

AERONAUTICAL INFORMATION CIRCULAR 23/15

RECOMMENDED USE OF ARINC 424 IDENTIFIERS FOR HALF-DEGREE WAYPOINTS IN THE GANDER OCEANIC CONTROL AREA

Introduction

Flights operating eastbound or westbound within the North Atlantic (NAT) Region are normally flight planned so that specified ten degrees of longitude (30°W, 40°W etc.) are crossed at whole degrees of latitude. This operating concept has supported a lateral separation minimum of 60 nautical mile (NM) in the NAT minimum navigation performance specification (MNPS) airspace. Commencing 12 November 2015, an operational trial of a 25 NM lateral separation minimum will be implemented by establishing NAT organized track system (OTS) tracks that are spaced by one-half degree of latitude.

Insertion of latitude/longitude waypoints into the flight management computer (FMC) can be achieved using multiple formats and accomplished via automated or manual means. However, while standard pilot pre-flight and in-flight procedures call for each pilot to independently display and verify the degrees and minutes loaded into the FMC for each waypoint defining the cleared route of flight, recent occurrences of gross navigation errors within the NAT Region indicate that certain formats and entry methods for insertion of latitude/longitude waypoints are more error prone than others.

In particular, manual entry of latitude/longitude waypoints using short codes derived from the ARINC 424 paragraph 7.2.5 standard (5050N = 50°N/50°W, N5050 = 50°30'N/50°W) has been directly associated as a causal factor contributing to many of these recent occurrences.

Purpose of Circular

This Aeronautical Information Circular (AIC) advises operators, navigational database vendors, and flight planning services that, due to the unresolved potential for FMC insertion errors:

- Aircraft navigation data bases should NOT contain waypoints in the Gander Oceanic Control Area in the ARINC-424 paragraph 7.2.5 format of "Nxxxx".
- If an aircraft operator or flight planning service has an operational need to populate data bases with half-degree waypoints in the Gander Oceanic Control Area, they are advised to use an alternate format, such as "Hxxxx".

The information provided is intended for publication in the Spring 2016, *Transport Canada Aeronautical Information Manual* (TC AIM – TP 14371E).

Background

For waypoints inserted into the FMC using the existing ARINC 424 paragraph 7.2.5 format, the placement of "N" for **NORTH latitude** either before or after the numbers representing latitude and longitude determines whether the display represents ½ degree or a whole degree of latitude. For example:

- "4050N" represents 40 degrees **NORTH latitude** and 50 degrees **WEST longitude**; whereas
- "N4050" represents 40 degrees, 30 minutes **NORTH latitude** and 50 degrees **WEST longitude**.

When a database contains both the half and whole degree coordinates the potential for manual insertion errors increases. This is further complicated by cockpit display limitations which make it difficult for the crew to identify errors that have been introduced into the FMC. With one-half degree positions and other latitude/longitude positions that are not exactly at whole degrees, current technology does not display the full extent of the stored position data on the instruments used for primary reference.

Preferred Methods of Waypoint Insertion

It is recommended that insertion of waypoints into the FMC be accomplished by established automated systems (e.g. CPDLC, AOC automated systems) wherever possible.

Note: Although not yet ready for use, the functionality supporting the uplink of CPDLC route clearances is under development for use in the Gander control area (CTA). When available, operators will be notified via NOTAM.

The use of whole latitude/longitude coordinates to enter waypoints, using procedures that provide for adequate mitigation of display ambiguity, is strongly advocated.

Regardless of FMC waypoint format and entry method, flight crew procedures should require each pilot to independently display and verify the **DEGREES** and **MINUTES** loaded into the FMC for the latitude/longitude waypoints defining the route contained in the NAT oceanic clearance.

Further Information

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