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April 21, 2008

Ms. Marlene S. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

**Re: Ex Parte Filing: ET Docket No. 06-135; RM-11271; ET Docket No. 05-213; ET Docket No. 03-92**

Dear Ms. Dortch:

This is to advise, on behalf of the Aerospace and Flight Test Radio Coordinating Council ("AFTRCC"), that today Daniel G. Jablonski and the undersigned met with Angela Giancarlo, Legal Advisor to Commissioner McDowell, regarding GE Healthcare's proposal for a body sensor network.

The points made by AFTRCC's representatives are set forth in its earlier filings and in the material attached.

A copy of this ex parte notice is submitted for each of the above-referenced proceedings.

Any questions regarding this filing should be directed to the undersigned.

Respectfully submitted

William K. Keane
*Counsel for AFTRCC*

WKK/jdp

cc: Angela Giancarlo

Enclosure

AFTRCC

AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL

# Sharing between Aeronautical Mobile Telemetry (AMT) and Medical Body Area Network Service (MBANS): A Presentation to the Federal Communications Commission

# Background

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- GE Healthcare proposes a safety of life service on an secondary, uncoordinated basis in the band 2360 – 2400 MHz
- AMT (industry and government) uses 2360 – 2390* MHz for flight test of aeronautical and aerospace systems

  *2390 – 2395 MHz also allocated for Amateur Radio service
- AMT users include
  - Military aircraft and systems (e.g., F/A-18, Joint Direct Attack Munition, etc.)
  - Civil aircraft (Boeing, Lockheed, Learjet, Cessna, Bombardier, etc. use band for aircraft development programs throughout the US)
  - NASA uses band for research balloons with visibility of ~25% of CONUS
- AMT operation
  - 2360 – 2390 MHz is used primarily as a downlink from aircraft/missiles
  - band is being developed for uplinks as part of a networked architecture in order to achieve even more efficiency in spectrum use and help meet rapidly increasing demand for bandwidth

# ITU-R Rec. M.1459

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- **Protection requirements of AMT operations are detailed in ITU-R Recommendation M.1459, approval of which was led by the U.S.**
  - M.1459 establishes that AMT systems are noise, rather than interference, limited; AMT system noise temperatures are typically ~250 Kelvin
    - AMT equipment is designed and maintained to the highest levels to achieve this noise floor
    - AMT operators work to identify sources of, and eliminate, interference from adjacent bands
  - Recommendation M.1459 makes clear that interference analyses appropriate to terrestrial comm systems are not to be used when analyzing interference into AMT systems
  - Recommendation further describes the deep-fading environment within which AMT operations are conducted, and the manner in which high gain ground receive antennas routinely operate at very low elevation angles
  - When combined with the criticality of AMT data (e.g., the immediate detection of safety-of-life situations), the inability to repeat certain tests if dropouts occur (e.g., missile launches), and the need to re-fly entire tests if dropouts occur (e.g., flutter testing), the extremely stringent protection requirements of Rec. M.1459 are fully justified

# Erroneous MBANS Assumptions

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- **GE Healthcare (GEH) erroneously assumes that noise floor for AMT operations can be increased beyond M.1459 limits by interference from MBANS without causing harm**
- **Erroneously assumes that flight tests occur in remote areas**
  - AMT ground stations are often located in or near urban areas (e.g., Wichita, KS)
  - During close-in operations (e.g., repeated takeoffs and landings), and transit from airports to test ranges, in-band interference to MBANS from AMT transmitters is likely
    - Such operations represent a significant percentage of flight test time at most ranges
- **Even more fundamentally, erroneously assumes that contention protocols can be used to detect possible interference from AMT or to AMT, i.e. detection of a telemetry signal from an aircraft is of no use in predicting or mitigating interference to an AMT ground station**
  - When an MBANS node detects a nearby aircraft (i.e., at short range), contention protocol will cause the MBANS to hop to a channel in which the MBANS, with its -85 dBm sensitivity, will be completely unable to detect the presence of a distant aircraft. Thus, when an MBANS switches to a new channel, a functioning AMT link can be rendered inoperable.
  - Use of listen-before-talk contention protocols will cause -- rather than prevent -- interference to AMT
  - Hence, analyses based on contention protocols, such as the MBAN analyses, are fatally flawed and must not be used as a basis for regulatory decision-making!

# Additional flaws in MBAN Analyses

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- **Proposal to use a secondary allocation for monitoring "life-critical" data (e.g., GEH Ex Parte, 12/27/07. at p. 7), where interference from the incumbent primary service is likely, fraught with problems.**
- **Secondary allocation of a COTs system with a noise temp of 10,000K to a noise-limited band (T = 250K) for such a use is inappropriate.**
- **Proposed expansion of MBANS beyond in-hospital use, to include mobile operation, precludes any possibility of coordination with AMT.**
- **Analysis of interference to AMT also based on the erroneous assumption that MBANS will be located in the sidelobe of a high gain AMT receive antenna:**
  - MBANS transmitters will be in the main beam of an AMT antenna (a 20 - 40 dB increase in interference level over GEH assumptions) for long enough to cause loss of bit synchronization, after which it may be impossible to re-establish the AMT link without starting flight test sequence from scratch.
  - For one-time test events, such as a missile launch, the loss of the test data will be severe in terms of cost, safety, and repeatability.
- **MBANS analyses do not take into account the possibility of AMT use of the band for uplink purposes.**

# Conclusion

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- **As a matter of sound engineering practice, *low-sensitivity, high noise systems* should not share spectrum with *high-sensitivity, low-noise systems* where coordination is a fundamental prerequisite, and where the consequences of interference are high.**

- **Likewise, it is not sound spectrum management to permit systems used for "life critical" applications to be operated on a secondary basis in a band where the risk of interference from the primary user is substantial.**