

## The Center for Countermeasures (CCM)

The Center for Countermeasures (the Center) is a joint activity that directs, coordinates, supports, and conducts independent countermeasure/counter-countermeasure (CM/CCM) T&E activities of U.S. and foreign weapons systems, subsystems, sensors, and related components. The Center accomplishes this work in support of DOT&E, the Deputy Assistant Secretary of Defense for Developmental Test and Evaluation ((DASD(DT&E))), weapon systems developers, and the Services. The Center’s testing and analyses directly support evaluations of the operational effectiveness and suitability of CM/CCM systems.

Specifically, the Center:

- Determines performance and limitations of missile warning and aircraft survivability equipment (ASE) used on rotary- and fixed-wing aircraft
- Provides T&E support to Program Offices for the rapid development and deployment of directed-energy weapons (DEW)
- Develops and evaluates CM/CCM techniques and devices
- Operates unique test equipment that supports testing across the DOD
- Provides analyses and recommendations on CM/CCM effectiveness to Service Program Offices, DOT&E, DASD(DT&E), and the Services
- Supports the development of directed-energy test resources
- Supports Service exercises, training, and pre-deployment activities

The Center conducts these activities — from testing and analysis of CM/CCM systems, to support training and pre-deployment activities, and development of CM/CCM tools

and techniques — to enhance and support the survivability of equipment, aircraft, and personnel. The Center’s core mission to support T&E of ASE directly leads to a “more lethal force” by enabling the survivability of aircraft in a threat environment. Survivability enables mission success. This fiscal year, the Center has broadened its test support to include DEW used for Counter-Unmanned Aerial Systems and base defense.

In FY19, the Center completed 45 T&E activities. The majority of its T&E efforts were focused on Joint Urgent Operational Needs Statements (JUONS) in support of ASE activities. The Center’s predominant involvement in JUONS testing helped fulfill immediate mission needs that resulted in the successful deployment of critical equipment to combat theaters, and as a result, contributed to a “more lethal force.” In FY19, the Center participated in DEW T&E activities, sending its engineers and scientists to assist Program Offices with data collection, reduction, and analysis, and providing its custom test instrumentation and equipment to collect data. The Center also provided realistic Man-Portable Air Defense System (MANPADS), Portable Range Threat Simulator (PRTS), and High-power Portable Range Threat Simulator (HPRTS) threat environments for Service aircrew pre-deployment training. In the course of these activities, the Center conducted the test support and analysis of more than 29 DOD systems or subsystems — and reported the results. The Center also provided subject matter experts (SMEs) to working groups, task forces, and Program Offices. While conducting its test activities, the Center continues to improve its T&E capabilities and test methodologies.

### DEW TEST ACTIVITIES

#### Project Endurance DEW Test

- **Sponsor:** Defense Advanced Research Projects Agency (DARPA)
- **Activity/Benefit:** The Center provided one Remote Launcher System (RLS) and one Multi-Spectral Sea and Land Target Simulator (MSALTS) in support of Project Endurance, which is a DARPA program whose intent is to demonstrate an entire engagement timeline, from threat acquisition to engagement (kill chain), using a laser weapon as the threat defeat mechanism. The Center provided scientific consultation during pre-test setup and execution. The Center also provided the MSALTS to assess the threat acquisition and handoff portion of the kill chain, as well as the functionality of laser keep-out zones and the RLS to assess the system’s ability to exercise the entire kill chain against a free-flying missile. DARPA conducted the test from February 12 to March 22, 2019, at the Aerial Cable Range, White Sands Missile Range (WSMR), New Mexico.

#### Static Rocket, Artillery, Mortar (RAM) Lethality Test

- **Sponsor:** Survivability Vulnerability Assessment Directorate High Energy Laser Systems Test Facility (HELSTF)
- **Activity/Benefit:** The U.S. Army Space & Missile Defense Command conducted RAM lethality tests from July 15 – 26, 2019, at HELSTF’s Tactical High Energy Laser Static Test Site. The Center, through its partnership with HELSTF, participated in test preparation and setup from July 8 – 21, 2019, at the HELSTF, WSMR, New Mexico.

#### Atmospheric Propagation and Material Effects Test

- **Sponsor:** Naval Air Warfare Center
- **Activity/Benefit:** In partnership with HELSTF, the Center provided test setup support and operated the beam characterization and material effects recording instrumentation, as well as the high-energy laser system surrogate. Two of the Center’s scientists also supported

the data reduction efforts. The Naval Air Warfare Center conducted the test from August 12 – 22, 2019, at the HELSTF, WSMR, New Mexico.

September 16 – 20, 2019, at the HELSTF, WSMR, New Mexico.

## Mobile High-Energy Laser Measurement Cruise Missile Electro-Optical Target Board Initial Operational Capability Test

- **Sponsor:** Program Executive Office for Simulation, Training, & Instrumentation (PEOSTRI)
- **Activity/Benefit:** In partnership with HELSTF, the Center provided test setup support and operated a high-energy laser system. Two of the Center’s scientists also supported the data reduction efforts. PEOSTRI conducted the test on

## Solid State Laser Technology Maturation Laser Weapon System Demonstrator

- **Sponsor:** Office of Naval Research (ONR)
- **Activity/Benefit:** In partnership with HELSTF, the Center provided test setup support and operated the beam characterization equipment. Two of the Center’s scientists also supported the data reduction efforts and provided scientific consultation. The ONR conducted the test from September 9 to October 27, 2019, at the HELSTF, WSMR, New Mexico.

## ASE JUONS TEST ACTIVITIES

### Army: Advanced Threat Warner (ATW) and Common Infrared Countermeasures (CIRCM) Tests

- **Sponsor:** U.S. Army Technology Applications Program Office (TAPO) and the 160th Special Operations Aviation Regiment (SOAR) Systems Integration and Maintenance Office (SIMO)
- **Tests:**
  - ATW and CIRCM Flight Test (February 4 – 14, 2019), Redstone Arsenal, Alabama
  - ATW and CIRCM Flight Test Phase 2 (May 21 – 23, 2019), Redstone Arsenal, Alabama
- **Activity/Benefit:** The Center provided one Joint Mobile Infrared Countermeasure Test System (JMITS) for simultaneous, two-color infrared (IR) missile plume simulations and jam beam data collection. The IR simulations elicited a response from the ATW and also provided an IR source for the CIRCM to track; the jam beam radiometers characterized the CIRCM jam return. The Center provided near real-time feedback on missile plume simulation quality and jam beam data. The Center collected data and performed an assessment to determine the ATW’s ability to detect and declare threats and provide a handoff to the CIRCM, and the CIRCM’s ability to put energy on the threat. TAPO/SIMO used the Center’s assessment and data to help evaluate the integrated ATW/CIRCM system, as installed on the MH-60M, and determine its readiness for fielding. Center participation in these tests was in direct support of ongoing TAPO ATW JUONS efforts.

- MH-60S, AH-1Z Developmental Testing IT-2.1 (April 9 – 16, 2019), Hot Springs, Virginia
- MH-60S, AH-1Z IT-2.132 Fly-Fix-Fly (June 11 – 12, 2019), Patuxent River, Maryland
- A/MH-6M IT-1.403 Regression Test (June 24 – 26, 2019), Redstone Arsenal, Alabama
- MH-60S, AH-1Z IT-2.133 Laser Warning (LW) Flight Test (July 10, 2019), Chesapeake Bay Detachment, Maryland
- MH-60S, IT-2.133 LW Flight Test (July 23, 2019), Chesapeake Bay Detachment, Maryland
- DAIRCM Hostile Fire Indication (HFI)/LW IT-2.2 (August 23 – 30, 2019), China Lake, California
- MH-60S, AH-1Z, and UH-1Y IT-2.2 Phase 2 (August 23 to September 3, 2019), Hot Springs, Virginia
- MH-60S, AH-1Z, and UH-1Y IT-2.2 Phase 1 (September 19 to October 24, 2019), Eglin AFB, Florida
- **Activity/Benefit:** The Center provided one JMITS with four MANPAD threat seekers for the IT-1.1 portion of the testing and one MSALTS for all testing conducted prior to IT-2.2 (August 23 – 30, 2019). The Center provided three types of threat-representative lasers for the HFI/LW testing. The Center provided a JMITS with four MANPAD threat seekers, an MSALTS, and three laser threats for the IT-2.2 phase of the DAIRCM testing. The simulators provided the two-color IR missile plume simulations and laser CM (jam beam) data collection capability required to test the DAIRCM missile warning system’s (MWS) ability to detect and declare the threat and the DAIRCM directed infrared countermeasure’s (DIRCM) ability to acquire, track, and put laser energy on target. PMA-272 conducted testing in low, medium, high, mountainous, and littoral ultraviolet (UV) and IR clutter environments. The Center collected data and performed assessments to help DAIRCM developers and stakeholders assess the DAIRCM’s missile warning and CM capabilities. PMA-272 used data from these tests to evaluate and update, as needed, the DAIRCM hardware and software to improve the MWS and DIRCM performance; ensure human system interface/warning indications were properly displayed; and aircrews were aware of threats in the area, the threat’s location, and whether a CM had been deployed. The Center’s

### Navy: Distributed Aperture Infrared Countermeasure (DAIRCM) Tests

- **Sponsor:** Program Executive Officer, Tactical Aircraft Programs (PMA-272) on behalf of the Detachment 1 (Det 1), 413th Flight Test Squadron, TAPO, and SOAR SIMO
- **Tests:**
  - HH-60G IT-1.1 (October 9 – 19, 2018), Nellis AFB, Nevada
  - A/MH-6M IT-1.13 (November 6 – 9, 2018), Redstone Arsenal, Alabama
  - MH-60S IT-2.01 (December 10 – 12, 2018), Hot Springs, Virginia
  - A/MH-6M IT-1.4 (March 1 – 6, 2019), Eglin AFB, Florida

participation in these tests was in direct support of ongoing PMA-272 JUONS efforts.

## **Air Force: Medium Fixed-Wing (MFW) ATW JUONS Software Version 3.1a Regression Flight Test**

- **Sponsor:** U.S. Department of the Air Force, 645th Aerospace Systems Group
- **Activity/Benefit:** The Center provided one MSALTS for two-color IR missile plume simulations to collect system response data for ATW software version 3.1a (installed on the

MFW platform) regression testing. The Center collected data to help the Air Force determine the ATW's ability to detect and declare threats and provide a handoff to the onboard CM system (flares) while performing both scripted and operationally representative flight profiles. The Air Force will use this data to improve aircraft survivability. The 46th Test Squadron Defensive Systems conducted the test from June 3 – 7, 2019, at Eglin AFB, Florida.

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## ASE TEST ACTIVITIES

### **Army: CH-47F Integrated Survivability Equipment Test**

- **Sponsor:** Project Management Office (PMO) ASE
- **Activity/Benefit:** The Center provided the PRTS to produce threat radar emissions to verify CH-47F AN/APR-39C(V)1 Radar Warning Receiver integration performance while in flight. The Center collected the data that PMO ASE used to verify the CH-47F AN/APR-39C(V)1's ability to detect and identify the PRTS's radar threat emissions. The PMO ASE conducted the test from May 3 – 14, 2019, at Test Area-3, Redstone Arsenal, Alabama.

- **Activity/Benefit:** The Center provided one missile plume simulator for single threat engagements against the LIMWS, as installed on the UH-60M. The missile plume simulator provided simultaneous, two-color missile plume simulations to evaluate the LIMWS's ability to detect and declare threats. The Center also provided PMO ASE a preliminary assessment of the LIMWS system as installed on the UH-60M. The Center's participation in these tests was in direct support of a QRC effort.

### **Army: AH-64E FOT&E 2**

- **Sponsor:** U.S. Army Operational Test Command
- **Activity/Benefit:** The Center deployed an MSALTS working in conjunction with its instrumented MANPADS and HPRTS as part of an integrated air defense system. The MSALTS produced UV missile plume simulations to stimulate the common missile warning system (CMWS) after the instrumented MANPADS acquired, tracked, and simulated a launch on the AH-64E aircraft. The HPRTS produced acquisition, and target track threat radar emissions to stimulate the APR-39C(V) 1 on the AH-64E aircraft. The Center provided a realistic, high-threat environment for AH-64E V4 and V6 flight crews to determine basic threat identification, and to perform counter-maneuvers in an open-air environment. The U.S. Army Operational Test Command conducted the test from March 26 to April 11, 2019, at Fort Hood, Texas.

### **Army: CIRCM Tests**

- **Sponsor:** PMO ASE
- **Tests:**
  - MSALTS and JMITS Accreditation Tests (January 28 to February 13, 2019, and April 23, 2019), Redstone Arsenal, Alabama
  - CIRCM Program of Record Cold Weather Flight Test (February 11 – 15, 2019)
  - CIRCM Littoral Flight Test (March 5 – 12, 2019)
  - CIRCM Risk Reduction Test (April 22, 2019 and May 21, 2019), Redstone Arsenal, Alabama
  - CIRCM Low-Rate Initial Production Risk Reduction (June 4 – 5, 2019), Courtland, Alabama
  - CIRCM IOT&E Test (June 12 – 21, 2019), Hollytree, Alabama
  - CIRCM High Foliage/Mountain Terrain Test (July 12 – 17, 2019)
  - CIRCM Pre-Free Flight Missile Flight Test (July 31 to August 3, 2019), Redstone Arsenal, Alabama
  - CIRCM IOT&E Regression Flight Test (July 22 to August 5, 2019), Redstone Arsenal, Alabama
  - CIRCM Engineering and Manufacturing Development Flight Test Phase 2 (July 29 to September 14, 2019), Redstone Arsenal, Alabama
  - CIRCM High/Medium Clutter Flight Test (September 23 to October 16, 2019)
  - CIRCM Free Flight Missile Test (September 16 to October 18, 2019), Aerial Cable Range, WSMR, New Mexico
- **Activity/Benefit:** The Center provided MSALTS and JMITS simultaneous UV/IR missile plume simulations and jam beam

### **Army: Limited Interim Missile Warning System (LIMWS) Quick Reaction Capability (QRC) Flight Tests**

- **Sponsor:** PMO ASE
- **Tests:**
  - UH-60M Flight Test Phase 1, (June 27 to July 1, 2019) Courtland Airport, Courtland, Alabama
  - UH-60M Flight Test Phase 1a, (July 10 – 11, 2019) Hollytree, Alabama
  - UH-60M Flight Test Phase 2a, (August 5 – 16, 2019) Redstone Arsenal, Alabama
  - UH-60M Flight Test Phase 2b, (August 23 to September 3, 2019) Hot Springs, Virginia
  - UH-60M Flight Test Phase 2c, (September 23 to October 2, 2019) Houston, Texas

data collection. The UV simulations elicited a response from the CMWS, the IR simulations provided an IR source for the CIRCIM to track, and the jam beam radiometers characterized the CIRCIM jam return. The Center's simulators conducted single and dual threat engagements against the CMWS and CIRCIM as installed on the HH-60M and UH-60M. The Center provided near real-time feedback on missile plume simulation quality and jam beam data. These tests evaluated CIRCIM end-to-end functional performance while exposed to own ship motion, vibration, and electromagnetic environments specific to the aircraft. The Center also supported free flight missile testing with remote launchers to assess the CIRCIM against real MANPAD threats. The Operational Test Center provided pilots to conduct operational test engagements during the June 12 – 21, 2019, testing at Hollytree, Alabama. The JMITS and MSALTS were also accredited prior to going into IOT&E testing. Upon completion of IOT&E, the Center will publish an independent assessment analysis report.

## **Navy: MV-22B Department of the Navy (DON) Large Aircraft Infrared Countermeasure (LAIRCM) ATW Tests**

- **Sponsor:** PMA-272, Navy Commander, Operational Test and Evaluation Force (OPTEVFOR) and the VMX-1
- **Tests:**
  - DON LAIRCM ATW Integrated Test-4B (IT-4B) (April 3, 2019), Yuma Proving Ground, Arizona
  - DON LAIRCM ATW/APR-39D(V)2 IT-4 (October 24 to November 2, 2019), Electronic Combat Range, China Lake, California
  - DON LAIRCM ATW FOT&E (February 19 – 22, 2019), Yuma Proving Ground, Arizona
- **Activity/Benefit:** The Center provided one JMITS (IT-4B) and JMITS/MSALTS (IT-4 and FOT&E) missile plume simulators for two-color IR missile plume simulations and jam beam data collection. The Center also provided three threat-representative lasers for the APR-39D(V)2 IT-4 test. During the IT-4B test, the Center collected JMITS data and

performed a preliminary assessment to help the sponsor evaluate the DON LAIRCM ATW system installed on the MV-22B and its readiness for rapid fielding. During the ATW/APR-39D(V)2 IT-4 test, the Center collected JMITS/MSALTS data and performed a preliminary assessment to help the sponsor determine the ATW's ability to detect and declare IR and laser threats for its evaluation of the integrated DON LAIRCM ATW/APR-39D(V)2 system installed on the MV-22B. During the FOT&E test, the Center collected JMITS/MSALTS data and performed a preliminary assessment to help the sponsor evaluate the ATW's ability to detect and declare IR threats during operational flight engagements.

## **Navy: KC-130J ATW FOT&E Flight Test**

- **Sponsor:** PMA-272 and OPTEVFOR
- **Activity/Benefit:** The Center provided one JMITS missile plume simulator for two-color IR missile plume simulations and jam beam data collection. The Center collected data and performed a preliminary assessment to help PMA-272 and OPTEVFOR evaluate the DON LAIRCM ATW system installed on the KC-130J and its readiness for rapid fielding. PMA-272 conducted the test on April 3, 2019, at Yuma Proving Ground, Arizona.

## **Navy: CH-53E DON LAIRCM ATW Software Formal Release (FR) 3.2**

- **Sponsor:** PMA-272
- **Activity/Benefit:** The Center provided one MSALTS missile plume simulator for two-color IR missile plume simulations and jam beam data collection. The Center collected data and performed a preliminary assessment to help PMA-272 determine if FR 3.2 fixed deficiencies found in FR 3.1 for the DON LAIRCM ATW system installed on the CH-53E. Center participation in this test was in direct support of ongoing PMA-272 efforts to upgrade software currently being fielded in theatre. PMA-272 conducted the test from May 21 – 23, 2019, at Hot Springs, Virginia.

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## **TRAINING SUPPORT FOR SERVICE EXERCISES**

- **Exercise and Sponsor:** The Center supported the following three Service exercises, focusing primarily on completing the Joint Strike Fighter (JSF) Operational Test Team (JOTT) Integrated Product Team Comparison Testing as it prepared for the JSF IOT&E:
  - 305th Air Mobility Wing Jersey Wrath Weapons and Tactics Training (November 8 – 17, 2018), Phoenix, Arizona
  - 10th Mountain, 1st Brigade Combat Team Mountain Peak 18 Exercise (November 26 to December 7, 2018), Fort Drum, New York
  - JSF/Combat Search and Rescue and Close Air Support JOTT final Comparison Testing (March 25 – 28, 2019), Naval Air Station, China Lake, California
- **Activity/Benefit:** The Center provided personnel and equipment to simulate a specific MANPADS threat environment for participating aircraft, as well as SME support to observe aircraft ASE systems and crew reactions to the threat environment. At the end of each exercise, the Center's SME presented MANPADS capabilities and limitations briefings to the pilots and crews, and at the end of the briefings, allowed them to operate and manipulate the specific MANPADS. The Center provided the Services realistic MANPADS threat environments used to train pilots and crew and give them a better understanding of ASE equipment and its use. The Center also incorporated radio frequency (RF) training support with the PRTS for the 10th Mountain pilots participating in the Mountain Peak 18 exercise. The data the

Center collected and provided to the trainers/testers helped the units develop and refine their tactics, techniques, and procedures to enhance survivability in a combat environment.

## T&E TOOLS

The Center continues to develop tools for T&E of ASE and DEW. The Center deploys its personnel and specialized T&E tools throughout the country. The Center takes its T&E tools to the Services, providing them with cost-effective test support to collect critical data needed to assess the performance of their CM/CCM systems. In addition, the Center supports the Service's ASE programs with its unique test equipment, which reduces duplicative T&E capabilities. This benefit, along with the transportability of the Center's unique test equipment, provides the DOD a cost savings that results in "greater performance and affordability."

The Center is a permanent member of the Test Resource Management Center's (TRMC) Directed Energy Instrumentation Initiative review panel. PEOSTRI chairs this panel and serves as its executive agent for testing of Services rapid prototyping and fielding.

### High Energy Laser Remote Target Scoring (HRTS)

The Center is developing the HRTS system, which integrates a sensor suite onto a tracking mount to track, image, score, and provide Time-Space-Position Information (TSPI) from mobile/transportable platforms during High-Energy Laser (HEL) engagements. This capability will enable the tracking and scoring of targets such as unmanned aircraft systems, RAM, or cruise missiles during HEL engagements. The Center has identified both HRTS hardware and software commonality for possible use and integration with other Center activities and T&E tools, including Joint Standard Instrumentation Suite (JSIS). The HRTS system will be available for use by all the Services in FY21.

### JSIS

JSIS provides the capability to collect MANPADS missile plume and hostile fire signatures, TSPI, and related data for ASE T&E and threat model development. JSIS's transportability allows it to be used both in the United States and abroad to reduce costs and expand the types of threat data available in the United States. The JSIS baseline was developed from FY13 through FY18 under sponsorship from the TRMC's Central T&E Investment Program (CTEIP). JSIS 2.0, also sponsored by CTEIP, will provide a missile attitude determination capability and will be delivered in FY20. Implementation of the Full Operational Capability began this year and will be completed in FY23. The Center is also evaluating JSIS development to incorporate DEW T&E capabilities.

The threat signature and flyout data JSIS provides are used to create or improve threat models. Intelligence agencies require high-fidelity threat data to produce/improve certified threat models (i.e., trajectory and signature), and threat models form

the basis of the majority of ASE T&E. The Missile and Space Intelligence Center will use data collected using JSIS to create threat models for use in modeling and simulation (M&S) of ASE. The Navy (PMA-272), Army (PMO ASE), and Air Force (LAIRCM System Program Office) have endorsed JSIS, and it will be an integral support element of each Program Office's aircraft self-protection capability development.

In FY18, JSIS reached its Initial Operational Capability (IOC). Data that JSIS collected in FY18 was essential input to an improved threat model release in FY19. The CTEIP-sponsored JSIS 2.0 completed Critical Design Review (CDR) this FY and full system implementation is underway toward an FY20 delivery. The JSIS Full Operational Capability phase launched in FY19 and its implementation will be ongoing through FY23. Among the added capabilities will be a full complement of signature instrumentation to support current Programs of Record; a full complement of signature instrumentation focused on emerging programs; additional instrumentation to support data collection for multiple, concurrent events; instrumentation to support static, live fire events; and full trajectory coverage for missile attitude related data collection along with supporting computer, network, and trailers to field throughout the United States and OCONUS. The Preliminary Design Review was completed in May 2019 and CDR preparations were completed in September 2019.

### Missile Simulator Emitters Upgrade

The Center is currently overseeing a TRMC-funded project to upgrade the emitters on JMITS/MSALTS. This upgrade will increase JMITS/MSALTS bandwidth and processing capabilities to meet the requirements of advanced MWS/DIRCM systems. IOC for the first upgraded simulator is expected during 3QFY20.

### Threat Signature Generation

The Center continually generates plume signatures that are used as the input signatures for JMITS and MSALTS in open-air missile simulator testing of MWS/DIRCM systems. The Center has generated over 10,000 signatures for this purpose. The Center also provides signatures to various programs upon request for use in signature model analysis and test activities not involving the Center. The Center has been a key participant in an M&S Working Group that continually evaluates threat signature models with the goal of improving them and creating uniformity in model version use.

### Towed Optical Plume Simulator (TOPS)

The TOPS system is currently an Air Force Small Business Innovative Research effort to investigate ways to improve the

Towed Airborne Plume Simulator (TAPS) system by replacing the pyrophoric fuel source with solid state optical emitter sources to simultaneously emit energy in two independently controlled IR bands (Red and Blue) and one UV band. The energy sources will be mounted in a pod towed behind an aircraft. At the conclusion of the initial development effort, the Center conducted a brass board data collection event from October 29 to November 1, 2018. The Center conducted this short-range, ground-based

data collection event to demonstrate laser and LED-based energy sources within a pod form factor proof-of-concept. The project has now moved to its next phase, which consists of building a pod that can be towed behind an aircraft. Arnold Engineering Development Complex leads the project, and the Center participates and monitors the effort as a future technology improvement for the TAPS system.

## ALLIED T&E EFFORTS

The Center and the Test and Evaluation Threat Resource Activity (TETRA) worked together to continue international cooperative T&E efforts with Allied/Coalition Partner nations. The Center and TETRA continued to support several allied Air Electronic Warfare (EW) cooperative T&E initiatives, including:

- The Australia, Canada, Great Britain, and U.S. (ACGU) Air EW Cooperative Test and Evaluation Project Arrangement (Air EW CTE PA) was conducted under the authority of the Multinational Test and Evaluation Program Memorandum of Understanding. In FY19, the Air EW CTE PA participants:
  - Cooperatively used Air EW threat intelligence to improve Air EW M&S tools and in Air EW CTE PA test scenarios.
  - Conducted an RF CM working session in Huntsville, Alabama, and Warner Robins AFB, Georgia, from October 29 to November 2, 2018, in which RF CM T&E experts from all ACGU nations participated.
  - In conjunction with Australia's Trial BANE at Royal Australian Air Force (RAAF) Edinburgh on February 4 – 8, 2019, developed methodology for the use of Air EW M&S tools Chimera and Laboratory Intelligence Validated Emulator in the Integrated Threat Analysis and Simulation Environment (ITASE).
  - Planned the Trial CANE1 at RAAF Edinburgh October 7 – 25, 2019, in which numerous hi-fidelity, emulative Chimera threat models were integrated with Threat Modeling Analysis Program threat models into ITASE.
  - In cooperation with Australia and Canada, conducted F/A-18 electro-optical (EO)/IR/RF CM testing for changing expendables from round to square form factor from July through August 2019 at Naval Air Station

China Lake, California. RAAF and Royal Canadian Air Force personnel observed U.S. DOD testing processes, instrumentation techniques, and methods, as well as aided in test data analysis.

- Continued development of Air EW T&E methodologies, procedures, and techniques for use in testing the new generation of Integrated ASE systems.
- Refined planning for the Air EW CTE PA's VIRTUAL RIDER Trial scheduled for FY20.
- The Air EW CTE PA Lead Nation role rotates between the ACGU nations each year. The U.S. DOD was assigned the lead for the period of July 2019 through October 2020. In assuming the lead, the DOT&E Center team and Army PMO ASE, along with DOT&E's Joint T&E (JT&E) Team's support, hosted this year's PA Steering Committee and Project Officer meeting from June 10 – 14, 2019, at JT&E Suffolk, Virginia. Together, the Center Team and the JT&E Team planned the event and provided administrative/security support for the meeting.
- TETRA continues to support the NATO Air Capability Group 3 - Subgroup 2 meetings for Air EW. Participation in this group ensures U.S. DOD involvement with all major NATO Air EW tests/trials. Participation in NATO test events also provides data collection opportunities that may not be available locally. Annually conducted major NATO Air EW events include:
  - Trial EMBOW – EO/IR CM T&E event
  - Trial MACE – RF CM T&E event
  - Trial MAMBO – Advanced EO CM T&E event