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September 6, 2000

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th St., S.W.
Washington, DC 20554

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Re: Ultra-Wideband
ET Docket 98-153

Dear Ms. Salas:

Aviation Management Associates, Inc. (AMA) is an aviation consulting firm which has provided services to a variety of aviation clients, including airports, airlines, aviation trade associations, and aviation manufacturing and service companies, since 1984.

During the last sixteen years AMA has been involved on behalf of its clients with virtually all of the major technological developments evaluated or adopted by the Federal Aviation Administration (FAA). This includes communication, navigation, surveillance and aviation infrastructure technology and policy which range from Instrument Landing Systems, Microwave Landing Systems, Loran C, Global Positioning and Augmentation Systems, Airport Surveillance Radars, Automatic Dependent Surveillance and Multi-dependent Static Surveillance. AMA has also been active in the Federal Aviation Research Advisory Committee, RTCA, and many other aviation advisory committees and forums. In addition, AMA continues to provide support to a variety of clients involved in aircraft development and certification.

Seldom, if ever, has AMA been exposed to a technology as promising as Time Modulated Ultra Wide Band (TM-UWB) to address so many critical aviation safety and efficiency concerns.

Safety Applications

Because of its apparent high capacity for carrying data over a large number of channels and multipath resistance, TM-UWB may be an ideal candidate to replace hundreds of miles and thousands of pounds of aging deteriorating wiring currently used in a commercial transport category aircraft. The National Transportation Safety Board (NTSB) and FAA have identified wiring as a possible cause of two of the most recent commercial aircraft tragedies, Trans World Flight 800 in July 1996 and Swiss Air Flight 111 in September of 1998. In fact, FAA has placed a high safety priority on seeking alternatives to currently certified aircraft wiring and components.

TM-UWB, used in conjunction with rapidly developing micro-electromechanical (MEM) devices, offers tremendous opportunities to improve aviation safety through the development of real-time aircraft monitoring systems. These systems, similar to those currently used by in-flight engine performance monitoring systems, allow extensive performance parameter monitoring which enables aircraft to be maintained in response to actual environmental conditions and precursors which indicate system or component degradation prior to failure.

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TM-UWB may provide needed high capacity short range communications between aircraft and airline maintenance and operations in the airport environment. Currently, both licensed and unlicensed spectrum are often overloaded in many urban areas and fail to meet current requirements much less forecasted needs.

TM-UWB can also serve to provide increased safety at a much lower cost for terrain avoidance and runway incursion radars. Both of these safety issues rank with the highest aviation safety concerns of both the FAA as well as the NTSB. Short range low power TM-UWB could conceivably place low cost avoidance safety systems in every aircraft flying saving many lives annually by doing so.

Efficiency Applications

It is our understanding that TM-UWB can supplement its inherent communications benefits with positioning capability. This makes TM-UWB feasible as a system which provides aircraft navigational guidance. Indeed, the lack of a detectable signal which is virtually immune to multipath interference is ideal to provide highly reliable precision navigational guidance to aircraft. In fact, TM-UWB may be the most viable replacement for the Local Area Augmentation System (LAAS) which must rely upon VHF communications to transmit position correction from the ground to an aircraft in close proximity to an airport.

In addition to critical safety of life benefits, TM-UWB may provide significant airline operational and passenger benefits by permitting distribution of communications and entertainment to individual seats throughout the aircraft. Integration of TM-UWB into GPS devices would permit knowledge of relative and absolute positions indoors, underground and in other environments where GPS is unusable. Integration of TM-UWB positioning and communications capability into cellular phones would permit airlines to determine passenger location in an airport environment and communicate updated aircraft arrival and departure times and gates.

Aviation Issues

As an aviation company, AMA is also concerned, regardless of the potential benefits, that TM-UWB may have a pejorative effect upon allocated aviation spectrum reserved for restricted use safety of life services. As a result, AMA has followed the issues and arguments closely in an effort to assess the viability of TM-UWB for commercial applications, especially aviation.

Notwithstanding the myriad of technical information reviewed, AMA cannot perceive a differentiation between intentional and non-intentional interference as defined by FCC Regulations Part 15. As far as we are aware the TM-UWB is a signal indistinguishable from the sort of noise commonly emitted by many digital and other electrical devices and possesses no unique characteristics that set it apart from any other Part 15 device.

Although AMA understands that there is little concern in the aviation venue in addressing individual TM-UWB devices, there seems to be considerable concern in aggregating multiple devices in a confined area. This appears to manifest itself in the discussion of raising a spectral noise floor. AMA does not understand how this issue is any different from the proliferation of cellular telephones, PDAs and other electronic devices at airports and on airplanes which also place energy within restricted bands at Part 15 levels. If there is a true concern about the spectral noise floor, how will the proliferation of these devices be addressed by the aviation community and the FCC? Further, if TM-UWB eventually replaced short range cellular and at least some of the other land mobile

communications in an airport environment, could the noise floor actually decrease as a result?

A major aviation concern lies in the potential interference between TM-UWB and GPS. Interestingly, GPS is a positioning system developed and operated by the Department of Defense for military applications. GPS was never designed nor intended to meet civil requirements, much less civil aviation requirements. As a result the FAA has proposed various augmentation architectures and technologies to address GPS shortfalls to meet civil aviation availability, reliability and integrity requirements. Unfortunately, FAA's initial program, known as the Wide Area Augmentation System (WAAS), has increased in cost from its initial estimate of $509 million to a current estimate well in excess of $3.5 billion and has been delayed yet again until at least 2002 prior to initial instrument flight rules (IFR) operational deployment. According to the Department of Transportation Inspector General the "cost and schedule implications of fixing... problems have yet to be determined" . Further, according to key Congressional members, this program is in serious jeopardy of cancellation as a result of cost overruns, program delays and a changing operational environment, notwithstanding recent declarations of limited visual flight rules (VFR) operational applications.

A complimentary program known as the Local Area Augmentation System (LAAS) will not see initial deployment until 2006. Even with initial deployment, the certification and widespread deployment of an installed aircraft base able to benefit from GPS will not occur until approximately 2015. Until then aviation users will continue to rely upon today's air navigation systems as a primary means of navigation.

Coincidentally GPS including WAAS and LAAS will not provide new operational capability beyond that provided by navigational systems currently in use. While GPS WAAS and LAAS will not permit aircraft to land in more inclement weather conditions than today as provided by Category III Instrument Landing Systems, there is hope that the ground navigation infrastructure can be decommissioned and the number of small airports supporting vertical path guidance expanded. There are obviously strong economic incentives for the deployment of GPS augmented systems suitable for aviation.

Summary

Notwithstanding the potential economic benefits derived from the deployment of GPS augmented systems for aviation, AMA is not convinced that the immediate potential benefits of TM-UWB should be denied or delayed given that deployment and full utilization of GPS for aviation is more than a decade away. In other words, the FCC should not consider holding TM-UWB hostage to GPS given the potential for near term benefits of TM-UWB to meet critical aviation safety requirements.

It would seem there is adequate time to launch TM-UWB well in advance of any substantive impact on GPS, since the aviation community is committed to use GPS WAAS and LAAS. Timely rulemaking would encourage further technological development and integration of TM-UWB with GPS, possibly even as an alternative to WAAS and LAAS. This would be a substantial benefit to the entire aviation community. In this regard, FCC could revisit rulemaking as appropriate to address continuing development of GPS WAAS and LAAS for aviation applications when and if necessary.

TM-UWB technology has an opportunity to change the world in ways we cannot even yet imagine - ways that may save thousands of lives and billions of dollars. I would urge the FCC to move forward as quickly as possible to address aviation concerns with meaningful rulemaking that enables the rapid deployment of TM-UWB so that lives may

be saved and economic benefits can begin to accrue as we continue to monitor the aviation venue for opportunities as well as impacts.

Thank you for the opportunity to comment on this rulemaking action.

Sincerely,

Gary R. Church
President