DRAFT JADS/JOINT STARS NEWS RELEASE
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JADS/JOINT STARS END-TO-END TEST IS AN OUTSTANDING SUCCESS

KIRKLAND AIR FORCE BASE, NM – The Joint Advanced Distributed Simulation (JADS) Joint Test Force (JTF) announced that the live test missions flown on 25 and 31 March 1999 achieved outstanding success and completed the fourth and final phase of the JADS End-To-End (ETE) Test. The ETE Test was designed to evaluate the utility of advanced distributed simulation (ADS), including distributed interactive simulation (DIS), for both developmental and operational test and evaluation of command, control, communications, computers and intelligence (C4I) systems. The ETE Test consisted of four phases: (1) development of the synthetic environment, (2) developmental and operational testing in the laboratory, (3) transition to the prime mission equipment/aircraft, and (4) two live test missions using ADS to populate the battlespace with thousands of threat vehicles and then link friendly C4I/weapon system co-actors.

The C4I system used in the ETE Test was a Northrop Grumman E-8C Joint Surveillance Target Attack Radar System (Joint STARS). The E-8C aircraft, flown by the Joint STARS Joint Test Force based in Melbourne, Florida, was equipped with an onboard radar processing simulation and integrator called the Virtual Surveillance Target Attack Radar System (VSTARS) that was designed and built by the prime contractor, Northrop Grumman, together with Lockheed Martin and Motorola under a JADS contract. During the live test mission, VSTARS, while running concurrently with the E-8C's radar, accepted virtual target information from a Janus war game scenario generator remotely located at the White Sands Missile Range, New Mexico. Information was sent over a standardized DIS network and radio frequency linked to the aircraft via a satellite communications (SATCOM) link. VSTARS then converted the data elements into virtual radar reports and seamlessly combined them with live target information the E-8C's radar was collecting from a 1st Cavalry Division multicompany exercise at Fort Hood, Texas, to form composite radar reports for a simulated war scenario set in Southwest Asia. These reports were transmitted in real time via the Joint STARS surveillance and control data link (SCDL) to Bravo Company, 303d Military Intelligence (MI) Battalion, 594th MI Brigade ground station module (GSM) and an Army Joint STARS Program Office common ground station (CGS). The GSM fed the information into an analysis and control element slice which nominated targets via the Advanced Field Artillery Tactical Data System (AFATDS) to Fort Sill, Oklahoma, and the Tactical Army Fire Support Model (TAFSM) simulation modeled on the Army Tactical Missile System (ATACMS). The TAFSM used these reports to conduct simulated firing missions back into the Janus virtual battlespace. The success on the virtual battlefield was observed in real time by operators in both the E-8C and the GSM.

The ETE Test was noteworthy for achieving a number of extremely important firsts. The most important was the successful development of VSTARS, the first system simulation of a complex, multimode--moving target indicator (MTI), fixed target indicator, and

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synthetic aperture radar (SAR)--airborne radar surveillance and battle management system. VSTARS, which recently received an accreditation by a Department of Defense joint test for use in testing, is the only valid Joint STARS simulation recognized by the Joint STARS Program Office (JPO) at Hanscom Air Force Base. Based on actual Joint STARS engineering models, VSTARS uses the actual processes, messages and software of the Joint STARS radar and operations and control (O&C) subsystems. As a result, VSTARS operator displays and controls, system parameters, radar timelines, and message formats are identical to those of the actual Joint STARS system. In addition, VSTARS provides connectivity to the Joint STARS CGS through an emulation of the SCDL that operates over commercial communication links. With VSTARS the only simulation taking place is the simulation of the radar modes within the radar subsystem. With a war game scenario generator VSTARS makes it possible to realistically simulate the entire battlefield environment to include all moving and nonmoving targets, radar target detections, assignment of strike weapons and other target engagement actions, and required reporting. Moreover, VSTARS enables the mixing of virtual MTI radar reports and virtual SAR reports in a seamless manner with actual radar reports produced by the E-8C during an operational mission.

The ETE Test achieved still more very important firsts. During the live test more than 10,000 entities conducting doctrinally realistic movement were transmitted from the Janus war game scenario generator at White Sands Missile Range via a T-1 link to Melbourne, Florida, and from there via SATCOM to the VSTARS installed in the E-8C flying over Fort Hood, Texas. Another first occurred when VSTARS successfully mixed these 10,000 plus entities in real time with the actual radar reports from ongoing surveillance the E-8C was providing of a Fort Hood exercise involving several companies of the 1st Cavalry Division so that both the virtual and live reports were displayed simultaneously in a seamless manner on the aircraft and GSM operator workstations in a simulated scenario set in Southwest Asia. In yet another first, virtual targets were provided to an Army fire direction center which issued orders to a virtual ATACMS that then conducted virtual fire missions--fourteen on the first mission and fifteen on the second. The battle damage results of these fire missions were observed by operators in the air onboard the E-8C and on the ground in the GSM and CGS who could see in near real time on their workstation displays precisely how many entities did not move out of the target areas after the ATACMS virtual fire missions.

Observing the first live mission from onboard the Joint STARS aircraft, Colonel Mark Smith, the test director of the Joint Advanced Distributed Simulation Joint Test Force, stated that, "The success of the ETE Test is an important milestone for both the Simulation Test and Evaluation Process and simulation-based acquisition. The ETE Test showed how ADS can be used to overcome many of the testing, evaluation, and training limitations inherent with live exercises." Live peacetime exercises provide an extremely limited environment for a command, control, communications, computers, intelligence, surveillance, and reconnaissance system possessing Joint STARS' ability to detect, locate, track and target very large numbers of vehicles moving within a vast area. For example, affordability and personnel training tempo normally limit live exercises to a

very small number of vehicles. These exercises are generally confined to a small training area. The exercise area obviously is not similar to what Joint STARS is likely to cover during war or the threat of war. Many live exercises have a close combat orientation that does not allow Joint STARS to exploit its ability to target forces deep, before they can close with friendly surface forces. The need to minimize risk limits realism. Limited numbers of E-8Cs, which are often supporting real-world contingencies, can make it impossible to support live testing, evaluation and training. Finally, live exercises do not have the controls and repetition needed for evaluation.

Now, thanks to ADS in the form of VSTARS, far more realistic testing, evaluation and training is possible, even when actual E-8C aircraft are not available, while saving significant amounts of money. The synthetic environment possible with VSTARS can provide the controls and repetition needed to greatly enhance future testing and evaluation of a variety of systems to include Joint STARS, the CGS, the All Source Analysis System, and the Block II ATACMS. Similarly, the controls, repetition and absence of constraints possible with VSTARS that are inherent with live exercises should contribute immensely to the processes for developing future joint and service doctrine and defining requirements. VSTARS can greatly enhance the ability of commanders and their components to develop and test war plans and should play a major role in expeditionary Air Forces command and control training. VSTARS is already being used in the Supreme Headquarters Allied Powers, Europe Technical Center and will play a key role in the Expeditionary Force Experiment '99 and Ulchi Focus Lens '99. VSTARS, especially its ability to seamlessly combine live and virtual environments, will allow mission planning and rehearsal to reach a new level of excellence, dramatically lowering risks during actual operations. Finally, unit joint distributed mission training can become far more realistic, producing far more capable units. To this end the JADS JTF is working with the JPO, the 93d Air Control Wing at Robins Air Force Base, and points of contact at Fort Hood and Fort Huachucha to install necessary connectivity and to incorporate VSTARS into the Joint STARS Mission Crew Training System and the GSM and CGS trainers. Establishing training connectivity between U.S. Air Force and U.S. Army facilities will achieve the first interservice distributed mission training capability.

Already VSTARS is drawing high praise from operators, testers, and trainers. One Joint STARS tester stated that, "Even knowing it was a simulation, I could suspend reality and believe I was operating Joint STARS." An operator said, "You could train several people on their jobs, and they would think they were sitting on the plane." A trainer noted that, "I could do more training in one hour with VSTARS than I could do in ten hours with anything other than the plane." Colonel (Brigadier General select) Robert Latiff, Joint STARS program manager, said, "I am thoroughly pleased with the astounding successes achieved with VSTARS and commend the JADS program and the contractors for their excellent work. When we can link-up operators from all the services with this wonderful simulation capability we will have truly done a great service to our warfighters."