2899 SECONDARY 5616 (SELCAL TRANSMITTED)
   SHANWICK RADIO, AIRLINE 123, SELCAL OKAY, HF PRIMARY 2899 SECONDARY 5616.
c) For flights on T9 and T290, monitor VHF channel 128.360 as advised by Shanwick Radio. Exceptionally, in the event of navigational non-conformance or in an emergency, controllers may communicate directly with the flight. Controllers will use the callsign “Shanwick Control”.

6.1.15 Depending on which data link services are offered in the oceanic CTA and the operational status of those services, the aeronautical radio operator will provide appropriate information and instructions to the flight crew.

6.1.16 If a data link connection cannot be established, maintain normal voice communication procedures. In the event of data link connection failure in a NAT CTA after a successful logon revert to voice and notify the appropriate radio station. Inform the OAC in accordance with established problem reporting procedures.

Note: Flights on Tango 9 or Tango 290 should contact Shanwick Radio on HF voice.

6.1.17 To reduce frequency congestion, flight crews of flights using ADS-C should not additionally submit position reports via voice unless requested by aeronautical radio operator.

6.1.18 ADS-C flights are exempt from all routine voice meteorological reporting; however, the flight crew should use voice to report unusual meteorological conditions such as severe turbulence to the aeronautical radio station.

6.1.19 For any enquiries regarding the status of ADS-C connections, flight crew should use CPDLC. Should the ATS unit fail to receive an expected position report, the controller will follow guidelines for late or missing ADS-C reports.

6.1.20 When leaving CPDLC/ADS-C or ADS-C-only airspace, the flight crew should comply with all communication requirements applicable to the airspace being entered.

6.1.21 If the flight crew does not receive its domestic frequency assignment by 10 minutes prior to the flight’s entry into the next oceanic CTA, the flight crew should contact the aeronautical radio station and request the frequency, stating the current CTA exit fix or coordinates.

Note: Flights on Tango 9 or Tango 290 should contact Shanwick Radio on HF voice.

**SELCAL**

6.1.22 When using HF, SATVOICE, or CPDLC, flight crews should maintain a listening continuous air-ground communication watch on the assigned frequency, unless SELCAL equipped, in which case they should follow the following sequence of actions:

a) provide the SELCAL code in the flight plan; (any subsequent change of aircraft for a flight will require refiling of the flight plan or submitting a modification message (CHG) which includes the new registration and SELCAL);

b) check the operation of the SELCAL equipment, at or prior to entry into oceanic airspace, with the appropriate radio station. (This SELCAL check must be completed prior to commencing SELCAL watch); and

c) maintain thereafter a SELCAL watch.

6.1.23 It is important to note that it is equally essential to comply with the foregoing SELCAL provisions even if SATVOICE or CPDLC are being used for routine air/ground ATS communications. This will ensure that ATC has a timely means of contacting the aircraft.
SATVOICE Communication

6.1.29 The Aeronautical Mobile Satellite (Route) Service (AMS(R)S), more commonly referred to as SATVOICE, can be used as a supplement to HF & CPDLC communications throughout the NAT region for any routine, non-routine or emergency ATS air/ground communications. NAT ATS provider State AIPs contain the necessary telephone numbers and/or short-codes for air-initiated call access to radio stations and/or direct to OACCs. Since oceanic traffic typically communicates with ATC through radio facilities, routine SATVOICE calls should be made to such a facility rather than the ATC Centre. Only when the urgency of the communication dictates otherwise should SATVOICE calls be made to the ATC Centre. SATVOICE communication initiated due to HF propagation difficulties does not constitute urgency and should be addressed to the air-ground radio facility. The use of SATVOICE is described in The SATVOICE Operations Manual (ICAO Doc 10038).

6.1.30 The provisions governing the use of SATVOICE for ATS communications in the NAT region are contained in Doc.7030. These provisions include that even when using SATVOICE, flight crews must simultaneously operate SELCAL or maintain a continuous air-ground communication listening watch on the assigned HF/VHF frequency.

6.1.31 Operators must also recognise that they are bound by their own State of Registry’s regulations regarding carriage and use of any and all long-range ATS communications equipment. Some States do not authorise the carriage of SATVOICE as redundancy for HF equipage.

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Communications and Position Reporting Procedures

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Data Link Communications

6.1.32 Data link communications have been gradually introduced into the NAT for position reporting (via ADS-C & CPDLC) and air/ground ATC communications using FANS 1/A CPDLC. Operational procedures are specified in ICAO Doc 10037, “Global Operational Data Link (GOLD) Manual”. AIS publications of the NAT ATS provider States should be consulted to determine the extent of current implementation in each of the North Atlantic OCAs.

6.1.33 When operating CPDLC, the aircraft data link system provides indication to flight crews of any degraded performance which results from a failure or loss of connectivity. The flight crew should then notify the ATS unit of the failure as soon as practicable. Timely notification is essential to ensure that the ATS unit has time to assess the situation and apply a revised separation standard, if necessary.

6.1.34 Similar to SATVOICE usage, flight crews electing to use Data link communications for regular ATS communications in the ICAO NAT region remain responsible for operating SELCAL (including completion of a SELCAL Check), or maintaining a continuous air-ground communication watch on the assigned HF frequency outside VHF coverage. As stated in section 2.1.4 of the ICAO Global Operational data Link (GOLD) Manual (Doc 10037) ANSPs are required to notify operators, using the AIP or other appropriate AIS, the detail of all the supported data link services. Such notification will include advice when the aircraft SATCOM system is not serviceable. In such circumstances, when the planned route of flight is to extend beyond VHF coverage, the ANSP may restrict the use of CPDLC and ADS-C, even within VHF coverage areas, if so Operators should then ensure that the relevant CPDLC/ADS-C descriptors (J5/P2/D1) are not filed.

6.1.35 Flights equipped with CPDLC and/or ADS-C should ensure that the data link system is logged on to the appropriate OACC. This applies even when the aircraft is provided with ATS Surveillance services. With the introduction of PBCS separation, establishing and maintaining a data link connection becomes even more important since an active data link connection is one of the requirements for the application of the separation. CPDLC provides communication redundancy and controllers will in many cases use CPDLC for communication even though the flight crew is maintaining a continuous air-ground communication watch on the assigned DCPC VHF frequency. ADS-C furthermore enables ATC to perform route conformance monitoring for downstream waypoints.

6.2 INTER-PILOT AIR-TO-AIR VHF FACILITY 123.450 MHZ AND EMERGENCY FREQUENCY 121.5 MHZ

6.2.1 The frequency 121.5 MHz should be continuously monitored by all aircraft operating in the NAT region so as to be prepared to offer assistance to any other aircraft advising an emergency situation.

6.2.2 An air-to-air VHF frequency has been established for world-wide use when aircraft are out of range of VHF ground stations which utilise the same or adjacent frequencies. This frequency, 123.450 MHz, is intended for pilot-to-pilot exchanges of operationally significant information (N.B. It is not to be used as a “chat” frequency).

6.2.3 123.450 MHz may be used to relay position reports via another aircraft in the event of an air-ground communications failure.

6.2.4 This frequency (123.450 MHz) may also be used by flight crews to contact other aircraft when needing to coordinate offsets required in the application of the Strategic Lateral Offset Procedures (SLOP).

6.2.5 If necessary initial contact for relays or offset coordination can be established on 121.5 MHz, although great care must be exercised should this be necessary, in case this frequency is being used by aircraft experiencing or assisting with an ongoing emergency.
6.2.6 Therefore in order to minimise unnecessary use of 121.5 MHz, it is recommended that when possible aircraft additionally monitor 123.450 MHz when flying through NAT airspace.

6.3 POSITION REPORTING

Time and Place of Position Reports

6.3.1 Unless otherwise requested by ATC, position reports from flights on routes which are not defined by designated reporting points shall be made at the significant points listed in the flight plan.

6.3.2 ATC may require any flight to report its position at any intermediate waypoints when deemed necessary.

6.3.3 In requiring aircraft to report their position at intermediate points, ATC is guided by the requirement to have positional information at approximately hourly intervals and also by the need to accommodate varying types of aircraft and varying traffic and MET conditions.

6.3.4 Unless providing position reports via ADS-C, if the estimated time for the ‘next position’, as last reported to ATC, has changed by three minutes or more, a revised estimate must be transmitted to the ATS unit concerned as soon as possible.

6.3.5 Flight crews must always report to ATC as soon as possible on reaching any new cruising level.

Contents of Position Reports

6.3.6 For flights outside domestic ATS route networks, position should be expressed in terms of latitude and longitude except when flying over named reporting points. Except in those areas defined in State AIPs where operators meeting specified requirements can flight plan their user-preferred trajectories, flights whose tracks are predominantly east or west, latitude should be expressed in degrees and minutes, longitude in degrees only. For flights whose tracks are predominantly north or south, latitude should be expressed in degrees only, longitude in degrees and minutes. However, it should be noted that when such minutes are zero then the position report may refer solely to degrees.

6.3.7 All times should be expressed in four digits giving both the hour and the minutes UTC.

6.3.8 Radio operators may simultaneously monitor and operate more than one frequency. Therefore, when initiating an HF voice contact it is helpful if the flight crew include advice on the frequency being used (see examples below).

“Operations Normal” Reports

6.3.9 When “operations normal” reports are transmitted by flight crews, they should consist of the prescribed call followed by the words “OPERATIONS NORMAL”.

Standard Message Types

6.3.10 Standard air/ground message types and formats are used within the NAT region and are published in State AIPs and Atlantic Orientation charts. To enable ground stations to process messages in the shortest possible time, flight crew should observe the following rules:

a) use the correct type of message applicable to the data transmitted;

b) state the message type in the contact call to the ground station or at the start of the message;

c) adhere strictly to the sequence of information for the type of message;
than one facility within the NAT region, for example the contamination of the airspace by volcanic ash. Where available, information is also provided outlining the steps taken by ANSPs to deal with any long-term unavailability of an ATC facility.

### 6.8 OPERATION OF TRANSPONDERS

6.8.1 All aircraft operating as IFR flights in the NAT region shall be equipped with a pressure-altitude reporting SSR transponder. Unless otherwise directed by ATC, pilots flying in NAT airspace will operate transponders continuously in Mode A/C Code 2000, except that the last assigned code will be retained for a period of 30 minutes after entry into NAT airspace or after leaving a radar surveillance service area. Pilots should note that it is important to change from the last assigned domestic code to Code 2000 since the original domestic code may not be recognised by the subsequent Domestic Radar Service on exit from the oceanic airspace. However, because of the limited time spent in the NAT HLA, when flying on route Tango 9 or Tango 290 the change from the last assigned domestic code to Code 2000 should be made Northbound 10 minutes after passing BEGAS or ADVAT and Southbound 10 minutes after passing LASNO or GELPO.

6.8.2 It should be noted that this procedure does not affect the use of the special purpose codes (7500, 7600 and 7700) in cases of unlawful interference, radio failure or emergency. However, given the current heightened security environment flight crews must exercise caution when selecting Codes not to inadvertently cycle through any of these special purpose codes and thereby possibly initiate the launching of an interception.

6.8.3 Reykjavik ACC provides a radar control service in the south-eastern part of its area and consequently transponder codes issued by Reykjavik ACC must be retained throughout the Reykjavik OCA until advised by ATC.

### 6.9 AIRBORNE COLLISION AVOIDANCE SYSTEMS (ACAS)

6.9.1 Turbine-engined aircraft having a maximum certificated take-off mass exceeding 5,700 kg or authorized to carry more than 19 passengers are required to carry ACAS II in the NAT region. The technical specifications for ACAS II are contained in ICAO Annex 10 Volume IV. Compliance with this requirement can be achieved through the implementation of traffic alert and collision avoidance system (TCAS) Version 7.1 as specified in RTCA/DO-185B or EUROCAE/ED-143.

6.9.2 Flight crews should report all ACAS/TCAS Resolution Advisories which occur in the NAT region to the controlling authority for the airspace involved. (See Chapter 13.)
CHAPTER 7
APPLICATION OF MACH NUMBER TECHNIQUE

7.1 DESCRIPTION OF TERMS

7.1.1 Mach Number Technique (MNT) is a technique whereby aircraft operating successively along suitable routes are cleared by ATC to maintain a Mach number for a portion of the enroute phase of flight.

7.1.2 The ATC clearance RESUME NORMAL SPEED allows the flight crew to fly a cost index (ECON) speed instead of a fixed Mach number with the condition that ATC must be advised if the speed changes by plus or minus Mach .02 or more from the last assigned Mach number.

7.2 OBJECTIVE

7.2.1 MNT is used by ATC to improve the utilisation of airspace on long route segments where ATC has only position reports to ensure control the longitudinal spacing between pairs of aircraft that are close to minimum longitudinal separation between flights is maintained. When two or more aircraft are operating along the same route at the same flight level and maintaining the same Mach number, the time interval between them is more likely to remain constant than by using any other method.

7.3 PROCEDURES IN NAT OCEANIC AIRSPACE

7.3.1 Oceanic clearances include assigned Mach numbers (when required) which are to be maintained until ATC issues the clearance RESUME NORMAL SPEED. Aircraft capable of maintaining an assigned Mach must flight plan their requested Mach number. ATC uses assigned Mach number or other speed information, along with position reports information to calculate estimated times along the cleared route. These times are used as the basis for longitudinal separation and for coordination with adjacent units.

7.3.2 ATC will try to accommodate flight crew/dispatcher requested or flight planned Mach numbers when issuing oceanic clearances. It is rare that ATC will assign a Mach number more than 0.01 faster or 0.02 slower than that requested and will issue the clearance RESUME NORMAL SPEED when traffic permits.

7.3.3 The monitoring and maintenance of longitudinal separation is dependent upon the provision of accurate times in position reports.

7.3.4 The assigned Mach number must be maintained. If an immediate temporary change in the assigned Mach number is essential (due to turbulence for example), ATC must be so informed.

7.3.5 If a Mach number has been assigned, flight crews should maintain their last-assigned Mach number during climbs in oceanic airspace. If due to aircraft performance this is not feasible ATC should be advised at the time of the request for the climb.

7.4 PROCEDURE AFTER LEAVING OCEANIC AIRSPACE

7.4.1 After leaving oceanic airspace flight crews maintain their assigned Mach number in domestic controlled airspace unless and until the appropriate ATC unit authorises a change.
8.4.11 When appropriate and possible, the navigation system which, in the opinion of the flight crew, has performed most accurately since departure should be selected for automatic navigation steering.

8.4.12 In view of the importance of following the correct track in oceanic airspace, it is advisable at this stage of flight that, if carried, a third or equivalent flight crew member should check the clearance waypoints which have been inserted into the navigation system, using source information such as the NAT track message or data link clearance if applicable.

8.4.13 Flight crews should attempt to determine the offsets (if any) being flown by aircraft immediately ahead on the same track one flight level above and one flight level below. They should then select an offset which differs from the other aircraft. If this is not possible, or practical, then flight crews should randomly choose one of the flight path options. See Chapter 8 for rationale and more details.

**Entering the NAT HLA and Reaching an Oceanic Waypoint**

8.4.14 With the implementation of OWAFS, flight crews should expect an ATC clearance of RESUME NORMAL SPEED after oceanic entry via a CPDLC uplink or voice. It is not automated in all OCAs. If not offered, request NORMAL SPEED.

8.4.15 Once cleared RESUME NORMAL SPEED, insert the appropriate current flight plan cost index (ECON) into the FMS. This should typically be within plus or minus Mach .01 of the previously assigned Mach number.

8.4.16 Flight crews must inform ATC if, as a result of the RESUME NORMAL SPEED clearance and subsequent insertion of cost index (ECON), the speed varies plus or minus Mach .02 or more from the last assigned Mach number.

8.4.17 ATC will assign a fixed Mach number when required due to traffic.

8.4.18 Advise ATC immediately of any data link issues that might affect FANS (CPDLC/ADS-C) data link operations or any situation, like weather conditions, that require a more significant speed change.

8.4.19 When passing waypoints, the following checks should be carried out:

   a) just prior to the waypoint, check the next two waypoints in each navigation system against the Master Document.

   b) at the waypoint, check the distance to the next waypoint, confirm that the aircraft turns in the correct direction and takes up a new heading and track appropriate to the leg to the next waypoint.

   c) before transmitting the position report to ATC, verify the waypoint coordinates against the Master Document and those in the steering navigation system. When feasible the position report “next” and “next plus 1” waypoint coordinates should be read from the CDU of the navigation system coupled to the autopilot.

8.4.20 Even if automatic waypoint position reporting via data link (e.g. ADS-C) is being used to provide position reports to ATC the above checks should still be performed.

8.4.21 Flight crews should also be aware that in the NAT region ADS-C conformance monitoring is commonly employed. ATC establishes event contracts that will result in automatic alerts whenever the aircraft diverges from its cleared profile. Unless previously advised by the flight crew of the need for such a divergence, flight crews should expect ATC to query the situation. Standardised CPDLC alert messages have been developed for use here.
Routine Monitoring

8.4.188.4.22 It is important to remember that there are a number of ways in which the autopilot may unobtrusively become disconnected from the steering mode. Therefore, regular checks of correct engagement with the navigation system should be made.

8.4.188.4.23 A position check should be made at each waypoint and the present position plotted 10 minutes after passing each waypoint. For a generally east-west flight, this 10 minute point will be approximately 2 degrees of longitude beyond the oceanic waypoint. It may therefore in fact be simpler to plot a present position 2 degrees of longitude after each 10 degree waypoint. There may be circumstances, (e.g. when, due to equipment failure, only one LRNS remains serviceable) in which additional plots midway between each waypoint may be justified.

8.4.198.4.24 It is good practice to cross check winds midway between oceanic waypoints by comparing the flight plan, LRNS and upper milli-bar wind charts data. Such a cross check will also aid flight crews in case there is a subsequent contingency situation requiring the use of dead reckoning.

8.4.208.4.25 The navigation system not being used to steer the aircraft should display cross-track distance and track angle error. Both of these should be monitored, with cross-track distance being displayed on the HSI where feasible.

Approaching Landfall

8.4.218.4.26 When the aircraft is within range of land based navaids, and the flight crew is confident that these navaids are providing reliable navigation information, consideration should be given to updating the LRNSs. Automatic updating of the LRNSs from other navaids should be closely monitored, and before entry into airspace where different navigation requirements have been specified (e.g. RNP5 in European BRNAV airspace), flight crews should use all aids (including VORs and DMEs) to confirm that the in-use navigation system is operating to the required accuracy. If there is any doubt regarding system accuracy, the appropriate ATC unit should be informed.

8.5 SPECIAL IN-FLIGHT PROCEDURES

CPDLC Route Clearance Uplinks

8.5.1 CPDLC route clearance uplinks allow the flight crew to LOAD the CPDLC route clearance uplink directly into the FMS without having to manually enter waypoints possibly introducing navigational errors. All ANSPs in the NAT are progressing to have full functionality soon.

8.5.2 As per ICAO Doc 10037 GOLD Manual there are 4 possible CPDLC route clearance uplinks that can be used as described in the table below:

<table>
<thead>
<tr>
<th>CPDLC Route Clearance Uplink</th>
<th>GOLD Description</th>
<th>Route Discontinuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>UM74 / RTEU-2</td>
<td>PROCEED DIRECT TO [position]*</td>
<td>No</td>
</tr>
<tr>
<td>UM79 / RTEU-6</td>
<td>CLEARED TO [position] VIA [route clearance]</td>
<td>Yes if [position] is not part of FMS flight plan</td>
</tr>
<tr>
<td>UM80 / RTEU-7</td>
<td>CLEARED [route clearance]</td>
<td>Entire FMS routing is replaced</td>
</tr>
<tr>
<td>UM83 / RETU-9</td>
<td>AT [position] CLEARED [route clearance]</td>
<td>After [position] entire FMS routing is replaced</td>
</tr>
</tbody>
</table>

*Not loadable by some Airbus aircraft

8.5.3 Flight crews should ensure that the CPDLC route clearance uplink properly “loads” before sending WILCO.
CHAPTER 10
ATS SURVEILLANCE SERVICES IN THE NAT HLA

10.1 GENERAL

10.1.1 ATS Surveillance services are provided within the NAT HLA where radar, ADS-B or multilateration coverage exists in accordance with ATS Surveillance procedures in the PANS ATM (Doc 4444). (See Attachment 8)

10.1.2 Although ADS-B coverage exists throughout the NAT, ADS-B equipage is not mandated except on routes Tango 9 and Tango 290.

10.2 OPERATION OF SSR TRANSPONDE

10.2.1 All aircraft operating as IFR flights in the NAT region shall be equipped with a pressure-altitude reporting SSR transponder. Where radar services are provided in the NAT region, transponder codes issued by the control unit must be retained while operating in radar airspace and for a period of 30 minutes after entry into NAT airspace or after exiting a radar service area. After the 30 minute time frame, transponders must be operated continuously in Mode A/C code 2000.

Note 1: Because of the limited time spent in NAT HLA when flying on Route Tango 9, change to code 2000 should be made 10 minutes after passing BEGAS northbound and 10 minutes after passing LASNO southbound.

Note 2: Tango 290, the change from the last assigned domestic code to Code 2000 Northbound shall be made 10 minutes after passing ADVAT, and Southbound 10 minutes after passing GELPO.

Note 3: All eastbound flights routing Reykjavik – Shanwick – Scottish shall squawk Mode A Code 2000 ten minutes after entering EGGX airspace.

10.2.2 This procedure does not affect the use of the special purpose codes (7500, 7600 and 7700) in cases of unlawful interference, radio failure or emergency.

Note: Flight crews should exercise caution when selecting codes so as not to inadvertently cycle through any of the special purpose codes.

10.3 OPERATION OF ADS-B TRANSMITTERS

10.3.1 ADS-B services are already available in some continental airspaces immediately adjacent to the NAT region as well as within some portions of the NAT HLA. ADS-B equipage is not mandated except on routes Tango 9 and Tango 290.

10.3.2 Eligibility for ADS-B service in the NAT is based upon the provisions in the Doc 7030 section 5.5.

Note: The following documents provide guidance for the installation and airworthiness approval of ADS-B OUT system in aircraft:

1. European Aviation Safety Agency (EASA) AMC 20-24 or CS-ACNS; or

2. FAA AC No. 20-165B — Airworthiness Approval of ADS-B; or
Random Routings

16.3.8 Use of OTS tracks is not mandatory. The orientation/location of the published OTS may not be appropriate for the origin and/or destination of a particular flight. A NAT route segment that does not follow a published OTS track, in its entirety, is known as a “Random Route”. Aircraft may fly on random routes which remain clear of the OTS or may fly on any route that joins or leaves an outer track of the OTS. There is also nothing to prevent an operator from planning a route which crosses the OTS. However, in this case, operators must be aware that while ATC will make every effort to clear random traffic across the OTS at published levels, re-routes or significant changes in flight level from those planned are very likely to be necessary during most of the OTS peak traffic periods.

16.3.9 Outside of the OTS periods operators may flight plan any random routing, except that during the hour prior to each OTS period some additional restrictions apply. These are detailed in Chapter 4.

Adjacent Airspace, Route Structures, Links & Constraints

16.3.10 A large majority of flights through the NAT HLA enter and/or leave it via the North American region. To facilitate these flows of traffic, various transitional airspaces and linking route structures have been established in and through the adjacent NAM region. These are described in Chapter 3 above. Of particular significance is the NAR structure. Details of these routes and associated procedures are contained in the AIP of the relevant State authorities and/or via their websites. The necessary Internet Links to obtain this information are listed above in Chapter 3. Account must be taken of these route structures in planning any flight through the NAT region that starts or ends in the North American region.

16.4 ALTITUDE & SPEED

Flight Levels

16.4.1 During the OTS Periods (eastbound 0100-0800 UTC, westbound 1130-1900 UTC) aircraft intending to follow an OTS track for its entire length may plan at any of the levels as published for that track on the relevant current daily OTS Message. Aircraft following a “random route” (see above definition) or flying outside the OTS time periods, may plan any flight level(s) irrespective of direction (i.e. there is no need in the NAT HLA to plan in accordance with the ICAO Annex 2 Table of Cruising Levels). Planners should note however that the NAT provider State AIPs, both during the OTS time periods and outside them, reserve some appropriate direction levels for use by the opposite direction traffic flows that then predominate. The current usage allocation of flight levels in the NAT HLA is published in the UK and Canadian AIPs and shown at Attachment 5 below as the “North Atlantic Flight Level Allocation Scheme” (NAT FLAS). Hence, flight crews and planners should always consult the current AIPs and any supporting NOTAMs when flight planning random routes through the NAT HLA. If a flight is expected to be level critical, operators should contact the initial OACC prior to filing the flight plan to determine the likely availability of specific flight levels.

Mach Number

16.4.2 In the NAT HLA the Mach number technique is used to manage longitudinal separations between aircraft following the same track. With the implementation of OWAFS, operators will have more efficiencies in the NAT. Chapter 7 above provides more detailed information about the application of Mach number techniques. Chapter 4 provides details about ATC flight planning (ICAO FPL) requirements. Operators can flight plan cost index (ECON) provided that the planned true Mach number for any portion of the flight within the NAT is specified in item 15 of the ICAO FPL. Consequently, flight plans for the NAT HLA segment of flight must define aircraft speed in terms of a Mach number. This is true even if procedures dictate that aircraft speed be defined in terms of TAS for other (continental airspace) segments of that same flight. Oceanic clearances include a True Mach number to follow and because this is used by ATC to regulate longitudinal separations, no tolerance is permissible. Consequently, NAT flights should not be planned or flown on the assumption that LRC or ECON fuel regimes may be used.
16.6.3 The dispatcher is responsible for providing the pilot-in-command with information necessary to conduct a flight safely and legally under appropriate State civil aviation authority regulatory requirements. ICAO Annex 6 defines the requirement for an en route aircraft, but when operating under US FAR Part 121, and certain other State civil aviation rules, the dispatcher shares responsibility for exercising operational control with the pilot-in-command of the flight. A successful flight will always start with an intelligent, informed and conservative plan.

Flight Planning

Route Planning

16.6.4 The daily published OTS tracks provide near to optimum NAT segment routings for about half of all the flights between Europe and North America. For many other flights the location of the OTS structure on the day may constrain available random routings. Consequently, the development of a successful NAT flight plan almost always requires consideration of the detail of the relevant OTS structure. Operators can influence the OTS construction process by providing Preferred Route Messages and participating in this collaborative decision making (see Chapter 2).

16.6.5 The eastbound and westbound OTS structures are the subject of separate “NAT Track Messages” published via the AFTN. A detailed description of the NAT track message is provided in Chapter 2 above.

Planning on an OTS Track

16.6.6 Dispatchers must pay particular attention to defined coordinates, domestic entry and exit routings, allowable altitudes, track message identification number (TMI) and any other information included in the remarks section. They must also take care to be apprised of any amendments or corrections that may be subsequently issued. When such amendments are issued the TMI is appended with an alpha suffix (e.g. “123A”). Since NAT track messages are often manually entered into company flight planning systems, dispatchers should verify that all waypoints on flight plans comply with the current OTS message.

- The NAT Data Link Mandate (DLM) requires aircraft to be equipped with, and operating, CPDLC and ADS-C in the NAT region. Currently, the mandate incorporates FL290 to FL410 inclusive. For other details, see DATA LINK REQUIREMENTS in Chapter 1. The NAT region is implementing DLM in phases. To fly within the DLM airspace aircraft must be equipped with FANS 1/A or equivalent ADS-C and CPDLC. See Chapter 1.
- It is important for dispatchers to understand that transition routes specified in the NAT track message are as important as the tracks themselves. The transition route systems in North America – the North American Routes (NARs) and the US East Coast routes are described in Chapter 3. Dispatchers should comply with any specified transition route requirements in all regions. Failure to comply may result in rejected flight plans, lengthy delays and operating penalties such as in-flight re-routes and/or the flight not receiving requested altitudes.
- If (and only if) the flight is planned to operate along the entire length of one of the organized tracks, from oceanic entry point to oceanic exit point, as detailed in the NAT track message, should the intended track be defined in Item 15 of the ICAO flight plan using the abbreviation "NAT” followed by the code letter assigned to the track.
- The planned Mach number and flight level at the commencement point of the track should be specified at the organised track commencement point.
- Each point at which a change of Mach number or flight level is requested must be specified as geographical coordinates in latitude and longitude or as a named point.
- For flights operating along the entire length of an OTS track, estimated elapsed times (EET/ in Item 18) are only required for the commencement point of the track and for oceanic FIR boundaries.
Re-Routes

16.6.28 When traffic exceeds track capacity, ATS providers may not be able to accommodate a flight’s filed altitude or routing. A different flight level on the planned route will be offered as the first option. If this is not possible, ATC will offer an alternative route. On an eastbound flight the flight crew should anticipate a preferred route within the domestic route structure appropriate to the oceanic exit point of the re-route. For westbound flights into Canada, ATC will normally attempt to route the flight back to its original route unless the flight crew requests a new domestic routing.

En route Contingencies

16.6.29 Dispatchers must also be aware of special procedures for In-Flight contingencies as published in Chapter 13 of this manual. They include procedures for use in the event that the aircraft is unable to maintain assigned altitude for weather, turbulence, aircraft performance or maintenance problems or loss of pressurization. The general concept of the in-flight contingency procedures is to parallel offset from the assigned track by 5 NM and descend below FL 290; or once on the 5 NM parallel offset, establish a 150 m (500 ft) vertical offset (or 300 m (1000 ft) vertical offset if above FL 410) from those flight levels normally used, and proceed as required by the operational situation.

16.6.30 Procedures for loss of communications and HF failure are contained in Chapter 6.

Dispatcher/pilot considerations for en-route diversions

16.6.31 Chapter 13 notes that pilots and dispatchers shall collaborate, when able, regarding where the flight diverts based on the nature of the en-route contingency and the viability of the otherwise adequate airports available to assure the airport is actually suitable for the diversion.

Dispatcher guidance for NAT RVSM operations.

References

The FAA Advisory Circular AC91-85A was developed by ICAO sponsored international working groups, to provide guidance on airworthiness and operations programmes for RVSM. ICAO has recommended that State CAA’s use of AC91-85A or an equivalent State document for approval of aircraft and operators to conduct RVSM operations. Appendices 4 and 5 of AC91-85A contain practices and procedures for flight crews and dispatchers involved in RVSM operations. This particular dispatcher guidance, available at WWW.FAA.GOV/DOCUMENTLIBRARY/MEDIA/ADVISORY_CIRCULAR/AC_91-85A, was developed using those appendices as the reference.

Flight Planning

NAT RVSM Airspace

This is defined as any airspace between FL 285-290 - FL 4120 inclusive where 1,000 ft vertical separation is applied (i.e. FLs 290 thru 410 inclusive).

Limits of Operational Authorisation

At the flight planning stage, the dispatcher is responsible for selecting and filing a route that is consistent with the carrier’s operational authorisation (e.g. Operations Specifications), taking account of all route, aircraft and weather considerations, flight crew constraints and other limitations.

Guidance for Dispatchers

NAT Doc 007 V.2022-1 (Applicable from January 2022)
ground radio check. HF equipment can be tested by calling the nearest Aeronautical Radio or Flight Service Station for a ground radio check. If contact cannot be made on the initial test frequency, try others. If no contact is made, have the equipment checked. Do not leave the ground until everything is working satisfactorily.

17.11.3 Flight crews should be aware that on most occasions when they communicate with Oceanic Air Traffic Control Centres on HF and, on some occasions VHF, they do not talk directly to controllers. Radio Communicator staff, i.e., Aeronautical Radio Inc. (ARINC) or an international flight service station (IFSS), relay messages between aircraft and ATC. Such units are not always co-located with an ACC. For example, Shanwick Radio is in the Republic of Ireland while Shanwick Control is based at Prestwick, Scotland. Also, it is important to note that controller workload associated with low level IGA flights is usually high, so some delays can be expected for responses to requests for a change of flight level, route, etc.

17.11.4 Remember, flights above FL055 must be operated under IFR procedures and therefore a continuous continuous air-ground communicationlistening watch on appropriate frequency must be maintained.

17.11.5 An HF SELCAL device will ease the strain of a continuous continuous air-ground communicationlistening watch on the designated HF R/T Frequency. Ensure that the SELCAL code selected in the aircraft is valid for the NAT region (see Chapter 6). Also ensure that the Code is included in Item 18 of the filed ICAO flight plan.

17.11.6 Aeronautical Mobile Satellite (Route) Service (AMS(R)S), more commonly referred to as SATVOICE, may be used for any routine, non-routine or emergency ATS air/ground communications throughout the NAT region. Remember to carry the SATCOM numbers for the areas (both ATC and radio) you are flying through. Requirements and procedures for use are detailed in Chapter 6.

17.11.7 A continuous air-ground communicationlistening watch should be maintained on the 121.5 MHz emergency frequency unless communications on another frequency prevents it. 121.5 MHz is not authorized for routine use.

Note: All civilian and military aircraft flying in the Elk area, as shown in the Chart in Attachment 7, must maintain continuous air-ground communicationlistening watch on 121.5 MHz or 126.7 MHz.

Communications failures

17.11.8 Procedures to follow in the event of radio communications failures in the NAT region are not those which are used in domestic airspaces. Chapter 6 and relevant national AIPs provide detail of the procedures to follow here.

17.11.9 Although HF coverage exists throughout the NAT, there are a few associated problems. Depending on atmospheric conditions, it can be relatively noisy with the signal fading in and out. Sometimes several attempts are required to successfully transmit or receive a single message. Additionally, sunspot activity can completely disrupt HF communications for considerable periods of time, varying from a few minutes to several hours. Notices are published whenever disruptive sunspot activity is expected. It may be possible to relay VHF or UHF communications through other aircraft operating in the NAT. 123.450 MHz should be used for air-to-air communications. Do not plan to use other aircraft as primary means of communication. There is no guarantee there will be another aircraft within range when needed. Consider this an emergency procedure and plan accordingly.

17.12 SURVEILLANCE

17.12.1 Radar and or ADS-B coverage in the NAT region is limited. All aircraft operating as IFR flights in the NAT region shall be equipped with a pressure-altitude reporting SSR transponder. Some radar sites that do cover portions of the NAT are secondary radar equipped only. In any emergency situation (lost,
8. PERMANENT MILITARY OPERATIONS

8.1 AREA ELK FL 50 AND BELOW

8.2 Maritime surveillance aircraft conduct daily all-weather operational flights in Area ELK. These aircraft are required to operate on various headings and altitudes up to and including FL50 and to make rapid climbs and descents without prior warning. Because of operational considerations they operate without navigation or identification lights during the hours of darkness and often without SIF/IFF.

8.3 The Canadian Maritime Command (CANMARCOM) provides advisory information between maritime and other aircraft in Area ELK based on known air traffic.

8.4 Standard pressure setting 29.92 inches is used for transit and separation within the entire area.

8.5 In the interest of flight safety it is essential that CANMARCOM be informed in advance of all flights or proposed flight in or through Area ELK. Aircraft flight level(s), track and approximate times of ELK penetration and exit are required. Military aircraft are encouraged to communicate directly with CANMARCOM. On prior request, frequencies will be assigned on which to report position and obtain ELK clearance. ASW aircraft will be routed clear of all known military and civil traffic.

8.6 CANMARCOM may be contacted by the following means:

a) Letter to Commander maritime Command, Halifax, N.S., Canada.
b) Message to MOC HALIFAX.
d) On request of the pilot when filing flight plans at departure points in North America, aircraft flight plans may be relayed through ATC channels to Moncton ACC for Maritime Command Operations.
e) In-flight position reports or advisories when not transmitted directly as in paragraph 4 above may
be relayed through Gander or Moncton ACC. These messages should specify "Pass to Maritime-Operations Centre."
ATTACHMENT 8
NORTH ATLANTIC ATS SURVEILLANCE COVERAGE CHARTS

*Note: see State AIPs for detailed surveillance and communication coverage.
Legend: - Green: surveillance with VHF voice;
- Yellow: surveillance without VHF voice.
For planning purposes, this area is bounded by the following:


Southern boundary: GUNPA (61N000W) - 61N007W - 6040N010W - RATSU (61N010W) - 61N020W - 63N030W - 62N040W - 61N050W – SAVRY

Aircraft not equipped with FANS 1/A (or equivalent) systems will be allowed to operate within this area at DLM designated flight levels, provided the aircraft is suitably equipped (transponder/ADS-B extended squitter transmitter).
### BOPUT.
Southern boundary:
GUNPA (61N000W) - 61N007W - 6040N010W - RATSU (61N010W) - 61N020W - 63N030W - 62N040W - 61N050W - SAVRY transmitter).

### Tango 9 and Tango 290 Requirements
- a) VHF 8.33Khz equipped (Field 10a: ‘Y’)
- b) NAT HLA certified (Field 10a: ‘X’)
- c) RNP2 certified:
  - Field 10a: GNSS – ‘G’
  - Field 10a: RNP – ‘R’
  - Field 10a: Other Info – ‘Z’
- Field 18: "NAV/RNP2"
- d) Surveillance equipment
  - SSR Mode S
  - Field 10d: E Transponder
  - Mode S, including aircraft identification, pressure altitude and extended squitter (ADS-B) capability
  - ADS-B B1 Ads-B with dedicated 1090 Mhz ADS-B ‘out’ capability

### Datalink Mandate Compliance
- » Phase 2A, commenced 5 February 2015: FL 350 to FL 390 (inclusive) all tracks within the NAT OTS. This phase applies to all aircraft operating on or at any point along the tracks;
- » Phase 2B, commenced 7 December 2017: FL 350 to FL 390 (inclusive) throughout
the ICAO NAT region:
» Phase 2C, commencing 30 January 2020. FL 290 to FL 410 (inclusive) throughout the ICAO NAT Region.

<table>
<thead>
<tr>
<th>ICAO FPL Requirements</th>
<th>Multiple requirements for PBCS, HLA, Data Link Mandate, Equipage and 3(^{rd}) Part Contracts</th>
<th>Ongoing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item 10a of the ICAO flight plan will be annotated with the letter “X” to indicate that the aircraft meets the requirements for HLA operations.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The letter “R” is required in Item 10a of the flight plan along with the performance-based navigation levels that can be met specified in Item 18 following the indicator PBN/.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The RNP4 designator, “L1” is required for 30NM lateral and 30NM longitudinal.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Either “L1” or the RNP10 designator, “A1” is required for 50NM longitudinal.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The equipment qualifier J-code must be found within Item 10a of the flight plan. The presence of at least one of the following J-codes is required:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o “J 5” (INMARSAT),</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o “J6” (MTSAT), and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o “J7” (Iridium) for performance-based separation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The equipment qualifier P-code “P2” must be found within Item 10a of the flight plan.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The “P2” equipment qualifier indicates the</td>
<td></td>
</tr>
</tbody>
</table>
### Checklist for dispatchers

**NAT Doc 007 V.2022 - 1** (Applicable from January 2022)

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aircraft is certified CPDLC RCP-240. The text string “RSP180” must appear in Item 18 of the flight plan, following the indicator for surveillance equipment and capabilities (SUR/), which indicates the airframe is certified and compliant.</td>
</tr>
</tbody>
</table>

- Lateral & Vertical
- Datalink Requirements
- State Approvals (NAT HLA/RVSM) See: Chapter 1.
- Approval for flight in NAT ADS-B airspace. See: Chapter 1.

2. **Minimum Equipage (Navigation/Altimetry/Communications)**
   - NAT HLA/RVSM. See: Chapter 1
   - RVSM. See: Chapter 1 and Chapter 16
   - HF Communications. See: OpSpecs
   - DLM. ADS-C (Automatic Dependent Surveillance Contract) and CPDLC (Controller Pilot Data Link Communications). See: OpSpecs
   - ETOPS/EDTO. See Annex 6 Part 1
   - MEL provisions. See: OpSpecs

3. **Special non-compliance routings**
   - Not approved for NAT HLA/RVSM. See Chapter 1.
   - Routings without functioning HF Communications. See: Chapter 4.
   - Maintenance Flights, temporarily non-RVSM. See: State AIPs.
   - Delivery and Humanitarian Flights. See: State AIPs.

4. **Flight planning**
   - Eastbound or westbound flights should be flight planned by significant points at whole degrees of latitude at each crossed ten degrees of longitude (10°W, 20°W, 30°W, 40°W etc.);
   - Northbound or southbound flights should be flight planned by parallels of latitude spaced at five degree intervals (65°N, 60°N, 55°N etc.). See Chapter 4 and Chapter 16.
   - Separate Organised Track System (OTS) structures. See: Chapter 2 and Chapter 3.
   - North American Region., transitional airspaces and linking route structures in and through NAM Region. See: Chapter 3 and AIS of the relevant State authorities and/or via their websites.
   - Flight Levels on OTS Track may plan at any of the levels as published for that track. Aircraft on a random route may plan any flight level(s) irrespective of direction. See: North Atlantic Flight Level Allocation Scheme (NAT FLAS Attachment 5). States AIPs and NOTAMs.
   - Mach Number See: Chapter 7.
   - FPL completion. A free text editor is available on the EUROCONTROL website.
   - Approvals:
     - NAT HLA, the letter ‘X’, in addition to the letter ‘S’, within Item 10.