



*International Civil Aviation Organization*

**ICAO FIFTH MEETING OF SPECTRUM REVIEW  
WORKING GROUP (SRWG/5)**

Video Teleconference, 15 – 17 March 2021

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**Agenda Item 4:** Frequency coordination process and improvement for the Asia/Pacific Region

**UPDATES TO FREQUENCY FINDER**

A program for managing, assessing compatibility and presenting frequency assignments for aeronautical communication and navigation systems on a map

(Presented by the Secretariat)

**SUMMARY**

This paper presents the latest work, enhancements and functionalities brought to the Frequency Finder tool to assist ICAO Regional Offices and States to manage and coordinate aeronautical frequency assignments.

**1. INTRODUCTION**

1.1 ICAO has developed the program Frequency Finder that offers a tool to assist ICAO Regional Offices and States to manage and coordinate aeronautical frequency assignments. This program combines the data base management functions for updating not only the ICAO COM lists 2 and 3 as well as the SSR list for SSR Mode S II codes. Frequency Finder provides also for the calculation of interference areas and a geographical interface for plotting of the frequency assignments, including any interference area.

1.2 The module for the coordination of SSR Mode S Interrogator Identifier codes has been implemented and is in operation.

1.3 Work on the development of a module for VHF/UHF navigation systems as in COM list 2 (ILS, VOR, DME and GBAS) is near completion and is currently under evaluation using updated frequency assignment planning criteria. These updated frequency assignment planning criteria were recently approved by the Navigation Systems Panel and the Frequency Spectrum Management Panel and will be incorporated in the upcoming revision of the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (DOC 9718), Volume II.

**2. CURRENT WORK ON FREQUENCY FINDER**

2.1 Frequency Finder, which is a common platform for ICAO and States, provides a solution on the urgent implementation of frequencies (SRWG/5 – WP/04 para. 2.3 refers). In order to better support States and ICAO regional offices, ICAO has successfully enhanced the following features to Frequency Finder tool:

- 1) The import and export functions in the three modules of Frequency Finder; and

- 2) Interface standardization and consistency among modules to improve user friendliness and effectiveness of the tool

## 2.2 The export function through e-Submission in the VHF-COM, VHF-NAV and SSR modules

2.2.1 The export function through e-submission in the VHF-COM is improved using correct terminologies. Furthermore, the same function has now been introduced in VHF-NAV and can now provide the State (user) with the capabilities mentioned below. This same function has also been introduced in the SSR module in order to be consistent with the two other modules.

- It provides brief instructions to the user (the State) on the next step;
- The State (user) can, through a dialogue box, consult the excel file prior submission to the ICAO Regional Office (RO);
- The State would then follow the procedure of sending an email to the RO with the attached excel file through the email software she/he uses.

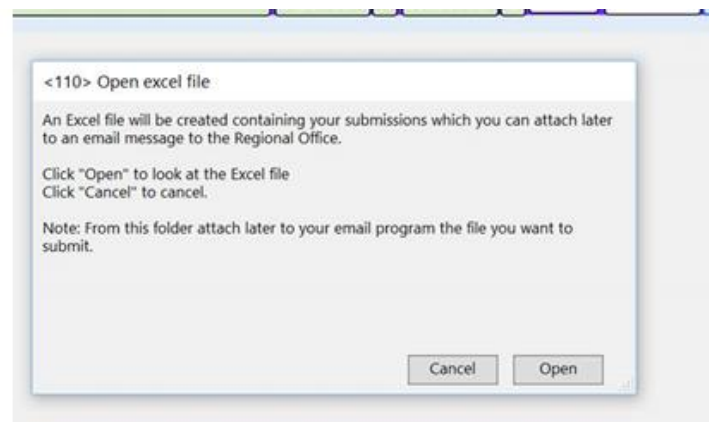


Figure 1 – Screenshot of the dialogue box for export submissions

## 2.3 The import function through e-Submission in the VHF-COM, VHF-NAV and SSR modules

2.3.1 The import function now provides the RO with the possibility to select the file and upload it to the server after having saved the excel file received from the State in the chosen folder e.g. “import submissions”.

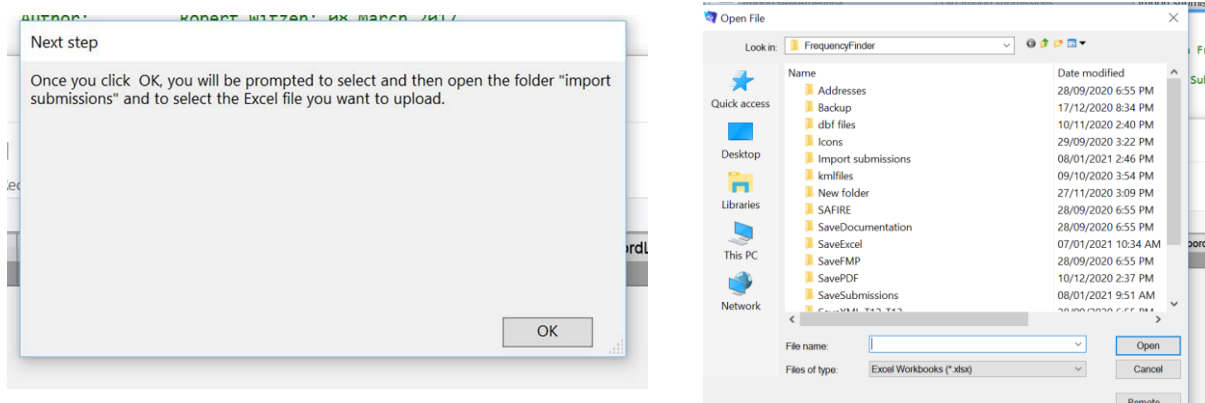


Figure 2 – Screenshot of the dialogue box for import submissions

## 2.4. Interface standardization and consistency among modules

2.4.1 When developing applications, it is important to maintain the interface standardization and consistency so that all applications (modules, in case of FF) work consistently and users can use them intuitively. When applications adhere to standards and maintain consistencies, users know what to expect, learnability is increased, and confusion is reduced. The New version of Frequency Finder improved those providing many benefits not only for existing users but also for new users such as decreasing the learning time, while providing the ability to locate certain important functions in the three modules simultaneously. Following are the two main improvements but there are continuously many improvements incorporated in the new version of Frequency Finder, which increase user friendliness and effectiveness of the tool.

2.4.2 Interface - The startup page of Frequency Finder as well as the startup page and the main page of VHF-COM pages (Figure 3) have adopted a new look as shown from the figures below.

2.4.3 Quick search - In the VHF-COM module a quick find function was introduced that allows a search with as many keywords as needed (Figure 4).

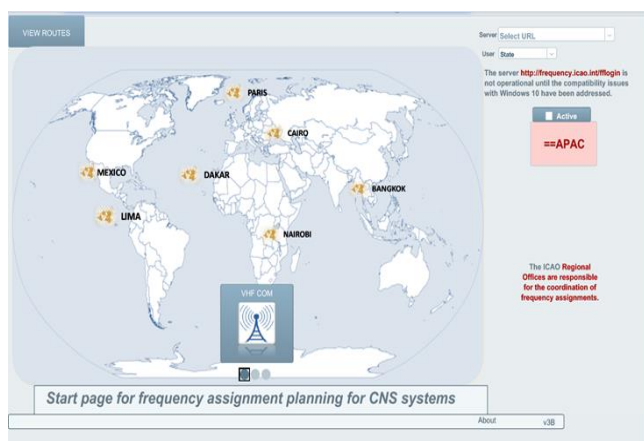


Figure 3 – Screenshot of the new interface to the startup of Frequency finder

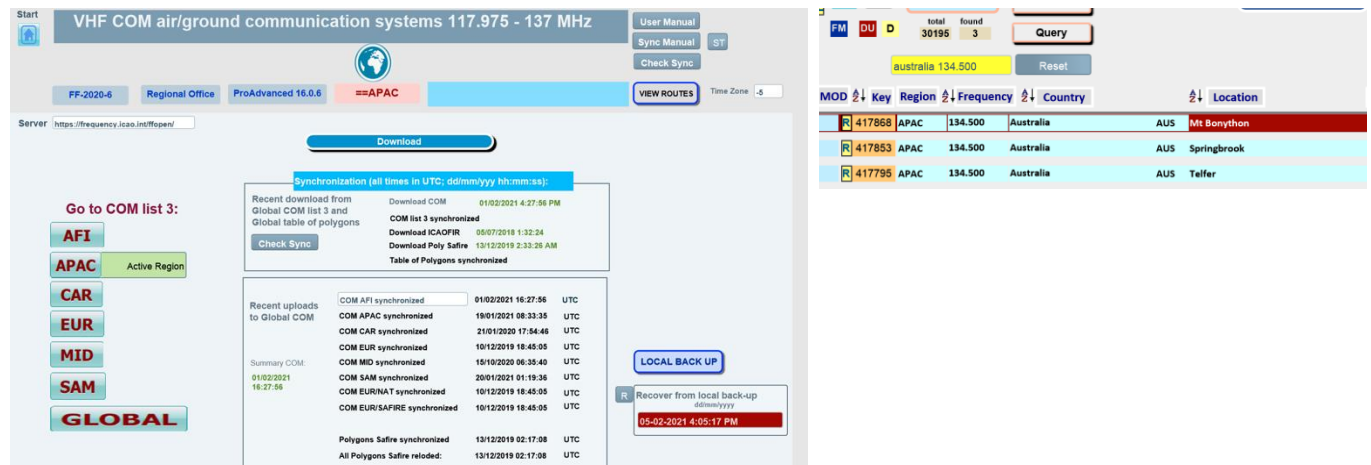


Figure 4 – Screenshot of the new interface to the startup of VHF-COM module and the Quick search function with a reset button

## 2.5 Plotting interference areas in the VHF- Navigation systems (VHF-NAV)

2.5.1 When using the VHF COM and SSR II Code modules, States are capable to plot interference contours or SSR coverage using Frequency Finder. This is often used to visualize the outcome of the evaluation and to facilitate coordination activities in case of interference. At the workshops organized by ICAO, calculating those contours is one of the most important items; it assists the user in visualizing the task, while being based on the agreed assignment criteria. Hence, it needs to be fully understood by participants and users.

2.5.2 Currently, this functionality has not been implemented in the NAV module. Therefore, in order to provide States with a better approach to frequency assignment planning for NAV systems, Frequency Finder will be modified to plot interference areas on the google map, in a manner similar to the COM and SSR II modules. This functionality will also provide users attending the ICAO workshops visualization benefits in addition to the existing calculations and for the greater benefit of consistency among the modules of the FF tool. ICAO plans to implement this new functionality in the Frequency Finder tool before releasing the latest version to States.

## 3. ONLINE COURSE DEVELOPMENT RELATED TO FREQUENCY MANAGEMENT FOR CIVIL AVIATION

### 3.1 Background information

3.1.1 ICAO's international Standards and Recommended Practices (SARPs) and relevant documents related to Frequency Spectrum have progressively been developed became applicable since the 1946. Among those, the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718) provides the ICAO spectrum strategy, policy statements as well as frequency assignment planning criteria for aeronautical radio communication and navigation systems. As indicated in sections 1 and 2 of this WP, ICAO has developed an aeronautical frequency management software tool, the Frequency Finder. This tool is now used by ICAO Regional Offices and frequency managers in States to identify and coordinate frequency assignments in a manner compatible with Annex 10 - Aeronautical Telecommunications - Volume I (Radio Navigation Aids) and V- Aeronautical Radio Frequency Spectrum Utilization and Doc 9718, Handbook on Radio Frequency Spectrum Requirements for Civil Aviation.

3.1.2 Since 2016, ICAO has been delivering instructor-led regional workshops on frequency planning issues and the efficient assignment of the aeronautical frequency spectrum through the usage of the Frequency Finder tool. These workshops facilitate the usage of the Frequency Finder tool by States officials involved in aeronautical frequency management and the assignment of frequencies for different aeronautical navigational aids and services, and facilitate the interaction of States with the regional offices. However, learning from experience, an additional deeper consistent, comprehensive, reliable and cost-effective training methodology is necessary to appropriately understand complexity of this subject and the requirements described in Annex 10, Volumes III and V and other relevant documents, such as Doc. 9718, Volumes I and II. This course will provide the background necessary to ensure that Officials from Member States are be adequately prepared for the workshops by providing the necessary frequency management basics. The overall ICAO competency-based training methodology will support in this regard.

### **3.2 Objectives and expected benefits**

3.2.1 This online course is foreseen to be very beneficial. It will serve as the prerequisite to the regional workshops that ICAO HQ organizes based on requests from Regional offices and States. In addition, it will promote the frequency management knowledge to a broad, worldwide, targeted audience.

3.2.2 Upon completion of this course, the participants will be able to:

- explain the fundamentals of frequency management and the fundamentals of spectrum management;
- identify the spectrum management process and identify the specific process of frequency management and spectrum management related to aeronautical services and aeronautical communication system operations;
- describe and understand interference protection in relation to spectrum management;
- identify the differences between spectrum management and frequency management from aviation perspective; as well as
- understand the Frequency Assignment planning criteria for aeronautical radio communication systems, which includes the introduction to the ICAO Frequency Finder tool.

### **3.3 Future workshop development**

3.3.1 The webcourse material is currently under development, if all goes well, it will be ready for launching by the end of the year. Prior to the launching, the webcourse will require validation by target expert audience to provide feedback on the course.

## **4. ACTION BY THE MEETING**

4.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) make extensive usage of the Frequency finder tool for frequency coordination ;
- c) discuss any relevant matter as appropriate; and
- d) provide feedback on FF tool usage, suggestions, bugs and recommendations

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