



WELCOME TO THE DECEMBER/JANUARY 2014 EDITION of the M&S Newsletter. This issue presents articles ranging from NASA training to launch a new spacecraft, to climate models showing 21st century temperature and precipitation changes. Additional articles feature testing, tactics, and training for the U.S. Military, virtual upgrades to boost on-board flight operations, and a successful warhead sled test. This edition also includes a list of upcoming events within the M&S community. Please note that the complete or original articles are available through the links provided.

We hope the December/January 2014 M&S Newsletter provides valuable insight into the world of M&S and we welcome your comments.

—M&S Newsletter Staff

Testing, Tactics, Training: Training Squadron Sets the Bar

Photo Credit: U.S. Air Force photo/Airman 1st Class Christopher Tam



Staff Sgt. Quenton Bailey inputs the location of a downed aircraft point during a continuation training exercise Aug. 28, 2013, at Nellis Air Force Base, NV. The 505th Test Squadron (TS) trains active-duty Air Force, joint and coalition service members from various geographic and functional air operations centers across the world to maintain a combat mission ready status. Bailey is a 505th TS interface control technician.

THE 505TH TEST SQUADRON PROVIDES testing, tactics development, and training for the United States military and coalition forces.

Their focus is on providing advanced air operations center training and Air Operations Center (AOC) testing and tactics development at the operational level of war.

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An AOC is the senior command and control element of the Air Force's Theater Air Control System and is responsible for effectively planning, directing, and executing joint air operations in support of the joint force commander's operation or campaign objectives.

The squadron is heavily focused on the United States Air Force Warfare Center commander's priorities of integrating air, space, and cyberspace in simulated war-fighting.

"The 505th Test Squadron (TS) is able to meet these priorities through our advanced training and testing efforts," said Don Russell, a 505th TS command and control instructor and training specialist.

Trying to provide advanced operational level training using a combination of live, virtual, and constructive exercises such as Red Flag and Virtual Flag is an important goal of

the squadron.

"What we strive to do is provide the most realistic training environments that challenge operations and intelligence workers," Russell said. "We attempt to push these (workers) out of their comfort zones to simulate stresses of major combat operations."

The 505th TS is able to provide this advanced training using a well trained staff comprising 20 different Air Force specialty codes and various exercises to create an unmatched training opportunity for AOC workers.

The squadron also trains members of the Air National Guard, Air Force Reserve, air operations groups, and squadrons across the U.S.

This article originally appeared on the U.S. Air Force website. For complete article, [click here](#).



Defense Department Successfully Conducts Warhead Sled Test

THE DEFENSE DEPARTMENT ANNOUNCED yesterday the successful testing of an advanced conventional precision effects warhead, a critical part of a national effort to establish a conventional prompt strike capability. This capability will contribute to the country to defend its interests with precision weapons at hypersonic speeds.

During an interview with American Forces Press Service, Susan Hurd, special assistant to the director of strategic warfare, called the test a significant technology development advancement.

"The successful execution of this high-speed sled test of a Kinetic Energy Projectile warhead was a necessary step in the progression to a conventional prompt strike capability," she said. "Now that we've demonstrated that the warhead functions in a flight representative environment we're one important step closer to that goal."

"High performance computer modeling and simulation as well as a series of small scale and static tests have already been done on this warhead," Hurd said. "But in order to assess its performance in flight conditions you have to do the dynamic test – you have to do the sled test.

Hurd emphasized this test was "critical" in order to subject the warhead to the "dynamic environment it would see in flight."

"The sled test was designed to be representative of conditions of flight and target engagement for the warhead," she said.

The 846th Test Squadron conducted the successful test at the Holloman High Speed Test Track, located on Holloman Air Force Base, New Mexico.

This article originally appeared on the Department of Defense website. For complete article, [click here](#).



Astronauts Practice Launching in NASA's New Orion Spacecraft

Photo Credit: NASA



Astronauts Rick Linnehan and Mike Foreman try out a prototype display and control system inside an Orion spacecraft mockup at Johnson Space Center during the first ascent and abort simulations for the program.

NASA ASTRONAUTS RECENTLY EXPERIENCED what it will be like to launch into space aboard the new Orion spacecraft during the first ascent simulations since the space shuttles and their simulators were retired.

Ascent simulations are precise rehearsals of the steps a spacecraft's crew will be responsible for – including things that could go wrong – during their climb into space. They can be generic and apply to any future deep space mission or very specific to a launch that's been planned down to the second. For now, Orion's simulations fall into the first category, but practicing now helps ensure the team will have the systems perfected for the astronauts in any future mission scenario.

“Simulations like these provide valuable experience by giving astronauts and our operations team an early look at what going to deep space in Orion will be like,” said Lee Morin, an astronaut and supervisor of Johnson's rapid prototyping laboratory, who has been working on the

Orion displays. “Rehearsing launch and ascent—two of the most challenging parts of Orion's mission—also gives us an opportunity to work toward optimizing how the crew interacts with the spacecraft.”

Designing a spacecraft's cockpit for ease of use and efficiency is no easy task. Each space shuttle had 10 display screens, more than 1,200 switches, dials, and gauges, plus hundreds of pounds of procedures printed on paper. Orion, which is designed for deep-space exploration and autonomous or piloted rendezvous and docking, will use new technology to distill all of that down to just three computer screens, each the size of a sheet of paper.

This article originally appeared on the NASA website. For complete article, [click here](#).



Keeping it Real: Virtual Trainer Upgrades Boost Shipboard Flight Ops

ANSWERING THE FLEET'S CALL FOR MORE AUTHENTIC TRAINING

environments, the Office of Naval Research (ONR) is delivering a more cost-effective, realistic simulator to train Sailors responsible for directing the movement of helicopters aboard ships, officials announced October 23.

The Helicopter Control Officer Trainer (HCOT) is being used by HCOs and Landing Signalman Enlisted (LSE) personnel at naval bases in San Diego and Norfolk, where courses required by the Chief of Naval Operations are taught.

The trainer initially was developed after Chief of Naval Research Rear Adm. Matthew Klunder visited Naval Air Station North Island, San Diego, CA., and talked to Sailors about ways to make their virtual training more realistic, taking into account moving ships, crashing waves and blinding rain, among other variables.

“These dedicated Sailors play an important role in shipboard aviation, and they wanted a training environment that was as lifelike as the challenges they face in the shipboard environment,” Klunder said. “Staying in constant contact with

the fleet allows us to quickly and effectively address concerns from the flight deck up to the bridge without breaking the bank.”

Upgrades to the HCOT simulation eliminate the need for costly maintenance of aging hardware by combining training for personnel, both HCOs in a ship's flight control tower and LSEs on the ship's deck coordinating take-offs and landings with hand signals.

For those manning the control tower, the setup features five touch-screen monitors with the same controls they would use at their shipboard stations. Instructors inside and outside of the mock tower play the roles of helicopter pilots or other crew members who would interact with the officers.

For the signalmen, a piece of headgear gives them a 360-degree view of a virtual ship deck. Another individual then uses a video game controller to either launch or land a helicopter based on the student's hand signals.

This article originally appeared on the U.S. Navy website. For complete article, [click here](#).

M&S Journal

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<http://msco.mil/MSJournal.html>.



M&S Newsletter

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at: <http://msco.mil/MSNewsletter.html>



Army Medicine Personnel Practice Teamwork at Mayo Clinic Simulation Center



Photo Credit: Steve Lambert

Members of the 865th Army Reserve Combat Support Hospital (Combat Surgical Hospital), out of Utica, NY, practice teamwork in the Mayo Clinic's Multidisciplinary Simulation Center in Rochester, MN.

THE SCENE WAS CHAOTIC—The 865th Army Reserve Combat Support Hospital, out of Utica, NY, was hit with their first round of casualties since deploying to Afghanistan. One woman was having a miscarriage, another an asthma attack, a third needed an appendectomy, and a young boy who'd swallowed a small toy was wheezing from a partially blocked airway.

Complicating matters, the medical team had difficulty explaining to the boy's frantic mother—who couldn't speak English and refused to leave her son's bedside—what was wrong with her child and getting consent to treat him.

This make-believe scenario recently played out at the Mayo Clinic Multidisciplinary Simulation Center in Rochester, MN, where the 865th was conducting a training exercise.

The 10,000-foot center was set up to reflect a hospital with an emergency room, operating room, intensive care unit, pharmacy, laboratory and X-ray, and a patient administration and tactical operations center. The clinicians used all types of equipment, including anesthesia machines, mechanical ventilators, blood pressures cuffs, defibrillators, perfusion simulators, and high tech manikins that have a heartbeat and a pulse and can breathe, cry, and yell.

Monitoring the training from observation rooms, expert Army observers communicated with Combat Surgical Hospital, or CSH, personnel through headsets, informed the clinicians of the type of injuries, related stressors and conditions with which they were dealing, and often changed the status of a patient's condition to mimic the chaos of real life combat situations. Mayo technicians operated the manikins' vitals via remote control.

“With these patients they can simulate any wound in the world, change the scenario and tempo and pace of the patients coming in,” said Col. Kurt Vonfricken, a thoracic and general surgeon with the 865th CSH. “I had scenarios where I had to be in a couple of places at once. At one point I had to take on another surgeon's patient. The patient had had a laparoscopy and colon resection, they were bleeding and I had to come back and operate. Then there was a patient who had a traumatic amputation, one with a knife in his shoulder and one shot through the chest where we had to open the chest, fix the lung and do open chest CPR. It's safer than having live patients; this is how you train a team. I don't think you can do it any better.”

This article originally appeared on the U.S. Army website. For complete article, [click here](#).





Climate Models Show Potential 21st Century Temperature, Precipitation Changes

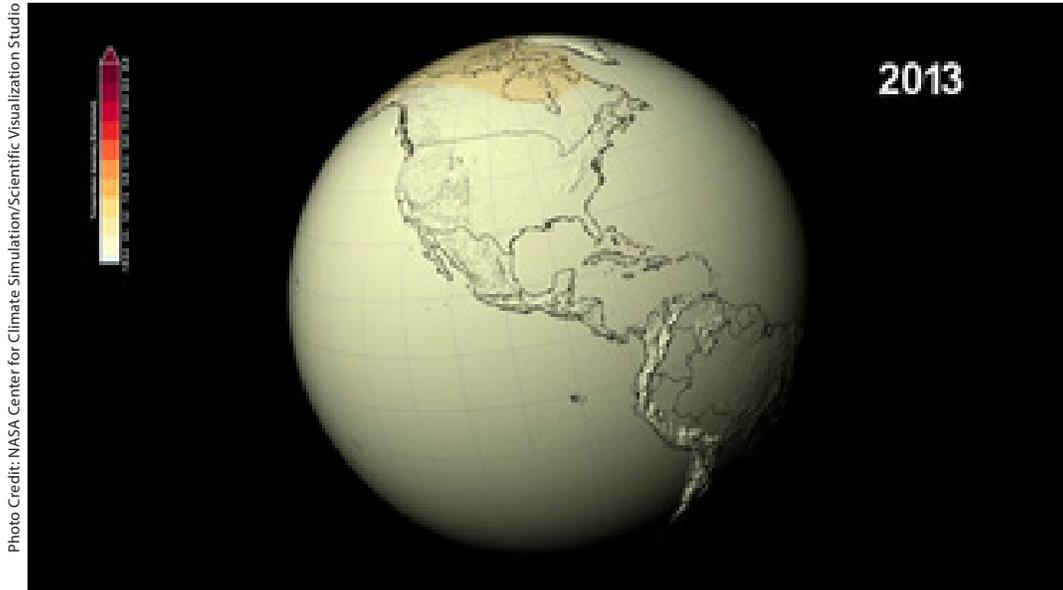


Photo Credit: NASA Center for Climate Simulation/Scientific Visualization Studio

Models used by the IPCC estimate global temperature and precipitation patterns will change throughout the 21st century given current rising greenhouse gas levels. This video depicts a scenario in which carbon dioxide concentrations reach 670 parts per million (ppm) by 2100, up from around 400 ppm today.

NEW DATA VISUALIZATIONS FROM THE NASA CENTER for Climate Simulation and NASA's Scientific Visualization Studio at Goddard Space Flight Center, Greenbelt, MD, show how climate models used in the new report from the United Nations' Intergovernmental Panel on Climate Change (IPCC) estimate possible temperature and precipitation pattern changes throughout the 21st century.

For the IPCC's Physical Science Basis and Summary for Policymakers reports, scientists referenced an international climate modeling effort to study how the Earth might respond to four different scenarios of carbon dioxide and other greenhouse gas emissions throughout the 21st century. The Summary for Policymakers, the first official piece of the group's Fifth Assessment Report, was released Friday, September 27.

This modeling effort, called the Coupled Model Intercomparison Project Phase 5 (CMIP5), includes dozens of climate models from institutions around the world, including from NASA's Goddard Institute for Space Studies.

To produce visualizations that show temperature and precipitation changes similar to those included in the IPCC report, the NASA Center for Climate Simulation calculated average temperature and precipitation changes from models that ran the four different emissions scenarios. The final products are visual representations of how much temperature and precipitation patterns would change through 2100 compared to the historical average from the end of the 20th century.

The changes shown in these maps compare an average of the model projections to the average temperature and precipitation benchmarks observed from 1971-2000. This baseline is slightly different from the baseline used in the IPCC report, which was 1986-2005. Because the reference period from 1986-2005 was slightly warmer than 1971-2000, the visualizations are slightly different than those in the report, even though the same model data is used.

This article originally appeared on the NASA website. For complete article, [click here](#).



FEATURED HIGH LEVEL TASK

High level tasks are special technology-related projects that will enhance the applications of M&S throughout the DoD for the benefit of our Warfighters. By focusing on the goals stated in the “Strategic Vision for DoD Modeling and Simulation,” these high level tasks are delivering solutions that will contribute to closing fundamental gaps in current M&S capabilities.



Rapid Data Generation Improves Simulation Exercises

THERE IS AN INCREASING NEED for modeling and simulation (M&S) among Department of Defense organizations. Event planners and operators who use and provide M&S data to run simulation exercises require M&S-ready data to make simulated scenario events more realistic and accurate. M&S data production (i.e., refining, thickening, integrating, and formatting) is labor intensive, time-consuming, and costly. Reusing M&S data is the most effective way to minimize data production time and cost.

The DoD M&S Steering Committee sponsored the development of an enterprise capability to enable data discovery, enhancement, correlation, implementation, and reuse across the spectrum of communities enabled by M&S (Acquisition, Analysis, Experimentation, Intelligence, Planning, Test and Evaluation and Training): The Rapid Data Generation (RDG) Common Data Production Environment (CDPE). It is the foundational data discovery and retrieval capability that promotes reuse across the M&S enterprise. The CDPE enables the discovery, retrieval, and reuse of data that has already been produced for M&S applications and facilitates the discovery and integration of authoritative source data through web services.

In November 2013, the Joint Training Integration and Evaluation Center (JTIEC) RDG program manager, Army Program Executive Office for Simulation Training and Instrumentation (PEO STRI), fielded the CDPE initial operating capability (IOC). The intent of the capability is to discover and retrieve unclassified order of battle (OOB) data available from the Joint Staff J7 Joint Training Data Services (JTDS) and the TRADOC Intelligence Support Activity (TRISA) Threat Force Structure data repositories. There are

currently seven data providers supporting RDG and 36 users obtaining CDPE accounts.

In FY14, the CDPE will enable the discovery of unclassified environmental representation, and classified OOB data by integrating additional data providers, and increasing functional capabilities, to improve the user experience. For instance, RDG is integrating the Environmental Data Cube Support System (EDCSS). EDCSS is a technology that ensures more realistic virtual and constructive simulation exercises by allowing the incorporation of real weather and terrain characteristics and effects (e.g., rain-induced mud), and providing consistency between the distributed simulations and operational weather products (e.g., reports, charts, and maps) for operators. When fully integrated, the RDG CDPE will enable the discovery and reuse of data and weather effects resulting in more realistic simulation events. These integrated efforts increase the likelihood of mission success.

Users can apply for RDG CDPE accounts at <https://cdpe.jten.mil>. For additional information, visit www.msco.mil (Ask M&SCO).





M&S WHAT AND WHEN

MODELING & SIMULATION CALENDAR OF EVENTS

2014 Human Systems Conference

February 4 – 5, 2014
Arlington, VA

25th Annual SO/LIC Symposium & Exhibition

February 10 – 12, 2014
Washington, DC

SEDC 2014 Conference

April 3 – 5, 2014
Chantilly, VA

15th Annual Science & Engineering Technology Conference/Defense Tech Exposition

April 8 – 10, 2014
Hyattsville, MD

MODSIM World 2014

April 15 – 17, 2014
Hampton, VA

AlaSim International

May 6 – 7, 2014
Huntsville, AL

ITEC

May 20 – 22, 2014
Cologne, Germany

2014 SOFIC (Special Operations Forces Industry Conference)

May 20 – 22, 2014
Tampa, FL

82nd MORS Symposium

June 16 – 19, 2014
Alexandria, VA

2014 Pacific Operational Science and Technology Conference

August 26 – 29, 2014
Honolulu, HI

2014 Fall Interoperability Workshop (SIW)

September 8 – 12, 2014
Orlando, FL

17th Annual Systems Engineering Conference

October 27 – 30, 2014
Arlington, VA

I/ITSEC 2014: Interservice/Industry Training, Simulation & Education Conference

December 1 – 4, 2014
Orlando, FL



The M&S Newsletter

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