



Joint Test and Evaluation

|| The Joint Test and Evaluation (JT&E) Program enables planning and execution of joint tests to support the future fight.

The Joint Test and Evaluation (JT&E) Program considers emerging technologies and the increasingly complex and dynamic, joint, multi-domain operational environment to develop solutions intended to enhance the United States' operational effectiveness, suitability, and survivability in combat. The Services and Combatant Commands (CCMD) help identify critical challenges that need to be addressed in their areas of responsibility to maintain superiority across joint, multi-domain operations. The JT&E Program provides operational test and evaluation management and expertise to develop, test, and validate joint solutions, including agile warfighting tactics, techniques, and procedures (TTP), concepts of employment (CONEMP), and concepts of operations (CONOPS). In turn, Services and CCMDs provide leadership and support to the planning and execution of JT&E projects and their successful transition to the warfighter. The JT&E Program focuses on joint requirements that cannot be economically or effectively maintained within each of the individual Services and CCMDs. Given the increased integration and dependencies of platform, network, and command and control solutions across the domains, JT&E's mission and unique focus on system of systems testing is becoming increasingly critical to the Department's strategic objectives, to include modernization. JT&E test techniques, workforce talents, and reach-back are essential to the adequate evaluation of the effectiveness of operational plans across the CCMDs.

In FY21, the JT&E Program managed 3 Joint Tests and 10 Quick Reaction Tests (QRT). A Joint Test averages about two years in duration and is preceded by a six-month Joint Feasibility Study. QRTs provide a quicker response to urgent joint needs but must focus their objectives to execute within the shortened, one-year schedule. The JT&E Program also managed one Special Project that was fully resourced by the CCMD sponsor.

Joint Tests

Joint Integrated Fire Control – Directed Energy Weapons for Air Defense (JIFC-DAD)

The advancement of adversaries' ballistic and cruise missiles continue to threaten U.S. interests. U.S. Indo-Pacific Command (USINDOPACOM) J8 recognized the benefits of emerging technologies, specifically directed energy weapons (DEW), in improving air defense capabilities against such threats for U.S. joint forces and coalition partners. When employed with existing kinetic systems, DEW may enhance area air defense capabilities and enable commanders to effectively, affordably, and rapidly defeat massed attacks. In January 2021, JT&E initiated the JIFC-DAD Joint Test to deliver a validated CONEMP that optimizes the integration of DEW with kinetic weapon systems and provides a layered defense of critical assets against a mix of wartime air threats. The first field test is scheduled for early 2022.

Joint Interoperability through Data Centricity (JI-DC)

CCMDs utilize more than 40 independent, mission partner networks in current daily operations, requiring significant resources and complexity to manage multiple computer systems, networks, and associated infrastructure. The DOD Chief Information Officer and U.S. Central Command J6 recognized the benefit of having a data-centric environment that can consolidate operations with coalition and multi-national partners onto a single network. In February 2019, JT&E initiated the JI-DC Joint Test to optimize, test, and evaluate the effectiveness of such a data-centric network currently developed by U.S. Central Command. The joint field tests focused on the ability of U.S. and coalition warfighters to effectively employ data-centric procedures and share information with authorized targeteers in the development of targeting packages. The procedures developed within the JI-DC project are expected to be implemented across multiple CCMDs and adapted for the Joint Staff Joint All Domain Command and Control concept. The JI-DC project should demonstrate that data can be effectively, efficiently, and securely shared using a data-centric network. It should also provide warfighters with confidence that the data are accessible to authorized recipients only.

Recovery Enhanced by Synchronizing Capabilities to Unify Effects (RESCUE)

Personnel recovery operations will face a challenge in the increasingly complex multi-domain, anti-access/area denial environment. The Joint Personnel Recovery Agency recognized that current doctrine and TTPs need to be updated to deploy, assemble, and operate joint forces with acceptable risk in a contested environment so as to provide effective and timely support to personnel recovery. In January 2021, JT&E initiated the RESCUE Joint Test to develop new TTPs that integrate and synchronize information-related capabilities with traditional kinetic fires. Specifically, such TTPs leverage information operations, military deception, public affairs engagement, the use of national assets, interagency coordination, and space-related capabilities. The RESCUE TTP demonstrated the benefit of integrating these capabilities into the joint planning processes during a risk reduction event at Marine Forces Special Operations Command Raven Exercise in October 2021. The primary field test to demonstrate the execution of personnel recovery using the updated TTPs is scheduled for Keen Edge Exercise at USINDOPACOM in January 2022.

Quick Reaction Tests

Assessment of Joint Maritime Mining on USINDOPACOM Operational Plans (AMMO)

Maritime mining is a low-cost and effective means to deny an adversary access to geographic locations and delay their action. U.S. adversaries have advanced their integrated air defense systems and substantially increased risk to the warfighter when deploying mines. USINDOPACOM J8 recognized the need to develop, test, and validate a joint CONEMP to maximize the wartime effect of both legacy and advanced maritime mines, given the increased risk in their deployment. In April 2021, JT&E initiated the AMMO QRT that will utilize advanced modeling and simulation to develop a CONEMP for near-term and legacy mine capabilities intended to maximize operational and strategic effect within USINDOPACOM operational plans and minimize risk to U.S. forces and coalition partners. The AMMO QRT is scheduled to complete the first table top exercise in January 2022, while the second is planned for Spring 2022. The AMMO QRT will provide critical updates to the Office of the Chief of Naval Operations N81 Capabilities Based Analysis for Maritime Mining.

Integration of Joint Optimization for Electromagnetic Spectrum (EMS) Superiority (I-JOES)

Joint forces are critically dependent on the electromagnetic spectrum (EMS) across all domains and functions. To achieve EMS superiority, USINDOPACOM J8 recognized the need for validated cross-functional TTPs that integrate intelligence, electromagnetic warfare, and spectrum management at the component level. In April 2021, JT&E initiated the I-JOES QRT to develop component-level TTPs that: 1) incorporate EMS targets and collection requirements into joint targeting or collection cycles, 2) integrate EMS operations into the joint air tasking cycle, and 3) develop component EMS operations plans to feed the CCMD and Joint Task Force Joint Electromagnetic Spectrum Operations. The I-JOES QRT will complete the first field test during the Keen Edge Exercise in January 2022.

Joint Basin-Scale Communications (J-BASC)

U.S. Strategic Command (USSTRATCOM) recognized an emerging communications technology that could be integrated within the existing architecture to meet a critical joint force need. In April 2021, JT&E initiated the J-BASC QRT to develop, test, and evaluate the new communications CONOPS that considers this technology. Planning is underway for field test activities scheduled in January and May 2022. Details are classified.

Joint Discreet Adversary Strategy Defeat (J-DASD)

USSTRATCOM J8 recognized the need to apply tailored deterrent strategies for specific adversaries by integrating the full spectrum of U.S. military capabilities, both nuclear and conventional, with elements of U.S. national power. In April 2021, JT&E initiated the J-DASD QRT to develop and test CONOPS that specifically addresses the following areas: 1) integration of strategic deterrence action, 2) development of deterrence options, 3) degrading potential impact of threat actors, 4) executing deterrence operations in a timely manner, and 5) reducing the risk of deterrence failure. The J-DASD QRT will conduct two field test events during USSTRATCOM exercises to collect measurements for the entire messaging processes.

Joint Integrated Network – Korea (JIN-K)

U.S. Forces Korea are updating their near real-time, joint/coalition integrated air-ground common operational picture. The update will enhance integration and distribution of sensor and targeting data to mobile and command post sites throughout the theater of operations. Joint Staff J6 recognized the need to develop new TTPs that optimize the benefits of this update and deliver the required joint capabilities within the Multi-Domain Resilient Air-Ground Operations Network. In January 2021, JT&E initiated the JIN-K QRT to develop, test, and validate such TTPs. The JIN-K QRT will conduct field tests in Spring 2022. The validated TTP will enable warfighters to effectively utilize available data within a common operational picture and retain real-time situational awareness from the tactical through strategic levels. Further, the TTP will reduce bandwidth consumption and directly contribute to projection of combat power.

Joint Interagency – 5G Radar Altimeter Interference (JI-FRAI)

In March 2020, the Federal Communications Commission reallocated the 3.7 to 3.98 GHz frequency spectrum to 5G C-Band applications. The Office of the Under Secretary of Defense for Acquisition and Sustainment and U.S. Transportation Command recognized the need to determine the effects of 5G C-Band interference on military, U.S. Coast Guard, U.S. Customs and Border Protection, and Civil Reserve Air Fleet-partner aircraft radar altimeters (RADALT). In April 2021, JT&E initiated the JI-FRAI QRT to provide an initial assessment of 5G interference on selected military RADALT systems. The initiative is using military RADALT as a use case to support current and future operational avionics testing, mitigations, and standards development. The JI-FRAI QRT will assess 5G interference risks, mitigations, standards, conditions, and future test resource requirements by leveraging Service-funded bench test results and conducting improved operator-in-the-loop bench testing, over-the-air testing, and operationally realistic 5G interference flight tests. The initial phase of testing commenced with enhanced bench testing scheduled for December 2021. The final two phases of testing are scheduled to occur in FY22 and will deliver a Combined Test Methodology with procedures for evaluating 5G interference on RADALTs and other avionics.

Joint/Interagency – Ground/Air Transponder Operational Risk Reduction (JI-GATOR)

Multiple transponder systems (across aviation and ground-based services) broadcast data such that commercial services can collect and display those data to any end user. Aviation is dependent on broadcast modes such as Automatic Dependent Surveillance-Broadcast for navigation, air traffic control, and flight safety. Headquarters, U.S. Air Force A3, and North American Aerospace Defense Command – U.S. Northern Command recognized that the open, unencrypted design of Automatic Dependent Surveillance-Broadcast could create operational security issues for military, U.S. Coast Guard, and U.S. Customs and Border Protection aircraft and introduce vulnerabilities affecting air surveillance accuracy and air surveillance system availability. In June 2019, JT&E initiated the JI-GATOR QRT to develop, test, and validate joint and interagency TTPs intended to mitigate vulnerabilities in aviation transponder data confidentiality, integrity, and availability. JT&E completed the field tests in May and July 2020. TTPs enabled operators to configure their systems to restrict unwanted transponder emissions/tracks and interpret the data in the air traffic control environment, improving operational security, air traffic control, and air surveillance. These TTPs accounted for the differences between air traffic

control system hardware configurations in the DOD and interagency aircraft across a range of air traffic control environments.

Joint Interagency Net-Centric Cross-Domain Risk to Operational Cyber Systems (JINX ROCS)

The Eastern Air Defense Sector and Western Air Defense Sector rely on a range of transponders and associated datalinks that underpin air defense awareness and control in support of the homeland defense mission. DOT&E recognized the need to evaluate the cyber risks to the Eastern Air Defense Sector/Western Air Defense Sector architecture, system, and information. In April 2021, JT&E initiated the JINX ROCS QRT to develop, test, and validate time-critical TTPs to detect, respond to, and recover from cyber interference within the data stream and architecture, as well as a means to optimize available sensors to support these activities. The first field test series began at Eastern Air Defense Sector Headquarters in December 2021, with completion scheduled in February 2022. The JINX ROCS QRT is scheduled to conduct the second field test at Arctic Edge in April 2022. Testing will validate the TTPs needed for air defense sector operators to maintain battlespace situational awareness in a cyber-contested environment.

Joint Littoral Fire Support Coordination (J-LIFE)

The joint warfighter requires doctrine to deconflict, coordinate, and integrate attacks that include newly fielded capabilities and emerging technologies. USINDOPACOM J8 recognized the need for an effective doctrine that minimizes the risk of fratricide, reduces duplication of effort, and assists in shaping the operating environment for land-based fires into the maritime domain. In January 2021, JT&E initiated the J-LIFE QRT to develop and validate TTPs to update existing joint and Service doctrine in support of the U.S. Marine Corps' Expeditionary Advanced Base Operations and U.S. Army's Multi-Domain Task Force. To meet these objectives, the J-LIFE QRT conducted an observation event at Project Convergence in October 2021 and is scheduled to utilize a U.S. Pacific Fleet Battle Problem exercise to conduct the first field test in January 2022.

Joint Sustainment in the Littorals – Fuel and Water Distribution (JSL-FWD)

Expeditionary Advanced Base Operations require forces to continue to distribute fuel and water in an evolving anti-access/area denial environment. USINDOPACOM J8 recognized the need for joint CONOPS to enable flexible and resilient logistical supply and sustainment to maintain operations in such an increasingly complex and dynamic environment. In January 2021, JT&E initiated the JSL-FWD QRT to develop, test, and validate a joint CONOPS for agile, scalable, and expeditionary fuel and water distribution that connects existing tactical fuel and water distribution systems ashore to locations beyond the high water mark via an over-the-shore connection. The JSL-FWD QRT is scheduled to conduct field tests in early 2022.

Special Projects

Joint – Rapid Alerting for Survivability and Endurability (J-RASE)

Electromagnetic pulse is an evolving threat to critical U.S. infrastructure, including strategic command, control, and communications (C3) systems, requiring the need for timely notification and protective procedures to prevent damage to such systems. USSTRATCOM recognized the need for an enterprise solution to endure and sustain operations that support the deterrent capability of the joint force. In October 2019, JT&E initiated the J-RASE Special Project to develop, test, and validate TTPs focused on improving C3 system and logistics survivability during an electromagnetic pulse alert notification. The J-RASE team completed two field tests demonstrating the effectiveness of the operationally realistic processes for rapid notification of forces and supporting agencies to initiate actions to enhance the survivability of their C3 systems and manage their units'

capability to endure and sustain operations in a degraded, contested communications environment. The J-RASE TTP improves the joint warfighters' ability to rapidly prepare for an attack, initiate protective measures, recover quickly, sustain, and endure while continuing to meet current operational requirements.