SATCOM For Net-Centric Warfare

April 2016

MilsatMagazine

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DISPATCHES

45th Space Wing & The Dragon

The 45th Space Wing supported SpaceX's successful launch of a Falcon 9 Dragon spacecraft headed to the International Space Station from Space Launch Complex 40 at Cape Canaveral Air Force Station on April 8 at 4:43 p.m. ET.

This was the seventh major launch operation for the Eastern Range this year and was also the eighth contracted mission by SpaceX under NASA's Commercial Resupply Services contract.

Science research, crucial hardware and supplies are being delivered via the SpaceX Dragon capsule.

Included in the delivery is the Bigelow Aerospace expandable habitat module that will be tested while attached to the ISS.

A combined team of military, government civilians and contractors from across the 45th Space Wing provided support to the mission, including weather forecasts, launch and range operations, security and safety.

Serving as the mission's Launch Decision Authority was Brigadier General Wayne Monteith, the 45th Space Wing Commander.

"*This mission once again clearly demonstrates the successful collaboration we have with our mission partners at NASA and SpaceX as we continue to shape the future of America's space operations and serve as the* 'World's Premier Gateway to Space'," he said.

patrick.af.mil/

DISPATCHES

Orbital ATK Is Sounding Off

Orbital ATK has good reason to celebrate, as the firm has been selected by the National Aeronautics and Space Administration (NASA) as the prime contractor for the NASA Sounding Rockets Operations Contract III (NSROC III) program.

The award is a one-year base contract with four one-year option periods and is valued at approximately $200 million. Orbital ATK won the new contract in an open competition and has served as the prime contractor on the program since 2010. During that time, the company supported 94 sounding rocket launches and set the record for 41 consecutive successful missions, the most in the 57 year history of the program. Sounding rockets are used to conduct suborbital missions for scientific and atmospheric research.

Under the NSROC III program, which is centered at NASA's Wallops Flight Facility in Virginia and the White Sands Missile Range in New Mexico, Orbital ATK's Technical Services division will plan, coordinate and carry out suborbital research rocket missions from locations in the United States and around the world.

The Orbital ATK team will also work with the NASA Sounding Rockets program to develop and implement additional capabilities. Orbital ATK and the firm's teammates expect to employ technical and administrative staff at Wallops Flight Facility and White Sands Missile Range over the term of the contract. Orbital ATK's teammates include three small businesses: LJT and Associates, Inc., the Hammers Company, and Hawk Institute for Space Sciences.

In addition to NSROC III, the company supports another high-altitude scientific research program for NASA, as the company is the prime contractor for the NASA Balloon Operations contract. This program is administered by the Goddard Space Flight Center's Wallops Flight Facility and is managed from the Columbia Scientific Balloon Facility (CSBF) in Palestine, Texas. The CSBF staff has launched more than 1,700 scientific balloons from seven countries over the past 35 years.

orbitalatk.com

Visit By USN Rear Admiral Brown To Cal Poly's CubeSat Program

U.S. Navy Rear Adm. Brian Brown, deputy commander, Joint Functional Component Command for Space, listens to a presentation of the CubeSat program during a recent visit to California Polytechnic State University, April 1, San Luis Obispo, Calif. During his visit, Brown spoke with members of Cal Poly's CubeSat program on various topics such as CubeSats, which are satellites made up of multiples of 10-centimeter cube units, their thoughts on the industry and where it's headed, and the ongoing partnership between Cal Poly and Vandenberg.

U.S. Air Force photo by Airman 1st Class Robert J. Volio.

U.S. Navy Rear Adm. Brian Brown, deputy commander, Joint Functional Component Command for Space, recently visited California Polytechnic State University on April 1st.

During his visit, Brown spoke with members of Cal Poly's CubeSat program on various topics such as Cal Poly's activities with CubeSats. These are satellites comprised of multiples of 10-centimeter cube units, their thoughts on the industry and where it's headed, and the ongoing partnership between Cal Poly and Vandenberg.

"*As space-based capabilities have become a common component of almost every aspect of our lives, it's imperative that we continually seek out and expand our partnerships with like-minded space fairing entities to maintain the peaceful and safe use of space*," said Brown.

"*Our partnerships with industry and academia are particularly important because it helps us keep pace with cutting edge thinking and technological innovation. We are especially lucky at JFCC Space to have Cal Poly, a center of the CubeSat universe, so close by and look forward to continuing our mutually beneficial relationship.*"

The CubeSat program was founded 17 years ago and prepares students for future engineering roles by providing them opportunities to design, build, test, launch and track satellites.

The platform has been a catalyst for the consistent running relationship between Cal Poly and Vandenberg.

"*Our programs provide a lot of opportunities for Cal Poly and Vandenberg personnel,*" said Dr. Jordi Puig-Suari, Cal Poly aerospace engineer professor and CubeSat team advisor

"*We've had courses at Cal Poly where members of Vandenberg come to receive training, whereas our students go work at the base when they graduate. We have some students from Vandenberg that are completing grad school with us, both military and civilian. We also have a number of former students who currently work at the base as civilians.*

"*Recently, we've tried to start working closer with the schoolhouse on base. Some of the classes have come and toured our lab. The Air Force curriculum is highly based on the weapons systems they're going to be operating which are very big. We show them what some of the other things they're going to be sharing space with are. It's been going incredibly well.*"

Cal Poly's role in the space game has increased of late, thanks to the production of CubeSats.

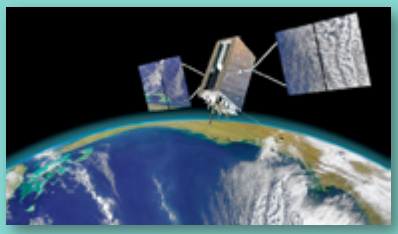
"*When we started working on CubeSats, our relationship with Vandenberg accelerated,*" said Puig-Suari. "*We started launching from Vandenberg. We were down there with our team, working with safety and range personnel, as well as members of the Joint Space Operations Center. We became a space player and at that point, our interface with the space people from the Department of Defense became a day-to-day operation.*"

The CubeSat program has provided a foundation for Vandenberg and Cal Poly to thrive as a team, a notion cemented by Brown's visit.

"*Our relationship with Vandenberg has been and will continue to be very critical in the success of our operations,*" said Puig-Suari. "*I think it's great when we have these tours and these face-to-face gatherings, they're very important and informative. We look forward to many more future endeavors with Vandenberg.*"

Story by t,
30th Space Wing Public Affairs, USAF.

Northrop Grumman Ready To Take On GPS III



Northrop Grumman Corporation has submitted an innovative proposal to the United States Air Force for the next-generation Global Positioning System (GPS) III program.

The Air Force is looking to update the GPS system, which has been delivering precise global position, navigation and timing services worldwide for more than two decades.

Northrop Grumman's proposal is based on a navigational payload prototype built and tested in 2015 and a heritage space vehicle, proven to operate in the harsh environment of Medium Earth Orbit (MEO).

In addition to current GPS III capabilities, the company's payload demonstrated enhanced transmission power for the military code, a critical capability for operating in regions of the world where jamming is prevalent.

"*The Air Force plans to develop a new generation of GPS space vehicles that will deliver the advanced capabilities needed by military and civil users, while countering the future threat environment*," said Tim Frei, vice president, communications systems, Northrop Grumman Aerospace Systems.

"*Our producible and resilient payload prototype meets these requirements. We are ready to bring this capability to the warfighter.*"

The Air Force plans to award up to three $5 million study contracts in the third quarter of 2016, under the GPS III Space Vehicles 11+Phase 1 Production Readiness Feasibility Assessment request for proposal. The study contracts will run for 26 months, with two additional six-month options. A competition for 22 spacecraft is anticipated in 2018.

lockheedmartin.com

DARPA's XS-1 Program Enters Phase 2

In an era of declining budgets and adversaries' evolving capabilities, quick, affordable and routine access to space is increasingly critical for both national and economic security.

Current satellite launch systems, however, require scheduling years in advance for an extremely limited inventory of available slots.

Moreover, launches often cost hundreds of millions of dollars each, due in large part to the massive amounts of dedicated infrastructure and large number of personnel required. DARPA created its Experimental Spaceplane (XS-1) program to help overcome these challenges and create a new paradigm for more routine, responsive and affordable space operations, reducing the time to get capabilities to space.

In an important step toward these goals, DARPA has announced Phase 2 of the XS-1 program, which seeks to design and fabricate an experimental unmanned spaceplane using state-of-the-art technologies and streamlined processes, and fly the vehicle ten times in ten days.

The reusable XS-1 would demonstrate the potential for low-cost and "aircraft-like" high-ops-tempo space flight, enabling a host of critical national security options while helping to launch a new and potentially fruitful commercial sector. A Special Notice was posted on FedBizOpps on April 11 announcing the XS-1 Phase 2 Proposers Day, to be held on Friday, April, 29, 2016, in Arlington, Virginia.

"*During Phase 1 of the XS-1 program, the space industry has evolved rapidly and we intend to take advantage of multiple impressive technological and commercial advances,*" said Jess Sponable, DARPA program manager. "We intend to leverage those advances along *with our Phase 1 progress to break the cycle of escalating DoD space system launch costs, catalyze lower-cost satellite architectures, and prove that routine and responsive access to space can be achieved at costs an order of magnitude lower than with today's systems.*"

XS-1 envisions that a fully reusable unmanned booster vehicle would fly to high speeds at a suborbital altitude. At that point, one or more expendable upper stages would separate, boost and deploy a satellite into Low Earth Orbit (LEO).

The reusable first stage would then return to Earth, land and be prepared for the next flight. Although relatively small by conventional aircraft standards, the XS-1 flight booster size—akin to a business jet—would be sufficient to validate credible scaling to larger reusable launch systems. Moreover, demonstration of on-demand and routine access to space, akin to aircraft, is important for next-generation DoD needs.

XS-1 has four primary technical goals:

- *Fly 10 times in a 10-day period (not including weather, range and emergency delays) to demonstrate aircraft-like access to space and eliminate concerns about the cost-effectiveness and reliability of reusable launch.*
- *Achieve flight velocity sufficiently high to enable use of a small (and therefore low-cost) expendable upper stage.*
- *Launch a 900- to 1,500-pound representative payload to demonstrate an immediate responsive launch capability able to support both DoD and commercial missions. The same XS-1 vehicle could eventually also launch future 3,000+-pound payloads by using a larger expendable upper stage.*
- *Reduce the cost of access to space for 3,000+-pound payloads, with a goal of approximately $5 million per flight for the operational system, which would include a reusable booster and expendable upper stage(s).*

Successful design would require integrating state-of-the-art technologies, processes and system approaches to deliver routine aircraft-like operability, reliability and cost efficiency. In particular, incorporation of autonomous technology and operations promises to significantly decrease the logistical footprint and enable rapid turnaround between flights.

Structures made of advanced materials, cryogenic tanks, durable thermal protection, and modular subsystems would make possible a vehicle able to launch, fly to high speeds and then land in a condition amenable to rapid turnaround and launch with the next payload. Reusable, reliable propulsion would also be essential for a low-cost and recurring flight capability.

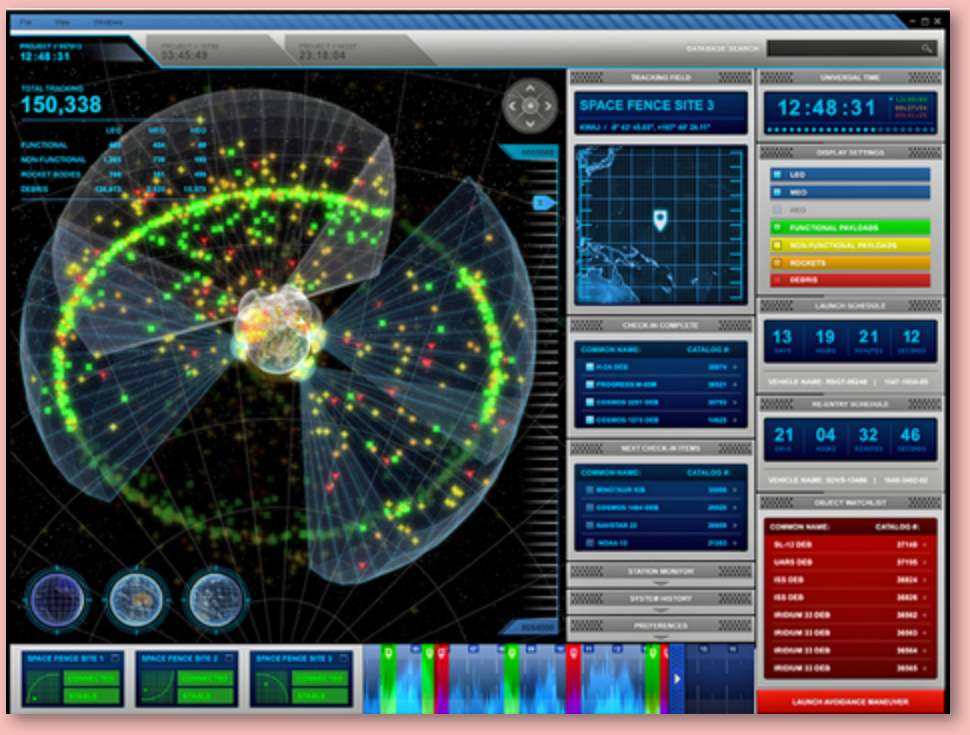
In Phase 1 of XS-1, DARPA sought to evaluate the technical feasibility and methods for achieving the program's goals. To achieve that, it awarded prime contracts to three companies, each working in concert with a commercial launch provider: The Boeing Company (working with Blue Origin, LLC); Masten Space Systems (working with XCOR Aerospace); and Northrop Grumman Corporation (working with Virgin Galactic). Phases 2 and 3 will be competed as a full and open Program Solicitation mandating an Other Transaction Authority (OTA) agreement with the expectation of a single resulting award. Cost share is expected.

Specifically, the program is structured to directly transition any successful technology to the industrial and commercial launch sectors, with the goal of enabling new launch markets and sale of launch services back to the government at dramatically lower costs and more rapid time frames than are possible today.

By ensuring the technologies and launch systems would be available through the commercial sector, government leaders would have the opportunity to begin relying on XS-1 and derived systems. Militarily-relevant applications of the technology may also spur adoption and help enable future capabilities such as disaggregated spacecraft architectures and next-generation, reusable space-access aircraft.

darpa.mil/program/experimental-spaceplane

Space Fence Going Up



In a special February ceremony on Kwajalein Atoll in the Pacific Ocean—more than 2,100 nautical miles southwest of Honolulu—the U.S. Air Force and Lockheed Martin broke ground at the future six-acre site of the new Space Fence radar system.

The event marks the official start of construction for the S-band ground-based radar system, designed to replace the 1960s Air Force Space Surveillance System to improve the way objects are tracked in orbit and increase our ability to predict and prevent space-based collisions.

In addition to the radar arrays, the Kwajalein installation will include an on-site operations center and an annex to the current island power plant that will ensure the Space Fence system has everything necessary to provide continuous space situational awareness.

Lockheed Martin won the $915 million contract in June of 2014 to engineer, manufacture and deploy the Space Fence radar system.

The total contract value is estimated at greater than $1.5 billion over an eight-year period of performance if all options are exercised.

The Lockheed Martin-led team—which includes AMEC Foster Wheeler and General Dynamics SATCOM Technologies—has decades of collective experience in space-related programs, including sensors, mission processing, cataloging, orbital mechanics, net-centric communications and facilities.

"The number of small satellites and satellite operators around the world is skyrocketing, rapidly crowding an environment already congested by the more than 17,000 pieces of space debris that we are able to track today," said Steve Bruce, vice president for Advanced Systems at Lockheed Martin's Mission Systems and Training business.

"By comparison, when it comes online in 2018, Space Fence will enable the Air Force to locate and track hundreds of thousands of objects orbiting Earth with more precision than ever before to help reduce the potential for collisions with our critical space-based infrastructure."

lockheedmartin.com/us/products/space-fence.html

DISPATCHES

DARPA Wants Gremlins Everywhere...

DARPA has awarded Phase 1 contracts for its Gremlins program, which seeks to develop innovative technologies and systems enabling aircraft to launch volleys of low-cost, reusable unmanned air systems (UASs) and safely and reliably retrieve them in mid-air.

Such systems, or "gremlins," would be deployed with a mixture of mission payloads capable of generating a variety of effects in a distributed and coordinated manner, providing U.S. forces with improved operational flexibility at a lower cost than is possible with conventional, monolithic platforms.

The Phase 1 contracts have been awarded to four teams whose proposals cover a spectrum of technical approaches to this challenging mission. The teams are led by:

- ***Composite Engineering, Inc. (Roseville, California)***
- ***Dynetics, Inc. (Huntsville, Alabama)***
- ***General Atomics Aeronautical Systems, Inc. (San Diego, California)***
- ***Lockheed Martin Corporation (Dallas, Texas)***

Phase 1 of the Gremlins program is designed to pave the way for a proof-of-concept flight demonstration that would validate an air recovery concept of multiple gremlins. The program plans to explore numerous technical areas, including:

- ***Launch and recovery techniques, equipment and aircraft integration concepts***
- ***Low-cost, limited-life airframe designs that leverage existing technology and require only modest modifications to current aircraft***
- ***High-fidelity analysis, precision digital flight control, relative navigation and station keeping***

Named for the imaginary, mischievous imps that became the good luck charms of many British pilots during World War II, the program envisions launching groups of UASs from existing large aircraft such as bombers or transport aircraft—as well as from fighters and other small, fixed-wing platforms—while those planes are out of range of adversary defenses.

When the gremlins complete their mission, a C-130 transport aircraft would retrieve them in the air and carry them home, where ground crews would prepare them for their next use within 24 hours.

The gremlins' expected lifetime of about 20 uses could provide significant cost advantages over expendable systems by reducing payload and airframe costs and by having lower mission and maintenance costs than conventional platforms, which are designed to operate for decades.

"We've assembled a motivated group of researchers and developers that we believe could make significant progress toward Gremlins' vision of delivering distributed airborne capabilities in a robust, responsive and affordable manner," said Dan Patt, DARPA program manager. *"These teams are exploring different, innovative approaches toward achieving this goal and are rolling up their sleeves for the hard work ahead."*

darpa.mil/

DISPATCHES

Harris Falcons Heading Out

Harris Corporation has received a $17 million order to supply Falcon III® multiband networking radios to a nation in the Middle East as part of a tactical communications modernization program.

The Harris RF-7850M radios will provide wideband networking to forces at the brigade level and below and will deliver command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) capabilities.

The RF-7850M is the first international tactical radio to simultaneously support wideband communications, mobile ad-hoc networking, and legacy narrowband waveforms.

"*The RF-7850 represents the latest generation of wideband, software-defined networking radio technology*," said Chris Young, president of Harris Communication Systems. "*It will immediately enable our customer to conduct the C4ISR operations that are essential to daily missions.*"

rf.harris.com/capabilities/tactical-radios-networking/rf-7850m-hh.asp

Harris Corporation also received an $11 million order from an African nation to supply their Falcon III® multiband, multi-mission radios as part of an ongoing modernization effort.

The order includes:

- ***The RF-7800H-MP wideband tactical manpack radio, which delivers expanded data capabilities in long-range, beyond-line-of-sight environments***
- ***The RF-7850M-HH multiband networking handheld radio, the first international radio to offer wideband communications and mobile, ad-hoc networking along with legacy narrowband waveforms***
- ***The RF-7800V-HH VHF Combat Net Radio (CNR), which provides the ability to communicate with greater speed and range, achieving information superiority on the battlefield.***

"*Harris' Falcon III radios will support the customer's need for simultaneous, secure voice and high-bandwidth data across a wide range of military missions*," said Chris Young in regard to this contract. "*Our strong presence in the region, coupled with our ongoing investment in advancing Falcon® solutions, enables us to transition customers from their legacy, voice-dominated tactical radios to networked wideband tactical radios.*"

rf.harris.com/capabilities/tactical-radios-networking/rf-7800h-mp.asp

Gilat In The Sky With Diamonds

Gilat Satellite Networks Ltd. has partnered with Diamond Aircraft of Austria to deliver airborne broadband connectivity via satellite.

Diamond designed a special enclosure for Gilat's BR71 terminal behind the cockpit of Diamond's DA42 MPP GUARDIAN aircraft.

This long-range, twin-engine aircraft was designed for homeland security ISR missions.

First orders for the Gilat-Diamond Satcom-On-The-Move (SOTM) airborne solution have already been received by government agencies in Latin America and central Asia for homeland security ISR applications.

"*In Diamond Aircraft, we found a dynamic partner who matched our innovative spirit and pursuit of technological excellence*," said Moshe (Chico) Tamir, Corporate VP and Head of Gilat's Strategic Initiatives Division. "*I have no doubt that together we will deliver the best airborne mobility solution on the market.*"

"*Partnering with Gilat is a win-win scenario for both companies*," said Christian Dries, CEO of Diamond Aircraft. "*We give Gilat wings and Gilat gives us a complete Beyond-Line-Of-Sight SATCOM package—and a real competitive edge over other aircraft manufacturers.*"

gilat.com/

OPTIMAL SPACE PROTECTION

By Rebecca Cowen-Hirsch, Senior Vice President, Government Strategy & Policy, US Government, Inmarsat

When it comes to providing satellite services to customers, we are fierce competitors. When it comes to the Commercial Integration Cell (CIC), we are close collaborators.

By "we," I am referring to the six satellite services companies—DigitalGlobe, Eutelsat, Inmarsat, Intelsat, Iridium Satellite Communications and SES Government Solution—that have signed six Cooperative Research and Development Agreements (CRADAs) and joined together as part of the CIC.

On June 1, 2015, the Joint Space Operations Center (JSpOC) launched the CIC pilot program to explore a partnership between the Department of Defense (DoD) and the satellite industry. Through the ensuing expanded cooperation and synergies, JSpOC is seeking greater space situational awareness while improving the command and control capacity of US Strategic Command's Joint Functional Component Command for Space (JFCC Space).

According to US Navy Commander David Samara, the former deputy director of strategy and plans at JFCC Space, "*The CIC will allow for rapid identification, diagnosis and resolution of on-orbit anomalies while also increasing the overall resilience of US government satellite operations.*"

Lieutenant General Jay Raymond, former Commander of JFCC Space and the 14th Air Force (Air Forces Strategic), said that JSpOC tracks 23,000 objects in orbit and that number will increase as new technologies, such as the Space Fence, come online. He described the CIC pilot as "*the next step in our ongoing efforts to partner with like-minded space-faring entities to promote the peaceful and responsible use of space*" through the enhanced integration of industry capabilities into day-to-day space operations.

With the private sector embedded into relevant exercises and training sessions, the CIC promises to usher in major advancements in the reporting, tracking and resolving of events that compromise satellite communications. (Lieutenant General David J. Buck, JFCC Space and 14th Air Force commander, also advocates for the benefits of the CIC—he has recently approved a Concept of Employment for the CIC as all parties move forward under the CRADAs.)

DoD leadership originally conceived of this idea during the September 2014 Schriever War Game, during which Lieutenant General Raymond had access to a CIC within the exercise's operations center. Options made available via commercial resources were found to boost efficiencies and fidelity throughout the entire space situational awareness enterprise, which then paved the way for discussions about an expanded deployment of CIC.

Since the pilot program's launch, industry partners have lent their insights into commercial best practices in order to help JSpOC optimize data sharing and decision-making related to space situational awareness, interference events, indications/warning and contingency operations, thereby leading the way for a superior state of crisis preparedness. As governed by CRADAs, the CIC has used existing IT support and working facilities on the JSpOC floor.

General John Hyten, commander of Air Force Space Command, has repeatedly cited the US National Space Policy of June 2010 as a prime driver of this very level of partnership. The policy states that "a *robust and competitive commercial space sector is vital to continued progress in space*" to "*increase assurance and resilience of mission-essential functions … against disruption, degradation and destruction, whether from environmental, mechanical, electronic or hostile causes.*"

BUDGET ALLOCATIONS PROVE PROMISING

The CIC is one of several initiatives being highlighted by the US Air Force since the White House approved $5 billion worth of funding from fiscal 2016-2020 for "space protection" measures.

"*Space capabilities are vital to US national security and the ability to understand emerging threats, project power globally, support diplomatic efforts, and enable global economic prosperity,*" according to a White House report that was prepared in support of the fiscal 2017 budget entitled ***Meeting Our Greatest Challenges: National Security and Global Leadership***. "*[The budget] supports a variety of measures to help assure the use of space in the face of increasing threats to US national security space systems. In addition, it supports the development of capabilities to defend and enhance the resilience of these space systems. These capabilities help deter and defeat interference with, and attacks on, US space systems.*"

As part of the CIC, Inmarsat has worked with leaders on the JSpOC floor literally every day. During highly productive focus group sessions, we have directed our attention to two key technology and data sharing areas intended to introduce improved processes and commercial/government integration: conjunction assessment and electromagnetic interference and resolution.

In the modern age of both a crowded space environment and the potential for hostile nations to target the nation's orbital assets, conjunction assessment has emerged as crucial—a single collision or attack can destroy a satellite. This destruction impacts not only the missions supported by the satellite, but also threatens other satellites with the remaining debris. Thus, a single incident could derail much needed progress for many, many years.

"*We must reinforce the peaceful use of space while ensuring continued space operations through partnerships and resiliency,*" said Admiral Cecil D. Haney, USSTRATCOM commander. "*The US continues to partner with responsible nations, international organizations and commercial firms to promote responsible, peaceful and safe use of space. We also strive to maximize the advantages provided by improved space capabilities while reducing vulnerabilities; and seek to prevent, deter, defeat and operate through attacks on our space capabilities.*"

This is why the sharing of best practices with the Department of Defense (DoD) is imperative for the industry. These conversations have been a rich and even an eye-opening exchange of ideas—an unprecedented, cohesive effort between the government and the industry's leading companies.

With regard to the latter, competitive interests are put aside each time the team walks inside JSpOC's doors. The purpose is unified and all are committed to ideals that benefit the nation; the troops on the ground, in the air and at sea; and, lastly but still significantly, all of the commercial interests in space.

At Inmarsat, recognized is the tremendous value in being good stewards of the space domain. The company shares the same space with many other operators. Thanks to the CIC, all can work together to protect that space.

inmarsatgov.com

Rebecca M. Cowen-Hirsch is Inmarsat's Senior Vice President for Government Strategy and Policy in the United States Government Business Unit, based in Washington, D.C.

SatCom Frontier

Perspective #1: Helping the Military to See Clearly

By Skot Butler, President, Intelsat General Corporation

Recently, I was honored to speak on a panel at a major satellite show, with the subject of the panel being government airborne satellite services.

Civil and military use of airborne platforms equipped with satellite terminals continues to expand, fueling an accelerating demand for Beyond-Line-Of-Sight (BLOS) satellite communications bandwidth and specialized terminals.

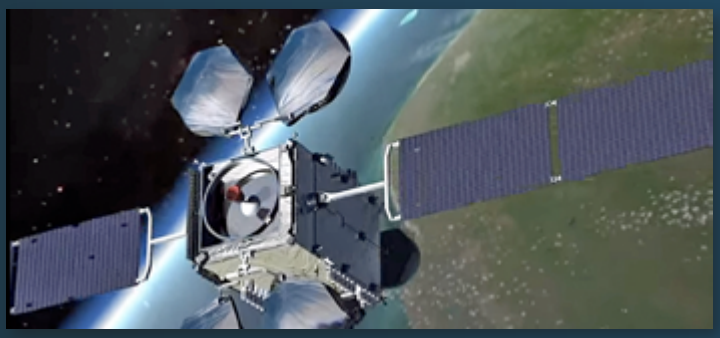
Commercial satellite communications are a critical enabler of these operations, supporting broadband communications and the transfer of intelligence, surveillance, and reconnaissance data and other mission critical information.

When looking at airborne satellite services, it's important first to understand the term is not homogeneous. I typically think of it in terms of three main types or "buckets" of airborne satellite services:

- *Unmanned, or remotely piloted, vehicles—both larger legacy platforms, for example the multiple Predator, Reaper, and Gray Eagle variants, and emerging small scale, tactical Class III platforms that can be launched and recovered by small teams in the field*
- *Airborne en-route communications—often used by senior government leaders and offering services consistent with what they have on the ground, including video teleconferencing.*
- *Manned ISR—growing and bandwidth-intensive operations which, like unmanned ISR, put the majority of the throughput demand in the opposite direction— off the platform in this case—than traditional two way data communications like broadband*

The main point here is that these service types each place differing demands onto the satellite equipment and service architecture. This has significant implications both for user CONOPS and future satellite design.

Significant changes are here and will continue at a pace more rapid than any time since the dawn of our industry. High throughput satellite (HTS) systems are just the first stage of architecture and performance game changers, positioning large amounts of capacity in space at only an incremental cost increase over wide beam satellites. HTS satellites do this by using small spot beams, which improve bits/Hertz efficiency, and by frequency re-use, which increases the aggregate amount of capacity.



Artistic rendition of an Intelsat Epic^{NG} satellite.

Intelsat's new Epic^{NG} satellites are designed to increase UAV data rate performance by 2x to 10x via their high-throughput spot beams and enable broadband performance to antennas with apertures smaller than 30 cm. For example, in the case of the Army's Gray Eagle, users can double their data rates with no hardware changes at all, and increase speeds by 8x with a waveform upgrade. On the Global Hawk platform, the Air Forces' elusive 274 Mbps off the airframe is achievable on Epic^{NG}.

These 'low-disruption' improvements are possible partly because Intelsat Epic^{NG} delivers HTS with an open architecture, which supports multiple connection topologies. Traffic from a user beam can be routed loopback to the same user beam, cross-connected to another user beam, or reach back to a core beam. Intelsat chose this approach, in part, to avoid a closed, proprietary system that would carry significant costs for our customers, in time and money. This means that users can choose their preferred ground equipment, whether that's an installed base or a new deployment, which can lead to substantial cost savings for the customer. We don't want to dictate the kind of modem the end customer must use.

HTS also provides enhanced protection against jamming. Intelsat Epic^{NG}'s powerful and narrow spot beams present a smaller footprint and are harder to jam. The digital payload can also be configured to "notch out" the jamming signal once it is detected and assign a new link to the customer. Epic^{NG} is also compatible with protected tactical waveform (PTW).

The initial Intelsat Epic^{NG} satellites are a first step toward more capable and flexible satellite designs that will ultimately lead to software-defined payloads that will deliver immense benefits for customers. The move to fully reconfigurable—on orbit—satellite payloads offers the revolutionary possibility that satellite design and launch can be standardized and streamlined. When the beam coverages can be done via software, even more value can be delivered to the government customer. The satellite subject-matter expert panel generally agreed that...

- *The military and government aero services market is a quickly growing area where there is room for a few different technologies, architectures and services models*
- *Interoperability is important and this is not so much a technical challenge but one of service management*
- *Most users rightly do not care about technology, frequency band, etc.—they need to meet their mission objectives with a solution that delivers the proper value and capability*

The commercial industry will continue innovating in space, because that is what we've always done. These innovations have put us on the cusp of much greater satellite capacity in space, and we look forward to putting this capacity to work for our customers.

intelsatgeneral.com/

SATCOM FRONTIER

PERSPECTIVE #2: THE LATEST LINK... AUTOMATIC BEAM SWITCHING

By Philip Kwong, Business Development Advisor, Intelsat General Corporation

A quotation from Sun Tzu's The Art Of War...*"If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle."*

Military leaders have long understood that mission success often depends on knowing both the enemy's and one's own capabilities. For Napoleon at Austerlitz, Lee at Chancellorsville, Eisenhower on D-Day, and the "*Left Hook*" of Desert Storm, knowledge of the enemy was key to victory. Today, this requirement is further complicated by the speed of operations and the desire to push intelligence to the lowest tactical units. In this environment, it is not surprising that combatant commanders' first priority is ISR (Intelligence, Surveillance and Reconnaissance)—usually provided by remotely piloted aircraft (RPAs).

RPAs provide immediate information on enemy forces, friendly forces, and environmental conditions that are invaluable to the military decision maker. The immediacy of this information enables the military to achieve greater depth, agility, versatility, initiative, and synchronization—the five tenets of U.S. Army operations. However, delivering ISR to the tactical edge of combat requires vast amounts of bandwidth. This bandwidth demand increases as more sensors and applications are added to RPAs.

High-throughput satellites (HTS), such as Intelsat's Epic^{NG}, help solve this problem by increasing the available bandwidth by 300 to 400 percent using high-throughput spot beams. In designing the Epic^{NG} satellites, Intelsat engineers looked at the possible loss of signal as RPAs passed from one small spot beam to the next spot beam.

To address this concern, IGC partnered with L-3 Communications Systems West to develop a software update for automatic beam switching (ABS) in order that RPAs could fully benefit from the new HTS capabilities of Intelsat Epic^{NG}.

A video ***at this direct link*** offers a look at how ABS works. Using real air and ground satellite terminals connected to Intelsat's Horizons-1 satellite and a navigation simulator, this demonstration shows how the system automatically changes both frequency and polarization as the RPA moves from one beam to another with minimal effect. The next demonstration will use an RPA and the first Intelsat Epic^{NG} satellite, IS-29e, which was successfully launched on January 27.

GOVSAT INSIGHTS

By Ryan Schradin, Executive Editor, GovSat Report (Sponsor: SES Government Solutions)

HOSTED PAYLOADS MAKE IT HAPPEN

An interview with Earl White, former Air Force Senior Executive and Intelligence Advisor at the United States Space Security and Defense Program.

In early March, the GovSat report editorial team had the opportunity to attend this year's satellite industry conference in National Harbor, Maryland. One of the first panel discussions attended focused on the adoption of hosted payloads by the government and the military.

The panel was entitled, "*Developments in the Adoption of Hosted Payload and Smallsats for Government Use,*" and the presentation brought together industry leaders, government decision makers and members of the Hosted Payload Alliance (HPA). The discussion covered the benefits hosted payloads could deliver to government organizations, the challenges that hinder hosted payload adoption and matters that industry and government could do—together—to overcome those challenges.

One of the panel participants was Earl White, a former Air Force Senior Executive and Intelligence Advisor at the United States Space Security and Defense Program. Earl's contributions to the panel discussion resonated well, as he spoke clearly and passionately about mutually-beneficial hosted payload programs that withered on the vine, and the reasons why—he believed—they failed.

He also asserted that he had a list of steps the industry could take to make hosted payload programs more viable, which he would then provide offline to those in the audience who were interested in his conclusions.

GovSat followed up with Earl following the conference to obtain his list and to obtain his opinion on the hosted payload state-of-affairs within military and government agencies.

GOVSAT REPORT (GSR)

In your panel discussion at SATELLITE 2016, you touched briefly on hosted payloads and their potential benefit to government and military organizations. Can you expand on that for our readers? Why should government agencies and military branches be looking at hosted payloads as an alternative? What can they deliver for these organizations?

EARL WHITE

As a career space intelligence officer, I see hosted payloads from a mission assurance perspective.

I've been following the development of counter-space threats for many years. Space is now a warfighting domain, not because of US actions ,but because of large investments from countries that are interested in negating the advantages the US has created through our use of space. As current systems providing essential services to warfighters and policy makers come under increasing risk, hosted payloads offer a way to quickly improve resiliency.

THE CAPACITY IS COMING

An overarching theme at one of this year's satellite industry events was technological "disruption." The theme wasn't negative, as in satellite disruption from jamming or interference—although that was discussed at length—but rather optimistic in evaluating disruptive technologies that are going to shake up the industry and impact how the satellite industry operates.

High-throughput satellites (HTS) were atop the list of disruptive technologies that were discussed at this event.

Aneal Krishman, a Principal at Veritas Capital and infantryman with the U.S. Army Reserve, joins other satellite experts to discuss the military's need for COMSATCOM and the disruptive power of HTS.

Every major satellite operator either has launched—or is in the process of launching—HTS satellite constellations. This new generation of satellites has the potential to deliver incredible capabilities and benefits to government agencies, military services and other users simply due to its incredible increase in bandwidth resulting from its ability to take advantage of frequency reuse. This means that each individual satellite can deliver exponentially more data at incredibly higher throughputs than traditional, wideband satellites.

This is extremely essential for military and civilian government organizations, whose demand for reliable connectivity extends beyond the reach of terrestrial networks and out into the field where SATCOM connectivity is the most viable option. HTS enables a high-speed, high-bandwidth experience that is accessible in even the most austere environments. HTS also enables many of the advanced capabilities the military needs in the field, including the delivery of high-quality, real-time intelligence data.

This need was echoed in the remarks of *Aneal Krishman*, who serves as a Principal at Veritas Capital and also served in Iraq as an infantryman with the US Army Reserve. During a panel discussion entitled "***Disruptions and Opportunities: MilSatCom and ComSatCom in Both Space and Ground Segments***," Aneal said, "*In Iraq, most of the bandwidth we were using and the technology that was set up, was over commercial networks that were dedicated to the government... for example, the drone program...*"

A second big advantage, of course, is the cost savings from leveraging large commercial investments in the bus and primary payloads.

GSR

Why do you feel we don't see more successful hosted payload programs across the federal government? What keeps the government from embracing hosted payloads to fill more of their satellite and space requirements?

EARL WHITE

Hosted payload proposals seem to surface when a company has surplus SWAP (size, weight and power) in a future satellite system, and smart people see the opportunity to provide a useful service to the government. The proposals I've seen often have substantial cost advantages over current systems, and yet almost always fail.

There are several reasons. First, if the government needs a space-enabled service, there is probably an existing program of record to provide it. The program was competed and approved through a lengthy process that considered the available options. The best way for a hosted payload to be embraced is to participate in that acquisition process, which for the Department of Defense (DoD) means being considered in an Analysis of Alternatives (AoA).

Industry, however, operates on a much faster timeline than the government, and decisions on whether to fly a hosted payload often can't wait on a multi-year government decision process. We just don't have the decision or the funding processes in place to take advantage of the speed of the industry, and it's getting even more critical with the emergence of New Space.

Second, the national security community must have confidence that the systems they use are going to be available when needed. It's fairly easy to have confidence when buying a commodity such as COMSATCOM bandwidth, but it's a much different calculus with a hosted payload. Here you have to understand the health of the company—will the bus and primary payload make enough money to continue operating? What happens if it doesn't?

You have to have confidence in the cyber protection of a system you don't control. You also need to know that primary commercial payload operations will not interfere with urgent government use of the secondary. We've seen examples of government-industry partnerships that work, but that isn't yet a mainstream experience.

I think another reason is that national security space organizations like the NRO and Air Force Space Command have been extremely successful in what they do, and it's a well-known business principle that the more successful a business, the more resistant to change. Why change what works?

Unfortunately, the threat environment is changing dramatically and what is successful today is not going to be good enough for tomorrow. Part of tomorrow's solution—I'm convinced—is in hosted payloads. And the nation needs to learn how to leverage them effectively.

GSR

What can industry do to help increase the number of successful hosted payloads programs?

But why is HTS considered disruptive? The answer lies in the cumulative launch of HTS satellites across the industry and the government's corresponding ability to leverage the advanced capabilities. In some cases, one single HTS satellite can deliver the same capacity as an entire constellation of traditional, wide-band GEO satellites. The result will be the government's ability to acquire more satellite bandwidth, capacity and capabilities without having to increase spending.

That disruption is important to the evolution of our national space architecture, especially today. Discretionary government funding for social programs, military modernization and homeland security priorities has proven to be limited, leaving many to cut back their spending and reprioritize where they're putting scarce budget dollars. Leaders on the various panels certainly recognized fiscal realities and were actively engaged in discussions on how best to leverage the commercial market.

Pete Hoene, CEO of SES GS, discussed the role HTS will play in making high bandwidth IT capabilities available to the military.

Pete Hoene, CEO of SES GS, discusses the role that HTS will play in making high bandwidth IT capabilities available to the military. Photo is courtesy of GovSat.

Cost efficiencies and budgets aside, there are other benefits to leveraging commercial HTS constellations. One of which is the ability to use this technology sooner.

COMSATCOM providers actively replenish their respective satellite fleets. This means that they're constantly ordering, provisioning and launching new satellites with exciting new capabilities and innovative new technologies. This includes new HTS constellations that are now either launched or will be launched in the very near future.

The same innovative HTS technologies are available to the government through the satellite manufacturers, such as Lockheed Martin, Northrup Grumman and SSL. However, by the time they allocate budget dollars, compete contracts, select vendors, build satellites, schedule launch and bring that satellite online, years could have passed.

Doug Loverro, the Deputy Assistant Secretary of Defense for Space Policy at the Department of Defense (DoD), discusses why COMSATCOM is essential for delivering advanced capabilities to military personnel. Photo is courtesy of GovSat.

In those years in which the government was, "building it themselves," there was most likely a similar satellite being built and launched – or already operated—by a COMSATCOM company. Simply put, integrating COMSATCOM into a wider architecture will facilitate technology insertion at commercial industry's pace and deliver HTS technology to the military—and the advanced capabilities it delivers to the warfighter—much sooner.

This isn't just sentiment or verbiage espoused solely by the COMSATCOM industry and service providers. Military decision makers have openly acknowledged their inability to keep pace with the COMSATCOM industry.

EARL WHITE

I can think of several things. Industry needs a strategic approach that matches an end user's needs. For instance, industry might match their future capabilities against the list of missions that STRATCOM wants to protect, and focus on a mission where they can add resilience to the current capability. It may be cost advantageous to add resiliency to a current system over the government fielding an entirely new constellation.

Second, a company with Independent Research and Development (IRAD) funds might consider working a Cooperative Research and Development Agreement (CRADA) with the DoD or National Lab to develop payloads that meet future government needs. Some of the labs are aware of the future national security space needs and are always eager to get rides into space.

The most important things, however, require the cooperation of the government. Industry needs a much closer relationship with the acquirers and users of national security space. It is impractical for every company with SWAP to participate in an AoA, yet there needs to be a way for the government to understand and consider hosted payload options.

I'd recommend that industry look to the example of the Commercial Cell in the Joint Space Operations Center (JSpOC). This cell was created by an association of competing SATCOM companies to represent their operational capabilities to the JSPoC with a small footprint and without revealing proprietary information. I think this model might work with AoAs as well.

Finally, I think it's important for industry to take note when they run into roadblocks to hosted payloads, and work with the government to define changes to regulations or laws. We are in a dynamic and increasingly dangerous environment. None of us can afford to let regulations or laws stand when they no longer serve our needs.

GSR

What does the government have to change and what does senior leadership have to do to increase the adoption of hosted payloads?

EARL WHITE

Today's senior government space leaders understand the need for resilient systems and agile acquisitions and are already acting to make changes in their organizations.

You can see it in the National Geospatial Agency's Commercial Imagery Strategy published last December. I'm particularly eager to see what comes out of AFSPC's Space Enterprise Vision (SEV), which I believe is now in review at the OSD level. I hope and expect that the SEV will direct increasing consideration of hosted payloads, and will provide mechanisms to make that happen.

Still, the acquisitions organizations are going to need a great deal of industry help as they make the transition. I also see great promise in OSD's Silicon Valley initiatives. They don't yet address the New Space industry, but I'm hoping that the agile processes developed there will translate into much more agile space acquisitions—perhaps fast enough to match commercial decision making timelines.

In fact, *Doug Loverro*, the Deputy Assistant Secretary of Defense for Space Policy at the Department of Defense (DoD), was quoted as saying, "*In order to keep pace with the ever-expanding user need. And the users are incorporating new technologies—video, Internet, streaming services and more we haven't thought of yet—as fast as the commercial world produces them on the ground. We can't go ahead and maintain that pace of change in space. The only people that can maintain that rate of change in space is the commercial world.*"

Mr. Loverro went on to identify many of the aforementioned economic and process challenges as contributing factors to this disparity between government and industry, citing the WGS satellite constellation as an example, "*[The DoD] defined WGS in the 1996 budget that we submitted to the President. That system was defined twenty years ago. The systems that are being launched by the commercial world today were defined two years ago…three years ago. They're not subject to the bureaucratic process and – quite frankly – the economic process that drive DoD decision makers. And that's critical because it allows new technology to be ingested.*"

The commercial satellite industry has proven quick to integrate leading edge technology into their fleets without significant delay The coming disruption of HTS will enable a broader range of COMSATCOM services and solutions to the government – all available at competitive price points.

This trade event reinforced that this is truly an exciting time for the use of COMSATCOM across the military and federal government. The emergence of HTS technology and the launch of next generation HTS constellations will provide the bandwidth necessary for truly revolutionary IT services as well as improved capabilities in the field and will do so at drastically reduced cost.

The pace at which industry moves will expedite the availability of bandwidth, capacity and advanced capabilities to end users—delivering the connectivity of the future to the tip of the spear today.

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GSR

Where do you see hosted payloads in the next five to ten years? Do you anticipate that the government will overcome these challenges and use them more extensively? If so, where do you see them having the most adoption and impact—for civilian agencies or the military?

EARL WHITE

I fully expect national security space to increasingly consider hosted payloads as options for resilience and cost savings. If they successfully build the needed processes—and industry responds with well-thought out, well-planned and well-designed options—we should see a real increase in the number of hosted payloads flying in the next decade.

The large LEO cross-linked constellations now in development would offer amazing opportunities for hosting government payloads, and are particularly attractive when integrated with traditional GEO ComSats. It's very easy for me to see opportunities in tactical ISR, missile warning, weather, secure communications and space situational awareness.

There are many that could add a great deal of resiliency to national security space. The key is getting the government to engage early enough with requirements for security and command and control, and to think through all the regulatory and funding hurdles well in advance.

*This article is republished, courtesy of GovSat Report (**ses-gs.com/govsat**), and Executive Editor Ryan Schradin. He is a communications expert and journalist with more than a decade of experience and has edited and contributed to multiple, popular, online trade publications that are focused on government technology, satellite, unified communications and network infrastructure. His work includes editing and writing for the GovSat Report, The Modern Network, Public Sector View, and Cloud Sprawl.*

His work for the GovSat Report includes editing content, establishing editorial direction, contributing articles about satellite news and trends, and conducting written and podcast interviews. Ryan also contributes to the publication's industry event and conference coverage, providing in-depth reporting from leading satellite shows.

*The GovSat Report is sponsored by SES Government Solutions (**ses-gs.com/govsat**).*

HPA CORNER: WHAT'S HOLDING BACK THE ADOPTION OF HOSTED PAYLOADS?

By Kay Sears, Vice President, Strategy & Business Development, Lockheed Martin

The American military faces an inflection point in space. Potential adversaries are aggressively developing new space capabilities in response to decades of U.S. preeminence. The Department of Defense (DoD) must respond to these developments in a reduced budgetary climate, and find more affordable ways to upgrade space assets and design a space architecture for the future.

In such a climate, hosted payloads would seem to be an ideal solution. With many space programs under review for next generational architectures and the existence of the Hosted Payload Solutions (HoPs) contract, the time is now for the Department of Defense to make hosted payloads a resilient part of each new architecture. The perceived hurdles to implementing hosted payloads are primarily cultural in nature, not technical. Yes, change is difficult, but the delay has been long enough. The objective benefits of hosted payloads are overwhelming and new space realities demand new approaches.

This column's question for HPA Members is…"***What can industry do to help change the status quo in the Department of Defense regarding hosted payloads?"***

"*One of the most interesting quotes I heard at the Satellite conference last month was: 'the new heroes in the Pentagon are those who control costs.' Clearly, examples like the Air Force Commercially Hosted Infrared Payload (CHIRP) allowed the U.S. Government to accomplish 85 percent of the mission at 15 percent of the cost.*

"*Although CHIRP is a proven concept, only some parts of the government have embraced commercially hosted payloads--the FAA has been relying on hosted payloads for the Wide-Area Augmentation System (WAAS) for over 20 years and is currently developing their 3rd generation of commercially hosted payloads.*

"*The WAAS system is critical to the U.S. National Airspace System and the FAA trusts its commercial partners to deliver. They realize a commercial partner is already subjected to deliver timely and affordable access to space for their commercial customers, therefore reducing risk for them. Agencies across the government should take comfort in knowing that hosted payloads have a proven record of on-time delivery with significant cost savings.*

"*Industry can help change the status quo by continuing to highlight the success of government hosted payloads such as CHIRP and WAAS; explaining the benefit of hosted payloads at reducing costs, decreasing risk, and improving resilience; emphasizing the numerous hosting opportunities each year (there are approximately 15-20 commercial GEO launches a year, globally); and continuing to execute and deliver hosted payload programs for other government agencies to demonstrate their potential to meet DoD needs."*—***Todd Gossett***, Senior Director of Hosted Payloads at **SES Government Solutions**

"*First, industry needs to continue to inform the U.S. government about the benefits of hosted payloads. For us in industry they are obvious, but many in government may overlook the substantial benefits of hosted payloads for easier (and more costly) options. We need to remind those in government what hosted payloads offer: faster access to space; greatly reduced cost; tremendous resiliency through disaggregation; and operational flexibility to use commercial or government facilities and different command and control options.*

"*We need to continue to press to get hosted payloads as an integral part of mission architectures and ensure they are integrated with CONOPS and ground systems. We need to emphasize that hosted payloads do not threaten major programs, but instead provide cost-effective and resilient options to enhance almost any architecture.*

"*Industry needs to more closely partner with the U.S. government to provide solutions to satisfy the differences in mission and acquisition timing between the government and commercial companies. The benefits are clear. The obstacles can be overcome. The key is to make hosted payloads an integral part of all architectures and we will all benefit."*—***Myland Pride***, Director, Government Affairs, **Intelsat General Corporation**

"*From my perspective, it will take a crisis or a mandate from Congress and the Pentagon to enforce this partnering with industry. In a crisis when there is not time for a new program of record, hosted payloads could help the DoD get important capabilities on orbit within two or three years or less. However, considering the increasingly congested, contested and competitive environment in space, we would be wise not to wait for a crisis. Current efforts by U.S. Government senior officials to leverage the benefits of hosted payloads seem to be "reasoned-out" by way of "we can't afford to do more than what we are already doing now."*

"*What we need is a mandate and a budget from Congress that specifically goes to opening the floodgates of using commercial satellite to host U.S. Government payloads. Not in 10 or 20 years, but now."*—***Al Tadros***, Vice President, Government Business, **SSL**

For additional information regarding HPA, please visit ***hostedpayloadalliance.org***

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COMMAND CENTER: KAI TANG, VICE PRESIDENT, US GOVERNMENT BUSINESS UNIT, INMARSAT

On... Addressing The Needs Of First Responders...

Mr. Tang is the Inmarsat wholesale representative to all US government users and responsible for Inmarsat's US government market and pricing strategy. He previously served as Director for Tactical and Assured Communications for Inmarsat's Global Xpress development program.

Prior to joining Inmarsat, Mr. Tang was the GS-15 Division Director for Navy Satellite Communications (SATCOM) within the Navy's Communications Program Office for the Program Executive Officer Command, Control, Communications, Computers and Intelligence (PEO C4I) in San Diego, California. There, he was responsible for a $1.6B FYDP (Future Years Defense Program) portfolio overseeing the overall acquisition efforts including development, testing, fielding, and life cycle support of all Navy Military and Commercial SATCOM systems. This included the Navy EHF SATCOM Program (NESP), Super High Frequency (SHF) terminal programs, Broadcast Service (GBS) and Commercial SATCOM programs such as the Commercial Broadband SATCOM Program (CBSP), Commercial Wideband SATCOM Program (CWSP), Television-Direct to Sailors program (TV-DTS), and the Navy's Iridium project.

Mr. Tang was also responsible for airborne and expeditionary programs such as Navy VIP Aircraft Communications and the Joint VSAT project for JIEDDO. As the Navy's senior SATCOM acquisition expert, Mr. Tang was a frequent public speaker on topics of commercial satellite operations and acquisition strategy.

Mr. Tang received his BS and MS in Electrical Engineering from the University of California at Los Angeles (UCLA).

How does Inmarsat treat the NGO and First Responder areas of need?

KAI TANG

In times of disaster and humanitarian relief, we realize that responders mobilize quickly. With literally no advanced notice, they must be prepared to get on a plane or a ship and go anywhere in the world to provide aid and relief in regions recovering from any one of a number of catastrophes.

Inmarsat is the NGO and first responders' "first in, last out" proven satellite communication (SATCOM) capability of choice through our trusted global mobile L-band satellite services and the company's latest Ka-band service, Global Xpress. Our Broadband Global Area Network (BGAN) and Global Satellite Phone Service (GSPS) services are the established "first in" capability of choice because of their portability and global mobility. In fact,

Photo of a vessel swept inland during Typhoon Haiyan. Photo courtesy of the Philippine Air Force.

our mobile, lightweight and affordable BGAN terminals are small enough to fit into a backpack. That's invaluable to the first responder mission—especially during the critical first 24 hours on the scene. No one knows in advance where or when the next unfortunate event will occur, so nothing beats the benefit of a small, highly portable terminal that you can be quickly packed and is then suited for travel. Communications is necessary and critical, but not the most important item competing for precious cargo space. And, frankly, these responders often have less than 72 hours of notice before moving into an unknown geographic location to work under extremely challenging conditions. Taking the time to arrange for shipping of gear means time taken away from focusing on the mission.

Similarly, there's no substitute for a terminal that's easy to use—requiring little assembly, configuration, or SATCOM expertise. When deplaning and turn on cell phones, the expectation is for most users that the equipment will work. For first responders, the moment they get off the plane and step into those challenging environments, they want to be confident in knowing their equipment will also work—hence, the Inmarsat equipment selection.

As the humanitarian emergency response and relief mission expands, connectivity needs to naturally increase—now there's Global Xpress to deliver that high-throughput connectivity in a VSAT form but with the same smaller size, ease of use and worldwide mobility that Inmarsat customers have come to expect.

Inmarsat Global Xpress is the first and only commercial high-throughput network that spans the world, delivering seamless, globally available, high-speed Ka-band connectivity. With Global Xpress, they'll be able to meet the expanding and increasing needs of their mission until they are the "last out" of the region. Inmarsat is proud of the first responders we support as well as the fact that they have selected Inmarsat to meet their needs.

What tools are used to produce viable communications and what is required to ensure proper installation and use of those tools?

KAI TANG

Inmarsat has a proven track record that encompasses more than 35 years of experience in delivering mobile satellite communication capabilities to NGOs/first responders. In times of need, these organizations/units must focus on their mission to provide critically needed response and relief.

Inmarsat's mission is to enable them to focus on these crucial priorities by providing SATCOM capabilities that require a minimum of installation for use and essentially no technical training to set up—we're talking just a few minutes to attain connectivity. Our SATCOM is delivered as a service, enabling NGO/first responder communities to spend minimal time installing, troubleshooting and configuring, and enabling them to commit the maximum time possible to their mission.

Do you have any examples of success stories?

KAI TANG

Trying to think of a major event wherein Inmarsat was not been highly involved is difficult. If I had to pick just one event over the last few years that epitomizes our role, I'd cite Typhoon Haiyan.

After arriving on the scene of this natural disaster, there were crews setting up terminals instantly and easily, while a cell phone tower directly next to team was literally bent in half. That's a great example of a single picture being worth a thousand words: Inmarsat considers cell phone coverage as ubiquitous.

Users assume cell phone coverage will "be there" for us, most of the time. However, in times of disaster, such is usually not the case. During natural and man-made disasters, Inmarsat equipment has proven time and time again the viability of the firm's critically-needed services—all to benefit those in dire need.

www.inmarsatgov.com/