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May 28, 2004

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

Re: Ex Parte Filing
ET Docket No. 00-258; WT Docket No. 02-8

Dear Ms. Dortch:

This is to report that yesterday representatives of the Aerospace and Flight Test Radio Coordinating Council ("AFTRCC"), and certain of its member companies, met with the staff of the Office of Engineering and Technology regarding the above-referenced proceeding. In attendance for AFTRCC were Frank Weaver and Tiara Prater, The Boeing Company; Jennifer Warren, Lockheed Martin Corporation; Daniel Jablonski, Johns Hopkins University Applied Physics Laboratory; and Ken Keane, AFTRCC counsel.

Present for the Commission were Julius Knapp (via telecon), Jamison Prime, Rodney Small, and Ted Ryder.

The AFTRCC representatives addressed interference concerns relative to co-channel operations between amateurs and flight testing in the band 2390-2395 MHz. Details regarding these concerns are set forth in the attached Engineering Statement from Mr. Jablonski. The AFTRCC representatives urged that a formal coordination mechanism was necessary in order to avoid interference to flight testing's use of the communications channels at issue (i.e. telemetry downlinks essential to aircrew safety); that the Commission should initiate a rulemaking looking toward upgrading the amateur allocation at 2300-2305 MHz in return for deletion of the amateur allocation at 2390-2395 MHz; and otherwise reiterated the positions taken in AFTRCC's Comments on file in the proceeding.

In addition, AFTRCC addressed the request by DARS parties for tighter out-of-band emission limits on flight testing. The AFTRCC delegation referenced its earlier filed Comments. In addition, it was noted that much government flight test work was done by AFTRCC member

companies, and that those companies had long operated under the limits specified in the Commission's Rules without complaint from other parties.

An original and one copy of this filing are submitted for inclusion in each of the Dockets.

Respectfully submitted,

/s/ William K. Keane

cc: Julius Knapp
Jamison Prime
Rodney Small
Ted Ryder

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Engineering Statement regarding the use of Amateur Television in the 13 cm Band

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This engineering statement is submitted on behalf of the Aerospace and Flight Test Radio Coordinating Council. It addresses the question as to whether there is a risk of interference as between amateur operations at 2390-2395 MHz, and flight test operations in the same band. As shown below, the answer is affirmative.

It is understood that the amateur community uses the band in question primarily for fast scan television with some usage as well for broadband data applications. In terms of the technical characteristics, a review of publicly available literature with regard to amateur television ("ATV") reflects an emphasis on increasing power levels to the 15-50 watt range accomplished via the installation of PEP "brick" amplifiers; "combined antenna and height gain", accomplished by the use of high gain antennas mounted on masts, towers or other high structures; and, generally, on increasing ATV operating ranges to 20-50 miles, accomplished by the above techniques and the careful use of low-loss cabling. See, e.g. An Introduction to Amateur Television, QST, 1993.

The public literature also reflects stated goals of "flying ATV gear in radio-controlled aircraft, and lofting balloon packages to the edge of space to provide spectacular pictures for hundreds of miles!" (Ibid; emphasis in original). As stated in the references, these goals apparently have already been met both by individuals and informal groups. This is further supported by recent postings to, for example, the Internet web site of the Baltimore Radio Amateur Television Society ("BRATS", http://www.bratsatv.org). In addition to operating an ATV repeater (W3WCQ/R), BRATS provides information on boosting effected radiated power levels, maximizing range, transmitting ATV signals from model rockets (with altitudes of up to one mile), etc.

Although ARRL's literature on ATV deals mostly with the use of lower frequency bands, and in particular the 70 cm band, many of the features that characterize ATV operations at these lower frequencies will of necessity apply to the 13 cm band as well.

For example, results of a preliminary search of current amateur activities in the 13 cm band include reference to ATV "contests", in which amateur radio operators engage in design competitions with the goal of demonstrating the maximum possible power and range combinations for ATV operation. In one such contest (cf. http://www.on1hh.be/foto/atv/), information on the construction of a 20 Watt amplifier for use in ATV operations in the 13 cm band is provided with the goal of enabling other amateur operators to reproduce the design at minimal expense.

ATV signals are roughly similar in bandwidth (~6 MHz), and comparable (or higher) in power, to signals broadcast by flight test aircraft. ATV receive antennas, however, typically have gains 10-30 dB less than those of flight test tracking antennas. These are large parabolic dishes designed to track aircraft and missiles operating 200 or more miles away. Thus, under line-of-sight conditions, flight test ground stations will detect and react to ATV signals at distances far beyond those over which amateurs can receive those signals.

Take, for example, the combination of a 20 Watt amplifier and a 14 dB directional antenna. (Such antennas are also recommended in the ATV literature). A transmitter equipped with such an amplifier would have an effective radiated power 20 dB higher than that of a flight test vehicle using a 5 watt transmitter. When such a transmitter/antenna combination is placed on a tower or mast (BRATS recommends a height of at least 40 feet for amateur operations), the line of sight range to a flight test telemetry antenna located 25 feet in the air (as is typical at many flight test telemetry ground stations), will be approximately 15 statute miles. If either the ATV transmit antenna or the telemetry receive antenna is located on a hill or mountain, this line of sight range will easily increase to many tens of miles. When the ATV transmitter is operated on a general aviation, ultralight, or radio controlled aircraft, the range would increase even further.

Flight test telemetry transmissions also have the potential to interfere with ATV reception. However, because flight test aircraft use omni-directional antennas, and correct for the reduced effective radiated power by use of the high gain tracking antennas referenced above, flight testing is considerably less likely to interfere with ATV than ATV is to interfere with flight test.

Thus, absent some sort of coordination mechanism, it is my view that co-channel sharing of the band 2390-2395 MHz as between amateurs and flight testing presents significant risks of interference. This may present serious issues for flight test use of the band inasmuch as interference to flight test telemetry is a safety matter for the ranges.

/s/ Daniel G. Jablonski

Daniel G. Jablonski has 30 years experience as an electrical engineer and physicist, with considerable experience with flight test equipment and operations. He has B.S. and M. S. degrees in electrical engineering from MIT and a Ph.D. in physics from Cambridge University. He is a senior member of the IEEE, a member of the Editorial Board of the I.E.E.E. Transactions on Microwave Theory Techniques, and a licensed Professional Engineer in the State of Maryland.