



David Smallwood to Receive the 2004 Melvin L. Baron Award

David O. Smallwood has been selected to receive the 2004 Melvin L. Baron Award. His selection is *"in recognition of a lifetime of outstanding leadership in shock and vibration, sustained technical excellence, and major contributions to the advancement of understanding structural response to shock and vibration."*

The Mel Baron Award is one of the most prestigious awards given by SAVIAC. The award is given on an annual basis to a person who has made outstanding contributions to the field of shock and vibration. These contributions can be in

the form of written publications, oral presentations, or other specific actions that have advanced the understanding and application of computational methods for structures, and/or modeling of shock effects on structures. The Award may also be given in recognition of an individual's lifetime achievements whose cumulative effect has been to advance the state of the art in the field.



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The 75th Shock & Vibration Symposium Featured Organizations

Naval Surface Warfare Center Dahlgren Division

The featured government agency for the 75th Shock & Vibration Symposium is the Naval Surface Warfare Center Dahlgren Division (NSWCDD). Dahlgren Division, one of six NSWC divisions, is comprised of three major sites: (1) Naval Surface Warfare Center, Dahlgren Laboratory (NSWCDL) in Dahlgren, Virginia; (2) Coastal Systems Station (CSS) in Panama City, Florida; and (3) Combat Direction Systems Activity (CDSA) at Dam Neck in Virginia Beach, Virginia. All three NSWCDD locations will be participating at this year's Symposium.

NSWCDL was established in 1918 as the Navy's chief proving ground for large caliber guns and named Dahlgren in honor of Rear Admiral John Adolphus Dahlgren, the father of modern naval ordnance. CSS had its origin in the mine countermeasures research conducted during World War II at the U.S. Naval Mine Warfare Test Station located at Solomons, Maryland. In 1945, equipment, facilities, and personnel were transferred to Panama City, Florida. It was designated as part of the Dahlgren Division in 1992. The

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Northrop Grumman Newport News

Newport News is one of seven business sectors of Northrop Grumman; the others are Electronic Systems, Information Technology, Mission Systems, Ship Systems, and Space Technology. We featured Ship Systems at the 72nd Symposium in Destin, FL and look forward to featuring a number of the other sectors at future Symposia. Newport News was last featured at the 68th Symposium in Monterey, CA as the first non government entity featured. Headquartered in Newport News, Va., they are the nation's sole designer, builder, and refueler of nuclear-powered air-

PCB Piezotronics, Inc.

Any idea what the PCB in PCB Piezotronics, Inc. stands for? Well stick around as I tell you about this year's Featured Company and you'll soon find out. PCB is headquartered in Depew, NY, a suburb of Buffalo, and also the home of its factory. PCB was founded in 1967 by Jim and Bob Lally to pursue the application of microelectronics to piezoelectric sensors. Jim and Bob were also among the founders of the original Kistler Instrument Company in 1955. They now consist of The Modal Shop, Oceana Sensors, Larson Davis, and STI Technologies under the PCB Group name. They are divided into five divisions; Vibration, IMI Sensors, Force/Torque, Pressure, and Electronics, each division operating as a separate business unit to ensure that the customer is always working with the people most knowledgeable for the application. There are approximately 580 people employed by the company, of which 450 are at the Depew site, with 194 in the production end. In the past year they hired 100 new employees.

I was met at the airport by Jim Sullivan, PCB National Sales
PCB continued on page 7

craft carriers and one of only two companies capable of designing and building nuclear powered submarines. Newport News also provides after-market services for a wide array of naval and commercial vessels. The Newport News sector employs about 19,000 people.

Northrop Grumman Newport News' corporate life began as the Chesapeake Dry Dock & Construction Company, chartered in 1886 by railroad magnate Collis P. Huntington to repair ships servicing his trans- **NGNN, continued on page 2**

portation hub. The first ship delivered was a tugboat named Dorothy. By 1897 they had built three warships for the U.S. Navy. Prior to WWI they built 6 of a total of 22 dreadnoughts and they began building carriers in the 1930s. During WWII over 31,000 employees built 239 Liberty ships, seven carriers and four cruisers. The Navy awarded them the prestigious "E" pennant for excellence in ship construction. After WWII they moved into nuclear power, partnering with the Navy to design the first supercarrier, the Enterprise and the submarine, Shark. During the Cold War they merged with Tenneco and expanded operations with a new yard where they built three liquefied natural gas carriers, the largest ever built in the U.S. at over 390,000 deadweight tons. They were spun off in 1996 to concentrate on aircraft carriers and submarines but merged with Northrop Grumman in 2001 as part of the defense consolidation.

I started my visit with a tour of the shipyard with Bob Marshall and Chris

Campbell of the Central Shock Group. We saw the George H W Bush, CVN-77, the 10th Nimitz class aircraft carrier. This 97,000 ton vessel is about 25% complete. We also saw the USS Eisenhower, in port for refueling and the Texas (SSN 775), the second in the Virginia class, christened in the summer of this year. Newport News has the biggest crane in the free world, a 900 metric ton monster. They are currently completing design work on the third SEAWOLF, the Jimmy Carter, which will be delivered by General Dynamics Electric Boat to the Navy in 2004. They are also working on four additional Virginia class submarines (the Hawaii, North Carolina, New Hampshire and one unnamed submarine) and one aircraft carrier.

The next day I met Travis Kerr, this year's Program Committee Co-Chair, who took me to see Mike Duman, Director, Technical Division. Mike has 350 engineers and designers providing direct support to various programs. A principal function of his Central Shock Group is to manage the

new generation aircraft carrier, CVN 21, shock work. This is of particular importance because the CVN 21 shock requirements being decided upon today will be used for the next 50 years. At the conclusion of the construction planning contract, which runs thru 2006, the shock requirements will be set. Building a carrier can be a logistics nightmare, requiring unique skills to buy other people's equipment and integrate into a ship. Newport News does the main systems and since they rely on vendors they must be sure to convey the requirements to the vendors and support and train the vendors, especially in the shock area. Mike is not a stranger to shock, his first assignment out of school at Newport News in 1982 was a DDAM analysis to support the SSN718 Split Stern Planes design change.

Travis is an engineer in the Central Shock Group led by Bob Marshall. The group is responsible for UNDEX response (whole ship model), whipping and close in UNDEX calcula-

origin of the CDSA can be traced back to 1963 when the U.S. Navy established the Fleet Computer Programming Center on the Dam Neck Naval Base as the first tactical software command. Following a number of name changes and organizational realignments, CDSA was established as an Echelon V Command in December 2000 and aligned with the Dahlgren Division.

NSWCDD holds 17 technical warrants and supports 13 others. They support 6 of the 12 NAVSEA product areas and are a principal research and development, and test and evaluation facility for the US Navy. NSWCDD helped research, design, develop, and test the 16-inch battleship gun, the famed World War II Norden bomb-sight, and the forerunner of the modern computer. NSWCDD's web site (www.nswc.navy.mil) has links to information for all three sites.

I started my research of the Dahlgren Division with a visit to CDSA to check out the rooms for the classified ses-

sions at the Symposium. While there I talked with Tom Sides, Head of the Systems Management, Engineering, and Analysis Branch, who has been at CDSA for 5 years. Previously, he worked at the Underwater Explosions Research Division for 12 years. Historically, CDSA has been responsible for the software and hardware used to control the combat systems on non-AEGIS U.S. Navy ships. A Systems Engineering approach is applied to the evaluation of current and future Naval combat systems to ensure servicemen and women have the best equipment possible. Two big concerns addressed by CDSA are the obsolescence of equipment and verifying the capabilities of equipment from the vendors. Additionally, because of the importance of inter-service or "Joint" warfare, CDSA is focusing on interoperability and maintaining a connection to the Joint Forces Command (JFCOM). The unique geographic location of Dam Neck provides CDSA with access to a fully instrumented live test range. The facility has access to live feeds from all types of U.S. Navy Radars.

I also talked with Dr. Dale Bloodgood, who just finished designing a hardened Peripheral Control Console. Dale as been an active participant at the Symposium since he completed his Ph.d work three years ago in Mechanical Engineering at Old Dominion University.

Although I've been to CSS many times and was most recently there for the Winter TAG meeting in February, I did the interviews over the phone with Jeff Blankenship. It was done this way because the guys there are so busy it wasn't possible to catch them earlier. Jeff is the former SAVIAC Director and is currently involved in shock mitigation as an electronics engineer. He is part of an environmental test lab that has 21" and 15" air guns used for water entry impact (2 phase shock) and has a limited displacement tester (LDT) for simulating nearby underwater explosion (UNDEX) events.

Jeff told me about the Shock Mitigation Project, lead by Dr. Ron

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75th Shock & Vibration Symposium Exhibitor Highlights

Exhibits will open this year on Tuesday, October 19th at 11:30 am, immediately following the Opening Session, for the Exhibitor's Luncheon and will remain open until 5:00. The area will reopen on Wednesday morning at 7:30, closing at 5:00 pm to enable the hotel to set up for the evening networking event in the Exhibit Hall from 7:00 - 9:00 pm. All breaks will be held in the Exhibit Hall.

To date, the following companies and organizations will be exhibiting. All exhibitor information is provided by the exhibitors. SAVIAC has performed minor editing.

ATA Engineering

ATA Engineering, Inc.'s (ATA) mission is to be the leading provider of analysis-driven and test-driven design of mechanical, electro-mechanical, and defense products. ATA's highly experienced staff uses a multi-disciplinary team approach, coupled with computer-aided engineering software and hardware, to provide innovative solutions to mission critical mechanical engineering problems.

Bruel & Kjaer

Bruel & Kjaer and its many partners will be exhibiting a wide range of vibration test equipment. Each link of the measurement chain will be exhibited: Endevco transducers (like the popular 66A mini triax accel with TEDS), Tira shakers (up to 22,000 force pounds), Vibration Research Controllers (with advanced Field Data Replication), and Bruel & Kjaer Analysis Equipment (PULSE Multi-Analyzer - over 6000 sold worldwide!). Stop by our booth to get a live demonstration or sign up for our new 2004 Master Catalog CD ROM.

Data Physics Corporation

Data Physics has been supplying high performance solutions in signal processing to the noise and vibration community for the past 20 years. The recently introduced scalable DSPcentric signal analysis engine, Abacus, provides a single platform uniquely suited for high-end data acquisition, realtime signal analysis and vibration control applications, from 8 to 1024 of channels. Come by our booth and discover why Abacus has already captured the imagination of users such as Boeing, ITT and NASA.

With the recent addition of a full line of electrodynamic shakers to complement its vibration controllers and dynamic signal analyzers, Data Physics is a total solution supplier for shock & vibration applications. More information is available at www.data-physics.com.

Enivate, Incorporated (formerly Enine Aerospace)

Enidine will be on display with the industry's broadest array of shock absorption and vibration isolation products for defense applications, including hydraulic, elastomeric, wire rope, and mechanical designs. Enivate can solve your shock & vibration isolation problems in the areas of shipboard shock, mobile electronics, engine isolation, noise attenuation, transportation/shipping and more. Let our world-class engineering and innovative designs "make your ride a little smoother." Visit Enivate at the SAVIAC exhibition area or at www.enivate.com.

General Dynamics Electric Boat Corporation

Electric Boat is a technology-oriented corporation that supports shock design, analysis and qualification of all major submarine systems with a variety of engineering, design and construction services. These services include shock design/analysis/qualification of structures and equipment, test vehicle fabrication, overall preparation for testing and simulation of test conditions. Electric boat has greatly advanced the state of the art of shock analysis by transitioning technologies and by developing validated methodologies, which are being used in the shock design and qualification of equipment and structures for modern nuclear submarines. The display and videos illustrate some of the engineering, design, construction and technology development activities that Electric Boat has performed for the U. S. Navy. Synergies of these capabilities with other General Dynamics operating units will also be displayed.

HI-TEST Laboratories, Inc.

Since 1975, HI-TEST Laboratories, Inc. has been an innovative leader in

the shock and vibration community. HI-TEST is the nation's only facility that provides the full range of NAVSEA approved MIL-S-901 shock testing as well as MIL-STD-167-1 vibration testing all at one convenient location. Our unrestricted local testing allows for 24/7 service!

LMS North America

The next revolution in LMS test, LMS Test.Lab is an integrated software suite for Noise & Vibration Testing and Engineering. Test.Lab covers both laboratory based and mobile testing applications, and is fully integrated with the LMS SCADAS III measurement front-end. More specifically, within LMS Test.Lab is the Environmental Testing product family, which performs vibration control (also known as "vibco") tests, including: Random Control, Sine Control, Shock Control and Multi-Axis Random Control. We will also be featuring T-Mon; A tightly integrated toolbox for editing and analyzing time data, speeding up the data reduction process; the LMS Test.Lab Operation Deflection Shapes (ODS) & Time Animation workbook (as part of the structural testing product family), which is designed to investigate the deflection shapes of structures in operational conditions, using either time or frequency domain data.

m+p international

m+p international is a worldwide provider of systems and software for noise and vibration measurement and analysis, emission testing, and process monitoring. From production to research, 1 channel to 192 channels, control, acquisition or analysis, Windows NT/200/XP or Unix, m+p has your system and software solutions. Available for demonstration will be m+p's complete line of vibration control, data acquisition, and analysis systems, including the new Smart Office Acoustic Acquisition and Analysis Wizard.

National Technical Systems

National Technical Systems is a full service independent environmental testing lab with locations throughout the US. Dynamics is our specialty. We

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Exhibitors, continued from page 4

provide vibration, shock and acceleration testing to specifications such as MIL-S-901D, MIL-STD-167-1, MIL-STD-810, MIL-STD-202, GR-63, and IEEE-344.. In addition, NTS offers R&D and specialized testing such as true pyro-shock capabilities to 100,000 g's, dual shaker vibration, multi-axis vibration, ED shakers to 45,000 F-lbs, modal analysis, and consultation services.

Newport News Industrial

Newport News Industrial provides the C-Worthy™ Shock & Vibration Isolation Mount. C-Worthy™ Mounts provide superior characteristics to include higher damping factor and better balance between tensile and compressive deflection regimes. With our product we provide expert analysis and application engineering services to ensure each mount isolation selection performs consistent with company objectives.

Northrop Grumman Newport News

Northrop Grumman Newport News is the nation's sole designer, builder and refueler of nuclear-powered aircraft carriers and one of only two companies capable of designing and building nuclear-powered submarines. The company also provides after-market services for a wide array of naval and commercial vessels. For more information visit www.nn.northropgrumman.com.

NSWC Carderock

Carderock Division of the Naval Surface Warfare Center (NSWCDD) supports current and future navy ships & submarines, their components, and their assigned personnel in providing full spectrum R&D, design, testing and evaluation, aquisition support, and in-service engineering to improve Survivability through reduced Vulnerability and improved Recoverability. NSWCDD technical expertise spans supporting LFT&E, Survivability, Shock, and Damage Control/Firefighting.

NSWC Dahlgren

The Dahlgren Division is one of six divisions of the Naval Surface Warfare Center Enterprise. The Dahlgren Division is comprised of three sites: the

Naval Surface Warfare Center Dahlgren Laboratory, Dahlgren, Va.; the Coastal Systems Station, Panama City, Fla., and the Combat Direction Systems Activity, Dam Neck, Va. Dahlgren Division is a principal research and development, and test and evaluation facility for the United States Navy. Dahlgren Division holds 17 Technical Warrants and supports 13 others. The Division conducts analysis, systems engineering, research, test, evaluation, and integration of naval and joint warfare systems. As part of the Naval Surface Warfare Center Enterprise, Dahlgren Division supports six of the twelve Naval Sea Systems Command Product Areas: Surface Ship Combat Systems; Navy Strategic Weapon Systems; Ordnance; Littoral Warfare Systems; Homeland Defense and Force Protection; and, Force Level Warfare Systems. Within the NAVSEA enterprise, Dahlgren Division's business focus is full spectrum science and engineering across the life-cycle of Navy ships and systems for today's Navy, tomorrow's Navy, and the Navy after Next. And beyond the NAVSEA enterprise, NSW-CDD partners with NAVAIR, SPAWAR, and NAVSUP to provide a total Navy solution through world-class engineering support to the Navy's "Virtual SYSCOM." Overall, Dahlgren Division's mission is to strengthen warfighter readiness and operational superiority by providing superior technical capabilities, systems engineering rigor, professional integrity, and leadership to the Nation and its allies.

NSWC Indian Head

The Energetics Evaluation Department of the Naval Surface Warfare Center, Indian Head Division provides excellent expertise in Production Support, Energetic Characterization, Metallurgical Analysis, Quality Evaluation, Product Qualification, Ballistics Engineering and Testing, Detonation Technology, Combustion Technology, Non-Destructive Evaluation and Predictive Technologies. Manufacturing and testing of Insensitive Munitions and other products has been performed at Indian Head for the US Government, Military, Foreign Governments/Militaries and for Private Industries through Foreign

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Military Sales, Cooperative R&D Agreements, Technical Transfers, OMNIBUS and private party contracts.

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PCB Piezotronics, Inc.

PCB Piezotronics designs and manufactures a complete range of accelerometers, microphones, pressure sensors, force sensors, load cells, and torque transducers utilizing piezoelectric, capacitive, strain gage, and piezoresistive sensing technologies. PCB also offers TEDS sensors and accessories and precision condenser, prepolarized, array, and special purpose microphones for accoustic measurement.

Precision Filters, Inc.

Precision Filters Inc. specializes in a broad range of high performance instrumentation for test measurements including signal conditioning, switch matrix systems, VME/VXI conditioners and modules. The all-new 28000 System sets the standard for bridge conditioners with up to 64 channels of 300 kHz bandwidth amplifiers in a ruggedized package complete with Ethernet Interface.

SEM

The Society for Experimental Mechanics, Inc. (SEM) was founded in 1943 as a nonprofit scientific and educational organization. The Society is composed of international members from academia, government and industry who are committed to interdisciplinary application, research and development, education, and active promotion of experimental methods to: (a) increase the knowledge of physical phenomema; (b) further the understanding of the behavior of materials, structures and systems; and (c) provide the necessary physical basis and verification

Manager, and a newcomer to SAVIAC and the Shock & Vibration Symposium. Jim served as my guide during my time in Buffalo and at PCB Headquarters. Jim introduced me to a lot of remarkable people, so I'll use the rest of this article to bring you their stories.

My first interview was with Craig Aszkler, the Vibration Division Manager. Craig provided me an overview of the company as well as a tour of the facility. PCB has a 24 hour hotline, 716-684-0001, where you always get a live person to answer your questions or have someone get back to you within 30 minutes. This supports their mission statement "Total Customer Satisfaction", with an unconditional warranty on their products. In their core capabilities all work is done in-house and they have a well equipped machine shop that has been automated for high volume operations but can be manually operated for small runs. Their plant in Depew is over 100,000 square feet but its not enough, they are currently looking for more space.

PCB is always interested in new ideas in their core competencies of manufacturing and calibrating piezoelectric based sensors. New ideas do need a compelling business case to go forward though. They have a relationship with the academic world where they donate sensors that don't meet the specs but are good enough for most jobs.

This year PCB opened a design office in San Clemente, CA. They are working on piezoceramic manufacturing, MEMS based variable capacitive elements, repackaging piezoresistive MEMS elements, and fluid based piezoresistive sensors. The goal is to provide a well rounded mix of accelerometers to their customers.

Bruce Martha, Lead Vibration Engineer, has over 20 years experience in sensor design, 8 with PCB where he works on special applications and new product development. He and his engineering group take

existing technologies and modify them to make new products and also take the results of the R&D work to implement for manufacturing.

Dr. Jeff Dosch is part of the R&D Group. They work on projects that don't fit into a specific product group and also help out if one of the other groups needs help. Their long term research focuses on bringing new products on-line in the next 2 - 3 years. Jeff has developed a high frequency shaker to use for calibration in the 10 Hz - 10 kHz frequency range and is working on a laser calibration system to handle low frequency and phase. Currently, no one is accredited to do phase. Jeff participates on standards committees and is a frequent contributor to IMAC as well as the S&V Symposium.

John Kessler, Calibration Technical Manager, a veteran of 20 years, showed me the calibration lab. They do a pre-calibration where they take each sensor directly from the manufacturing area, check it against the specs, and return for rework immediately if it fails.

Mark Valentino lives for acoustics. He got into it as a sideline to his work as the top vocalist in the Buffalo area for the past four years. He is currently looking into 2-D pressure arrays to use for sound mapping for holography. They are developing new acoustic models of Prepolarized and Externally Polarized Mic's (High dB mic (192 dB, High Frequency (140Hz) and array stands and enhanced power supplies (0V & 200V).

Bill Andrews, Electronics Division Manager, is responsible for the signal conditioning and cables that support the sensors. PCB won't go into the data acquisition and analysis areas, but do provide the equipment to connect their sensors. They get into a lot of unique applications requiring custom solutions across the company.

My final interviews were with Jim Lally, who is semi-retired and acting

Chairman of the Board of PCB, and Pat Walter, both of whom I caught up with at the Transducer Workshop in Lexington Park, MD. PCB is successful because they have a long term outlook, no one is dependent on next quarter's earnings to keep his/her job. Jim encourages employee initiative and believes it is responsible for the growth of the company and the new technologies they have developed. OK, its time to answer the question, "What does PCB stand for?" No its not Pizza, Chicken Wings and Beer, it's the abbreviation for picocoulomb, coulomb being the quantity of electricity transported in one second by a current of one ampere and pico being 1×10^{-12} .

Pat Walter is a new addition to PCB. He joined them at the end of last year with plans to focus on technical articles, training and technical support. He is working with Dave Corelli at PCB to launch the "PCB Educator's Forum", to encourage information exchange among faculty and provide an educational resource. Look for more details in a future article in the newsletter.

PCB Piezotronics is working hard to make the 75th Shock & Vibration Symposium the best yet. Jim Lally will provide one of the Welcoming Addresses at the Opening Session. Pat Walter will help in presenting the Henry Pusey Award for the best paper presented at the 74th Symposium. Pat has also developed a tutorial, "The Measurement and Utilization of Valid Shock and Vibration Data" and a session on "Blast Overpressure". Bob Sill has a Training Session presentation, "Evolution of Piezoresistive MEMS Shock Accelerometers" as has Rick Lally, "Adaptive Systems for Machinery Health Monitoring". On the social side, PCB will have a Hospitality Suite on Sunday evening to welcome you to the Symposium and is teaming with HI-TEST Labs for a pig roast on the beach front deck on Tuesday evening. This is only a small snap shot of PCB Piezotronics, look for more information at the Symposium and in future articles here. I encourage you to stop by their booth and chat awhile.

tions, insuring that CVN-21 meets its shock requirements and providing innovative shock isolation and testing solutions.

Ernie Horeth, Engineering Manager, Submarine Engineering, Hull, Structures & Outfitting, is responsible for the structural design of the Los Angeles & Seawolf class submarines, supports the Virginia class construction, and is working on concept designs for new submarines. He has a staff of 26 engineers and 76 designers. He has been to the last three Symposia and plans to send 4-5 people this year. For him, the Symposium provides new ideas and his people will take the information presented at the Symposium and distribute it to the shipyard. SAVIAC provides contacts for him and his engineers and the ability to get together with peers in the industry.

John Zinskie, Engineering Manager, Signatures and Hydrodynamics, has 56 people; 15 in shock (the Central Shock Group); 18 in noise reduction; 11 in signatures modeling (non-

acoustic applications); 6 in hull treatments for the Virginia class; and 5 in survivability programs. The technical leads form a three legged stool; susceptibility or detection, vulnerability or the ability to absorb hits, and recoverability or the ability to restore systems. They are currently working on a shock qualification plan for CVN-21. Data management is a big issue in this plan in order to minimize cost both during construction and post delivery technology insertions. This time there will be a database to follow each ship, providing a pedigree for each item installed and documenting the as-arrived condition of the ship. His group uses government and Navy labs for testing and consultation, along with industry specialists. Facilities and experts at the nearby NASA Langley Research Center have also been utilized on occasion.

Bob Marshall and I talked over lunch. As the Engineering Supervisor of the Central Shock Group he plans to expand from 15 to 30 people in two years to support CVN-21. His group will act as a clearinghouse to reduce

Peterson, where CSS is investigating and providing solutions to reducing shock induced injuries to operators of small, high speed crafts. The Human Factors Group, led by Rich Roesch, is dedicated to solving Human Systems Integration (HSI) issues related to systems operating in the littoral region. Finally, the Environmental Test Facility, lead by Bill Fontaine, has the equipment and personnel that can collect dynamic data in the littoral environment; structure meaningful tests around this data; and perform simulated environmental tests within the laboratory.

I met Jamie Howell, SAVIAC TAG member and co-chair of the 75th Shock & Vibration Symposium Program Committee for a visit of the Dahlgren Laboratory. Jamie took me around NSWCDD to interview several people in different positions working on different programs. We started with Joe King, Principal for Safety for the Target Acquisition System MK 23 and the System Safety Engineer for

the MK 29 Guided Missile Launching System ordnance alteration (ORDALT). System Safety looks for personnel and equipment hazards over the full life cycle of a weapons system. System Safety is primarily interested in Shock & Vibration from a safety perspective, not from a performance viewpoint. System Safety is concerned with hazards associated with personnel safety and the successful completion of Hazard Assessment Testing (HAT) including MIL-STD-167-1 vibration and MIL-S-901 Grade B shock testing.

Keith Cook is the Head of Launcher Systems Branch (G21) and is an expert in the dynamics area. His group of 35 engineers is the engineering arm of the surface launcher program offices. There is a lot of emphasis on shock so he makes sure all of his engineers have taken the "Principles of Shock Analysis and Design" short course offered through SAVIAC.

Pat Rios is the NSWCDD Program

shock qualification costs. They also provide services to outside vendors supplying equipment for the carriers. These are just a few of the people at Newport News that attend the Symposium. Kevin Arden, a longtime TAG member, Jay Warren, an expert in shock, Kuangcheng Wu, vibrations, and Rick Griffen, Sarah Stagers and Robin Lawson, have all made valuable technical contributions to the field at past Symposia.

Northrop Grumman Newport News is providing Irwin F. Edenzon, Vice President, Technology Development & Fleet Support as the Welcoming Speaker. Travis Kerr will co-present the Henry Pusey Award for best paper presented at last year's Symposium. Last year this honor was won by Troy Tanner who wrote and presented the paper while employed by Newport News. They will also be chairing sessions, presenting papers and exhibiting. At the end of the Symposium I believe you will have a new appreciation for the complexity of the products Newport News produces and the skill sets required of its employees.

Manager for the Evolved SEASPARROW Missile (ESSM). He provides support for air frame and missile system qualifications for use on board ships. Some of the qualification efforts include shock, vibration, E³ and HAT including 40-ft drop testing. These efforts result in close coordination with WSESRB and SEA 05P3.

Karen Clotfelter, a Section Head in the Warheads Branch (G22), models and assesses shock to detonation of explosives with focus on insensitive munitions (IM) from a system perspective. She works with NSWCDD, Navy program offices and DoD contractors on internal magazine shielding. There are about 20 people in the division modeling with DoE codes such as CTH and ALE3D and commercial codes such as LSDYNA.

Next I tag teamed Frank Redding, Section Head, and three of his engineers, Dr. Carl Sisemore, Francky Louis and John Kirkpatrick. Carl is a regular participant at the Symposium and has a patent pending on a

method to do a full ship shock analysis without using millions of elements. Frank is mulling over the idea of doing a Discussion Group at this year's symposium to propose a challenge analysis problem, I'll give you more details as they become available.

I talked briefly with Barry Mohle, Head of Weapons Dynamics Branch (G64) prior to visiting the testing facilities. His group is comprised of about 35 people. Barry gave a brief overview of a Vibration MILCON effort currently underway. The primary focus of the new facility will be shipboard and transportation vibration of encanistered missiles. He agreed to co-chair the Products/Facilities session and will be arranging for a number of presentations on their capabilities. Next I went to see John Cullen, Senior Engineer and Tim Edwards, Instrumentation Engineer who also reside in G64. At the time of this interview, they were at the test vibration facility where they were positioning an encanistered missile on two new sets of shakers. This new capability reduced the set up time from three weeks to one week and saved 15,000 lbs of fixturing. It has a spherical coupling and yaw misalignment to prevent buildup of forces.

Next up was a windshield tour of the Potomac River Test Range (G61) or more commonly known as the "gun line" and a briefing on the capabilities by Richard Mason. The gun range sits on the straightest part of the Potomac River, and is the worlds largest overwater instrumented gun range at 20 miles long and 5 miles wide. There are six active ranges and they have one gun of every type in the

Exhibitors, continued from page 5

for analytical and computational approaches to the development of engineering solutions.

Shock Qualification Q&A Area

Get your shock qualification questions answered on the spot (NAVSEA Instruction 9072.1A and MIL-S-901D).

SpectraQuest

Spectra Quest designs and manufactures products for machine diagnostics, machinery fault simulators, multi-

fleet.

I was lucky to catch Bob Keen in between trips to Japan as he cleaned up his office to move to another building. Bob is also a member of the SAVIAC TAG. He has worked on environmental testing of Navy missiles, WOX (shock impact test machine) and even has a patent on an integrated launcher concept. Currently he has another office uptown in the Aegis Ballistic Missile Defense (BMD) Test & Evaluation (T&E) Program Office busy working on the Japan/US Cooperative Ballistic Missile Defense Research Project with the Japanese government completing a nosecone design followed by flight tests.

I interviewed Eric Wheeler, a mechanical engineer for the Launcher Systems Branch, and his efforts are focused primarily on shock and vibration tasks. Eric has recently been involved in the ESSM, Tomahawk (TACTOM) and Standard Missile (SM-3) shock and vibration qualification efforts.

Finally, at the conclusion of the day of interviews, I interviewed Jamie Howell who is the Weapons System Shock and Vibration Manager for the Launcher Systems Branch. He is currently the DD(X) Shock Manager and is the NATO SEASPARROW Surface Missile System (NSSMS) MK 57 Shock and Vibration Manager. He has been at NSWCDD for almost four years and, in addition to his current programs, he has worked on many other programs such as ESSM, Tactical Tomahawk, Standard Missile, MK 45 Mod 4 gun and USS Winston Churchill (DDG 81) ship shock trials.

channel DAQ with innovative analysis and modeling software, turn-key vibration systems, and cost effective software CDs for: vibration and signal processing simulation, design assist structural dynamics calculations, mechanics of materials, balancing and alignment.

Taylor Devices, Inc.

Taylor Devices, Inc. will again provide Symposium attendees the opportunity to obtain and display literature at the

Prior to transferring to NSWCDD, Jamie was the VIRGINIA Class Shock Systems Integration Team (SIT) Leader for almost two years. He has over twenty-two years of shock and vibration experience with emphasis on shock and vibration requirements development, shock analysis, shock and vibration testing and data assessments.

NSWCDD is working hard to make this year's Symposium a success. Jamie Howell is serving as the Program Committee Co-Chair and will co-present the Henry Pusey Award for best paper presented at the 74th S&V Symposium. Jamie is also co-chairing the Navy Shock Qualification Perspective Panel with Kurt Hartsough, NSWCDD Philadelphia and he is developing and chairing the Test Method Design & Validation Session. Dave Houchins, Ron Peterson and Eric Pierce are presenting three topics during the training track. Barry Mohle is developing and co-chairing the Facilities Session. Walter Hoye along with Ahn Duong, NSWC IHD are developing a thermobarics/new threat session. Ron Peterson is also developing and co-chairing with Tim Coats from NSWC-CD a session on "Repeated Mechanical Shock". Finally, Tim Edwards, chair of the SRS Committee, has put together a session to be followed by a Discussion Group featuring Kjell Ahlin and then a Committee business meeting Discussion Group. With all this I'm sure you'll leave the Symposium impressed with NSWCDD capabilities and expertise.

Shock & Vibration Literature/Information Table. This display area is available at no charge on a first come-first serve basis to small business firms and service organizations who are attending, but not exhibiting at the Symposium. Taylor Devices' products are used worldwide for energy absorption and control, damping, and isolation of components, systems and structures.

Mel Baron, continued from page 1

Demonstrated personal leadership in the shock and vibration community is an essential qualification for the Award. The Award was financed by a grant from Weidlinger Associates in memory of Dr. Melvin Baron for his technical contributions and leadership in computational structural dynamics and related specialties in the field of shock and vibration. Previous Award recipients are Dr. Eugene Sevin (1998), Defense Nuclear Agency (retired); Prof Ted Belytschko (1999), Northwestern University; Prof Walter Pilkey (2000), University of Virginia; Prof Thomas Geers (2001), University of Colorado; Mr. George O'Hara (2002), Naval Research Laboratory; and Dr. Ivan Sandler (2003), Weidlinger Associates.

Mr. Smallwood is a prolific contributor to shock and vibration measurement technology, and a strong supporter of the community and SAVIAC. He pioneered the use of multiple shakers for

characterizing the vibration response of large test items through an early innovative use of digital vibration control systems. He developed methods to synthesize transient shaker inputs to match a defined shock response spectrum (SRS). This was of critical importance to the weapon component qualification testing for which shock environments are specified in terms of the SRS. Mr. Smallwood developed efficient digital algorithms for the calculation of the SRS that became widely used. He was named a Distinguished Member of the Technical Staff in Sandia National Laboratory's environments engineering group where he continued the development of vibration and shock test techniques and methods to analyze and characterize shock and vibration environments until his retirement in 2003. Today, he is a private consultant, teaching short courses and working part time on contract for Sandia National Laboratories in the

Structural Dynamics Research Department.

Mr. Smallwood has published over 70 papers in the field of shock and vibration and has contributed sections to four books. He has two patents, is a Fellow in the Institute of Environmental Sciences and Technology (IEST), has received two awards for best papers from IEST, is a recipient of the Henry Pusey Award for the best paper at the Shock and Vibration Symposium, serves on the Editorial Board of two technical journals (J. of the IEST and Shock and Vibration), and was a member of SAVIAC's Technical Advisory Group, 1986-2003.

Further information on the award as well as nominations forms can be found at www.saviac.org/Awards.htm or by contacting SAVIAC at 301 596-0100.

Exhibitors, continued from page 8**TEAC America**

TEAC will exhibit the new LX Series solid-state Data Recorders, featuring removable Flash-Memory Card recording media, DC/IEPE input amplifiers, LAN or FireWire interface, and up to 32-channel configuration. Also exhibited will be the GX-1 Data Recording System, with AIT recording media, 200kHz ADC per channel, plug-in signal conditioning amplifiers, and up to 64-channel configuration. LX and GX data-file converters and device drivers to many popular analysis software applications are available.

Team Corporation

Team Corporation will be introducing several new vibration test systems specifically addressing the evolving needs of the military shock and vibration test community. The insertion of COTS equipment into previously qualified principle units has traditionally

required requalification per MIL-S-901. This re-qualification can now be accomplished in the lab, using TEAM's proven SSTS System. It has long been recognized that simultaneous excitation in all axes best represents field conditions. With TEAM's family of tensor products, it is now possible to control all axes to RkHz, simultaneously. To learn more about these innovative products, visit TEAM Corporation's booth in the exhibit area.

US Army Aberdeen Testing Center

The U.S. Army Aberdeen Test Center is a Major Range and Test Facility Base (MRTFB) responsible for planning, instrumenting, conducting, analyzing and reporting on projects supporting research, development, operational, experiments, test and evaluation design, engineering, production and surveillance test for DOD agencies, other government agencies, for-

eign governments, private industry and academia. ATC is a world leader for integrating test, training and logistic support to the warfighter and is DOD's lead tester for ground vehicles, direct fire munitions and weapons, and congressional mandated Army Live Fire Testing. ATC also provides support in vulnerability/lethality testing, ballistic shock, climatic and vibration testing, UNDEX/surface shock testing, amphibious vehicles, landing craft, acoustic measurements and new technologies in maritime and land systems."

OTHER EXHIBITORS INCLUDE:**ABAQUS****DaqScribe****Kistler****MFPT****Noran Engineering****Spectral Dynamics****Prosig USA**

Be sure to check http://www.saviac.org/preliminary_program.htm for up-to-date programming for the 75th Shock & Vibration Symposium.

Registration Form

75th Shock and Vibration Symposium

October 17-22, 2004

Virginia Beach, VA

return to:
SAVIAC/ HI-TEST Labs
PO Box 87
Arvonia, VA 23004
(434) 581-3204
fax: (509) 351-9733

Name: _____

Organization: _____

Address: _____

Phone: _____ Fax: _____ Email: _____

REGISTRATION FEE: \$795 (Discounted price of \$695 granted to registrations, INCLUDING PAYMENT INFORMATION, if received by SAVIAC by September 26, 2004.)

I WILL BE ATTENDING (Check all that apply, send appropriate clearance form to NSWC/DD/Dam Neck)

- Unclassified Classified

TUTORIALS: \$250 each/\$350 if not attending Symposium (See the policy on Symposium attendance prior to registering) Sunday, Oct 17

- | | |
|--|---------|
| <input type="checkbox"/> Elementary Shock Isolation System Design – D. Christopher Merrill | 8-11 AM |
| <input type="checkbox"/> Introduction to DDAM Analysis Using NE/Nastran – Tony Abbey | 8-11 AM |
| <input type="checkbox"/> Substructure Coupling and Structural Modification for Shock & Vibration - Joshua Gordis | 8-11 AM |
| <input type="checkbox"/> The Navy Shock Qualification Process - Kurt Hartsough | 9-12 AM |
| <input type="checkbox"/> Performing DDAM Analysis Using MSC.Software products - Bart McPheeters | 12-3 PM |
| <input type="checkbox"/> Beyond the Shock Spectrum - Temporal & Frequency Moments, the Product Model, & Uncertainty - Dave Smallwood | 12-3 PM |
| <input type="checkbox"/> An Introduction to ABAQUS - Jeff Cipolla | 12-3 PM |
| <input type="checkbox"/> MIL-S-901D Shock Qualification Testing - Kurt Hartsough & Domenic Urzillo | 1-5 PM |
| <input type="checkbox"/> Navy Weapons Systems Safety Program – Jamie Howell | 4-7 PM |
| <input type="checkbox"/> Wavelets – Tim Edwards | 4-7 PM |
| <input type="checkbox"/> Productive DDAM Analysis Using ABAQUS – David Winkler & David Woyak | 4-7 PM |
| <input type="checkbox"/> Structural Detailing for Blast Resistance - Ted Krauthammer | 4-7 PM |

Monday, Oct 18

- | | |
|--|---------|
| <input type="checkbox"/> Basic Concepts of Digital Data Acquisition for Shock and Vibration Testing - Strether Smith | 8-11 AM |
| <input type="checkbox"/> Calibration, Maintenance and Operation of the LWSM & MWSM – Chris Grunau & Jeff Morris | 8-12 PM |
| <input type="checkbox"/> UNDEX and Acoustic Analysis Using ABAQUS - Jeff Cipolla | 8-11 AM |
| <input type="checkbox"/> Naval Shock Analysis & Design - Rudy Scavuzzo | 8-11 AM |
| <input type="checkbox"/> Damping – Jack Henderson, Peter Torvik & Ahid Nashif | 8-11 AM |
| <input type="checkbox"/> Validation and Editing of Shock & Vibration Data - Allan Piersol | 12-3 PM |
| <input type="checkbox"/> Introduction to Non-Linear Methods in Shock and Vibration using NE/Nastran – Tony Abbey | 12-3 PM |
| <input type="checkbox"/> Overview of Underwater Shock and DDAM - Young Shin | 12-3 PM |
| <input type="checkbox"/> MIL-S-901D Shock Qualification Extensions - Kurt Hartsough & Domenic Urzillo | 12-3 PM |
| <input type="checkbox"/> The Measurement and Utilization of Valid Shock and Vibration Data - Patrick Walter | 4-8 PM |
| <input type="checkbox"/> Shock Response Spectrum - Wayne Tustin | 4-7 PM |
| <input type="checkbox"/> Application of the USA Code to Underwater Shock Problems - John DeRuntz | 4-7 PM |
| <input type="checkbox"/> Navy Shock Database User Certification - Paul Medeiros & Kurt Hartsough | 4-7 PM |

SOCIAL EVENT: Wednesday evening, Registered attendee: no charge/Guest charge: \$10

- yes, I will attend yes, I will attend with 1 guest no, I will not attend

GUESTS' PROGRAM:

Tues WILLIAMSBURG, VA
Wed HISTORIC NORFOLK
Thur GOURMET COOKING

- guest attending Tues (10/19): \$50
 guest attending Wed (10/20): \$30
 guest attending Thur (10/21): \$10

TOUR: Friday 10/22 NSWCDD/Dam Neck yes (indicate # of persons) _____ Names: _____

TOUR RESTRICTED TO US CITIZENS AND SYMPOSIUM ATTENDEES

By registering for the Symposium you are agreeing to abide by the rules and regulations of Symposium conduct set by SAVIAC. These rules are available for viewing at www.saviac.org

PAYMENT INFORMATION: Please provide complete payment information. Checks should be made payable to SAVIAC/HI-TEST. Payment may also be made by AMEX, Visa, or Master Card. Purchase orders are not accepted. A \$50 administrative fee will be charged to ALL cancellations received after September 26, 2004. Substitutions are accepted.

- Check AMEX Visa Master Card Card # _____

Exp. Date _____ Cardholder Name (print): _____

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PLEASE FAX FORM & CREDIT CARD INFO TO (509) 351-9733 BY SEPTEMBER 26, 2004 TO RECEIVE DISCOUNT

YOU MAY ALSO REGISTER ON THE WEB AT www.saviac.org/75_symposium.htm



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In the September 2004 Current Awareness Newsletter

***Symposium Features Northrop Grumman Newport
News, NSWC Dahlgren, and PCB Piezotronics
Exhibitor Highlights
Industry News
Conference & Short Course Announcements
Symposium Registration Form
Symposium Visit Request Form***

The Current Awareness newsletter is published by the Shock and Vibration Information Analysis Center, which is operated by HI-TEST Laboratories, Inc., under contract to the U.S. Army Engineer Research and Development Center.

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