

ICNS 2005

Aviation Spectrum Needs and Challenges

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Attendees

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Introduction

- Goal
 - Discuss current issues with aviation bands of interest.
 - Record input/comments.
 - Draft an agenda or record topics of interest to be discussed at a breakout session of the August ACAST 2005 Workshop.
- Bands of Interest
 - ILS/VOR Band (108–117.975 MHz)
 - ILS Glide Slope Band (328.6–335.4 MHz)
 - DME Band (960–1215 MHz)
 - MLS Band (5000–5250 MHz)

VOR/ILS Band (108–117.975 MHz)

- Discussion Points
 - Would require the reallocation of this band for AM(R)S services (as identified by the WRC 2007 Agenda Item 1.6)
 - Eurocontrol has submitted a draft position to the ITU WP8B to decommission some VORs and continue 8.33 KHz voice expansion down into this band.
- Comments/Discussion
 - If WAAS equipage permits, up to ½ the existing VORs could be decommissioned, opening up additional VHF spectrum
 - Could get secondary “allocation” in which both ARN and AM(R)S can be deployed
 - If VOR band does get re-allocated, what additional capacity will this provide, and will it be sufficient for needs up to 2025?
 - Decommissioning of ILS would be much “farther term,” and would only likely be possible at smaller airports



ILS Glide Slope Band (328.6–335.4 MHz)

- Discussion Points
 - Requires a reallocation to AM(R)S.
 - This band provides propagation characteristics similar to the VHF voice bands.
 - Antenna size would be attractive, although they would need to be omni-directional for A/G links.
 - More efficient use of this band could provide some opportunity for spectrum relief.
 - Often overlooked due to the limited bandwidth (6.8 MHz).
 - 8.33 KHz voice in this channel?
- Comments/Discussion
 - Difficult to convince users of system that additional signals/services could be deployed without interference
 - Would likely require equipage with new ILS-GS receivers



DME Band (960–1215 MHz)

- Discussion Points
 - Would require the reallocation of this band for AM(R)S services (as identified by the WRC 2007 Agenda Item 1.6).
 - Some discussion recently as a solution in a separate voice/data scheme.
 - Coexist with JTIDS (frequency hopped).
- Comments/Discussion
 - UAT at 978 MHz (in US only, so far)
 - DMEs will NOT go away
 - Channel/propagation characteristics for wideband signaling? (JTIDS may have some work)
 - Area for investigation is continued need for TACANs
 - Exactly how is band partitioned among DME, TACAN, etc.?
 - Difficult to convince military to “give up/share” parts of band, unless they obtain some benefit (e.g., UAV spectrum)

MLS Band (5000–5250 MHz)

- Discussion Points
 - Would require the reallocation of this band for AM(R)S services (as identified by the WRC 2007 Agenda Item 1.6)
 - Dr. David Matolak is performing an MLS band channel characterization and modeling study under grant with NASA GRC.
 - Propagation limitations in the C-band would most likely limit solutions to the airport surface.
 - There is a need to develop a business case for C-band deployment.
- Comments/Discussion
 - 5150-5250 is UNII/ISM band; 5000-5091 is MLS band
 - Equipage would need motivation
 - What exactly is needed to have band classified for AM(R)S use? May need to convincingly show spectral congestion, and plan for use of band. (Actual demo/deployment ideal.)

Other Spectrum Considerations

- UAV spectrum requirements
 - Safety-of-Life (SoL) Command & Control
 - Between UAV controller, as well as ATC
 - Payload Data
 - Both LOS and Beyond LOS (BLOS) need to be considered.
 - Could involve a combination of the following
 - AM(R)S (SoL LOS)
 - AM(R)S (SoL BLOS)
 - Generic AMSS (non-SoL LOS)
 - Generic AMSS (non-SoL BLOS)
- Voice in VHF band, Data in DME band.
- Possible WRC-2010 Agenda Items.
- What are the implications of having “general” aviation allocations.
- What are the implications of dynamic allocation?
- Comments/Discussion
 - Reliability & BW requirements of UAVs ill-defined
 - For WRC-2010 agenda: is there a need to keep C, N, and S bands/services separate?

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Potential Spectrum Workshop Agenda Items

- Update on Dr. Matolak's 5 GHz sounding campaign.
- Update on draft positions for WRC-07
 - ICAO WG-F, WG-C
 - Eurocontrol
 - FAA
- C-band antennas for comm usage.
- Update on Future Comm Study
- Prototype 5GHz wireless network (Sensis, Protium)
- UAVs