Icelandic Airports & Charts

A Quick Guide to Mach Numbers

One of the most common questions that VATSIM pilots ask when they fly in the BIRD CTA/OCA for the first time are 1. What is a Mach number, and 2. How/where do I find it?

This guide attempts to briefly address both questions, to the extent necessary for VATSIM purposes.

What is a Mach number?

A **Mach number,** or Mach speed, is your speed relative to the speed of sound (Mach 1 = the speed of sound itself.) For example, Mach 0.80 = 0.8 times, or 80%, of the speed of sound.

At cruise, and especially in oceanic airspace, ATC uses your speed in Mach to separate aircraft from each other by speed control. Therefore, when requesting oceanic clearance, it is generally required to provide your requested Mach number/Mach speed for the oceanic crossing.

> For light aircraft flying too slow to changeover into Mach speed (<Mach 0.50), just let ATC know. ATC will issue you an oceanic clearance without a Mach number.

How do I find my Mach number?

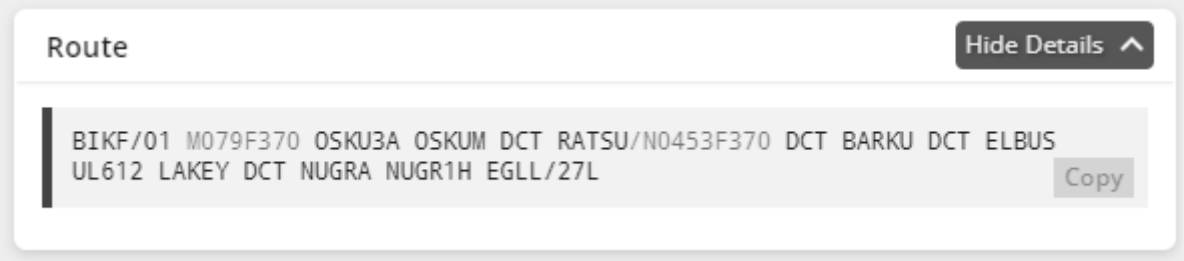
There are several ways to check what your Mach number is. Generally, assuming you have generated your flight plan using Simbrief or a similar tool, the easiest is to check your **flight plan route**.

Whenever you enter oceanic airspace, your ATC flight plan's Route section (item 15 on an ICAO flight plan) should note your planned Mach number next to the **first oceanic waypoint of your route — OR at the start of your flight plan route**, if you are departing from an airport underlying oceanic airspace already (like those in Iceland, Greenland, and the Faroe Islands.)

This generally follows the format `MxxxFxxx`, where the three digits after M are the Mach number (a decimal point goes after the 1st digit), and the three digits after F are the planned flight level at that waypoint.

- E.g., `M078F350` means Mach 0.78 at FL350.

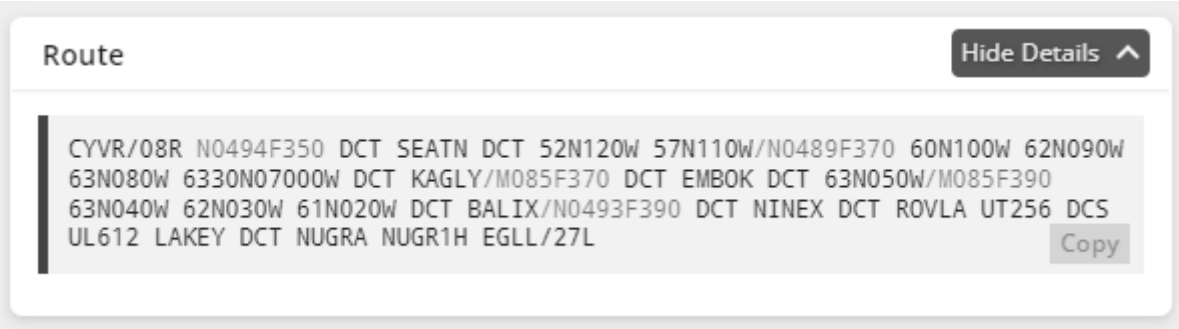
Example 1: Departing an airport underlying the BIRD CTA

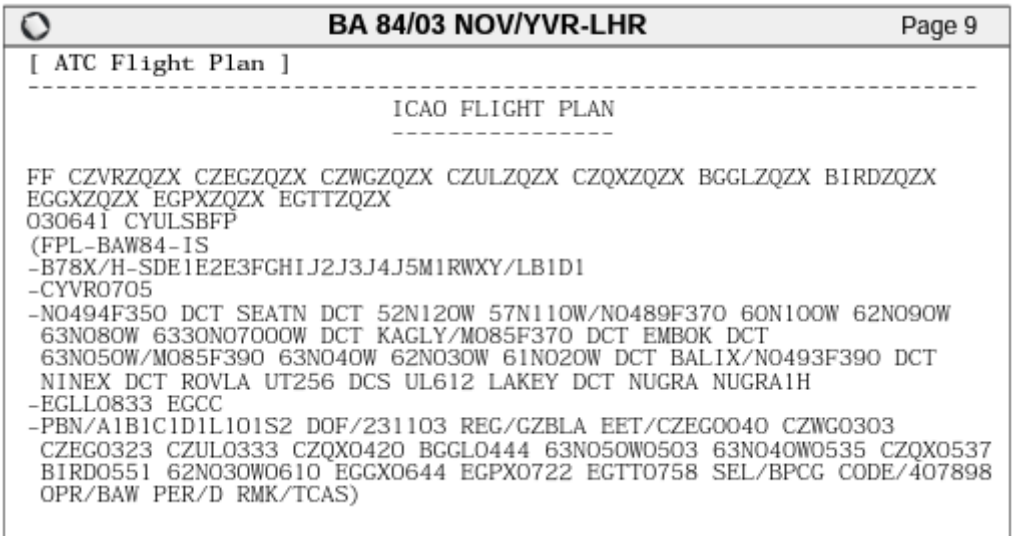


(The 1st screenshot is from Simbrief's Flight Briefing webpage; the 2nd is from the OFP/Operational Flight Plan PDF.)

In this example, the aircraft is departing from Keflavik int'l airport (BIKF) in Iceland. Therefore, the oceanic portion of your flight starts from essentially the very beginning of your route, and so your planned Mach number (and planned cruising level) is listed at the start of the flight plan route. In this case, it is **Mach 0.79** at **FL370.**

Example 2: Passing through BIRD CTA enroute





In this example, because the aircraft enters oceanic airspace starting at **KAGLY**, the oceanic Mach number & requested flight level are listed after that waypoint with a slash — `KAGLY/M085F370`, which means at KAGLY you are planning **Mach 0.85** at **FL370.**

> There are also other ways to check your Mach number — for example, looking at your flight log (which should list your vertical and speed profile), or simply looking at your primary flight display/airspeed indicator if you are already airborne. The above is *one* simple way to check your planned Mach speed, but relying on this number is not a substitute for good planning and due diligence as a pilot.
>
> Pilots are *strongly encouraged* to cross-check your Mach speed using multiple methods, to ensure you are reporting an accurate Mach speed to ATC.

General Briefing

Introduction

Illustration by Isavia.

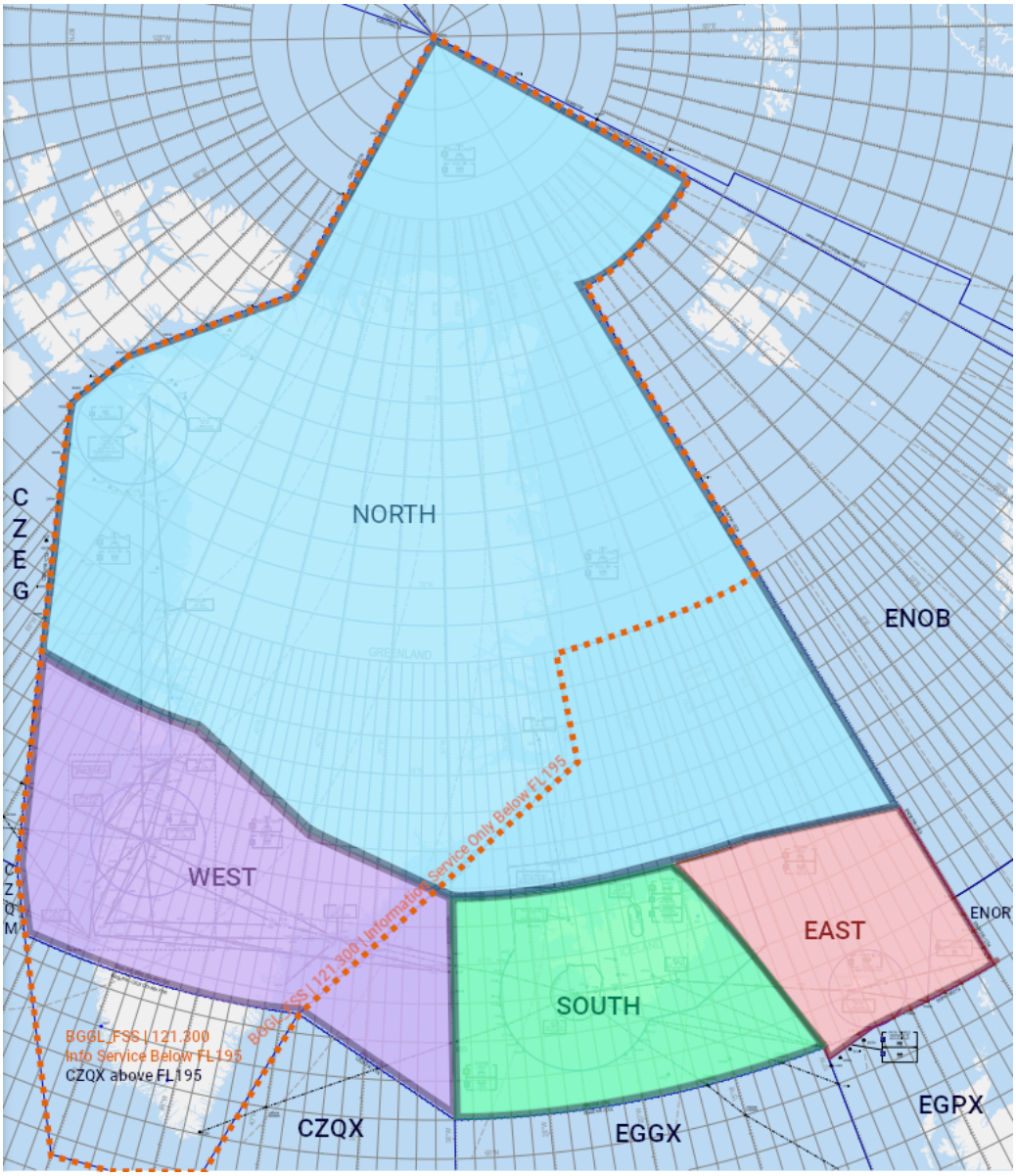
The **Reykjavik Control Area (BIRD CTA)** covers over 5.4 million square kilometres of oceanic airspace between North America and Europe, stretching all the way to the North Pole. Under this airspace lie three territories: Iceland, Greenland and the Faroe

Islands, each with unique geography, airports, and airspace. Together, they offer the VATSIM pilot limitless opportunities for flying.

Our closest neighbors are **Norway, Canada,** and **Scotland.** Neighboring FIRs and oceanic areas include Murmansk (ULMM), Bodo Oceanic (ENOB), Polaris (ENOR/ENSV), Scottish (EGPX/SCO), Shanwick (EGGX), Gander (domestic & oceanic; CZQX/CZQO), and Edmonton (CZEG.)

Sectors

The BIRD CTA is split into four sectors: **North, South, East,** and **West.**



The most commonly staffed Reykjavik Control position is **BIRD_S1_CTR** (frequency 119.700.) This position, when online by itself, covers the **West, South, and East** sectors, and provides top-down coverage for **all of Iceland (BI** airports)**, **EKVG** (& surrounding airspace of the Faroe Islands), and **BGSF** (& surrounding airspace over parts of central Greenland.)

There are, of course, various other BIRD positions available to be opened, where multiple controllers split the various BIRD sectors between them. When multiple BIRD positions are open, you may check vatglasses.uk to see which controller is controlling what airspace, or wait for a "contact me" message from the controller.

> **NOTE:** Sometimes, during major events like Cross the Pond, the division of airspace between controllers may be changed from what it usually is, to accommodate the specific needs of that event. **This may cause Vatglasses to be inaccurate.** If you receive a "contact me" message from a BIRD controller, even if Vatglasses says you're not in their airspace, **do what the controller says.**

The North sector is controlled exclusively by **Iceland Radio (BICC_x_FSS.)** Iceland Radio is a unique position on VATSIM that provides a variety of air traffic services, including:

- ATC in the North sector.
- Oceanic clearances for airborne aircraft entering the entire BIRD OCA.
- Oceanic/IFR clearances for departures on the ground at Greenlandic uncontrolled airports (usually relayed by local AFIS, but if no local AFIS is online, then pilots may contact BICC directly.)
- *(If BGGL_FSS/Nuuk Information is offline and workload permits)* Flight information service in Nuuk FIR below FL195, including top-down ATC at BGSF (Kangerlussuaq) if no local BGSF ATC is online.

if you are confused about when to talk to Iceland Radio, simply message the controller (we're always happy to help, provided we're not too busy!) or wait for a "contact me" message.

Oceanic Airspace

Much of the BIRD CTA — except some low-level airspace over Iceland and Greenland — is **oceanic airspace,** forming of the North Altantic (NAT) oceanic area. The parts of the BIRD CTA which are oceanic airspace are known as the **Reykjavik Oceanic Area (BIRD OCA.)**

Even though the BIRD OCA is oceanic airspace, the *entirety* of the BIRD CTA/OCA has either radar or ADS-B coverage within controlled airspace. Therefore, **position reports are not required,** and pilots can expect to receive a typical ATS surveillance service similar to any domestic ATC position, including speed control, vectors, etc.

NAT Tracks

The North Atlantic oceanic airspace uses a system of tracks called the **North Atlantic Organized Track System (NAT OTS,)** to regulate traffic crossing the ocean. While usually remaining in Shanwick & Gander OCAs, the tracks do occasionally enter the Reykjavik OCA.

If you want to learn more about how the NAT tracks work, read this helpful guide published by the Gander OCA on VATSIM. (Ignore the sections on the routes & Concorde tracks, as they are not relevant to the BIRD OCA.)

Entering Oceanic Airspace

> As of 20th March 2024, it is **no longer required** to obtain an oceanic clearance to fly within the BIRD OCA. **However, you must still transmit certain information to Reykjavik prior to entering oceanic airspace,** as you would have in the past to request your oceanic clearance.

All flights entering oceanic airspace must have an IFR clearance. It is not permitted to fly VFR in oceanic airspace – you must either fly below controlled airspace (generally, below FL55 over the ocean, or below FL195 over Greenland), or obtain IFR clearance.

If you are:

- Already airborne,
- Entering BIRD OCA, and
- Have not previously spoken to any other oceanic ATC (Gander, Shanwick, etc.)

You need to contact Iceland Radio (if online) or Reykjavik Control before entering oceanic airspace, and provide the controller with the following information:

- Oceanic Entry Point (OEP) – i.e., your first waypoint in oceanic airspace
- ETA for the OEP
- Mach Number
- Requested Flight Level – i.e., intended flight level at oceanic entry
- The highest acceptable (maximum) Flight Level which you can attain at the OEP

> Even though there are no more "oceanic clearances," the above procedure is still called a **"request for clearance" (RCL) message** (yes, it is confusing...)

At the moment, you **must use voice** to transmit your RCL message to Reykjavik Control/Iceland Radio. The Nattrak website has not been updated yet.

The controller may respond to your RCL message in one of two ways:

- **"Fly current flight plan,"** which means follow your existing flight plan, as previously cleared & loaded into your FMS, with no changes.
- Issuing an **amended** clearance, which may include changes to your routing, flight level, or Mach speed. This may be necessary to separate you from other traffic, or to fix errors in your original flight plan.

Again, if you have previously received ATC service from any other oceanic sector, e.g., Gander, Shanwick, etc., you do not need to provide Reykjavik Control with a new RCL message.

Voice Phraseology

Example 1: Fly current flight plan *(no changes to flight plan required)*

> “🛩 Reykjavik Control, ICE123, request for clearance.
>
> 🎧 ICE123, go ahead.
>
> 🛩 ICE123, oceanic entry point is VALDI, estimating VALDI at 1234z, Mach .79, FL340, maximum flight level 360.

> ICE123, roger, fly current flight plan.
>
> ✈ Fly current flight plan, ICE123.

Example 2: Amended clearance

If your flight plan must be amended, instead of "fly current flight plan," Reykjavik Control/Iceland Radio will use the phrase **"amended [speed/route/level] clearance,"** followed by the details of the amended clearance. E.g.,

> ✈ Reykjavik Control, ICE456, request for clearance.
>
> ICE456, go ahead.
>
> ✈ ICE456, oceanic entry point is IPTON, estimating IPTON at 1235z, Mach .79, FL340, maximum flight level 360.
>
> ICE456, amended route and speed clearance, after IPTON cleared direct ING, then direct NASBU, maintain Mach .76.
>
> ✈ After IPTON cleared direct ING then direct NASBU, maintain Mach .76, ICE456.
>
> ICE456, readback correct.

ATC may also issue a conditional instruction (e.g., cross a waypoint, climb/descend to a level, etc.) **"at," "at or before,"** or **"at or after"** a certain time, to ensure traffic separation. E.g.,

> ICE456, cross IPTON at or after 1236z.

If you are flying via a NAT track, Reykjavik Control/Iceland Radio will also verify the current **TMI number** with you prior to oceanic entry, to make sure you are flying the correct tracks. (If you don't know what a TMI number is, read the Gander OCA guide linked above.)

Within Oceanic Airspace

Cost Index (ECON) Operations

In oceanic airspace, you may now fly in Cost Index (ECON) mode for optimal fuel efficiency – you do not have to strictly adhere to a specific Mach number. You may deviate by up to **±0.02 Mach** from the Mach number you originally reported to ATC without prior permission. If they deviate by >0.02 Mach from the originally reported Mach number, **you must notify ATC.**

Note that controllers may still instruct you to fly a fixed Mach number if required for separation.

> This procedure was previously known as "Operation Without Assigned Fixed Speed" (OWAFS) – the difference is that now (as of 20th March 2024), pilots are expected to fly ECON mode *by default,* not just when ATC instructs "resume normal speed."

Strategic Lateral Offset Procedures (SLOP)

In BIRD OCA, **above FL285,** you may use SLOP (Strategic Lateral Offset Procedures). This is a random offset off your aircraft's track, intended to "artificially" induce a navigation error that reduces the likelihood two aircraft will occupy the same airspace at once.

At pilot's discretion, aircraft with the capability to offset (using their FMS) may offset **right** of track, up to a maximum of **2 NM** (the exact offset you choose should be random.) ATC does not need to approve SLOP, or be informed when SLOP is in use. **Left offsets are prohibited.**

You must not apply SLOP below FL285 in the Reykjavik OCA, and must end the use of SLOP before entering domestic airspace.