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Federal Communications Commission
Office of the Secretary

August 1, 2008

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
c/o Natek, Inc.
236 Massachusetts Avenue, N.E.
Suite 110
Washington DC 20002

Re: ET Docket No. 08-59
Ex Parte Statement

Dear Ms. Dortch:

This is to report that Thursday, July 31, Daniel G. Jablonski, Johns Hopkins University Applied Physics Laboratory; Frank Weaver, Joe Cramer and Stan Jenkins, The Boeing Company; Danny Hankins, Cessna Aircraft Company; Tom Grady, Bell Helicopter Textron; Giselle Creeser, Lockheed Martin Corporation; Clark Hart, Lockheed Martin Aeronautics Company; Don Hoehn, Bombardier/Learjet; Darby Becker, United Technologies; Marc Ehudin, Textron; and the undersigned, counsel for Aerospace and Flight Test Radio Coordinating Council ("AFTRCC"), met with OET Representatives Ira Keltz; Alan Stillwell; Geraldine Matise; Mark Settle; Jamison Prime; and Gary Thayer, regarding AFTRCC's position in the above-referenced proceedings. The points made by AFTRCC during the course of the meeting were consistent with its earlier filings.

AFTRCC reviewed a PowerPoint presentation with the staff, a copy of which is attached. In addition, AFTRCC reviewed a video reflecting the results of the Learjet and Cessna tests discussed in AFTRCC's May 27 Comments. A copy of the DVD with the video is supplied herewith.

A copy of this ex parte notification is being filed for inclusion in the Docket.

Sincerely,

William K. Keane

Counsel for Aerospace and Flight Test Radio Coordinating Council

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List ABCDE

cc (w/PowerPoint):
Ira Keltz
Alan Stillwell
Geraldine Matise
Mark Settle
Jamison Prime
Gary Thayer

AFTRCC

AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL

Aerospace & Flight Test Radio Coordinating Council

Presentation to Office of Engineering and Technology

July 31, 2008

Background

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- GEH Healthcare ("GEH") proposes a secondary allocation for medical telemetry devices in the band 2360-2400 MHz -- except from 2370-2390 MHz where the proposed allocation would be exclusive
- Most of the band (2360-2395 MHz) is allocated for flight test telemetry (aka, aeronautical mobile telemetry or "AMT")
- Aeronautical mobile telemetry ("AMT") provides a real-time link between test pilots and ground engineers
- AMT is vital to enhancing the safety of flight tests, to expediting the completion of flight test programs, and to delivering aircraft that meet FAA certification and customer requirements
- Real-time telemetry is essential to the global competitiveness of the U.S. Aerospace industry (the nation's most important contributor to a positive balance of trade at $61 billion in 2007 and the employer of 645,600 Americans).

GEH's Arguments

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- GEH argues that the band is "lightly used;" that there is little risk of interference from its body sensor networks ("BSNs") to AMT, or vice versa; and that the claimed benefits of its technology -- anytime, anywhere use -- outweigh whatever risks there may be to flight testing
- However, GEH fundamentally misapprehends the incompatibility of the two safety-related services at issue

GEH's Usage Arguments Are Mistaken

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- GEH overlooks -
  - usage by AFTRCC Members pursuant to hundreds of Government-issued frequency assignments
  - usage by Military Departments at 24 Major Ranges
  - usage by NASA at many of those Ranges
- GEH equates AMT with a consumer application
  - usage metrics germane for consumer services have no relevance for flight testing

GEH Has Opposed the Notion of New Allocations for Telemetry in General, and Secondary Allocations for Medical Telemetry, in Particular

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- In WT Docket No. 07-100, GEH has stated: "Given the frequencies available on a primary basis, [GEH] has no current plans (or need) to use the 1427-1432 MHz band on a secondary basis. Any additional WMTS designations at this time would be premature and an inefficient use of scarce spectrum" (Reply Comments filed September 11, 2007 in WT Docket No. 07-100 at 6th page)

- GEH devoted an entire section of its Comments to the notion: **"The Commission Should Not Risk Patient Safety By Permitting Secondary WMTS Operations in the 1427-1432 MHz Band"** (Ibid at Section III; emphasis in original)

- For these reasons alone, GEH's proposal should be dismissed. The following points are offered solely to complete the record.

GEH's Sharing Arguments Have Shifted

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- Originally it was that AMT antennas operated at high elevation angles

  That argument has since been dropped in the face of data showing that tracking antennas routinely operate at horizontal levels

- GEH also argued that flight test centers are "remote"

  But major flight test centers, both civil and Government, are proximate to densely populated, urban areas -- Seattle, Eglin, Pax River, St. Louis, Wichita, and Point Mugu, for example

Contention-Based Spectrum Sensing is Integral to GEH's Entire Sharing Proposal, Yet ...

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- GEH has discounted the effectiveness of spectrum sensing
  - In the TV White Space proceeding it stated that it is "not confident that sensing technology will be able to provide adequate protection to users" (Comments of GE Healthcare filed January 31, 2007 in ET Docket No. 04-186 at 5)
  - It also stated that "it may be impossible to perform robust sensing" (September 17, 2007 ex parte in ET Docket No. 04-186 at page 14)
- The maker of one of the chips GEH has proposed to rely upon recommends against its use in applications like this

  > "Using the CD ["Carrier Detect"] in a listen before transmit protocol in the 2.4GHz band is not that useful" (http://faq.nordicsemi.no/?q=32)

- The combination of flight testing and BSNs in proximity will mean no vacant spectrum -- especially for hospital use where BSN density would be highest

Contention-Based Spectrum Sensing is Integral to GEH's Entire Sharing Proposal, Yet ... (cont.)

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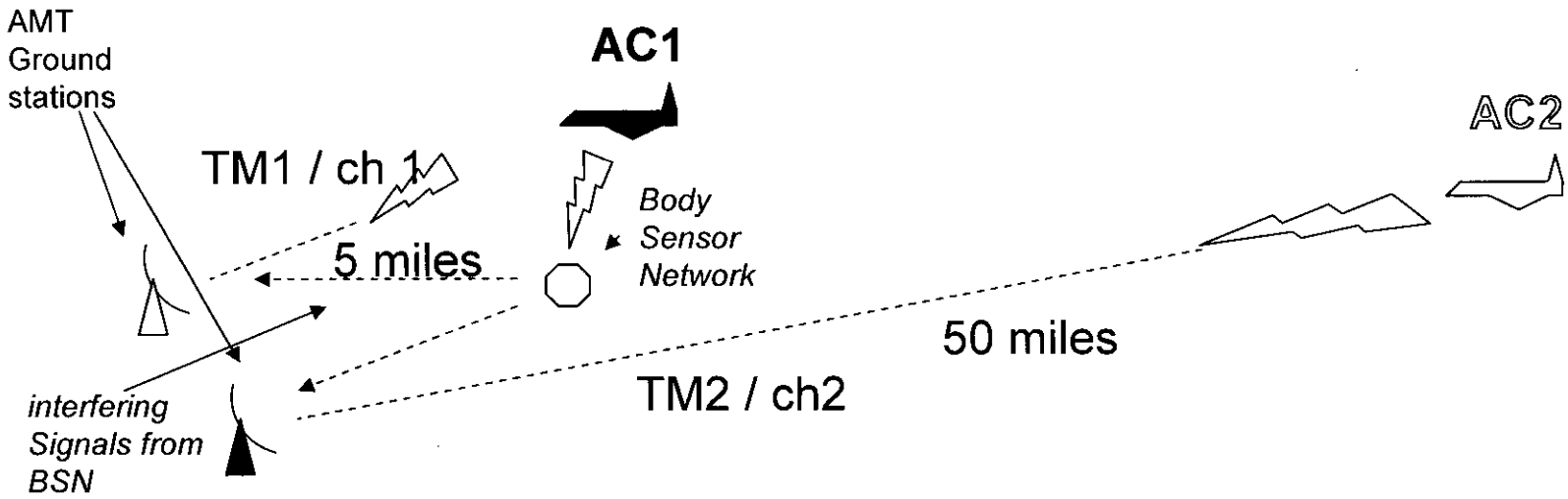
- Contention-based sensing would actually make matters worse



BSN detects **AC1**. However, the BSN is not capable of sensing **AC2**, because **AC2** is out of range of the BSN's low gain antenna. The BSN, upon detecting **AC1**, switches from Ch1 to CH2. This causes loss of TM2 from **AC2**, and necessitates a full restart of the signal acquisition process. The contention sensing process will fail as long as the BSN is operating on CH2 within the beam of the TM2 receive antenna.

GEH Fails to Address the Risks to Life-Critical Patient Telemetry from New AMT Technologies in this Band

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- These technologies (e.g., iNet) will enable flight test agencies to achieve further efficiencies in use of spectrum resource by dynamically increasing/decreasing the spectrum designed to test aircraft depending on the needs of the test and the particular maneuvers
- Uplink transmissions are planned to be omni-directional with power levels measured in the hundreds of watts, or more
- Operation of these transmitters will cause destructive, co-channel interference to all BSNs within line of sight of the AMT transmit antenna
- Putting aside any interference from test aircraft, GEH has not even attempted to show how it could avoid the risks to patient safety from uplink operations

GEH Argues that AMT Antennas are Interference-Limited

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- GEH offers no data to back up this assertion.
- Data presented by AFTRCC in fact shows the opposite: Interference from spurious sources in this, a Restricted Band, is exceptional -- not the rule

GEH's Arguments About the Learjet Test -- which demonstrates the effects of a 1 mW signal on AMT Antennas -- Are Fallacious

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- GEH argues that the test overstated the power spectral density of a BSN. But GEH
  - fails to take into account the bandwidth of the AMT receiver -- which is much wider than the bandwidth of the BSN transmitter; hence, total power in the bandwidth of the AMT receiver is the relevant parameter, not the power spectral density of the BSN transmitter (or its surrogate)
  - fails to take into account the presence of high gain LNAs at the AMT tracking antennas

GEH's Arguments About the Learjet Test -- which demonstrates the effects of a 1 mW signal on AMT Antennas -- Are Fallacious (cont.)

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- GEH argues that the test was conducted with the signal generator only 0.7 miles from the tracking antenna
  - but signal strengths even greater than those which caused data drop-outs and tracking antenna capture at 0.7 miles, were measured at distances of 3.2 miles -- and would have occurred at greater distances due to further reduced ground clutter

The Probability of Interference to Flight Testing Is Much Higher Than GEH Estimates

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- GEH limits its analysis unrealistically to one, and only one, BSN device
  - There could be dozens, if not hundreds, of BSNs proximate to AMT tracking antennas
- GEH calculates that no more than four BSNs could cause interference since four could share one 1 MHz channel
  - But AMT channels are typically five MHz wide -- meaning at least 20 BSN networks could be operating in a single AMT channel at any one time

There is No Effective Means of Enforcing Secondary Status for "Life Critical" Medical Telemetry Devices

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- In the event of interference received, regulators and primary incumbents will be under extraordinary pressure to protect the "secondary" device
- Since BSNs could be used anywhere, at any time -- patients travel, after all -- there is no way of ensuring that they will not cause interference to another safety-related service, AMT
- In the event of interference, the AMT operator will be unable to identify the source

There is No Effective Means of Enforcing Secondary Status for "Life Critical" Medical Telemetry Devices (cont.)

- Make no mistake -- GEH can not be counted on to help enforce whatever usage restrictions (e.g., geographic exclusion zones) it might propose. In opposing secondary status for medical telemetry, GEH has said --
  - "Licensees familiar with the FCC, its requirements and processes understand the differences between primary and secondary use, health care facilities generally do not" (Reply Comments of GE Healthcare filed September 11, 2007, at page 4, quoting from Comments of Land Mobile Communications Council)
  - Medical device manufacturers like itself should <u>not</u> be "strongly encouraged to assist authorized healthcare providers in seeking registration with WMTS frequency coordinator" (Reply Comments, supra, at 2d page)

The Risks to Aircraft and Patient Safety and Development are Manifold

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- Flight test telemetry provides a real-time link between the test pilot and ground engineers: In the event of interference, engineers will lose the ability to detect dangerous conditions aboard the aircraft
- Interference to telemetry requires re-flying test points or entire missions, disrupts test schedules, and can delay certification and delivery to market -- all at major expense to manufacturers
- There is no substitute for real-time telemetry in flight testing

Bottom Line: AMT and BSNs Are Incompatible

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- Extremely sensitive (e.g., 35 dB gain) AMT tracking antennas would be denied entire sectors of limited airspace
  - Interference would occur not just from main beam conjunction but also sidelobes where gain is also high (e.g. 18 dB)
- AMT will cause interference to life-critical BSN monitoring devices which may have no vacant spectrum to hop to especially with implementation of new technologies like iNet

DOCKET NO. 08-59

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