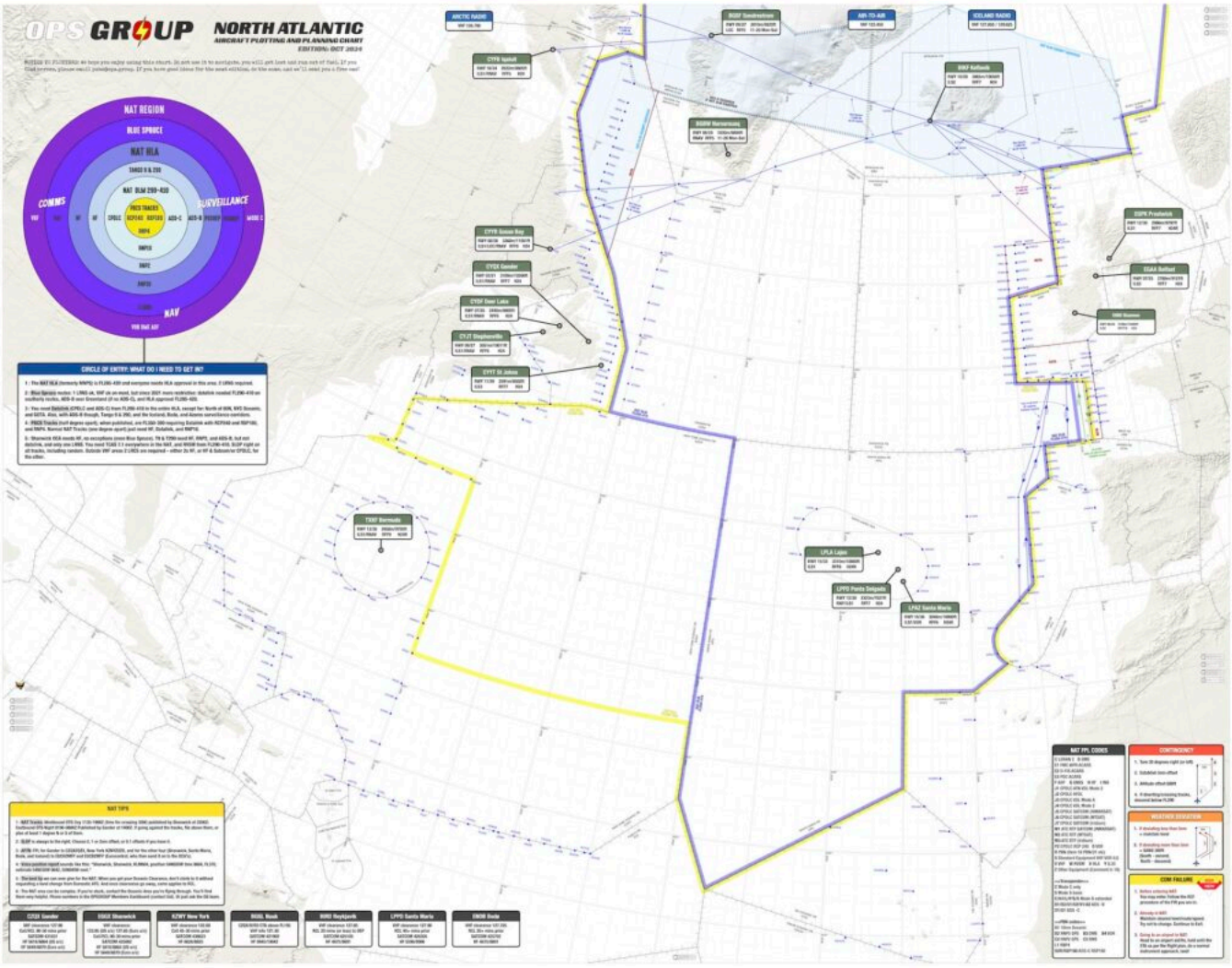
2025 North Atlantic Plotting & Planning Chart

David Mumford
5 November, 2024

The new OPSGROUP NAT/North Atlantic Plotting and Planning Chart 2025 is released today! This is our chart showing North Atlantic Oceanic Airspace and adjoining domestic airspace, with easy to read NAT Tips, Airspace Requirements, Emergency Procedures, and much more!



OPSGROUP members – you can grab a copy in your Dashboard. View it on your iPad or Laptop etc. as a PDF, or print it out! If you're not a member, read on for how to get a copy…

Changes in this NEW edition (Oct 2024):

- **FULLY UDPATED** for 2025!
- **UPDATED!** NAT Tips – using NAT Tracks, SLOP, filing an Oceanic Flight Plan, and helpful tips.
- **UPDATED!** Quick reference for contingency, weather, and comms failure with easy graphics.
- **UPDATED!:** NAT Airspace Circle of Entry 2025 – easily check what you need for Nav, Comms and ATC Surveillance depending on which bit of the NAT you will be flying through.
- **Additional** diversion airports, now 16 total primary NAT alternates with runway, approach, length, RFF, and hours.
- **Easy view** of boundaries for HLA and DLM/Datalink mandated airspace.
- **Updated** NAT FPL codes, clearance frequencies, Satcom, and HF.
- **Fully updated** "South East Corner" with new Tango routes.
- and … Treasure Boxes!

Other chart features:

- Requirements for NAT tracks, PBCS tracks, datalink mandate.
- Common NAT Diversion Airports.
- Runway Orientation, Length, best IFR Approach.
- RFF Category and Opening hours.
- NAT FPL Codes and sample FPL.
- Blue Spruce routes and equipment requirements.
- All NAT Entry/Exit points with associated required landfall fixes.

There are two options to download a copy of the NAT Chart:

OPSGROUP Members

You can get it in your Dashboard, under **Briefings and Guides**.

Get it from the OPSGROUP Store

Not a member? Get a copy from the **OPSGROUP Store**.

The Golden (FAA) Rules for a Good Plot

OPSGROUP Team
5 November, 2024

Some people really enjoy plotting. If the other pilot has added some tiny krakens or miniature pirate ships to find on the chart, it can be a fun way to pass the time on a dark and endless North Atlantic crossing. For

most though it is an irritating thing not made an easier by the somewhat confusing requirements as to **how, when and why** you need to do it.

So here is a brief summary of the FAA Plotting requirements.

What do the rule books say?

The place to find the info is this – AC 91-70B

It is an advisory circular providing '*general information and guidance for commercial and General Aviation operators ("you") planning flights in oceanic and remote continental airspace'.*

Sounds good until you actually open and discover it is **114 pages long** and the first chunk is a very long list of links to other documents which you also need to refer to for information and guidance. We actually started writing this post in 2019 when the current AC came out…

So, this post is *just* looking at plotting. That's it. Just plotting.

Why do we need to plot?

We plot so that we can check that the airplane is actually going where it should be going, and that we are where we are supposed to be.

The North Atlantic is big and remote and unlike land, there aren't many places to put Navaids, which means you are **relying entirely on your Long Range Navigation Systems** (usually something to do with satellites) to ensure you are in the correct place.

The second problem is we make mistakes – sometimes we put the wrong things in the box (see the section on half degree waypoints below). So plotting can help **catch those navigation errors** before they become really 'gross'.

The FAA say "*you should use a chart, of appropriate scale, to provide yourself with a visual presentation of your intended route, regardless of your type(s) of LRNS." (6.3.1.11)*

And ICAO say… actually they pretty much say the same. (Position Plotting 8.2.10)

When do we need to plot?

The earlier FAA AC 91-70A had a whole section (3.6) on when plotting is required:

- **Turbojet aircraft:** If you are operating along a route segment where the distance between standards ground based navaids **exceeds 725nm**
- **Turboprop aircraft:** ditto ditto **450nm**

But – this was removed in the new AC. **So, do you still need to plot?**

Well, the simple answer is yes, and the more complicated answer is that "plotting" means something a little different now. **It isn't about drawing it on a map so much as checking and cross-checking** your position.

What is the difference between the cross-checking versus plotting?

Acceptable procedures are outlined in section 6.4.8 of AC 91-70B.

We used to plot manually in order to check we were where we were supposed to be. This cross-check hasn't really changed – we are still cross-checking the FMS and master document (OFP) against the currently effective route clearance to prevent inadvertent deviations from the cleared route. **The big difference is you don't actually have to do it on a paper map anymore (6.4.8.2).**

It is also required regardless of the distance from the nearest NAVAID.

So what do we do it on?

Up until 2019, manual plotting was required, but this changed when the FAA realised FMS-driven navigation displays and what-have-you were actually just as accurate

Opspec/MSpec A061 says you can used an electronic flight bag (EFB) for "interactive plotting" instead of a paper chart (6.3.1.11.2) – in other words an alternate "navigation display", where the alternate means not necessarily a paper plotting chart.

Back to how do we do it…

The aircraft position check should be made at a point approximately 10 minutes after a waypoint.

- Plot your current Lat/Long and record the time.
    - Use the "non-steering" LRNS to find your current lat/long because if your other one is lost it won't really help you to use it.
    - Confirm the circle/cross/miniature airplane symbol you are using (the nav system is using) to mark your current position agrees with your route clearance. I.e. **its on the right track and not out in the middle of anywhere it shouldn't be.**

- Next up, have a look at where you're heading:
    - Check the **active leg** by confirming the **FROM and TO waypoints** of the clearance against the active flight plan
    - Confirm what is in the **FMS matches the clearance**
    - Check you have the **right autopilot mode** in. LNAV/NAv is good. HDG is not good
    - Check the **"expanded" waypoint** to make sure there are no rogue minutes in there
    - **Confirm your ETA** over the next waypoint (and check you are the flying the assigned Mach number)
    - Check you're still **SLOP**-ing if you should be, and at some point, make sure the SLOP ends when it should as well
    - Give the wind a quick check as well. It's just handy to know in case you lose all your LRNS stuff

Re-clearances.

You've done all of the above, prepared a beautiful map ready to go and *horror of horror* ATC send you a new clearance. This is annoying and is the reason most GNE's seem to occur, or rather folk not doing it right is the reason.

- **Confirm the re-clearance** with the other pilot. You both have to "receive" it
- Make sure you tell the aircraft the new clearance otherwise it won't fly where it is supposed to. Both should double check the inputs as well to **catch any finger trouble**
- **Re-plot it** ready for your plotting checks
- It can be a good idea to **check the new distances between waypoints**
- Add in **a little fuel check** in case it is significantly different to your planned route.

A note on half degrees.

Half degree waypoint are fun little things. "Fun" because they are easy to mess up because no-one ever seems entirely sure how to type it into the aircraft computer.

Here is an ICAO paper on it. Well, actually it is on general **waypoint insertion**, but with a focus on half degree ones.

The issue tends to be with the identifiers. For example, ARINC 424 uses an "N-prefix" format which means you might see N5250 and be all *"that looks like half of north 50"* but actually this would mean 52030N 050000W. So you need to potentially check two things here.

- First, if you receive a clearance with a half degree waypoint, confirm the identifier (N5250) has been loaded with the half degree (52030N 050W) like in the picture below
- If you have a clearance with no half degree waypoints and are whacking in pre-loaded Idents, check they **don't** have half degrees – because N5250 night not mean N52000 W050000.

The ident doesn't show the half waypoint – so the full waypoint must be checkedStill confused about what to insert? Read this handy guide from Honeywell.

Watch this space.

The FAA are plotting a new draft – AC 91-70C – which will probably be out towards the end of 2021/ start of 2022.

All done?

We wrote a load of stuff on plotting back in February 2020. Most of it still applies and you can read it here.

We have also made a handy **Opsicle** (refreshing bits of ops info, just for members). This one is called **The FAA North Atlantic Plotting Guide** and if you are a member then you can download it here.

Oceanic Plotting: Classic Navigation meets New Age Tech

Chris Shieff
5 November, 2024

Flying over large expanses of ocean, one might assume the cockpit would be a quiet, boring space with little more to do than to speculate about company rumors or constantly graze on the galley snacks you long ago promised yourself you'd stop eating. But the reality is that to ensure a safe and compliant oceanic crossing, the tasks involved can be intensive and the cockpit can be a busy place!

Plotting and monitoring your route over the ocean – or any remote area for that matter – is one of those vital tasks necessary to ensure safe navigation. And with some familiarization with up-and-coming technology and hands-on training, plotting can serve as both a confirmation of aircraft navigational abilities and a last ditch resort if such capabilities fail.

Why We Plot

Legally speaking, the crew of any turbojet that flies a route that exceeds 725 nm from "the service volume of an ICAO approved ground based navaid must perform plotting procedures as a way to generate a '**reliable fix**' of its position once per hour (the distance decreases to 450 nm if flying a turboprop)," explains Guy Gribble, General Manager of International Flight Resources.

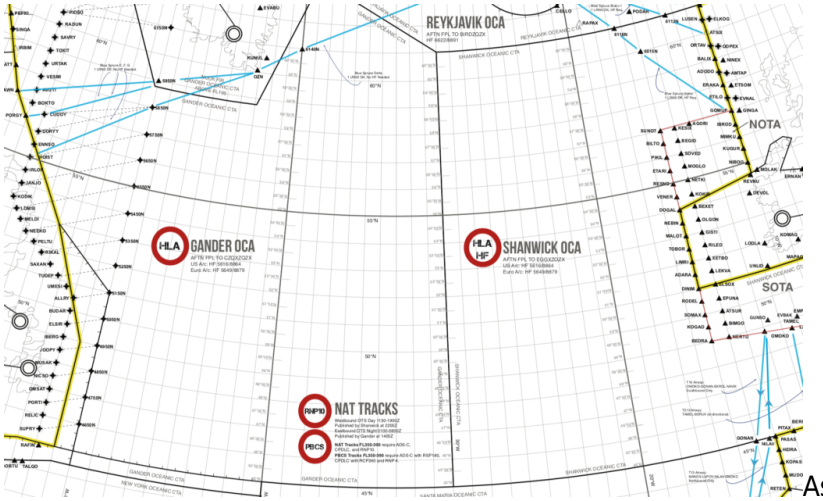
With the breadth and reliability of most modern aircraft long range navigational systems (LRNS) and flight

management systems (FMS), it may seem archaic to manually plot an oceanic course. But studies have shown that **plotting greatly reduces the chances of flying off course and causing a gross navigational error**. FMS's are *NOT* infallible and the pilots operating them even more so!

Plotting not only assists in ensuring you are flying your cleared AND verified route, it serves as a system of checks and balances when reviewing your (and your co-pilot's) inputs into the FMS. In the event of a partial or complete loss of navigational abilities, the plotting chart also works as an **emergency form of dead reckoning**. And lastly, combined with the Master Document, the plotting chart is the trip's legal record of compliant (or lack thereof) oceanic navigation if a state authority were to review or investigate the trip for any reason.

Requirements

The first requirement begins with the plotting chart itself. The chart must be oriented North, be based on WGS-84 (World Geodetic Standard of 1984) and mean sea level, and of a valid date. It must also be to a scale that can clearly depict the flight route and other oceanic tracks. Other than that, manufacturers are free to customize charts to whatever preferences they desire.



As far as chart validity dates go, many charts do not have expiration dates; rather that dates published are based upon the measurement of variation. "You may have to go to the manufacturer's website to see if a new chart is available," Gribble says. "If you download it on an iPad, they are updated automatically."

The information crews must include on the chart starts with the aircraft's **CLEARED route** (reroutes are very common, and many GNE's have occurred by crews flying the filed flight plan, not the cleared flight plan). The **route's waypoints** – coast out, coast in, and lat/long positions – must be clearly marked on the chart using standard symbology. The chart should also include graphic depictions of **ETP's** (Equal Time Points). ETP's are calculated locations where an aircraft would turn around, divert or continue on its route in case of an abnormal or emergency situation. Flight planning services normally provide these points with your flight plan and are usually based on an engine failure, a depressurization event or a medical emergency. If one of these emergencies were to occur, the crew may have to perform a contingency manoeuvre and must try to avoid adjacent and underlying oceanic tracks should a diversion or descent be required. Thus, neighboring **oceanic tracks** published daily should be included on the chart for situational awareness. Additionally, it's a good idea to mark decent **alternate airports** on the chart.

Monitoring your oceanic route is accomplished through a **10 Minute After Waypoint Check**. 10 minutes (or roughly 2 degrees of longitude) after crossing each oceanic waypoint, the crew must verify their current position by **1)** plotting the current lat/long on the depicted route, **2)** computing both magnetic course and distance to the next waypoint and **3)** comparing this information to that of the FMS. There are three methods permitted to do this:

1. The Plotting or Paper Method
2. The Navigational Display Method
3. A customized and approved method

The "plotting or paper method" is for aircraft with any navigational configuration. It requires the crew to record the time and plot their present lat/long on the paper chart by using the coordinates from the "non steering" LRNS and take immediate action if the plotted point doesn't align with the cleared route. The "steering" LRNS – the one coupled and following the autopilot – is then used to verify that the next waypoint is consistent with the cleared route and the autopilot is steering to that waypoint.

The "navigational display method" is for aircraft equipped with an operable FMS. The crew must confirm that the aircraft symbol is on the route programmed in the FMS and set to the smallest scale and checked for any cross track deviation. The crew must take corrective action to address such deviations. And, as with the previous method, the steering LRNS is used to confirm it is headed to the next waypoint on the cleared route. "With the navigational display method, an easy way to record your fix is to have your digitally generated map zoomed in to at least 5nm. Then have your autopilot coupled FMC display the time, lat/long and RNP – the 4 pieces of info you need. Then just take a picture of that with an iPad or iPhone, and that will serve as your recorded plot," explains Gribble.

And for the "customized and approved method"... if you have created one that has been authorized, we'd love it if you shared! FedEx is one such carrier that has created its own procedures for confirming a reliable fix.

Regardless of the method, it should be **spelled out entirely** in the company's operating manuals. Comparing navigation system positioning isn't the only form of cross-checking. If a reroute is given, good crew resource management is absolutely required when copying, entering and cross-checking the new route.

Along with plotting the position, crews must calculate the magnetic course (remember your private pilot days: true course +/- east/west variation = magnetic course) and measure distance to the next waypoint, both of which are necessary if navigational capabilities of the aircraft are compromised and dead reckoning is required. If you don't remember how to do these, don't worry, **Code7700** has published a helpful guide on how to do it manually and electronically. There are also several apps and Excel based tools available out there, and many plotting charts have examples to walk you through it.

Ops Spec B036 authorizes navigation over oceanic and remote areas for aircraft having multiple long range navigation systems (B054 if only using a single LRNS) and B037 or 39 dictates whether over the Atlantic or Pacific oceans. "The important thing about B036 is that the operator must spell out in that authorization whether plotting will be accomplished by paper or an electronic method," explains Gribble. "Part 135 operators must also demonstrate that they have initial and recurrent training programs along with the procedures spelled out. And for the few Part 125 operators, they are required to have a Letter of Deviation Authority."

Gribble warns, "Operators spend all this time and effort getting LOA's, Op Specs, and updating manuals and procedures. Then crews never read them again. Keep studying those documents! There are so many restrictions in your LOA's. Maybe you're not approved to fly Blue Spruce routes. Unfortunately crews forget what the documents detail, and resort to just flying the way other pilots have been operating. There's a loss of knowledge."

He also stresses, "Absolutely use the ICAO (NAT OPS Bulletin 2017-005) or FAA (AC 91-70B Appendix D) issued oceanic checklists! They are excellent resources and cover everything from preflight through arrival at the destination."

Paper VS The Future

Just over a year ago at an international operators conference there was a presentation for electronic plotting. The presenter spent an hour demonstrating how to **perform an oceanic crossing without paper**. Although impressive, at that time there was no single app that could perform all the required plotting tasks, and the shear number of additional apps that had to be opened and closed on the iPad to substitute for whatever the main app lacked was astounding. At that point, paper was still king. But in just a little over a year, technology does what it usually does – improved exponentially. And it now looks like there are some apps that can handle all the oceanic plotting tasks, and they're only getting better.

Mitch Launius, from 30West IP, sees the opportunity for increased safety as these electronic apps continue to improve. "Having another form of redundancy in the cockpit will make things safer in the cockpit. This technology is very new. You could say we're only at Version .5 – barely out of Beta – but these programs will evolve quickly. This is just the tip of the iceberg. It's going to happen."

30West IP has produced several YouTube webcasts, a few which focused on the operational capabilities of some of these apps. "The FAA fully understands the opportunity electronic devices and some of these apps offer for oceanic navigation and they are embracing it – just slowly – as they want to ensure safety of changing procedures." He points out the requirements for permitting **Electronic Flight Bags** into cockpit. "If you're Part 135, you will need the POI's authorization to receive Ops Spec A061, which would show that an operator demonstrates a change to its procedures." AC 91-78 Use of Class 1 or Class 2 Electronic Flight Bag is also good resource to check.

However, if an operator is **Part 91**, there is **no authorization required**. "Regardless of what you hear, there is no Letter of Authorization required if you are a private operator," explains Launius. "An inspector would like to see three things, advisory in nature only, however. They want to see that the company's operating manuals address the addition of EFB and oceanic navigation, that the crew is trained, and that there is a document management procedure in place for recording the crossing." AC 120-76 Guidelines for the Certification, Airworthiness and Operational Approval of Electronic Flight Bags should be used for guidance.

If transitioning a flight department from paper to electronic plotting might seem intimidating and difficult, Launius disagrees. "It might be much easier than you think. You must update your manuals with a few paragraphs to acknowledge the use of EFB and change in procedures. Then have all the pilots meet and train on the EFB's. And if you're a part of an SMS, you'll just need to show a change in management policy. So perhaps have the pilots meet back up in 6 months and discuss what works and what doesn't and restructure the procedures as needed."

“If your department is flying to Europe 2 or 3 times a month, using electronic plotting is going to be very useful,” says Guy Gribble. “But if you’re only flying 2 or 3 times a year, I still believe the ease and affordability of paper is preferable, for now. Some of the newest models of Gulfstream, Globals and Falconjets actually will have the ability of their FMC’s to pull data of its location and wirelessly transmit it to an iPad. Now that’s truly electronic plotting.”

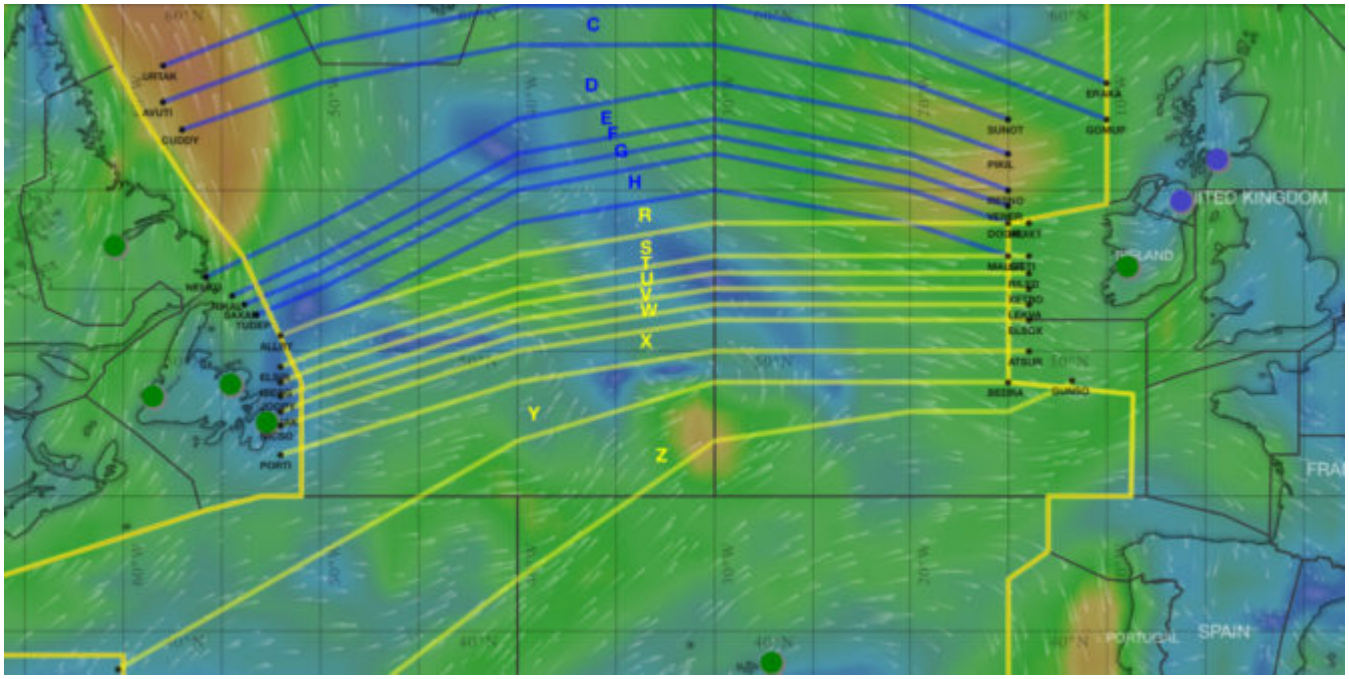
Code7700 has published an impressive article comparing some of the leading **electronic plotting apps**. Arinc, Jepp FD, Foreflight, plotNG and Garmin are just a few that offer these apps, along with some other flight planning services. Some of the benefits of going paperless is the ability to download both the flight plan and daily oceanic tracks, ETP’s can be updated as can ETA’s, and, through typing or using a stylus, the Master Document can also be downloaded and filled out as the flight proceeds without the all the chicken scratch normally seen on paper plots.

If operators perform many crossings per year, crews will become accustomed to using the apps as well as some of the creative techniques that may be required to compensate for some of the more complicated tasks. Course calculating and distance measuring still seem to be rather cumbersome tasks on most of the apps but operators have come up with some inventive and manageable ways to overcome this. Of course the cost is much greater than the affordable bundles of paper charts, but some of the flight planning companies may provide the app for free if using their services. Ultimately, it will come down to the operator’s needs and the frequency of oceanic crossings.

Thanks to Roger Harr at www.n138cr.ch for the header photo of this article!

July 2019 North Atlantic Update

David Mumford
5 November, 2024



There are **four new things** to tell you about the North Atlantic, following the flurry of new and updated

NAT Bulletins that ICAO issued last week. Get ready for some acronyms! Here's a summary:

1. OWAFS

Operations Without an Assigned Fixed Speed
ICAO NAT Bulletin 2019_001

We wrote about this before. This Bulletin just formalises the practice that has already been in place since April 2019 in the Shanwick, Santa Maria, and New York Oceanic FIRs (not WATRS).

Here's how it works: You'll get a normal oceanic clearance, with a fixed Mach Number, like you always did. But then somewhere after the Oceanic Entry Point, you may get a CPDLC message saying **RESUME NORMAL SPEED**. You should reply with **WILCO**. What that means is: **Fly ECON, or a Cost Index with Variable Mach**. You can fly within 0.01 up or down of your cleared Mach, but if it varies by 0.02 or more you must advise ATC.

2. ASEPS

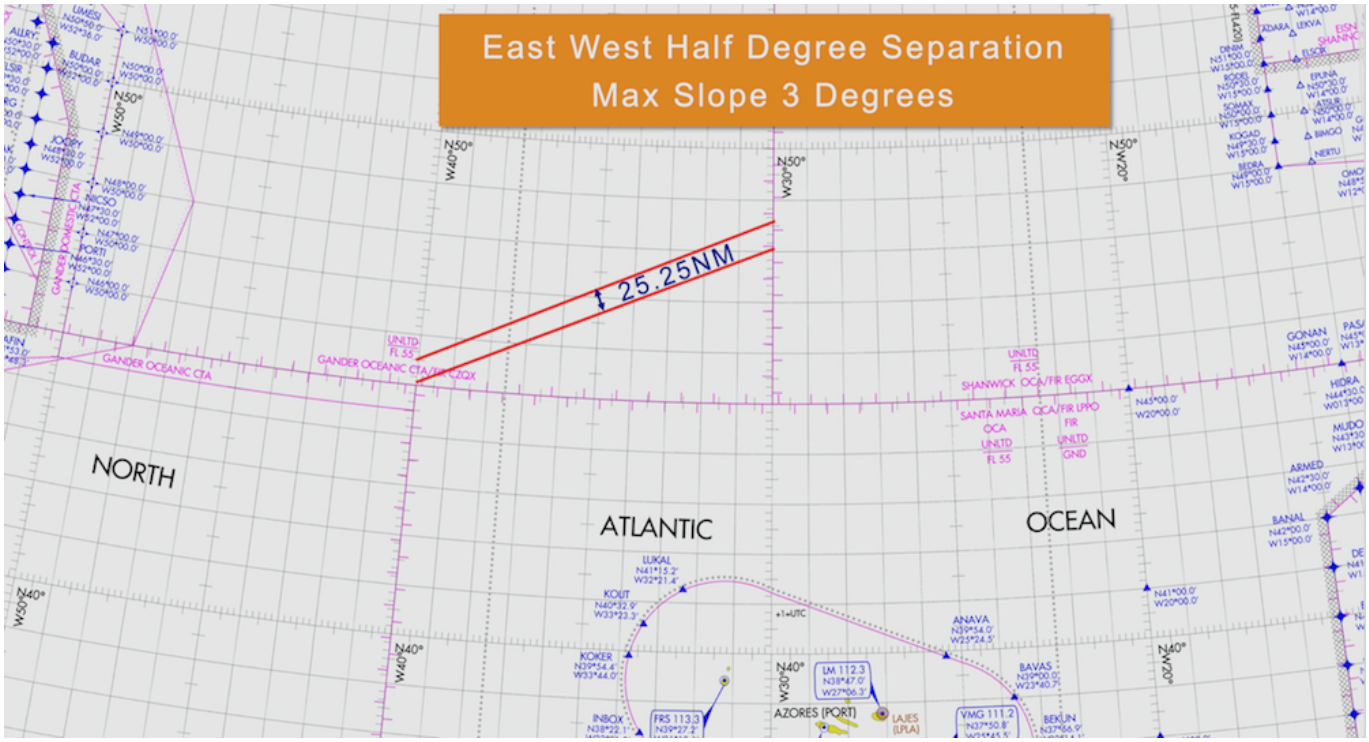
Advanced Surveillance Enhanced Procedural Separation
ICAO NAT Bulletin 2019_002

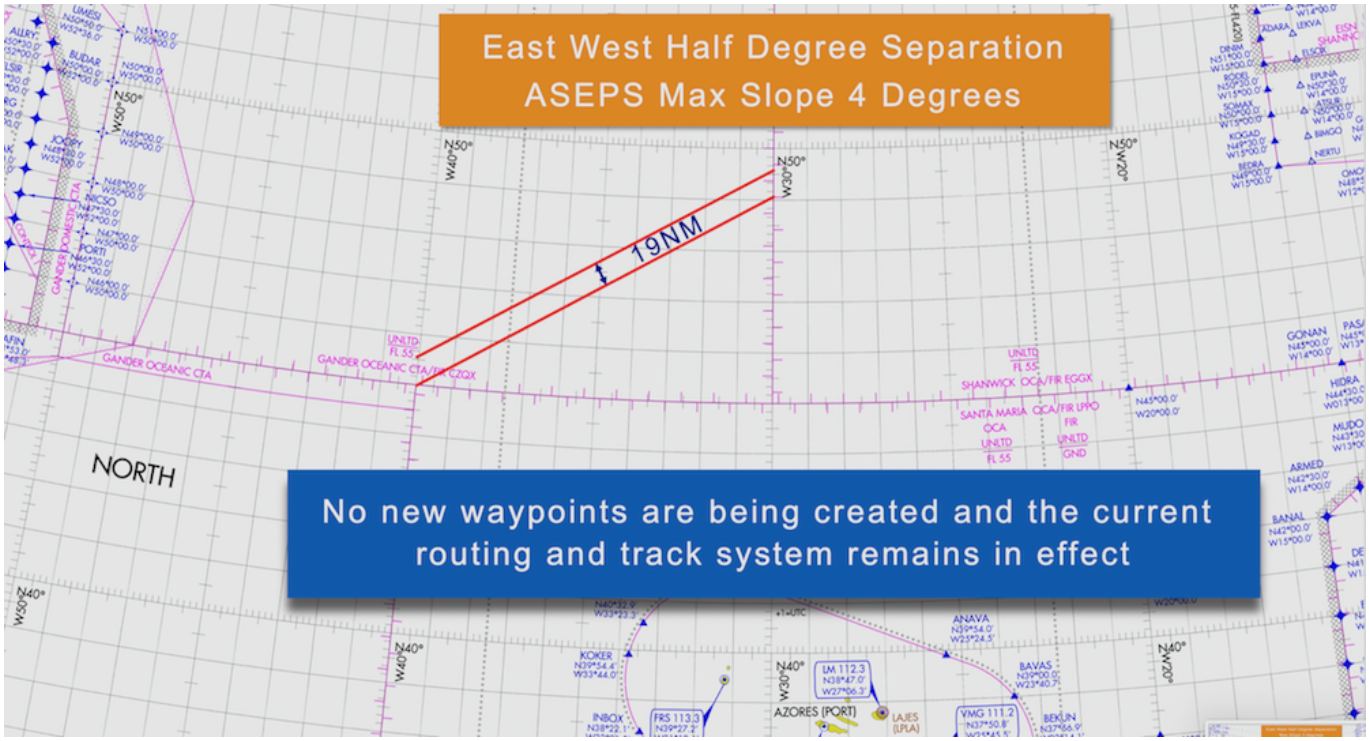
ASEPS was another trial that started in April 2019 – this time in the Shanwick, Gander and Santa Maria FIRs.

So far it has only been for **longitudinal separation**, which can be brought down to as close as **14NM** for compliant aircraft (RVSM/HLA approval, ADS-B, and fully PBCS compliant – which means meeting the specifications of RNP4, RCP240 and RSP180).

But in the new Bulletin, from October 2019 they plan to reduce **lateral separation** for compliant aircraft as well – down to **19NM** from the previous limit of 25NM.

There are no plans to change the design of the NAT Tracks, which will continue to be spaced 25NM apart. The initial benefit of the 19NM lateral separation will basically just be that steeper route angles will now be available for pairs of aircraft flying parallel routes outside of the NAT Track system – the current "gentle sloping turn" limitation is 3 degrees latitude between 10 degrees of longitude, but on 10th October 2019 that will change to a limitation of 4 degrees latitude between 10 degrees of longitude. The result of this will be a lateral separation of 19NM on the steeper turning routes.





Images courtesy of 30WestIP

3. Data Link Performance Improvement Options

ICAO NAT Bulletin 2019_003

Nothing to worry about, this is just a list of common datalink errors and what to do about them.

Two key take-aways:

1. Update your aircraft avionics software as soon as updates are available.
2. Answer your messages within 60 seconds or send a Standby message (recent data indicates Business Aviation operators are very bad at this).

4. NAT DLM – The North Atlantic Data Link Mandate

ICAO NAT Bulletin 2017_001_Revision 04

This one is just a slight revision to the plans for the datalink mandate. Datalink is currently required between **FL350-390** in the NAT region, and from 30th Jan 2020 this mandate will be extended to between **FL290-410.**

So with this revised Bulletin, the **change** is that they have decided they will **cap it at FL410** – whereas previously there were no plans for any upper limit at all. This will basically match the NAT HLA and RVSM vertical limits and makes sense. This will allow non-compliant aircraft to continue to operate at FL430 and above – mostly GA/BA operators.

Further reading:

- **OPSGROUP members** can watch the replay of Member Chat #9, where we discuss all these changes in more detail.
- The last round of important changes on the NAT went into effect on 29th March 2019: the PBCS tracks were expanded; real-time Space-Based ADS-B surveillance and reduced longitudinal separation standards were introduced; and the contingency and weather deviation procedures were changed.
- Check out our NAT Plotting & Planning Chart – updated for July 2019.

*Special thanks to Mitch Launius at **30WestIP.com** for help with this post. For assistance with international procedures training for business aviation crews worldwide, check out the website.*