

ITU Regional Seminar for CIS and Europe

Development of modern
Radiocommunication ecosystems

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Intergovernmental organisation with 41 Member and 2 Comprehensive Agreement States committed to building, together with our partners, a Single European Sky that will deliver the air traffic management (ATM) performance required for the 21st century and beyond

EUROCONTROL

Over 1.900 highly qualified professionals spread over 4 European countries work at EUROCONTROL, deploying their expertise to address ATM challenges

- **covering both operational and technical elements**
- **advising on both civil and military aspects of ATM**
- **having experience at bringing States with different needs together for a common goal**

Spectrum Fundamental resource for Aviation

- ATM will evolve much faster than ever
- The Spectrum resource is the backbone of future aeronautical modernisation
- Aviation cannot operate without adequately protected spectrum
- Secure long-term availability of suitable radio spectrum to meet all of aviation's current and future objectives

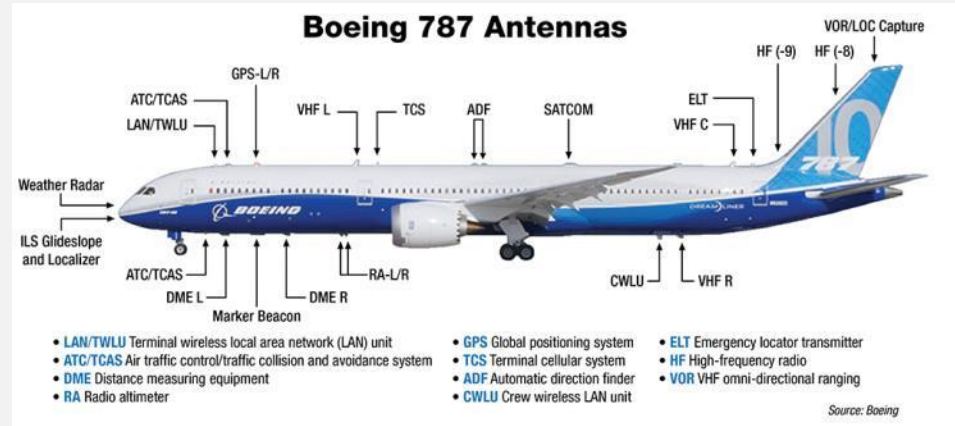
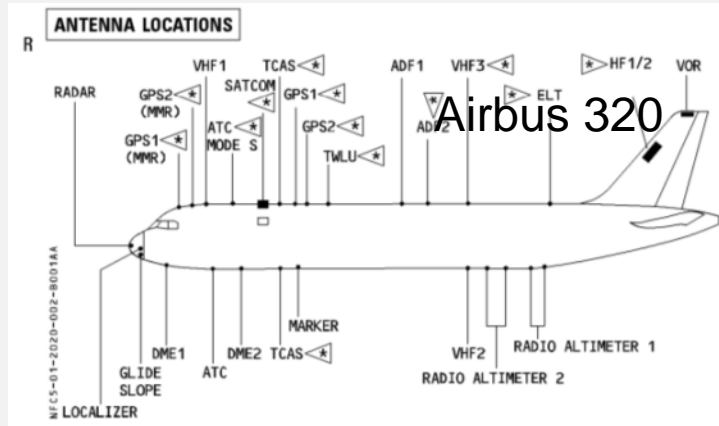


Spectrum in Aviation



- ITU and ICAO two UN specialised agencies, agreed on specific safety protections for spectrum used by aviation safety and regulatory of flight systems
- Aeronautical Radionavigation Service (ARNS)
- Aeronautical Mobile Route Service (AM(R)S)
- Aeronautical Mobile Satellite Route Service (AMS(R)S)
- Aviation Avionics, Communication, Navigation and Surveillance (ACNS) systems are designed, developed to operate in interference free, clean spectrum
- Aviation belongs to humanity
- Safety is the most important deliverable of aviation
- No Safety = No Trust = No Passenger
- Interference with aviation bands can have severe negative impacts on aviation cost, capacity, safety and security

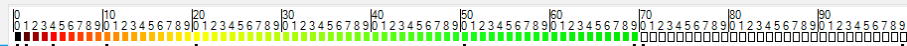
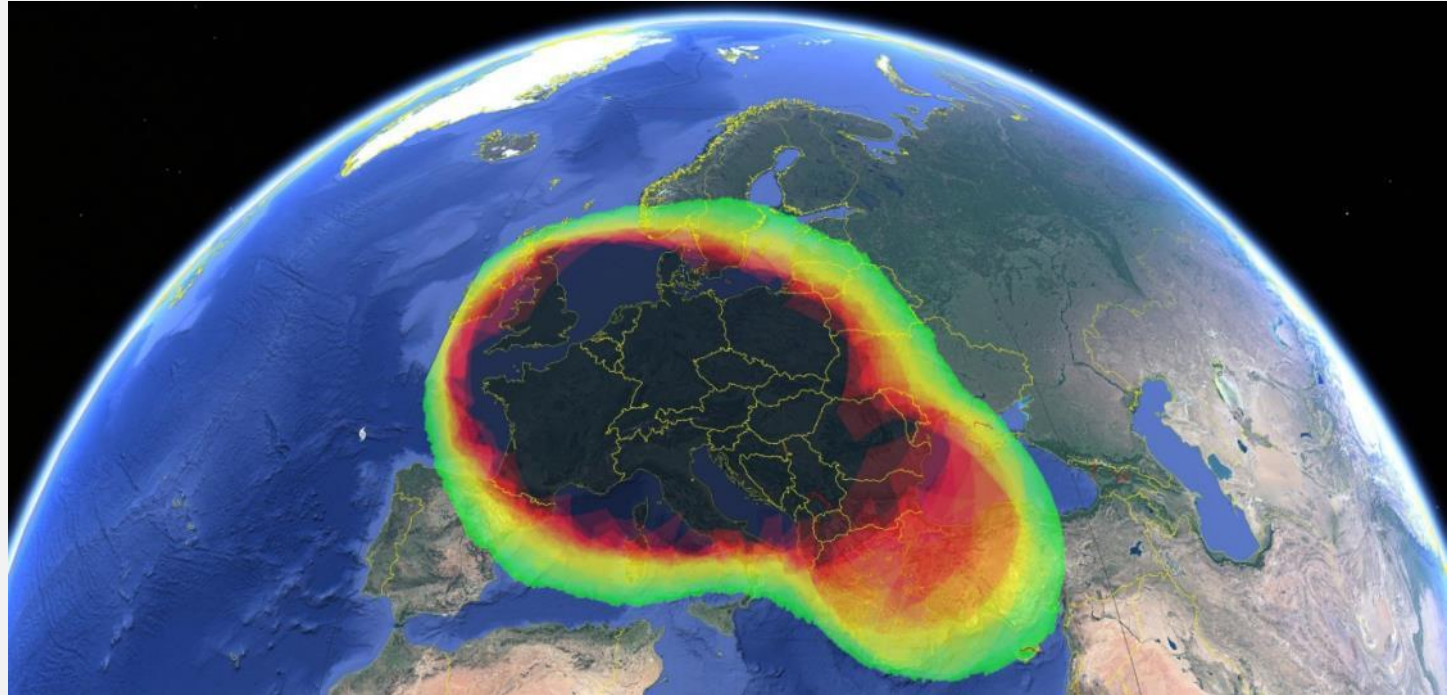
Aircraft cannot fly without spectrum



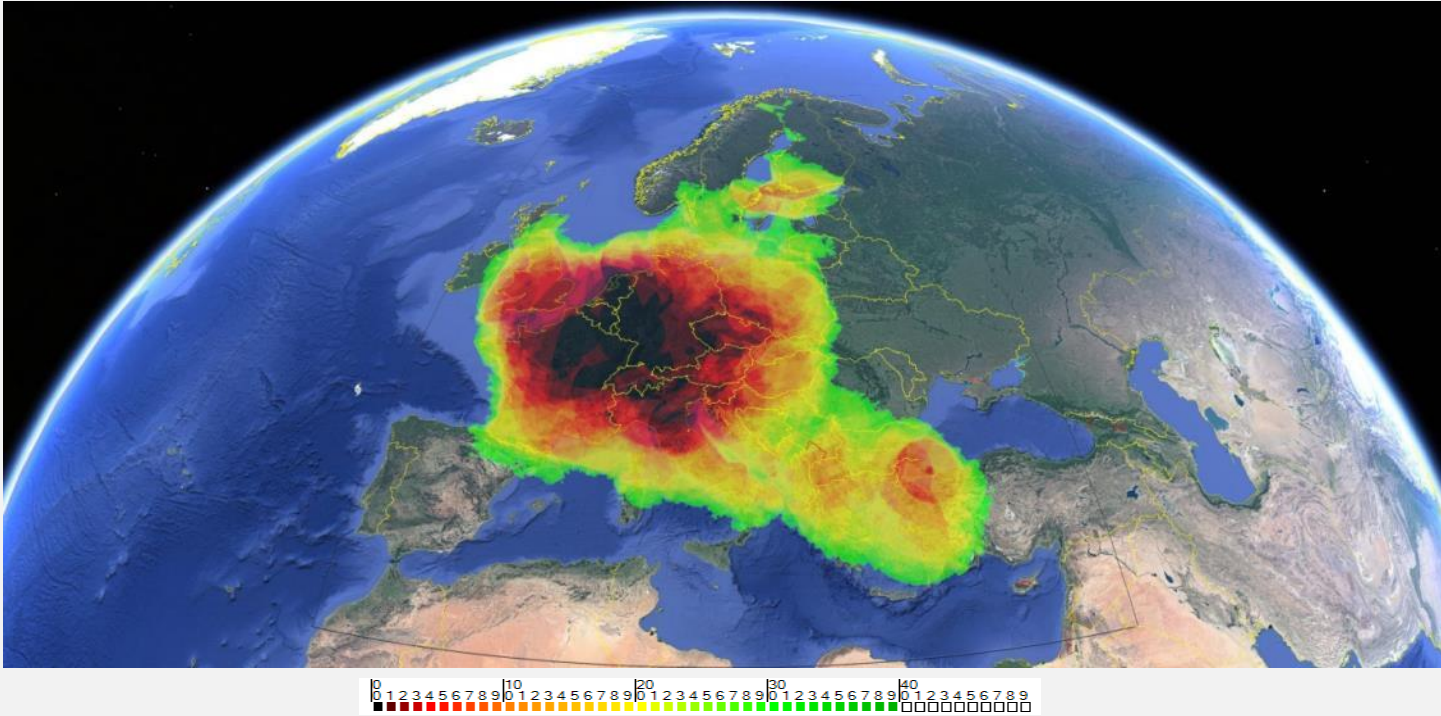
**Additional frequencies to deliver additional capacity;
But the aviation spectrum is congested**



The First Problem: Spectrum limits: VHF Frequency Shortage

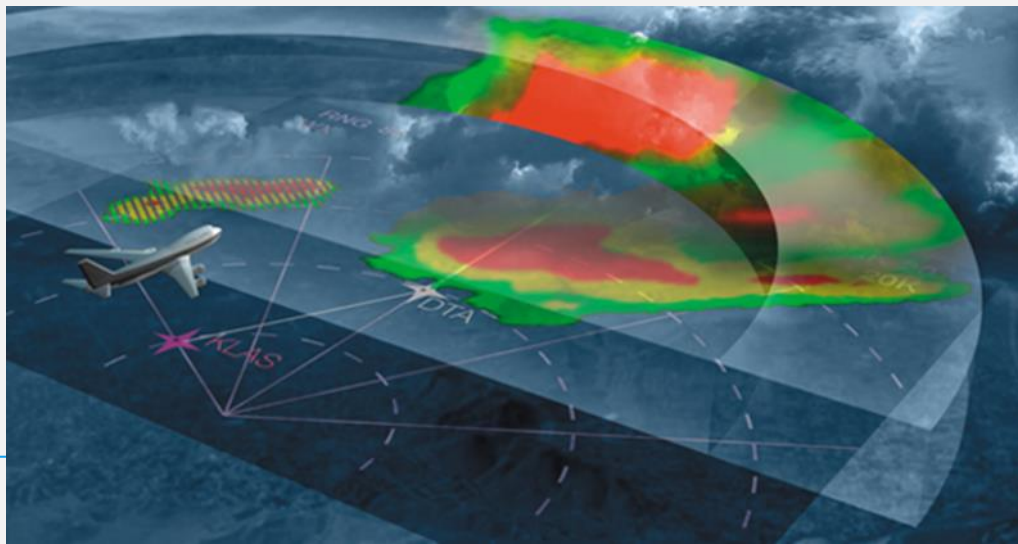


Coming soon: Navigation Aids Frequencies shortage



Risks on Aviation



- Aeronautical spectrum allocations will continue to be under significant pressure from other sectors for the foreseeable future
- Sharing safety spectrum with non aviation safety users
- New spectrum bands for aviation use are unlikely to be made available
- Reduced possibility to get adequately protected spectrum to support aviation growth



Sharing Logic

Non safety of life systems, willing to share a safety of life band; have to comply with the same safety requirements applicable in that band

Observations

- Spectrum limited natural scarce resource; under severe pressure
 - In Europe many aviation bands are getting congested
 - Aviation need additional spectrum to satisfy the demand
 - Modernisation of legacy ACNS systems, transition phase, ...
 - New aviation systems such as WAIC, RPAS are requiring spectrum
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- It is unlikely that aviation get any new adequately protected spectrum to sustain the traffic growth, to modernise its ACNS systems or to accommodate new aviation systems
 - The solution is the adoption of new, spectrally efficient technologies that operate in protected spectrum already allocated to aviation; yet this spectrum needs to be globally available to aviation
 - Any pressure on already allocated spectrum to aviation can negatively impact the capability of aviation in modernising its ACNS systems

Spectrum Vision

- Long-term sustainability of aeronautical radio spectrum
- Secure adequately protected spectrum for future traffic growth
- Coherent spectrum efficient ACNS architecture
- ACNS Holistic inter-discipline support in spectrum matters
- State-of-the-art technology in a timely and safe manner
- Cost effectiveness through the overall life cycle
- Identifying sunset closes of legacy systems
- Avoiding the retention of obsolete and redundant systems

ACNS systems

- Mechanisms to catch up with technology
- Cost effective technological evolutions
- Minimise the **transition** timeframe and impact
- Synchronisation of ground, space and airborne investment cycles
- CNS Inter-domain redundancy
- Frequency hopping
- Resistance to interference, jamming, hacking
- Net benefit spread across all stakeholders
- Reduced overall live cycle cost



EUROCONTROL Aviation spectrum vision and strategy

- Secure long term adequately protected spectrum to allow the modernisation of ACNS systems to meet future capacity challenges; sustain the traffic growth; reduce the overall operational cost while increasing the performance of ACNS;
- Modernise the ACNS infrastructure by adopting spectrally efficient systems to:
 - Increase the capacity;
 - Reduce the size, weight, power consumption and maintenance cost of ACNS equipment;
 - Adopt holistic ACNS approach to reduce the number of equipment and antennas on the ground and aircraft; without neglecting the required in and intra domain redundancies;
 - Accommodate new aviation safety and regularity of flight systems within the already allocated protected spectrum to aviation
 - Maintain and where needed increase the safety levels;
 - Respond adequately to all aviation security requirements;

Conclusion

- Aviation Spectrum Vision and Strategy to be effective needs to be adopted at global (Worldwide) level
- ICAO and ITU have a major role



Thank You

Questions?

