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March 31, 2010

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street S.W.
Washington DC 20554

**Re: WT Docket No. 07-293; ID Docket No. 95-91;**
**GEN Docket No. 90-357; RM-8610**
**Ex Parte Statement**

Dear Ms. Dortch:

This is to report that Tuesday, March 30th, Marc Ehudin, Textron Corporation (Cessna); Joseph Cramer, The Boeing Company; Daniel G. Jablonski, Ph.D., Johns Hopkins University Applied Physics Lab; Chip Yorkgitis, Kelley Drye & Warren, LLP; and the undersigned, counsel for Aerospace and Flight Test Radio Coordinating Council ("AFTRCC"), met with John Giusti, Chief of Staff and Legal Advisor for Wireless to Commissioner Copps, and Charles Mathias, Legal Advisor for Wireless to Commissioner Baker, regarding AFTRCC's position in the above-referenced proceedings.

The AFTRCC representatives explained the basics of flight test operations, the importance of interference-free telemetry to pilot safety, and the need for technical solutions to the risk of interference from adjacent band Wireless Communications Service ("WCS") operators. They urged that coordination with potentially numerous WCS base stations was not a workable solution absent frequency separation, superior filtering and other measures as referenced in the attached materials exchanged at the meeting.

A copy of this ex parte notification is being filed electronically for inclusion in the referenced Dockets.

Sincerely,

William K. Keane

*Counsel for Aerospace and Flight Test Radio Coordinating Council*

cc: John Giusti
Charles Mathias

# Aerospace and Flight Test Radio Coordinating Council (AFTRCC)

# “Impact to Flight Test Safety of WCS Proposals ”

Presentation in
WT Docket No. 07-293 and
IB Docket No. 95-91

# Aerospace and Flight Test Radio Coordinating Council Members

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AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL

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# Role of Flight Test Telemetry

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- Flight test telemetry channels provide real-time safety link between aircraft under test and ground engineers.
- Via telemetry, engineers are able to monitor the condition of the aircraft during its maneuvers, and warn the pilot to abort in the event trouble is detected. It is vital for aviation safety.
- If aircraft lost, real-time telemetry enables engineers to analyze the final moments of flight, and determine the cause of the failure.

**Airplane Damaged During Flutter Test Lands Safely at Boeing Field**

# WCS Protection of Flight Testing

- WCS allocated in the 2305 – 2320 MHz and 2345 – 2360 MHz
- WCS OOBE has been limited to 43 + 10 log (P) dB from band edge to 2370 MHz, and 70 + 10 log (P) above 2370 MHz.
- However, WCS power is measured on peak basis per Rule 27.50(a); and
- Current OOBE limit into SDARS band, 2320 – 2345 MHz (110 + 10 log (P) dB), has effectively precluded mobile use of the WCS band.
- There has been little use of the band to date.

# Results of WCS Field Tests

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- Recent field tests of WCS devices have confirmed the interference threat.
- A low noise flight test telemetry receiver was tuned to a center frequency of 2362.5 MHz with a 12 MHz bandwidth (2356.5-2368.5 MHz).
- Test conducted at a distance of approximately 60 feet with an omni-directional antenna having zero dB gain given (typical large AMT antenna not available).
- Despite the frequency separation (the WCS band edge was 2352.5 MHz), the WCS signal caused severe interference to the Aeronautical Mobile Telemetry (“AMT”) receiver.
- If a typical, higher gain AMT antenna had been used for the test, the interference would have been experienced at over 11 miles – even farther had the antenna been tower-mounted as is usually the case.

# WCS Proposals Will Adversely Impact Flight Testing

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- WCS wants power measured on an average basis, not peak as required by Rule 27.50(a),with a peak-to-average ratio of 13 dB
- Measuring WCS power on an average basis -- much less allowing a peak-to-average ratio of 13 dB (or greater in the case of LTE) -- will significantly increase OOBE into 2360-2370 MHz.
- Effectively relaxes the OOBE limit from 43+10 log(P) to only 30+10 log(P).

# WCS Proposals Will Adversely Impact Flight Testing (cont.)

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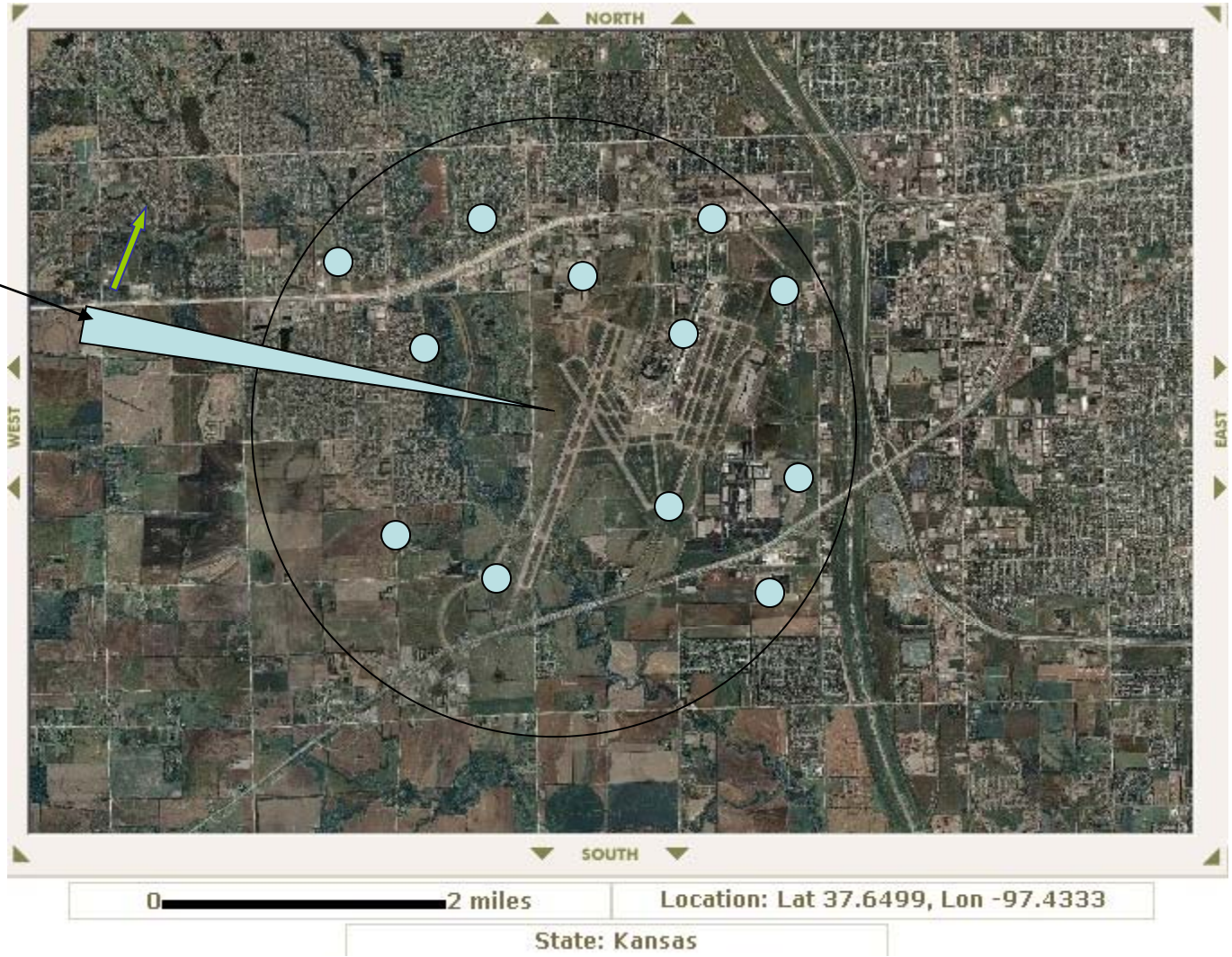
- *This would greatly increase the risk of telemetry drop-outs, and reduce maximum aircraft range by 30 percent . By operation of $\pi r^2$, this results in a 51 percent reduction in reliable airspace operating area.*
- Aircraft are routinely required to operate out to maximum range from AMT ground stations in order to cope with FAA restrictions, weather conditions, local air traffic congestion, etc. That essential flexibility will be lost.
- Mission re-flights increase risk. Mission re-flights increase costs. Mission re-flights cause delivery delays, and reduce global competitiveness.

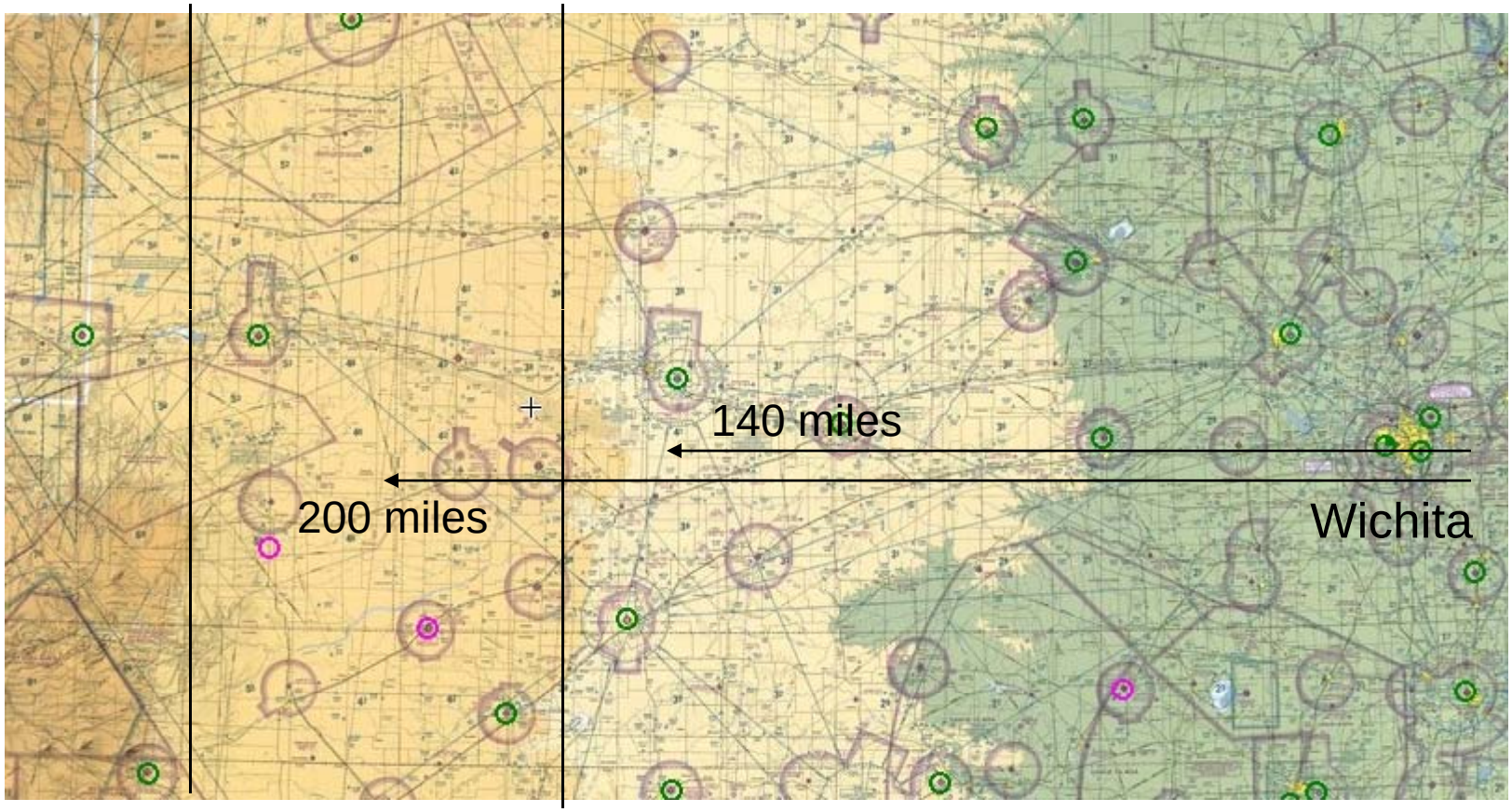
# Impact to Flight Testing

Geography near Wichita, Kansas showing possible WCS base station tower placement within 2 miles of Mid-Continent Airport, where Cessna, Learjet, and others conduct their flight tests

Beam of AMT receive antenna as it cuts across WCS towers and their associated portable and mobile terminals while tracking an aircraft



# Impact to Flight Testing




Maximum operational distance near Wichita of 200 miles is reduced to 140 miles if WCS placement doubles the AMT noise floor.

# FCC Has Repeatedly Recognized Protected Status for Flight Test Band

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- Recognized that flight testing is a safety service which must be protected "from harmful interference that could result in loss of life."[1/]
- Determined that telemetry bands should be classified as "Restricted" and protected from fundamental emissions of unlicensed devices -- agency stressed that the telemetry band "involv[es] safety of life." [2/]

[1/] *In the Matter of Amendment of Part 2 of the Commission's Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference, Geneva,* 1979. FCC 84-306, released July 2, 1984, at 2.

[2/] *In the Matter of Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License,* 4 FCC Rcd 3493, 3502 (1989).

# FCC Has Repeatedly Recognized Protected Status for Flight Test Band (cont.)

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- Recognized potential cost to manufacturers and the taxpayer from even brief telemetry drop-outs is significant:

  "[F]light test, telemetry, and telecommand operations are vital to the U.S. aerospace industry to produce, deliver, and operate safe and efficient aircraft and space vehicles."[3/]

[3/] *Second Notice of Inquiry in GEN. Docket No. 89-554, In the Matter Of An Inquiry Relating to Preparation for the International Telecommunication Union World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum,* FCC 90-316, 5 FCC Rcd 6046, 6060, para. 101 (1990).

# U.S. Has Protected Flight Test Band Internationally

- U.S. took extraordinary measures at WRC-07 to protect S-band telemetry:

  "The United States of America and Canada refer to footnote number 5.394 of Article 5 of the Radio Regulations concerning the use of the 2 300-2 390 MHz band in the United States and the 2 300-2 400 MHz band in Canada and state that, in application of the Final Acts of the World Radiocommunications Conference (Geneva, 2007) in those bands, *the aeronautical mobile service for telemetry has priority over other uses by the mobile services*."[4/]

[4/] Declaration No. 78, Document 427-E (WRC-07) (emphasis added).

# WCS Arguments

- WCS argues that it is not proposing to change the OOBE rule of 43+10 log(P) dB
  - But it is proposing to change the Rule by which OOBE compliance is measured (average versus peak power) -- exacerbating the interference to AMT.
- The same WCS parties <u>opposed</u> average power measurement when WCS Wireless sought a waiver just three years ago incident to a prospective merger with XM Satellite Radio. Quoted in AFTRCC ex parte of May 7, 2008 at 3.
- AT&T has argued that there should be a 10 MHz guard band to protect its operations at 2110-2155 MHz (AWS-1) from any adjacent interference from 2155-2180 MHz band (AWS-3). See AFTRCC ex parte of August 18, 2008.

# AFTRCC Proposal Enhances Spectral Usage and Aviation Safety

AFTRCC
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- Limit use of upper bands to base stations only (FDD)
- Retain peak power measurement consistent with existing Rule 27.50(a) and various other wireless services (1390-1392; 1390-1392/1432-1435 MHz; and 1670-1675 MHz; see Rules 27.50(e)-(f))
- With peak power, increase existing protection levels from 43 + 10 log (P) in 2360 – 2370 MHz to 70 + 10 log (P) measured on an EIRP basis (i.e. after transmit antenna) at band edge and above
- Coordination required to maintain protection as against close-in base stations
- Require transmit power control (“TPC”) for WCS base stations, mobiles and portables

# AFTRCC Proposal Enhances Spectral Usage and Aviation Safety

- As alternative to FDD element, create guard band *together with* base station filtering and TPC to yield OOBE levels specified above. Exclusion zones required.

*  *  *

- Benefits
  - Enables achievement of mobile broadband use in the National Broadband Plan, "while protecting neighboring federal, non-federal Aeronautical Mobile Telemetry (AMT) and satellite radio operations" -- *as the Plan requires*. *Id*. at 75.
  - Deals with interference at the source, where it is most readily prevented
  - Minimizes enforcement/regulatory burdens for Commission.