Air Force SBIR/STTR

Air Force SBIR/STTR Transition Story

Transition

An example of Air Force supported SBIR/STTR technology that has been transitioned into an Air Force or other DoD system or subsystem or used by Air Force test ranges and facilities or maintenance depots.

SBIR Topic Number:
OSD04-C17

SBIR Title:
Advanced Materials for Space Environment Protection of Polybenzoxazole Polymers

Contract Number:
FA8650-06-C-5014

SBIR Company Name:
GATR Technologies Inc., Huntsville, AL

Technical Project Office:
AFRL Materials & Manufacturing Directorate, Wright-Patterson AFB, OH

Deployable Inflatable Satellite Terminal Supports Data

- Air Force satellite systems need to be smaller, more compact, and more mobile with less logistical impact
- The GATR Antenna System (ground-based inflatable antenna) supports high-bandwidth satellite communications (Ku, C, and X band) at equivalent transfer rates to rigid dish systems at 1/16th the package's volume, and orders of magnitude less in weight
- The GATR Antenna is the world's first Federal Communications Commission (FCC) licensed inflatable satellite antenna
- With over 30 units deployed, GATR continues to field units which enable high-bandwidth Internet, phone and data access for deployments and projects in Afghanistan, South Africa, South America, Haiti, and Korea, as well as assisting in humanitarian efforts (hurricane disaster recovery) in the United States
- GATR Technologies has received several awards and recognitions for its antenna system, including a Tibbett's Award in 2006, Popular Science's "Invention of the Year 2007," its recent 2009 ranking (#259) in Inc's 500, and its listing as one of "Inc. 500: The Hottest Products" of 2009

Commercialization Pilot Program Series

RX2009-134

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Air Force Requirement

The original requirement was to develop a coating to protect polybenzoxazole (PBO) fibers from atomic oxygen and Ultraviolet (UV) radiation for the purpose of protecting composite structures in low earth orbit. Improvements to the process and UV stability were made to flexible composite antenna in the Phase II effort.

SBIR Technology

The GATR Antenna System is a deployable inflatable satellite communication terminal serving the military, public safety and broadcast sectors. GATR's unique inflatable design enables deployment of a 1.8 and 2.4 meter satellite terminal in as few as two airline checkable cases, simplifying transportation and set-up, and making it ideal for first-in deployments, remote applications and contingency scenarios. GATR also has a 1m and 4.6m antenna in development. The patented design combines the transmission power advantages of a large aperture antenna with the low weight and portability of a small aperture antenna.

The antenna itself is a flexible fabric inflatable ball held down by four plates and wires. A blower runs continually to keep the fabric ball inflated, and a reflective flexible fabric dish (suspended around the inside rim of the ball at about mid-plane) forms a precision parabolic surface on the inside. The ball also serves as the structure that holds the feed mount (transmitter/receiver). The antenna provides satellite connectivity equivalent to that of a rigid dish of equivalent size.

The material Novel - Colorless ORganic/Inorganic Nanocomposite (CORIN) developed for space applications proved well suited for a ground based antenna design. It was discovered that the material processes used in the research could be used to produce the antenna material for an inflatable satellite communications (SATCOM) antenna. Initial Phase II enhancement activities were performed with the Air Force Special Operation Command (AFSOC) at Hurlburt Field, Florida, using the GATR terminal for unmanned aerial vehicle (UAV) feeds. Based upon the AFSOC success, this system proved it could fill a Global Reach technology gap within the entire United States Special Operations Command (USSOCOM).

During discussions concerning the transition strategy, it was decided that the Air Force SBIR Commercialization Pilot Program (CPP) was the best way to bring the major stakeholders together. In September 2009, an agreement was signed by GATR Technologies, the Air Force Research Laboratory (AFRL), and USSOCOM to mature and integrate the GATR Antenna System into a designated program of record for uses with U.S. Special Operations.

Transition Impact

Material refinements through the AFRL Materials & Manufacturing Directorate (AFRL/RX) have made it possible for GATR to develop the world's first Federal Communications Commission (FCC) licensed ground-based, inflatable satellite antenna.

GATR's unique, patented design enables deployment of large aperture satellite terminals packaged in as few as two airline checkable cases, making it ideal where a large-aperture antenna is required but transportation and space are limited. Not only does the design reduce the impact of transporting (volume and expense); it also enables deploying just about anywhere with minimal staff. Personnel experienced with deploying the equipment can have the system ready to use in as little as 60 minutes, then torn down and ready to transport in 30 minutes.

With over 30 antenna systems built, GATR continues to field units which enable high-bandwidth Internet, phone and data access for deployments and projects for military and civilian efforts in Afghanistan, South Africa, South America, Haiti, and Korea, as well as assisting in humanitarian efforts (hurricane disaster recovery) in the United States.

Company Impact

GATR Technologies has received several awards and special recognitions for its antenna system, including a Tibbett's Award in 2006, Popular Science's "Invention of the Year 2007," its recent 2009 ranking (#259) in Inc's 500, and its listing as one of "Inc. 500: The Hottest Products" of 2009.

GATR's focus is to continue to refine and improve its manufacturing process and product performance as well as develop new products that can be used along with its current product line that will enable communications around the world. For more information, contact GATR Technologies Inc., 11506 Gilleland Road, Huntsville, Alabama 35803, tel: (256) 382-1334; www.gatr.com.

U.S. AIR FORCE

SBIR/STTR

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