



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY



WRC-23 RESULTS

AVIATION PERSPECTIVE

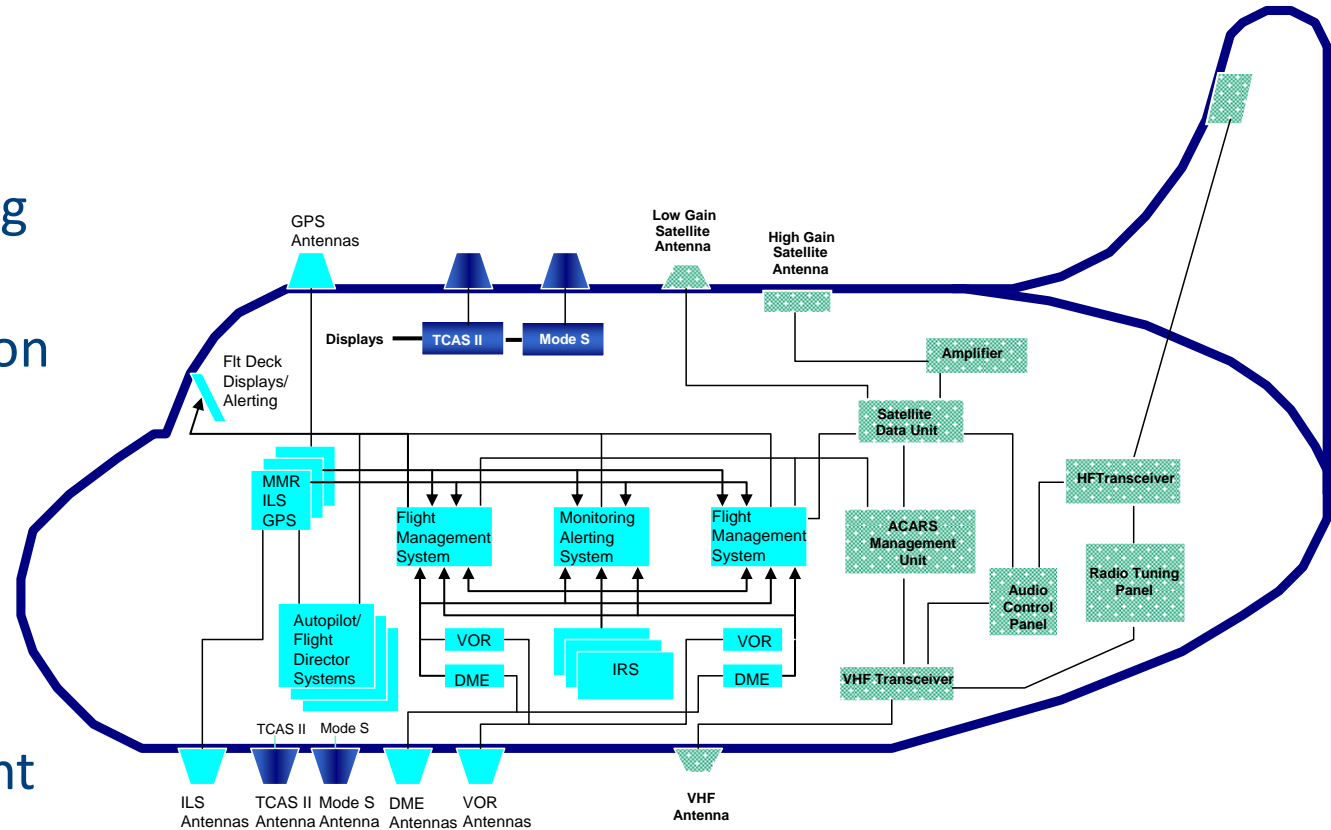
BY Isaiah Kofi Tefutor (CNS Technical Officer ICAO)

For the PRIDA Workshop
19-21 March in Abidjan, Côte d'Ivoire

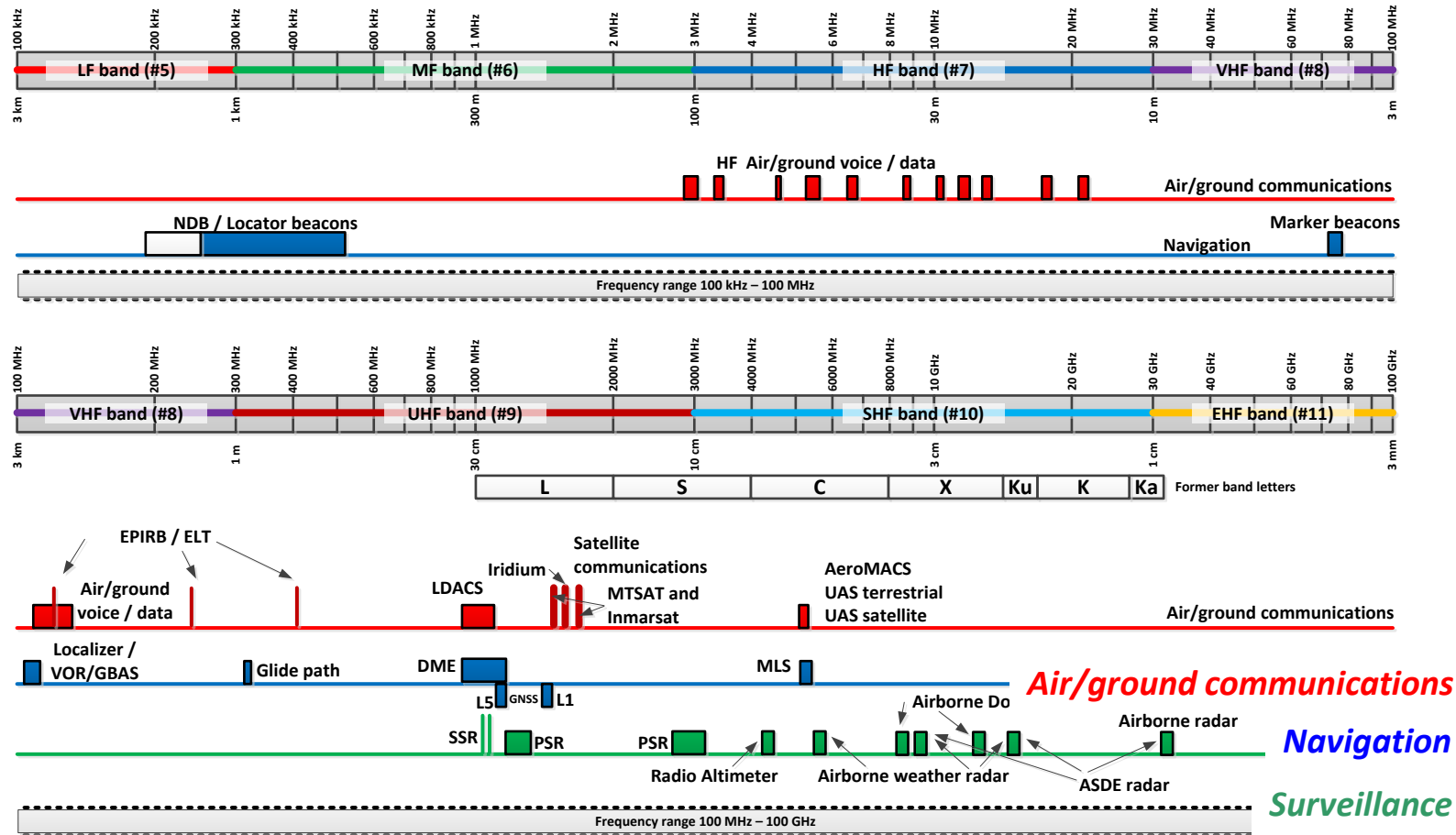
Aeronautical Frequency Spectrum Management



Accurate navigation, landing guidance, situational awareness (airborne collision avoidance system, radar, radio altimeters) weather radar and reliable communications with air traffic control are prerequisites for a safe flight



- 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 Satellite (R) Service

Aeronautical Frequency Spectrum Management

Scarce natural resource with finite capacity limits and constantly increasing demands



Congestion imposes the need for efficient frequency spectrum management

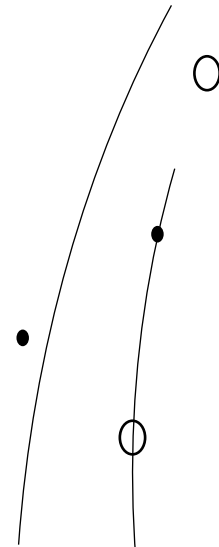
SPECTRUM MANAGEMENT
Combination of administrative and technical procedures



SPECTRUM MANAGEMENT
necessary to ensure interference free and efficient operation of radio services (e.g. Air/Ground Communications and Radionavigation)

ITU WRC - General overview

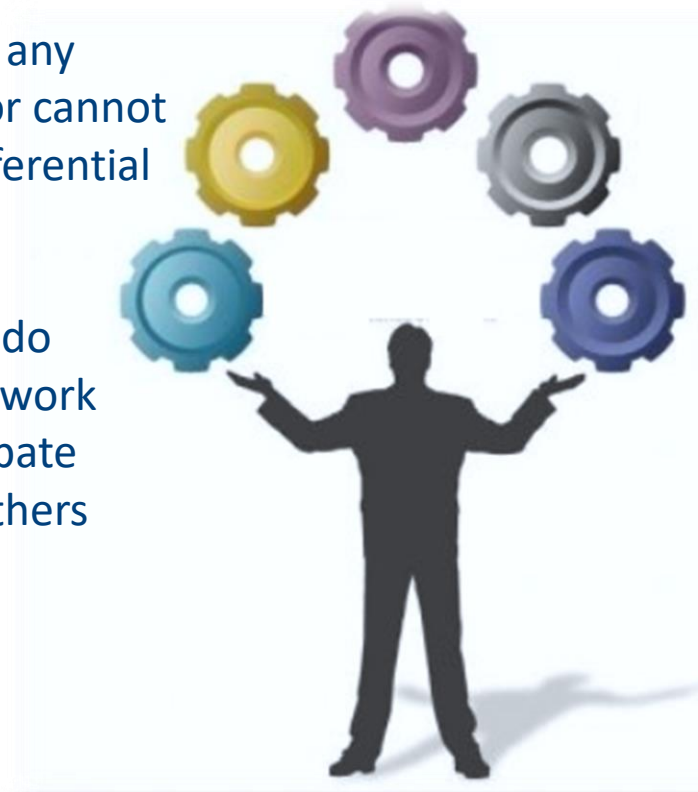
- 1 WRCs update the International Radio Regulations**
- 2 Held every 4 years**
 - Last was 20 Nov–15 Dec 2023
 - Next in 2027
- 3 Main purpose**
 - To revise the Radio Regulations (RR);
 - To address Radiocommunication issues of a worldwide character.
- 4 Why participate at World Radiocommunication Conferences**
 - To protect existing services
 - To obtain access to spectrum for new services
 - To enhance spectrum access for existing services
 - To facilitate market access for radio equipment manufacturers; and
 - To provide regulatory certainty to operators



ITU Radio Regulations update cycle

➤ A very competitive environment

- Aviation or any other sector cannot expect preferential treatment
- Those that do their homework and participate succeed, others lose



Definition of Radio Frequency Management:

“Radio frequency management is done by experts who meld years of experience with a curious blend of regulation, electronics, politics and not a little bit of larceny. They justify requirements, horsetrade, coerce, bluff and gamble with an intuition that cannot be taught other than by long experience.”

**Vice Admiral Jon L. Boyes
U.S. Navy**

ITU WRC

WRC-23 by numbers

8

4 Weeks

(5 ½ weeks, when counting RA-23 and CPM27-1)



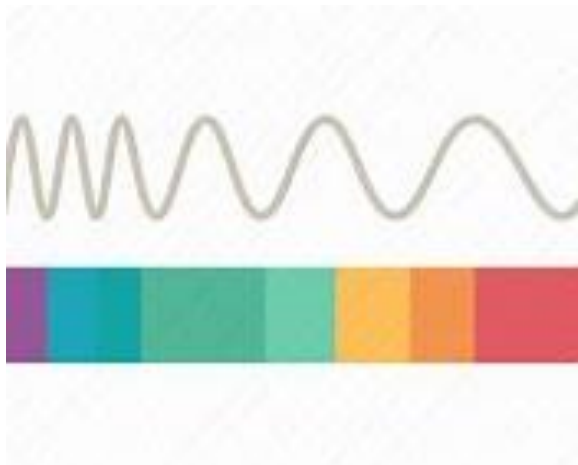
- 163 Administrations
- Several UN specialized agencies and offices, including ICAO, IMO, WMO, UNOOSA...
- Women 22% of WRC23 delegates

~4000 delegates



- Over 50 meetings/day, including weekends
- After 3AM – latest finish to a meeting
- 9AM - ...start time the next (same) morning

Contents



- **Brief Spectrum Introduction**
- **ITU World Radiocommunication Conferences**
- **WRC-23 Outcome**

The ITU WRC-23 agenda

Main items of aeronautical interest

1.6

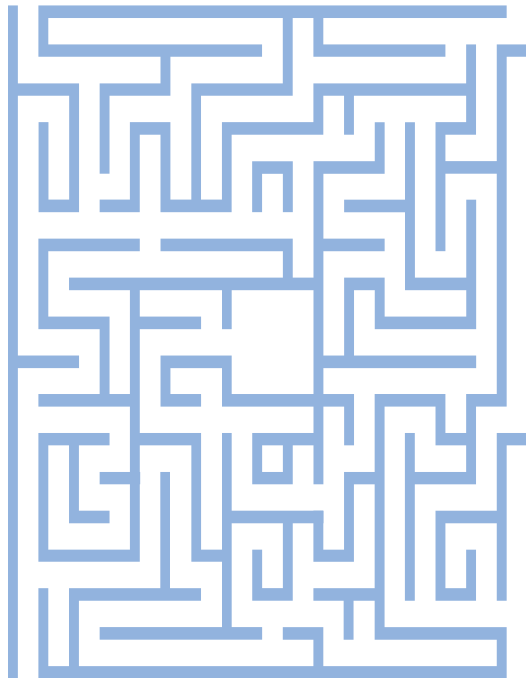
Spectrum use by sub-orbital vehicles

1.7

potential facilitation of aeronautical VHF over satellite

1.8

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



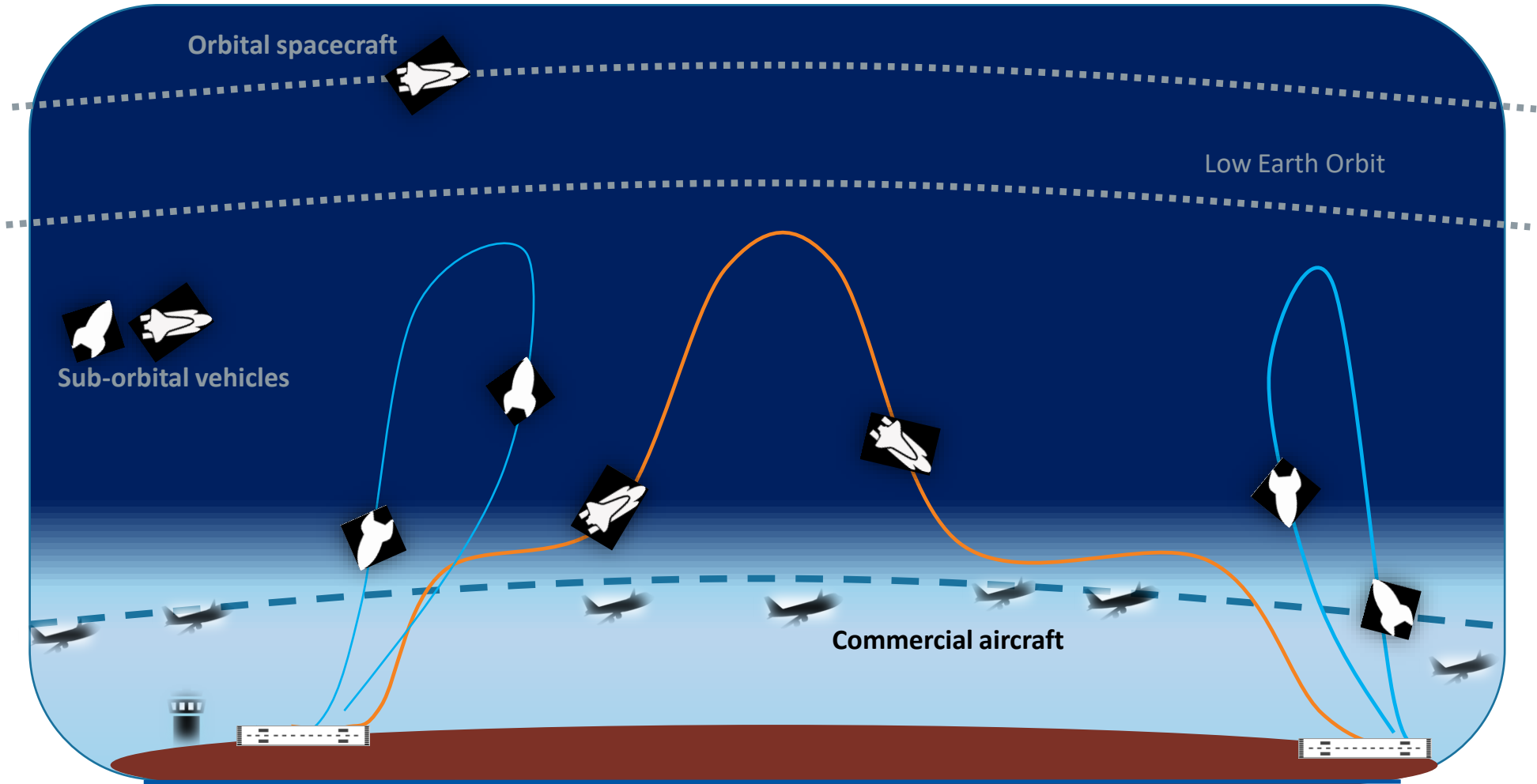
1.9

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

9.2

Difficulties or inconsistencies encountered in the application of the Radio Regulations

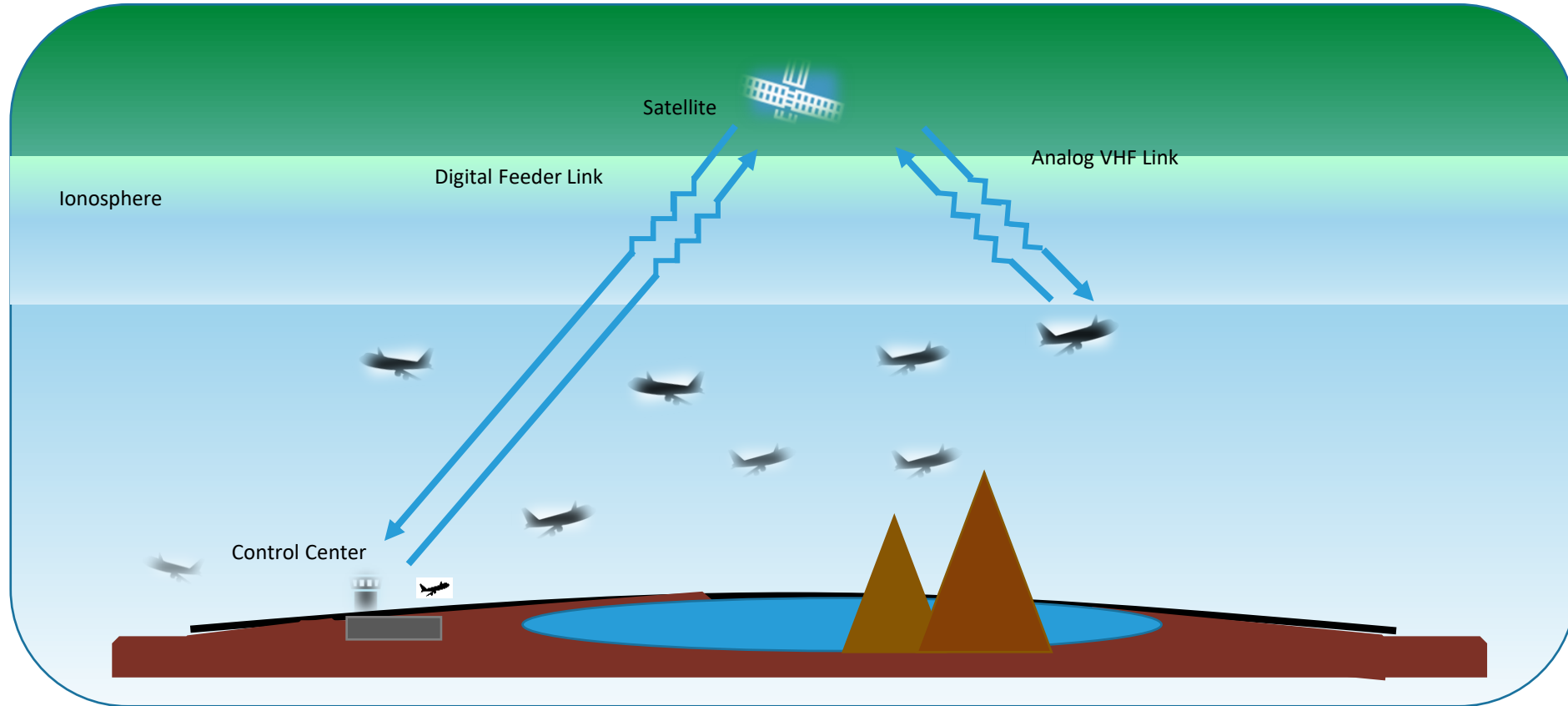
WRC-23 Agenda Item 1.6: Spectrum use by sub-orbital vehicles



Free images of spacecraft from Pixabay

Aviation stayed out of harm's way by rejecting a potential new and narrow definition of sub-orbital vehicles, which could have negatively affected aviation's access and use of spectrum.

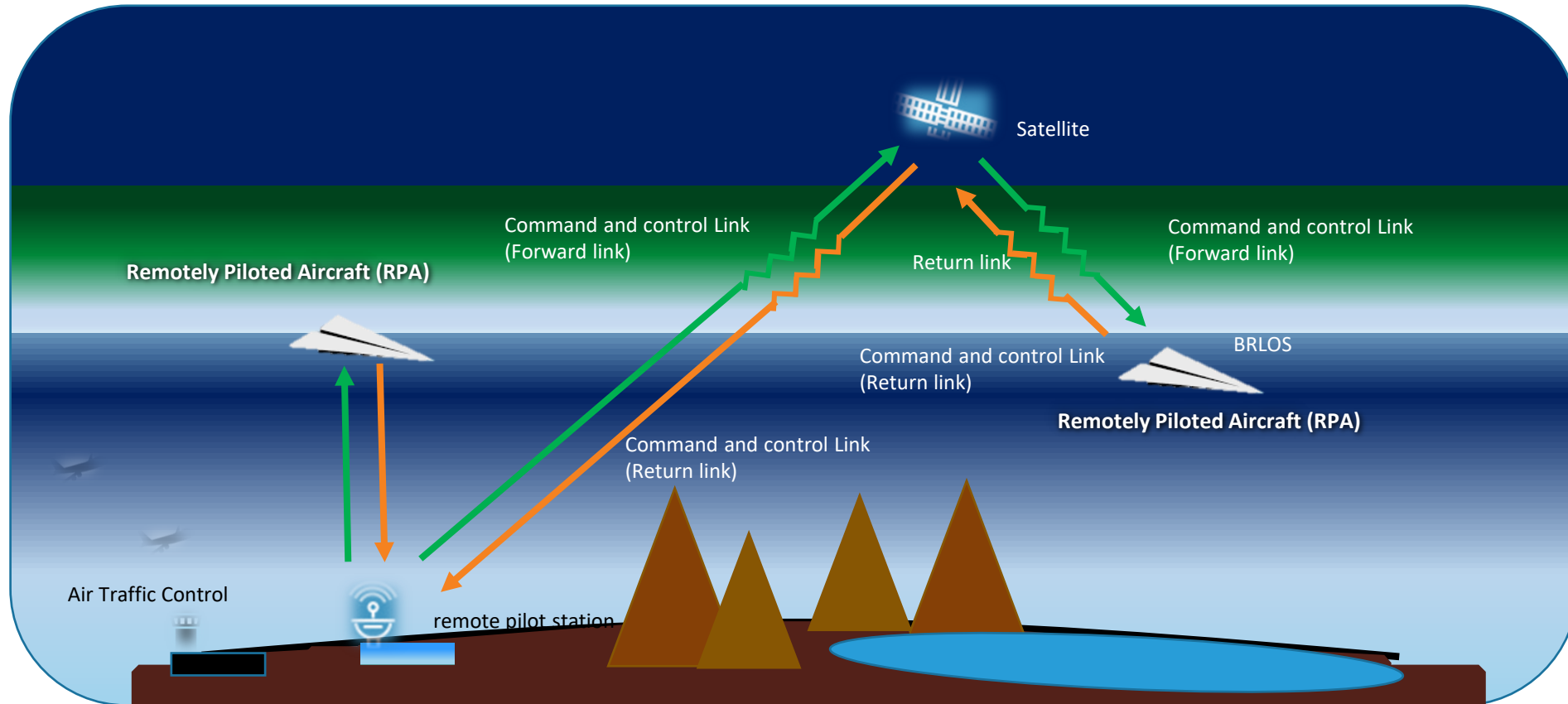
WRC-23 Agenda Item 1.7: Potential facilitation of aeronautical VHF over satellite



Original image from ICAO CP-DCIWG

A new aeronautical mobile satellite route service allocation in the VHF band was achieved, covering the full aeronautical com band, while preventing any undue constraints on existing aeronautical VHF systems

WRC-23 Agenda Item 1.8: Beyond-line-of-sight C2-link for RPAS

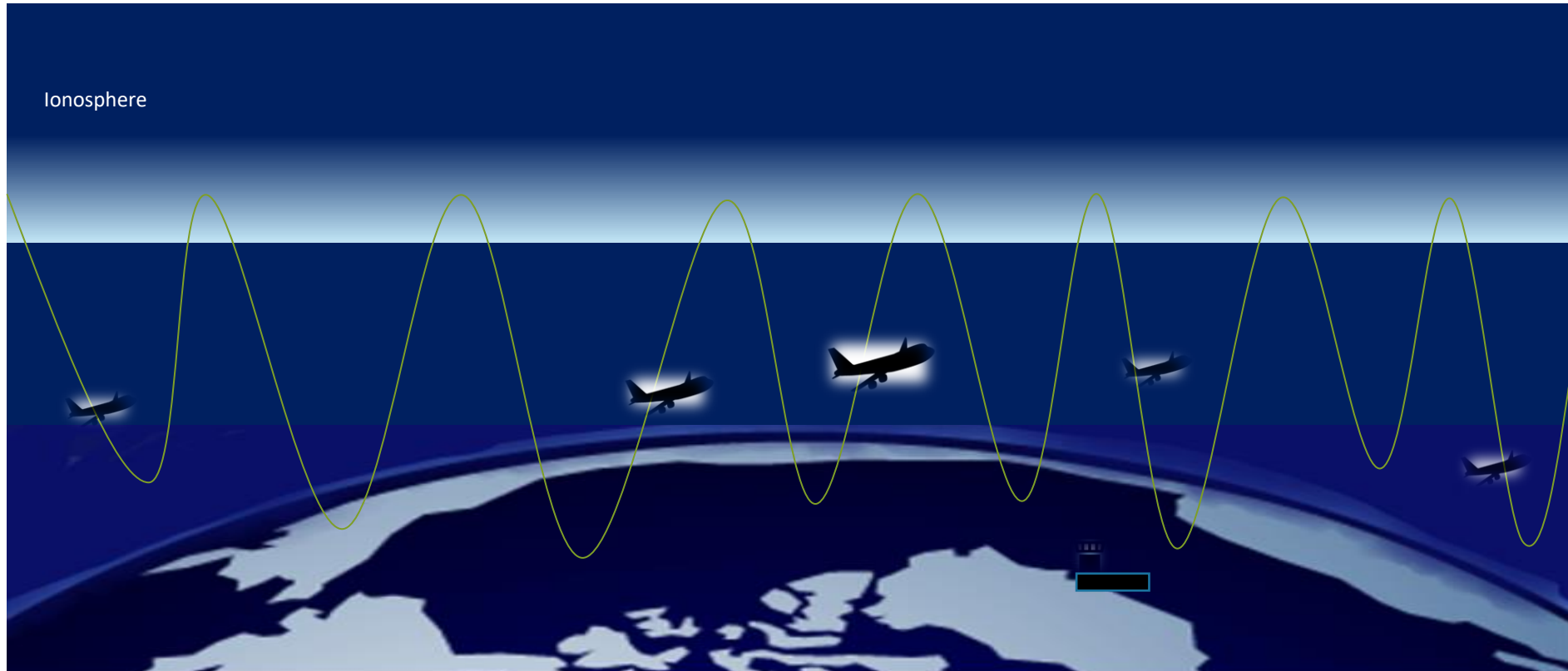


While ITU Resolution 155, developed by WRC-15, remains controversial, and unfinished; a worse result would have been to reject it outright while not providing any alternative.

The result of the conference provides stability for the already developed C2 Link SARPs, while also providing aviation with an opportunity to search for more suitable spectrum allocations than the Fixed Satellite Service. It is now important that aviation capitalizes on this opportunity.

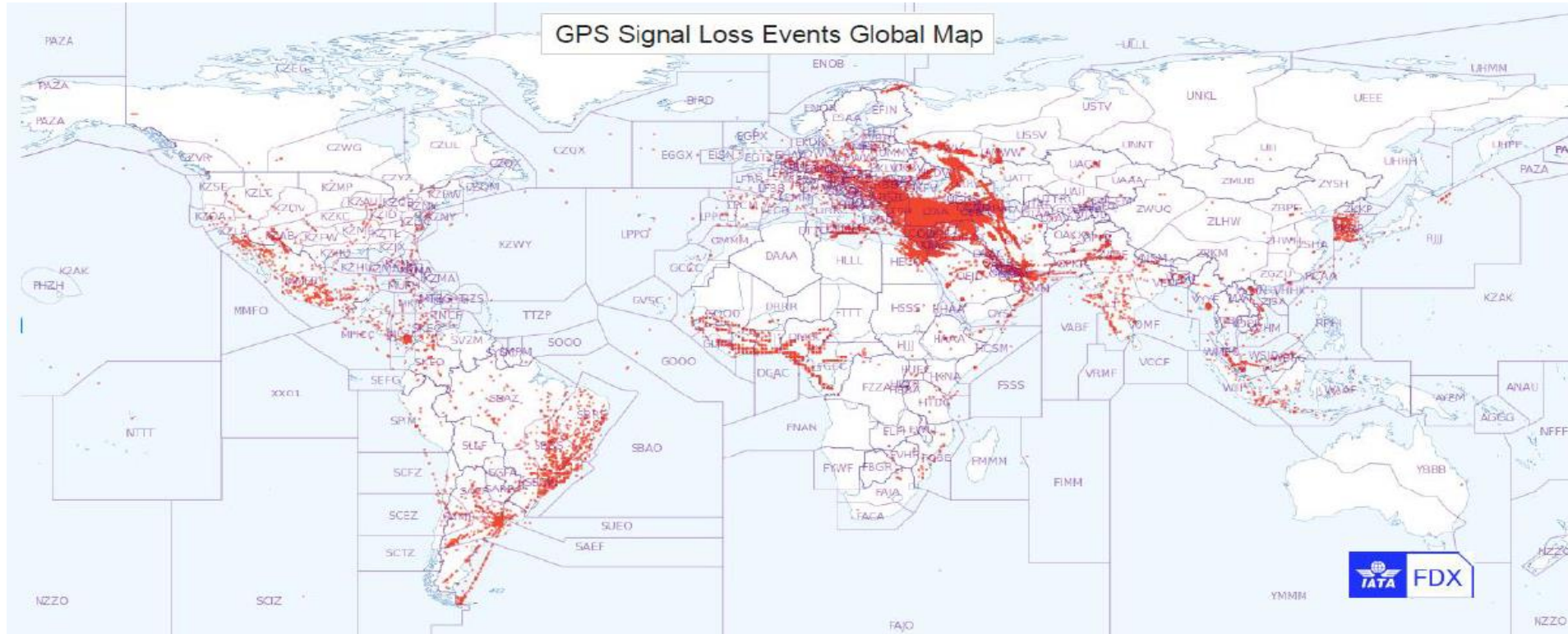
WRC-23 Agenda Item 1.9:

Modifications to aeronautical HF, potentially enabling crystal clear and reliable HF voice and high-speed HF data



A minor update was made to the method aeronautical HF spectrum is allocated, making it possible to merge multiple channels to achieve greater bandwidths.

WRC-23 Agenda Item 9.2: Difficulties or inconsistencies encountered in the application of the Radio Regulations



GNSS RFI recorded events (August 2021-December 2022), source is IATA FDX program

A new RNSS Resolution agreed, which urges administrations “to apply necessary measures to avoid the proliferation, circulation and operation of unauthorized transmitters that cause or have the potential to cause harmful interference to RNSS systems and networks operating in the frequency bands 1164 – 1215 MHz and 1559 – 1610 MHz...”, while also, recognizing the “right of administrations to deny access to RNSS, for security or defence purposes”

Questions





Thank You!