International Civil Aviation Organization
North American, Central American and Caribbean Office

WORKING PAPER

Fifth North American, Central American and Caribbean Working Group Meeting (NACC/WG/5)

Port of Spain, Trinidad and Tobago, 22-26 May 2017

Agenda Item 3   **Implementation on Air Navigation Matters**
                         3.3   ANI/WG Progress on AIM, ATM and CNS

FREQUENCY FINDER APPLICATION

(Presented by Secretariat)

EXECUTIVE SUMMARY
This working paper introduces the program "Frecuency Finder" which is a program that performs the management, assessing compability on map frequency assignments for aeronautical communication and navigation system.

Action:	Suggested Actions are presented in Section 3.
Strategic Objectives:	• Safety • Air Navigation Capacity and Efficiency
References:	• ICAO Annex 10 - Aeronautical Telecommunications • ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (2)

1.   Introduction

1.1   Aeronautical services are supported by Communications, Navigation, and Surveillance (CNS) systems that base their operations on the radio spectrum. Many of these services suffer problems caused by noise, interference that could cause degradation in communications and the information that they provide.

1.2   ICAO had been supporting States, doing the frequency assignation thought manual ways, and recently, has been developing software to support the frequency assignment management of the CNS systems, thus contributing to better management of the radio spectrum and better provision of services by aeronautical systems.

2. **Discussion**

2.1 The planning and assignment of aeronautical frequencies for air-ground communication systems, frequencies for air navigation systems and assignment of radar mode-S data with interrogator (II) codes has been a task that ICAO has undertaken in support of States and air traffic service providers.

2.2 This task has generally been done manually, which it is time and effort demanding. This manual work increases the probability of making mistakes. The increase in air traffic in recent years and the installation and commissioning of a large number of air-ground communication systems make it necessary to optimize the use of the radio spectrum.

2.3 The assignment of the electromagnetic frequencies for the different systems is a delicate task that must take into account the technical characteristics of the systems, the propagation of radiofrequency and the operational use that the system must provide.

2.4 Electromagnetic interference causes communications degradation, operational misinterpretation of the information that is presented, among others, it is critical to avoid this type of problem.

2.5 To help solve this problem ICAO is developing the "Frequency Finder" program which is a tool to assist in the management of frequency assignments, to be used by ICAO, its Regional Offices and States to manage and coordinate the allocation of frequencies.

2.6 This program combines database management functions to update ICAO COM lists, interference zones and a geographic interface for mapping frequency assignments on a map (currently only with Google Earth).

2.7 The graphical interface can be used to overlay frequency assignments in certain geographic areas such as the ACC or FIR sectors, with air routes and combined with other ICAO databases being developed.

2.8 The program was initially developed to support regional offices that have a central role in the coordination of frequency assignment, with particular attention to Europe (and in North America: the United States and Canada). The program is being modified for Frequency Allocation Planning in Europe (in particular, the use of 8.33 kHz).

2.9 The program facilitates:
  1. Frequency compatibility analysis
  2. The interference resolution
  3. The allocation of new frequencies

2.10 The program is designed to manage the following modules:
  1. VHF air-ground communications (DBS-AM, VDL Mode 2 and VDL Mode 4)
  2. VHF navigation (ILS, VOR, GBAS, VDL mode 4)
  The VHF communications module is very advanced and ready for use.

Still in development;
3.   NDB
4.   HF air-ground communications
5.   Allocation of codes for S mode secondary radars

2.11   All modules are under constant evaluation and evolution of their versions including new criteria according to ICAO regions and documentation.

2.12   The system is developed in FileMaker13 Pro Advances for database management, contour interference calculation, frequency assignment compatibility and the generation of all files needed to map the frequencies in their coverage (Google Earth), including The areas of overlap and interference.

2.13   Visit the following website: https://www.youtube.com/watch?v=kBKhPzIl6cs&t=37s

3.   Suggested Actions

3.1   The Meeting is invited to:

a)   take note of the information presented;

b)   to appoint technical staff from the States to participate in the Technical Meeting/Workshop of the Frequency Finder that will be taking place in Mexico City in October; and

c)   any additional activity required.

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