

NTSA's Training Industry *news*

IN THIS ISSUE

- 1 Current News
- 2 President's Notes
- 3 The Global Marketplace
- 5 Contracts
- 5 Training & Simulation Report
- 9 Major Program Report
- 10 Who's Where
- 12 NTSA Corporate Members

Current *news*

Weekend Cyber-warriors

Reprinted from *Aviation Week & Space Technology*

Top U.S. Air Force generals in charge of space and cyber-operations tell senators that the country will have to consider how to attract and retain highly skilled cyber-warriors, and probably in unusual ways. Gen. C. Robrt Kehler, commander of Air Force Space Command, told the Senate Armed Services Strategic Forces subcommittee that the service is pushing National Guard and reserve service in front of active duty personnel who are considering leaving. If they accept, U.S. Air Force still gets to call upon the airmen as needed, even as they seek other opportunities. Some defense officials involved in cyber-activities have been cajoling the U.S. national security establishment for years to start thinking creatively about recruiting and keeping cyber-warriors, including whether they should be required to wear uniforms and serve like other military personnel.

U.S. Navy Eyes Ocean for Electricity

Reprinted from *Aerospace Daily & Defense Report*

The U.S. Defense Department is aggressively pursuing alternative energy programs that can provide stable and cost-effective power for numerous operations. One source under study by the U.S. Navy is ocean thermal energy conversion (OTEC), which converts the solar radiation collected in the surface of tropical waters into electricity.

Naval Facilities Engineering Command awarded Lockheed Martin \$8.1 million last year to develop the design for a pilot plant. Lockheed is working on a 10-megawatt plant that would be built offshore of Oahu, Hawaii, and cabled into the Navy base at Pearl Harbor. Should the Navy approve funding for the pilot plant in the next year, it could be "in the water and running" around 2014, says Dennis Cooper, OTEC program manager for Lockheed Martin.

OTEC's appeal is its limitless power source, the ocean; specifically, tropical areas with surface waters of around 80 degrees Fahrenheit and cold water deep below. The process works much like an air conditioning system. Warm surface water is pumped under pressure through heat exchangers and used to vaporize

ammonia into an expanding gas. The gas is pumped through a turbine generator where it drives the rotors to produce electricity. After the gas is discharged from the turbine it goes through a condenser in which cold water, pumped up from 3,000 feet, condenses it back to a liquid. The ammonia is then pumped back to the heat exchangers to repeat the cycle.

Defense Landscape Has Big Hurdles for A&D

Reprinted from *Aerospace Daily & Defense Report*

Top aerospace and defense (A&D) executives are moving to reposition their businesses for an era of leaner Pentagon spending. But they face formidable hurdles in getting their organizations to execute on the new business strategies, according to a report released March 8.

CSC's 2010 A&D Market Survey, undertaken in cooperation with Aviation Week, finds that A&D companies are committed to sustaining investments in product innovation as they weather challenging economic times and seek new markets to offset a decline in government funding for large weapons platforms. But the industry is beset with inadequate program management and managers that lack consistent processes and IT tools as they transition from vertically integrated manufacturing enterprises to becoming product and service integrators with a worldwide network of partners.

"The survey shows an emergence of new issues the A&D industry is facing," says Eileen Sweeney, president of CSC's Manufacturing Group. "They include the need for better supply chain integration, collaboration among partners, use of analytics for faster, more accurate decision-making and new ways to do business in foreign markets." The global survey was sent to 2,200 senior commercial aerospace and defense executives. CSC's 35-page report was based on 110 responses, including 14 from chief executive officers.

Boeing Phantom Eye Targets USAF's Desire for HALE UAV

Reprinted from *Aerospace Daily & Defense Report*

Boeing is eyeing a place in the persistent intelligence,

Current News cont. on page 4



An Affiliate of NDIA
NATIONAL TRAINING
AND SIMULATION
ASSOCIATION

A non-profit organization that serves the interest of the simulation, training services, training support, and computer-based training systems industries.

President's *notes*

Rear Adm. Fred Lewis, USN (Ret.)

For NTSA Members:

It's becoming clear that 2010 will be a very significant year for modeling and simulation and for NTSA, on a number of fronts. It is a large part of my job to keep NTSA at the forefront of these rapid-fire developments, and I believe we are not only there, but are in many ways leading the charge.

I have previously mentioned the 2010 Modeling and Simulation Leadership Summit, the best attended most substantive of these events to date. At the Summit, which focused on development and promulgation of a national plan for M&S, we enjoyed the active and enthusiastic support, as ever, of the Congressional Modeling and Simulation Caucus. The Summit resulted in the formation of a number of working groups which will shortly produce a series of concrete, attainable recommendations to move along a path leading to enhanced recognition at the national level of modeling and simulation technology and the integral role it plays today across the spectrum of human learning. I am becoming increasingly convinced that, because the technology has been so successful in seamlessly infusing itself into such a number and variety of human experiences, its pervasiveness in today's world has either gone unnoticed or is largely taken for granted. While this in itself is not a bad thing, it is also important to raise awareness not only of the role it plays today, but of its limitless future potential. Among other results, this Leadership Summit effort should enhance awareness among young people of the dynamism of the technology and the promise it holds for future career paths.

On another front, NTSA, in cooperation with the National Science Foundation, recently participated in a cyber teaching/learning conference which focused on the challenge of leveraging M&S technology to enhance K12 education on a national level. This first meeting mandated a larger assembly, which will move into an action phase, resulting in a specific set of recommendations for embedding modeling and simulation into the educational process, in order to enhance the level of STEM education nationally. As I have said several times previously, but I believe bears repeating: the U.S. must move, and briskly, to improve the level of science, technology, engineering and math instruction, and the number of students pursuing and graduating in the sci-

ences, if we are to remain at the technological forefront in a ruthlessly competitive world. How ruthlessly competitive? Recently I saw a television clip about a high tech entrepreneur in India, owner of a software development company, who had established a private company school to teach hundreds of young people advanced computer programming and other related skills, to fulfill his future employment needs. Enough said.

Next, I would like to refer to remarks given by Vice Admiral John (Mike) McConnell, USN (Ret), the keynote speaker for the industry side at I/ITSEC 2009. In his speech, McConnell dramatically and forcefully pointed to the urgency of developing a national-level defense against cyber terrorism, citing the cataclysmic damage a sophisticated, coordinated and massive cyber attack could inflict on our national economic and defense infrastructures. The Admiral correctly pointed out that simulation technology could play a vital role in preparing for such an onslaught, through its ability to replicate complex theoretical events and train for optimum outcomes. I am in complete agreement with the Admiral that this is a challenge of utmost national concern. One only need see what disruption natural and human actors have already achieved in a limited context to imagine the level of chaos and paralysis a major effort would produce.

As a start to addressing this challenge through modeling and simulation, we are in the process of developing a cyber Special Event at I/ITSEC 2010. This is envisioned as a panel, comprised of diverse participants with industry, government and academic backgrounds, who will examine and hopefully define the role M&S can and should play in this critical area.

As a last note, it's by now obvious that I/ITSEC 2010 promises to be the largest and perhaps the most exciting I/ITSEC yet. The diversity and importance of the planned Special Events testify to the spread of our technology in many new and critical areas. It is personally and professionally exciting for me and for our entire membership to be a part of this growth and expansion, which is making a lasting and ongoing contribution to our national security and well-being.



An Affiliate of NDIA



Training Industry news is published bimonthly by the National Training and Simulation Association, an affiliate of NDIA, 2111 Wilson Blvd., Suite 400, Arlington, VA 22201. Telephone (703) 247-9471. FAX (703) 243-1659. Correspondence about NTSA should be sent to the above address. The National Training and Simulation Association assumes no responsibility for unsolicited materials; these require return postage. Reproduction of contents of this newsletter in whole or part is authorized provided appropriate credit is given.

Copyright © by National Training and Simulation Association.

NTSA EXECUTIVE COMMITTEE OFFICERS

Chairman

Mr. Rich Bensinger
General Dynamics C4 Systems

Vice Chairman

Mr. Trevor Huth
Dynamics Research Corporation

Secretary

Mr. Milt Fulghum
FlightSafety International

Deputy, Membership

Mr. E. Terry Lewis
Binghamton Simulator Company

Deputy, Programs

Mr. Gabe Batstone
NGRAIN

Deputy, M&S Awards

Mr. Perry Geib
ATSIM, Inc.

Deputy, STEM Initiative

Mr. Charles Bartel
Moog, Inc.

NDIA President

LTG Larry Farrell, USAF (Ret.)

NTSA President

RADM Fred Lewis, USN (Ret.)

The Global marketplace

German, French Defense Exports Rise

Reprinted from *Aerospace Daily & Defense Report*

Although the U.S. and Russia retain their top rankings in terms of conventional arms trades, the latest data from the Stockholm International Peace Research Institute (SIPRI) also reveals that France and Germany have done much better in the past five years than the U.K.

During the period from 2005-2009, Germany saw a jump of more than 100 percent in defense sales, with France's figure up 30 percent over the prior period of 2000-2004. The U.K., by contrast, saw a 13 percent drop. The big German jump largely comes from armored vehicle sales.

The latest SIPRI ranking shows the U.S. having the lion's share of arms exports, at 30 percent, followed by Russia with 23 percent, Germany with 11 percent, France with eight percent and the U.K. at four percent. The U.S. was responsible for 23 percent of U.K. defense exports, making it the largest customer for British defense firms, ahead of India and Saudi Arabia.

The biggest overall arms importer was China, with nine percent of all purchases made. Russia dominated the Chinese market, representing 89 percent of deals, followed by France, which despite a European Union arms embargo on Beijing still registered three percent of exports to China.

Asian Acquisition

Reprinted from *Aerospace Daily & Defense Report*

A new forecast from consultancy Frost & Sullivan on the Asian-Pacific land defense systems market predicts the market will reach revenues of \$9.4 billion in 2016. Aging equipment and increased awareness of smuggling, piracy and terrorism will drive growth, and cyber-era capabilities will lead to acquisitions, analysts predict.

"Network-centric warfare is one of the factors triggering military modernization and a more network-oriented military defense structure," says research analyst Chern Wai Cheong. "Communication systems, radars and intelligence, surveillance and reconnaissance systems will see growth in the land defense systems market together with other market segments such as armored vehicles, missiles, artillery and firearms," Cheong says.

France, Russia to Negotiate Helo Carrier Buy

Reprinted from *Aerospace Daily & Defense Report*

France has agreed to enter into exclusive negotiations for the sale of four Mistral helicopter carriers to Russia. The move, announced March 1 by French President Nicolas Sarkozy during a state

Global cont. on page 8

Upcoming events

Registration is open for these upcoming NTSA events.

MAY 18-20, 2010 • ITEC 2010
EXCEL CONFERENCE & EXHIBITION FACILITY •
LONDON, ENGLAND

MAY 25, 2010 • USAF APBI 2010
HOPE HOTEL & CONFERENCE CENTER
DAYTON, OH

JUNE 9-10, 2010 • 2010 TRAINING & SIMULATION
INDUSTRY SYMPOSIUM (TSIS)
RENAISSANCE ORLANDO RESORT AT SEAWORLD •
ORLANDO, FL

JUNE 30, 2010 • M&S EXPO ON CAPITOL HILL
RAYBURN FOYER, RAYBURN HOUSE OFFICE
BUILDING • WASHINGTON, DC

AUGUST 10-12, 2010 • JOINT ADL CO-LAB
IMPLEMENTATIONFEST 2010
ROSEN CENTRE HOTEL • ORLANDO, FL (#01D0)

Please visit www.litsec.org for more information
or contact Barbara McDaniel at
(703)247-2569 or bmcdaniel@ndia.org

Current News from page 1

surveillance and reconnaissance unmanned aerial vehicle arena with its Phantom Eye demonstrator. A twin-engine, hydrogen-fueled prototype designed to stay aloft at 60,000 feet for days, Phantom Eye will have a wingspan of 150 feet and a 53-foot length. The high-altitude/long-endurance unmanned aerial vehicle will take off using a cart and land using nose gear and skids, a design choice made to conserve weight, says a Phantom Works executive.

The goal of the prototype, according to Darryl Davis, head of the advanced projects division, is to conduct a 96-hour flight demonstration. The prototype is a 60-70 percent scale prototype of an objective operational system that Boeing is considering for later development. This system could notionally stay aloft for seven days (including transit time) carrying 2,000 pounds of payload about 4,000 nautical miles. Davis says the aim is to have only three aircraft detailed to surveil a particular area for 30 days straight.

U.S. to Deploy New Video-Crunching Gear

Reprinted from Defense News

A new line of video-crunching computers is headed to U.S. troops in Afghanistan—first for local use, and ultimately as a web tool accessible from anywhere, officials at Joint Forces Command said. The \$29 million Valiant Angel system is at the heart of the U.S. plan to give troops and intelligence operatives better access to the trove of video and wide-area imagery gathered by American and allied aircraft. Users will be able to mark up videos and imagery with a John Madden-style telestrator, tag scenes with keywords, use Internet chat and retrieve all of it later. “Gone are the days when we will allow data to fall to the cutting room floor,” said Justin Thurber, a Defense Intelligence Agency employee assigned to Joint Forces Command as the operations officer for Valiant Angel.

STEM on the Move

Reprinted from Aerospace Daily & Defense Report

The Business and Industry STEM Coalition has announced a commitment to doubling the number of graduates with a bachelor’s degree in science, technology, engineering or mathematics (STEM) to 400,000 from 200,000 by 2020. The coalition, a newly-formed group of 30 companies and trade organizations, also said it will develop an inventory of employment skills needed by the business sector over the next 10 years, as well as engage employers to promote STEM programs in all 50 states and improve attitudes of the general public toward STEM professionals.

Bolden Says More Details Coming on NASA Reorganization

Reprinted from Aerospace Daily & Defense Report

NASA Administrator Charles Bolden is asking Congress to be patient as his agency grinds out the details of the turnabout space program embodied in the FY11 White House budget request, telling a House Appropriations subcommittee March 23 that some more programmatic information will be released soon. In

testimony before the panel’s commerce, justice, science and related agencies subcommittee, Bolden also says he has been in touch with U.S. Air Force Secretary Michael Donley and top military and intelligence officials on their mutual need for a heavy-lift launch vehicle. And he says he personally would like to “lease” commercial human-rated vehicles that NASA’s astronauts could pilot to the International Space Station guided by a mixed team of NASA and contractor personnel at Mission Control Center-Houston.

U.S. Government Unprepared for Large Cyber Attack: Experts

Reprinted from Defense News

The U.S. government isn’t prepared to cope with a widespread cyber attack, former top Bush and Clinton administration officials said. The officials participated in a public cyber-security war game February 16, where they simulated how the government would respond to a widespread cyber attack. The scenario started with malware spread through an iPhone app; the attack eventually crippled cell phone networks and internet service and ended with much of the East Coast without power due to a failing electrical grid. The simulation illuminated areas where the government appears not to be prepared:

- Federal agencies don’t have the legal authority to turn off people’s cell phones and terminate internet and cell phone service to stop an attack.
- Cell phone and internet service providers may be reluctant to cooperate with federal actions to cease internet or cell phone services, pointing to the need for security agencies to include them in their cyber-security planning to coordinate responses before an attack.
- Citizens would be hard-pressed to know what to do during an attack if major news organizations are inaccessible.
- Federal agencies do not adequately control federal employees’ access to social networking sites while at work, even though those sites may be used to spread malware and viruses during an attack.
- Governors may be reluctant to surrender power to the federal government, forcing the president to nationalize the National Guard.

USAF Lays Out Aircraft-Buying Plans Through 2040

Reprinted from Defense News

The U.S. Air Force is taking a long look down the road at buying and fielding new airplanes. Mandated by Congress and released February 1, the “Aircraft Investment Plan” maps out how many planes the Air Force, Marine Corps and Navy plan to buy through 2020 and sets goals for 2021-2040. It does not include helicopters. The report calls for a joint approach to long-range strike and electronic warfare but does not drastically alter the Air Force’s announced plans for its two main acquisitions this decade—the F-35 Lightning II and KC-X tanker. By aircraft, here is what the report’s authors foresee for the Air Force:

Current News cont. on page 6

Training & Simulation *report*

Supporting the Development of a NATO Training Capability

Reprinted from Roland & Associates Press Release

The USJFCOM J7 TD Group, Solutions division, Technical Development and Innovation branch engineering staff, successfully conducted the joint multi-resolution model (JMIRM) federation test from March 1-10, 2010. The JMIRM federation is the central component of the NATO Training Federation. The JMIRM is a federation that integrates the joint theater level simulation and the joint conflict and tactical simulation. This test validated the upgrade of the existing JMIRM federation with the latest versions of joint theater level simulation and joint conflict and tactical simulation. It is the final step in the verification and validation development process before a new version of JMIRM is released for operational training. This upgrade was funded by Allied Command Transformation Command. The delivery of the final version of the software to NATO ACT was scheduled for April 2010.

Joint, Synthetic and Sustainment Training Branch

Reprinted from U.S. Navy Press Release

Commander, U.S. Second Fleet, conducted a fleet synthetic training event in February, providing valuable training to a range of ships and commands at various stages in their pre-deployment training cycle. Operation Bold Spectrum was a force-level event (FST-F) which encompassed critical mission areas including ballistic missile defense, antisubmarine warfare and maritime security

operations. The Army and Air Force participated in support of Operation Bold Spectrum, along with Germany and Canada.

The event marked the first time that Riverine Group One and Riverine Squadron One, units of Naval Expeditionary Combat Command, used synthetic training as a deployment certification event. The FST program is administered by U.S. Fleet Forces Command in Norfolk, Virginia. FST in-port training can be conducted around the globe. It combines shipboard trainers, aircraft and submarine simulators and high-tech simulation centers into an interoperable network. FST helps the Navy maximize opportunities to conduct live training by conducting some training in pier-side events.

Forterra Systems Acquired by SAIC

Reprinted from Forterra Systems Press Release

Forterra Systems has announced that all assets of the company have been acquired by Science Applications International Corporation. Forterra personnel and the OLIVE product line will be absorbed into SAIC's Analysis, Simulations, Systems Engineering and Training business unit based in Orlando.

SAIC has been following the opportunity presented by the growth in virtual world technologies to support collaboration and training/learning and saw the acquisition of Forterra as an aggressive way to enter the market. They felt Forterra had the best technology and business model to match key customer require-

Training cont. on page 7

Contracts

General Dynamics and Austal to Bid on LCS — As Rivals

Reprinted from *Defense News*

Shipbuilding partners Austal USA and General Dynamics have agreed to revoke their teaming arrangement on the littoral combat ship program—a move that positions Austal to bid as a prime contractor on this year's contest for 10 littoral combat ship vessels for the U.S. Navy, and allows General Dynamics to go after another five ships to be awarded in 2012.

The announcement was first made March 5 through the ASX Australian Securities Exchange. Austal USA's parent company, Austal, is headquartered in Henderson, Western Australia. The move—first reported in January to be in the works—is a direct response to a new acquisition strategy announced by Navy officials last September.

Oshkosh Comes Out on Top Again in Army FMTV

Reprinted from *Aerospace Daily & Defense Report*

U.S. defense officials have handed a major contracting victory to Oshkosh Corporation, announcing recently that the company will continue to provide the Army's family of medium tactical vehicles (FMTV) despite significant protests from more established competitors. Oshkosh has estimated the work eventually to be worth \$3 billion for the production of FMTVs, which are the backbone of the U.S. Army resupply and ground transport fleet. The decision overrules the protest filed by BAE Systems—which had previously produced more than 56,000 FMTV trucks and trailers—and calls for production of up to 12,415 trucks and 10,926 trailers, along with support and engineering services.

Current News from page 4

- **Bomber:** The Air Force could spend \$2 billion to \$4 billion a year to develop a new long-range strike aircraft by 2020. Whether the plane will have a pilot on board or will fly at supersonic speeds is undecided. The report says: “A study is underway to identify the right mix of manned and unmanned technologies ... and to determine the right balance between range, payload, speed, stealth, and onboard sensors.” Until the new bomber arrives, the Air Force will keep about 160 B-52 Stratofortresses, B-1B Lancers and B-2 Spirit bombers.
- **F-22 Raptor:** The service will spend \$1.9 billion to upgrade its 180 fighter jets with improved communications and avionics gear. Retirement of the Raptors could begin in 2025.
- **F-35:** The Air Force is in line to buy 602 F-35s through 2020 at a cost of about \$70 billion. Two-thirds arrive in 2016 or later. The Air Force fleet will eventually total 1,763 jets.
- **MQ-9 Reaper:** Forecasts call for the service to buy 372 of the attack and reconnaissance unmanned aerial vehicles from 2011 through 2018. The price tag: about \$820 million. Later models will have an electronic warfare capability.
- Four to five remote-controlled jets will arrive each year through 2017. There is no projection for later years.

The report did not offer an overall cost for the RQ-4s. For 2011, the Air Force is asking \$737 million for four Global Hawks, their payloads and logistics support.

U.S. Last in Combat Gear Output per Spent Dollar

Reprinted from Defense News

The United States scored last in a new study that examined how 33 major militaries spend funds on weapon systems—while potential U.S. rival Russia ranked third. In a study, out March 15, consulting firm McKinsey & Co. examined how efficiently 33 nations that account for 90 percent of worldwide defense expenditures perform a range of functions. The study looked at how these militaries go about doing certain tasks in three key areas: personnel, maintenance and weapon buying. “In general, countries that make it a point to support their domestic defense industries have higher procurement costs than those that rely on imports. Countries that procure older equipment from the global market tend to have very capable fleets for less money,” according to the report.

The U.S. and Australia both tallied scores of 17, worst among the 33 nations McKinsey examined. Brazil gets the most military output per dollar spent, racking up a study-best 330 points, followed by Poland’s 287 and Russia’s 253. The average score was 100 points, according to the report, which will be published as a special defense issue of the firm’s “McKinsey On Government” publication, which focuses on government management practices. John Dowdy, head of defense and security for McKinsey, said there is no question, however, which nation’s military brings the biggest punch to any given fight: the United States. “The American military is very high quality, but that comes at a very high cost,” he said.

NASA Making International Partnerships More Central

Reprinted from Aerospace Daily & Defense Report

NASA will allow its international partners into the “critical path” for human exploration, and try to fly a heavy-lift launch vehicle in the 2020-2030 time frame that can enable exploration beyond low Earth orbit, according to Administrator Charles Bolden. In a February 6 briefing for reporters waiting at Kennedy Space Center for the launch of the space shuttle Endeavour to the International Space Station, Bolden conceded that he must negotiate details of the abrupt shift in U.S. space policy with Congress as it tackles the U.S. space agency’s FY11 budget request. Going into those negotiations, he said it may be possible to preserve many of the jobs on the Constellation program of human exploration that the budget request abandons to begin work on a new and more capable line of vehicles down the road.

It also may be possible to preserve some of the jobs to be lost at Kennedy when the shuttle retires and Constellation is dropped by encouraging the private companies the Obama Administration hopes will take over human transportation to low Earth orbit to move assembly and even production to the Florida field center. “We have an incredible amount of infrastructure that can be used here,” he said. “We don’t want to build more infrastructure.”

France Ups Afghan Effort

Reprinted from Aviation Week & Space Technology

Defense Minister Herve Morin says France will send 80 more instructors to bolster its Afghan training corps and may consider additional reinforcements. The announcement followed a joint statement by President Nicolas Sarkozy and German Chancellor Angela Merkel that the two countries will study ways to use the 5,000-person Franco-German brigade in theaters outside of Europe, including possibly in Afghanistan. Both countries are being pressured to increase contributions to NATO’s Afghan force. Merkel recently agreed to reinforce Germany’s contingent, but Sarkozy balked although he left the door open to send more training, police and civil reconstruction personnel.

Tests Show Gigapixel Sensor Can Do the Job of Many UAVs

Reprinted from Aviation Week & Space Technology

The U.S. military’s demand for full-motion video in combat zones is being met by stepping up unmanned aerial vehicle patrols and fielding multi-camera surveillance systems on manned and unmanned aircraft. But a gigapixel sensor is being tested that can downlink as many video streams as 65 Predators and allow a single platform to track targets across an area the size of a city. Inflight tests between June and November 2009, the autonomous real-time ground ubiquitous surveillance imaging system (Argus-IS), mounted in a pod under a YEH-60 Black Hawk helicopter, demonstrated wide-area video imaging and tracking of people and vehicles, says John Antoniadis, director of intelligence, surveillance and reconnaissance.

Current News cont. on page 8

Training from page 5

ments and that Forterra was addressing synergistic markets. SAIC fully intends to continue development and the commercial sale of the OLIVE platform to all interested parties—both in the public sector and in commercial, enterprise markets.

Training Deal

Reprinted from *Aerospace Daily & Defense Report*

Canada has awarded CAE a C\$250 million (\$245 million) contract to provide the aircrew training system for its new Boeing CH-147F Chinook heavy-lift helicopters. The Canadian company will deliver a weapon system trainer, two tactical flight training devices, a gunnery trainer and other desktop and laptop devices early in 2014. The contract includes 20 years of in-service support. In February 2009, CAE was awarded a C\$345 million contract to provide the training system for Canada's new Lockheed Martin C-130J transports.

Rotary Realism

Reprinted from *Aviation Week & Space Technology*

In a move to improve safety by cutting the large amount of pilot training still performed in the aircraft, CAE has launched a line of rotorcraft flight simulators designed to cost less than training in a single-turbine helicopter. Prices for the CAE 3000 Series will range from less than \$4 million to around \$10 million. A fixed-based version meeting Level 7 flight-training device standards features a three-axis vibration platform and CAE Tropos-6000 visual system with direct-projection dome display providing up to 200-degree horizontal X 80-degree vertical field-of-view with chin-window coverage. A Level D device with six-axis motion can be specified.

The simulators can model white-out visibility, oil rig turbulence and other mission-specific conditions, while dynamic "artificially intelligent" human and vehicle models increase the realism of emergency-medical and search-and-rescue simulations. The first Series 3000 device will be deployed within CAE's own training center network by summer, the company states.

India Conducts Main Battle Tank Simulator Trials

Reprinted from *Jane's Defence Weekly*

The Indian Army is concluding trials of badly needed simulators for its Soviet- and Russian-designed T-72 and T-90S main battle tank fleets to save on platform attrition during training. Canada's CAE India—partnering with Tata Advanced Systems, one of India's larger private defense manufacturers—is competing with Zen Technologies of Hyderabad, southern India, to provide 82 containerized simulators for the two main battle tanks that comprise the bulk of the army's 59 armored regiments. These include 18 and 22 tank driver simulators respectively for T-72s and T-90s and 42 gunner and crew-gunnery simulators for the T-90Ss.

Army sources said the simulator trials were nearing completion and final evaluation was under way at the armored corps center

in Ahmednagar, western India. Price negotiations would follow as a precursor to inking the contract within FY10-11, the sources said. Both competitors, however, refuted Russian state export agency Rosoboronexport's claims that only the original equipment manufacturer could provide a simulator and all other attempts to develop one would be deemed an infringement of intellectual property rights.

CAE India and Zen Technologies executives said no original equipment manufacturer software, source codes or equipment were needed from Russia to develop the simulators, which they said were not covered by intellectual property rights. Alongside this, CAE India had also completed full-crew and gunnery training simulators for the indigenously designed Arjun main battle tank.

Simulator for Bahrain

Reprinted from *Defense News*

Bahrain has selected Rockwell Collins' transportable Black Hawk operations simulator (T-BOS) to train pilots of the Arabian Gulf country's UH-60M Black Hawk utility helicopters. The T-BOS will be delivered to Bahrain under a Foreign Military Sales contract administered by the the U.S. Army. The Bahrain T-BOS is the second foreign sale of the trainer, developed by Rockwell Collins, Cedar Rapids, Iowa. The first foreign T-BOS will be delivered to the United Arab Emirates later this year, the company said.

T-BOS is a high-fidelity flight simulator that can be deployed to forward operating bases. It can be ready for training within eight hours of arrival due to its own power and environmental control unit, according to Rockwell Collins. The trainer is in use at several Army bases in the United States.

French Exercise C2 NATEX

Reprinted from Roland & Associates Press Release

The scope of C2 NATEX 2009, held from November 16 - December 4, 2009, was to practice and exercise the interoperability of the various elements of the national chain of command and the procedures for operational tactical planning and execution of a crisis response operation. The exercise focused on the FHQ (operational level) and component command HQs (tactical level) with the aim of planning and conducting a joint campaign.

C2 NATEX 2009 was a two player level exercise with the force headquarters as the higher level and the subordinate level made up by the land and air component commands. A logistic headquarters was also included in the subordinate level. This was an MEL/MIL driven CAX.

The joint theater level simulation was the simulation tool deployed by the French Simulation Center for Education, Training and Experimentation. The center is staffed with eighteen personnel and located in Ecole Militaire in Paris. It was the first time in France that joint theater level simulation was used to support such a main national joint exercise with a scenario at the tactical level

Training cont. on page 10

Global from page 3

visit by Russian President Dmitri Medvedev, confirmed statements made on February 8 by Jacques de Lajuie, director of international development at French armaments agency DGA. They did not divulge details of the sale, its value or the length of time expected to conclude talks. Each ship is estimated to cost around 500 million euros (\$675 million).

The 20,000-metric ton, 199-meter (653-foot) Mistral is a multi-role assault vessel that functions as a command, landing and hospital ship, as well as a helicopter carrier. It is designed to carry 16 helicopters, including six at a time on deck. Its normal complement is eight Tiger attack helicopters and eight NH90 frigate helicopters, but

Current from page 6

sance for BAE Systems Technology Solutions group. Designed to overcome the narrow field-of-view of current airborne surveillance sensors, Argus-IS “can image an entire city with enough resolution to detect and track targets from a person on upward,” he says.

Predator Progress

Reprinted from *Aviation Week & Space Technology*

The two latest variants of the Predator unmanned aerial vehicle for the U.S. Army and Customs and Border Protection Service will move closer to initial deployment following the completion of key tests in California. Weapons tests of the Army’s MQ-1C Sky Warrior, a heavily modified derivative of the General Atomics Aeronautical Systems (GA-ASI) Predator A, were successfully completed following the last live firings of nine Hellfire P+ missiles. GA-ASI Chairman and Chief Executive Officer Neal Blue says a post-test review identified “minor technical and desired fixes,” adding that an “updated software release will be verification-tested from our El Mirage flight operations facility.”

The MQ-1C, soon to be redesignated the Gray Eagle—currently also known as the Army’s extended range/multi-purpose unmanned aircraft system—is being fast-tracked into service with newly-formed quick reaction capability units in Iraq and Afghanistan. Blue says the updated release will be used to support soldier training prior to a limited user test scheduled for May, and subsequent fielding slated for July.

NASA Plans New Robot Generation to Explore Moon

Reprinted from *Space News*

U.S. astronauts may not return to the Moon anytime soon, but robotic explorers seem poised to go there—and just about everywhere else—in the solar system in short order. NASA’s new space exploration plan includes a heavy emphasis on robotic missions that would land on the Moon, Mars and even asteroids to pave the way for human exploration.

The agency’s 2011 budget proposed by President Barack Obama calls for funding two such missions starting next year. One of those missions is a lunar expedition that would test the ability to control

it also can accommodate larger rotorcraft up to the CH-53 Super Stallion class. Four landing craft, 13 tanks or 60 infantry fighting vehicles and 400 troops can fit below decks.

The deal has drawn harsh criticism from some ex-Soviet bloc states, particularly the Baltic countries and Georgia, as well as the U.S. Congress. Sarkozy said denying the sale of military hardware to Russia is inconsistent with the broader aim of integrating Moscow into the Western security sphere. “We can’t entertain a confidential relationship with Russia in the morning over the Iranian question and then do the exact opposite in the evening when it comes to armaments,” he said.

robots remotely from Earth or the international space station. The next wave of robotic missions could also test technologies for mining or extracting water, rocket propellant and other resources, according to the NASA budget proposal.

“Trying to do mining operations autonomously in a remote location and under extremely difficult conditions represents a huge challenge,” said Gerald Sander, manager of NASA’s In-Situ Resource Utilization Project. “But we’re up to the task.” Besides, NASA will not go it alone if its new budget gets final approval. It has already recruited allies and expertise from private industry to help kick-start its robotic revolution.

General Atomics Chief Sees Vast Advances in UAS Capabilities

Reprinted from *Aerospace Daily & Defense Report*

Technological advances could enable unmanned aerial systems to deliver radically improved situational awareness within five years, according to Neal Blue, chairman and chief executive officer at unmanned aircraft developer General Atomics. “We’re probably no more than one-fifth along the way to developing really remarkable situational awareness,” said Blue. “We’re about one-fifth of the way of what we can actually achieve within the next five years.” Blue said communications links, or “bandwidth down,” are the biggest limitation to providing wide-area situational awareness at very high resolution. Advances in onboard processing and the integration of data feeds from multiple platforms also will be crucial.

Watch This

Reprinted from *Aerospace Daily & Defense Report*

U.S. Air Force planners aren’t keen on banning social networking among service members because those capabilities are proving to be good digital aids in combat. “Internet Relay Chat is a good example,” says Lt. Gen. William Lord, the service’s chief information officer. “You have an intelligence analyst in the U.S. who is looking at a live picture of the battlefield while chatting online with a Predator operator that can point [the unmanned aerial vehicles’] sensors. He’s in turn chatting to a joint terminal attack controller that can draw a circle around the correct building among several to put the bomb on. Chat wasn’t invented to do that, but chat is one of the things that enables us.”

Major Program *report*

Boeing Selects 767 for USAF KC-X Tanker Bid

Reprinted from *Aerospace Daily & Defense Report*

Boeing's so-called NewGen tanker, a 767-based design for the U.S. Air Force KC-X competition, will feature a new refueling boom and a flight deck based on the 787 commercial transport. Company officials announced March 4 that the aircraft will be based on a 767, but they declined to identify the 767 variant. An artist's concept of the design appears to point to a 767-200. In a departure from its last KC-X design proposal, Boeing is using the new flight deck, which they say will provide information displays that are 75 percent larger than the Airbus A330, on which Northrop Grumman/EADS' potential rival bid would be based.

Confusion Surrounds Use of Exotic Weapons

Reprinted from *Aerospace Daily & Defense Report*

While U.S. military acquisition and program officials continue to say they have stretched and innovated to focus on both conventional and irregular conflicts, they express a lack of direction and confusion when it comes to the day-to-day information war. Evidence of this poorly understood conflict is often most visible as constant cyber probes and attacks that can't be traced to any government. Along with chronic cyber-attacks, this fourth dimension of warfare does or will involve many other non-kinetic technologies including directed energy, intelligence gathering and electronic surveillance, U.S. experts confirm.

However, deciding whether these advanced capabilities are even adequately recognized, defined and funded is unknown. This multifaceted problem was created because "we've misdefined" the missions involved in information war and what the desired effect on the enemy is supposed to be, according to Vice Adm. James Winnefeld, the Joint Staff's director for strategic plans and policy. Understanding and focusing on these issues is complicated by questions of "who owns" these information warfare capabilities within the Defense Department and that could take "the next five years" to resolve.

U.S. Army Issues RFP for Ground Combat Vehicle

Reprinted from *Aerospace Daily & Defense Report*

The U.S. Army delivered on its promise to release the request for proposals for a new ground combat vehicle before the end of February, unveiling the first phase on February 25. Now, more details are emerging over the prominent successor to part of the erstwhile Future Combat Systems. The request for proposals for the technology development phase of the infantry fighting vehicle being developed under the ground combat vehicle effort will result in up to three contract awards. The Army anticipates awarding the first contracts for the technology development phase in the

fourth quarter of FY10. There will be three phases to the ground combat vehicles program: technology development, engineering and manufacturing design and low-rate initial production.

F-35B Achieves First Vertical Landing

Reprinted from *Aerospace Daily & Defense Report*

The multinational Lockheed Martin F-35 achieved its first vertical landing March 18, a major step forward for the struggling stealthy single-engine fighter's test program. The vertical landing took place at Naval Air Station Patuxent River, Maryland. The aircraft rode more than 41,000 pounds of thrust to achieve the vertical landing: this milestone is key to proving the aircraft will be suitable for the U.S. Marine Corps and British and Italian forces.

U.S. Navy Issues Request for Proposal for More LCSs

Reprinted from *Jane's Defence Weekly*

The U.S. Navy has issued a request for proposal for the next 10 littoral combat ships in lieu of a final design selection. General Dynamics and Lockheed Martin, the two littoral combat ships prime contractors, are currently under contract to complete two ships apiece and are in a heated contractual battle to secure the final design for the littoral combat ship.

General Dynamics' 2,790-ton aluminum trimaran design is in competition against Lockheed Martin's steel monohull in a program that could lead to the procurement of up to 55 ships. The U.S. Navy would not elaborate on the details of the request for proposal, but Navy officials have said they are happy with both designs of the ship. A decision on the design is anticipated in the second quarter of 2010, when the Navy will select a single prime contractor for the littoral combat ship program and award a fixed-price contract for two ships in FY10, with options for a further eight through to FY14.

U.S. Phases Out Humvee Purchases

Reprinted from *Jane's Defence Weekly*

The U.S. Army is completing its procurement of the once ubiquitous Humvee as requirements have been filled and heavier armored vehicles are gaining prominence within the force. According to Defense Department officials and budget documents, the Army is not buying any Humvees but is asking for \$989 million in FY11 to recapitalize some of its current fleet.

Other U.S. services are requesting to buy a total of 860 Humvees and the Army has "some other prior year Humvee procurements to accomplish as well, so the line is not terminated," Lt. Gen. Edgar Stanton, the military deputy for budget, said during a February briefing.

Who's where

■ U.S. Air Force Space Command has named **Douglas Beason** as chief scientist and technology adviser, reporting assessments and advice to the commander, Gen. Robert Kehler. Beason's responsibilities cut across Space Command's entire portfolio, including operational satellites, launch vehicles, the cyberspace mission and research and development efforts. Beason is a retired Air Force colonel who spent 24 years in the service and has more than 30 years' experience in the applied science and national security fields, the release said.

■ **Vice Adm. Harry B. Harris, Jr.**, USN, has been named commander of the Sixth Fleet, commander of Striking and Support Forces NATO, deputy commander of U.S. Naval Forces Europe, deputy commander of U.S. Naval Forces, and Joint Force maritime component commander Europe in Naples, Italy.

■ **Thomas J. Cassidy, Jr.**, a veteran fighter pilot and rear admiral who battled a skeptical U.S. Air Force to win acceptance for unmanned aerial vehicles, has retired as president of the Aircraft Systems Group at General Atomics Aeronautical Systems Inc. (GA-ASI) Cassidy will be succeeded by **Frank Pace**, executive vice president of GA-ASI. He is credited with spearheading the conceptualization, development and delivery of the Predator and Predator B. Cassidy will retain a role at GA-ASI as non-executive chairman of the company's management committee.

■ **Mark DeYoung** is the new president and chief executive officer of Alliant Techsystems, Minneapolis. He was president of the company's Armament Systems group, its largest business entity.

■ **David Drabkin** has been named director of acquisition policy for Northrop Grumman. He was the acting chief acquisition officer, deputy chief acquisition officer and senior procurement executive for the U.S. General Services Administration and has acquisition experience with the U.S. Defense Department and Defense Logistics Agency.

■ **Austin Yamada** has been appointed senior vice president for strategy and business development for QinetiQ North America's Missions Solutions group. He was a senior vice president for business acquisition for the group's intelligence, security and space sector.

■ **Maj. Gen. Ellen Pawlikowski** has been appointed commander of the U.S. Air Force Research Laboratory, Wright-Patterson AFB, Ohio. She succeeded **Maj. Gen. Curtis Bedke**, who retired after more than 30 years of Air Force Service.

■ **Edward M. Swallow** has become vice president of business development for the Northrop Grumman Corporation Information Systems sector's civil systems division, Reston, Virginia. He was the sector's vice president of business acquisition process and proposal operations.

■ **Mark W. Kenny** has been appointed Washington-based vice president of Irregular Warfare programs for the Northrop Grumman Corporation. He was director of the U.S. Navy's Office of Irregular Warfare.

■ **Capt. Randall M. Hendrickson**, USN, has been selected for promotion to rear admiral (lower half) and named deputy director of the Missile Defense Agency in Washington. He was the head of theater missile defense in the office of the chief of naval operations.

Training from page 7

both for air and army units and to move non-automatic logistic convoys.

Simulator Gets Upgrade

Reprinted from *Defense News*

In parallel with the upgrade of the British Royal Navy's Lynx Mk8 maritime helicopters, CAE UK, a unit of Canada's CAE, has upgraded the company's Lynx Mk8 full mission simulator. CAE UK also delivered a new Lynx cockpit procedures trainer and a CAE Simfinity system-based trainer to the Royal Naval Air Station Yeovilton, England. This gives the Royal Navy a comprehensive suite of training devices for the Lynx Mk8, CAE said.

The simulator upgrade has incorporated the second-generation

anti-jamming tactical UHF radio for NATO (called SATURN), a new identification friend-or-foe system and the latest defensive aids suite into the training devices.

Avatars Ease U.S. Marine Instructors' Exercise Tasks

Reprinted from *Defense News*

An experimental system turns video imagery of live training into a 3-D virtual simulation—and then allows users to manipulate the avatars to test what-if scenarios. But that's just the tip of BASE-IT (behavioral analysis and synthesis for intelligent training), an ambitious demonstration project funded by the U.S. Office of Naval Research in response to a request from the U.S. Marine Corps.

Training cont. on page 11

Training from page 10

“They wanted more intelligent tracking systems in the live training environment,” said Roy Stripling, Office of Naval Research program manager for human performance and education. “They wanted to be able to do after-action reviews with the kind of detail that you can do in virtual environments.”

The Office of Naval Research is developing algorithms that will enable the software to analyze video imagery and compute the optimum angle for pan-tilt-zoom cameras to capture video of Marines. The software will automatically annotate the imagery, creating timelines that instructors can jump to.

BASE-IT will use video and GPS data to record where individual Marines are looking, pointing their weapons and moving; compare these to a database of textbook tactics; and help instructors spot incorrect techniques. “It’s not just cameras,” said Eric Jarabak, Marine Corps programs manager for training systems. “There is instrumentation that is placed on them. Some of it is placed on their head, such as a GPS tracker. Some of it is placed on the gun and head. Inertial navigation sensors will tell us where they’re looking and where their gun is pointed.”

BASE-IT will also offer an intriguing tool: converting video images of Marines into gamelike 3-D visualizations, allowing instructors to move the digital avatars in detailed after-action reviews. “You’re playing back a run, and you say, ‘Hey, I would like that fire team to go left instead of right,’” said Christian Darken, a researcher at the Naval Postgraduate School in Monterey, California, who is developing BASE-IT models. “Let’s go into simulation mode, and now you’re doing a sort of real-time-strategy-ish game, where you can grab a unit and say, ‘Let’s do this.’”

This sort of alternate history requires models detailed and accurate enough to assess all the ramifications if a training exercise is modified. How would a Marine fire team react if a sniper had appeared on the left flank instead of the right? If fire team A had turned left at the intersection instead of right, what would fire team B have done? BASE-IT researchers believe these aspects can be modeled but caution that, like any behavioral model, those used in BASE-IT must be somewhat subjective.

Training System Upgrade

Reprinted from Defense News

Meggitt Training Systems, Suwanee, Georgia, a unit of Britain’s Meggitt Group, won a \$5.4 million contract from the U.S. Army National Guard to continue upgrading its virtual small arms training equipment. Known as combat skills marksmanship trainers, the systems are used by small-unit leaders to rehearse missions. The company has begun deliveries to the Guard of new weapon simulators, ranging from M9 pistols to Mk19 grenade launchers. The combat skills marksmanship trainer covers a range of operations. The training systems embedded software enables instructors to design new scenarios quickly to reflect emerging mission changes, Meggitt said.

F-35 Pilot Training on Track Despite Plane’s Problems

Reprinted from Military Times

The U.S. development of a training pipeline for pilots and maintainers for the F-35 Lightning II remains on track despite recent problems with the jet’s cost and development schedule. “Our focus has remained the same: to be ready when that first jet arrives,” said Navy Capt. Mike Saunders, deputy commander of the 33rd Operations Group, Eglin Air Force Base, Florida. Saunders is helping oversee the joint command that is standing up the F-35’s First Fleet Training squadrons for the Air Force, Navy and Marine Corps.

All three services plan to begin flying the F-35 within the next two years, Saunders said. The Marine Corps’ training squadron, Marine Fighter Attack Training Squadron 51, stood up April 2, making the Corps the second service to formally create a training unit. The Air Force created the 58th Fighter Squadron last year. The Navy’s Strike Fighter Squadron 101 will stand up next year. The Air Force and Marine Corps have several pilots at Eglin for training. The Navy, which will be the last service to put the F-35 into operation, expects to send its first pilots to the Florida base next year.

Poland’s NDU Updates M&S Capability

Reprinted from Roland & Associates Press Release

The Polish National Defense University is the most important military university in Poland. It is subordinated to the Ministry of National Defense and is a contemporary university with modern research and educational academic facilities. The National Defense University conducts long-term research in the field of security as well as current analyses and strategic studies for the offices of the President, Prime Minister, Minister of National Defense and other public authority institutions.

The University includes the War Games and Simulation Center, which is one of the most modern in Europe and the only one in Poland as well as the CBRN Defense Center. Command Post Exercises, organized jointly with local authority administration institutions, are an important part of the didactic process. The War Games and Simulation Center staff use the joint theater level simulation for many of their major studies and command post exercises that focus on operational and strategic scenarios. The War Games and Simulation Center routinely conducts several joint theater level-supported exercises each year. The most recent was a Crisis Management CAX in November 2009.

NTSA would like to recognize the following company members for their support throughout the year.

**NTSA
SUSTAINING
CORPORATE
MEMBERS**

AAI Corporation	Cogent3D, Inc.	JHT, Inc.	QinetiQ North America
Accenture	Combat Training Solutions, Inc.	JVC U.S.A.	Quantum3D, Inc.
ACME Worldwide Enterprises, Inc.	Computer Sciences Corporation	Kongsberg Maritime Simulation, Inc.	Raytheon Company
Advanced Interactive Systems	Concurrent Computer Corporation	L-3 Communications Link Simulation and Training	Rockwell Collins Simulation & Training Solutions
Advanced Simulation Technology Inc. (ASTi)	Cubic Defense Applications Group	Laser Shot, Inc.	SAAB
Advanced Systems Technology Inc.	DiSTI	Lockheed Martin Simulation, Training & Support	Science Applications International Corporation
Aechelon Technology, Inc.	DRS C3 Systems, Inc.	LSI, Inc.	Serco, Inc.
AEgis Technologies Group, Inc.	Dynamic Animation Sytems	MÄK Technologies	SimiGon Ltd.
Aero Simulation Inc.	Dynamics Research Corporation	Meggitt Training Systems	Sony Electronics, Inc.
Alion Science & Technology	Elbit Systems, Ltd.	MetaVR	Ternion Corporation
American Systems Corporation	Engineering & Computer Simulations (ECS)	Moog, Inc.	Thales
The ASTA Group, LLC	Engineering Support Personnel Inc.	Motion Reality, Inc.	TSM Corporation
AT&T	Environmental Tectonics Corporation	MPRI	URS
BAE Systems	Equipe Simulation	MYMIC, LLC	VDC Display Systems
BARCO Simulation	FAAC	nGRAIN	Veraxx Engineering Corporation
BBN Technologies, Inc.	FlightSafety International	Northrop Grumman Corporation	VMASC (Virginia Modeling, Analysis and Simulation Center)
The Boeing Company	General Dynamics	OPINICUS Corporation	Wegmann USA, Inc. Training and Simulation
Booz Allen Hamilton	HAVELSAN A.S.	Organic Motion, Inc.	WITTENSTEIN Aerospace & Simulation, Inc.
CAE USA	Hewlett-Packard (HP)	Pal-Tech, Inc. / Gradient eLearning	Zedasoft, Inc.
Calytrix Technologies	Indra Systems, Inc.	PLEXSYS Interface Products Inc.	
Camber Corporation		Presagis	
Carley Corporation			
Christie Digital Systems, USA			

**NTSA
REGULAR
CORPORATE
MEMBERS**

3D Perception	Continuum Dynamics, Inc.	MASA Group	SMART Technologies, Inc.
Adacel Systems, Inc.	Control Products Corporation	Military Wraps	Soar Technology, Inc.
ADAYANA Government Group	Corsair Engineering	Motion Analysis Corporation	Sonalysts Inc.
Advantech Business Builders, Inc.	Crytek GmbH	National Aerospace Laboratory NLR	Southwest Research Institute
AgustaWestland	Digimation	National Center for Simulation	SRI International
Alelo	Display Solutions	Natural Point	Stirling Dynamics Ltd.
Allied Container System, Inc.	eMDee Technology	NCI Information Systems	Stottler Henke
Applied Research Associates, Inc. (ARA)	Georgia Tech Research Institute	Oshkosh Specialty Vehicles	Survival Systems USA
Argon ST	Goodrich Corporation	Photo Etch	SYMVIONICS, Inc.
AVT Simulation	Government of Ontario, Canada - Ministry of International Trade and Investment	Pinebrook Inc.	Sytronics, Inc.
Bihrl Applied Research, Inc.	The Harrington Group	PULAU Electronic Corporation	The Tatitlek Corporation
Binghamton Simulator Company	imedia.it, Inc.	Q4 Services, LLC	Tec-Masters, Inc.
Blue Ridge Simulation	Immersive Display Solutions	Raydon Corporation	TerraSim Inc.
Bosch Rexroth BV	Industrial Smoke & Mirrors	RGB Spectrum	Thermodyne Cases
Boston Dynamics, Inc.	Intelligent Decisions, Inc.	RPA Electronic Solutions, Inc.	Total Immersion Software, Inc.
BreakAway, Ltd.	InterSense, Inc.	SAIC/EMA	Vcom3D, Inc.
C ² Technologies, Inc.	J.F. Taylor, Inc.	Scalable Display Technologies	VirTra Systems
Compro Computer Services, Inc.	JRM Technologies, Inc.	SDS International	Westar Display Technologies, Inc.
Computer Comforts, Inc.	Martin Electronics, Inc. dba Chemring Ordnance	SimAuthor, Inc.	WILL Interactive
Concurrent Technologies Corporation		SIMMersion, LLC	Zel Technologies, Inc.
		SimPhonics, Inc.	

**NTSA
ASSOCIATE
CORPORATE
MEMBERS**

Advanced Brain Monitoring	Design Interactive, Inc.	Kell-Sibley Enterprises, LLC	SimStaff Technical Services
Aerosertec, USA	Digital Consulting Services, Inc.	L.C.O.A. Defense Systems	Sparta, Inc. dba Cobham Analytic Solutions
Aerosim Technologies	DSE, Inc.	LRK Associates	Systems Technologies, Inc.
Aptima, Inc.	e-Tech Solutions Corp.	MBDi	Training & Simulation Journal
ATSIM, Inc.	Evertz	MDG Fog Generators, Ltd.	University of Central Florida, Institute for Simulation and Training
Binghamton University	Hart Technologies, Inc.	Night Readiness, LLC	vectorCSP
Buck Leahy Consulting & Communications, LLC	HotSeat Chassis, Inc.	Precision Lightworks	Visual Purple, LLC
Columbus Technologies and Services, Inc.	Intelligent Automation, Inc.	ProModel	
Craig Technologies, Inc.	Intevac Photonics, Inc.	Riptide Software, Inc.	
DCS Corporation	J.F. Hales & Associates, Inc.	Seay Business Solutions, LLC	
	KaTron A.S.	Simulation Systems and Applications Inc.	

For membership information, see page 4 of this newsletter, visit <http://www.trainingsystems.org>, or call (703) 247-9471.
National Training and Simulation Association • 2111 Wilson Blvd., Suite 400 • Arlington, VA 22201-3061

