

ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation

Volume II - Frequency assignment planning criteria for
aeronautical radio communication and navigation systems
(ICAO Doc 9718, Volume II)

Workshop

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Doc 9718, RF Handbook

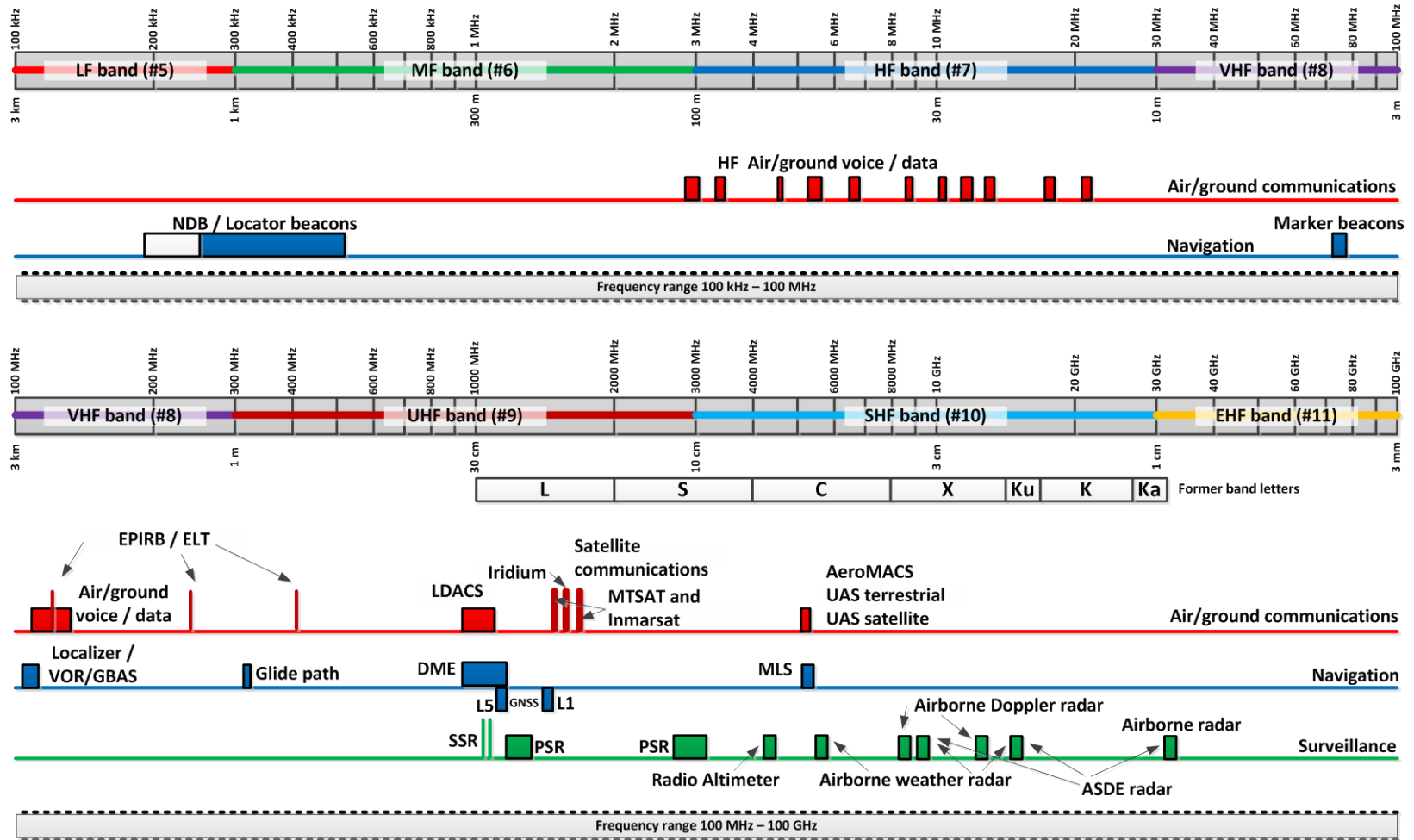
Volume I → Spectrum Management

- **ICAO Frequency Spectrum Strategy:**
 - High level vision on existing and future spectrum requirements in support of the evolving CNS systems and infrastructure requirements
- **ICAO Frequency Policy Statements:**
 - Statements of official policy on each and every frequency band used by aeronautical systems for the provision of CNS
- **ICAO Position for WRC:**
 - ICAO Position on the specific agenda items of the upcoming ITU WRC to ensure that aeronautical requirements and safety concerns are met

Volume II → Frequency Management

- **ICAO Frequency Assignment Planning**

Vol. I – Overview of spectrum for aviation



Notes:
 Drawing not to scale
 Not all Regional or sub-Regional allocations are shown
 Band identification (e.g. VHF) and band # per Radio Regulations
 The satellite communication bands used by MTSAT and Inmarsat are not allocated to the Aeronautical Mobile Satellite (R) Service

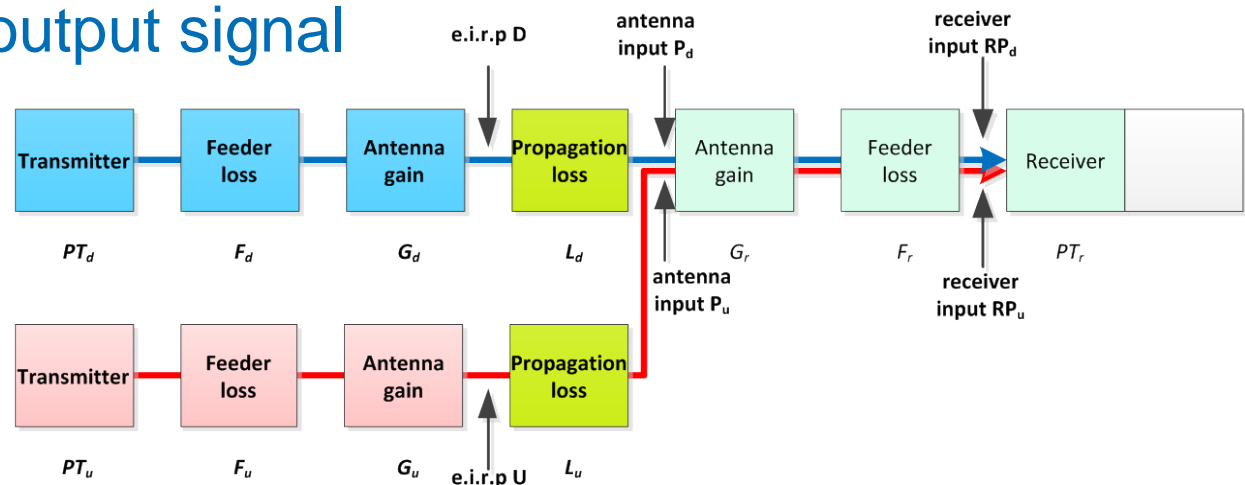
Vol. II – Frequency assignment planning

- Provides for globally harmonized frequency assignment planning criteria and guidance material to support the application of SARPs in Annex 10, Vol. V
- Developed in conjunction with the revisions to Annex 10, Vol. V
- Developed by the frequency Spectrum Management Panel (FMSP)
- **Implementation has been agreed through the relevant Regional eANP**
- Support the development of a frequency assignment plan which encompasses Global and Regional COM lists and the Global Air Navigation Plan

Vol. II – Frequency assignment planning

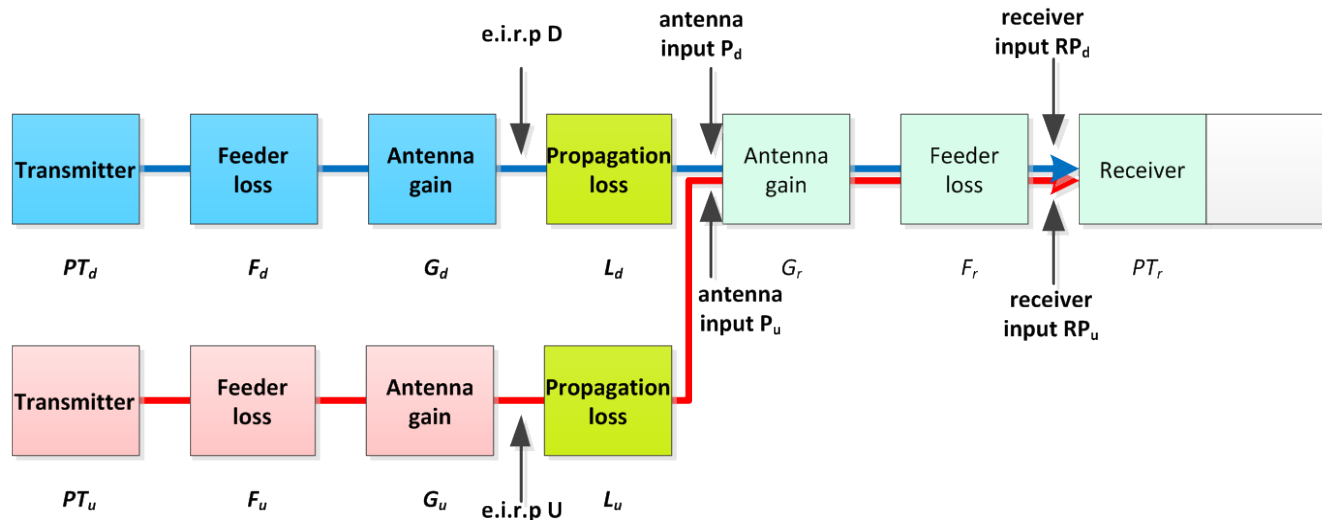
Chapter 1 – General methodology (1)

- General methodology for compatibility analysis
 - General model for compatibility assessment
 - Based on:
 - Protection of desired signal at receiver input
 - Not to exceed maximum permissible distortion of receiver output signal



Vol. II – Frequency assignment planning

Chapter 1 – General methodology (2)



- Determine the desired signal level at receiver input
- Determine the undesired signal level at receiver input
- Determine the D/U ratio
- If P_D and P_U are the same, D/U is $L_D - L_U$

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Radio wave Propagation model

- Propagation model
 - Based on free space propagation
(Re. Recommendation ITU-R P.525)
- Propagation model does not accommodate certain phenomena which are difficult to predict such as
 - Changes in the refractive index of the atmosphere
 - Ducting
- ITU has developed propagation curves for aeronautical communication and navigation systems (Recommendation ITU-R P.528)

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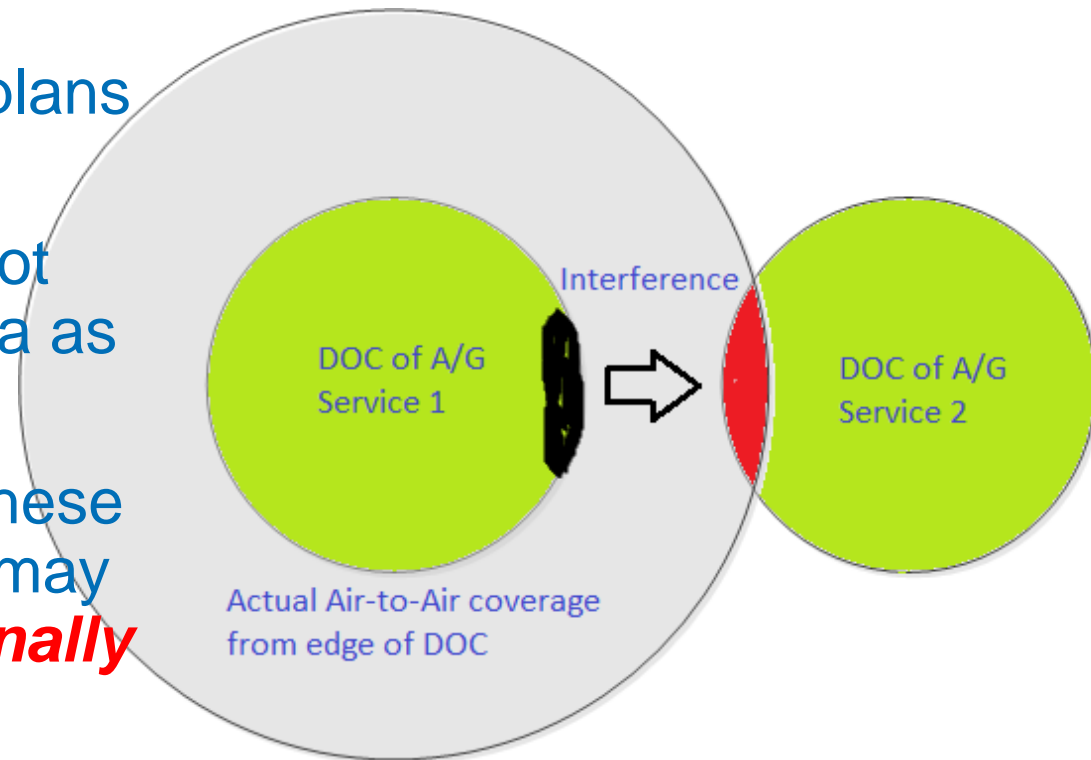
Compatibility criteria for frequency coordination (1)

- Frequency assignment planning criteria are to be considered as a generic technical measure to support frequency coordination.
- Planning criteria provide for a rather conservative method to assign frequencies without causing harmful interference.
- In most cases, a detailed technical analysis would result in reduced geographical separation being required.
- Consideration of actual operational use

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Compatibility criteria for frequency coordination (2)

- Frequency assignment plans
- may include frequency assignments which do not meet the planning criteria as agreed by ICAO
- In many of such cases these frequency assignments may be considered **operationally** compatible

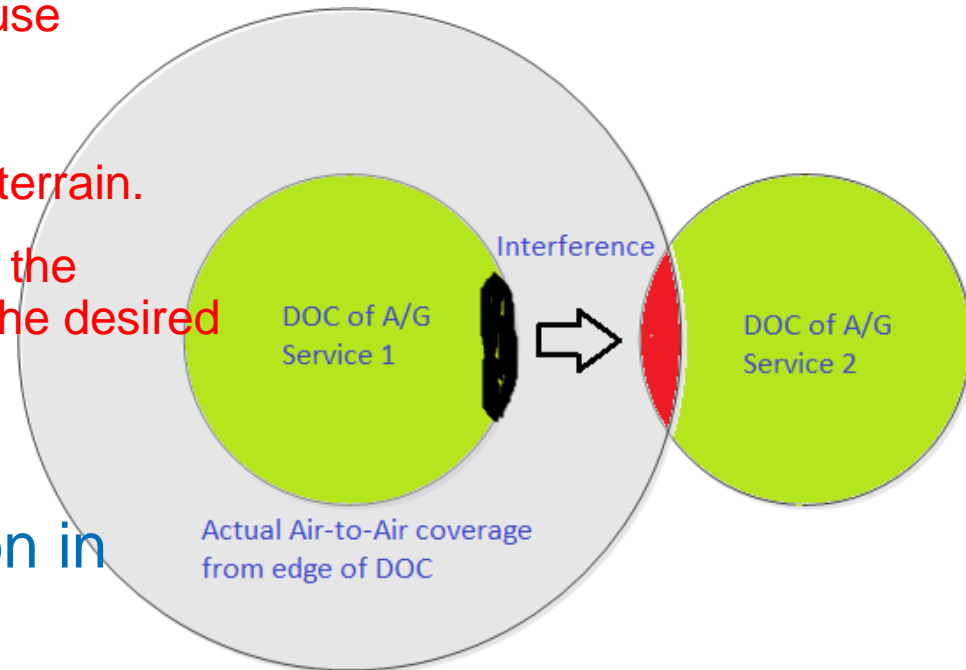


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Compatibility criteria for frequency coordination (3)

- consideration of the operational use
- absence of interference reports
- consideration of the effect of the terrain.
- as result of a detailed analysis of the technical characteristics of both the desired and undesired stations

- Non-compatible identification in Frequency Finder does not necessarily imply operational incompatibility



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Compatibility criteria for frequency coordination (3)

- A station that is considered “Not Compatible” because it does not meet the ICAO frequency assignment planning criteria is not, by default, also operationally “Not Compatible” .
- Frequency Finder displays geographical areas where interference is *predicted* to support a more detailed analysis.

