Wiley Rein & Fielding LLP

1776 K STREET NW
WASHINGTON, DC 20006
PHONE 202.719.7000
FAX 202.719.7049

Virginia Office
7925 JONES BRANCH DRIVE
SUITE 6200
McLEAN, VA 22102
PHONE 703.905.2800
FAX 703.905.2820

www.wrf.com

David E. Hilliard
202.719.7058
dhilliard@wrf.com

January 25, 2002

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

Re: ET Docket No. 98-153 - Ultra-Wideband
Ex Parte Notice

Dear Ms. Salas:

On January 24, 2002, Robert Pettit of Wiley, Rein and Fielding sent the attached emails to Peter Tenhula, Senior Legal Advisor to Chairman Powell; Bryan Tramont, Senior Legal Advisor to Commissioner Abernathy; Paul Margie, Legal Advisor to Commissioner Copps; and Monica Desai, Legal Advisor to Commissioner Martin. The recipients were alerted in voice messages that the emails were to be sent. Copies of the attachments that were included with the emails are also enclosed. All of the attachments have been previously submitted in association with ex parte notices filed heretofore in this proceeding by either X-Treme Spectrum or Time Domain Corporation.

Pursuant to Section 1.1206 of the Commission's Rules, 47 C.F.R. §1.1206, an original and a copy of this letter have been submitted for inclusion in the public record. Please contact me at the phone number listed above if you have any questions concerning this letter.

Respectfully,

/s/ David E. Hilliard
David E. Hilliard
Counsel for Time Domain Corporation

cc: Messrs. Tenhula, Tramont, and Margie and Ms. Desai

Pettit, Robert

From: Pettit, Robert
Sent: Thursday, January 24, 2002 1:30 PM
To: 'ptenhula@fcc.gov'
Subject: Government Uses of UWB

DOC010.PDF

DOC088.PDF

DOC076.PDF

This is the list of government contracts for UWB that I indicated I would send to you. Please call if you have any questions.

Pettit, Robert

From: Pettit, Robert
Sent: Thursday, January 24, 2002 1:19 PM
To: 'btramont@fcc.gov'
Subject: Government Uses of UWB

DOC010.PDF

DOC088.PDF

DOC076.PDF

This is the list of government contracts for UWB that I indicated I would send to you. Please call if you have any questions.

Pettit, Robert

From: Pettit, Robert
Sent: Thursday, January 24, 2002 1:22 PM
To: 'pmargie@fcc.gov'
Subject: Government Uses of UWB

DOC010.PDF

DOC088.PDF

DOC076.PDF

This is the list of government contracts for UWB that I indicated I would send to you. Please call if you have any questions.

Pettit, Robert

From: Pettit, Robert
Sent: Thursday, January 24, 2002 1:31 PM
To: 'mdesai@fcc.gov'
Subject: Government Uses of UWB

DOC010.PDF

DOC088.PDF

DOC076.PDF

This is the list of government contracts for UWB that I indicated I would send to you. Please call if you have any questions.

GOVERNMENT AND DEFENSE PROJECTS

TIME DOMAIN GOVERNMENT PROJECTS

National Institute of Standards and Technology Advanced Technology Program

- Internal communications and tracking system for medical equipment

NASA Johnson Space Center

- Astronaut / Space Station Extra Vehicular Activity communications and position location and tracking for space walks: Phase II Small Business Innovation Research contract
-

National Science Foundation

- Universal Home Networking: Phase I Small Business Innovation Research contract

Department of Commerce

- Firefighter locator: Phase I Small Business Innovation Research contract

NASA Glenn Research Center

- Phased Array and SAR Radar: Phase I Small Business Innovation Research contract

NASA Goddard Space Flight Center

- Interspacecraft Communication: Phase I Small Business Innovative Research contract

NASA Marshall Space Flight Center

- Terahertz waveform Cooperative Research and Development Agreement (CRADA)

TIME DOMAIN DEFENSE PROJECTS

DoD Military Operations in Urban Terrain Advanced Concept Technology Demonstration

- Through wall radar for military operations in urban terrain to clear buildings by detecting human presence through walls

Office of Naval Research

- Location and status tracking system for environmental conditions history and shelf life of ammunition in storage depots to circumvent the need for destructive testing and lot sampling

Office of the Assistant Secretary of the Navy for Safety and Survivability

- Personal, Position, Location, and Tracking System to locate sailors aboard ships during life-threatening situations

Army Missile and Aviation Command Advanced Concept Office

- Over-the-horizon communications link using unmanned aerial vehicles: Phase II Small Business Innovation Research contract

Army Missile and Aviation Command Weapons Sciences Directorate

- Blue Laser research: Phase II Small Business Technical Transfer Research contract

Army Tank Automotive and Armaments Command Tank Automotive RDE Center

- Terrain mapping radar system to provide ground truthing for Grizzly mine-breaching program: Phase II Small Business Innovation Research contract

Army Simulation Training and Instrumentation Command

- Advanced Tactical Engagement Simulation Program for the Objective Infantry Combat Weapon to detect hits on non line-of-sight targets during military exercises: Phase II Small Business Innovation Research contract

Army Simulation Training and Instrumentation Command

- Cooperative Research and Development Agreement to introduce time modulated ultra wideband technology into military training

National Security Agency

- Technology license for Army Research Laboratory to study how and where time modulated ultra wideband communications should be implemented for the Army

Marine Corps

- Personnel Identification System: Phase I Small Business Innovative contract

Defense Threat Reduction Agency

- Evaluation of UWB for airborne surveillance and ground penetrating radar

Land Warrior Program

- Evaluation of UWB for Land Warrior Program

Army STRICOM

- Development of Mobile ad hoc networking BAA with military and commercial dual-use capability

Army STRICOM

- Aim-point determination and geometric pairing solution for OICW weapon system: Phase II Small Business Innovative Research contract

DoD Office of Science and Technology

- OST IDIQ Program

Navy Sea Systems Command (NAVSEA)

- UWB engineering expertise for technology insertion into Naval Applications

Navy Research Lab (NRL)

- To provide precise timing via wireless

COMPLETED PROJECTS

Defense Advanced Research Projects Agency Advanced Technology Office

- Self-Healing Minefield program that causes mines to autonomously fill in minefield breaches

Army Corps of Engineers

- Cooperative Research and Development Agreement to mark locations of unexploded ordnance on training ranges, for subsequent munitions clearing

Army Space and Missile Defense Command Battle Lab

- Wireless communications for Future Operations Center local area network, the next generation tactical operations center

Army Simulation Training and Instrumentation Command

- Lightweight Personnel Detection Device to track soldiers during military training exercises

L3 Communications

- Provision of 3 full duplex evaluation PulsON radios with propagation software.

Navy Training Command

- Demonstration of Time Domain's PulsON® radio to track weapons on a training range: Phase 1 Small Business Innovation Research contract

Army Material Command

- Proposal to support intelligent mines with PulsON® radar sensor and PLT

National Telecommunication & Information Agency

- Utilization of the PulsON® pulsers to facilitate interference testing in support of the FCC NPRM

National Telecommunication & Information Agency

- Utilization of PulsON® pulsers to facilitate interference testing in support of the FCC NPRM

Johnson Space Center

- Astronaut / Space Station Extra Vehicular Activity communications and position location and tracking for space walks: Phase I Small Business Innovation Research contract

Army Missile and Aviation Command Advanced Concept Office

- Over-the-horizon communications link using unmanned aerial vehicles: Phase I Small Business Innovation Research contract

Air Force Rome Labs

- UWB SAR Research: Phase I Small Business Innovation Research contract

Army Missile and Aviation Command Weapons Sciences Directorate

- Photonics Research Support: Phase I Small Business Innovation Research contract

Army Missile and Aviation Command Advanced Concept Office

- Over-the-horizon communications link using unmanned aerial vehicles: Phase I Small Business Innovation Research contract

Army Tank Automotive and Armaments Command Tank Automotive RDE Center

- Terrain mapping radar system to provide ground truthing for Grizzly mine-breaching program: Phase I Small Business Innovation Research contract

Army Simulation Training and Instrumentation Command

- Advanced Tactical Engagement Simulation Program for the Objective Infantry Combat Weapon to detect hits on non line-of-sight targets during military exercises: Phase I Small Business Innovation Research contract

Below is a list of government contracts involving ultra-wideband technologies:

Time Domain (including contracts awarded but not yet signed)

National Institute of Standards and Technology (NIST) Advanced Technology Program
Internal communications and tracking system for medical equipment

National Aeronautics and Space Administration (NASA)
Astronaut / Space Station Extra Vehicular Activity communications and position location and tracking for space walks: Phase II Small Business Innovation Research contract

National Science Foundation
Universal Home Networking: Phase I Small Business Innovation Research contract

Department of Commerce
Firefighter locator: Phase I Small Business Innovation Research contract

DOD Military Operations in Urban Terrain Advanced Concept Technology Demonstration
Introduction and evaluation of RadarVision in military operations in urban terrain to clear buildings by detecting human presence through walls

Office of Naval Research (ONR)
Location and status tracking system for environmental conditions history and shelf life of ammunition in storage depots to circumvent the need for destructive testing and lot sampling

Office of the Assistant Secretary of the Navy for Safety and Survivability
Personal Position Location and Tracking System to locate sailors aboard ships during life-threatening situations

Defense Advanced Research Projects Agency (DARPA) Advanced Technology Office
Self-Healing Minefield program that cause mines to autonomously fill in minefield breaches

Army Missile and Aviation Command (AMCOM) Advanced Concept Office
Over-the-horizon communications link using unmanned aerial vehicles: Phase II Small Business Innovation Research contract

Army Missile and Aviation Command (AMCOM)
Blue Laser research: Phase II Small Business Technical Transfer Research contract

Army Tank Automotive and Armaments Command (TACOM) Tank Automotive RDE Center (TARDEC)
Terrain mapping radar sensor to provide ground truthing for Grizzly mine-breaching program: Phase II Small Business Innovation Research contract.

Army Corps of Engineers
Cooperative Research and Development Agreement to mark locations of unexploded ordnance on training ranges, for subsequent munitions clearing

Army Simulation Training and Instrumentation Command (STRICOM)

Advanced Tactical Engagement Simulation Program for the Objective Infantry Combat Weapon to detect hits on non line-of-sight targets during military exercises: Phase II Small Business Innovation Research contract

Army Space and Missile Defense Command, Battle Lab (SMDCBL)

Wireless communications for Future Operations Center local area network, the next generation tactical operations center

Army Simulation Training and Instrumentation Command (STIRCOM)/ Univ. of Central Florida

Cooperative Research and Development Agreement to introduce time modulated ultra-wideband technology into military training.

Army Simulation Training and Instrumentation Command (STIRCOM)

Lightweight Personnel Detection Device to track soldiers during military exercises at the National Training Center (ultra lightweight gear with precision location and tracking)

National Security Agency (NSA)

Technology license for Army Research Laboratory to study how and where time modulated ultra wideband communications should be implemented for the Army

Æther Wire & Location, Inc.

DARPA

Grant for development of a position location system with a network of RF transceivers (ultra wideband localizers) (Æther Wire web site)

Intelligent Automation Incorporated (IAI)

Department of Commerce

Contract to develop a communication and tracking system for firefighters, police, and similar personnel (FCC Comment 9/6/00)

NASA

Contract to apply ultra-wideband technology to the next generation space suit so that the motions of an astronaut can be tracked (FCC Comment 9/6/00)

U.S. Army Simulation and Training Command

Contract to develop ultra-wideband for use in training exercises to track the motions of trainees and equipment (FCC Comment 9/6/00)

U.S. Army

Contract to apply ultra-wideband technology to the Grizzly Minefield Breaching Vehicle (FCC Comment 9/6/00)

U.S. Air Force

Contract that demonstrated the many advantages of ultra-wideband in phased array radar and in synthetic aperture radar (FCC Comment 9/6/00)

DOD's DARPA (Defense Advanced Research Projects Agency)
Working to evaluate distance learning in U.S. Dependent Schools on U.S. military bases abroad and the potential of wireless access to high bandwidth access (FCC Comment 9/6/00)

Multispectral Solutions, Inc. (MSSI)

Numerous Agencies
MSSI's Short Pulse Communications Systems (SPCS) has been evaluated by numerous government agencies for low detection voice and data communications (FCC comments)

U.S. Marine Corps Warfighting Laboratory
Contract for collision avoidance sensor (FCC comments)

Naval Air Systems Command
Contract for multifunction precision altimeter, collision avoidance sensor and low data rate communications system (FCC comments)

U.S. Navy
Contract for miniaturized high speed ultra-wideband video data link (FCC comments)

DOD's DARPA
Sub-contract for ultra-wideband precision geolocation system for urban warfighter applications (FCC comments)

Naval Air Warfare Center - Aircraft Division
Contract to develop ultra-wideband wireless intercom systems for Navy Aircraft (Press Release)

National Institute for Occupational Safety and Health (NIOSH)
Contract for development of ultra-wideband vehicle backup sensors for mobile mining equipment (Press Release)

Naval Facilities Engineering Command
Contract for development of Asset Location & ID System (Press Release)

U.S. Marine Corps
Contract for development of network-capable radios (Press Release)

U.S. Special Operations Command
Contract for development of ultra-wideband radar sensors for wide area surveillance, and intrusion detection (Press Release)

Department of Transportation
Contract for the development of an ultra-wideband tagging system for the detection of problem drivers (Press Release).

Navy Surface Warfare Center (Hummingbird Project)

Contract to develop precision altimetry and collision/obstacle avoidance applications (Press Release)

U.S. Army Research Laboratory

Contract for the development of an ultra wideband radar proximity fuze (Press Release)

U.S. Army Missile Command

Contract to develop high-speed ultra wideband (UWB) link for the transmission of command & control and live video data to/from an unmanned aerial vehicle (Press Release)

DOD's DARPA

Collision avoidance radar for use in DOD's Organic Aviation Vehicle (International Defense Review, 3/1/2001)

National Academy of Science

Contract to develop electronic license plates with dual function of collision avoider and RF tagging for vehicle to roadside communication (Press Release)

DOD's Office of Special Technology

Contract to develop an ultra-wideband voice/data packet radio using groundwave propagation for non-line-of-sight communications. (Jane's Int'l Defense Review 2/99)

ITT Industries

Air Force

Contract to research and develop ultra-wideband sources and antennas for communication systems (Sec. of Defense News Release)

Department of Energy - Lawrence Livermore National Laboratory

Defense Special Weapons Agency & U.S. Army's Humanitarian Demining Office

Working on development of a fieldable man-portable land mine detection system (Jane's Int'l Defense Review 2/99)

US Army, Navy & Air Force Strongly Pursuing Ultra Wideband Defense Applications

- DoD pioneered UWB with a few, specialized applications.
- Now, U.S. Army, Navy and Air Force are each strongly funding R&D efforts to exploit ultra wideband (UWB) technology for defense applications--See partial catalogue of contracts, below.
  - Revolutionary potential applications in radar, communications, ranging, tracking and position locating;
- Commercial investment and development has brought UWB technology to the cusp of widespread application throughout DoD.
- US technology lead in UWB for defense applications is best assured for the future by US dominating world-wide commercial market.
- US commercial control of UWB market is also best assurance that key US Government users will continue to be protected. Foreign developers won't care about USG requirements.
- FCC on February 14 should issue "win-win" rules for Government users and US industry for UWB commercial development.
- XtremeSpectrum on November 29, 2001, filed a "universal compromise" proposal with the FCC that fully resolves all interference concerns raised by involved parties, such as the GPS community, while simultaneously allowing the US UWB industry as a whole to commercially deploy products.

DoD Investment in Ultra Wideband Technology for Defense Applications (Partial Catalogue for 1998-2001)

Radar

Defense Advanced Research Projects Agency (DARPA)

- DARPA: $130M contract to Lockheed Martin for development of UWB foliage penetrating radar (1997)
- DARPA: Phase III subcontract to Multispectral Solutions, Inc. (MSSI) for the design, development and delivery of UWB transceivers for DARPA's Exdrone UAV. (1998)

Advanced Concept Technology Demonstrator Program (ACTD)

- ACTD: $3 million over 15 months to Time Domain to develop a portable through-wall surveillance radar ("SoldierVision") for the Army Night Vision Laboratory. (2000)

US Army

- Army Research Laboratory: Phase I SBIR contract to MSSI for development of UWB radar proximity sensor for fuzing applications. (1998)
- Army Aviation and Missile Command: Phase I SBIR contract to MSSI develop UWB altimeter and obstacle avoidance sensor for the DARPA Micro Air Vehicle (MAV). (1999)
- Army Aviation and Missile Command: Phase II SBIR contract to MSSI for further development of UWB collision avoidance radar for MAV. (2000)

US Navy

- Office of Naval Research: Contract to Mebatek Inc. to research UWB synthetic aperture radar (SAR) for UAVs. (1996)
- Navy Program Executive Office for Unmanned Aerial Vehicles and Cruise Missiles: Phase II SBIR contract to MSSI to develop a highly accurate yet inexpensive UWB radar altimeter.
- Naval Surface Warfare Center (NSWC Dahlgren): Contract to MSSI to develop a combined UWB altimeter and obstacle-avoidance radar in support of the USMC Warfighting Laboratory's *Hummingbird* UAV program.
- Navy: Contract to Lockheed Martin to produce Advanced Wideband Mine Countermeasures (MCM) system (designated "Pathmaker") for nautical craft. (1999)
- NSWC Dahlgren: Contract with MSSI for development of UWB guided projectile navigation system. (2001)

US Special Operations Command (SOCOM)

- SOCOM: Contract to MSSI for development of UWB intrusion detection radar. (1998)
- SOCOM: Phase I SBIR contract to MSSI for development of UWB radar sensor for wide-area surveillance. (1998)
- SOCOM: Phase II SBIR contract to MSSI for advanced development of UWB radar sensor for wide-area surveillance. (1999)

DoD

- DoD: Contract to Essex Corporation to define new radar applications for its UWB Advanced Optical Processor (AOP). (2000)
- DoD: Manned airborne reconnaissance R&D funding includes $8 million for UWB collection project and $5.5 million for UWB mission planning and pre-processing software project. (2001)
- DoD: (2001) Contract to MSSI for development of a short range UWB radar for helicopter terrain and obstacle avoidance. (2001)

Communications

US Air Force

- USAF Research Laboratory: Contract for $15 million to ITT Industries for indefinite delivery/indefinite quantities for R&D in the area of UWB sources and antennas for communications systems. (2000-2005)

US Army

- Army Space and Missile Defense Command (SMDC): Contract to Time Domain to demonstrate UWB wireless communications for Tactical Operations Center (TOC). (2000)
- Army Simulation and Training Command (STRICOM): Contract to Time Domain for UWB communications and position-location links to support the tactical engagement simulations (ATES) program.
- Army SMDC: Contract with Time Domain to link UWB wireless system with a space-based soldier communications system.

US Navy

- Navy Combat Information Center: Phase I SBIR contract to MSSI to demonstrate a UWB surface wave communications system for improving CIC operations. (1999)
- Naval Air Warfare Center – Aircraft Division: Phase I SBIR contract to MSSI for development of an aircraft UWB wireless intercom system. (1999)
- Naval Air Warfare Center: Phase II SBIR contract to MSSI for further development of UWB aircraft intercom system. (2000)
- Navy: Three-year, Indefinite Delivery/Indefinite Quantity (IDIQ) contract to MSSI for development of UWB communications equipment. (2000)
- Office of Naval Research (ONR): $2.88 million contract to MSSI under the Dual Use Science & Technology (DUS&T) Program for development of UWB network-capable radios for the US Marine Corps. (2000)

DoD/US Government

- Office of Special Technology (OST): Contract to MSSI to develop a UWB voice/data packet radio. (1997)
- OST: Proof-of-concept contract to MSSI ($2.12 million) to develop a multiband intra-team radio modified for UWB operation. (1998)
- DoD: Contract to MSSI for development of UWB tactical mobile ad hoc wireless network and for a low probability of detection communications system. (2001)

Advanced UWB features (positioning, range-location, tracking)

DARPA

- Special Unit Operations/Situation Assessment System (SUO/SAS): Contract to Raytheon and Phase II subcontract to MSSI for development of an impulse-based precision geolocation system. (1998)

US Army

- STRICOM: Contract to Boeing and Time Domain to demonstrate a lightweight personnel detection device (LPDD). (2000)

US Navy

- Naval Facilities Engineering Command (NAVFAC): Contract to MSSI for a Precision Asset Location and Identification System (PALIS). This UWB technology offers warehouse-to-debarkation tracking of critical Navy/Fleet Marine Force (FMF) assets. (2000)
- Office of Naval Research (ONR): $5.7 million contract to CACI International Inc, CYTEC and Time Domain to develop a radio system and prototype tracking tags (2001).
- Navy: Contract to Time Domain for UWB personnel position, location and tracking (PLT) system for man-overboard situations.