ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation

Workshops

Egypt, Cairo, 9 – 13 October 2016

Thailand, Bangkok, 18 – 21 October 2016

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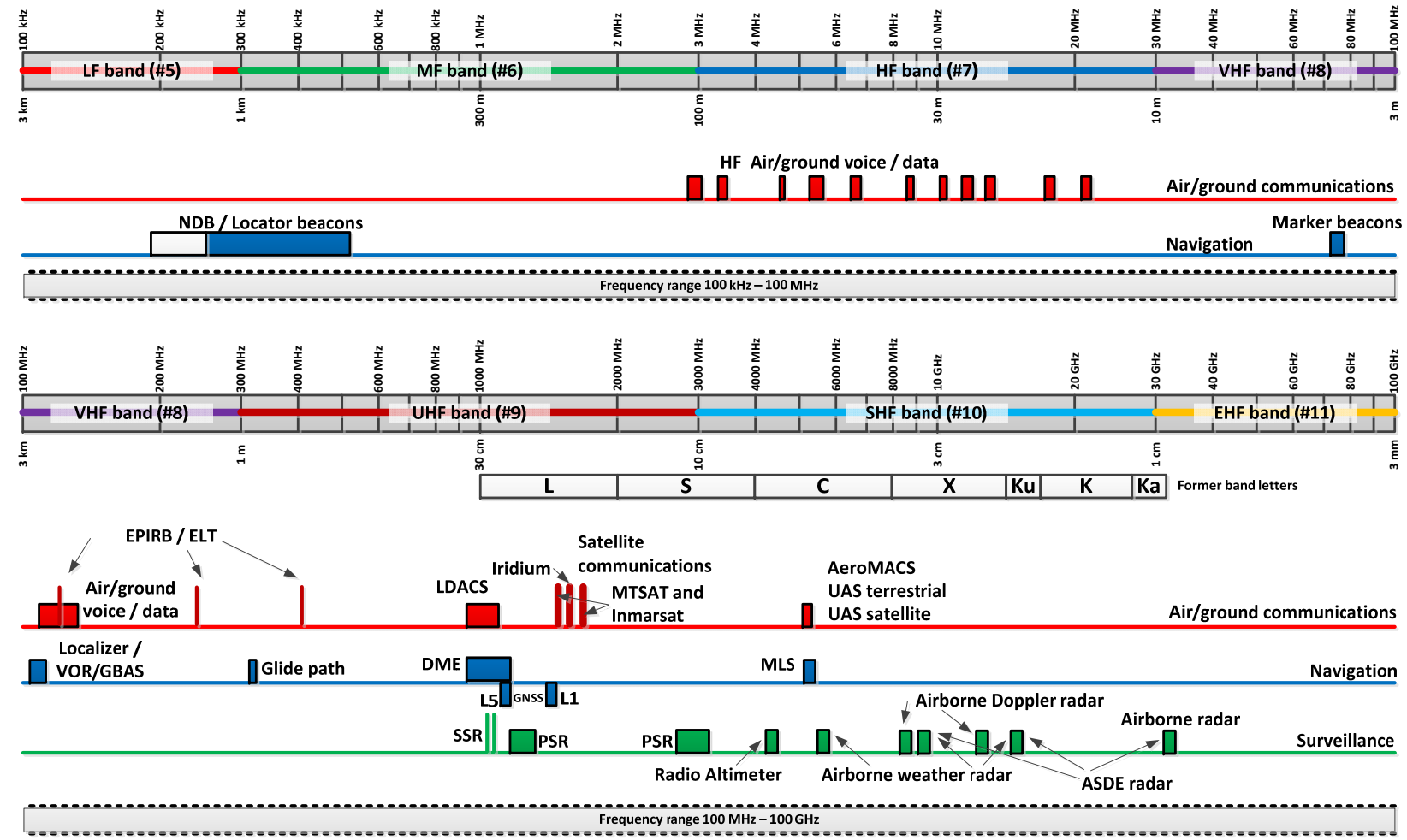
Introduction

- Volume I + Spectrum Management
  - Spectrum strategy - Provides for the long term of current and future spectrum usage of radio systems
  - ICAO policies on use of aeronautical spectrum to support the ICAO spectrum strategic objectives
  - ICAO position for future ITU WRC .
- Volume II + Frequency Management
  - ICAO Frequency Assignment Planning

Vol. I – Overview of spectrum for aviation



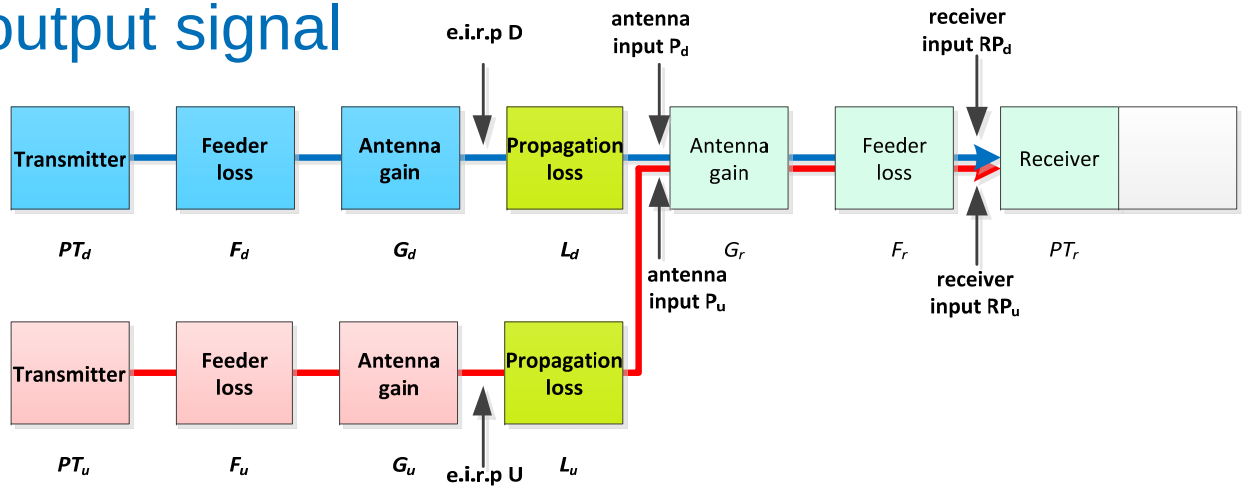
Notes:
Drawing not to scale
Not all Regional or sub-Regional allocations are shown
Band identification (e.g. VHF) and band # per Radio Regulations
The satellite communication bands used by MTSAT and Inmarsat are not allocated the the Aeronautical Mobile Satellte (R) Service

Vol. II – Frequency assignment planning

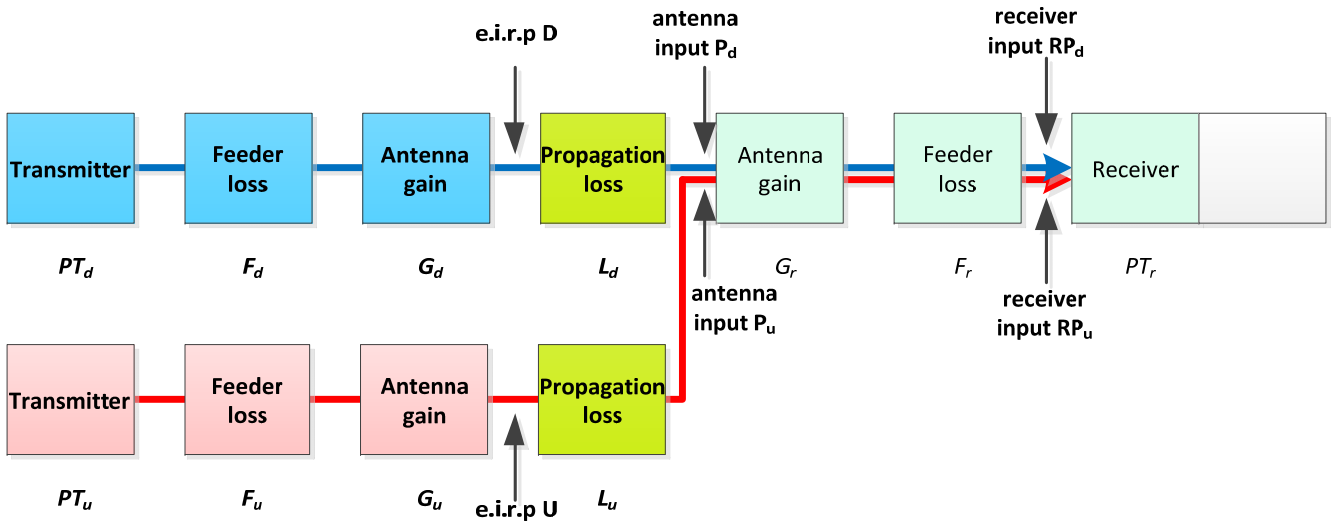
- Provides for globally harmonized frequency assignment planning criteria and guidance material to support the application of SARPs in Annex 10, Vol. V
- Developed in conjunction with the revisions to Annex 10, Vol. V
- Developed by the frequency Spectrum Management Panel (FMSP)
- **Implementation has 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 $L_D - L_U$

Vol. II – Frequency assignment planning 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)

Vol. II – Frequency assignment planning

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 may result in reduced geographical separation being required.
- Consideration of actual operational use

Vol. II – Frequency assignment planning

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
  - 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

Vol. II – Frequency assignment planning

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.

Thank you