fly uk

IFR North Atlantic Oceanic Flight and ATC Communication

Fly UK

Version 1.0

May 2019

Objectives

This document explains how fly an Oceanic route, in particular, how to write the flight plan and how to communicate with air traffic control (ATC) in the Oceanic airspace.

This guide is intended to be practical and contains the main guidelines and most important information; for deeper and more accurate information, refer to the links shown in the Bibliography.

This guide focuses on the North Atlantic airspace (NAT) that covers the Oceanic routes eastbound and westbound to and from the North American regions. Moreover, it covers the procedures to be applied for random routes in the Atlantic Air Space.

This guide can be applied to online flying when on the FSD server, but also on the IVAO and VATSIM networks.

Contents

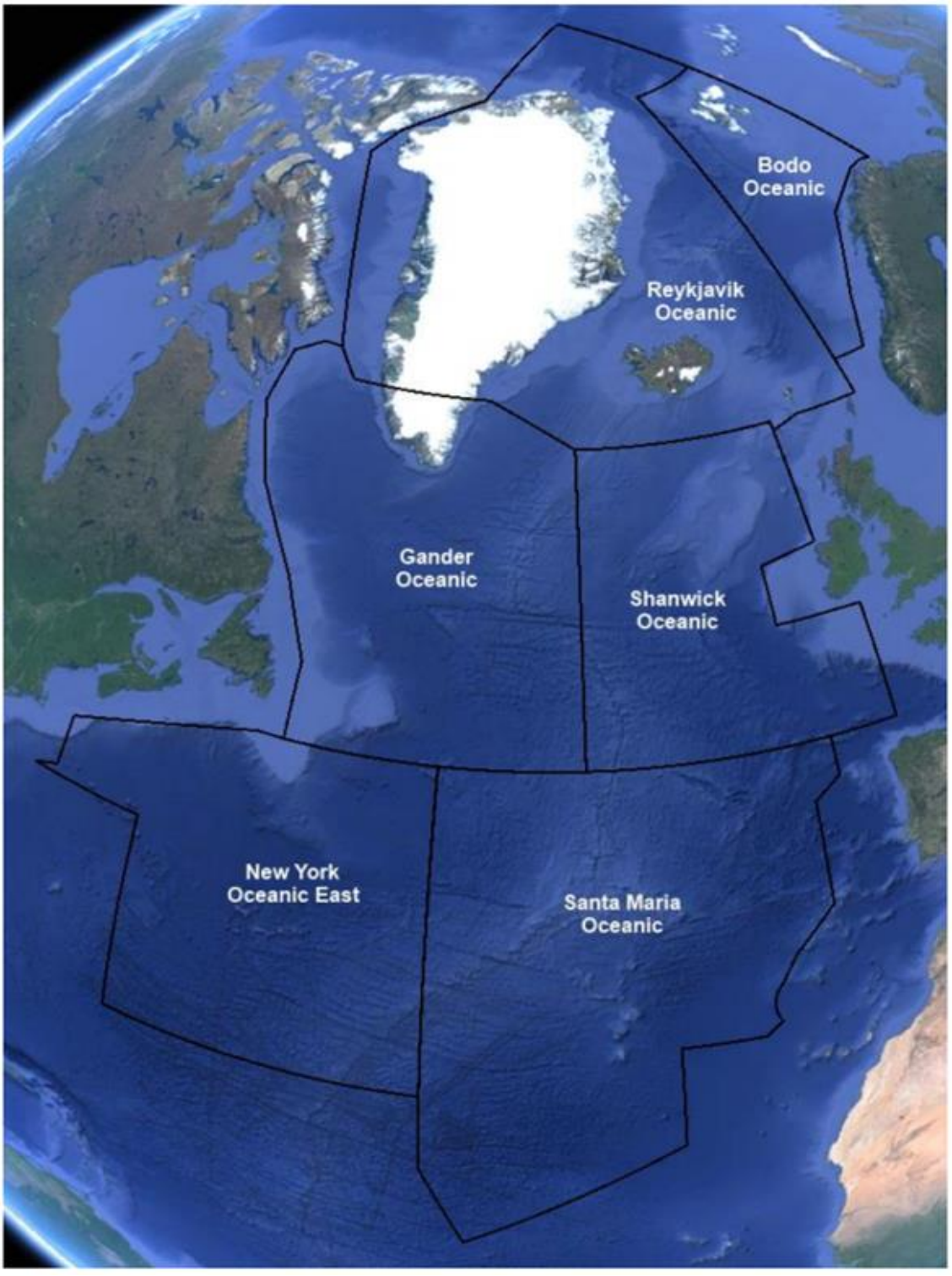
1 Glossary of terms

ACC	Area Control Centre
BOTA	Brest Oceanic Transition Area
ETOPS	Extended Range Twin-engine Aircraft Operations
FIR	Flight Information Region
GOTA	Gander Oceanic Transition Area
HLA	High Level Airspace
MNPS	Minimum Navigation Performance Specifications
NAT	North Atlantic
NAR	North American Route
NOTA	Northern Oceanic Transition Area
OAC	Oceanic Area Control Centre
OCA	Oceanic Control Area
Oceanic Entry Point	The point on the FIR boundary where the aircraft enters the first oceanic control area
Oceanic Exit Point	The point on the FIR boundary where the aircraft leaves the last oceanic control area
OTS	Organised Track System
SELCAL	Selective calling
SLOP	Strategic Lateral Offset Procedures
SOTA	Shannon Oceanic Transition Area
TAS	True Airspeed
TMI	Track Message Identification
UTC	Co-ordinated Universal Time
WPR	Waypoint Position Report

2 Oceanic North Atlantic Airspace Map

2.1 Description of the Airspace

Figure 1 – The North Atlantic High Level Airspace (NAT HLA)



The Shanwick FIR (EGGX) and Gander Oceanic FIR (CZQX) cover the airspace above the North Atlantic, from 44° North to 61° North and partly up to 64° North (only in Gander FIR). This airspace is moderately hostile to civil aircraft, as there are virtually no land-based navigational aids or communication relays.

The Shanwick FIR covers the airspace from the coasts of Europe to 30° W. The airspace is class A from FL55 to FL660, (below FL55 is a class G airspace within the OCA, NOTA, SOTA and BOTA).

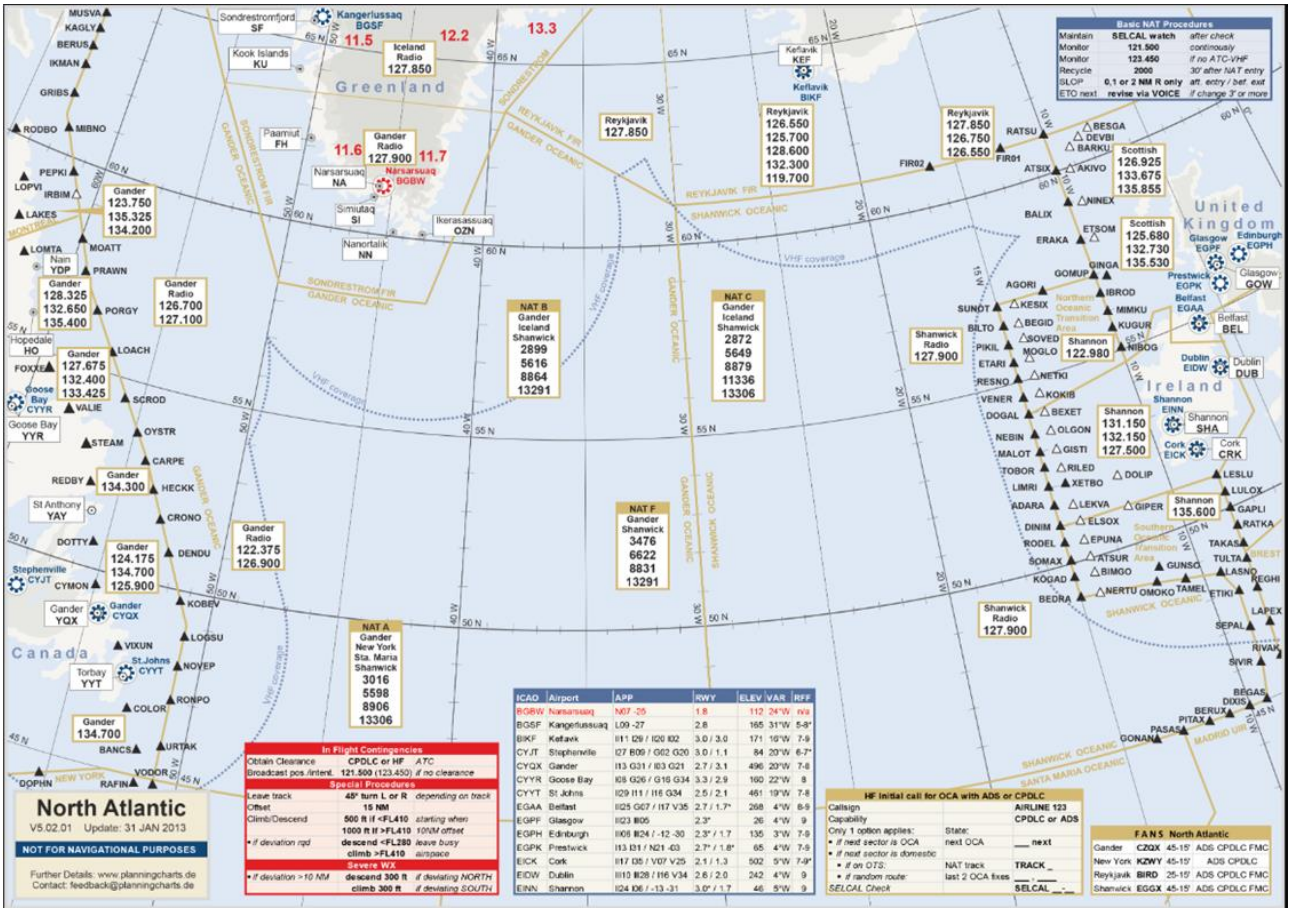
The Gander Oceanic FIR covers the airspace from 30° W to the coasts of Newfoundland and Labrador. The airspace is class A from FL55 to FL660 (except the area over southern Greenland is a class A airspace from FL195 to FL660).

Traffic within the Shanwick FIR is managed by the Shanwick Oceanic Control Centre located in Prestwick, Scotland. The name of the FIR is actually a combination of Shannon and Prestwick -> Shan-wick.

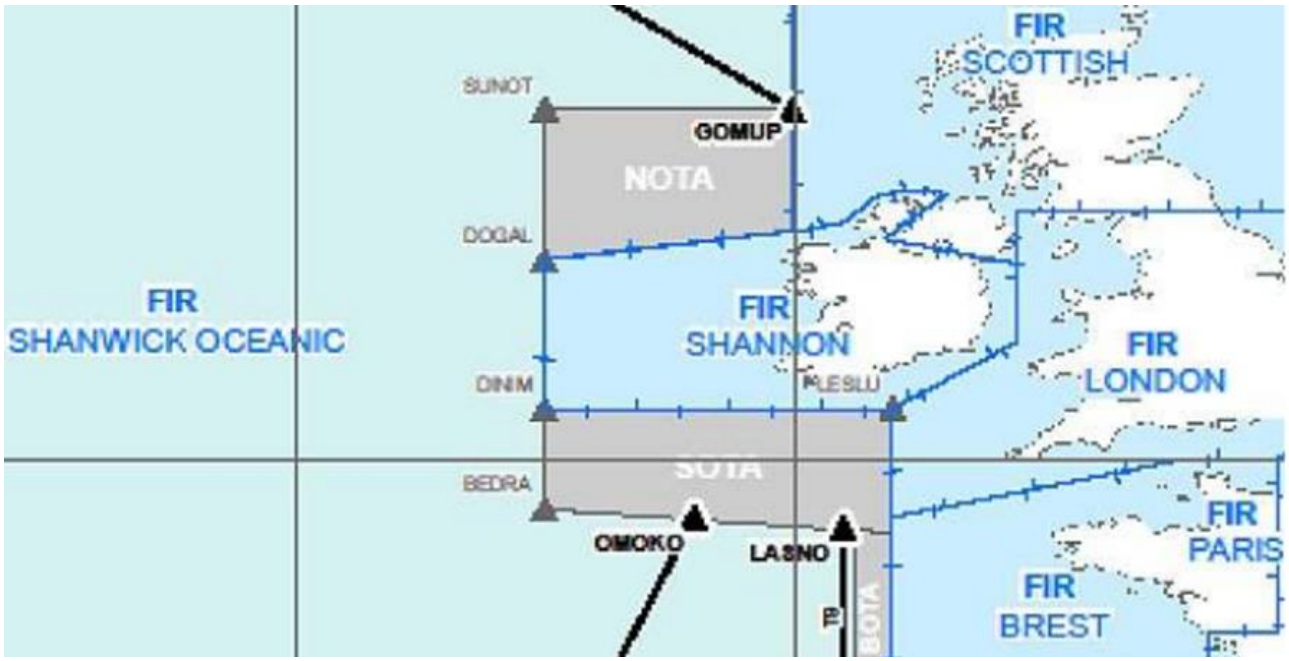
Communications to pilots over the North Atlantic are made via Shanwick Radio which is located in Shannon, Ireland.

Traffic within the Gander Oceanic FIR is managed by the Gander Oceanic Control Centre, which is a non-radar unit of the Gander ACC. Communications to pilots over the North Atlantic, are made via Gander Radio.

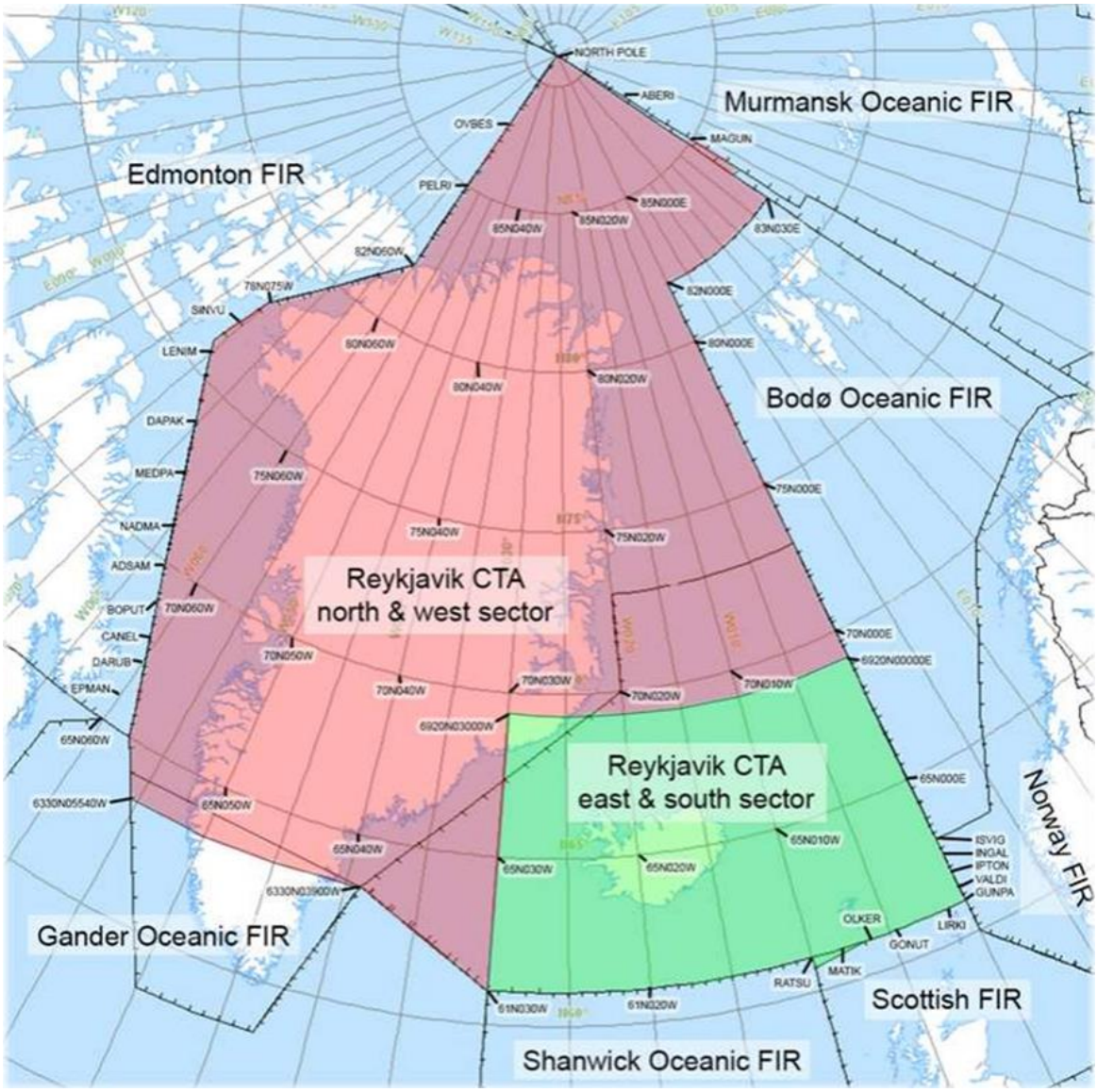
Detailed Map with the Entry/Exit Points:



NOTA SOTA and BOTA Transition Areas Detail:



Specifics of the Northern Airspace:



The Reykjavik CTA is a large control region that covers the Republic of Iceland, Greenland and a large portion of the North Sea/North Atlantic Ocean. There is full radar coverage within the confines of the east and south sector, and procedural control within the confines of the north and west sector (above FL195). However, the entire CTA is classified as oceanic airspace and all aircraft departing and arriving require an oceanic clearance (except domestic flights within Iceland).

The domestic region is bordered on the west and north by Söndreström FIS (below FL195) and Iceland Radio (above FL195) (Greenland), to the south by Shanwick Radio (United Kingdom) and Scottish Control (Scotland) and to the east by Bodø Oceanic and Stavanger Control (Norway).

Services in Iceland are generally conducted in English, although Icelandic or other languages are permitted if there is prior agreement between the controller and pilot.

3 Overview of the Oceanic Procedures

The purpose of introducing Oceanic procedures stems from two aspects:

- Very long flights along established routes in areas with little or no radio coverage
- Aviation safety: aircraft with different performances that follow the same route must maintain the correct horizontal and vertical separation.

Vertical separation is guaranteed by the use of different flight levels, horizontal separation by the control of speed (which rarely happens in domestic flights).

Shanwick and Gander control area (OCA) is an ATC environment with no surveillance radar capability. Having no surveillance radar capability means that the ATC cannot use radar to control aircraft - it is a non-radar environment. Therefore, the Oceanic controller receives estimates and position reports in order to provide procedural separation while flying in Oceanic FIR. In real life, Controller-Pilot Data Link Communications (CPDLC) and Aircraft Communications Addressing and Reporting System (ACARS) data-link communications are sent and received directly between controllers and pilots. High frequency (HF) radio remains the primary means of voice communications.

On the VATSIM and IVAO network, HF and ACARS is, as per today, unfortunately not practicable. However, CPDLC and voice communication via Very High Frequency (VHF) is available. Not all controllers are equipped with CPDLC software, and as it is not a controller requirement. This is also not a requirement for pilots to have, in order to fly over the North Atlantic Ocean.

Oceanic flights usually follow pre-established routes called NAT tracks which are published daily and are part of the OTS (Organized Track System). In the real world, the routes are mostly eastbound during the European night and westbound during the European day.

In addition to the predefined routes it is also possible to follow different routes (Random Routes).

3.1 OTS NAT Tracks

The NAT tracks are a part of the OTS Organized Track System which includes the North Atlantic routes eastbound and westbound.

NATs are only within MNPS (Minimum Navigation Performance Specifications) airspace. Aircraft that wish to follow a NAT track must be compliant and certified with the MNPS requirements. Aircraft flying above or below this airspace must file a random route.

Each day the Shanwick and Gander Control Centres release a set of 5 to 7 tracks in each direction. Typically, they carry the letters A to G for the westbound tracks and U to Z for the eastbound tracks.

These Tracks consist of two RNAV Entry points, followed by four or five coordinates of Latitude and Longitude and finally of two RNAV Exit points.

The tracks are defined and published with due consideration to the Weather situation on the day, especially with regard to the jet stream winds, which are westerly.

The westbound tracks are usually aimed to lay outside the core of the jet stream to eliminate unnecessary headwind, while the eastbound tracks are aimed into the core of the Jetstream to make use of the tailwind.

The hours of validity of the two Organized Track Systems (OTS) are normally:

Day-time OTS (westbound): 1130z – 1900z

Night-time OTS (eastbound): 0100z – 0800z

The NAT tracks are published every day at this link

Or for a less formal notation here link

The hours of validity are specified in the track message.

The most northerly track of a day OTS is designated as NAT Alpha; the adjacent track to the south as NAT Bravo; etc.

For the night OTS, the most southerly track is designated as NAT Zulu; the adjacent track to the north as NAT Yankee; etc.

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

Example of NAT tracks issued by Shanwick:

North Atlantic Tracks - *Last updated at 2019/04/20 08:10 GMT*

The following are active North Atlantic Tracks issued by Shanwick Center (EGGX) and Gander Center (CZQX). Any NOTAMs pertaining to these tracks (waypoint changes, procedures) will be found by searching the ARTCC NOTAMs under Shanwick Center (EGGX), Gander Center (CZQX), Boston Center (KZBW) and New York Center (KZNY).

```
192002 EGGXZOZX
(NAT-1/3 TRACKS FLS 310/390 INCLUSIVE
APR 20/1130Z TO APR 20/1900Z
PART ONE OF THREE PARTS-
A GOMUP 59/20 61/30 62/40 62/50 MAXAR
EAST LVLS NIL
WEST LVLS 310 320 330 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-
B SUNOT 58/20 60/30 61/40 61/50 PIDSO
EAST LVLS NIL
WEST LVLS 310 320 330 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-
C LIMRI 51/20 50/30 47/40 45/50 RAFIN
EAST LVLS NIL
WEST LVLS 310 320 350 360 370 390
EUR RTS WEST NIL
NAR NIL-
END OF PART ONE OF THREE PARTS)
```

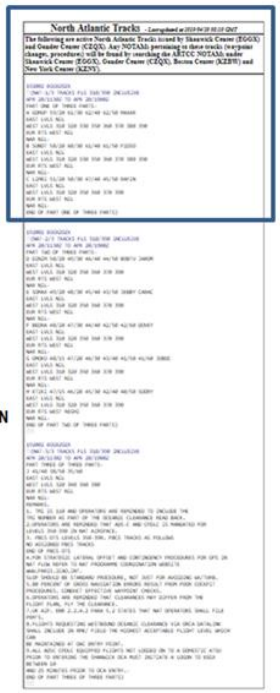
Delivery time by **Shanwick** (westbound track)

NAT # - FL range – time of validity

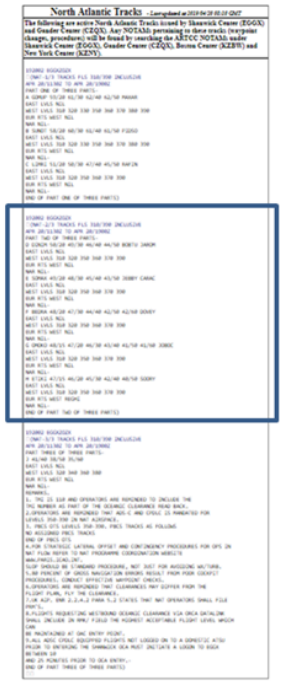
NAT track **Alfa** Entry Point **GOMUT**- wpts -Exit point **MAXAR**

EAST FL **NIL** (eastbound not admitted)
WEST FL admitted

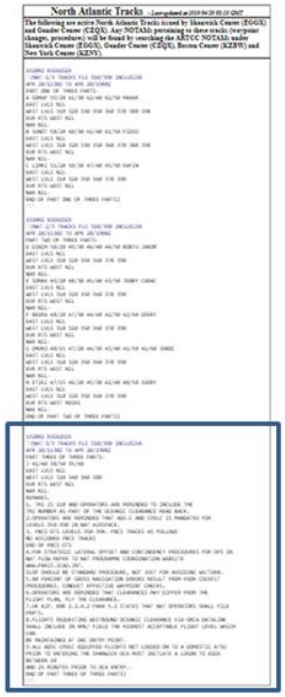
EUR NIL no specific route from dept Airpt to Entry Point
NAR NIL no specified **N**orth **A**mer **R**oute from exit point to dest airpt
BUT YOU ARE REQUIRED TO CHOOSE ONE IN THE FLIGHT PLAN BY THE NAA RULES



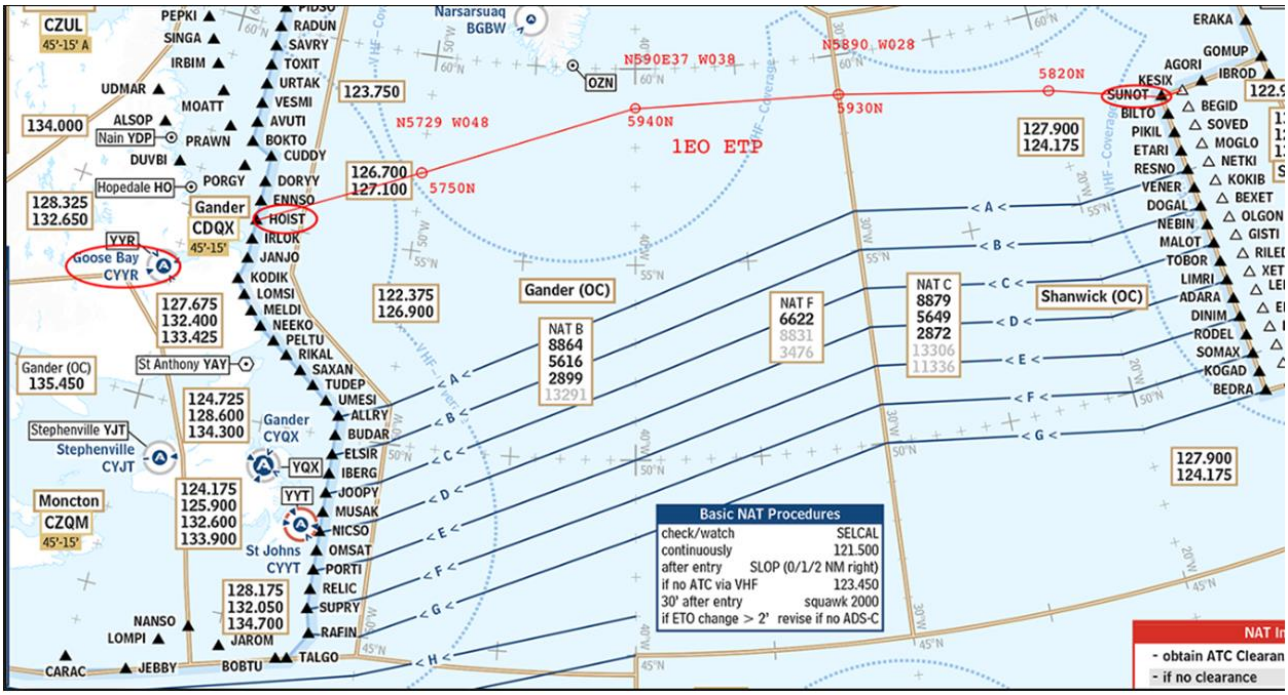
```
192002 EGGXZOZX
(NAT-2/3 TRACKS FLS 310/390 INCLUSIVE
APR 20/1130Z TO APR 20/1900Z
PART TWO OF THREE PARTS-
D DINIM 50/20 49/30 46/40 44/50 BOBTU JAROM
EAST LVLS NIL
WEST LVLS 310 320 350 360 370 390
EUR RTS WEST NIL
NAR NIL-
E SOMAX 49/20 48/30 45/40 43/50 JEBBY CARAC
EAST LVLS NIL
WEST LVLS 310 320 350 360 370 390
EUR RTS WEST NIL
NAR NIL-
F BEDRA 48/20 47/30 44/40 42/50 42/60 DOVEY
EAST LVLS NIL
WEST LVLS 310 320 350 360 370 390
EUR RTS WEST NIL
NAR NIL-
G OMOKO 48/15 47/20 46/30 43/40 41/50 41/60 JOBOC
EAST LVLS NIL
WEST LVLS 310 320 350 360 370 390
EUR RTS WEST NIL
NAR NIL-
H ETIKI 47/15 46/20 45/30 42/40 40/50 SOORY
EAST LVLS NIL
WEST LVLS 310 320 350 360 370 390
EUR RTS WEST REGHI
NAR NIL-
END OF PART TWO OF THREE PARTS)
```

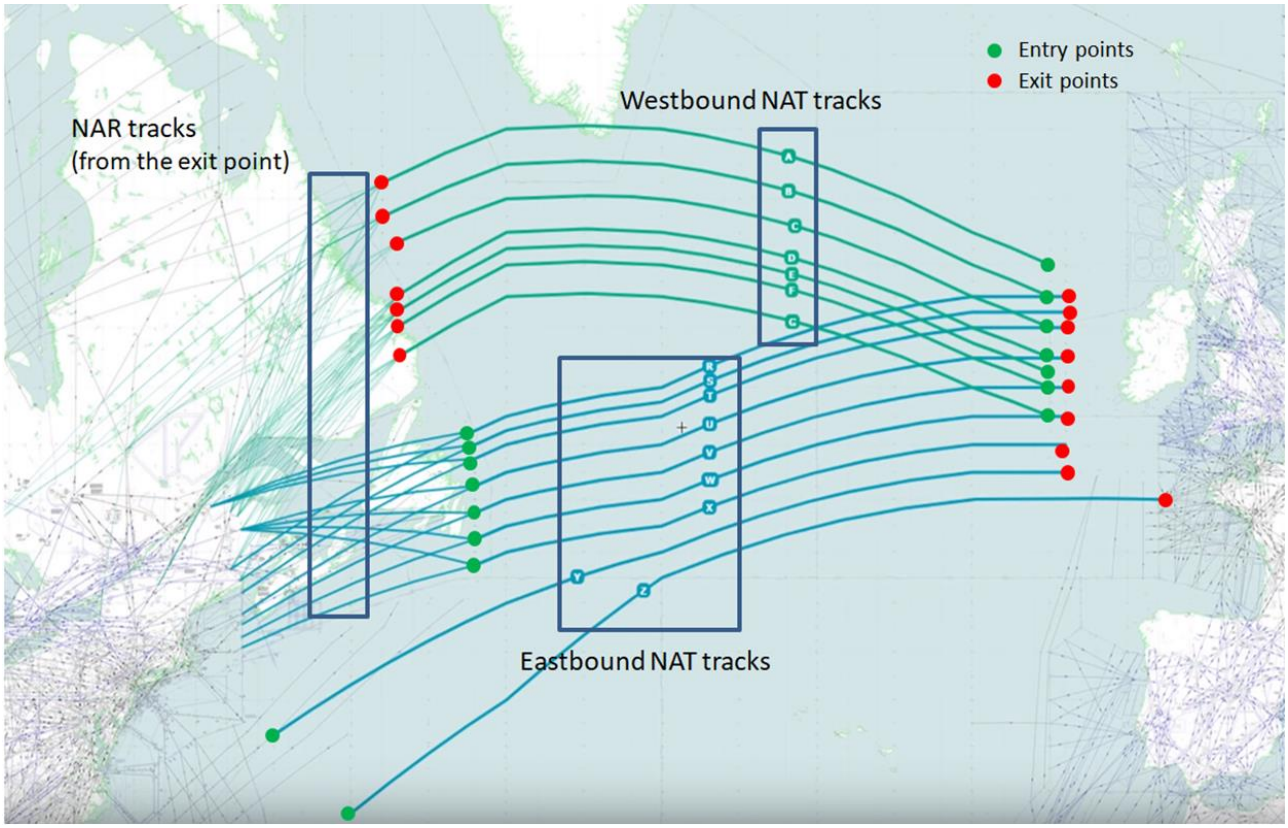


```
192002 EGGXZOZX
(NAT-3/3 TRACKS FLS 310/390 INCLUSIVE
APR 20/1130Z TO APR 20/1900Z
PART THREE OF THREE PARTS-
J 41/40 38/50 35/60
EAST LVLS NIL
WEST LVLS 320 340 360 380
EUR RTS WEST NIL
NAR NIL-
REMARKS.
1. TMI IS 110 AND OPERATORS ARE REMINDED TO INCLUDE THE
TMI NUMBER AS PART OF THE OCEANIC CLEARANCE 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
NO ASSIGNED PBCS TRACKS
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.
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.-
END OF PART THREE OF THREE PARTS)
```



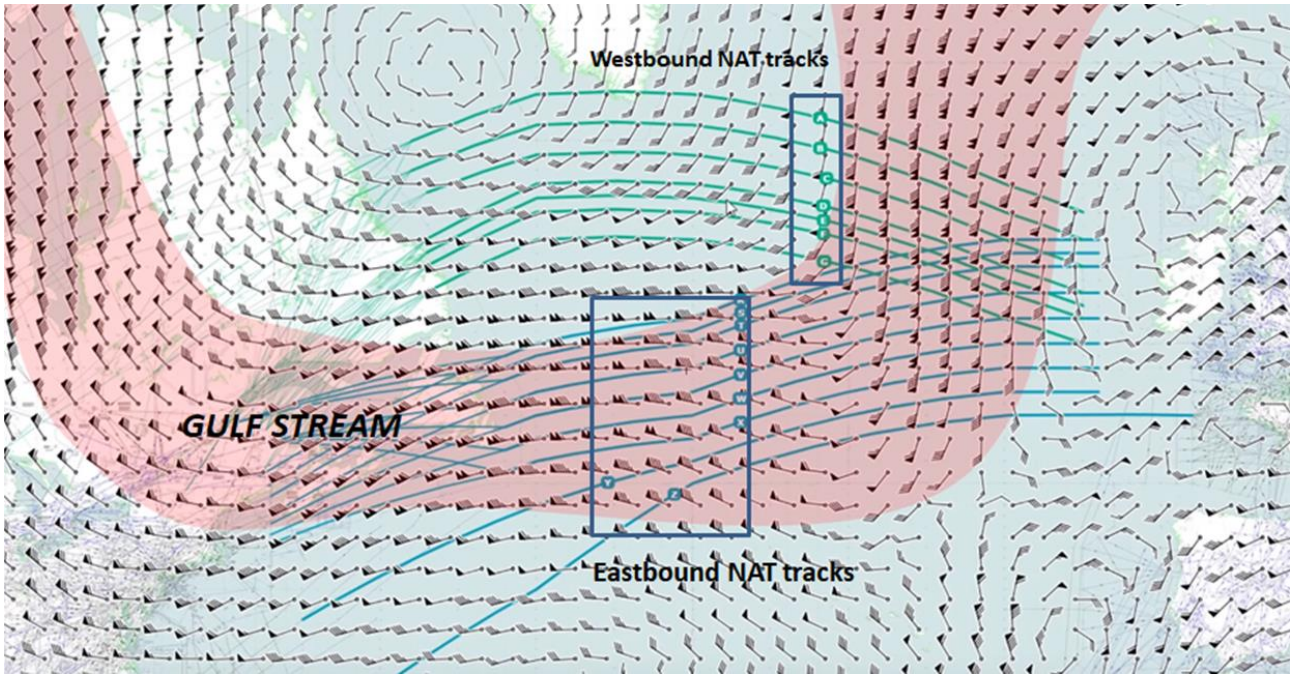
NAT Tracks example:





Nat Tracks are chosen day by day and published following the main wind stream west to east and east to west and studying how to avoid the jet stream turbulence evolution. The objective is to have the best tailwind and/or less head wind.

Example of NAT track overlapped with the weather situation



The **eastbound NAT tracks** try to follow the Gulf Stream
The **westbound NAT tracks** try to avoid it passing north of the eastbound tracks

3.2 Random Track System

Random tracks are basically handmade routes across the North Atlantic, using Lat/Lon waypoints, just like the NATs.

Random tracks are used for routes where the NATs are not suitable, such as flights from eastern Canada/USA, to the Scandinavian countries, or southern Europe, who will most probably not transit via the Shannon (EINN), Scottish (EGPX), London (EGTT) or Brest (LFRR) Flight Information Regions.

In general, you have to file a Random Route when you do not fly an OTS NAT Track.

Examples of random tracks:

- Westbound flight during the European night (eastbound NAT tracks out of their time of validity): you have to file a random route
- Eastbound flight during the European day (westbound tracks out of their time of validity): you have to file a random route
- Flights above F400 (eastbound) and/or F390 (westbound) you have to file a random route
- A route fully out of the NAT tracks during their time validity: you have to file a random route
- However random tracks which cross through, or come within 120 miles of the NATs, will not be accepted. Aircraft flying these routes are expected to file a NAT track.

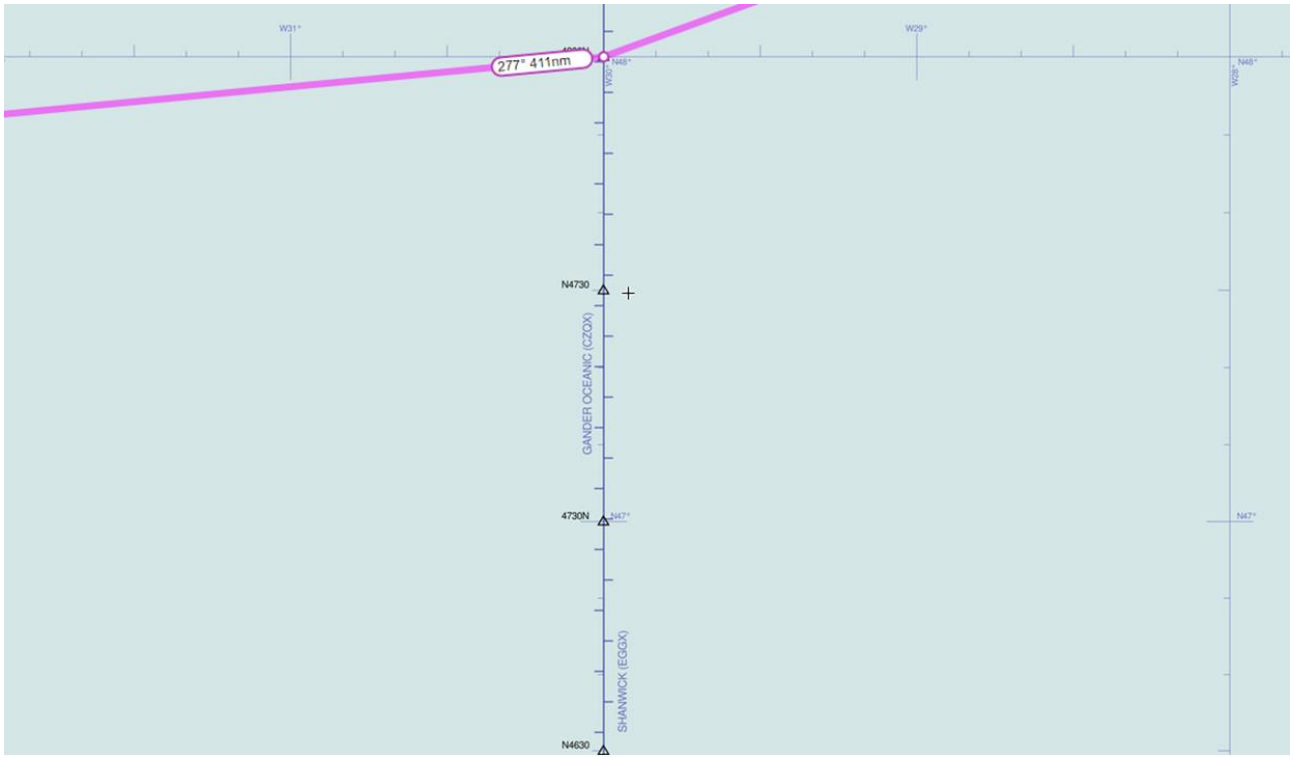
3.2.1 NAT Track Time of Validity

Random tracks are also used when the time of the flight is out of the valid period of the NAT tracks.

It is necessary to check if your flight will be within or out of a NAT track validity time.

It is the pilot's responsibility to check if the aircraft will cross the 30° west meridian (in the middle of the Atlantic Ocean), that is the separation between the GENDER (CZQX) and SHANWICK (EGGX) at the UTC time within or out of the validity of the chosen NAT track (eastbound or westbound). If your flight crosses this point within the validity of the NAT track, you can fly a NAT track, otherwise you have to fly a Random route (using the same point if you like but the notation in the flight plan will follow the random route notation and not the NAT track notation).

NAT track 30°W Meridian Crossing Point:



3.3 TANGO routes

When the French Controllers go on strike (which is often!) the airspace surrounding France becomes of high interest to international operators, especially the North-South routes within Shanwick's airspace.

There are three very useful routes if you happen to be flying North-South. With the changes in February this year from MNPS to HLA, the normal confusion over what is required to operate on T9, T16, and T213 ('The Three Sisters'), has increased further. Let's try to get all the specifics in a row.

Tango 9 LASNO-BEGAS
The most popular of the three – often chock full of holiday traffic between Northern Europe and the Canaries. Requirements:

- HF Radio. One is sufficient (but in VATSIM/IVAO we use the VHF).
- An Oceanic Clearance. Get it from Shanwick at least 30 minutes before you arrive at the boundary, 60 minutes is the best target time. (refer to ATC comm paragraph)
- At least one LRNS/Long Range Nav System
- HLA Approval if you want to fly above FL285.

Tango 213 TAMEL-BERUX

- HF Radio. One is sufficient (but in VATSIM/IVAO we use the VHF).
- An Oceanic Clearance. Get it from Shanwick at least 30 minutes before you arrive at the boundary, 60 minutes is the best target time. (refer to ATC comm paragraph)
- Two LRNS/Long Range Nav Systems
- HLA Approval if you want to fly above FL285.

Tango 16 OMOKO-NAVIX

- HF Radio. One is sufficient (but in VATSIM/IVAO we use the VHF).
- An Oceanic Clearance. Get it from Shanwick at least 30 minutes before you arrive at the boundary, 60 minutes is the best target time, or Santa Maria if you're going north (refer to ATC comm paragraph)
- Two LRNS/Long Range Nav Systems
- HLA Approval if you want to fly above FL285.

Key Points:

- You probably won't get the level that you want – either because the airway itself is busy, or because you're crossing a bunch of East-West NAT Traffic. If the rest of your Flight Plan shows FL380, plan FL320 for most of the Tango portion – especially T9.
- You need a HF radio to enter Shanwick FIR, period. There are no exceptions.
- You need HLA Approval to use the routes at FL290 and above, same goes for RVSM.

Operating Tips:

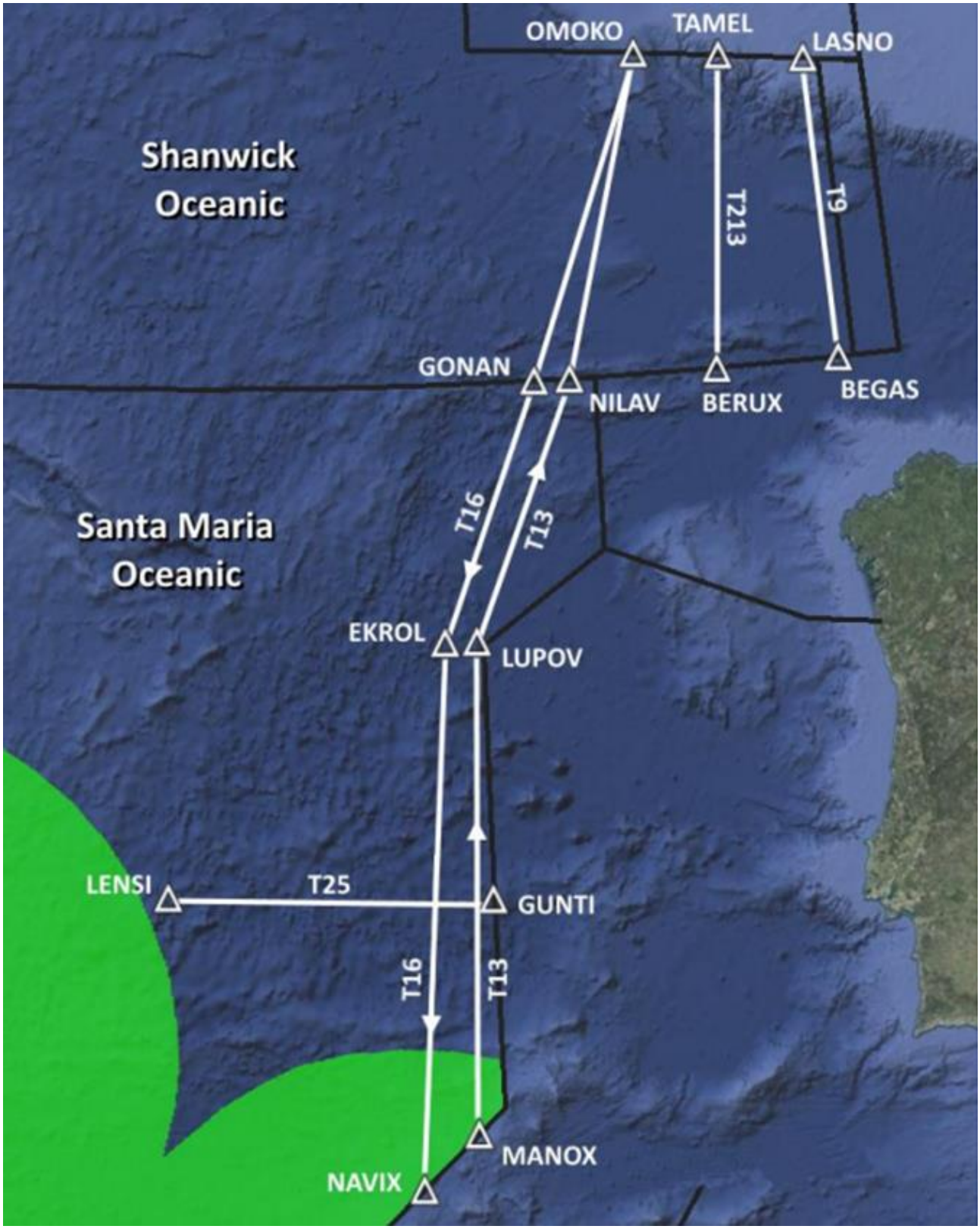
- You can make an Oceanic request by Data-link (ACARS), Clearance delivery – 127.65 VHF, 123.95 VHF or via HF (Frequencies vary on the day, but 5598 is normally a safe bet). (In VATSIM/IVAO we use the VHF).
- If you get a low Flight Level for the Oceanic Route, Shanwick are happy for you to check in again closer to the boundary and see if higher is now available.
- Entering the Oceanic Airspace, make a full position report: Position and time/flight level/ Next position and estimate for that point/Following position
- Don't make a full exit position report when you enter domestic airspace, just callsign and "Approaching LASNO, FL370". Exception: Santa Maria likes one.
- Shanwick and Santa Maria are outside the IFPS zone, so copy flight plans to EGGXZOZX and LPPOZOZX – failure to do so will delay getting an Oceanic clearance.
- No contact on HF? Relay on 123.45, or Sat Phone EGGX 423201 or EIAA 425002.

From Shannon ATC

Thanks to Shannon ATC for adding this useful information for crews operating on the Tango Routes:

- EICK Departures via T9/T213/T16 should get their Oceanic clearance prior to departure – ask the Tower 45 minutes ahead of time.
- All other EI/Irish departures can request clearance when airborne. For info, the earlier crews request their clearance the better, as it means they are more likely to get a better level and it allows ATC to plan for getting the aircraft to that level.
- Important: Due to the risk of two aircraft using the same squawk leading to a mis-ident, Northbound traffic entering SOTA via T9, LASNO or T213, TAMEL should squawk 2000 at least 10 minutes prior to the Irish boundary.

TANGO Routes, connecting the North-South West of France, Portugal, Morocco



3.4 Flight Planning

The first distinction to be made is whether it is necessary to plan a flight along the **OTS NAT tracks** or to use a **Random Route** (refer to the previous paragraphs).

Once you have determined what type of route to follow, you have to set the flight plan.

These are the main official rules from the North Atlantic MNPS Airspace Operations Manual:

4.2.1 ***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 organized track be defined in Item 15 of the flight plan using the abbreviation 'NAT' followed by the code letter assigned to the track.*

4.2.2 Flights wishing to join or leave an organized track at some intermediate point are considered to be random route aircraft and full route details must be specified in the flight plan. ***The track letter must not be used to abbreviate any portion of the route in these circumstances****.*

4.2.3 The planned Mach Number and flight level for the organized track should be specified at either the last domestic reporting point prior to oceanic airspace entry or the organized track commencement point.

4.2.4 Each point at which a change of Mach Number or flight level is planned must be specified by geographical co-ordinates in latitude and longitude or as a named waypoint.

4.2.5 For flights operating along the whole length of one of the organized tracks, estimates are only required for the commencement point of the track.

3.4.1 Flight Planning using the OTS NAT Tracks

The flight plan route can be divided into 3 sections:

- **Section 1: Domestic route from the departing airport to the entry point of the planned NAT track**
    - If you fly westbound (from Europe to USA) there are not specific rules to follow so you will use the waypoints and airways available from the departing airport to the entry point
    - If you fly eastbound (from USA to Europe) **it is mandatory to follow the NARs** to link the domestic flight to the entry point
- **Section 2: The NAT track from the entry point to the exit point**
- **Section 3: The domestic route from the exit point to the destination airport (with intermediate domestic waypoints)**
    - If you fly westbound (from Europe to USA) **it is mandatory to follow the NARs** to link the exit point inbound the destination airport
    - If you fly eastbound (from USA to Europe) there are not specific rules to follow so you will use the waypoints and airways available to link the exit point to the destination airport

Additional information

- It is mandatory to specify the True Airspeed (TAS) and cruise FL in the domestic flight up to the Entry Point in Section 1
- It is mandatory to specify the Mach Speed and the initial FL in the Oceanic Airspace in Section 2
- It is mandatory to specify the True Airspeed (TAS) and cruise FL in the domestic flight after the exit point in Section 3

Example EGLL-KJFK from London Heathrow to New York JFK

The route as proposed by **Simbrief** is:

```
EGLL/09L CPT4K CPT UL9 SLANY DCT DOGAL NATG ELSIR N320A EBONY J573 ENE
PARCH3 KJFK/22R
```

Dividing it into the 3 sections you can read:

Sec.1: Domestic flight wpts Europe

```
EGLL/09L CPT4K CPT UL9 SLANY DCT
```

Sec2: Entry point/NAT track/Exit point

```
DOGAL NATG ELSIR
```

Sec.3: Domestic flight USA **NAR**+wpts

```
N320A EBONY J573 ENE PARCH3 KJFK/22R
```

Now we can delete the departure and destination waypoints, delete the SID in EGLL (will be assigned by ATC), and add the additional information of Speed and FL adding a / and using the following notation:

```
N0450F320 CPT UL9 SLANY DCT DOGAL/M080F360 NATG ELSIR/N0460F380 N320A EBONY
J573 ENE PARCH3
```

N0450F320	N0450 is the TAS, F320 the cruise level in the domestic flight
DOGAL/M080F360	DOGAL is the entry point, M080 the cruise speed in Mach, F360 the cruise level in the oceanic flight
NATG	NAT G is the NAT track identified by the letter G
ELSIR/N0460F380	ELSIR is the exit point, N0460 the TAS and F380 the flight level in the domestic flight at destination.

This is your final flight plan to file in IVAO or VATSIM

Also, there should be a note of the TMI (refer to the TMI paragraph) of the NAT track in the Remark section. (Simbrief already proposes the correct NAT Track. If you want to check it or design your own route you can check the active NATs of the day and read the TMI here

Note that the exit point FL is higher than the entry point - we have supposed that having less fuel along the NAT we have changed (following the correct ATC procedure as described in this guide) to get a more efficient flight. To plan a FL change, a FL is a Pilot's decision (and it could be planned in advance) or it could be an ATC instruction for vertical separation along the route.

3.4.2 Random Route Flight Planning

A flight plan for a Random Route is similar to a flight plan for a NAT track. However, you have to:

- Specify all the waypoints or coordinates (in a Random Route you cannot refer to a NAT track letter)
- Select the coordinates/waypoints following specific rules described below

How to choose the waypoints/coordinates in a random route?

- Flights on a random route in a generally eastbound or westbound direction should normally be flight planned so that **specified ten degrees of longitude** (20°W, 30°W, 40°W, 50°W etc.) **are crossed at whole or half degrees of latitude**. If you are flying **north of the 70°** parallel you have to specify the oceanic waypoint each **20° instead of 10° of longitude** (meridians are narrow here)
- Entry into NAT airspace via one of the Oceanic Transition Areas (OTA) will be via a designated (named) Oceanic Entry Point (OEP). When the OEP is in proximity to a specified ten-degree meridian of longitude (20°W, 50°W, etc.), both the OEP and the meridian crossing point must be included in the route
- Flights which are generally northbound or southbound should normally be flight planned so that specified parallels of latitude spaced at **five-degree intervals** (65°N, 60°N, 55°N etc.) are crossed at whole degrees of longitude
- Random route points defined by latitude and longitude can either be expressed in a 7-character (46N050W) or 11-character (4730N03000W) format. However, the two formats cannot be mixed on the same flight plan.

How to indicate Speed and FL?

Like in the OTS Nat tracks, it is necessary to specify in the flight plan Speed and FL both in the domestic leg and the oceanic leg

Example of LFPG-TNCM route from Paris to Saint Maarten

```
N0450F330 LGL UN491 KOKOS UT120 BADUR UN585 REGHI UN480 ETIKI/M083F350
DCT 46N020W 44N030W/M083F370 41N040W 32N050W 20N060W DCT OBIKE/N0445F390
A516 PJM
```

You can recognize here the 3 sections with the additional information of speed and FL in yellow

Sec.1: Domestic flight wpts Europe

```
N0450F330 LGL UN491 KOKOS UT120 BADUR UN585 REGHI UN480
```

Sec2: Entry point/oceanic wpts/Exit point

```
ETIKI/M083F350 DCT 46N020W 44N030W/M083F370 41N040W 32N050W 20N060W DCT
OBIKE/N0445F390
```

Sec.3: Domestic flight wpts

```
A516 PJM
```

Note that in Section 2 there is a planned level change at a specified waypoint `44N030W/M083F370`

Note that there is no NAR route from the exit point because we are not flying in the North American airspace.

3.4.2.1 Setting coordinates in the flight plan

There are two methods you can use to file your coordinates correctly:

1. Degrees only (7 characters) Two figures describing latitude in degrees followed by "N" (North) or "S" (South), followed by three figures describing longitude in degrees followed by "E" (East) or "W" (West). Where necessary, make up the correct number of figures by the insertion of zeros (e.g. 46N050W).

2. Degrees and minutes (11 characters) Four figures describing latitude in degrees and tens and units of minutes followed by “N” (North) or “S” (South), followed by five figures describing longitude in degrees and tens and units of minutes followed by “E” (East) or “W” (West). Where necessary make up the correct number of figures by inserting zeros (e.g. 4620N05005W).

Common errors

It is often observed that a mixture of the above is used e.g.- 46N05450W, 5455N030W, and also only 5 characters e.g. 4540N. These are not acceptable formats.

3.4.2.2 Flight Levels on Random Routes

On a Random Route, as a general rule, the Flight Levels follow the semi-circular rule; eastbound odd levels, westbound even levels.

However, as reported in the Transport Canada Aeronautical Information Manual NAT-North Atlantic (NAT) Operations, there is an exception that must be respected, considering that in the air space between Canada, Iceland and Europe, the prevailing traffic follows the NAT Tracks (in the European daylight hours towards the west, from Europe to the USA, at night European, from the USA to Europe). During the hours of NAT track validity, Random Routes must also follow the same odd or even flight levels.

NOTE: Pilots planning to conduct a flight wholly or partly outside the OTS should indicate in the flight plan the cruising level(s) appropriate to the direction of flight. The exceptions are:

- Within the Gander/Shanwick OCAs and the Reykjavik CTA, during the westbound OTS (valid from 1130 to 1900 UTC at 030˚W), westbound aircraft may flight plan FL310 or FL 330
- During the eastbound OTS (valid from 0100 to 0800 UTC at 030˚W), eastbound aircraft may flight plan FL340 or FL380.

3.4.2.3 Requirements for Flight Plans on Random Route segments at/or south of 70 degrees North

For flights operating at/or south of 70N, the planned tracks shall normally be defined by significant points formed by the intersection of half or whole degrees of latitude with meridians spaced at intervals of 10° from the Greenwich meridian to longitude 70W.

The distance between significant points shall, as far as possible, not exceed one hour's flight time. Additional significant points should be established when deemed necessary due to aircraft speed or the angle at which the meridians are crossed (e.g. at intervals of 10° of longitude between 5W and 65W).

(a) For flights operating along the fixed ATS route network between Canada, the United States, Bermuda and the CAR Region, the track shall be defined by appropriate reference to this route network.

(b) Eastbound flights departing Keflavik shall file their route via OSKUM if crossing 010W between 64N and RATSU inclusive.

(c) These flights shall not file their route via ALDAN.

(d) Eastbound flights departing Reykjavik shall file their route via MOXAL if crossing 010W between 64N and RATSU inclusive.

3.4.2.4 Requirements for Flight Plans on Random Route segments north of 70, and at/or south of 80 degrees North

The planned tracks shall normally be defined by significant points formed by the intersection of parallels of latitude expressed in degrees and minutes with meridians normally spaced at intervals of 20° from the Greenwich meridian to longitude 60W, using the longitudes 000W, 020W, 040W and 060W.

The distance between significant points shall, as far as possible, not exceed one hour's flight time.

Additional significant points should be established when deemed necessary due to aircraft speed or the angle at which the meridians are crossed (e.g. at intervals of 20° of longitude between 10W and 50W).

However, when the flight time between successive significant points is less than 30 minutes, one of these points may be omitted.

For flights whose flight paths at or south of 80N are predominantly oriented in a north-south direction, the planned tracks shall normally be defined by significant points formed by the intersection of whole degree of longitude with specified parallels of latitude which are spaced at 5°.

3.4.2.5 Requirements for Flight Plans on Random Route segments north of 80N degrees North

The planned tracks shall be defined by points of intersection of parallels of latitude expressed in degrees and minutes with meridians expressed in whole degrees. The distance between significant points shall, normally equate to not less than 30 and not more than 60 minutes of flying time.

3.4.3 ETOPS

3.4.3.1 History and Definition

The ICAO coined the acronym for Extended Twin Operations for twin-engine aircraft operation further than one hour from a diversion airport at the one-engine inoperative cruise speed, over water or remote lands, on routes previously restricted to three- and four-engine aircraft.

As aircraft reliability and range improved, it became clear that all multi turbine-engine aircraft were pushing the boundaries of flight away from nearby alternates to increasingly distant ones and a review of the existing arrangements for ETOPS began.

Many years of discussion led, in 2012, to changes to ICAO Annex 6 Part 1 under Amendment 36. This introduced the *Extended Diversion Time Operations (EDTO)* regime in place of ETOPS. However, since then, although the EDTO regime has been widely accepted, the term EDTO has not been universally adopted the continued use of ETOPS is explicitly allowed for in Annex 6, provided that EDTO concepts "are correctly embodied in the concerned regulation or documentation".

Annex 6, and particularly Attachment D to that Annex, now contains guidance on extended range operations for **all turbine-engine airplanes** which are conducted **beyond 60 minutes** from a point where it is possible to fly to an en-route alternate aerodrome.

The main change is that a distinction is drawn between such operations which do not exceed an established *'Threshold Time'* defined as *"the range, expressed in time, established by the State of the Operator to an en-route alternate aerodrome, whereby any time beyond it requires an EDTO approval from that State".*

This means that ETOPS (old name for the new type of certificate EDTO) today stands for ***E**x**T**ended **OP**erations **S**tandards* and applies to all multiengine aircraft. It is expressed in minutes (120/180/ maximum today is 330), is valid for a specific State of Registration and validated capability of the aircraft to fly in critical conditions (not only a One Engine Failure, but also Cargo Fire Suppression, Fuel Reserve, Maintenance, Passenger Recovery Plan and others) up to an alternate airport.

Because the ETOPS certification is related to the equipment of a specific aircraft, it is possible to have two different aircraft of the same type (e.g. 737NG or A320) with a different ETOPS certification, released by the same State of Registration.

The ETOPS for some aircraft:

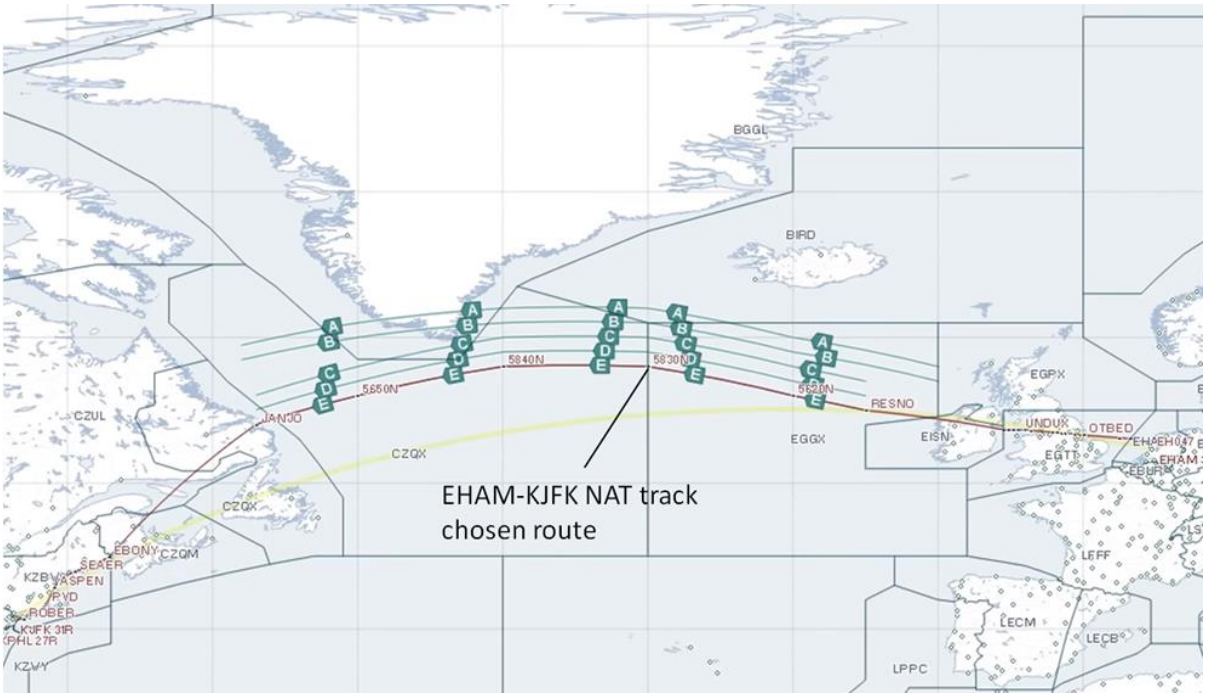
Boeing 737NG	120min - 180 min (depending of the State of Registration)
Airbus A320 family	120min - 180 min (depending of the State of Registration)

3.4.3.2 ETOPS in the flight plan

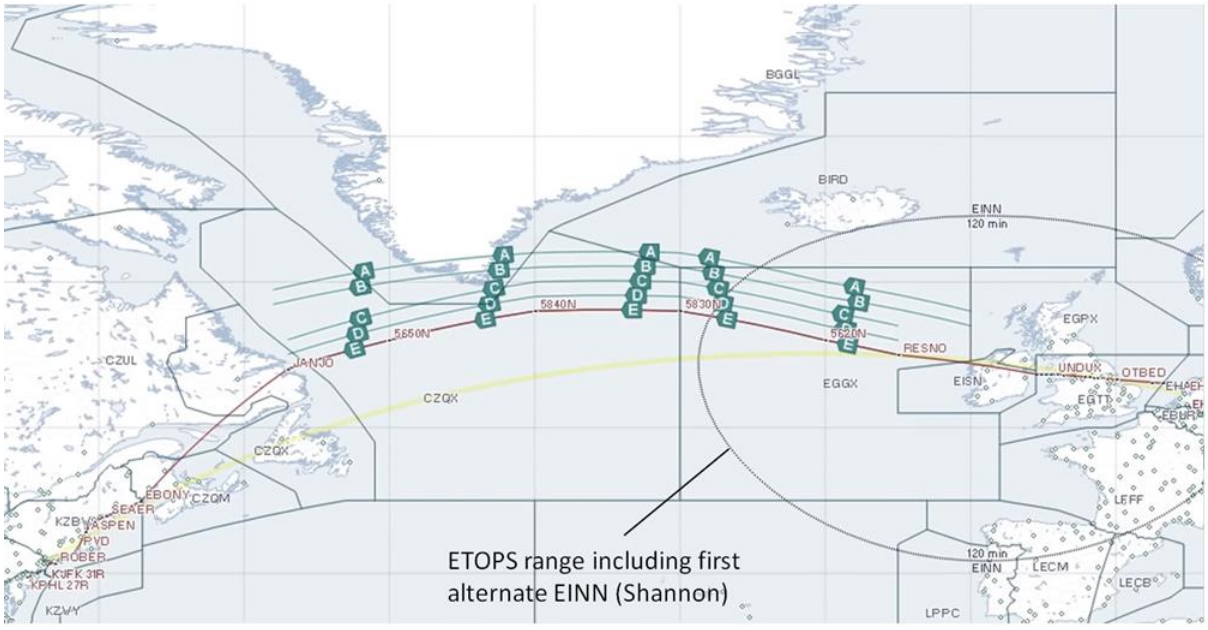
When you create an Oceanic flight plan it is necessary to identify the alternate airports that are in range (in minutes) with the ETOPS certification of your aircraft.

In the following example we examine the ETOPS verification for a flight EHAM-KJFK for an aircraft with an ETOPS certification of 120 minutes.

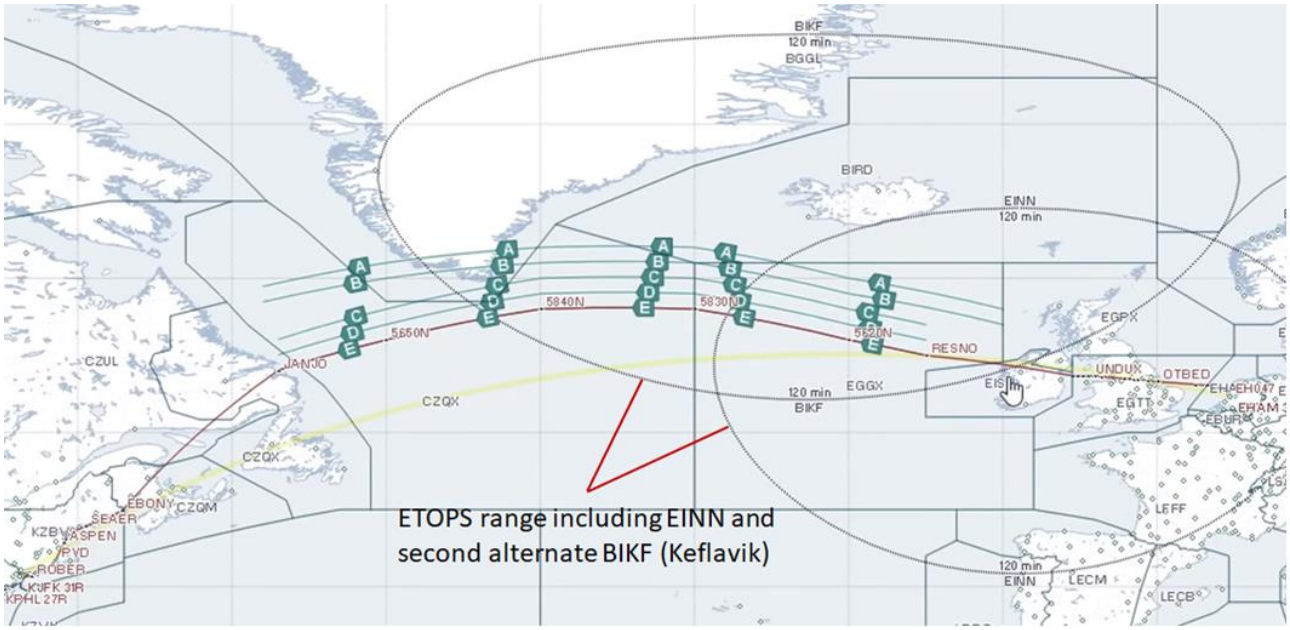
Route EHAM-KJFK



First alternate westbound is typically EINN and the 120 range shows the area covered by the ETOPS certification.

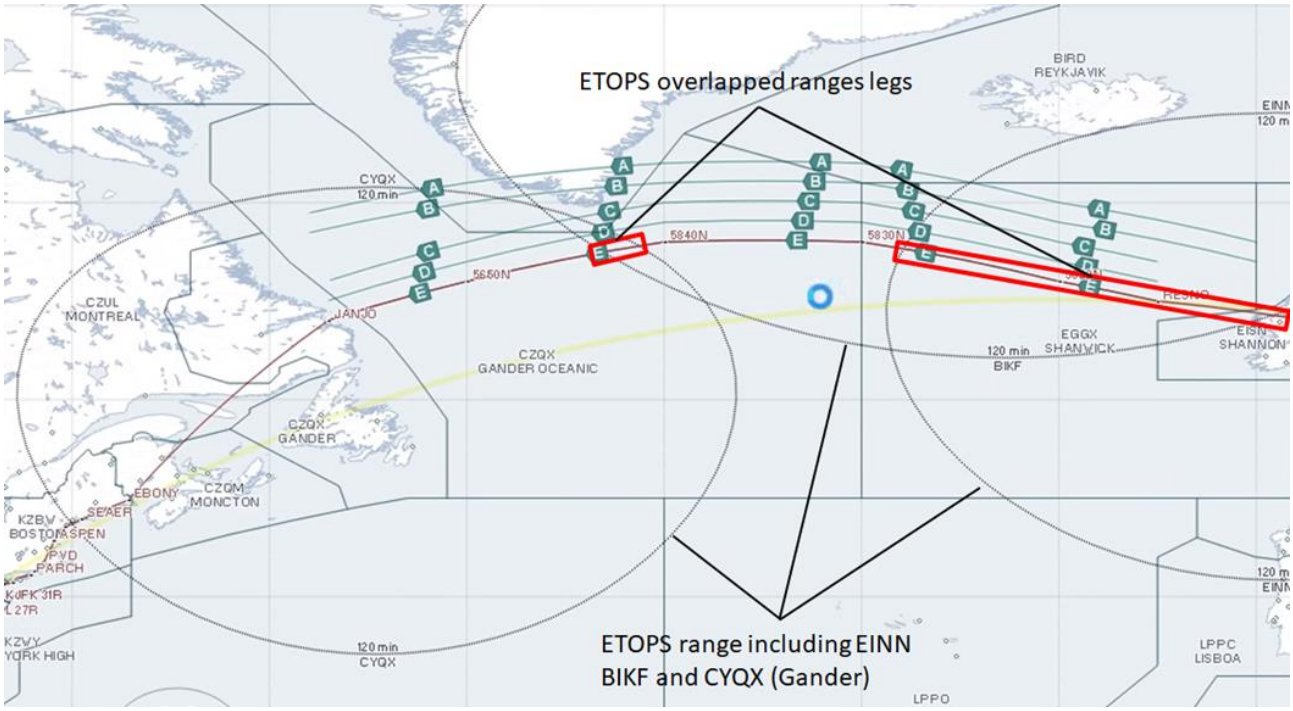


Second alternate is BIKF the two 120 range circles that show the area covered by the ETOPS certification:



Choosing the Third alternate CYHZ a leg is not covered by the ETOPS range circles. In this case it is necessary to change the route or to change the alternate.

Choosing CYQZ (Gander) the ETOPS range circles are now all overlapped:



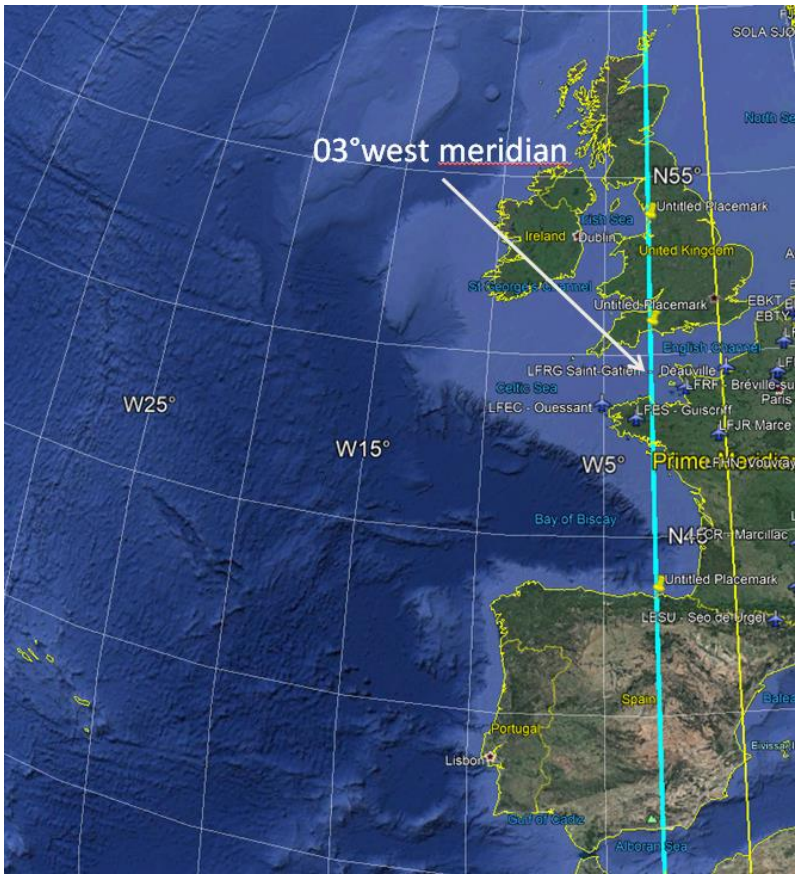
When the ETOPS ranges are all overlapped, the flight plan is compliant with the ETOPS rules. At any point of the route there is now at least one alternate airport for a diversion in case of a failure. The overlapped legs represent the portions of the route where the pilot can decide between two alternate airports.

As a general rule the decision is taken after considering the alternate airport's facilities in relation to the emergency, the distance and the winds.

4 ATC Communication

The ATC communications for an Oceanic flight are quite different from a domestic flight. In particular:

- The departure ATC delivery will deliver the clearance only until the entry point;
- The Oceanic clearance is delivered by the OAC of the entry point (refer to the oceanic map: Shanwick OCA (westbound clearance), Reykjavik OCA, Bodo OCA, Santa Maria OCA, Gander OCA (eastbound clearance), New York OCA);
- The Oceanic clearance must be asked for at least 30 min before the entry point. If the departure airport is nearby the entry point, the delivery will be obtained on the ground at the departure airport (in this case it is the ATC delivery that will address you to the OAC for the Oceanic delivery). In particular:
    - Westbound route: if the departure airport is **west of 03°W**, ask Oceanic clearance on the ground.
    - Westbound route: if the departure airport is **east of 03°W**, ask for it whilst in the air 30 min before the entry point.
    - **If ATC do not send you to the OAC for the Oceanic Delivery remember that it is your responsibility to ask for it!**



This means that the delivery could be an enroute delivery or on the ground delivery. In any case, the ATC (on the ground or enroute) will address for the Oceanic clearance and, after obtained, you will switch back to the previous ATC.

In addition to the delivery communication, the Oceanic flight requires a position report: it allows the ATC to check your position to control the proper vertical/longitudinal separation.

4.1 The IFR Clearance (Domestic and Oceanic Communication)

Following the example flight EGLL-KJFK:

```
N0450F320 CPT UL9 SLANY DCT DOGAL/M080F360 NATG ELSIR/N0460F380 N320A EBONY
J573 ENE PARCH3
```

The communications are:

4.1.1 Domestic ATC clearance

***Pilot**: Heathrow Delivery, good day, Skyways1234, Boeing 747, Stand 545 with information Echo, QNH 1013, requesting IFR clearance.*

***ATC**: Skyways1234, Heathrow Delivery, good day, cleared to DOGAL via Compton 3G departure, Squawk 1140*

***Pilot:** Cleared to DOGAL via Compton3G departure, Squawk 1140, Skyways1234*

***ATC**: Skyways1234, Readback correct, contact Ground on 121.9*

***Pilot:** ground to 121.9, Skyways1234*

4.1.2 Oceanic Clearance

If not obtained whilst on the ground, the Oceanic clearance must be asked for after departure, checking the ETA at the Entry point, DOGAL.

You need to call NO LATER THAN 30 minutes before the entry point to get your clearance. If you are inside an Area Controller's sector, do not worry, the Area Controller will be fully aware of you needing the clearance and will release you or instruct you to ask the ATC to address the OCA.

***Pilot**: Skyways1234 request frequency change to Shanwick for Clearance.*

***ATC:** Skyways1234, that is approved, report back*

***Pilot:** Wilco, Skyways1234*

Note, before you call Shanwick please make sure you have the following details ready at hand:

- *Aircraft type*
- *Requested Track and TMI number (Track and TMI here https://blackswan.ch/northatlantictracks) **The TMI number is just the Julian calendar number - that is the number of the day in the current year***
- *Requested Flight level*
- *Requested Speed in Mach*
- *Estimated time at the Entry Point*
- *Maximum flight level possible in case level of choice is unavailable*

Pilot: *Shanwick, good day Skyways1234.*

ATC: *Skyways1234, Shanwick, standby*

IMPORTANT NOTE: If the controller of either Delivery or Radio says Standby:
The Controller will call you when he is ready to take your details, you need to wait for him to be ready.
DO NOT ACKNOWLEDGE THE STANDBY!

ATC: *Skyways1234, pass your message*

Pilot: *Skyways1234, Boeing 747, inbound DOGAL, Estimating DOGAL at 1500Z, Request New York via Track GOLF, Flight level 360, Mach decimal 80,* [optional] *and maximum Flight level 370 (or able to FL370),* [optional] *SELCAL HJ-BL*

Note that you are not obliged to include the TMI in the request (it should be included in the remarks section of your flight plan). By specifying a NAT track letter, ATC is aware that you are asking for a NAT track valid for the specific day/time.

ATC: *Skyways1234, roger your request, standby*

ATC: *Skyways1234, I have your oceanic clearance, advise ready to copy.*

Pilot: *Skyways1234, pass your message (or ready to copy)*

ATC: *Shanwick clears Skyways1234 to Kennedy via DOGAL, NAT Track GOLF, TMI 110 Flight level 360, Mach decimal 80, cross DELOG not before 1455Z,* [optional] *SELCAL check EF-LQ coming up*

*Note that the controller may impose a **time restriction** on your crossing of the Entry Point. This can be achieved by making use of the FMC Progress page where you will set the time of arrival at a specific waypoint (refer to your FMC instructions). A time restriction will only be issued if there is heavy traffic. Nevertheless, it is your responsibility to advise the controller of any ETA Changes of more than 3 minutes early or late. You will have to inform the domestic ATC of the restriction if unable to comply (e.g. too little space to reduce speed to respect the time constraint). ATC will help you in this case.*
You should do so either by private chat or by Voice, NEVER by text on frequency as this will most likely be lost.

Optionally, you can declare your maximum FL so that OAC can give you a different FL in the clearance. Also, as an option, you can declare your SELCAL. In this case OAC will send you a test for the SELCAL.

Pilot: *Skyways1234, [optional] SELCAL checked, cleared to Kennedy via DELOG, NAT Track GOLF, TMI 110*, Flight level 360, Mach decimal 80 and DELOG not before 1455Z*

** If the TMI number is included in the read-back, there is no requirement for the pilot to read back the NAT Track co-ordinates even if the cleared NAT Track is not the one which was originally requested. What OAC wants to be sure of is that you have the correct coordinates of the NAT Track. To do this you can readback all the coordinates or confirm the TMI number as given by the OAC. If you specify the TMI number, OAC is aware that you have all the coordinates onboard.*

If any doubt exists as to the NAT Track co-ordinates, the pilot should request the complete track co-ordinates from the OAC. Similarly, if the pilot cannot correctly state the TMI, the OAC will read the cleared NAT Track co-ordinates in full and request a full read back of those co-ordinates.

ATC: *Skyways1234, read back is correct, return to previous frequency, (or return with domestic) good day.*

Then call the previous frequency.
Along the way Shannon will likely ask you whether you have your clearance, which you must acknowledge and also give him the details of the clearance. He needs to know so that he is eventually able to climb you to your appropriate level in good time.
Shortly before DELOG, you will be instructed to call Shanwick.

ATC: *Skyways1234, Report DELOG to Shanwick radio on 12790 kilohertz, good day.* *(We will use the VHF frequency instead)*

Pilot: *DELOG to Shanwick on 12790 kilohertz, Skyways1234.*

NB. The real radio station works on HF, this cannot be implemented on IVAP (in the IVAO network), however it's still called Kilohertz.

4.2 Position Report

When you are nearby the Entry Point (DELOG in our example) you should be carrying out the following actions:

- Bring up the progress page in the FMC. There you will find all the information the Controller requires from you for the position reports.
- You need to report:
  - each time you pass a waypoint/coordinate **or** 45 Minutes after your last contact, whichever occurs earlier.
  - In case of a FL change.
- When you call Shanwick you only state your callsign and "Position report" for a report or "Request" if you have a request.

Pilot: *Shanwick Radio, Skyways1234 good morning, with Position Report.*

ATC: *Skyways1234, Shanwick Radio, Pass your message.*

Pilot: *Skyways1234 has passed [or inbound or overhead] DELOG at 1501Z, Flight level 360, Mach decimal 80, estimating 53 North, 20 West at 1522Z, 53 North, 30 West is next.*

ATC: *Skyways1234 has passed DELOG at 1501Z, Flight level 360, Mach decimal 80, estimating 53 North, 20 West at 1522Z, 53 North, 30 West is next.*

--- Check and correct the controller if necessary, using "negative, I say again" ---

Pilot: *Readback correct, Skyways1234*

As an alternative, the Pilot can also ask -

Pilot: *Readback correct, Skyways1234, and we request a SELCAL check, code Delta Golf Foxtrot Papa [optional and if not asked before]*

ATC: *Skyways1234, roger checking on Delta Golf Fox Papa.*

The controller will put the code in his system and transmit, you will hear a gong if successful.

Pilot: *Skyways1234, SELCAL check ok.*

For more information on the SELCAL code, see the subsequent paragraph

You only need to check the SELCAL once.
After this you may put down your headphones, remember to report every 45 minutes!

Finally set Squawk 2000 in Oceanic airspace.

4.3 Leaving the Track

After Passing 50° West westbound or 20° West eastbound you will be handed over respectively to Gander Domestic Control or Shannon. You will be assigned a squawk; once Identified, you DON'T NEED TO report your position again.

4.4 Oceanic Clearance for Random Route

Following the example flight LFPG-TNCM:

```
N0450F330 LGL UN491 KOKOS UT120 BADUR UN585 REGHI UN480 ETIKI/M083F350
DCT 46N020W 44N030W/M083F370 41N040W 32N050W 20N060W DCT OBIKE/N0445F390
A516 PJM
```

The IFR clearance is the same with respect to the clearance limit, until the Entry Point, as is the deadline to obtain the Oceanic clearance: NO LATER THAN 30 minutes before the entry point.

Note that the flight plan reports a predefined FL change in the Oceanic leg.

After being asked to pass the message it goes as follows:

Pilot: *Skyways1234, Airbus 343, request clearance to Saint Maarten via random routing, EETIKI, 46 North 20 West, 44 North 30 West, 41 North 40 West, 32 North 50 West, 20 North 60 West, OBIKE, FL330, Mach decimal 83, estimating ETIKI at 1320Z*

ATC*: Skyways1234, roger, standby*

ATC: *Skyways1234, I have your clearance*

Pilot: *Go ahead, 1234*

ATC: Shanwick clears Skyways1234 to Saint Maarten via random routing, ETIKI, 46 North 20 West, 44 North, 30 west, 41 North, 40 West, 32 North, 50 West, 20 North, 60 West, OBIKE, FL330, Mach decimal 83.

Pilot: *Cleared to Saint Maarten via random routing, ETIKI, 46 North 20 West, 44 North, 30 west, 41 North, 40 West, 32 North, 50 West, 20 North, 60 West, OBIKE, FL330, Mach decimal 83, Skyways1234*

ATC: *Skyways1234, Readback correct, return to previous frequency.*

This concludes the section on North Atlantic Tracks.

4.5 Revised Estimate

It might happen that a given ETA to a specific waypoint for the position report is changed (e.g. due to a tail wind change. In this case, following the ICAO procedures as described below, you have to contact the OAC and communicate the variation.

Revised Estimate

After obtaining and reading back the Oceanic clearance or procedural report (see Section 4) the pilot should monitor the forward estimate for oceanic entry and if this changes by **3 minutes or more** should pass a revised estimate to ATC. As planned longitudinal spacing by these OACs is based solely on the estimated times over the oceanic entry fix or boundary, failure to adhere to this ETA amendment procedure may jeopardize planned separation between aircraft, thus resulting in re-clearance to a less economical track/flight level for the complete crossing; any such failure may also penalize following aircraft.

ACA865	*"Shanwick Radio, Air Canada 865 revised estimate"*
EGGX	*"Air Canada 865, Shanwick Radio, go ahead"*
ACA865	*"Revised estimate, Air Canada 865, 52 North, 020 West at 1606"*
EGGX	*"Shanwick copies 52 North, 020 West at 1606"*
ACA865	*"Correct"*

4.6 Flight Level Change

Asking for a level change in the OAC is slightly different from a domestic flight: there is no radar coverage so the controller cannot see you on the screen. The ATC communication becomes:

Pilot: *Shanwick, Skyways 123, request.*

ATC: *Skyways 123, pass your message.*

Pilot: *Request climb FL370, Skyways 123.*

ATC: *Skyways 123, climb FL370, report reaching.*

Pilot: *Climb FL370, will report reaching, Skyways 123.*

(a/c climbs)

Pilot: *Shanwick, Skyways 123, at FL370.*

ATC: *Skyways 123, copy.*

Basically, in descents/climbs a pilot needs to tell the ATC (well, ATC on VATSIM/IVAO, in reality it's the radio operator), when he reaches the new FL.

4.7 Change to the Flight Plan by ATC

When traffic levels are high, in order to maintain the correct vertical and horizontal separation, it is possible that the ATC cannot confirm to you the FL, or the speed or the entry point time or the entry point itself. In case of an entry point delay time, you might receive a revised estimate (refer to Revised Estimate paragraph).

In case of a different speed, flight level or entry point, the ATC communication becomes:

***Pilot**: Shanwick, Skyways 123, clearance request.*

***ATC:** Skyways 123, go ahead.*

***Pilot**: Request clearance to JFK via ROUTE FL370 M.84, estimating WYP 1407.*

***ATC**: Oceanic clearance with a level change, Shanwick clears Skyways 123 to JFK via ROUTE FL380 M.84.*

OR

***ATC:** Oceanic clearance with a speed change / entry point change / re-route*

5 SLOP (Strategic Lateral Offset)

ATC clearances are designed to ensure that separation standards are continually maintained for all traffic. However, the chain of clearance definition, delivery and execution involves a series of technical system processes and human actions. Errors are very rare but they do occur; neither pilots nor controllers are infallible.

Within an SSR environment the controller is alerted to such errors and can, using VHF voice communications, intervene in a timely fashion. This is not the case in Oceanic airspace, such as the North Atlantic, where the controller's awareness of the disposition of a significant proportion of the traffic is reliant largely upon pilot position reports through communication links utilizing HF or SATCOM Voice via third party radio operators. Furthermore, even among that proportion of traffic utilising data link for automated position reporting, and perhaps ATS communications, navigation errors continue to occur. Consequently, it has been determined that allowing aircraft conducting Oceanic flight to fly self-selected lateral offsets will provide an additional safety margin and mitigate the risk of traffic conflict when non-normal events such as aircraft navigation errors, height deviation errors and turbulence-induced altitude-keeping errors do occur. Collision risk is significantly reduced by the application of these offsets. These procedures are known as "Strategic Lateral Offset Procedures (SLOP)".

This procedure provides for offsets within the following guidelines:

- Along a route or track there will be three positions that an aircraft may fly: **centreline or one or two miles right** (using your FMC only if able)
- **Offsets will not exceed 2 NM right of centreline**
- Offsets **left of centreline must not be made**

Distributing aircraft laterally and equally across the three available positions adds an additional safety margin and reduces collision risk. Consequently, SLOP is now a standard operating procedure for the entire NAT Region and pilots are required to adopt this procedure as is appropriate. In this regard, it should be noted that:

a) Aircraft without automatic offset programming capability must fly the centreline.
b) Pilots of aircraft capable of programming automatic offsets should preferably not fly the centre line but rather elect to fly an offset one or two nautical miles to the right of the centre line in order to obtain lateral spacing from nearby aircraft (i.e. those immediately above and/or below). Pilots should use whatever means are available (e.g. ACAS/TCAS, communications, visual acquisition, GPWS) to determine the best flight path to fly.
c) An aircraft overtaking another aircraft should offset within the confines of this procedure, if capable, so as to create the least amount of wake turbulence for the aircraft being overtaken.

d) For wake turbulence purposes, pilots should fly one of the three positions shown above. Pilots should not offset to the left of centreline nor offset more than 2 NM right of centreline. Pilots may contact other aircraft on the air-to-air channel, 123.45 MHz, as necessary, to co-ordinate the best wake turbulence mutual offset option. (Note: It is recognised that the pilot will use his/her judgement to determine the action most appropriate to any given situation and that the pilot has the final authority and responsibility for the safe operations of the aircraft. As indicated below, contact with ATC is not required.
e) Pilots may apply an offset outbound at the oceanic entry point and must return to centreline prior to the oceanic exit point unless otherwise authorised by the appropriate ATS authority or directed by the appropriate ATC unit.
f) Aircraft transiting ATS Surveillance-controlled airspace mid-ocean should remain on their already established offset positions.
g) There is no ATC clearance required for this procedure and it is not necessary that ATC be advised.
h) Voice Position reports should be based on the waypoints of the current ATC clearance and not the offset positions.

6 SELCAL

In the real world, listening to the HF radio over the Oceanic airspace is really annoying due to the background noise. To avoid it you can set a SELCAL code.

SELCAL, or Selective Calling, is a signalling system used in conjunction with High Frequency (HF) radio communications. It is used to alert pilots communicating with ATC of an incoming radio message on HF. Each aircraft is assigned a 4 letter SELCAL code by ARINC (Aeronautical Radio Inc.), SELCAL equipment on board the aircraft monitors the HF radios for incoming signals and will generate an aural tone in the cockpit when the incoming signal matches the SELCAL code.

A SELCAL transmission consists of a combination of four preselected audio tones which takes approximately two seconds to transmit. The tones are generated by a SELCAL encoder at the ground stations and received by a decoder connected to the audio output of the aircraft receiver. SELCAL can relieve a flight crew from maintaining a listening watch on assigned frequencies, which can be especially helpful where ATC RTF still relies upon noisy HF channels.

Receipt of an assigned SELCAL code activates a flight deck call system which may be a light, an audible chime or both. On aircraft equipped with SELCAL, the flight crew can maintain a listening watch using either headsets or flight deck speaker.

Flight crews of aircraft with SELCAL equipment are advised to be alert to the potential for duplicated SELCAL codes and to listen closely to the Flight Identification (ID), as well as SELCAL, to avoid taking a clearance meant for another flight.

A SELCAL code is made up of two pairs of letters (4 letters), and respects the following rules:

- Only the letters A to S can be used.
- The letters I, N and O are not allowed.
- Duplicate letters in the same pair are not allowed (SEL/AABC or SEL/ABCC are not valid).
- The same letter in both pairs is not allowed (SEL/ABAC is not valid).
- The succeeding letter in the same pair must be higher than the preceding one (SEL/ACDB is not valid).
- Valid letters are: **A B C D E F G H J K L M P Q R S**

SELCAL example: **SEL/HJBL**

Wrong SELCAL code examples: ***SEL/AABC*** ***SEL/ABCC***

If you want to listen to a SELCAL code audio refer to this link

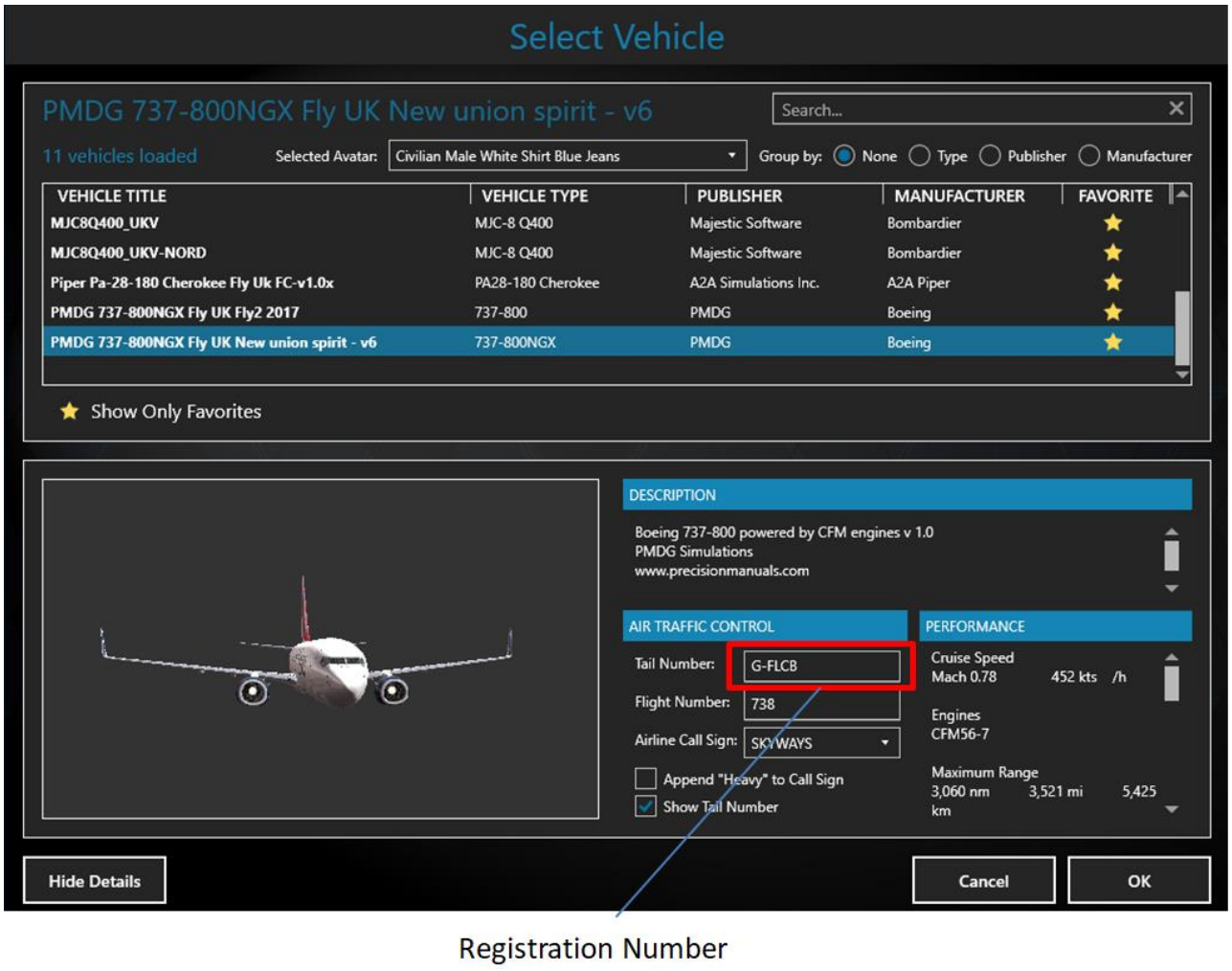
If you want to use SELCAL communications in an Oceanic flight, you need to enter both Registration and SELCAL code in the Flight Plan remarks. For VATSIM/FSD there is also a proper box to write the SELCAL only in the login page.

The Aircraft Registration Code can be read in the aircraft page of P3D (Tail Number)

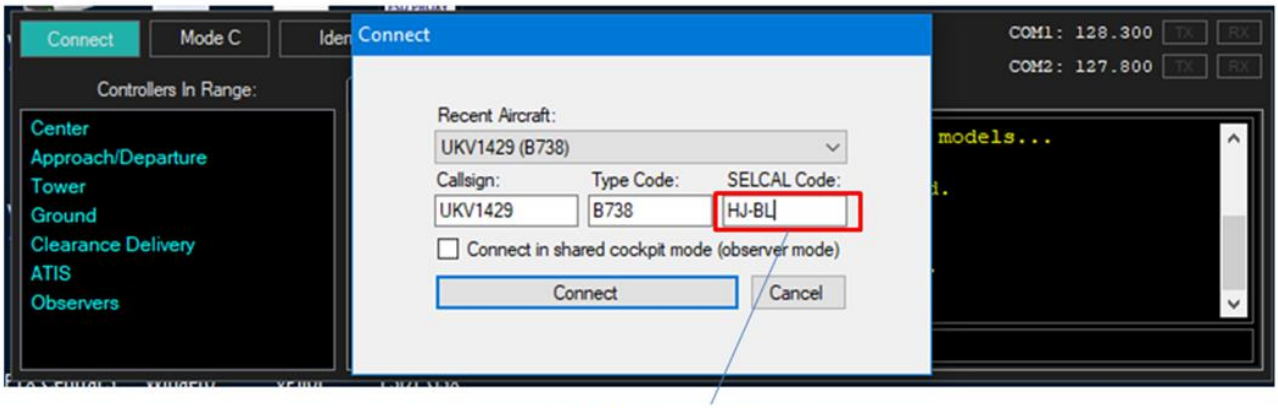
6.1 Setting the SELCAL on VATSIM FSD and IVAO

In IVAO you can write your Aircraft Registration (you can see it in the P3D airplanes window by selecting the aircraft) and the SELCAL code into the Remarks section of the Flight Plan.

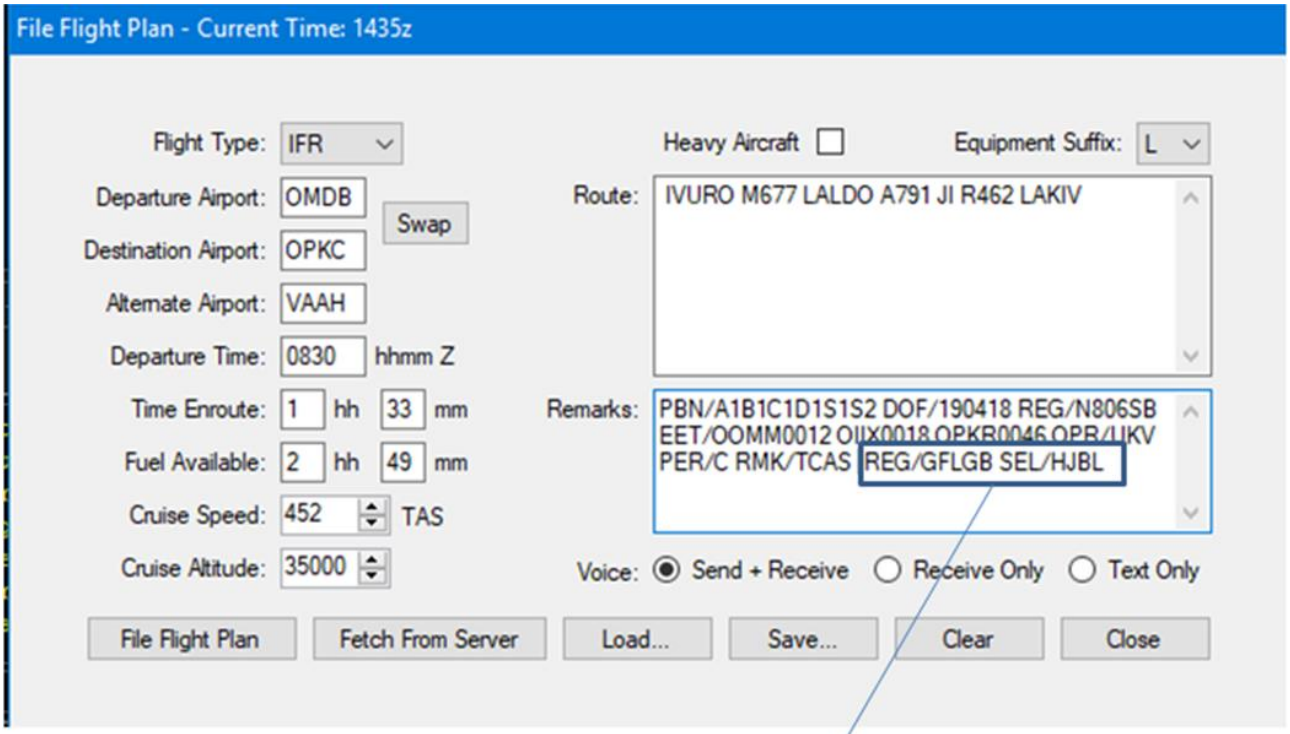
In VATSIM you must also write it in the BOX on the connection page.



vPilot (VATSIM and FSD)

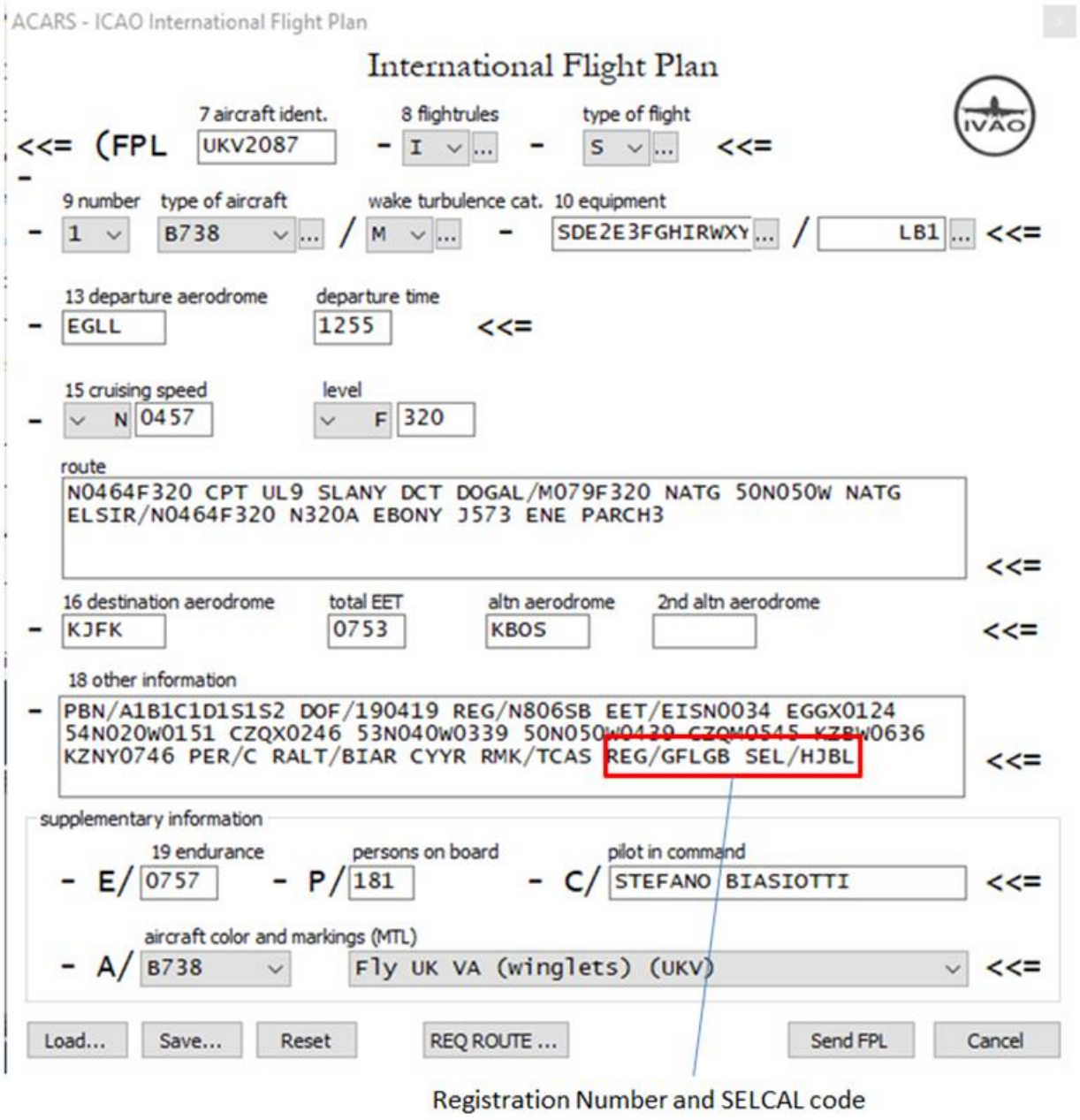


SELCAL (2letters-2letters)



Registration number and SELCAL code in the flight plan

iVap (IVAO)


ACARS - ICAO International Flight Plan
International Flight Plan
7 aircraft ident.
8 flightrules
type of flight
<<= (FPL UKV2087 - I - S <<=
9 number
type of aircraft
wake turbulence cat.
10 equipment
1 B738 / M - SDE2E3FGHIRWXY / LB1 <<=
13 departure aerodrome
departure time
EGLL 1255 <<=
15 cruising speed
level
N 0457 F 320
route
N0464F320 CPT UL9 SLANY DCT DOGAL/M079F320 NATG 50N050W NATG
ELSIR/N0464F320 N320A EBONY J573 ENE PARCH3
<<=
16 destination aerodrome
total EET
altn aerodrome
2nd altn aerodrome
KJFK 0753 KBOS <<=
18 other information
PBN/A1B1C1D1S1S2 DOF/190419 REG/N806SB EET/EISN0034 EGGX0124
54N020W0151 CZQX0246 53N040W0339 50N050W0439 CZQM0545 KZBW0636
KZNY0746 PER/C RALT/BIAR CYYR RMK/TCAS REG/GFLGB SEL/HJBL
<<=
supplementary information
19 endurance
persons on board
pilot in command
- E/ 0757 - P/ 181 - C/ STEFANO BIASIOTTI <<=
aircraft color and markings (MTL)
- A/ B738 Fly UK VA (winglets) (UKV) <<=
Load...
Save...
Reset
REQ ROUTE ...
Send FPL
Cancel
Registration Number and SELCAL code

7 Separation Minima

In a few words these are the Vertical, Lateral and Longitudinal separation minima. For more information, see Appendix 1.

VERTICAL SEPARATION MINIMA: 1000 feet or 2000 feet

- Between the non MNPS space (FL60 and FL280): **1000 ft.**
- Between the MNPS space: (FL290 and FL410): **1000 ft**.
- Above FL410 vertical: **2000 ft.**

LATERAL: **1 degree of latitude**

LONGITUDINAL: **10 minutes**

8 FMC Settings

The general setup of the aircraft is similar to normal operations, however there is a difference in the FMC setup for the Oceanic part.

After DELOG is entered (following our example) it is time to put in the Coordinates, this is done as follows.

In the Boeing Honeywell FMCs (737,747,757,767,777):

- Go to the LEGS page
- Enter the coordinates in the following format:
    - 53/20 becomes 5320N
    - 53/30 becomes 5330N

In the Airbus and MD11 FMC, the waypoint can either be entered directly on the Discontinuity on the FPLAN page or alternatively on the LAT Rev page of the last waypoint, i.e. DELOG in the following:

- 53/20 becomes 5320N
- 53/30 becomes 5330N

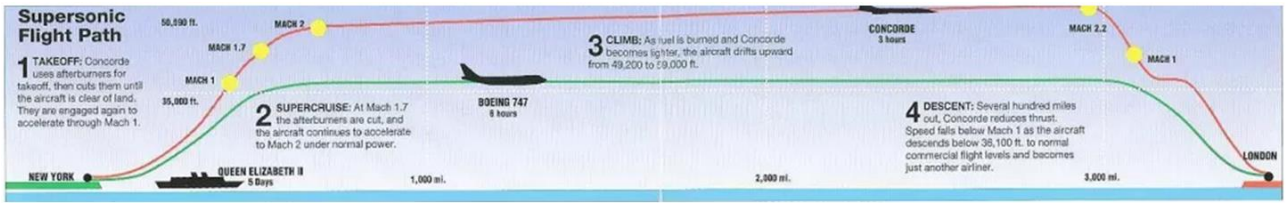
Explore also your FMC instructions to learn:

- How to set a SLOP (see SLOP in this guide)
- How to set a fixed time for a waypoint (in the case of a time restriction for the Entry Point)
- How to set the page of the waypoints with the estimated time:
    - To calculate when to ask for the Oceanic clearance before the Entry Point;
    - To be ready for a position report.

This document is useful to follow for your Oceanic flight.

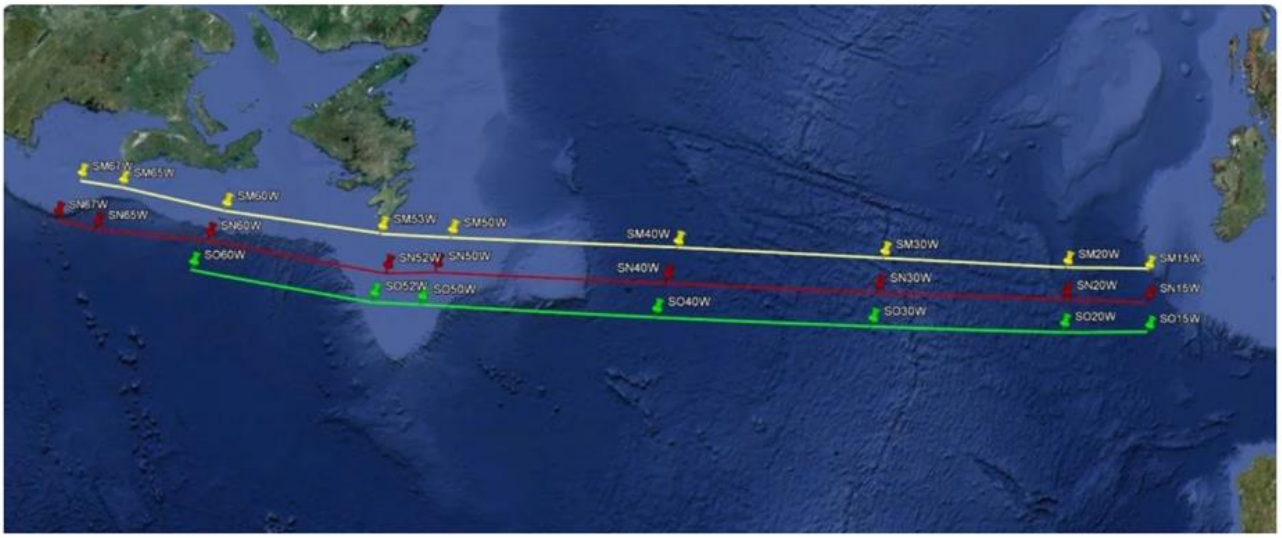
9 Curiosity: The Concorde Routes

Fly UK doesn't have the Concorde in its fleet, but it is worth mentioning its difference with the other aircraft.



Concorde operated on three specific 'Concorde only' tracks across the North Atlantic Ocean. These tracks formed part of the North Atlantic Track system, but unlike the other NAT (North Atlantic Track) routes used daily by normal airliners, which change twice daily to take account of the weather that day, they are fixed in position. This is because during supersonic cruise, Concorde flew at between 55000ft and 60000ft, which means Concorde flew above the weather on the edge of space. These Concorde tracks used the shortest distance possible that kept Concorde away from land and any other air traffic. The three North Atlantic Routes used for Concorde were as below.

NAT SM (Sierra Mike) – Normally used for Westbound Concordes flights
NAT SN (Sierra November) – Normally used for Eastbound Concordes flights
NAT SO (Sierra Oscar) – Alternative overflow flight route



The three North Atlantic Routes used for Concorde

A real map used by a Concorde pilot

Unlike traditional passenger airline flights which have a fixed cruise level, they also have step-up points at various stages during the flight. Concorde was able to use its exclusive airspace to make a more efficient gradual cruise-climb, which typically began at around FL500 (50,000FT) at this point Concorde would only climb slowly as the fuel was burned-up. Concorde had a maximum operating height of FL600 (60,000ft), although it was unusual for Concorde to get this altitude before it was time to begin its descent.

All the air traffic control (ATC) was provided via position reporting only. Concorde had to make position reports just like any other aircraft: after passing each of the SM/SN/SO waypoints. Travelling at Mach 2, position reports would typically be at 15 to 20 minute intervals.

When Concorde was traveling in supersonic flight, it had to have a 50-mile horizontal separation from any other Concorde at the same altitude. Although normally there would have only been a maximum of two Concorde crossing the North Atlantic at any one time, one eastbound and the other westbound.

10 Appendices

10.1 Appendix 1 - Separation Minima

(from the **NAT Doc 008 ICAO Application of separation minima North Atlantic Region**)

3.2 VERTICAL SEPARATION MINIMA

3.2.1 Minimum vertical separation between aircraft, airspace reservations, and between airspace reservations and other aircraft shall be:

A. 4000 feet at or above FL 450 between supersonic aircraft, and between supersonic aircraft and any other aircraft, or
B. 2000 feet at or above FL 290 between a formation flight and any other aircraft, or
C. 2000 feet at or above FL 290, or
D. 1000 feet from FL 290 to FL 410 inclusive between RVSM aircraft, or
E. 1000 feet below FL 290.

(Further rules in the ICAO APPLICATION OF SEPARATION MINIMA NORTH ATLANTIC REGION NAT doc 008 …see Bibliography)

3.3 LATERAL SEPARATION MINIMA

3.3.1 Lateral separation is applied between route segments. Segments may be wholly or partly separated but for aircraft to be laterally separated both must be within the separated segments or segment parts. The following lateral separation minima apply to all aircraft and include both moving and stationary airspace reservations:

(summary) between 23NM (inside the NAT tracks) and 120NM

(further rules in the ICAO APPLICATION OF SEPARATION MINIMA NORTH ATLANTIC REGION NAT doc 008 …see Bibliography)

3.4 LONGITUDINAL SEPARATION MINIMA

It is quite complex and so are the rules. To summarize:

3.4.1 Longitudinal separation shall be applied so that the spacing between the estimated positions of the aircraft being separated is never less than a prescribed minimum.

3.4.2 Longitudinal separation minima for aircraft flying along same/intersecting tracks shall be applied by ensuring that throughout the period where lateral separation does not exist (see Section 4.3 lateral separation) the aircraft are separated by a time interval equal to or greater than:

F. *10 minutes* between turbojet aircraft provided the Mach Number Technique is applied as prescribed in paragraphs 3.4.8 and 3.4.10 and Section 4.5 whether in level, climbing or descending flight, provided:

1. That when the succeeding aircraft is maintaining a true Mach number higher than the preceding aircraft the provisions of 4.5.3 to 4.5.6 shall be applied, and
2. The aircraft concerned have reported over a common point and follow:
   a. The same identical track; or
   b. Continuously diverging tracks until some other form of separation is provided, and Out of NAT tracks from 15 to 60 minutes

(further rules in the ICAO APPLICATION OF SEPARATION MINIMA NORTH ATLANTIC REGION NAT doc 008 …see Bibliography)

10.2 Appendix 2 - YouTube Videos

The Plane Highway in the Sky link

VATSIM Oceanic Flight planning and procedures Tutorial link

11 Bibliography

NORTH ATLANTIC MNPS AIRSPACE OPERATIONS MANUAL link

PILOT GUIDE TO ICELAND link

SKY LIBRARY link

THEAIRLINEPILOTS.COM link

NORTH ATLANTIC OPERATIONS AND AIRSPACE MANUAL link

APPLICATION OF SEPARATION MINIMA NORTH ATLANTIC REGION NAT doc 008 link

NORTH ATLANTIC (NAT) AIR NAVIGATION PLAN VOLUME II link

NORTH ATLANTIC OPERATIONS AND AIRSPACE MANUAL NAT doc 007 link

Transport Canada Aeronautical Information Manual (TC AIM) NAT—NORTH ATLANTIC (NAT) OPERATIONS link

TRANSATLANTIC RADIO OPERATION CHECKLIST link

FUN & INTERESTING READ ON REAL WORLD NORTH ATLANTIC CROSSINGS link

ETOPS DOCUMENT AND RULES link link2 link3 link4

SIMBRIEF:COM powerful flight planning tool link

12 Credits

Andre Almeida UKV1323

Stefano Biasiotti UKV1429

Ross Elliot UKV3764

Morten Hansen UKV1678

John Wheat UKV1372

… and all the other UKV pilots helping me in producing this interesting document.