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OCEANIC CONTROL - VERSION 1.0

22 DECEMBER 2013

Scope

This document outlines the general practice for Oceanic Control in the Shanwick and Gander FIRs. Procedures within this document are relevant to procedural control in other FIRs over the North Atlantic, though this manual is not intended as a training aid for those areas.

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Contents

Section 1 | Introduction

Crossing the North Atlantic Ocean requires aircraft to pass through one or more of five Oceanic FIRs and will almost always leave domestic radar coverage for a significant portion of flight. Control of such flights is handled by controllers receiving estimates and position reports in order to provide procedural separation.

The predominant direction of flight across the North Atlantic is east/west, with aircraft travelling from European airports to those within North America (and vice versa). To facilitate this movement and ensuring the procedural separation requirements are met, the Organised Track System (OTS) provides a common set of routes for aircraft travelling in each direction across the airspace. These North Atlantic Tracks (NATs) take into account the preferred routes for aircraft operators and the upper wind forecasts to provide a common set of routes that are reasonably economical, but allow ATC to accept and separate a larger number of flights into the oceanic airspace than would be possible with random routings.

This document is written to provide guidance to controllers on the VATSIM network wishing to provide ATC services for the Shanwick and Gander Oceanic FIRs. The concepts introduced within this document are applicable to Oceanic Control within the North Atlantic, though focus upon the specific procedures of Shanwick/Gander. It is important to be aware that this document is not exhaustive in its information and that other documentation is available. This document is intentionally light in information about navigation performance requirements and pilot-specific recommendations; additional resources and a basic overview of MNPS (Minimum Navigation Performance Specifications) can be found in the appendices of this document.

Supplementary Information

In cases, this document will provide information about how the real-life Shanwick/Gander stations operate, though this is not how it should be applied to VATSIM. In these cases, the background information is considered relevant and useful, though will be written in grey text.

Section 2 | Airspace

2.1 Controller Stations

The North Atlantic Oceanic airspace can be split into five Oceanic Control Areas (OCAs): Reykjavik, Shanwick, Gander, New York and Santa Maria. This document shall focus upon the Shanwick and Gander OCAs.

While other communication methods are present real-world, this document assumes that only voice communication is used on VATSIM. A rated controller should adapt the procedures as required for another communication medium.

Each OCA maintains contact with flights through high frequency (HF) radio to communicate with aircraft beyond VHF range. HF stations are manned by radio operators at Gander ("Gander Radio") in Canada and Ballygirreen ("Shanwick Radio") in the Republic of Ireland. The Oceanic Area Control stations are located respectively in Gander and Prestwick (Scotland), which act as the controlling authorities for their respective OCAs. On VATSIM, the distinction between radio operator and controller is not made, with the oceanic controller responsible for the airspace and in contact with pilots (using VHF-type frequencies due to the limitation of VATSIM).

2.2 Frequencies

Four standard frequencies are published for use within Shanwick/Gander Oceanic, though more frequencies are used during events.

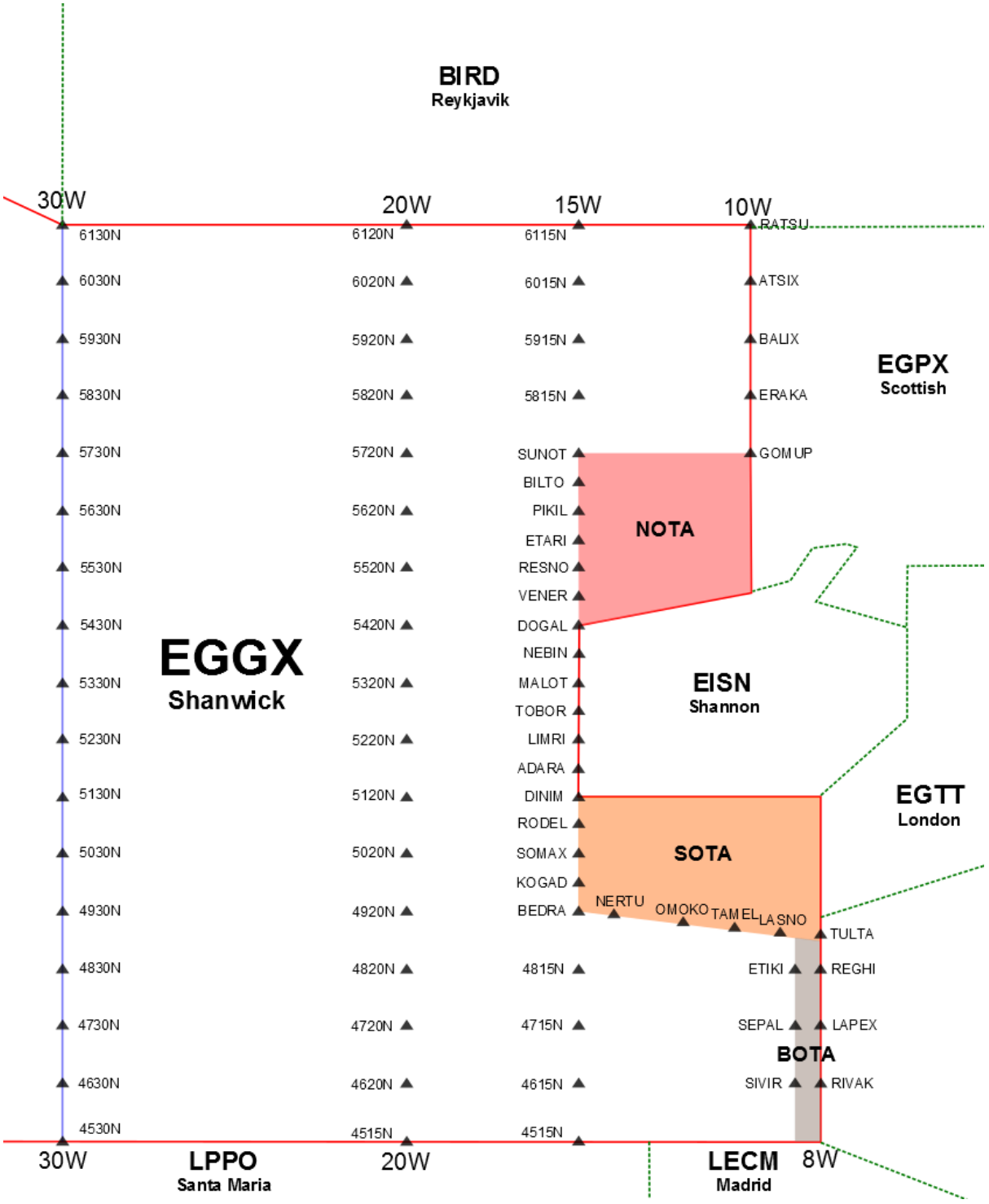
Shanwick		Gander	
EGGX_FSS*	131.800	CZQX_N_FSS	131.700
EGGX_S_FSS	131.850	CZQX_S_FSS	131.750

*The EGGX_FSS callsign and frequency may also be used by the callsign EGGX_N_FSS. There is no distinction between these two positions.

EGGX_FSS or CZQX_N_FSS should be the first position to open and each will typically cover the entirety of the Shanwick and Gander OCA in the absence of the other. Due to the variable nature of the NAT routings, division of responsibility between controllers is not published. Splits which divide the OCAs north/south should be agreed between the relevant controllers and coordinated with adjacent sectors. It is also not uncommon for controllers to implement another split (e.g. Clearance, Track Controller).

2.3 Shanwick FIR

The Shanwick FIR forms a border with the Gander FIR at 30 degrees west, Santa Maria at 45 degrees north and Reykjavik at 61 degrees north as depicted below. The FIR also forms eastern borders with domestic FIR/UIRs: Scottish, Shannon, London and Brest to the east and Madrid to the South East. All airspace within the FIR is Class A above FL55 with airspace below Class G. Class A airspace above FL55 is referred to as the Shanwick OCA (Oceanic Control Area).



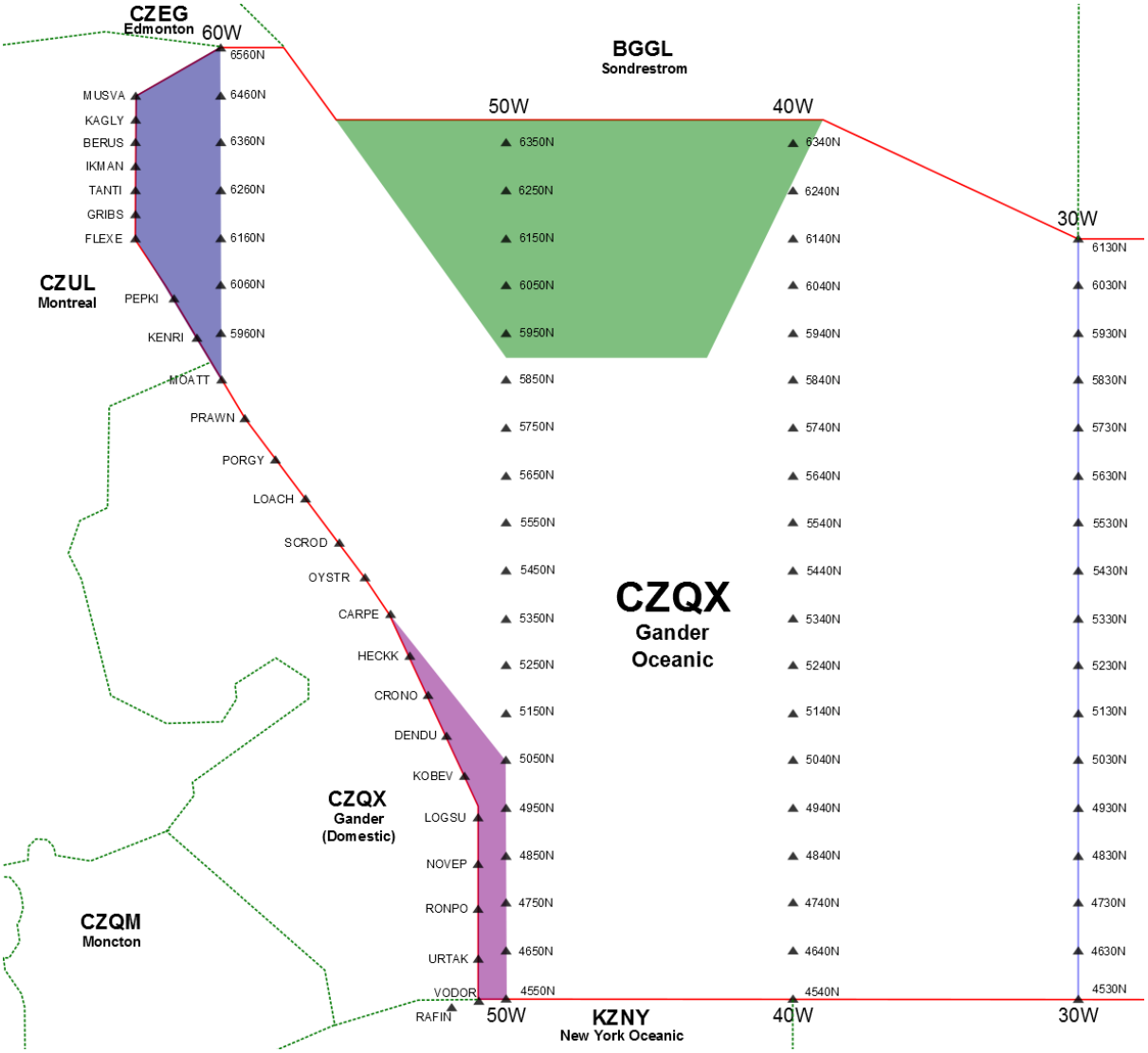
The Shanwick FIR can be subdivided into 4 regions delegated to different controlling authorities:

- Shanwick OCA: The majority of the Shanwick FIR airspace including all airspace west of 15 degrees west - controlled by Shanwick Oceanic
- NOTA (Northern Oceanic Transition Area): delegated by Shanwick to Shannon Control who provide a domestic (radar) service
- SOTA (Shannon Oceanic Transition Area): delegated by Shanwick to Shannon Control who provide a domestic (radar) service
- BOTA (Brest Oceanic Transition Area): delegated by Shanwick to Brest Control who provide a domestic (radar) service

Due to the arrangement of the delegated areas, traffic with London Control will pass under the control of either Shannon or Brest before entering Shanwick OCA. London will therefore only be involved in Oceanic operations where airborne flights obtain an oceanic clearance (in rare cases). Oceanic clearances will be referenced later within this document.

2.4 Gander FIR

The Gander Oceanic FIR forms a border with Shanwick at 30 degrees west, Santa Maria at 45 degrees north (between 30 and 40 degrees west) and New York Oceanic at 45 degrees north (between 40 and 51 degrees west). The FIR also forms borders with domestic FIR/UIRs including: Gander Domestic, Montreal, Edmonton and Sondrestrom. As with Shanwick, all Gander Oceanic airspace is class G up to FL55, the class A above referred to as the Gander OCA.



The Gander Oceanic FIR delegates 3 sections of airspace to domestic controlling authorities:

- Montreal: west of 60 degrees west (dark blue)
- Reykjavik: control over Greenland up to FL195 (green)
- Gander Domestic: above FL55 in the segment bounded by CARPE, LOGSU, VODOR, 4550N and 5050N (purple)

Section 3 | Oceanic Routings

3.1 North Atlantic Tracks (NATs)

In order to make the long crossing over the Atlantic possible (due to fuel consumption, diversion requirements and financial considerations) the vast majority of aircraft will need to fly within a narrow level band (typically FL310-FL400) and on specific routes generally attempting to fly with the strongest tailwind (eastbound crossing) or avoid the headwind (westbound crossing). However in this non-radar environment, controllers must apply much larger horizontal separation between aircraft than their radar-equipped counterparts. To overcome this conflict of interest, Shanwick/Gander publish a list of tracks each day which take into account both the airline operators' requests and ATC separation requirements. This more orderly system can accommodate a far higher flow of traffic.

Tracks route via specified waypoints across the ocean. Close to the mainland, waypoints are generally named using the standard five-letter convention. Over the ocean, the waypoints used are simple coordinate fixes (e.g. 57N 040W, also written 5740N or 57/40). Tracks are valid for specific flight levels, but on VATSIM, the latest NATs published can be used at any time and are not limited to the levels published. It is the responsibility of the controller to ensure that they are separating aircraft correctly.

This section will briefly outline the way NATs are published and then the adaptations applied to VATSIM.

The majority of North Atlantic Oceanic traffic occurs in two peak flows. Westbound ("Day Time") peak flow crosses the 30 degree west line between 1130 and 1900Z with eastbound ("Night time") peak flow crossing the same line between 0100 and 0800Z. As most of the traffic at any one time is in the same direction, eastbound and westbound NATs are published separately and valid for the peak periods. . Within 1 hour before and after the validity period of a set of tracks, aircraft are not permitted to cross 30 degrees west that are not separated from those tracks. Shanwick OAC (Prestwick) publishes the day time tracks around 2200z the night before activation in the morning and Gander OAC publishes the night time tracks around 1400z the afternoon before activation that evening. The process of track design depends upon input from operators, upper wind conditions, limitations of airspace and feasibility for surrounding controlling authorities.

NATs are named using letters of the alphabet. Westbound tracks are named with the most northerly track designated 'Alpha' and working down the alphabet to the final westbound track. Eastbound tracks are identified with the most southerly track designated 'Zulu' and working up through the alphabet to the final eastbound track. These names are re-used every day when old tracks are removed and new tracks published, though the number of tracks each day may vary.

The NATs are all published with a Track Message Identification (TMI) number. This is simply the Julian calendar day that the tracks are published. Checking this number confirms that both the pilot and the controller are working with the same NAT information. "Track Alpha" from one day to another will be a different published route, however "Track Alpha, TMI 001" will only be repeated once every year (1st January). Occasionally if the NAT message is amended after publication, a letter will be appended to the TMI number (e.g. 001A) and the entire message is re-issued.

As the NATs are not limited to any specific validity time on VATSIM, there is the possibility that eastbound and westbound traffic on NATs will conflict. Therefore it is advisable to ensure that eastbound and westbound levels on conflicting NATs are agreed between the controllers at each end of the NAT system. It is advised, though not required, that controllers should clear aircraft on levels that follow the semi-circular rule when eastbound and westbound tracks conflict. Tracks that do not conflict with an opposite direction track can be used at all available levels, subject to other traffic and routings.

3.1.1 The NAT Message

Below is an example of a NAT message published on the 1st May for tracks valid on the 2nd May.

```
011941 EGGXZOZX
(NAT-1/2 TRACKS FLS 310/390 INCLUSIVE
MAY 02/1130Z TO MAY 02/1900Z
PART ONE OF TWO PARTS-
A MALOT 52/20 51/30 49/40 47/50 RONPO COLOR
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-
B LIMRI 51/20 50/30 48/40 46/50 URTAK BANCS
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-
C DINIM 50/20 49/30 47/40 45/50 VODOR RAFIN
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-
D SOMAX 49/20 48/30 46/40 44/50 42/60 DOVEY
EAST LVLS NIL
WEST LVLS 310 320 330 340 350 360 370 380 390
EUR RTS WEST NIL
NAR NIL-

011941 EGGXZOZX
(NAT-2/2 TRACKS FLS 310/390 INCLUSIVE
MAY 02/1130Z TO MAY 02/1900Z
PART TWO OF TWO PARTS-
REMARKS.
1.TMI IS 121 AND OPERATORS ARE REMINDED TO INCLUDE THE
TMI NUMBER AS PART OF THE OCEANIC CLEARANCE READ BACK.
PRMS.
...
```

011941: *Published on the 1st of the month at 1941Z*
EGGXZOZX: *Shanwick*
NAT-1/2: *Part 1 of 2 of this NAT message*
MAY 02/1130Z: *Start of track validity*
MAY 02/1900Z: *End of track validity*

A MALOT 52/20 51/30 49/40 47/50 RONPO COLOR
Track A, following the route above from MALOT to COLOR
EAST LVLS NIL
Not available travelling eastbound at any level
WEST LVLS 310 320 330 340 350 360 370 380 390
Available Westbound from FL310-390 (inclusive)
EUR RTS WEST NIL
No NERS published today for this track
NAR NIL-
No NARs specifically published and associated with this track

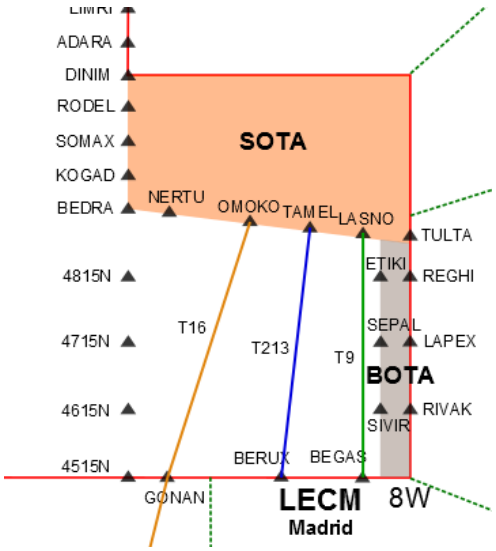
3.1.2 NAT Example

Within this document, we will use the NAT message information above (westbound only) for all further examples. The table and diagram below outline the 4 NAT tracks considered in the previous NAT message.

Track	TMI	Route
A	121	MALOT 52/20 51/30 49/40 47/50 RONPO COLOR
B	121	LIMRI 51/20 50/30 48/40 46/50 URTAK BANCS
C	121	DINIM 50/20 49/30 47/40 45/50 VODOR RAFIN
D	121	SOMAX 49/20 48/30 46/40 44/50 42/60 DOVEY

3.2 T Routes ('Tango Routes')

Three routes exist in the South East corner of Shanwick airspace travelling north/south for the purpose of flight between the SOTA area and Spain, the Canaries or the Lisbon FIR. These 3 routes do not change daily and are often termed the 'T routes': T9, T213 and T16.



T9

T9 provides a north/south route just west of BOTA. It connects SOTA to the Madrid FIR, north to south: LASNO, BEGAS. T9 connects to airways routing between the west of the Portuguese Coast to eastbound routings across the north of Spain.

T213

T213 also connects SOTA to the Madrid FIR, routing TAMEL, BERUX. It forms more limited connections to the western edge of the Lisboa FIR or southbound routes through mainland Spain towards Tunisia.

T16

T16 provides a connection from SOTA (at 12°W) to the Canaries, terminating at the Porto Santo VOR (SNT). North to South it routes: OMOKO, GONAN, 4016N, NAVIX, SNT.

Clearances

While referred to as T9 and T213, these routes will typically cleared by their individual waypoints. As Shanwick provides clearance down this dual-direction track, correct order of points reduces the chance of misinterpretation of the direction of travel.

3.3 Concorde

Concorde flight on VATSIM is still permitted, therefore the 3 legacy Concorde routes (SM, SN, SO) are still utilised. This document will cover Concorde routings and procedures separately in Section 8 |.

3.4 Domestic Routings

While not controlled by Oceanic Controllers, it is advisable for controllers to be aware of the routing structure at either edge of their airspace. This section will provide a basic overview of these routings.

3.4.1 NARs

The North American Routings (NARs) are published routings from the North American airway structure to the coastal fixes and vice versa.

Westbound NARs consist of 2 portions. First, the coastal fix is linked to an inland fix (INF) by what is termed the 'common portion'. The 'non-common portion' will then link the inland fix towards the system airports. Where an airport does not have defined non-common portions, pilots should file the full route of the common portion to the inland fix.

Eastbound NARs consist of a single portion - the 'common portion' which connect the inland fix to the coastal fix.

All NARs are designated by N*, were 'N' is spoken "North American Route" and * is the published designator (usually a 1/2 digit number followed by a letter). For example, at the time of this writing N21C ("North American Route 21C") is the spoken designator for an eastbound NAR beginning VITOL (the inland fix), routing via LOMPI and terminating at JAROM (oceanic/coastal fix).

Occasionally the NAT Message will specify NARs which must be used in conjunction with certain tracks.

3.4.2 Europe

Normal domestic routes apply for traffic exiting the Atlantic and routing through Ireland and the United Kingdom (available via the UK AIP or AIP Ireland). Rarely, an exact route is published for traffic using certain tracks. This is called the North Atlantic European Routing Scheme (NERS) and the requirement will be included in the NAT Message.

3.5 Random Routes

Aircraft are not required to fly down one of the above routes in order to cross oceanic airspace. When flying a route that is not published it is termed a 'Random Route'.

Section 4 | Separation

At least one form of procedural separation must be maintained between all flights in the Oceanic class A airspace. Separation can be:

- Vertical
- Longitudinal
- Lateral

It is important to note that the terms longitudinal and lateral separation refer to aircraft orientation, not the lines of longitude or latitude. Therefore longitudinal separation can be applied between two aircraft flying down the exact same degree of longitude (i.e. is applied between aircraft 'in trail').

4.1 Vertical

Aircraft flying subsonic are considered vertically separated below FL410 if a vertical distance of 1000ft is present. Between aircraft at and above FL410, 2000ft vertical distance is. (Note: 1000ft vertical separation between FL290-410 inclusive is subject to RVSM capability, which may be assumed for all flights on VATSIM unless otherwise specified.)

Aircraft flying supersonic must be separated from other aircraft by 4000ft at any level.

4.2 Longitudinal

Longitudinal separation is applied to ensure aircraft are never a certain number of minutes flying time from each other. Longitudinal separation exists between same direction turbojet aircraft flying a constant Mach number when they remain at least 10 minutes flying time from each other. Should aircraft not be assigned a Mach number or be on intersecting tracks, longitudinal separation must be increased to a minimum of 15 minutes.

Non-turbojet aircraft are considered separated longitudinally if they remain at least 30 minutes flying time from other traffic.

Where turbojet aircraft flying a constant Mach number converge on the same point (which must be reported by both aircraft or confirmed by other means) and then proceed down the same track or diverging tracks, the 10 minutes longitudinal separation may be reduced if the following aircraft maintains a slower speed. The separation required is outlined in the table below:

Separation	Following Aircraft slower by
10 minutes	0.01 Mach
9 minutes	0.02 Mach
8 minutes	0.03 Mach
7 minutes	0.04 Mach
6 minutes	0.05 Mach
5 minutes	0.06 Mach or more

Example

2 aircraft (X and Y) are planned to arrive at Track A, requesting FL350. The first aircraft, X, has requested M0.84, with Y requesting M0.80. These aircraft are estimating to arrive at MALOT within 10 minutes of each other.

In this situation, the first aircraft has planned to travel 0.04 Mach faster, therefore the separation at the entry point can be reduced to 7 minutes.

4.3 Lateral

Lateral separation is established distance between the routes of two aircraft (note: this is not the distance between aircraft at any given point, but distance between any 2 points along 2 different routes). Aircraft may be separated laterally by 60NM or 1 degree (subject to 'gentle-slope' rules). The published NATs may be deemed laterally separated from each other.

Considering coordinates on a flat surface, parallel tracks separated by 1 degree would equate to 60NM. However, as the earth is spherical, the separation between parallel tracks actually falls to below 60NM. For this reason, the gentle-slope rules ensure separation never falls below 50.5NM when flying between coordinate points.

4.3.1 Gentle-Slope Rules

The gentle slope rules allow lateral separation to be defined in terms of degrees, rather than nautical miles. At different latitudes, slopes of different gradients may be deemed separated from each other.

Tracks separated by 1 degree latitude are deemed separated from each other, provided that when travelling over 10 degrees longitude, the change in latitude does not exceed:

- 3 degrees at or above 58N
- 2 degrees between 58N and 70N
- 1 degree between 70N and 80N

Example

Two aircraft travel on parallel tracks starting at 58N20W and 59N20W. We will look at the different parallel tracks they might take over the next 10° longitude (i.e. to 30W)

Aircraft A (From 5820N)	Aircraft B (From 5920N)	Separated?
to 5530N	to 5630N	**3° - No**
to 5630N	to 5730N	2° - Yes
to 5730N	to 5830N	1° - Yes
to 5830N	to 5930N	0° - Yes
to 5930N	to 6030N	1° - Yes
to 6030N	to 6130N	2° - Yes
to 6130N	to 6230N	3° - Yes
to 6230N	to 6330N	**4° - No**

As you can see, as long as these tracks remain at or above 58N, then 3° of latitude change over the 10° longitude allows them to be deemed separated. At 4° change, lateral separation no longer exists. When the tracks travel below 58N, only 2° of latitude change over 10° longitude allows them to be deemed separated.

4.3.2 Strategic Lateral Offset Procedure (SLOP)

The Strategic Lateral Offset Procedure allows pilots to deviate from their route by 1 or 2NM to the right, remaining parallel to the centreline. The purpose of the SLOP is to reduce the chance of a collision when aircraft deviate from their cleared level contrary to their clearance. This is not required to be notified to, or cleared by the controller and as such is not considered when applying separation and is randomly selected by the pilot upon oceanic entry. Pilots must not deviate until entering the NAT and must re-join their cleared track before exiting the NAT.

4.4 Application of Separation

Vertical and lateral separation are the easiest to ensure for aircraft flying east/west across the North Atlantic. However, if neither of these exists between two aircraft longitudinal separation must be employed. This separation is applied through restrictions at the entry point of the NAT, calculated according to the aircraft speed.

4.4.1 The Mach Number Technique

Aircraft flying along the same route at the same level (or levels that are not separated) at the same requested Mach number shall be separated by at least their longitudinal separation requirement at the oceanic entry point.

Should the following aircraft be faster than the preceding, the separation applied shall be increased by 1 minute per increment of 0.01 Mach speed difference per 600NM of flight. This is applied as the faster aircraft following causes separation to reduce down the track. The 'rule of thumb' given is to ensure that by the end of that track, the longitudinal separation requirement still exists. For the purpose of this rule any distance from 1NM to 600NM shall have the full 1 minute per 0.01 Mach applied. Equally any distance from 601NM to 1200 shall have a full 2 minutes per 0.01 Mach applied and so on.

Example

Aircraft A is flying down the same 1500NM track as aircraft B across the North Atlantic (both turbojet). Aircraft A has requested M0.85, with aircraft B requesting M0.89. As the following aircraft is faster, we apply the Mach number technique to increase separation:

Difference in Mach = 0.04 (4 increments)

Track distance = 1500NM which falls into the 1201-1800NM band (3 minutes)

Increased separation = 4 x 3 = 12 minutes

Total separation at the entry point = 10 + 12 = **22 minutes**

4.4.1 East/West track estimation

For the purpose of reducing the time required to calculate track distance when providing clearances, application of the Mach number technique can be simplified to the following assumption:

For westbound clearances issued by Shanwick, the longitudinal separation requirement shall be increased by 3 minutes for each 0.01 difference in Mach for routes that terminate north of RAFIN and by 5 minutes for each 0.01 difference in Mach for routes that terminate south of RAFIN.

For eastbound clearances issued by Gander originating north of RAFIN and terminating at the boundary of Shanwick airspace, the longitudinal separation requirement shall be increased by 3 minutes for each 0.01 difference in Mach and 5 minutes for routes originating south of RAFIN.

Looking back at our example NAT tracks, you will notice therefore that tracks A-C terminate at or north of RAFIN, therefore only require 3 minutes additional spacing at the entry point per 0.01 difference of Mach. Track D terminates south of RAFIN and so requires 5 minutes per 0.01 difference of Mach.

4.4.1 T Routes

For the purpose of utilising the Mach number technique, the distances (and therefore separation increase per increment of Mach required) of the T routes are listed below.

T16: 972NM, 2 minutes per 0.01 Mach

T9: 216NM, 1 minute per 0.01 Mach

T213: 225NM, 1 minute per 0.01 Mach

4.4.4 Opposite Direction Level Changes

When lateral separation cannot be ensured with flights travelling in opposite directions, vertical separation must be in place a minimum period before and after the estimated time at which the aircraft will cross (i.e. while longitudinal separation still exists). For non-turbojet aircraft, vertical separation must be in place 30 minutes before and after this point.

In the case of turbojet aircraft, vertical separation must be in place 15 minutes before and after this point. This may be reduced to 10 minutes after crossing **if both** aircraft have reported passing the **same point**.

Section 5 | Clearance

5.1 Elements of Clearance

The oceanic clearance must contain the route, speed and level to fly, thereby allowing the controller to ensure lateral, longitudinal and vertical separation between flights entering oceanic airspace. Pilots should obtain an oceanic clearance around 40 minutes (though at least 30 minutes) prior to their oceanic entry point (reduced to 20 minutes in the case of entering Reykjavik from Scottish or Stavanger area). On VATSIM, clearance requests are to be transmitted via text or voice.

For real-life flights from stations that are close to the Oceanic boundary, such as all airfields west of 2 degrees, 30 minutes west in the UK or Ireland are required to obtain their clearance on the ground. This also applies for French airfields West of 0 degrees west. On VATSIM, such a requirement does not exist due to the difficulty of calculating estimates from the ground without accurate slot times. Aircraft shall call for their clearance in the air, preferably 30 minutes before the entry point to oceanic.

This document teaches the elements of a clearance request via RT examples. Separation requirements to be considered for a clearance are outlined within the previous section.

5.2 NAT Track clearance

The following is an example clearance on a fictional NAT A which begins at MALOT.

BAW123	Shanwick Radio, Speedbird 123 request oceanic clearance to Kennedy, New York.
EGGX	Speedbird 123, Shanwick Radio, go ahead.
BAW123	Shanwick Radio, Speedbird 123 requesting oceanic clearance to Kennedy, New York via NAT Alpha. Estimating MALOT at 1532, request Mach decimal seven eight, flight level 380.
EGGX	Speedbird 123, standby

Breakdown:

- "Kennedy, New York": the final destination of this flight
- "via NAT Alpha": not a requirement element of the clearance request, but commonly included - the NAT planned for this route.
- "Estimating MALOT at 1532": the time (UTC or "Z time") at which they expect to arrive at the first point of the NAT. All times must be in Z and therefore specifying "time 1532 zulu" is not a requirement.
- "request Mach 0.78": the speed the aircraft will fly down the oceanic route. This should always be a measurement based on the local speed of sound (i.e. a Mach number).
- "flight level 380": the requested level for the oceanic route

Note: notice that the pilot doesn't actually have to specify "track A" or the TMI, however the TMI must be confirmed in the clearance readback.

The controller will then consider the traffic situation for this track (and any other relevant flights). When considering the time estimate, the controller should consider it to be accurate to plus/minutes 2 minutes - the pilot is required to call back and update the estimate if it becomes inaccurate by 3 minutes or more. In this example, the controller decides that there is no conflicting traffic and so provides a clearance with no time restriction at MALOT.

EGGX	Speedbird 123, Shanwick Radio
BAW123	Shanwick Radio, Speedbird 123, Go ahead
EGGX	Oceanic clearance, Shanwick clears Speedbird 123 to Kennedy New York via NAT A. From MALOT maintain flight level 380, Mach decimal seven eight.
BAW123	Speedbird 123 is cleared to Kennedy via Track Alpha, **TMI 121**, from MALOT maintain FL380 mach decimal seven eight.
EGGX	Speedbird 123, correct, return to previous frequency

Note: the readback of the clearance should include the TMI. If it is not volunteered by the pilot, it should be confirmed. If the pilot is unable to provide the TMI, the entire NAT routing should be confirmed.

The oceanic controller should not specify a frequency to return to, even if they think they know what it was.

Clearance Restriction

In cases, providing a clearance with no restriction at the entry point is not possible, as this would result in separation not being ensured. To ensure longitudinal separation, controllers may be required to stipulate a time restriction at the entry point. The pilot is required to meet this restriction and this can involve them requesting a hold or other delaying action from the domestic controller.

EGGX	Oceanic clearance, Shanwick clears Speedbird 123 to Kennedy New York via MALOT, NAT Track A. From MALOT maintain flight level 380, Mach decimal seven eight. Cross MALOT not before time 1533.

The domestic controller handling traffic at MALOT should be informed of the restriction provided to this flight.

5.3 Random Routing

Not all clearance requests will be via one of the published NATs. Many aircraft will file on what is termed a ‘random route’.

BAW123	Shanwick Radio, Speedbird 123 request oceanic clearance to Toronto.
EGGX	Speedbird 123, Shanwick Radio, go ahead.

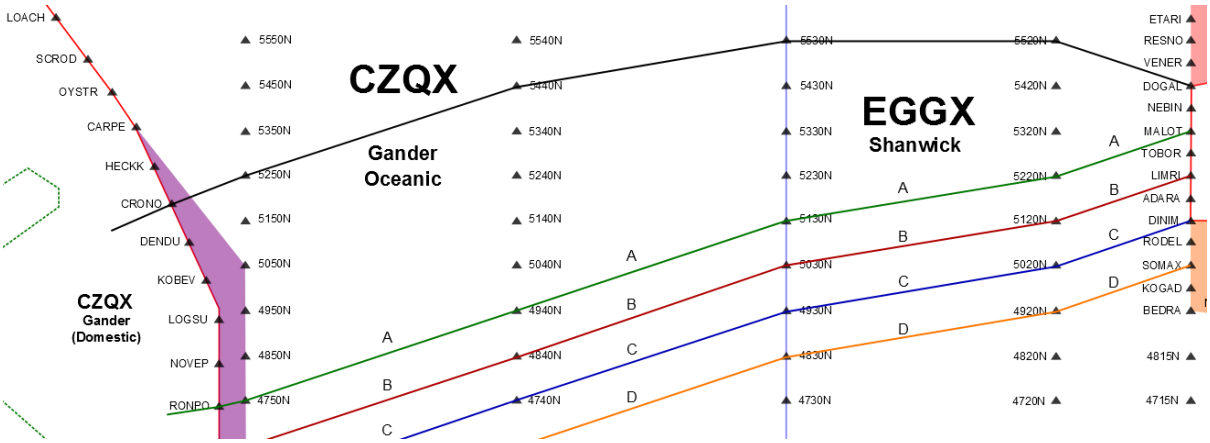
BAW123	Shanwick Radio, Speedbird 123 requesting oceanic clearance to Toronto via random routing: DOGAL 55/20 55/30 54/40 52/50 CRONO DOTTY. Estimating DOGAL at 1532, request Mach decimal 85, flight level 340.
EGGX	Speedbird 123, standby

Note: 55/20 is spoken as "55 North, 20 West"

In this case, the pilot is asking for clearance via the following routing:

DOGAL 55/20 55/30 54/40 52/50 CRONO DOTTY

Considering this routing, the controller should check that it does not conflict and remains separated from the NAT tracks, In the case of our example tracks, a diagram of the proposed routing (displayed in black) is shown below:



As can be seen, this routing remains laterally separated from track A (our most northerly NAT). Real life random routings should always remain separated from the NATs and would not be cleared if they cross. On VATSIM, this is left to the controller's discretion.

The controller decides that they can provide clearance as there is no conflicting traffic on this route at that level and so issues the clearance:

EGGX	Speedbird 123, Shanwick Radio
BAW123	Shanwick Radio, Speedbird 123, go ahead
EGGX	Oceanic clearance, Shanwick clears Speedbird 123 to Toronto via DOGAL, random routing: DOGAL 55/20 55/30 54/40 52/50 CRONO DOTTY. From DOGAL maintain flight level 340, Mach decimal 85.
BAW123	Speedbird 123 is cleared to Toronto via DOGAL 55/20 55/30 54/40 52/50 CRONO DOTTY from DOGAL maintain FL340 Mach decimal 85.
EGGX	Speedbird 123, correct, return to previous frequency

Note: The TMI is not included here as it is not applicable (i.e. this is not a route published for this day)

5.4 Tango Route

Clearance along a Tango route follows a similar format as a NAT clearance, except that the individual points are each specified, rather than stating the route name (e.g. 'Tango nine'). This is to clarify the direction of travel.

EGGX	Shanwick clears BAW123 to Lisbon routing LASNO, BEGAS. From LASNO maintain FL350, Mach .77

5.5 Amendments

It is not always possible to provide the exact clearance requested by a pilot. In such cases, it may be necessary to provide an amendment/condition to the flight. In such a case, the instruction is always prefixed with the type of amendment, which will fall into one of 5 categories:

- Re-route
- Level Change
- Speed Change
- Entry Point Change
- Clearance Limit change

EGGX	Oceanic clearance **with a re-route**. Shanwick clears Speedbird 123 to…

EGGX	Oceanic clearance **with a level change**. Shanwick clears Speedbird 123 to…

EGGX	Oceanic clearance **with a re-route AND speed change**. Shanwick clears Speedbird 123 to…

EGGX	Oceanic clearance **with a re-route AND level change AND speed change**. Shanwick clears Speedbird 123 to…

The format of the clearance after the amendment (examples above) does not change from a standard clearance. The prefix of "with a re-route" (or similar) is added to draw attention to the fact that a pilot's clearance differs from their request.

Section 6 | Procedural Reports

6.1 Position Reports

Voice communications over the North Atlantic typically occur via HF radio whereby each aircraft is assigned a primary and secondary frequency for communication. On VATSIM, communication is simulated as VHF frequencies.

In order to monitor a flight's progress without radar, the pilot will typically make positions reports at the significant points listed in the filed route or as requested by ATC. These reports are to be made and read back in full, for the pilot to confirm the information has been correctly relayed.

Example 1

BAW123	Shanwick Radio, Speedbird 123, position report.
EGGX	Speedbird 123, Shanwick Radio, go ahead.
BAW123	Position, Speedbird 123 reporting 52 North 20 West at 1521, flight level 380, Mach .78. Estimating 51 North 30 West at 1553, 50 North 40 West next.
EGGX	Speedbird 123, Shanwick copies 52 North 20 West at 1521, flight level 380, Mach .78. Estimating 51 North, 30 West at 1553, 50 North 40 West next.
BAW123	Correct, Speedbird 123.

Should a pilot's estimate become inaccurate by 3 minutes or more, they are required to inform Oceanic of their revised estimate, so that the controller may take action to ensure separation.

Example 2

BAW123	Shanwick Radio, Speedbird 123, revised estimate.
EGGX	Speedbird 123, Shanwick Radio, go ahead.
BAW123	Revised estimate, Speedbird 123, 51 North 30 West at 1556.
EGGX	Speedbird 123, Shanwick copies estimating 51 North 30 West at 1556.
BAW123	Correct, Speedbird 123.

6.2 Clearance Amendments

During flight, a pilot may request an amendment to their cleared level or speed. This can be performed with a position report or separately.

Example3

BAW123	Shanwick, Speedbird 123 request flight level 390.
EGGX	Speedbird 123, amended clearance. Shanwick clears Speedbird 123 climb flight level 390. Report Reaching.
BAW123	Cleared flight level 390, report reaching, Speedbird 123.

A pilot should always report reaching a new level. Even so, the RT "report reaching" is typically included as a reminder to the pilot.

When necessary, restrictions on these changes may be stipulated:

EGGX	...climb and reach flight level 390 before passing 51 North 30 West. Report Reaching.

EGGX	...maintain flight level 380. After passing 52 North 20 West, climb flight level 390. Report Reaching.

EGGX	...maintain flight level 380. At or after 51 North 30 West, climb flight level 390. Report leaving, report Reaching.

EGGX	...climb flight level 390, to be level before 51 North 30 West. Report Reaching.

Similar restrictions can be provided for speed changes.

6.3 When Able Higher

A "When Able Higher" (WAH) report is not required in Shanwick/Gander airspace, though is a requirement in portions of New York and Santa Maria oceanic. A WAH report simply informs the controller when the pilot expects to be able to accept a higher level.

Example 4

BAW123	Position, Speedbird 123 reporting MALOT at 1452, flight level 380, Mach .78. Estimating 54 North 20 West at 1521, 55 North 30 West next. **Able flight level 390 at 1540.**

6.4 Handoffs

When crossing from one station to another, pilots are required to provide a position report to both stations (i.e. to Shanwick and Gander when crossing 30 West). During real-world flight, this can be achieved by simultaneously transmitting over HF, however requires two separate position reports on VATSIM. Alternatively, for the purpose of VATSIM, one station can accept the position report and pass it on to the following controller or a pilot can be told to "Contact [Station] at [Point]", if the first station is happy not to receive a position report.

Section 7 | Coordination

The following section is to apply to all neighbouring oceanic or domestic facilities unless other agreements are published.

7.1 Domestic

7.1.1 Entering Oceanic

When domestic control is online, the domestic controller shall allow the pilot to contact oceanic on the appropriate frequency so that they can obtain their clearance in the correct timeframe. While the domestic controller will often check that a pilot has obtained their clearance, it still remains the pilot's responsibility to obtain a clearance before entering oceanic airspace.

It is not required to notify the domestic controller of the pilot's estimate for the oceanic entry point, nor of level/routing changes. However, Oceanic should notify the domestic controlling authority when a restriction has been placed at the entry point to allow them to plan appropriately.

In certain situations, it may be practical for Oceanic to coordinate a required spacing at the entry point with the domestic controller, requiring them to ensure this gap is in place, rather than the pilot. For example, by requiring that 2 aircraft must be "minimum 10 minutes" from each other at the entry point. The domestic controller can then ensure this gap exists and notify oceanic if this is not possible.

7.1.2 Leaving Oceanic

Aircraft crossing the North Atlantic should squawk 2000 30 minutes after entering oceanic airspace, meaning that an aircraft leaving oceanic into a radar environment is unknown traffic to the domestic controller. Oceanic shall provide the domestic controller with the callsign, level and ETA for the point at which the aircraft leaves oceanic airspace. This information should be provided in a timely fashion to allow the controller to plan, with an update should any of the information become inaccurate.

7.2 Oceanic

7.2.1 Shanwick & Gander

For traffic passing from Shanwick to Gander or vice-versa, the receiving station must be aware of all the relevant information pertaining to a flight entering their airspace (ETA, speed, level). This does not have to be provided until transfer of communication if:

- The aircraft is on a published NAT that is laterally separated from other opposite direction NATs at 30W and throughout the airspace of the receiving OCA OR
- The aircraft is on a published NAT at levels agreed between Shanwick/Gander OR
- The aircraft is flying east/west at a level that corresponds to the semi-circular rule

In these cases, coordination is deemed to have been effected.

In all other cases, flights shall be individually coordinated at least 30 minutes prior to transfer of control. Any subsequent changes to speed or level shall be requested from the receiving controller prior to being approved. Any changes to ETA should also be coordinated.

7.2.1 Adjacent OCAs

Aircraft entering to or from an adjacent Oceanic Control Area other than Shanwick/Gander (i.e. New York, Santa Maria or Reykjavik) shall be subject to individual coordination. The level, routing and speed shall be confirmed as soon as possible once an estimate for entry can be obtained.

It is acceptable simply to provide this information to the receiving controller prior to transfer of communication provided that:

- The aircraft is on a published NAT that is laterally separated from other opposite direction NATs at the transfer of control and throughout the airspace of the receiving OCA, OR
- The aircraft is on a published NAT at levels agreed with the receiving controller

Section 8 | Concorde

8.1 Tracks

Concorde traffic still routes across the Atlantic on VATSIM. On VATSIM, three legacy tracks are utilised for the purpose of Concorde flight. These are all published for FL500 or above and supersonic flight.

Concorde tracks are named NAT SM, NAT SN, NAT SO.

- SM: "Sierra Mike" for westbound flight only
- SN: "Sierra November" for eastbound flight only
- SO: "Sierra Oscar", overflow of supersonic traffic, as cleared by ATC

These tracks route via intermediate latitudes (i.e. degrees and minutes). For this reason points on track are commonly abbreviated to the track name and their longitude.

For example, Track SM is defined as the following points (with abbreviated names):

- 50° 41'N 15°W "Sierra Mike 15 West"
- 50° 50'N 20°W "Sierra Mike 20 West"
- 50° 30'N 30°W "Sierra Mike 30 West"
- 49° 16'N 40°W "Sierra Mike 40 West"
- 47° 03'N 50°W "Sierra Mike 50 West"
- 46° 10'N 53°W* "Sierra Mike 53 West"
- 44° 14'N 60°W* "Sierra Mike 60 West"
- 42° 46'N 65°W* "Sierra Mike 65 West"
- 42° 00'N 67°W* "Sierra Mike 67 West"

Note: tracks indicated in blue and by an asterisk (*) fall within domestic airspace and so are not relevant to Oceanic flight.

Supersonic flight via these Concorde tracks is separated from flights via other Concorde tracks.

8.2 Cruise Climb

During supersonic flight, Concorde aircraft undertake a 'cruise climb' at supersonic levels. Concorde accelerates to supersonic speed and maintain roughly Mach 2.00. As fuel is burnt, Concorde aircraft are able to climb as they become lighter, maintaining this constant speed, but changing level. This equates to a constant climb rate of approximately 50 feet per minute.

Clearance for 'cruise climb' is therefore required, along with specified limits of which levels an aircraft is cleared within. This is either referred to as a 'block' of levels or as a cruise climb.

EGGX	Speedbird Concorde 1 is cleared to New York, via track Sierra Mike, cross Sierra Mike 15 West at FL500 or above, climbing FL600 thereafter to cruise climb

EGGX	Speedbird Concorde 1 is cleared to New York, via track Sierra Mike, block FL500 to FL600.

Acknowledgements

Author

Kieran Hardern

Thanks to

The author would like to thank George Wright, Jamie Fox, Barrie Joplin and Chris Pawley for their extensive proof reading, corrections and suggestions.

Also thanks to Simon Irvine, Martin Bergin and Jean-Francois Desrosiers for their input regarding procedures and content.