

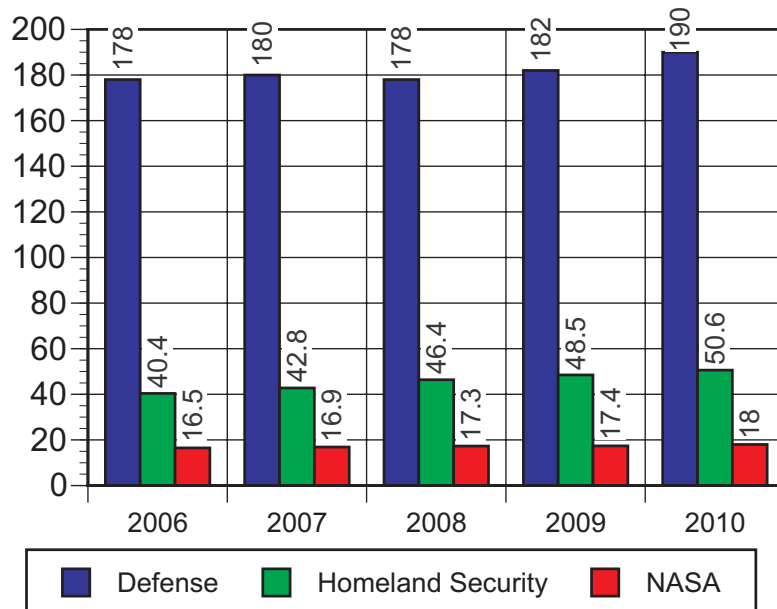
MILITARY & AEROSPACE FIBER OPTICS

Monthly Newsletter Covering Defense, Aerospace,
Government and Homeland Security Fiber Optic Markets

Vol. 1 No. 1

May 2007

**Defense (including RDT&E), DHS, and NASA
procurement programs (\$ billions)**



Source: IGI Consulting

MARKET SIZE

The military and aerospace fiber optics market — a few comments

The MAFO newsletter plans to publish a number of forecasts of the military and aerospace fiber optics markets in future issues.

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These could include systems, components, and agencies. These will be based on a series of studies now being developed by IGI Consulting, a sister company of Information Gatekeepers Inc. and a member of the IGI Group. These forecasts are based on number of assumptions using the best data available. It should be pointed out that there are few if any forecasts on the market for military fiber optics.

MAFO will use as much historical data as possible gleaned from contract awards, press releases, interviews, and other sources. The sources will include contracts by various agencies including SBIR/STTRs, OEM-generated contracts as part of larger systems, independent R&D, and many other major sources.

The starting point of any forecast has to be what is being spent today by DoD agencies, NASA, Homeland Security, and DOE, both for systems and RDT&E. This will provide an outside figure, and the fiber-optic market will be some percentage of these numbers. The numbers for the total spending of the DoD and DHS are truly huge and dwarf those of NASA and other agencies.

Department of Defense, Homeland Security, and NASA Procurement and RDT&E programs (\$ billions)					
	2006	2007	2008	2009	2010
Army procurement	28.2	28.7	24.3	25.2	27.4
Army RDT&E	11.7	11.0	10.6	11.4	12.2
Navy procurement	36.9	36.1	38.8	39.2	40.3
Navy RDT&E	19.0	18.9	17.1	17.8	18.3
Air Force procurement	35.8	35.7	33.8	34.4	35.5
Air Force RDT&E	22.2	24.4	26.7	27.5	28.4
Other Defense procurement	4.4	3.4	4.9	5.2	5.9
Other Defense RDT&E	19.8	21.7	20.8	21.4	22.2
DHS procurement	40.4	42.8	46.4	48.5	50.6
NASA	16.5	16.9	17.3	17.4	18.0
<i>Source: IGI Consulting, 2007</i>					

CONTRACTS

RSL Fiber Systems gains contract for naval project

Northrop Grumman Ship Systems in Pascagoula, Mississippi, has contracted with RSL Fiber Systems LLC to supply the Advanced Lighting System (ALS) for the US Navy's DDG 1000 program. The ALS integrates lighting hardware and control equipment to monitor fiber-optic-based LED and

conventional lighting via ships' communications networks. The contract anticipates installation of the system in all subsequent ships in the DDG 1000 class. It includes engineering support services.

Nexans to supply shipboard cables to two major Japanese shipyards

Nexans, the worldwide leader in the cable industry, has been awarded two frame contracts worth a total of around EUR16 million to supply power, control, and communication shipboard JIS type cables (Japanese Industrial Standard) to major Japanese shipyards: MHI (Mitsubishi Heavy industries) and IHI- MU (IHI Marine United Inc.). The cables will be installed in 39 vessels under construction in five Japanese shipyards.

The selection of a single cable supplier under a frame contract is an unprecedented move for Japanese shipyards: the objective is to increase the supply's overall reliability as well as improve the level of compatibility between the various types of shipboard cable.

Over a three-year frame contract worth approximately EUR11 million, Kukdong, a Nexans company based in South Korea, will be the sole supplier of JIS type shipboard cables to the Nagasaki, Kobe, and Shimonoseki shipyards of MHI for installation on 23 vessels, including container ships, PCTCs (Pure Car and Truck Carriers), and 78,000m³ and 83,000m³ capacity LPGCs (LPG Carriers). This is the first time that a single manufacturer will supply the cables for all the ships constructed by MHI's three shipyards. The cables should be delivered between June 2007 and October 2009.

For IHI-MU, Nexans has signed a one-year frame agreement worth around EUR5 million as the only cable supplier to the Kure and Yokohama shipyards for 16 containers and bulk carriers. It is also unique for IHI-MU to choose only one cable supplier for all the vessels built in its two shipyards over the year. Kukdong should deliver the cables between March 2007 and March 2008.

"We are very proud of being selected as a sole cable supplier to two major Japanese shipbuilders who need short notice delivery with high quality products. These two frame contracts with Japanese customers illustrate the importance of customer satisfaction. Kukdong, a Nexans company, has continuously been developing the reputation for its excellent quality, reliability, competitive prices and strong customer relationships," said Michel Lemaire, executive vice president for Asia and Pacific Area within Nexans.

The cables will be manufactured in Nexans' Jincheon plant in Korea.

Boeing receives FODMS contract

The Boeing Co. Inc., of Anaheim, California, is being awarded a \$7,100,000 time and Materials contract for the Fiber Optic Data Multiplex System (FODMS) program. The Boeing Company will provide design agent tasks for FODMS/Gigabit Ethernet Data Multiplex System (GEDMS) ship sets for DDG 110, 111, and 112. Work will be performed in Anaheim, California (85 percent) and Arlington Virginia (15 percent), and is expected to be completed by November 2011. Contract funds will not expire at the end of the current fiscal year. This contract was not competitively procured. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-07-C-5445).

Navy awards UAV contract to Pedigree

Pedigree Technologies, Fargo, North Dakota, is being awarded an \$8,438,667 cost-plus-fixed-fee contract for the research and development of Electro-Optical Radio Frequency and Acoustic Sensors for the Unmanned Aerial Vehicle platforms. Work will be performed in Fargo, North Dakota, and is expected to be completed in December 2011. Contract funds will not expire at the end of the current fiscal year. This contract was competitively procured with three offers received via a Broad Agency Announcement. The Naval Air Warfare Center, Aircraft Division, Lakehurst, New Jersey, is the contracting activity (N68335-07-C-0271).

General Dynamics wins Pentagon contract

General Dynamics Network Systems, of Needham, Massachusetts, was awarded on April 30, 2007, an \$18,406,189 modification to a fixed-price-incentive with award-fee contract for continuing efforts to survey, plan, design, install, and implement the information technology systems and infrastructure for Wedge 2-5 tenants. Work will be performed at The Pentagon, Arlington, Virginia, and is expected to be completed by December 31, 2010. Contract funds will not expire at the end of the current fiscal year. This was a sole source contract initiated on March 28, 2002. The Pentagon Renovation and Construction Program Office, Arlington, Virginia, is the contracting activity (MDA947-98-C-2002).

DRS Technologies receives \$52 million contract to produce battlefield digitization systems for the US Army

DRS Technologies Inc. announced that it has received a \$52 million contract to provide rugged Appliqué Computer Systems and peripheral equipment for the US Army's Force XXI Battle Command, Brigade and Below (FBCB2) program. The order was received by DRS from the US Army's Communications-Electronics Life Cycle Management Command (CELCMC) at Fort Monmouth, New Jersey.

The company's DRS Tactical Systems unit in Melbourne, Florida, will produce the FBCB2 computer systems, including more than 5,700 processors, 5,800 display units, 5,300 keyboards, 6,700 hard disk drives, and 1,400 rugged, solid-state hard disk drives.

DRS's Appliqué Computer Systems are installed on more than 40 US Army and Marine Corps wheeled and tracked vehicles, at tactical operations centers and at other command post platforms. The computer systems support the Army's Blue Force Tracking requirements, which include beyond-line-of-sight reporting and tracking, and vertical and horizontal information integration that is incorporated into the military's overall battlefield visualization efforts.

"This additional order reflects DRS's strong track record for providing America's military with the most innovative and reliable products of the highest quality," said Steven T. Schorer, president of DRS's Command, Control, Communications, Computers & Intelligence (C4I) Segment. "Our Appliqué computer systems have been successfully fielded for FBCB2, and this contract ensures they will continue to serve as crucial assets for the Army's network-centric communications infrastructure."

The FBCB2 program is focused on developing a digital battle command information system designed to provide commanders and soldiers — from the brigade level to the individual soldier and across all battlefield areas — with improved information for command and control and enhanced situational awareness. Supporting the US Army's overall battlefield visualization efforts, DRS's Appliqué Computer Systems provide a seamless flow of battle command information and interoperability with external command and control and sensor systems.

Incorporating the latest developments in digital information processing and networking, DRS-built FBCB2 systems provide improved combat support for lower-echelon battle command tactical mission requirements, including near real-time command and control capabilities, enhanced interoperability, situational awareness, and graphical combat area displays, throughout the force structure at the soldier, weapons, and platform levels. These systems assure that US armed forces keep pace with advanced technology developments of the 21st century.

DRS Technologies awarded \$7 million contract to provide ship communication network system for the Republic of Korea's Navy

DRS Technologies Inc. announced that it received a \$7 million contract from the Daewoo Shipbuilding & Marine Engineering (DSME) Co. Ltd. to provide Fiber Optic Data Multiplex System

(FODMS) — Navigation Sensor Distributors for the second KDX-III destroyer of the Republic of Korea's Navy (ROKN). Under a previously awarded contract from the Special & Naval Shipbuilding Division of Hyundai Heavy Industries Co. Ltd., DRS outfitted the first destroyer of this new fleet with the same equipment.

The FODMS is a unique, general-purpose, dual-network system that provides data and integrated communications between propulsion and power control systems, steering, navigation sensors, weapons systems, alarms, indicators, and integrated bridge systems, as well as Aegis combat systems. It is a complete information transfer system designed to meet evolving ship communications requirements and to handle data that are critical to ship operations, enhancing reliability, maintainability, and survivability.

The company's DRS EW & Network Systems unit based in Buffalo, New York, will accomplish the work for this contract, which will start immediately and continue through May 2010. The company expects to receive future contracts on this program as the ROKN deploys additional KDX-III destroyers.

For this contract, DRS will manufacture, install, and test the FODMS to ensure interoperability between legacy systems and the latest commercial off-the-shelf (COTS)-based systems. The company also will provide operation maintenance training to DSME employees and ROKN personnel.

"This award is our second commercial sale of the FODMS to an international customer. It reflects our success in providing vital communications systems that ensure the safety and survivability of a fleet during deployments and our efforts to expand our international business base," said Richard S. Danforth, president of the company's Command, Control & Communications Strategic Business Unit.

For the US Navy, the FODMS is used as an advanced message transfer system, operated by interior communications technicians in the DDG-51 Arleigh Burke-class guided-missile Aegis destroyers.

The FODMS was selected by the ROKN to distribute navigation sensor data to Aegis and non-Aegis weapons systems, communication systems, machine control and steering control systems, and navigation displays without the need to rewrite software or redesign hardware. It is based on the Military Survivable Adaptable Fiber-optic Embedded Network (SAFENET) standard, focused on enhancing survivability.

LGS wins two contracts totaling \$6.9 million for networks serving the Fort Hawaii Enclave

LGS, a subsidiary of Alcatel-Lucent dedicated to serving the US government community, announced that it has been awarded two contracts totaling \$6.9 million with the United States Department of the Army.

The contracts are in support of network upgrades for a number of installations and facilities that are a part of the Fort Hawaii Enclave, which includes Schofield Barracks, Wheeler Army Airfield, East Range, Helamono Military Reservation, Fort Shafter, Shafter Flats, and Tripler Army Hospital.

LGS will work with the US Army to provide high-speed IP networking to each facility linked together across a regional overlay optical network that will carry and deliver advanced voice, data, and video broadband networking capabilities. This will be one of the first 10-Gigabit multiprotocol label switching (MPLS) backbone network installed for the US Army. LGS will provide additional products and services as the project requires.

"Our long track record and past performance in service of the U.S. Army continues to help us win substantial contracts for network upgrades," said Ron Iverson, LGS CEO. "It is a pleasure to work closely with the Army as they arm their troops with the high-speed communications capabilities they need to effectively do their jobs."

Schofield Barracks is the largest Army post in Hawaii, located on an 18,000-acre site in central Oahu. It is named in honor of LTG John M. Schofield, who, in 1872 recognized the strategic importance of Oahu to the defense of the United States.

The agreement is a part of the Army's Installation Information Infrastructure Modernization Program (I3MP), which is focused on upgrading voice and data network infrastructure at Army bases around the world. I3MP is managed by Project Manager, Defense Communications and Switched Systems (PM DCASS). LGS and its predecessor organizations have had a team of people dedicated to working with the Army as part of the I3MP project for more than 15 years.

LGS selects Thales' SONET Datacryptor encryptors for DoD deployment

Thales, a global provider of cryptographic security products and services and ID management solutions to governments and financial networks, announced that LGS, a subsidiary of Alcatel-Lucent dedicated to serving the US government community, will offer to deploy the Thales SONET Datacryptors as a part of the Army's Infrastructure Modernization Program.

The first project to make use of the Thales Datacryptors is a network upgrade contract awarded to LGS by the U.S. Army for the Fort Hawaiian Enclave.

The Program Manager for Defense Communications and Army Switched Systems (DCASS) is responsible for the core data backbone infrastructure upgrades to Army installations around the world. PM DCASS is responsible for the execution of the Installation Information Infrastructure Modernization Program (I3MP). This program's objective is to seamlessly integrate voice, video, and data into a single cohesive system. The Thales SONET Datacryptors will be deployed to secure critical portions of LANDWARNET. The SONET Datacryptors have minimal latency and will allow the network to operate at maximum efficiency while encrypting mission-critical applications.

Thales's state-of-the-art Datacryptor SONET/SDH OC-3/12/48 encryptors are FIPS 140-2 Level 2 validated, as this certification is a key requirement of encryption products to the US government. Thales currently maintains over 30 FIPS product certifications for the Datacryptor product line.

"Security has become of critical importance to our customers so we are pleased that Thales Datacryptor products allow LGS to continue to deliver secure, high-performance solutions for the Army," said Ron Iverson, CEO, LGS. "We have ensured that their encryptors can be easily integrated into our solutions and work closely with them as they continue to upgrade and enhance their portfolio."

The Datacryptor SONET devices are transparent to the SONET switching equipment and offer customers easy scalability and central management. Datacryptor products can be centrally managed by a single secure management application, the Thales Element Manager, which is a key differentiator enabling simplified operation and reduced training cost. Thales' Datacryptor portfolio of encryption products (T1, E1, T3, E3, OC-3, OC-12, OC-48, OC-192, and Gigabit Ethernet) and solutions is recognized in the industry for securing the confidentiality of critical data in transit.

QPC Lasers wins \$1 million in contracts from US Navy

QPC Lasers Inc. announced that the United States Navy has awarded it two contracts totaling \$1 million to deliver high-energy laser engine prototypes for naval aviation directed energy weapons applications.

The QPC laser prototypes are being developed for potential deployment onto naval aviation platforms and utilize QPC's patented and proprietary semiconductor laser technologies which are designed to achieve a 10x reduction of cost, size, and weight compared to conventional laser technology.

"Having successfully completed earlier-stage Naval Aviation laser technology development contracts whose objective was single-unit laboratory demonstration, we are excited that the new contracts advance this QPC technology to the production prototype stage," said George Lintz, chief operating officer, QPC. "There is no more demanding customer or application for QPCs Brightlase and surface-emitting lasers technologies than the U.S. military, and we are confident in our ability to cost-effectively deliver superior performance."

The concurrent nine-month contracts build upon the company's previous high-brightness chip-based laser development for the US Navy, as well as for the US Defense Advanced Research Projects Agency (DARPA), the US Army, the Missile Defense Agency, and the Israeli Ministry of Defense.

The contracts leverage three of QPC's proprietary and patented technologies:

- Low-cost high-power surface-emitting lasers (HPSEL) technology. The HPSEL technology enables QPC to place hundreds of high-brightness lasers onto a single chip, which QPC believes will enable their products to achieve high power and brightness with a size, cost, and weight savings of more than 10 times compared with conventional laser technologies.
- Rugged military fiber coupled module production capability designed for reliable operation in demanding military environments applications.
- BrightLase high-power, high-brightness lasers, which are designed to produce laser beams more than 10 times brighter than conventional semiconductor lasers used in industrial and medical applications.

Cornet Technology announces its ClearWave automated remote fiber connectivity switch at the DISA Customer Partnership Conference

Cornet Technology Communications (CTC), the network communications solutions division of Cornet Technology Inc. (CTI) (www.cornet.com), introduced its ClearWave product at the Armed Forces Communications and Electronics Association (AFCEA) Technology Showcase at the Defense Information Systems Agency (DISA) Customer Partnership Conference 2007. ClearWave is an all-optical fiber switch capable of remotely managing optical networks. The solution eliminates the need to change fibers manually from port to port. ClearWave is available in three scalable configurations: 96 by 96, 192 by 192, and 320 by 320 input and outputs.

ClearWave supports remote fiber connection and redistribution, remote monitoring and testing, and rapid fault isolation and repair in a network operations environment. The switch reliably connects light between input and output fibers using beam collimators, devices used to straighten and make divergent light parallel as it exits a fiber, and three-dimensional micro-electro-mechanical system (MEMS) mirror arrays as a switch engine. With MEMS technology, ClearWave switches connections over fiber regardless of protocol or wavelength and through data rates of 40G/OC-768. ClearWave is managed through a graphical user interface (GUI) or a Single Network Management Protocol (SNMP) manager. The GUI facilitates the tracking of various information, including connection location, optical power, and connection time length.

Mike Hardesty, director of marketing and business development, Cornet Technology Communications division, said, "ClearWave addresses the need for a scaleable, highly reliable, reconfigurable and easily manageable optical switching solution. The product combines redundant configuration and easily automated fiber network growth and redistribution via remote control. ClearWave provides an efficient, cost-effective solution, reducing configuration errors and operating costs, while increasing network performance."

Cornet Technology has over 15 years experience working with the US Department of Defense. The company's communications products and services are found in multiple classes of US Navy ships, on US Army bases, on US Air Force bases, and in airborne communication centers.

CONFERENCE PAPER

IICIT holds annual meeting

The International Institute of Connector and Interconnection Technology Inc. (IICIT) held its 38th Annual Symposium and Expo at the Holiday Inn Dedham, Massachusetts, May 8-9, 2007. The

two-day event included a half day of tutorials and a full day of presentations covering topics such as connector markets, military and aerospace fiber-optic connectors, expanded beam connectors, and copper and wireline connectors. Exhibitors included Stratos Optical, Diehl Metall, CGI Inc., W.L. Gore, Sequel, ITT Canon, Tyco Electronics, The Plastic Optical Fiber Trade organization (POFTO), Pennwell magazines, and High Frequency electronics magazines.

IICIT is united in a quest for excellence in electrical and optical interconnects. Their purpose is to foster critical thinking, encourage innovation, provide clarity to issues that match end-user needs to product attributes, and promote personal and professional growth for members to help enrich their contributions to the industry.

Readers are invited to join. Years ago, a group call the Electronic Connector Study Group, made up of engineers, suppliers, and reliability personnel, were working to instill rigor and excellence in the interconnect portion of electronic and optical systems. That group, originating in the Delaware Valley, transitioned into the IICIT, a mainstream trade association with interconnect technology and connectors as its primary charters. As companies downsized, outsourced, and reengineered themselves into more profitable entities in a worldwide competition that is the manufacturing business of today, the components engineer who was the mainstay of IICIT has become an endangered species. Inexperienced engineers entering the market today are encountering the same problems that were surmounted 20 years ago.

IICIT has been reborn now to focus on teaching the lessons of the past, existing solutions steeped in reality and trial by fire, and in focusing on cutting-edge new initiatives for excellence. The most recent annual IICIT Symposium and Expo was a huge success and well received by the attendees, with a half day of symposium-style “basics” or legacy learnings and a second day of shared cutting-edge innovation. Ron Bishop was the keynote speaker. IICIT is already talking about next year, scheduled tentatively for May 2008. It is not too early to submit paper abstracts for consideration. Anyone interested in attending or securing a vendor booth or sponsoring any part of the 2008 39th Symposium and Expo should email info@iicit.org with specific interest and current contact information, so that everyone can work together to achieve a world-class symposium and expo. Meanwhile, enjoy the following paper, which was presented by Monish Doshi of Glenair at the 2007 conference and is published here for the first time.

Next Generation Navy Fiber Interconnect (NGCon) Development May 2007

Monish Doshi, Carl Foote, Greg Noll, and Jim Novacoski, Glenair

The Navy has determined to develop a fiber interconnect that can be used on air and sea platforms. This interconnect system must accommodate genderless, rear-removable termini in high-density packaging. A working group from the fiber interconnect industry has been working for the past five years to determine performance specification for the Next Generation Navy Fiber Interconnect (NGCon) system. This article describes the Navy’s needs, the NGCon Working Group’s progress to date, future plans for the NGCon, and Glenair’s NGCon product status.

Introduction and Background

To date, the Navy has been using two different types of termini (contacts) predominantly for multichannel, harsh-environment fiber interconnects. Navy Air (NAVAIR) applications use the M29504 4/5 Termini housed in MIL-DTL-38999 Connectors. Navy Sea (NAVSEA) applications use M29504 14/15 Termini housed in MIL-PRF-28876 Connectors. In 2002, the Navy determined to move towards “commonality” with respect to fiber optics by organizing a Working Group of industry professionals to

develop the Next Generation Navy Fiber Optic Interconnect (NGCon). The NGCon Working Group comprises representatives from NAVSEA, NAVAIR, DSCC fiber-optic manufacturers, communication systems designers, and several prime and subgovernment contractors.

The initial charge to the Working Group was to meet the following goals:

1. Reduced cost for connectors, backshells, and termini as compared to existing MIL-PRF-28876 and MIL-DTL-38999 systems;
2. High level of commonality with commercial fiber-optic manufacturing base;
3. Equivalent or improved environmental and mechanical performance compared to existing options;
4. Equivalent or improved repeatability and reliability;
5. Improved optical performance;
6. Support multiple DoD and industry fiber-optic connector markets;
7. Improved product availability.

The Navy asked the Working Group to develop multiple competitive designs for connectors, backshells, and termini; evaluate these designs in reference to the goals above; produce prototypes; select the final connector system design; and develop a draft specification.

Meeting five times over the first two years, the Working Group submitted and evaluated several designs and prototypes for all system components. Over the next two years, the final connection system design was identified, initial prototyping and verification testing began, and a draft specification was created. The draft specification was submitted by the Navy to a qualifying agency (DSCC) for promulgation of MIL-PRF specifications documentation.

NGCON Program Timeline Goals and Accomplishments

Item	Began	Completion
Terminus development	November 2002	February 2004
Connector design	April 2003	February 2004
Backshell design	August 2003	May 2004
Draft specification	September 2003	September 2004
Design Evaluation	December 2003	September 2004
DoD coordination of specification	October 2004	September 2005
Promulgation of MIL-PRF documentation	September 2006	2007 (expected)

Progress to Date

Terminus

The heart of fiber optical alignment when designing a new fiber connector system is the terminus. The NGCon Working Group established specific attributes for the terminus design. One design goal was to make the terminus smaller than previous qualified designs. Therefore, the standard commercial 1.25mm diameter "LC" connector ferrule style was selected as a desired baseline. This small-form factor 1.25mm diameter ferrule is readily available and less expensive

than legacy terminus ferrule designs. By creating a smaller terminus package, higher terminus densities per connector shell size could be realized (the goal was to fit 36 channels into a shell size 23 MIL-PRF-28876 style connector package).

Another design criterion was to make the terminus genderless. This important criterion means end-users need only one type of terminus, reducing inventory costs associated with stocking both pins and sockets. Furthermore, termination and assembly processes such as strip lengths, tools, and fixtures could be minimized and simplified.

1.25mm diameter ceramic ferrule technology has been studied and tested by various industry standards groups. Performance is predictable, as evidenced by years of field service, and standardizing on the 1.25mm ferrule size permits the use of an extensive array of tools such as polishing pucks/plates, scopes, adapters, etc. The prepolished end-face geometry (chamfer and pedestal diameter) also allows efficient use of consumables, and helps to reduce polishing time for field termination.

The terminus design was refined over the first few NGCon Working group meetings, and a final design was selected prior to embarking on the connector design. Terminus features are as follows:

- Genderless;
- Rear insertable and rear releasable;
- Uses a 1.25mm diameter ceramic ferrule;
- Sealing feature located on terminus body;
- Retention mechanism located on terminus body;
- Crimp style strength member termination.

Connector

Upon completion of the terminus design, the NGCon Working Group began the design of the connector shell, insert details, and alignment sleeve retainer. The connector features were chosen and designed specifically to meet the harsh environmental requirements of shipboard and avionics platforms. Connector keying was also enhanced to accommodate increased polarization options. The NGCon Working Group focused on the tolerances of alignment and mating surfaces to allow intermatability between various manufacturers' products.

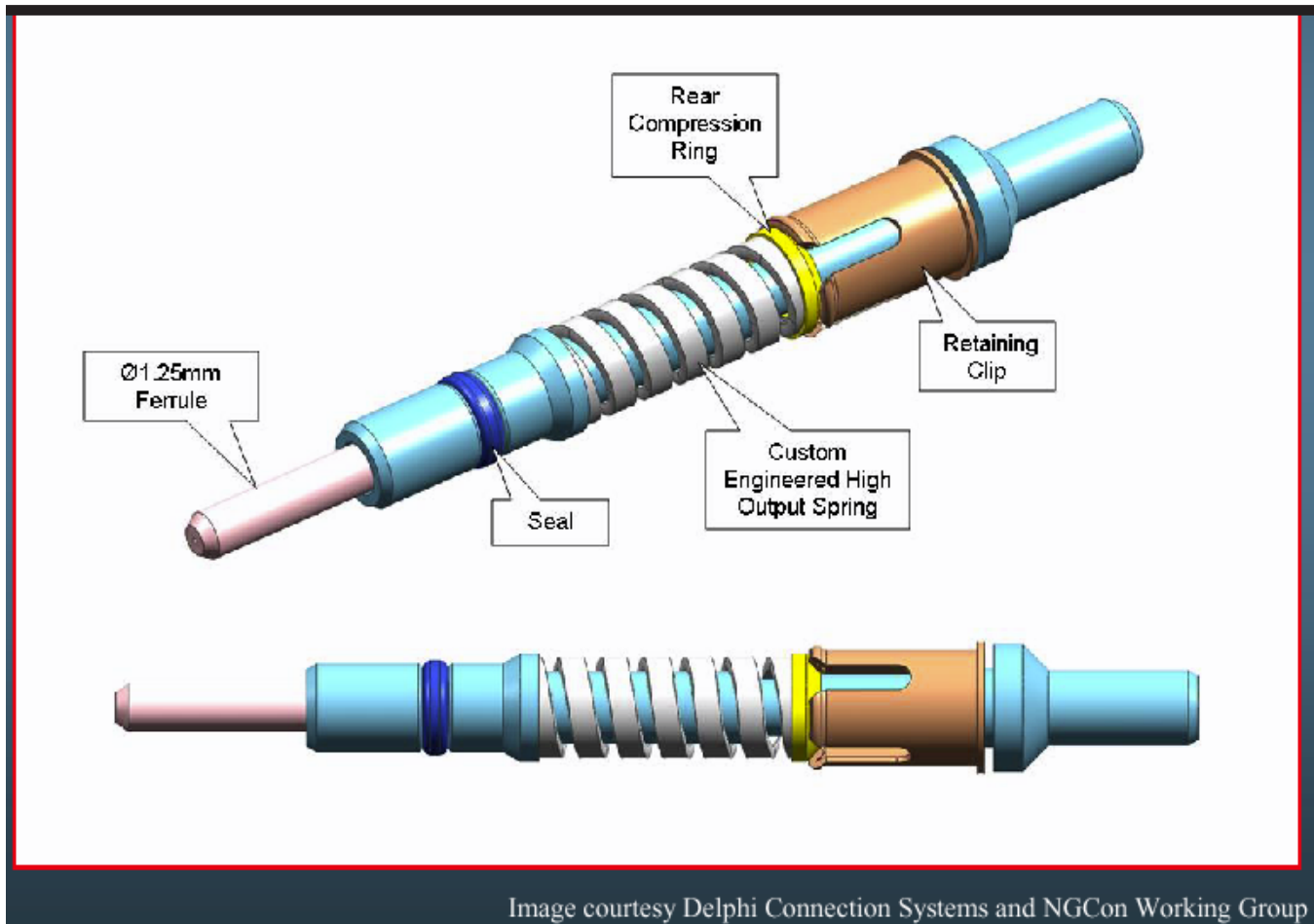
A removable alignment sleeve retainer (ASR) houses the ceramic alignment sleeves, which may be located on either the plug or receptacle connector insert. A screw, held captive to the ASR, is used to attach the ASR onto the insert. Guide pins locate the ASR in precise alignment with the terminus cavities.

The connector coupling uses a modified 60-degree stub Acme double-start thread, which provides maximum resistance in high vibration and shock environments. This thread also enables relatively quick mating of two connector halves as compared to single-start threads. This quick mating feature was of particular interest to shipbuilding representatives, since many matings occur in areas difficult to see and reach. The standard MIL-DTL-38999, Series III rear accessory thread and antirotation teeth design was selected to allow for a large variety of backshell design options.

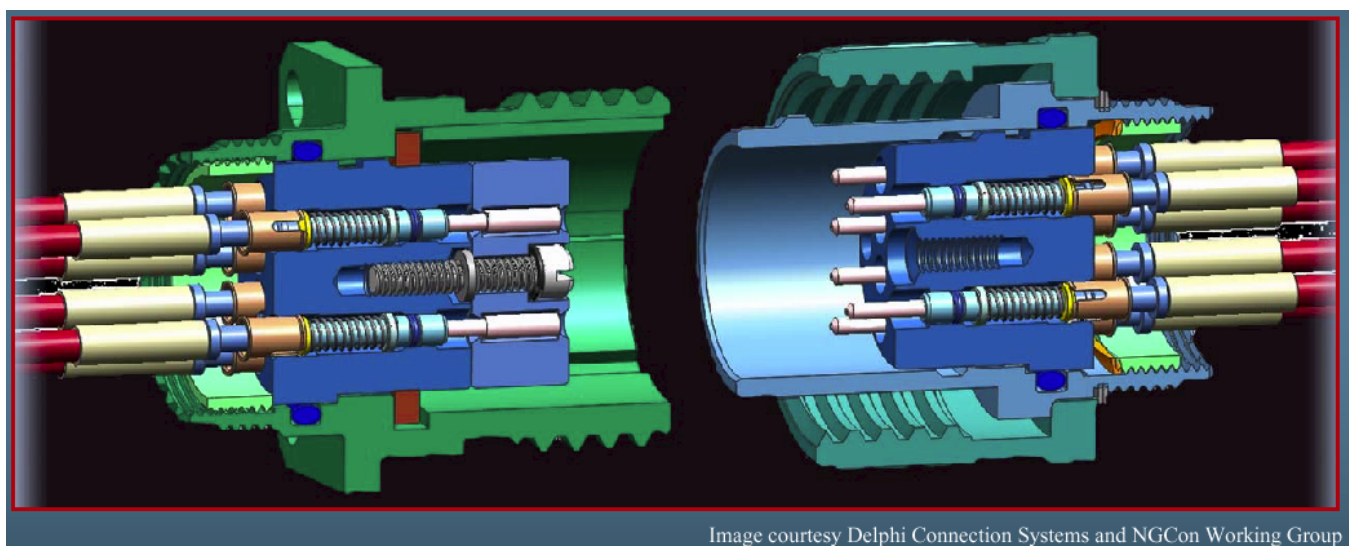
The connector design was refined over the next few NGCon Working Group meetings, and a final design was selected prior to embarking on the backshell designs. Connector features are as follows:

- Double-start modified 60-degree stub Acme coupling thread — same as M28876;
- Rear accessory threads and antirotation teeth to be same as D38999;
- Various material-finish options (no cadmium permitted);
- Insert-to-insert bottoming through the alignment sleeve retainer.

Terminus Design



Connector Design



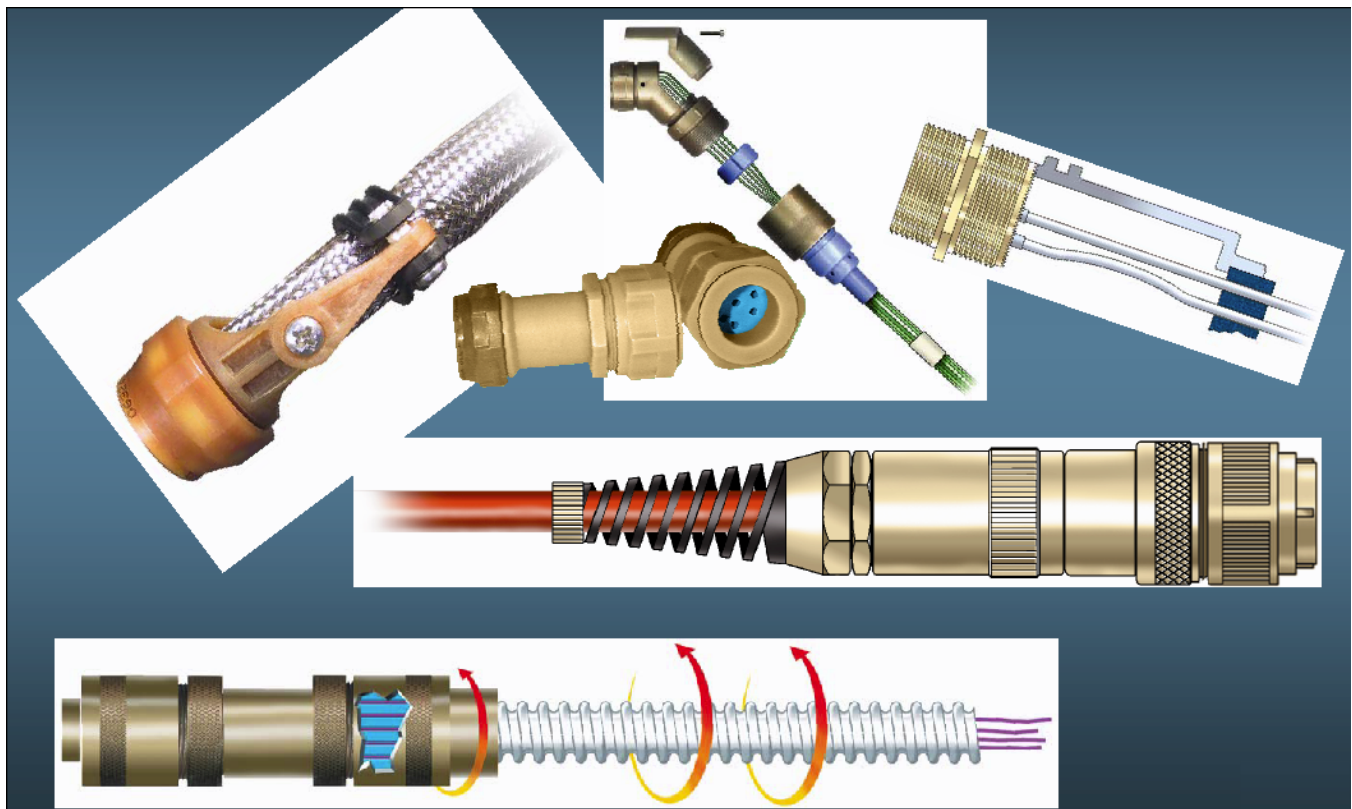
Backshells

Unlike MIL-PRF-28876, backshells are not an integral part of the connector assembly. Although the connectors may be procured with backshells when the appropriate designator is included in the part number, the backshells are attached to the connector shells by means of the rear accessory threads, and are therefore removable. The NGCon Working group discussed backshells in detail and reached the following key decisions:

- Flexible designs for multiple applications (one-size-DOES-NOT-fit-all philosophy);
- Backshell designs to correlate closely with the user-community requirements;
- Offer multiple design options:
 - Light, medium, and heavy duty
 - EMI protection
 - Ability to work with simplex and multicable construction
 - Accommodate conduit, braiding, shielding, and strength member terminations
 - Field serviceable
 - Require limited number of tools to assemble
 - Allow for angular options to work in confined spaces

By not defining specific designs (but rather the envelope dimension and performance requirements), and by committing to a standard rear accessory interface, and NGCon connector design allows for vast backshell options to support multiple end-user requirements.

Backshell Options



Qualification and Evaluation

To evaluate the overall design of the terminus, insert cavity, alignment sleeve retainer, and connectors, some preliminary MIL-S-901 shock testing has already been performed; the results were excellent. This testing verified performance of the following under a “violent” shock test:

1. Desired optical performance with respect to discontinuity;
2. Robustness of terminus retention mechanism (to preclude ejection of terminus from cavity);
3. Robustness of a commercially available LC Alignment Sleeve (to maintain alignment without cracking).

After this preliminary testing, the draft MIL-PRF specifications were circulated for initial comments, and DSCC (and the Navy) are in the process of compiling these comments and assigning recommended dispositions. Simultaneous with drafting of the MIL-PRF specifications, the Navy is also creating termination and connectorization methods and processes, along with documentation to address specific military qualification requirements. Further, the Navy is putting together Tool Kit requirements and writing up Tool Kit drawings and specifications. It is reasonable to expect the final MIL-PRF specifications and related documentation to be published in 2007.

Conclusion

The new NGCon Navy standard will offer many advantages over current qualified products that it is intended to replace:

- Single standard product for air and sea applications;
- Higher-density layouts;
- Improved optical performance;
- Improved repeatability and reliability;
- Various backshells and accessories;
- Reduced stocking costs for termini;
- Improved availability.

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NEW PRODUCTS

Stratos announces new optical transceiver

Stratos Optical Technologies, a provider of fiber-optic connectivity and OEO solutions for military applications, has announced the availability of the HTP-TR4 Quad Port Hybrid transceiver, a highly ruggedized, highly miniaturized component-level unit for 1 to 2.5Gbps multimode optical data link applications. The Quad Port Hybrid is the first product of its kind to combine three critical design attributes for avionics equipment applications: a one-square-inch footprint that fits within a maximum height of 0.235 inches, full compliance with 1x/2x Fibre Channel standards, and ruggedness that will withstand avionics vibration and shock requirements.

The Quad Port Hybrid is designed to be insertion-mounted with 15 pounds of force to a surface-mount BGA socket soldered to the application card. The socket includes an integrated retaining clip for high-vibration environments. This design avoids exposing the transceiver to high soldering temperatures, simplifies initial production, and enables faster and easier board reworks once the device is integrated into a specific product. Removal is accomplished via a specially designed tool that lifts the transceiver out of the BGA socket.

“The Quad Port Hybrid transceiver is a revolutionary new product for Stratos Optical,” said Grover Brower, site general manager for the Florida operations of Stratos Optical Technologies.

“The inspiration for its design came from discussions we had with several customers who needed this type of compact, rugged form factor for their avionics applications. It has recently been designed into a major avionics platform for the US military by one of their prime contractors, and will also serve other optical datalink applications, such as aircraft sensors, that require its low profile, small footprint, and ruggedized packaging.”

The optical interface of the Quad Port Hybrid is a polyimide optical flex pigtail cable terminated into an industry standard 1x12 MT connector. The device may be customized to have different optical flex lengths, custom within flex routing, or use alternate types of fiber termini such as ST, SC, or MIL-T-29504. The Quad Port Hybrid also contains an embedded processor with interface to allow the application layer to control the power level of each transmit channel, read the receive strength on each receive channel, and perform low-level diagnostic tests that determine that the device is running at proper voltage and is performing as designed.

The HTP-TR4 is expected to be available for production procurement by April 2007, and is priced at \$2,280 each for multiyear program production quantities above 1,000 pieces per year. For more information, please visit <http://www.us.tech.com/>.

BUSINESS

Nortech Systems hires Eugene Exley as regional sales manager

Nortech Systems is pleased to announce that Eugene Exley has joined the company's Aerospace Systems division as a regional sales manager responsible for the western United States. Exley brings approximately 20 years of business development, marketing, and engineering experience with electronics applications, primarily for defense customers, to the Nortech Systems division.

Prior to joining Aerospace Systems, Exley held the position of regional sales manager with General Technology Corporation (GTC), Albuquerque, New Mexico. GTC is the electronic manufacturing solutions (EMS) provider within Crane Aerospace & Electronics. Exley has also held senior sales and marketing positions with White Electronic Designs, PPI-Timezero Inc., Teledyne Advanced Manufacturing, and Eastern Electronics Company.

“Gene brings a strong background in defense-related electronics and will be an important contributor to Aerospace Systems' success,” said Mark Nordquist, national sales manager of the Aerospace Systems division. “In addition, his experience with medical and industrial accounts will help us capitalize on cross-selling opportunities across Nortech Systems.”

According to Nordquist, the defense marketplace continues to consolidate its vendor base, with suppliers like Aerospace Systems required to continually raise their performance levels. “We're meeting this challenge with the resources, capabilities and world-class quality standards necessary to support our customers as a key partner in their productivity,” said Nordquist.

Aerospace Systems offers full-service capabilities including design, manufacturing, testing, and system-level integration. It specializes in custom-designed wire harnesses and cable assemblies, including rugged high-speed data communications cables, flat molded, fiber optics, and higher-level complete box build assemblies for the defense industry and other demanding applications. Products are engineered to withstand severe environmental conditions, including extreme heat and cold, salt spray, water immersion, chemical and abrasion resistance, and electromagnetic and radio-frequency interference. For more information about Aerospace Systems, please visit www.aerospacesystems.com.

SCHOTT announces appointment of retired Air Force Maj. Gen. Scott Custer as executive vice president, defense

SCHOTT North America Inc. announced the appointment of retired Maj. Gen. Scott S. Custer as executive vice president, defense. In his new position, Custer will work to coordinate and develop SCHOTT's rapidly growing defense and security businesses.

Custer joins SCHOTT after an impressive career with the US Air Force, where he served most recently as vice director of the Joint Staff and concurrently served as the Joint Staff director of management. A graduate of the Virginia Military Institute (VMI), Custer has enjoyed a diverse career with assignments both domestically and abroad.

"SCHOTT is a very interesting, storied company, with a diverse product portfolio and know-how. I look forward to lending my expertise to help grow the business, while providing innovative solutions for the next generation of defense and security applications," Custer said.

SCHOTT is a high-tech supplier to the defense industry, with fiber optics, optical glass, electronic packaging, and armor expertise. Given its history and role as a leading technical glass supplier, with more than US\$150 million spent annually in R&D, SCHOTT is uniquely positioned to provide defense customers with the highest-quality innovative glass components that address their complex challenges.

TECHNOLOGY

NASA-supported project uses fiber-optic sensors

Fiber Optic Systems Technology Inc., a developer of patented non-intrusive sensing systems, announced that the US Patent and Trademark Office (USPTO) has awarded the company a fiber-optic impact damage-detection system patent, designed to monitor impact damage for airplanes, satellites, and manned spacecraft.

The patent covers a sensor system that uses fiber optics to determine the location and severity of damage to vehicles caused by high-energy micrometeoroids or orbital debris (MOD).

"This patent adds strategic value to our intellectual property portfolio and extends our reach into the commercial and strategic aviation and aerospace markets," FOX-TEK's vice president of engineering and operations, Dr. Don Morison, said.

Spacecraft traditionally use bumper shields and energy-absorbing materials to minimize the damage to vital areas caused by MOD impacts, but are typically still unable to sense MOD damage when it occurs.

Through a research project supported by the NASA Johnson Space Center in Houston, Texas, FOX-TEK's team of engineers developed a sensor system based on the company's patented fiber-optic monitoring system used for terrestrial infrastructure projects like pipelines and bridges. The new sensor system used optical fibers that are mounted on or within a structure and then linked to a detection system that accurately locates and measures damaged areas.

According to the USPTO, FOX-TEK's impact detection system is the only system in its class that precisely determines the location and direction of impact, the size of the object, and the extent of the damage.

"We're providing the aerospace industry with a mission-critical solution that far surpasses the limitations of current systems," FOX-TEK's president and CEO, Dr. Essam Zaghloul, commented.

"Our fiber-optic sensor systems have gained widespread acceptance throughout the oil and gas pipeline industry, and we expect to continue to enter new markets," he added.

MERGERS AND ACQUISITIONS**Lancer Systems buys units from Greene Tweed**

Lancer Systems LP has purchased the defense and fiber optics businesses of Greene Tweed & Co. Inc., which had developed the units to access commercial opportunities for its materials in the defense market. Lancer intends to build on the units through its assembly and electronics packaging technology. It will continue its materials relationship with Greene Tweed to strengthen its presence in defense and fiber-optic applications. Both companies are based in Kulpsville, Pennsylvania.

BAE Systems to acquire Armor Holdings

On May 7, 2007 Armor Holdings Inc., a diversified manufacturer of branded products for the military, law enforcement, and personnel safety markets, announced that it has entered into a definitive merger agreement to be acquired by BAE Systems Inc., an American subsidiary of the British defense conglomerate BAE Systems PLC. BAE has agreed to acquire all of the outstanding stock of Armor Holdings Inc. for \$4.1 billion, or a price per common share of \$88.00 through a one-step merger.

Following conversion of its 2.00 percent Senior Subordinated Convertible Notes, AH will have 41.638 million fully diluted shares. This means that BAE will be paying \$3.66 billion for shares and assuming or replacing about \$440 million of debt, for a total Enterprise Value of about \$4.1 billion.

Jacksonville, Florida-based Armor Holdings has ttm revenue of \$2.80 billion and EBITDA of \$329.15 million. At an Enterprise Value of \$4.1 billion, BAE is paying 1.46x revenue and 12.46x EBITDA.

Word of the impending transaction may have leaked, as trading volume and price began to sharply escalate during the week preceding the announcement. The ending share price on May 1 was \$70.69. At the Friday close prior to the announcement before market open on May 7, it had climbed to \$82.15. Thus, while the premium appeared to be only 7 percent, it was in fact nearly 25 percent from the close on May 1.

Recently, BAE, the parent company, announced they were raising \$1.5 billion in a share placing to help fund this acquisition. The balance will be funded by cash on hand.

Armor Holdings was created in 1996, focusing primarily on body armor for law enforcement. Through a steady string of acquisitions, the company added businesses that include safety seats for military pilots, private armored cars, and police equipment such as handcuffs. In 2006, it bought Stewart and Stevenson Services Inc., a prime military contractor for wheeled vehicles.

The Rockville-based BAE Systems Inc. subsidiary already has roughly \$10 billion in annual sales, and the company predicts that the addition of Armor Holdings will increase US sales by \$3 billion. Its operations include the design, manufacture, and maintenance of military aircraft, submarines, surface ships, avionics, radar, electronics, and weapons systems, and it also provides IT services.

Warren B. Kanders, chairman and chief executive officer of Armor Holdings Inc. said, "We are exceptionally pleased to join forces with BAE Systems plc, a global leader in the defense industry. We would like to thank our shareholders for the constant support they have shown our company through numerous transactions and business initiatives that have enabled us to deliver superior investment returns. Importantly, we would also like to thank our management team and our Board of Directors for their dedication and stewardship over the years."

Robert R. Schiller, president of Armor Holdings Inc., commented, "We are excited to move this business to the next phase of its development. We have no doubt that BAE Systems will place the needs of our customer and those of the men and women in uniform who depend on our products at the center of their ongoing effort. We owe a special thanks and a deep debt of gratitude to each of our over 8,000 employees around the world. Their tireless commitment to excellence and innovation has and will continue to make this organization strong for many years into the future."

Commenting on the proposed acquisition, Mike Turner, BAE Systems' chief executive said, "Armor Holdings is a strong business with an excellent track record and a highly regarded management team. The combination of Armor Holdings with BAE Systems' existing land systems business will strengthen our capabilities to the benefit of the US and UK armed forces and their international allies."

The deal is scheduled to close in the third quarter, but must first pass antitrust review and scrutiny by the Committee on Foreign Investment in the United States, which reviews transactions that could have national security implications.

SBIR/STTR CONTRACTS 2006

The following are among the fiber-related SBIR/STTR contracts let in 2006. The remaining 2006 contracts will be included in future issues of MAFO.

Accurate Damage Location and Identification in Composite Structures with Portable Unit

Current nondestructive methods for assessing structural damage and cracks/delaminations on aircraft are cumbersome and require rigorous time-consuming testing. To overcome the limitations of conventional nondestructive inspection/evaluation, Intelligent Optical Systems (IOS), in collaboration with Professor Ajit Mal of the Department of Mechanical and Aerospace Engineering at the UCLA School of Engineering, proposes to develop a novel diagnostic/prognostic ultrasound imaging system for determining the location and degree of structural damage in composite aircraft materials. The proposed damage identification system will integrate damage data from an array of fiber Bragg grating (FBG) sensor receivers with UCLA's autonomous data analysis and identification system to develop a field-usable, portable damage identification system. The sensor array will detect micro-amplitude high-frequency vibrations in surfaces of large composite aircraft components, simultaneously, to detect damage in multiple locations. Microscopic fiber transducers are optimal for dense-gridded structural damage location in aircraft. In Phase I, IOS will demonstrate feasibility with FBG-based receivers on test composite panel structures and validate UCLA's damage detection models. In Phase II, a complete working system will be implemented in a dense receiver array, to provide accurate damage location on actual components.

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Cold Atom Optical System for Space

We intend to develop a compact and robust diode laser system suitable for generating Bose-Einstein Condensation samples for spaced-based atom interferometers being developed for inertial navigation systems. Currently, the laser systems required are very complicated and can easily fill an optical bench. Four separate wavelengths are required for magneto-optic trapping, repumping from dark states, optical pumping of the samples, and probing of the final condensate. In phase I, we will demonstrate a laser technology that exhibits reliable autonomous locking and agile frequency-offset locking of a slave laser to a master laser. In phase II, the laser system will be packaged into a portable, space-qualified, self-contained system. The system will be completely fiber coupled with at least 200mW of 780nm optical power available at the output. The offset locking will be performed without acoustic or electro-optic modulators, thus reducing the complexity of the system and power requirements. The laser system will be entirely solid state with no moving parts.

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Electrohydraulic Actuator Control System Using Flight-hardened Fiber-optic Sensors

Luna Innovations proposes to develop a flight-hardened fiber-optic sensor system for the measurement of pressure, temperature, current, voltage, rotary position, and linear position. The purpose of this system is to provide control feedback for electromechanical and electrohydraulic actuation systems on aircraft. Sensors will be completely EMI immune and are an enabling technology for emerging fly by-light flight control systems. The 12-channel system will be optimized for weight, volume, and power consumption appropriate to a flight environment. It will be insensitive to variable losses in the fiber network, as well as to time/temperature effects on the internal optical components, including sources and detectors. Sensors will be based on Luna's patented technology, and will provide extremely high-fidelity measurements. During the Phase I project, prototype sensors will be designed for implementation within an electromechanical actuator system. Sensor compatibility with the prototype readout system will be verified. During the Phase II project, Luna Innovations will work with an actuator OEM and will design sensors for direct integration into the actuator. Additionally, a miniaturized readout system will be built and tested. The sensors developed during this program will advance the state of the art in actuator control by providing a high-speed, EMI-immune instrumentation suite.

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Low-cost, High-performance Inertial Rate Sensors

Defense systems such as the Space Based Infrared Systems (SBIRS) High and Space Tracking and Surveillance System (STSS) require extremely high-resolution line-of-sight (LOS) stabilization and extremely accurate inertial pointing knowledge. Key to mission objectives are ultrahigh-performance inertial rate sensors to provide absolute inertial LOS knowledge and low-frequency sensor information to support control system LOS stabilization for the pointing and tracking system. IFOS, with a team having many years of pioneering experience in fiber-optic gyroscopes (FOGs), proposes FOG development to meet space, particularly SBIRS High and SSTS, specifications. To meet the stringent SSTS requirements on minimal scale factor error and angular random walk as well as achieve the required angular rate and angular acceleration capabilities, IFOS will exploit innovative techniques including new components, coil production methods, and control techniques. Phase I will focus on design and the production of a proof-of-concept FOG. In Phase II, IFOS will work with Lockheed Martin on design optimization for SBIRS High/SSTS and design and fabricate four engineering prototype FOGs.

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Blue-green Laser for Undersea Communication

Aculight proposes the development of a blue-green laser system for underwater communications. The laser comprises a hybrid system in which a directly modulated 1064nm semiconductor laser is amplified in a multistage Yb-doped fiber amplifier and subsequently frequency doubled in non-critically phase match LBO crystal. In the phase I program, all key specifications will be demonstrated in a laboratory breadboard. We will demonstrate >10W output power at or around 532nm with pulse durations in the range 0.5-5.0ns and pulse repetition frequencies (PRF) in the range 100kHz-10MHz. The proposed architecture, which overcomes the PRF, size, weight, and efficiency limitations of current laser technologies, is ideally suited to the requirements of the solicitation and to the targeted deployment environment. In a Phase I option, we will operate our seed laser in a single frequency regime as required by the primary application. The option experiments will enable us to bridge the Phase I demonstration to a Phase II deliverable with minimal difficulty. The Yb fiber amplifier at the heart of the system is based around an established pulsed fiber laser product platform which will form the basis of the packaged laser delivered by Aculight in the event of a Phase II award.

Benefits:

High-power lasers have many potential applications in DoD systems. The proposed application for underwater communication represents a significant opportunity for Aculight. With the rapid increase in UAVs and UUVs, and the corresponding requirements for compact, efficient, and lightweight laser sources, we see the potential for an important and sizeable market. In addition to communications, Navy missions such as mine detection and other optical technologies that utilize blue-green lasers could also benefit from the development of the laser system. Aculight's

business philosophy is to target dual-use technologies that have both military and volume commercial applications. The proposed high-power green laser combining high power and high brightness with low signal noise at high repetition rates has a great potential to replace existing mode-locked DPSS lasers and directly modulated LDs for medical, material processing, and defense applications, such as micromachining, marking, and semiconductor processing.

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High-power Optical Amplifier

The objective of this proposal is to develop innovative highly reliable HPOA for free-space laser communications-based SATCOM operating over broad ranges of temperatures and of radiation environment. The Phase I effort is focused on investigating the feasibility of manufacturing of such a HPOA by means of simulating and designing the amplifier for the desired optical specs as well as modeling and designing optic/electronic components and packaging for the required reliability specs. Our proposed design is based on two-stage rare earth doped fiber amplifier. The first stage is a pre-amplifier with a low noise figure (i.e. 3dB), while the second stage is a high-power amplifier based on a doped double-clad fiber that would provide high output power (i.e. >500mW) in saturation when pumped with multimode pumps. In order to meet bandwidth requirements of 1500nm and 1450nm in addition to 1550nm, the HPOA designs based on amplified spontaneous emission filtering in Er/Yb doped and based on Thulium double-clad fiber will also be investigated for 1470-1520nm and 1450-1480nm, respectively. The proposed HPOAs consist of COTS components that have been widely used in telecommunications with proven reliability in terms of power handling and lifetime. In addition to Telcordia standards where the minimum operation temperature is 0 degrees C, pump lasers' temperature controller circuitry will be modified to accommodate an operation temperature down to -40 degrees C utilizing our patented ultralow-power consumption circuitry designs as means to minimize required operation power and associated thermal management issues. The proposed aluminum/PolyRAD packaging will be modeled and designed utilizing the radiation modeling code, NOVICE, to meet the radiation shield specs, as well as utilizing thermal modeling tool, COSMOSM, to provide thermal management. The projected dimensions and weight of the proposed HPOA are 15x12x4cm³ and 1.8lb, respectively.

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Space-qualifiable 1064nm Fiber-based Transmitter for Long-range Optical Communications

Fibertek has developed transmitters for Lidar and 3D imaging applications based on fiber optics architectures, both at 1064nm. We have demonstrated an all-fiber transmitter producing as much as 15W at 10Kpps. This all-fiber-based transmitter produces pulses at 1064nm as short as 750ps and can have its repetition rate varied from 10Kpps to several 10s of Mpps. In addition, the transmitter central wavelength can be tuned. The space-qualifiable 1064nm transmitter we propose here for long-range communication is based on these development efforts. We propose here to extend the operation of our architecture to 150ps pulses and demonstrate the front end during the Phase I portion of this effort, operating between 1Mpps and 60Mpps. We will also work to maintain near transform limited pulses and as high wall-plug efficiency as possible. An engineering unit, designed with space-traceable electronic components, will be delivered at the end of the Phase II portion of this SBIR effort.

Potential NASA Commercial Applications

In the not so distant future, both commercial and military communications will require high-bandwidth inter-satellite links (ISL), air-to-air communications nodes, and fixed site free-space local communications networks. Fiber technology will be crucial in developing a global satellite communications backbone that can be used to cost-effectively move information globally. With the continuing improvements in dense wavelength division multiplexing (DWDM) providing as much as 5Tbps transmission over a single fiber, efficient, compact high-bandwidth laser ISLs will be necessary to cost-effectively compete with terrestrial/transoceanic fiber cables.

Potential Non-NASA Commercial Applications

The transmitter developed under this program has numerous applications for ranging and target identification. The ability to modulate pulses at different rates and different pulse durations will also provide a wide range of opportunities in free communication, from undersea when the frequency of light is doubled, to military inter-satellite communications.

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High-speed Fiber-optic Micromultiplexer for Space and Airborne Lidar

To address the NASA Earth Science Division need for high-speed fiber-optic multiplexers for next-generation lidar systems, Luminix proposes to develop a new Fiber-optic micromultiplexer (FOMM) based on InP/InGaAsP photonic integrated circuits (PIC) and digital optical switches (DOS). This approach makes innovative use of a modular expandable binary tree architecture for robust high-speed switching with a new application of the latest PIC and DOS technology. This approach enables us to design a lightweight (200g), compact multiplexer that consumes only 1A of electricity and can switch a fiber-coupled NIR laser transmitter among 16 single-mode fiber outputs in 4ns while consuming only 5W of electricity. In Phase I, Luminix will demonstrate the feasibility of ~20ns switching and ~1W laser power with a proof-of-principle 1-to-4 FOMM that has three electro-optical fiber switches, which will reduce the development risk of a Phase II 1-to-16 prototype that incorporates the PIC/DOS technology. The demonstrated results will offer NASA enhanced return signal and image resolution for lidar systems.

Potential NASA Commercial Applications

The proposed 1-to-16 FOMM will lead to the creation of a fiber-based fixed-array laser transmitter that, combined with a fiber-arrayed detector, can form a laser image with a shaped field of view for an enhanced lidar return signal and image resolution. Monolithic integration, high reliability, low power consumption, light weight, and hermetically sealed mini-packaging will make the device suitable for next-generation space and airborne deployment.

Potential Non-NASA Commercial Applications

In addition to its use as an electro-optic switching array for NASA lidar, the 1-to-16 FOMM device will have competitive advantages in the areas of optical remote sensing and environmental monitoring. In addition to lidar applications, the proposed 1-to-16 FOMM device will be useful in fiber-optic communications and applications requiring all-fiber switching and multiplexing of high-power lasers.

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All-optical High-speed Fly By-Light Sensor Suite

Lambda Instruments Inc. proposes to investigate the feasibility of implementing an integrated suite of high-speed multimode optical fiber-based linear/rotary position, temperature, current/voltage, and pressure sensors. The proposed sensor suite builds upon in-house patented/patent-pending technology under development at Lambda and its subcontractors specifically in the area of optical fiber sensors and support optoelectronics for in-flight avionic applications. The development team's proposed suite of sensors employs absolute read-output capability that offers the benefit of continuous, accurate measurements in the presence of wide optical power fluctuations due to system power cycling, repeated optical fiber connector matings during maintenance, optical fiber source drift, and fiber bends/kinks. In addition, the proposed sensor suite employs an advanced WDM approach that significantly reduces the requisite amount of optical fiber cable between the VMSC and sensor sites. The core of the proposed WDM system consists of a proprietary miniature wavelength-router originally developed by Lambda engineers for in-flight displacement sensing within missiles where the extremely high g forces encountered during missile flight prevents the use of off-the-shelf miniature optical spectrum analyzers (OSAs) and commercially available telecom components.

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CONFERENCE**Avionics, Fiber-Optics and Photonics Technology Conference**

October 2-4, 2007, Victoria, BC, Canada

The aerospace industry has made great strides in recent years deploying fiber optics and photonics technology on commercial and military platforms. This trend will continue to grow as avionics fiber-optic system architectures, networking schemes, and components evolve and mature. In parallel with data and video transmission, photonics technology for analog/RF, flight control, free-space communication, and vehicle-monitoring applications will have an increasing role in future aerospace platforms. This application-oriented conference will provide a common international forum for leaders, researchers, engineers, technicians, logisticians, manufacturers, and instructors to convene and discuss all aspects of severe-environment fiber-optic component, systems, reliability, maintainability, producibility, and supportability technology, and its future direction.

Topics of interest include the following:

- Avionics and Vetrionics Fiber Optics and Photonics Technology Synergies
- Avionics Architecture/Networking and Standardization for Aerospace Systems
- Advanced Digital and Analog/RF Avionics Fiber-optic Networking and Transmission Systems
- Integrated Optics for Harsh Environments
- WDM Optical Components for Harsh Environments
- Optical Components for Analog/RF Signal Transmission and Distribution in Harsh Environments
- Fiber-optic Transmitters and Receivers (Transceivers) for Digital Avionics Systems
- Fly By-Light Components, Sensors, and Systems
- Integrated Vehicle Health Monitoring/Prognostic Health Monitoring Optical Components, Sensors, and Systems
- Commercial-Off-The-Shelf (COTS) Fiber Optics and Photonics Technology Insertion
- Digital and Analog/RF Aerospace Fiber-optic System Engineering and Link Loss Power Budgeting Methodologies
- Optical Fiber, Connector, Terminus, Cable, and Splice Solutions for Harsh Environments
- Free-Space Optical Communication / Optical Telemetry in Harsh Environments
- Aerospace Optical Information Assurance
- Specification, Standardization, and Qualification of Aerospace Fiber-optic and Photonic Components
- Fiber-optic and Photonic Component Testing, Screening, and Packaging Ruggedization for Aerospace
- Avionics Fiber-optic Component, Link, and System Built-in-Test / Health Diagnostics
- Modeling and Simulation of Aerospace Fiber-optic Components, Links, and Systems
- Fiber-optic Supportability, Maintainability, Producibility and Training for Aerospace
- Avionics/Aerospace Fiber-optic Component and System Reliability
- Onboard Subsystem and System Concepts, Demonstrations, Developments, and Deployments

Paper Submission deadline is May 30, 2007

Hotel reservation deadline is August 29, 2007

Pre-registration deadline is September 3, 2007

<http://www.ieee.org/organizations/society/leos/LEOSCONF/AVFOP2007/index.html>