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# INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY

# Overview of Aeronautical Spectrum Usage

For the PRIDA Workshop

25-27 April in Zanzibar, Tanzania

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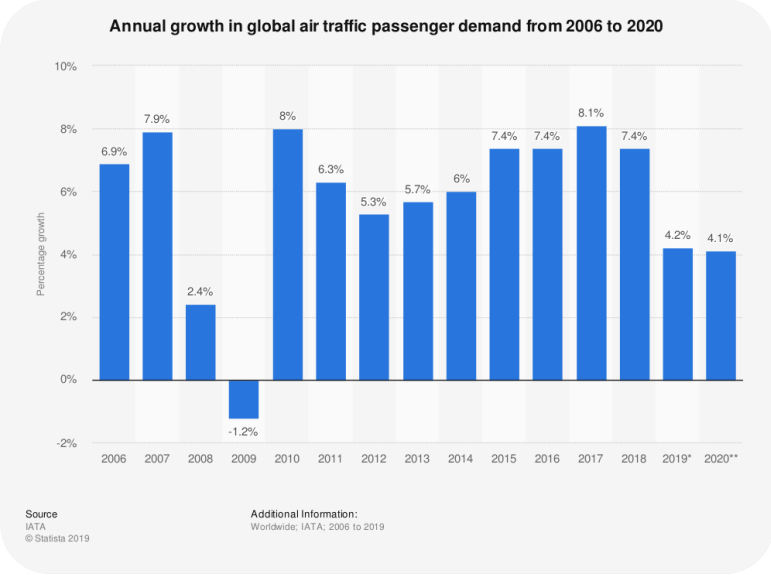
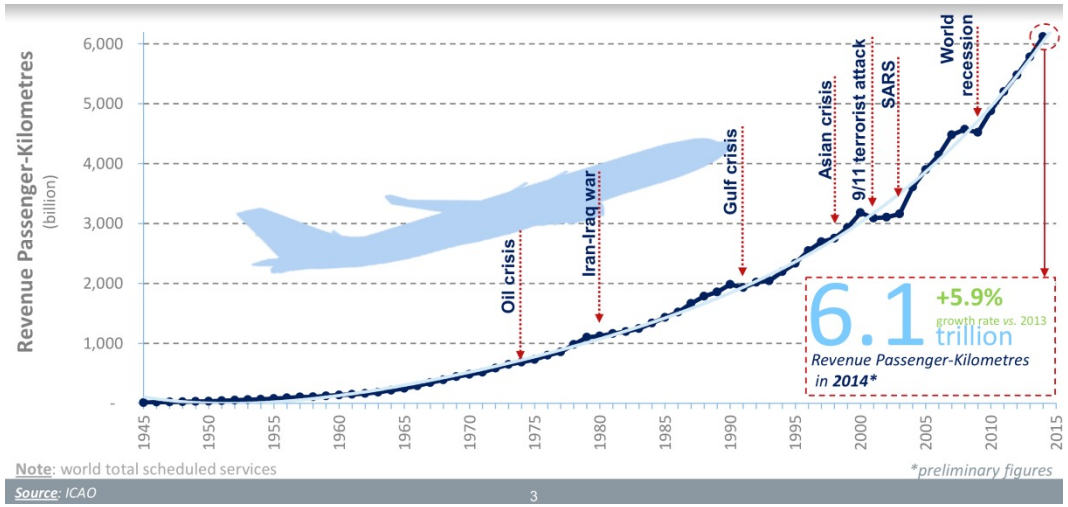
# Aeronautical Frequency Spectrum Management




## World wide consistent growth of air traffic
## Doubles every 15 years

- In **2019** over **4.5 billion scheduled passengers**
- **Air transport** now **carries 35% of world trade**, by value
- **Between 2019 and 2038,** 4.6 % expected growth of no. of airline passengers (pre-Covid-19 numbers)

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# Aeronautical Frequency Spectrum Management

## *(Aviation: One of users of Radio Frequency Spectrum)*

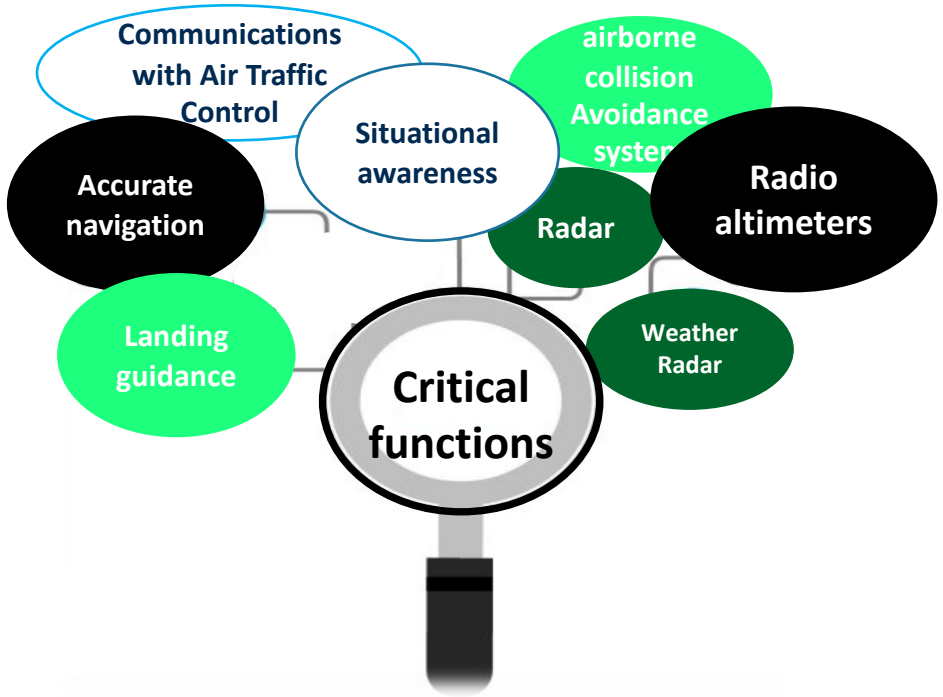
- About 100 000 flights take off to the sky and land every day without any incidents.

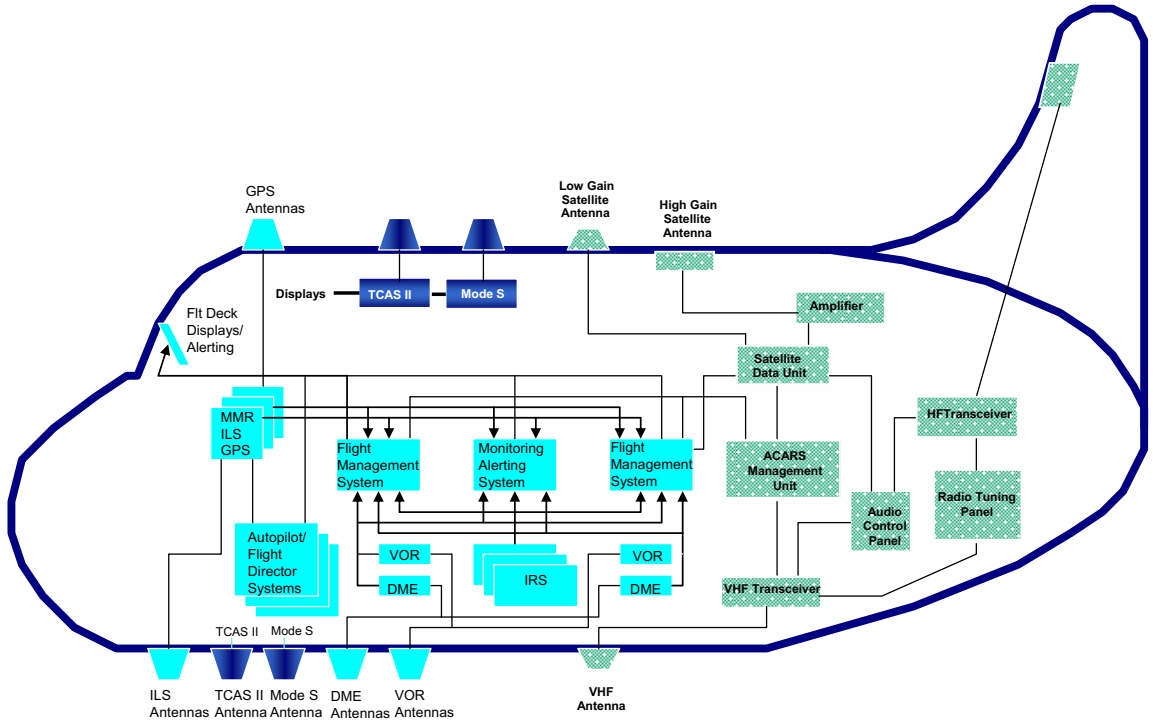
- **Safe aircraft operation on such a scale is highly dependent upon the availability of sufficient, suitably protected Radio Frequency Spectrum** that can support the high integrity and availability requirement associated with aeronautical safety systems.

# Communications, Navigation and Surveillance Systems – Prerequisite for aircraft operation



- An average size commercial aircraft is fitted with **over 30 antennas**.
- A large number of Communications, Navigations and Surveillance systems, which uses those antennas, are necessary **to provide functions critical to the safe flight of aircraft**.

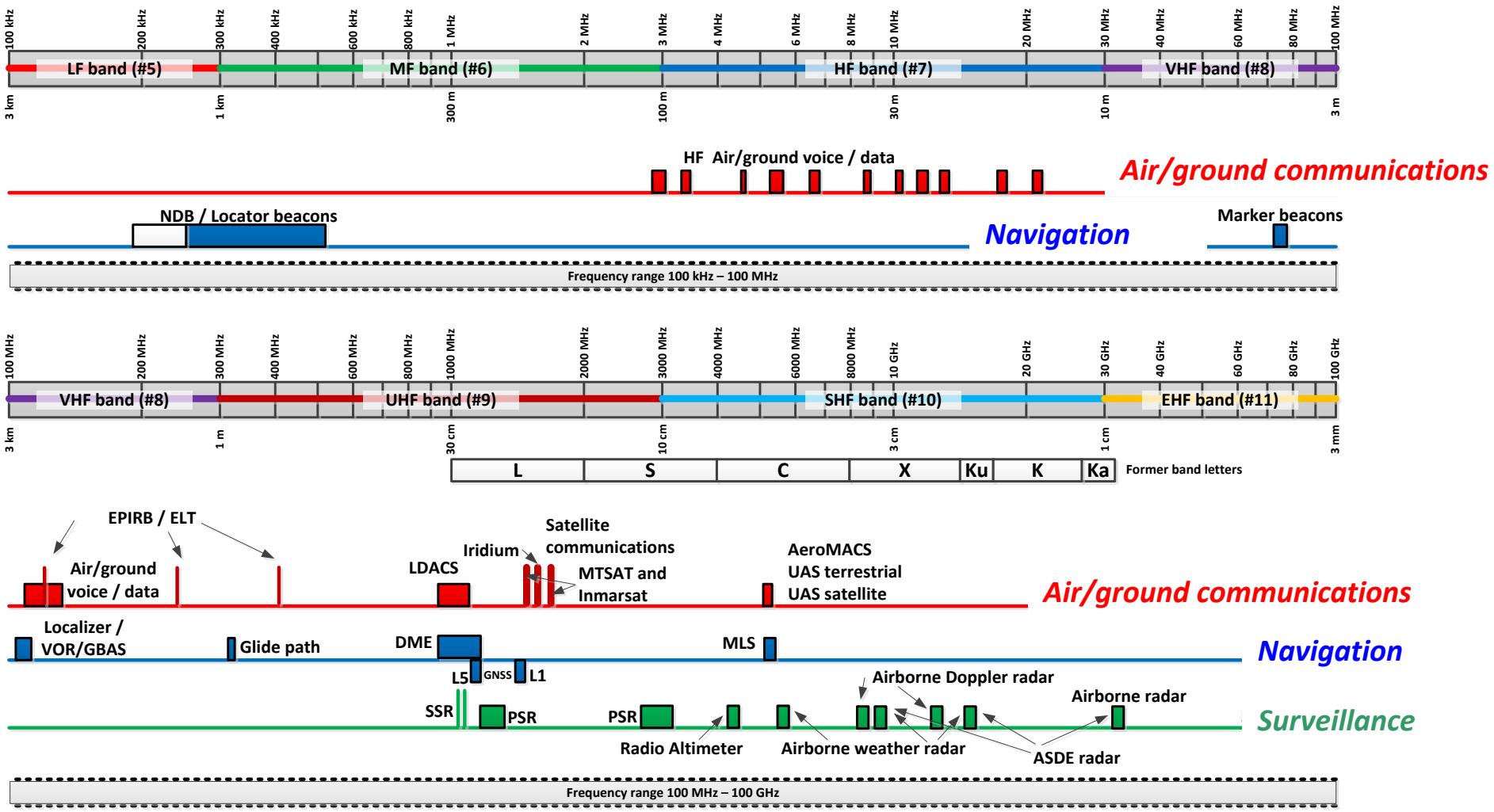


# Aeronautical Frequency Spectrum Management



## Over 1 GHz of frequency spectrum in global allocations to aeronautical safety services

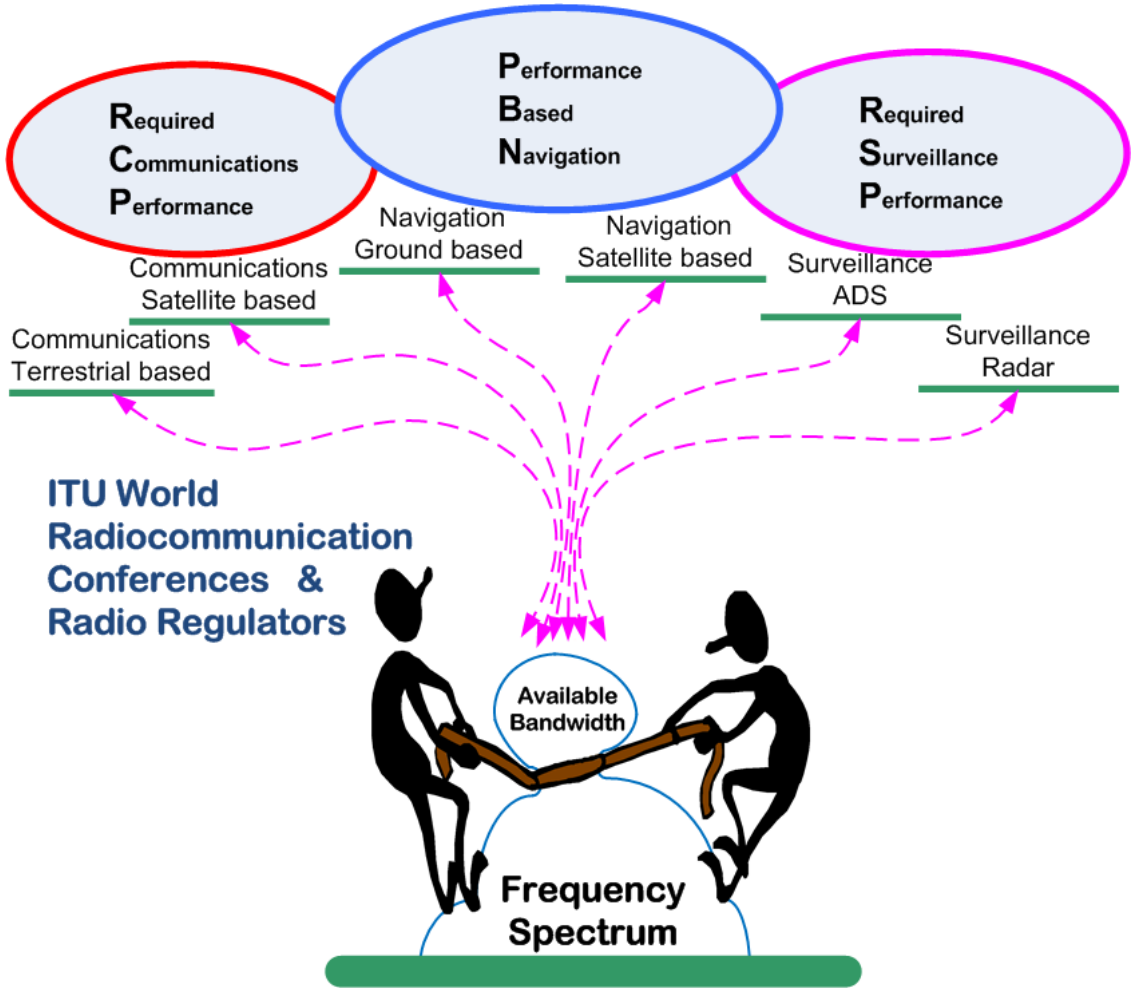



Notes:
Drawing not to scale
Not all Regional or sub-Regional allocations are shown
Band identification (e.g. VHF) and band # per Radio Regulations
The satellite communication bands used by MTSAT and Inmarsat are not allocated the the Aeronautical Mobile Satellte (R) Service

# Performance of Air Traffic Management

**Availability** and **access** to **frequency spectrum** is completely dependent on an outside program:

The **ITU World Radiocommunication Conferences**; and the WRC preparatory process in the ITU and the Regional Telecommunication Organizations



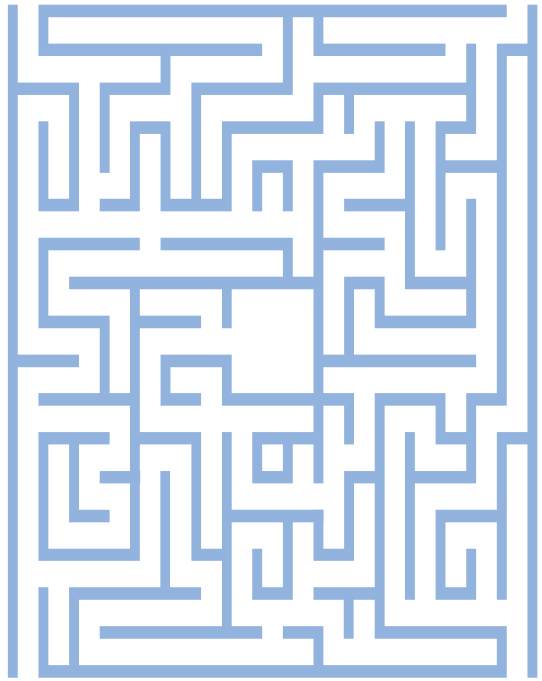
# The ITU WRC-23 agenda

## will be very busy for aviation

1 Spectrum use by sub-orbital vehicles

2 potential facilitation of aeronautical VHF over satellite

3 Finalization of a satellite allocation enabling beyond-line-of-sight C2-link for RPAS



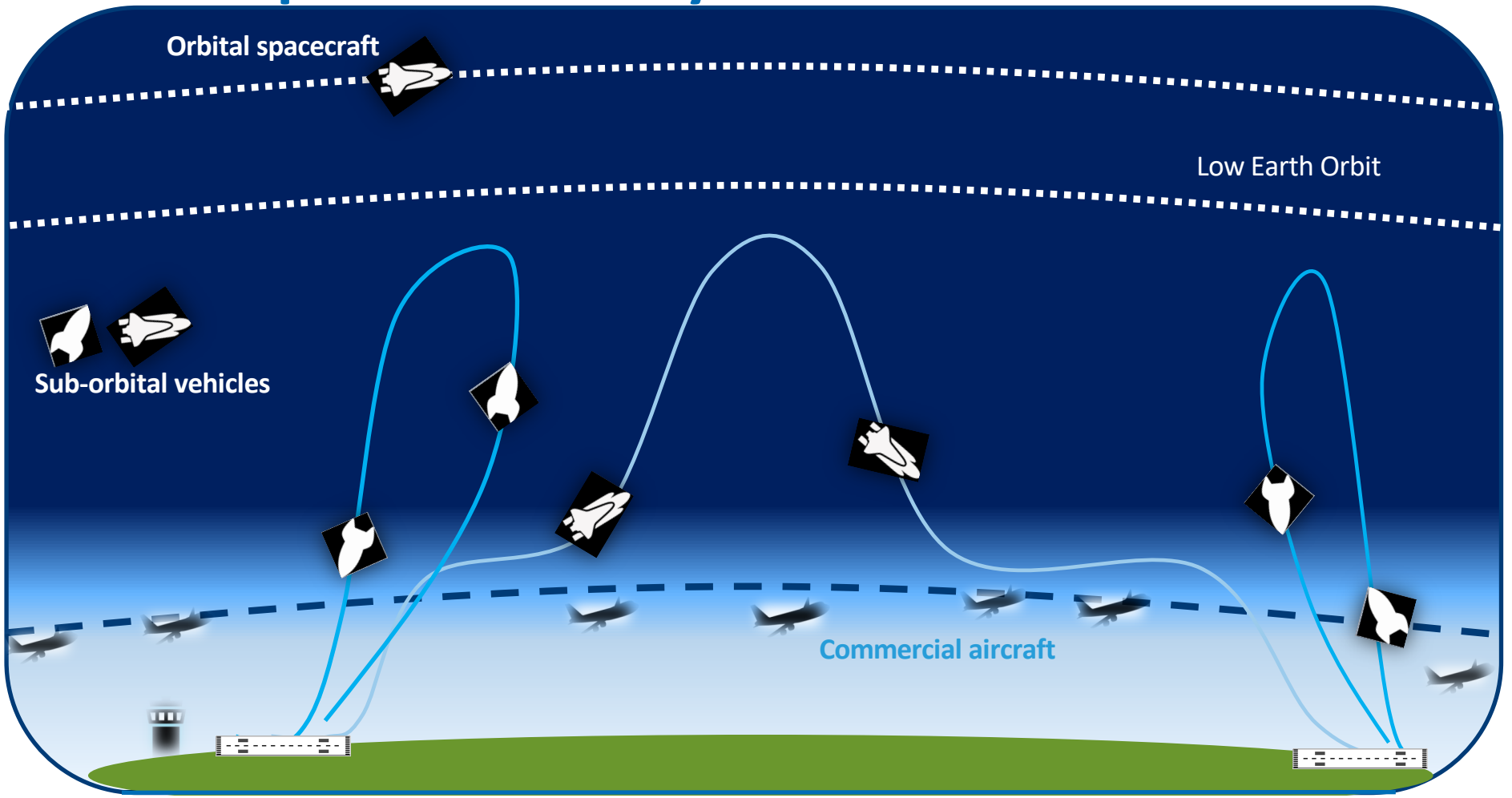
4 Modifications to aeronautical HF, potentially enabling crystal clear and reliable HF voice as well as HF data

5 Potential new non-safety aeronautical mobile service allocations

6 Difficulties or inconsistencies encountered in the application of the Radio Regulations

WRC-23

# WRC-23 Agenda Item 1.6: Spectrum use by sub-orbital vehicles




Free images of spacecraft from Pixabay

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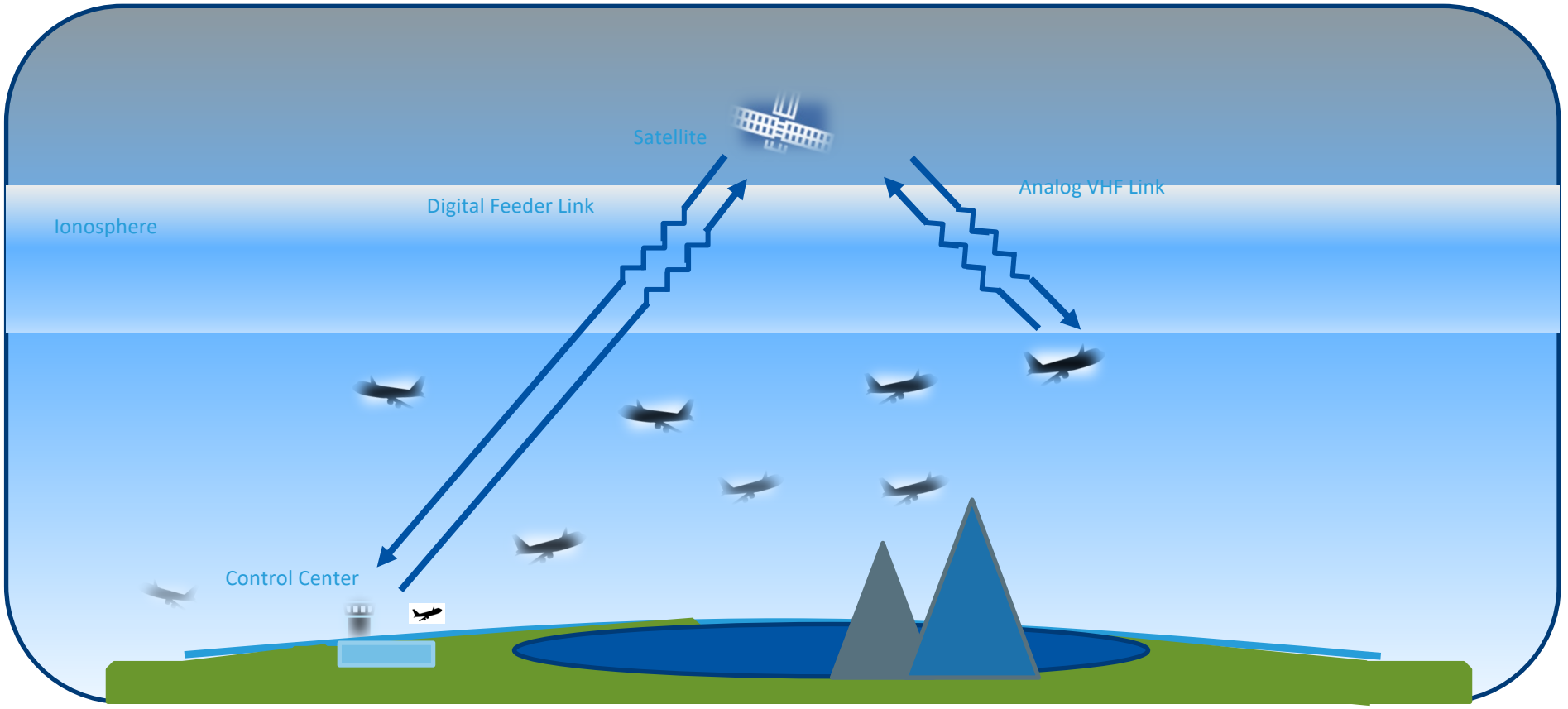
WRC-23

# WRC-23 Agenda Item 1.7:
## Potential facilitation of aeronautical VHF over satellite

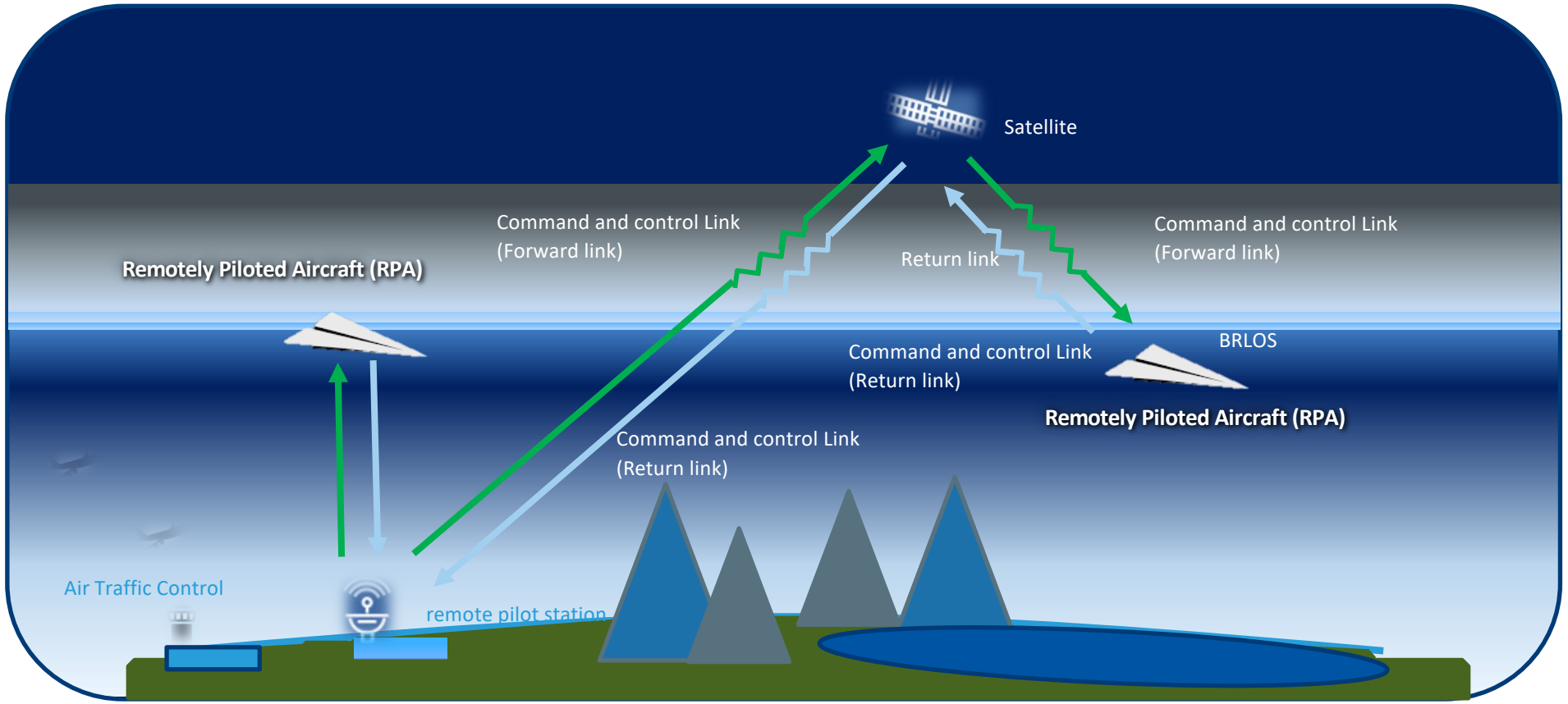



Original image from ICAO CP-DCIWG

WRC-23

# WRC-23 Agenda Item 1.8:

## Finalization of a satellite allocation enabling beyond-line-of-sight C2-link for RPAS

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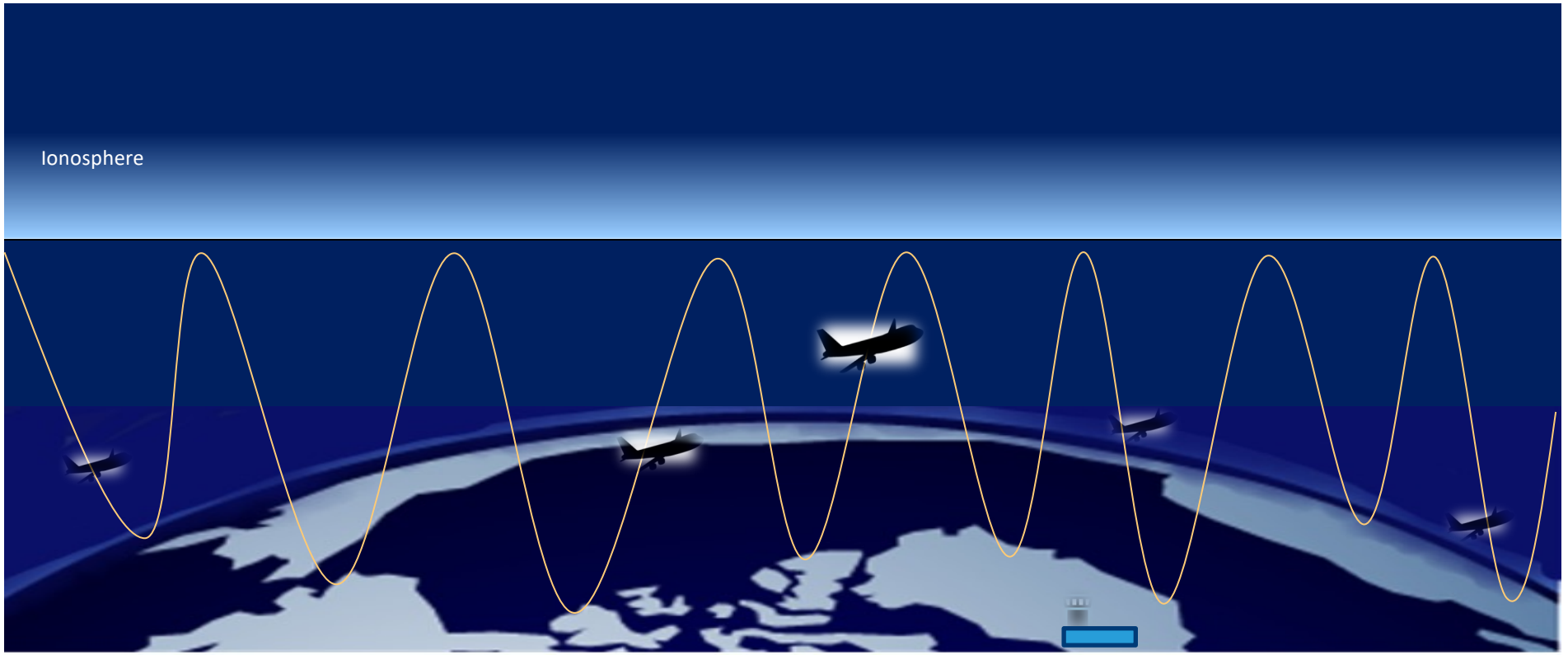
WRC-23

# WRC-23 Agenda Item 1.9:

## Modifications to aeronautical HF, potentially enabling crystal clear and reliable HF voice as well as high speed HF data

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# Thank You!

More information: Frequency Spectrum Management Panel (FSMP)
https://www.icao.int/safety/FSMP

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