2022
SIMULATORS
JOURNAL

SHARPENING THE WARFIGHTER'S BITE

IT'S TIME TO

ACTT
ACCELERATE CHANGE BY
TRANSFORMING TRAINING

AIR FORCE LIFE CYCLE MANAGEMENT CENTER PROGRAM EXECUTIVE OFFICE FOR AGILE COMBAT SUPPORT (AFPEO ACS)

IT'S TIME TO

ACTT

ACCELERATE CHANGE BY TRANSFORMING TRAINING

IT'S TIME TO ACTT

Welcome to I/ITSEC 2022. This year's theme is "**A**ccelerate **C**hange by **T**ransforming **T**raining; It's time to ACTT." The Simulators Division continues to ensure the Warfighter's spear is ready, lethal, and sharp. Through the Simulators Common Architecture and Requirements Standards (SCARS), we are ensuring training devices across our enterprise are affordable, cybersecure, and current with the weapon system. These traits ensure that training devices are helping to "Sharpen the Warfighters Bite". In doing this, we are expanding the ability of the Warfighter to learn and train through cutting-edge training systems and technologies. We recently opened our Sims Innovation Lab, a facility to use and assess unclassified commercial devices, exploring the potential for incorporation into training systems. This lab allows our Industry Partners to collaborate and demonstrate new and innovative technologies at a government location. The Simulators Division falls under the Air Force Materiel Command's Air Force Life Cycle Management Center and is included within the Air Force Program Executive Officer for Agile Combat Support portfolio.

OUR VISION IS: "To become the premier warfighting digital twin - real, ready, and lethal; capability delivered at the speed of relevance."

OUR MISSION IS TO: "Acquire and modernize training systems to enhance lethality and readiness by growing a diverse workforce motivated to Sharpen the Warfighter's Bite."

Our Distributed Operations Networks continue to prove their worth across the Air Force by conducting 8300+ training events for a total of nearly 25k training hours over the past year. The SCARS initiative is proving that remote cybersecurity scans are a reality. Remote scanning will help the Air Force avoid nearly $38M in costs over the next five years. **SCARS is more than cyber!** The program defines common interface standards for legacy simulators and next generation training devices. The common standards and open architectures introduced by SCARS enable shared synthetic environments across training devices. Since we last published this journal, our team stood up the Security Operations Center (SOC) then connected 8 sites to the SOC. SCARS will prove to be invaluable as we move toward the Joint Synthetic Environment (JSE) as the standard shared synthetic training environment for operational training. JSE will enable test and joint high-end advanced tactics and training for 5th generation and beyond capabilities via simulation of a high density and high-fidelity threat environment.

In FY22, we managed $3.4B crossing 10 different appropriations. Additionally, we processed 631 funding documents, 620 contract actions and executed $1.33M in expiring funds. We are responsible for 75 programs supporting 9 major commands, 29 program offices and   24 countries. The Program Office completed 5 source selections, reaping tremendous savings via competition and small business participation. The TSA III contract is cutting the time of our Source Selections for those programs by 50 percent.

I look forward to seeing you on the I/ITSEC floor as well as in our conference discussions.

COL MATT "T2" RYAN, USAF
Senior Materiel Leader, Simulators Division
Agile Combat Support Directorate (AFLCMC/WNS)

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VISION

To become the premier warfighting digital twin - real, ready, and lethal; capability delivered at the speed of relevance.

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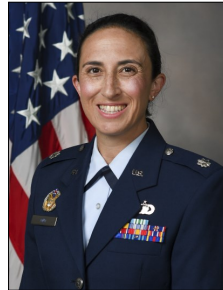
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SIMULATORS SNAPSHOT

The Simulators Division, an organization of approximately 600 people within the Air Force Life Cycle Center, performs an essential role within the US Air Force's operational training infrastructure. In Fiscal Year 2022, the division managed efforts totaling 3.4 billion dollars across ten different congressional appropriations. These efforts included 75 programs and projects supporting nine major commands, 29 program offices and 24 allied countries. The Division's forward leaning vision will ensure that our training devices, training networks, and training environment are second to none. This vision for training will keep our Warfighter's better trained and more lethal than our foes.

Our SCARS initiative is rapidly accelerating in its deployment of equipment, standards and capabilities. To date, we have connected 8 sites to our operating center with an additional 76 sites getting connected in the next two years. What this means is that we can remotely scan and deploy common applications to training systems across our networks. This program provides affordable security and sustainment for training devices. In addition to deploying common on-premises equipment, the SCARS team has been diligently working on our next set of standards that will include definition of a Government Reference Architecture for common types of training systems. The resulting standard non-proprietary internal interfaces enables competition for training system updates and new training devices. Also, SCARS is building a central repository of authoritative data for all USAF Operations Training, launching the design for equipment and processes for Software Integration Labs to deploy DevSecOps.

The last several years have been very notable for our Innovation Cell. We have successfully transitioned two contracts from SBIR contracts with four more in progress. We have also transitioned four other SBIRs into prototype deployments. The 2021 Match Day was a highly acclaimed event with tremendous support from Air Force leadership. However, by far the biggest development was the opening of the Sims Innovation Lab on Wright-Patterson AFB. The Innovation Lab is a space where our industry partners can explore and demonstrate their innovative training and simulation technology. I encourage you to take advantage of the Lab to highlight your technologies to our Innovation Team.

The Simulators Division is working closely with our partners across the Air Force and Navy to integrate JSE with the Virtual Test and Training Center. JSE will be the common environment to enable high-end advanced tactics and training to ensure the Readiness and Lethality of the United States Warfighter is second to none!

Every Airman, Every Mission, Every Day!

TSA III is an omnibus contract designed to accommodate training systems and training-related acquisitions, to include requirements analysis, development/production, modifications, sustainment, and instruction, managed by the Simulators Division, or upon approval to use, other Air Force organizations within the Life Cycle Management Center (LCMC). TSA III is established as a multiple award, ID/IQ contract off which task orders will be issued and allows United States Government (USG) Acquisition Teams a streamlined acquisition process using FAR Part 16 multiple award ordering procedures. It is anticipated that the majority of task orders will be competitively selected with minimal interchanges. The competitively-selected contractors, both large and small, demonstrated in the TSA III source selection that they have solid training system practices and procedures, and demonstrated performance.

TSA III is designed to streamline the acquisition planning and source selection process for issuance of task orders. A pre-qualified industrial base of training systems contractors are available to compete for the various task order requirements. The benefits of TSA III for the task order teams are:

- Streamlined acquisition planning process to maximize time and resource savings

- Strongly endorsed by senior leaders at AFMC and AFLCMC

- "Tailorable" templates (Instructions to Offerors (ITO), Evaluation Factors, Special H Clauses)

- Menu of Contract Line Item Numbers (CLINs)/Contract Data Requirements List (CDRL)

- Service Summary items

- Re-certify Systems Engineering Management Plan (SEMP) and Configuration Management

- Plan (CMP) at the task order level, but not resubmit

- Individual task order Requirements Approval Documents (RAD) eliminated

- Approved blanket Quality Assurance Surveillance Plan (QASP); no need to prepare individual program QASPs (Attachment 14)

- Minimal need for additional market research due to submission of annual capability statements

Because of the benefits listed above, TSA III is the preferred contract vehicle for use on competitive Training System acquisition, operation, and sustainment support unless otherwise directed by the Acquisition Strategy Panel (ASP) Chair. TSA III has a 10-year ordering period: a five-year base with five one-year options; ending 31 Aug 2025 unless additional approvals are made by the Senior Procurement Executive. The TSA III PM should be consulted during acquisition planning for a program.

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AIR COMBAT TRAINING SYSTEMS
SIMULATORS

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A-10 AIRCREW TRAINING SYSTEMS

The A-10 Aircrew Training Systems (ATS) program provides modifications, upgrades, and sustainment of the A-10 simulator devices and subsystems. Contractor Logistics Support (CLS), comprised of on-site technicians and on-call field service engineers, delivers continuous operational capability for 9 locations across Air Combat Command (ACC), Air Force Reserve Command (AFRC), Air National Guard (ANG), and Pacific Air Forces (PACAF) at Osan Air Base, ROK. The government solely owns all training assets, software and databases produced for the program, and purchases the services and equipment necessary to operate the Training System Support Center (TSSC) at Davis-Monthan AFB, and any contract Engineering Change Proposals (ECPs) affecting trainer hardware and software. Fielded inventory consists of 22 Full Mission Trainers (FMTs), 9 Hands-on-Throttle-and-Stick (HOTAS) trainers, 11 Brief/Debrief (B/DB) systems, one FMT used for development and all supporting systems and equipment. FMTs are a high-fidelity replica of the A-10C Thunderbolt II aircraft cockpit with a 360-degree visual display used to execute training for A-10C Initial Qualification, Mission Qualification and Continuation Tactical training, as well as Distributed Mission Operation (DMO) exercises and events. HOTAS trainers are a medium-fidelity cockpit used to train weapons delivery functions during the A-10C Formal Courses (Initial Qualification Training, Re-qualification Training) at Davis-Monthan AFB.

The mission of the A-10 ATS program is to provide a concurrent, combat realistic A-10 pilot training system...ultimately increasing combat capability and flight safety while decreasing overall training cost. The A-10 ATS devices are a fundamental component of Combat Air Force (CAF) pipeline pilot production, and A-10C Ready Aircrew Program (RAP) training requirements. The A-10 ATS augments reduced live-

A-10 Aircrew Training System (ATS)

fly training with simulator events, and protects unit-level aircrew readiness and currencies with direct operational readiness impacts to theater Combatant Commanders. FMTs enable pilots to train to wartime missions at the required proficiency levels, complete with a full-spectrum electronic warfare range, full-scale weapons deliveries, and large force DMO exercise takings. The A-10 ATS delivers unique training capability to simulate dangerous live-fly scenarios and enables Emergency Procedure (EP) training which ultimately impacts safety of flight and survivability during combat operations.

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B-1 TRAINING SYSTEMS

The B-1 Training System has two components that support initial, continuation, and re-qualification of the B-1 aircrews and maintainers. The Aircrew Training System consists of the Weapons System Trainers (WST), Mission Trainers (MT), and Cockpit Procedures Trainers (CPT). The Weapons System Trainers and Mission Trainers are classified as

B-1 Training Systems Weapons System Trainer

"legacy" training systems. Their host computers simulate aircraft systems, weapons, sensors, and environment using the actual aircraft Avionics Flight Software (AFS) to provide aircrews with visual, oral, and motion cues.

The Reconfigurable Cockpit Procedures Trainer was awarded in July of 2022. The contract will address deficiencies by converting an existing CPT into a Reconfigurable Cockpit Procedures Trainer (RCPT). This is an obsolescence modification that will bring the CPT into concurrency with the aircraft fleet and the Weapon System Trainers (WSTs), while also allowing the flexibility to easily switch between different configurations, which adds "reconfigurable" to the device name and function. It will also lower the operating costs of the training devices by employing a common architecture, software, and computational system across all operational flight trainers. The current WSTs and Mission Trainers (MTs) also require a technology refresh. They have many obsolescent systems and software programs that are failing and degrading the WST and MT performance.

The Training System Support Center (TSSC) performs minor hardware and software updates for all the devices. Contractor Logistics Support (CLS) provides sustainment, repairs, working thru Diminishing

Manufacturing Source issues for all the devices and concurrency upgrades. Both TSSC and CLS, along with concurrency upgrades are provided by Aero Simulation Inc. under the Training Systems Service contract. The period of performance for this delivery order runs through June 2026.

The B-1 Training System Integrated Product Team also manages an organically-supported Armament Systems Trainer. This trainer furnishes weapons load students with hands-on familiarization training in munitions and weapons loading and the Long-Range Anti-Ship Missile addition.

B-1 Training Systems Avionics and Armament Maintenance Training Systems

Pilots and Weapon Systems Officers from Dyess AFB, TX and Ellsworth AFB, SD continue participating in Distributed Mission Operation events like Coalition Virtual Flag that includes simulators from four coalition partners. Virtual Flag brings different aircraft simulators into the same simulated Battle-Space with an objective of completing training missions in a real-world environment.

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B-52 TRAINING SYSTEMS

The B-52 Simulator System consists of four distinct training devices: three Weapon System Trainers (WSTs), two Offensive Station Mission Trainers (OSMT), four Electronic Warfare Simulator, (2 of the 4 T4s have been deactivated and no longer used) and a Cockpit Procedures Trainer (CPT). The WSTs are comprised of three separate yet integrated trainers, including, the Flight Station Subsystem, Offensive Station Subsystem, and the Defensive Station Subsystem.

B-52 Offensive Station Mission Trainer (OSMT)

The B-52 Training System program provides total maintenance, logistics, and modification support for the entire Aircrew Training System. In addition to the major components identified above, the system includes a development System Integration Laboratory, a Support Center System, and all computer/peripheral equipment. The Contractor Logistics Support contract provides operators to support crew training in any of the aircrew training devices in addition to maintaining a very-high availability rate despite the age of the fleet. The Training Systems Support Center (TSSC) includes hardware and software engineers capable of modifying any of the trainers in order to maintain concurrency with the aircraft. The Training System simulates the necessary visual, motion, and aural cues

to provide ground training of Air Force Global Strike Command aircrew members, including aircraft commanders, pilots, radar navigators, navigators, and EWOs. All of the B-52 WSTs no longer participate on the Distributed Mission Operations (DMO) Network – the network that allows multiple, diverse training systems to engage in "live virtual" training missions.

The current B-52 Training Systems contract underwent a Source Selection, separating the CLS and TSSC contracts. On 15 Sept, the 4-year CLS contract was awarded to Aviation Training Consulting, LLC (ATC). The TSSC contract remains with ATC, and is going into its sixth year, of an 8-year contract. ATC's TSSC role manages the regular corrective updates to the trainers and B-52 Software Block upgrades.

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B-2 TRAINING SYSTEMS

The B-2 Training System provides realistic aircrew, maintenance, and weapons loading training in all phases of B-2 operations. Training includes initial qualification, proficiency and re-qualification training in areas such as emergency procedures, tactics, maintenance certifications, mission rehearsals, and weapons loading certifications. The B-2 Training System consists of 58 training devices designed to the highest practical level of fidelity to reflect actual look, feel, circumstances, and conditions of the Weapon System. The specific Aircrew training devices are the Weapon System Trainers and Mission Trainers. Maintenance Training devices include: Cockpit Procedure Trainers, Computerized Maintenance

Training Systems, Weapon System Training Aids, Crew Escape System Maintenance Trainer, Weapons Loading Trainer, and a Flight Control System Trainer.

B-2 Computerized Maintenance Trainer

The B-2 Training System provides the warfighter fully-integrated, effective, efficient, and economical off-aircraft training in the operation, maintenance, and employment of the world's most sophisticated weapon system. Training System modifications occur in parallel with aircraft changes to maintain concurrency with the air vehicle, and to support the 509th Bomb Wing for trainer operations, academic instruction, curriculum/courseware development, and sortie mission generation. Training System unique modifications are also accomplished to provide for technology upgrades and improvements to the quality and value of the training. The Training System Integrated Product Team (IPT) oversees and manages the concurrency upgrades, evolution of the Training System and operations and maintenance of the devices. The IPT includes the program management office at Wright-Patterson AFB, users and subject matter experts at Whiteman AFB, Air Force Global Strike Command, Air Education and Training Command and the Training System prime contractor.

The program awarded a sole source contract to the incumbent with a one year base and seven one year options; the program is currently in its third option year.   The B-2 Training System continues to participate in distributed training events such as Large Force Exercises and Red Flag events. Distributed training permits multiple, diverse training systems to engage in "live virtual" training missions. There are currently 14 Engineering Change Plans (ECPs) in work and multiple concurrency and obsolescence efforts that will be put on contract in the near future.

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B-2 Weapons Loading Trainer (WLT)

E-3 AWACS FLIGHT CREW TRAINER PROGRAM (FCT)

The E-3 Sentry is an Airborne Warning and Control System (AWACS) aircraft that provides all-weather surveillance, command, control, and communications needed by US, NATO, and other allied air defense

forces. It is the premier air battle command and control aircraft in the world today.

The E-3 Flight Crew Trainer (FCT) is supported by a Commercial Training and Simulation Services (CTSS) contract, which provides "Guaranteed Student" Aircrew Training for all flight crew positions to meet US Air Force performance standards. The training encompasses the full spectrum of E-3 pilot, copilot, flight engineer, and navigator instruction, including initial, difference, upgrade, continuation, senior staff, and requalification training.

High-fidelity, contractor-owned, training devices and a government-owned Navigation Part Task Trainer (NPTT) are utilized to meet Air Force training requirements. The contractor-owned devices consist of two Federal Aviation Agency (FAA) Level D equivalent Operational Flight Trainers (OFT) and one FAA Level 7 equivalent Flight Training Device (FTD). The Navigation Part Task Trainer is government-owned and contractor-supported through Contractor Logistics Support (CLS). All training devices under this program are located at the contractor-owned facility in Oklahoma City, OK.

Training services and support for this program are provided under contract to Link Simulation and Training, a division of CAE (formerly L3Harris Inc.). The contract was awarded in March 2015 with a period of performance beginning in March 2015 and including one base year and nine option years. As this program sunsets, it will be replaced by the future government-owned Diminishing manufacturing sources Replacement of Avionics for Global Operations Navigation (DRAGON) Flight Crew Training System (FCTS). The objective of the DRAGON program is to replace aging, predominantly analog, non-sustainable equipment with modern,

digital avionics systems that provide for future growth and enhanced operation, safety and reliability, while reducing lifecycle costs.

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E-3 AWACS MISSION TRAINING CENTER (MTC) PROGRAM

The Airborne Warning and Control System (AWACS) Mission Training Center (MTC) service contract provides a high-fidelity simulation of E-3C mission system hardware, performance, and capability. This includes emulations of E-3C AWACS active and passive sensor systems, data links, communication systems, constructive entities, common malfunctions, and databases. The MTC enables AWACS full mission crews, small teams, and individuals to train in a stand-alone mode or networked mode with other virtual Distributed Mission Operations (DMO) or live participants through a full range of AWACS mission employment options.

This program provides MTC availability and simulation support services supporting AWACS Initial Qualification Training (IQT), Mission Qualification Training (MQT), Upgrade Training (UGT), and Continuation Training (CT) at all MTC facilities. The AWACS MTC program previously had operations at Tinker AFB, OK; Elmendorf AFB, AK; and Kadena AB, Okinawa, Japan. Each system employed state-of-the-art DMO capability, operating in both local and long-haul networked environments. The program now, however, is in its sunsetting phase. Trainers have been decommissioned in all operating locations except

Kadena, which is in process and will be complete by 1 December 2021.

The MTC was one of the original systems to integrate into the Combat Air Forces (CAF) DMO Federation and was a founding partner in the development of CAF DMO operational and network standards.

MTC is provided under contract to PLEXSYS Interface Products. The contract was awarded in February 2014 with a period of performance beginning in February 2014 and ending 31 December 2023.

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E-3 MAINTENANCE TRAINING SYSTEM PROGRAM (MTS)

The E-3 Airborne Warning and Control System (AWACS) Maintenance Training System (MTS) program provides hands-on training in organizational on- and off-equipment maintenance procedures defined in E-3 Technical Orders. Mockup exercises familiarize students with the physical characteristics, location, removal, and replacement of line replaceable units (LRUs), shop replaceable units (SRUs), external test connectors, and built-in test equipment (BITE). The E-3 MTS program is supported by a wide variety of training devices to meet Air Force maintenance training objectives.

The Flight Deck Trainers (FDT) consist of a Familiarization Maintenance Trainer (FMT) and a Procedures Maintenance Trainer (PMT). Both are utilized to train new and experienced aircraft maintenance personnel on fundamentals, such as core task training, flight deck familiarization, aircraft servicing, engine operation, and various other actual flight deck operations.

A Surveillance Radar Training Set (SRTS) is used to train AWACS personnel in the operation and maintenance of E-3 Radar System Improvement Program (RSIP) modified radar systems. This device consists of student workstations, instructor operator workstations, SIMWARE development workstations, graphics workstations, prime mission equipment mockups, and simulated test equipment (STE).

The E-3 MTS also includes twelve additional mobile training sets that provide maintenance training for a variety of other subsystems. All devices under this program are located at Tinker AFB, OK.

Support for this program was awarded in June 2018 to Fidelity Technologies, Inc. The contract has one base year and seven option years. Support includes Contractor Logistics Support (CLS) for the FDTs, SRTSs, on-call Contractor Support (CS) for the mobile training sets, Training System Support Center (TSSC) support, and modification support.

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E-3 AWACS DIMINISHING MANUFACTURING SOURCES REPLACEMENT OF AVIONICS FOR GLOBAL OPERATIONS AND NAVIGATION FLIGHT CREW TRAINING SYSTEM (DRAGON FCTS) PROGRAM

The Airborne Warning and Control System (AWACS) Diminishing manufacturing sources Replacement of Avionics for Global Operations and Navigation (DRAGON) Flight Crew Training System (FCTS) program provides development, maintenance, logistics, and modification support for AWACS DRAGON aircrew training devices. DRAGON updates the Boeing 707/320 E-3 B/C (now known as the E-3G) fleet from the 1970s analog avionics technology and traditional analog cockpit instrumentation to a modern, glass cockpit founded on digital instruments and displays, and driven by a flight management system.

This conversion simplifies E-3 operations, allowing flight crews to focus on the most time-critical information. It also provides for future growth and enhanced operation, safety, and reliability while reducing lifecycle costs. The DRAGON upgrade removes the navigator position and transfers the responsibilities to the pilot, co-pilot, and flight engineer. At DRAGON's conclusion, the US Government will have one Federal Aviation Agency (FAA) Level 6-equivalent (fixed) Flight Training Device (FTD) and two FAA Level D-equivalent (full-motion) Full Flight Simulators (FFS).

Training services and support for this program are provided under contract to Link Simulation and Training, a division of CAE (formerly L3Harris). The contract was awarded in July 2016 with a period of performance beginning in July 2016 and including the

basic year and seven option years. The Government-owned devices will be supported through Interim Contractor Support (ICS) for no longer than two years and Contractor Logistics Support (CLS), following ICS, for the remainder of the contract. With the current contract ending in 2024, the request for proposal (RFP) for follow-on CLS is anticipated to occur around November 2023. While a final decision has not been confirmed, the notional timeline plans for the E-3G DRAGON platform to sunset in 2030 and be replaced by the E-7A. The DRAGON FCTS will operate accordingly.

E-3 AWACS DRAGON Cockpit Interior

The first training device under this program is located at the contractor-owned facility next to Tinker Air Force Base (AFB) in Oklahoma City, OK. Subsequently, this and both FFS devices will ultimately be located at the Consolidated Sims Building (CSB) at Tinker AFB.

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E-4B TRAINING SYSTEM

The E-4B training system is the first of its kind within the USAF portfolio. The Air Force recently contracted the procurement of the single trainer for E-4B, which no longer requires the need for a civilian training service in Miami, FL. The fleet of jets are stationed at Offutt AFB, NE. The inclusion of a trainer near the base allows for crews to train more often, provide capability to increase aircraft availability for maintenance training and operational tasks, as well as being able to complete E-4B specific training goals, such as aerial refueling. The visual system, as well as the cockpit layout mirror the aircraft layout and allow for a FAA level C equivalent rating for the crews. The device has been in service since April of 2022.

Development and installation of this device was awarded to CymSTAR, LLC in September 2020. The training system is supported through Contractor Logistics Support (CLS) and Training System Support (TSS) by CymSTAR, LLC.

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F-15 TRAINING DEVICE ACQUISITION AND SUPPORT (TDAS)

The F-15E Training Device Acquisition Services (TDAS) program has been managed by the Air Force Life Cycle Management Center's Simulators Division since 2011. In 2018, a follow-on 7-year contract was also awarded to The Boeing Company.

The F-15E TDAS program consists of the Aircrew Training Devices (ATD) and the Maintenance Training Devices (MTD). The ATDs consist of 6 Integrated Avionics Trainers (IAT) located at Seymour Johnson AFB with two additional trainers scheduled for delivery in late 2022. The MTDs consist of 26 Trainer Field Equipment (TFEs), 9 simulated/virtual trainers and 17 physical maintenance trainers located across 6 sites representing ACC, USAFE, PACAF, and AETC.

The F-15E IAT is a squadron- level, PC-based aircrew training device capable of simulating one F-15E Strike Eagle aircraft during ground and in-flight operations, including full weapons systems employment. Day-to-day operation of the F-15E IAT Trainer is supported by on-site contractor technicians.   Each F-15E IAT device consists of one pilot station and one Weapon System Officer (WSO) station. The two stations are normally both occupied to provide integrated pilot and WSO training; however, it is also possible to perform pilot-only and WSO-only training. The Pilot Station consists of two high-performance PCs plus a PC-based communication system. The WSO Station consists of a single high-performance PC to provide the cockpit displays to support realistic WSO training. The IAT is capable of standalone or local area networked operation with other IAT devices. It accurately represents the weapons systems capabilities of the F-15E aircraft.

F-15 MTDs provide students with the ability to become proficient in the maintenance of the aircraft using hardware and virtualized avionics devices that replicate actual aircraft equipment and functions. The TFE-21 F-15E trainer consists of high-fidelity cockpits connected to a computational system that provides high-fidelity aircraft component operational simulations that support normal operation, as well as malfunction simulations. Additionally, the TFE-21provides training in the Integrated Avionics System, Electrical Power and Lighting System, and Power Plant System. The TFE-24, F-15E Armament Load

Trainer, supports armament technical training and consists of a simulated, full-size, highly realistic F-15E aircraft built from salvaged parts. TFE-24 has a high-fidelity forward cockpit attached to a computational system that provides high-fidelity aircraft component simulations. The TFE-21 and TFE-24 use the same computer architecture and run a common software baseline. The TFE-25 F-15E Seat and Canopy Trainer consists of an actual F-15B forward fuselage made up of 95 percent aircraft components.   The student can be trained in ejection seat and canopy systems, egress training, egress maintenance inspection, seat and canopy removal and installation, and cockpit familiarization.

The F-15C/D (TFE-2, TFE-6, TFE-7)trainers, consists of aircraft components, support frames, and wiring necessary to connect them into a working system. The student can be trained in Automatic Flight Control System Surface Control, Armament Systems, Landing Gear and Arresting Hook Systems, Ejection Seat and Canopy Systems, and Engine Air Induction Systems.

The TFE-20 F-15C Armament System Trainers (AST) supports classroom training for checkout of the F-15C Armament system using flightline Support Equipment. The AST devices are configured with Operational Flight Program (OFP) capability using actual OFPs.

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F-15C/E/EX T2 TRAINING SYSTEMS

The F-15 T2 program consists of F-15E Personal Computer Aircrew Training Devices (PCATD), six F-15E Deployable PCATDs (D/PCATD), five F-15C Desktop Tactical Trainers (DTT), F-15C Weapons Tactics Trainers (WTT), F-15C Full Mission Trainers (FMT) with multiple configurations. These 8 devices are managed across 17 locations within five MAJCOMs (CONUS & OCONUS). The F-15 T2 simulators program is instrumental in providing support for two F-15 training locations: the ANG F-15C schoolhouse at Kingsley Field in Klamath Falls, OR and Air Battle Management Support at Tyndall AFB, FL.

All PCATDs are squadron/wing-level devices capable of simulating the F-15E Strike Eagle aircraft during Pilot/Weapon Systems Officer ground and in-flight operations, including full weapons employment. The F-15C & EX T2 training devices serve the same purpose for F-15C/EX units along with providing schoolhouse support. The FMTs are Hi-Fidelity aircrew training cockpits, while the WTTs are robust trainers used for Emergency Procedures training, take offs and landings. The DTTs are part task trainers used primarily for hands-on throttle/stick training without a cockpit and are planned to be phased out over the next year and an effort to procure additional FMTs for the field is completed.   F-15C FMTs are being refurbished and upgraded to the F-15EX configuration, which started in FY22, as part of the transition from F-15C to F-15EX aircraft.

The day-to day operation of F-15 T2 trainer fleet is centrally managed at the Boeing Training System Support Center (TSSC) in St. Louis, MO. Additionally, the fleet is supported by on-site contractor technicians at the two schoolhouse locations and squadron operators at the five Air National Guard squadron's locations. The primary services provided under the

current T2 CLS contract include modifications for enhancement and concurrency, on-site CLS, and the TSSC with 24 hour On-Call support.

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F-15C AND F-15E MISSION TRAINING CENTER (MTC)

The Boeing Company was awarded commercial services contracts under the Distributed Missions Operations (DMO) branch to provide training services for F-15C Eagle and F-15E Strike Eagle aircrews. Mission and procedures training for the F-15C and F-15E MTCs can be conducted as a single or multiple-ship formation, as well as operate with other DMO Network (DMON) sites and weapons system simulators.

F-15 Mission Training Center (MTC)

The first F-15C MTC contract was awarded November 1997 and was the first fighter program to use a commercial training simulation services approach, whereas the contractor builds and owns the simulators while the Air Force buys training services.

Boeing continues to provide services at RAF Lakenheath, United Kingdom; and Kadena Air Base, Japan for operational pilot training and maintenance engine run training. Each F-15C Mission Training Center includes four high-fidelity cockpits, 360-degree Constant Resolution Visual System (CRVS), four instructor operating stations, threat stations, brief/debrief systems, and a synthetic combat environment. Since first contract award, F-15C MTC services have surpassed 112,815 sorties flown by the Air Force, of which over 5,889 distributed missions were accomplished via the DMON since Oct 2007.

The first F-15E MTC contract was awarded August 2003. F-15E MTCs are operating at Mountain Home AFB, ID; Seymour Johnson AFB, NC; Nellis, AFB, NV; and RAF Lakenheath with the capability to support formal training unit (FTU) qualification, operational unit training, and maintenance engine run training. Each F-15E location includes at least two pilot and two weapon system operator high-fidelity cockpits in a split configuration, 360-degree CRVS, two instructor operating stations, two manned combat stations, and two brief/debrief systems, and a synthetic combat environment. Since first contract award, F-15E MTC services have surpassed 64,912 sorties flown by the Air Force, of which over 2,657 distributed missions were accomplished via the DMON since October 2007.

The Simulators Division transitioned the F-15C MTC and F-15E MTC programs into one combination contract for F-15 MTC follow-on services in June 2016. The latest 2021 contract award to Boeing is expected to carry MTC services to December 2026. The F-15 MTC services combined approach is intended to provide overall benefit to the warfighter by further maximizing training effectiveness, training continuity, system stability, and capture Air Force initiatives that will advance DMO training capability. The F-15C and F-15E MTCs remain the foundation for the future of

proven Air Force mission training, and the F-15 operational community recognizes the value of training in a DMO environment. Starting in 2021 at the Nellis AFB, NV Virtual Test and Training Center (VTTC) site, the MTC connected devices have a local network called the Nellis Mission Operations Network (NMON) with the ability to provide training and simulations at multiple security levels.

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F-16 SIMULATORS TRAINING PROGRAM

CAE USA (formerly L3 Harris Technologies) was awarded the follow-on comprehensive Simulators Training Program (STP) contract in November 2018, eight months ahead of the projected award date. The STP contract consolidates the sustainment contracts for the F-16 Mission Training Center (MTC) program, the F-16 Weapons and Tactics Trainer (WTT) Advanced Sustainment Program (WASP) program, and the F-16 Training System (TS) programs. The STP contract also includes development and installation of the Consolidated Unit-Level Trainers (CUTs) and allows for the future procurement of additional MTCs. The early award of the STP contract and execution of CUT development saves approximately $60M in duplicative Operational Flight Plan (OFP) updates, Engineering Change Proposals (ECPs) and miscellaneous upgrades, and Contractor Logistic Support (CLS) options over a four-year period.

The F-16 Block 40/50 MTC program provides simulators, concurrency upgrades, and CLS for Air Combat Command (ACC) to conduct individual and full mission training, including Distributed Mission Operations (DMO) networked capability with other training systems. Currently there are 10 fielded MTCs. Sustainment of these MTCs and all future OFP updates/upgrades and ECPs will be accomplished via modifications to the STP contract.

The F-16 TS program provides logistics support in the form of sustainment as well as modifications to 69 aircrew and 101 maintenance trainers at 26 United States Air Force locations world-wide. The sustainment involves a mix of 11 contractor-supported, on-site locations, with the remainder being on-call. A contractor operated Training Systems Support Center (TSSC) at CAE USA's Arlington, TX facility provides engineering support to accommodate concurrency and trainer-unique modifications. The CUT development effort is nearing completion, and installations will begin in October 2022, enhancing the capabilities of aircrew training at multiple locations. As in the case of the MTCs, ongoing sustainment of all devices and all future upgrades and ECPs will be accomplished via modifications to the STP contract.

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F-16 Egress Trainer

AIR MOBILITY TRAINING SYSTEMS

SIMULATORS

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C-130 AIRCREW TRAINING SYSTEM (ATS) PROGRAM

On 28 Aug 2018, CAE was awarded the sustainment Task Order under the Simulator Division TSA III IDIQ contract after a FAR Part 16 Fair Opportunity Selection. The fourth option year will be awarded on 1 January 2023. Overall, the C-130 Aircrew Training System (ATS) consists of forty-five devices supporting nine primary Weapon System Trainers (WSTs), geographically located at four ATS sites (with one future sites planned), a learning center, and one technical support system center (TSSC). It includes initial qualification, mission qualification, upgrade, and continuation training with guaranteed student training and student throughput. In addition, the C-130H ATS accomplishes maintenance and training on two Landing Gear Trainers (LGT) which supports advanced troubleshooting and hydraulics courses. The two landing gear trainers are located at Cannon AFB, NM and Little Rock AFB, AR.

C-130H Weapon System Trainer (WST)

C-130H Self-Contained Flight Trainer (SCFT)

Major modifications continued from FY21 are the Self-Contained Navigation System 8 (SCNS 8), Electronic Propeller Control System (EPCS), and Visual Fleet Upgrade. SCNS 8 will update training devices and courseware to ensure crewmembers are trained on current features and capabilities. EPCS removes the mechanical propeller syncrophaser system and replaces with EPCS, updates the courseware. The Visual Fleet System upgrade will increase visual system capability by replacing/upgrading existing visual systems (to include projectors, image generators (IG), mylar) with latest visual system technologies, ensuring aircrew training is realistic as possible. These modifications are currently active and the program is working ongoing execution along with additional modification requests.

In FY22, the program completed several modifications which included: the effort to move converted WST 11 from Tampa to Cheyenne, WST 11 Visual System upgrade, and relocation of WST 08 to Arlington Texas to start its conversion to an AMP2 over the next several years.

FY22 efforts awarded were Avionics Modernization Program (AMP) Increment 1 for WST 06, WST 01, and CPT 01, Cheyenne Site Management, Learning Management System transition, Cybersecurity Obsolescence Phase I. The AMP 1 modification will modernize the avionics suite in the aircraft. Learning Management System transition is migrating from Kenexa to a more sustainable solution (Bluedrop Learning logics), which will be hosted in the AWS GovCloud Environment. Cybersecurity Obsolescence Phase I includes non-reoccurring engineering for system and hardware updates across all the ATDs. Phase I will update 3 WSTs and 4 SLMS.

FY23 modifications planned will include Cybersecurity Phase II, Aero updates for 3.5 engines and NP-2000 propellers, WST 08 movement to St. Joe, site activation and electric motion at St. Joe. All these modifications will be in the execution phase once awarded over the next several years.

The C-130H ATS program has accomplished numerous Surge/Special project projects throughout the year. Some of these projects include: Flight Engineer Systems Refresher (FESR) training course, Financial Independent Audit Review (FIAR), and Student Librarian.

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C-130J MAINTENANCE AND AIRCREW TRAINING SYSTEM (JMATS) PROGRAM

The C-130J Maintenance and Aircrew Training System (JMATS) provides the U.S. Air Force with a long-term training solution for the C-130J Hercules aircraft. The C-130J MATS program is unique because it is the first known government-owned, contractor-operated training system initially procured as a commercial item under Federal Acquisition Regulation (FAR) Part 12 by the U.S. Air Force. The procurement contract itself utilizes the TSA III vehicle and is a firm, fixed-price effort and in June 2006 was converted from a FAR Part 12 commercial contract to a FAR Part 15 contract. The "ordering period" of the current "production" contract runs through 2025. The prime contractor for the production and modifications contract is Lockheed Martin Rotary and Mission Systems (LM-RMS). Major subcontractors include CAE USA and Flight Safety International.

C-130J MATS Enhanced Integrated Cockpit Systems Trainer

Within the JMATS program, aircrew training and contractor logistics support (CLS), for AMC only, was awarded to a small business provider, Nova Technologies, in January of 2020. The AMC training program provides ground and flight simulator instruction to C-130J pilots, co-pilots, loadmasters and engine-run technicians at Little Rock, Keesler, Dyess, and Ramstein Air Force Bases and at Yokota Air Base Japan, and to ANG crews at Qonset Point Rhode Island The JMATS AMC CLS contractor is providing maintenance and instruction, and is required to be capable of delivering guaranteed students to the

operational Air Force using Commands to include U.S. Marine Corps (USMC) KC-130J, and participating allied nation aircrews. The "production/modifications" contractor (LMRMS) is also providing operations of the Training System Support Centers (TSSC) at Little Rock AFB for AMC and NAVAIR devices only. The TSSC is operated under a separate contract delivery order also under the TSA III contract. Certain concurrency upgrades for both aircrew and maintenance devices can also be managed by the TSSC. Similarly, the maintenance training element of the JMATS program provides organizational maintenance training via Air Force-provided academic instruction and contractor-provided training devices sufficient to deliver 3c "go"-level student certification.

Current contract deliverables to the formal training unit at Little Rock, and the Main Operating Bases at Keesler, Dyess, Ramstein, and Yokota AB, and Quonset Point include Federal Aviation Administration Level D certified U.S. Air Force Weapon System Trainers (WST), Aircrew Courseware, Avionics System

C-130J MATS Loadmaster Fuselage Trainer (interior)

Management Trainers, Cockpit Procedures Trainers, Integrated Cockpit Systems Trainers, Fuselage Trainers, Engine and Propeller Trainers, Flight Control Trainers, Loadmaster Part Task Trainers (LMPTT), and local Little Rock AFB networking of WSTs. Contractor Logistic Support (CLS) and Aircrew Instruction are currently contracted on an annual basis dependent upon user community requirements (e.g., student throughput). Four KC-130J WSTs have been delivered to MCAS Cherry Point, MCAS Miramar, Iwakuni, Japan and the Joint Reserve Base (JRB) at Fort Worth, TX. NAVIAR has also procured additional fuselage trainers, Cockpit Procedure Trainers (CPTs), and Observer Training Aids (OTA). These efforts are also being managed by the Air Force Life Cycle Management Center in support of Naval Air Systems Command/U.S. Marine Corps (NAVAIR/USMC). The contract was recently modified to procure and deliver additional Air Combat Command (ACC)/Air Force Special Operations Command (AFSOC) HC/MC/EC/AC-130J WSTs delivered to various bases both CONUS and OCONUS. The program operates a Systems Integration Laboratory (a WST) as well as a classified laboratory used to facilitate the incorporation of modifications into the fielded device baselines.

C-130J MATS Weapon System Trainer, Exterior

The JMATS team, in 2022, has also begun efforts to

provide production and modifications of trainer devices specific to support the Air Force Reserve Command in the form of WC-130J training.

PROGRAM DOCUMENTATION

The C-130J MATS is covered under the aircraft's C-130J Program Management Directive (PMD) that was approved in May 2006 and the HC/MC-130 Recapitalization that was approved Mar 2011. The current operational requirements are captured in the C-130J Operational Requirements Document (ORD) approved Jan 2005 and the HC/MC-130J Capability Production Document (CPD) approved Aug 2009. The Logistics Product Support Guide was updated in Sep 2020.

PROGRAM CONFIGURATION BASELINE

The C-130J MATS maintains a trainer device baseline for AMC of all C-130J Weapon System Trainers (WSTs), Integrated Cockpit Systems Trainers (ICSTs), Cockpit Procedures Trainer (CPT), Fuselage Trainers (FuT), Loadmaster Part Task Trainers (LMPTTs), Avionics Systems Management Trainer (ASMT), Flight Control Trainer, and Engine Propeller Trainer. JMATS also maintains the baseline for each of the USMC's trainers (WSTs, CPTs, FuTs, and OTAs). Trainer baselines for the HC/MC/AC devices are maintained by a separate TSSC under the Air Commando Training System (ACTS) contract also managed from Wright-Patterson AFB by a separate team (not JMATS).

OTHER PROGRAM ISSUES

In 2018, the JMATS program relinquished the TSSC responsibilities for the AFSOC and ACC portion of the program to the AFSOC ACTS team at Wright-Patterson AFB under the ACTS contract. All responsibilities for baseline management have transferred to that team for the HC/MC/ AC-130J WSTs. The AFSOC ACTS is

responsible for conduct of training and maintenance of the training devices for AFSOC and ACC. In addition, JMATS has taken on the procurement roll for the AC-130J Gunship simulators in the FY19 time frame.

C-130J MATS Multi-Function Training Aid

PROGRAM OFFICE COMMENTS

The JMATS team continues to maintain a very high operations tempo to provide first class service to multiple Major Command customers. Acquisition for AMC, AFSOC, ACC, NAVAIR, ANG, AFRC, and AETC provides economies of scale within the acquisition community. The JMATS team is responsible for new procurement for all customers, and for modifications for the AMC and NAVAIR devices customers and for CLS plus instruction for the AMC customer only. The ACTS team is responsible for modification, CLS, and instruction for the AFSOC and ACC devices/locations.

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C-17 TRAINING SYSTEMS

The C-17 Training System (TS) contractor logistics support (CLS) contract is managed through the C-17 TS Program Office at Wright Patterson AFB and supports C-17 aircrew training IAW AFI 11-202 Volume 1 Aircrew Training and AFI 11-2C-17 Volume 1, C-17 Aircrew Training. Air Mobility Command (AMC), as lead command, in coordination with Air Education & Training Command (AETC), Air Force Reserve Command (ARC) and Air National Guard (ANG) user commands, establish C-17 aircrew training requirements through the ATS/CLS contract. This contract spans formal training at Altus AFB (13 initial and instructor upgrade courses) and periodic (monthly, quarterly, semi-annual, etc.) classroom and simulator training at 15 regional sites. The C-17 TS trained 2,496 pilots and 1,600 loadmasters through Ordering Period 3 (OP 3 12 month period). Additionally, through calendar year 21, the C-17 TS provided training culminating in simulator device usage for a total of 65,149 hours and loadmaster devices for a total of 12,659 hours. The TS contract services include the following:

- Operation, maintenance, sustainment, and support of 49, expanding to 55 C-17 aircrew Training Devices (ATD) and 37 Maintenance Training Devices (MTD).

C-17 Training System, Cockpit

- Hardware and software engineering support

- System-wide logistics support

- Day-to-day system-wide management

- Support of government quality assurance programs including the periodic simulator certification (SIMCERT) program and semiannual system review boards (SRB)

- Development and maintenance of simulator and simulator facility design criteria

- Simulator construction consulting services

- Studies that apply Informational Systems Design (ISD) best practices

- Development and maintenance of training information and materials including web based training programs

- Annual reviews and updates for all lesson materials through Level of Effort (LOE); recruit special qualified ATS contract instructors who conduct aircrew training in both traditional classrooms and/or aboard ATD's to each pilot

- Instruction and Training of USAF Air and Maintenance crews

The Aircrew Training System (ATS) provides initial training to pilots and loadmasters through individual instruction to aircrews and guarantee aircrew training standards by assessing proficiency levels. It also provides instruction at the "crew" level including annual Cockpit Resource Management (CRM) instruction, periodic Visual Threat Recognition and Avoidance Training (VTRAT), and the annual Instrument Refresher Course (IRC). The ATS contractor instructor teams may travel, when required, to C-17 equipped units to instruct a variety of aviation ground training courses. In addition, the Maintenance Training System (MTS) maintains, updates all aircraft maintenance training devices,

provides full maintenance and logistical support for C-17 hardware, and operates a Training System Support Center (TSSC) that updates, supports, and provides configuration management for all MTS components and computer systems. The MTS devices provide the means to deliver over 20 thousand hours of off-aircraft task certification training annually. This capability is essential to supporting operational aircraft and affords the warfighter the tools necessary to meet the challenges of an ever-changing wartime effort.

The C-17 CLS contractor is an integrated team member with the C-17 Training System Program, Wright-Patterson AFB, OH. This integrated team includes the Boeing Company, St. Louis MO, and their supporting contractors. This integrated team format helps keep the ATS/MTS systems concurrent with the latest aircraft configuration. To date, the C-17 TS Team has accepted and declared ready for training, a total of 26 Weapon Systems Trainers and associated learning centers. The Boeing Company currently provides aircrew training and MTS CLS on 14 USAF training sites: JB Charleston, SC; JB Lewis-McChord, WA; Altus AFB, OK; Jackson ANG, MS; JB McGuire-Lakehurst-Dix, NJ; Dover AFB, DE; Stewart ANG, NY; Martinsburg ANG, WV; Wright-Patterson AFB, OH; Memphis ANG, TN; Travis AFB, CA; JB Elmendorf-Richardson, AK; JB Pearl Harbor-Hickam, HI; March ARB, CA.

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C-5 TRAINING SYSTEMS

The C-5 Training System (TS), located at four training sites, provides aircrew and maintenance training that is concurrent with the C-5M Super Galaxy weapon system and its operating procedures.

The C-5 TS is used to initially train, upgrade, and maintain currency for C-5 pilots, flight engineers, loadmasters, and maintenance personnel. C-5 TS is divided into two contracts: Aircrew Training System (ATS) and Maintenance and Aircrew Training System (MATS) which are currently owned by CymSTAR, LLC and CTE-JV, respectively, delivering a total contractor training package, including total contract support in two major areas: student instruction and training device contractor logistic support. Instruction includes courseware maintenance and presentation for initial and mission qualification, continuation, and upgrade training for the ATS. CymSTAR also provides operation, maintenance, engineering, and modification support for: five C-5M Weapons System Trainers (WST); two Part Task Trainers (i.e., one Cargo Loading Trainer (CLT), and one Cargo Door and Ramp Trainer (CD&RT)); Desktop Trainers/Computer Aided Instruction student stations (Electronic Diagnostic System (EDS); Computer Based Training (CBT) stations; and Air Force Mission Support System (AFMSS) stations. Additionally, CTE-JV provides support for 22 Maintenance Training Devices and one Air Refueling Part Task Trainer. Training sites are located at Dover AFB, DE; Travis AFB, CA; and Joint Base San Antonio (Lackland), TX. Additionally, there is a WST to be utilized as a System Integration Lab (SIL) located in Broken Arrow, OK at the CymSTAR facility.

The latest C-5 Aircrew Training System concurrency modifications include those associated with the Reliability Enhancement and Re-Engine Program

(RERP) bringing the C-5 Aircrew Training System up to the latest operational flight program standards. Recent successes include Lateral Motion Enhancement, Edge Blends, and Hydraulic System Refurbishments. Upgrades are ongoing to the visual systems, Core Mission Computer/Weather Radar (CMC/WxR) and Communication, Navigation, and Surveillance/Air Traffic Management (CNS/ATM). Future modifications will include Distributed Mission Operations (DMO) connectivity. Additionally, the C-5 Training System team is planning to incorporate the LAIRCM Block 30 configuration into the Training System baselines.

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KC-10 TRAINING SYSTEM (TS)

The KC-10 Training System (TS) provides all aspects of ground-based aircrew training, logistics support, and maintenance for two KC-10 full-motion Weapons Systems Trainers (WSTs), two Flight Training Devices (FTDs), two Boom Operator Trainers (BOTs), and Computer Based Training (CBTs). The KC-10 TS contract provides for operation and maintenance of the training devices, modification development of hardware and software, system baseline configuration management and Technical Data Package (TDP) development at the Training System Support Center (TSSC) located in Fairfield, California near Travis AFB. The TSSC responsibilities include training syllabus courseware development/review, system updates, and distribution, as well as other administrative functions to include engineering and scheduling.

The KC-10 Maintenance Training System (MTS)

provides the Air Force maintenance instructors with Maintenance Training Devices (MTDs) and Virtual Maintenance Trainers (VMTs) to minimize the training impact on operational aircraft. These training devices provide a realistic training environment to train, and initially qualify, maintenance technicians and to support qualification for certain on-equipment tasks.

The KC-10 WST is a full-flight simulator that provides a realistic environment for training flight crews in aircraft operation to FAA Level C per 14 CFR Part 60 (where applicable). Training is carried out in a full-size, functional replica of the aircraft cockpit that is housed within a simulator enclosure. The simulator enclosure is mounted on a platform supported by six hydraulically operated actuators that provide motion cues in six axes (6 degrees of freedom). The WST visual system consists of a seven-channel FlightSafety International Vital X image generator, Sony HD projectors, and a collimated mirror providing a 225 x 45 degrees field-of-view (FOV). The WST is controlled from two Instructor Operator Stations (IOS) located to the rear of the crew seats in the simulator enclosure. There are currently two WSTs in the KC-10 TS program, located at Travis AFB, CA and Joint Base McGuire-Dix-Lakehurst, NJ (hereafter referred to as

KC-10 Landing Gear Trainer

KC-10 WST

The KC-10 BOT is a stationary simulator which provides a realistic environment for training boom operators in air refueling operations. Training is carried out in a full-size, functional replica of the aircraft Air Refueling Operator (ARO) station that is housed within a simulator enclosure. The BOTs are currently undergoing a complete visual systems replacement. The BOT is controlled from an IOS located to the rear of the ARO seat in the simulator enclosure. There are currently two BOTs in the KC-10 TS, with one each located at Travis AFB, CA and McGuire AFB, NJ.

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McGuire AFB). Thales is the Original Equipment Manufacturer (OEM) for the WSTs. All WSTs have completed a system rehost and Windows 10 Secure Host Baseline (SHB) upgrades.

The KC-10 FTD is a stationary simulator which provides a realistic environment for training flight crews in aircraft operation to FAA Level 6 per 14 CFR Part 60 (where applicable). Training is carried out in a full-size, functional replica of the aircraft cockpit that is housed within a simulator enclosure. The FTD visual system consists of a two-channel FlightSafety International Vital X image generator and two Samsung HD LCDs providing a 50 x 28 degrees FOV to each pilot. The FTD is controlled from two IOS located to the rear of the crew seats in the simulator enclosure. There are currently two FTDs in the KC-10 TS, with one each located at Travis AFB, CA and McGuire AFB, NJ. Thales is the OEM for the FTDs. Both FTDs have completed a system Rehost and Windows 10 SHB.

KC-135 TRAINING SYSTEM

The KC-135 Simulator System is comprised of 19 KC-135 Operational Flight Trainers (OFT), 9 Boom Operator Weapon System Trainers (BOWSTs), 3 Pilot Cockpit Familiarization Trainers (CFT), 2 Fuel Savings Advisory System (FSAS) CFT trainers, 1 Navigator Flight Trainer (NFT), and 1 Virtual Threat Recognition and Avoidance Trainer (VTRAT). The KC-135 TS also includes 28 Global Air Traffic Management (GATM) Interactive Hand Controller (IHC) Part Task Trainers (GIPTTs) Computer-Based Training (CBT) workstations, one Cargo Load Trainer (CLT), one Auxiliary Power Unit (APU) Trainer, three Boom Familiarization Trainers, two Oxygen Trainers, and one Air Refueling (A/R) Mockup Trainer.

The OFTs are fully-replicated, functional cockpit trainers. All 19 OFTs are equipped with full, six degrees-of-freedom motion systems equipped with

Lateral Maneuverability and Motion technology for improved lateral motion fidelity. They are also equipped with a collimated visual display using the Rockwell Collins EP-8000 Image Generator to meet Federal Aviation Administration (FAA) level C+ certification. OFTs are nearing completion of an update from the Block 40 Cockpit Configuration to the Block 45 Configuration plus subsequent OFP updates of Block 45. New courseware for Block 45 training was developed concurrently with the updates to the Aircrew Training Devices.

The BOWSTs consist of a complete boom compartment that provides a realistic visual representation of air refueling. It enables the student to identify visual cues from the air refueling boom and receiver aircraft. This enables them to maintain proper situational awareness during air refueling operations, including emergency procedures. BOWSTs provide realistic control forces in the controls used by the boom operator during refueling.

All devices and operating locations are undergoing updates to become Mobility Air Forces Distributed Mission Operations (MAF DMO) capable. OFTs and BOWSTs are being updated to have the capability to connect to one another and enable Same Aircraft Simulation (SAS) mode training where the OFT/BOWST students train as being in the cockpit and boom pod within a single aircraft. OFTs and BOWSTs located at the Formal Training Unit (FTU) are being connected to the Intra-Altus Network to enable interaction with C-17 and other KC-135 devices at the FTU. OFTs and BOWSTs not located at Altus are in the process of connecting to the Distributed Training Center Network (DTCN).

There are 3 CFTs located at the Altus FTU. These systems are non-powered cockpit panel replications to enable students to learn switch position, gauge position, and limited normal procedure training. Two additional CFTs devices are higher fidelity FSAS devices that also provide a functioning fuel management system. All 5 devices have undergone an upgrade from the Block 40 to Block 45 configuration.

The Learning Management System (LMS) provides a Sharable Content Object Reference Model (SCORM) compatible LMS and courseware. Continuation training CBTs are accessible to KC-135 aircrew members via internet access from their squadron and other locations.

The Cargo Loading Trainer, located at Altus is a full-sized trainer using a modified KC-135 fuselage designed to train boom operators on cargo loading and handling.

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KC-135 BOOM OPERATOR SIMULATION SYSTEM (BOSS)

The KC-135 Boom Operator Simulation System (BOSS) program's primary objective is to provide a comprehensive operations, maintenance, and sustainment program to ensure Air National Guard (ANG) KC-135 Boom Operators (BO) have fully functional base level training devices. In 2005, both Air Education Training Command (AETC) and the National Guard Bureau (NGB) began looking for better KC-135 Boom Operator training devices. The AETC program was called the Boom Operator Weapon

KC-135 Boom Operator Simulation System (BOSS)

System Trainer (BOWST) and the NGB program was called the KC-135 BOSS.

The NGB KC-135 BOSS is a high fidelity, squadron level continuation simulator that replicates the KC-135R, Block 40 boom pod. The KC-135 BOSS is comprised of the boom pod, a Visual Display Unit (VDU), two (2) Instructor Operator Stations (IOS), platform/stairs assembly for boom pod ingress and egress. The KC-135 BOSS provides an immersive simulation environment that utilizes realistic computer-generated images with an emulation of the actual aircraft boom controls.

The Micro-BOSS is a table-top Part Task Trainer (PTT) incorporating all of the software features and functionality of the KC-135 BOSS. Through the use of photo-realistic graphical displays, touch screens, an aural cueing system, a high definition out-the-window display, and representative joystick controls, the Micro

-BOSS provides the functional equivalent of a complete KC-135 boom pod station. Micro-BOSS operates the same software as the KC-135 BOSS but does not include the Boom Operator Pod mockup student station. The Micro-BOSS is NOT certified for training and therefore, is only used as a debrief suite/PTT.

The KC-135 BOSS is designed to support complete boom operator training curriculum (initial qualification, difference qualification, certification, requalification, mission certification, and instructor upgrade training) and meet Aerial Refueling Airplane Simulator Qualification (ARASQ) standards. It is designed for squadron-level training and to be operated by unit personnel with the option of dedicated on-site contractor personnel. The simulator system is comprised of 17 KC-135 BOSS training devices and 24 KC-135 Micro-BOSS PTTs. The system is currently fielded at a total of sixteen ANG KC-135 wings, in both CONUS and Outside Continental United States (OCONUS) (Hawaii and Alaska) locations.

The KC-135 BOSS Mobility Air Force (MAF) Distributed Mission Operation (DMO) connectivity is via Air Reserve Component Network (ARCNet). The ARCNet is operated and maintained by the Distributed Training Operations Center (DTOC) in Des Moines IA. The DTOC organizes DMO events for ANG and Air Reserve Component pilots. The requirement to operate on the ARCNet is the same as MAF DMO. However, connections to the MAF DMO will be made through the DTOC to the Mobility Air Force (MAF) Distributed Training Center Network (DTCN).

Current locations of the ANG KC-135 BOSS are Meridian, MS; McGhee Tyson, TN; Salt Lake City, UT; Birmingham, AL; Lincoln, NE; Bangor, ME; Pittsburgh, PA; McGuire AFB, NJ; Milwaukee, WI; Sioux City, IA; Hickam AFB, HI; Phoenix, AZ; Eielson AFB, AK; Selfridge, MI; Rickenbacker, OH; and Forbes Field, KS.

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KC-46 AIRCREW TRAINING SYSTEM (ATS) PROGRAM

The KC-46 Aircrew Training System (ATS) is being developed concurrently with the KC-46A aircraft to support long-term training of aircrews. A thirteen year contract was competitively awarded to FlightSafety International-Defense (FSI-D) Company on 1 May 2013 for the design, development, delivery, and maintenance of the KC-46 training devices, creation of the courseware, and student instruction. The Contract is a fixed-price incentive (firm target) contract, with firm-fixed price options, to support the KC-46 Aircraft Program by furnishing an integrated

contractor operated and supported aircrew training system that provides total KC-46 aircrew training. FSI-D has an Associate Contractor Agreement with The Boeing Company to facilitate obtaining design information for the ATS. Requirements for the KC-46 ATS are directed by the KC-46 Aircraft Program Capabilities Development Document.

The aircrew training suite consists of five device types: Weapon System Trainer (WST), Boom Operator Trainer (BOT), Fuselage Trainer (FuT), Pilot Part-Task Trainer (P-PTT), and Boom Operator Part-Task Trainer (BO-PTT). Ready for Use (RFU) at the Formal Training Unit (FTU) — when the device's functionality was tested and available for use but courseware was yet to be tested — occurred in January 2019 on the Engineering & Manufacturing Development (EMD) Suite #1 at Altus AFB, OK. Ready for Training (RFT) — when the FTU officially stood up
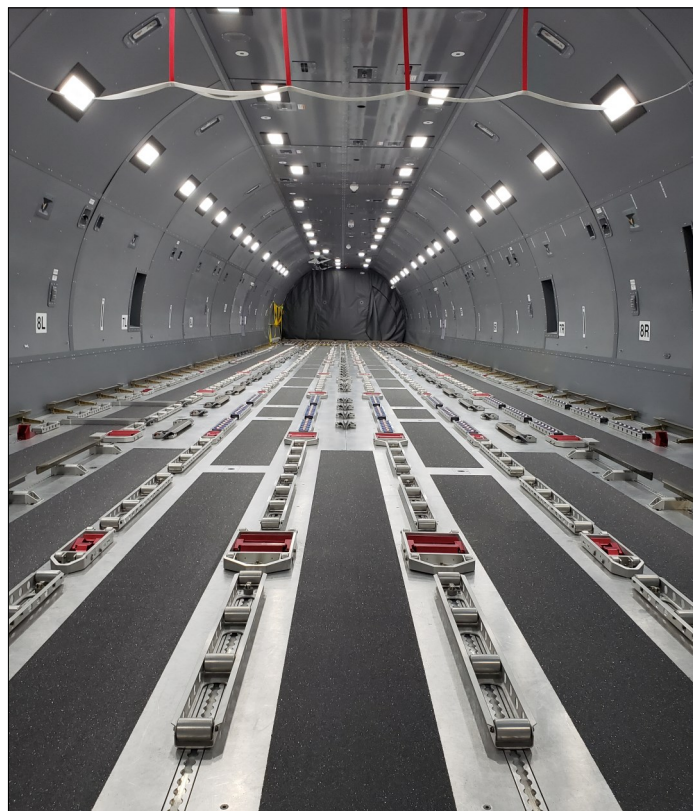
KC-46 Fuselage Trainer (FuT), Interior

and students began formal training — was accomplished 29 July 2019, less than eight months after the first aircraft delivery. The second EMD suite, located at McConnell AFB, KS, achieved RFU in April 2019. Seven of the ten production and seven of the eleven Operation & Sustainment options have been exercised to date.

Current fielded devices (as of Aug 2022):

- Altus AFB, OK (FTU): 5 WSTs, 5 BOTs, 2 FuTs, 5 P-PTTs, 3 BO-PTTs

- McConnell AFB, KS (MOB 1): 3 WSTs, 2 BOTs, 1 FuT, 2 P-PTTs, 1 BO-PTT

- Pease Air National Guard Base, NH (MOB 2): 1 WST, 1 BOT, 1 FuT, 1 P-PTT

- Seymour Johnson AFB, NC (MOB 3): 1 WST, 1 BOT, 1 FuT, 1 P-PTT

- Joint Base McGuire-Dix-Lakehurst, NJ (MOB 4a): 2 WSTs, 2 BOTs, 1 FuT, 2 P-PTTs

PROGRAM IMPACT

The KC-46 ATS will deliver more capability than any other training system in the Air Force fleet. In addition to having Distributed Mission Operations capabilities to operate with simulators at other bases across the nation, the FTU will feature the Intra-Altus Network, allowing the KC-46 ATS devices to connect to and operate with KC-135 and C-17 simulators co-located at the base.

The KC-46 ATS is postured to be the first Air Force training system to achieve Federal Aviation Administration (FAA) Level D-equivalent certification. AMC/Det 2 uses the FAA certification guidelines to award a 14 CFR Part 60 Level D certification. The program will also deliver Air Refueling Airplane Simulator Qualification (ARASQ) Level II training

capabilities. Success is largely dependent on Air Refueling Airplane Simulator Qualification data availability under the significantly compressed KC-46 Aircraft Program schedule. FAA Level-D with ARASQ Level II certification would afford significant cost savings to the Air Force, allowing an unprecedented amount of aircrew qualification training to be completed in the simulator rather than on the aircraft.

PROGRAM DESIGN MATURITY

The KC-46 ATS uses an incremental approach for device fidelity. Increment One (1) will match the KC-46 aircraft's Initial Operational Test & Evaluation (IOT&E) configuration with some performance characteristics estimated until exact aerodynamic performance data can be collected. Increment Two (2) will match the aircraft's configuration once the KC-46 Delta Physical Configuration Audit (DPCA) is complete and free-air aerodynamic data is collected – leading to the achievement of 14 CFR Part 60 Level D equivalent certification for the WST. Increment Three (3) will provide additional fidelity to the WST and BOT for tanker/receiver aerodynamic performance via ARASQ data collection.

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KC-46 MAINTENANCE TRAINING SYSTEM (MTS) PROGRAM

The KC-46 Maintenance Training System (MTS) is being developed concurrently with the KC-46A aircraft to support long-term training and certification of KC-46 maintenance personnel. The contract was

awarded to Boeing on 6 July 2016 under a Firm Fixed Price contract for the EMD, production and initial sustainment of training devices supporting three regional maintenance training facilities: McConnell AFB, KS, Joint Base McGuire–Dix–Lakehurst, NJ, and Travis AFB, CA Requirements for the KC-46 MTS are directed by the KC-46 Aircraft Program (AFLCMC/WLC) Capabilities Development Document.
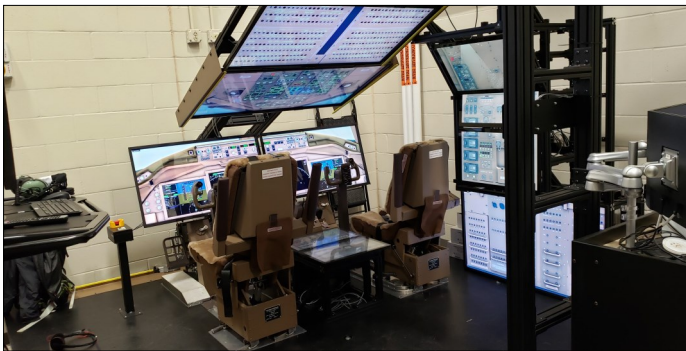
KC-46 Maintenance Training Systems

The maintenance training suite consists of seven Augmented Hardware Training Device (AHTD) types (Advanced Wiring and Electrical Repair; Flight Controls; Aerial Refueling; Flight Deck/Avionics; Landing Gear; Engine/Auxiliary Power Unit; Fuels Systems) and Interactive Multimedia Instruction (IMI) provided in Virtual Maintenance Training System (VMTS) classrooms.

The first training devices will be delivered to McConnell AFB. During EMD, the KC-46 MTS devices have a staggered delivery schedule starting with the VMTS in December 2018 and completing with the Flight Controls and Aerial Refueling Trainers by 4QFY23. Ready for Training (RFT) with the Mission Ready Airman (MRA) course was achieved in August 2019 and MRA training courses [along with transition, general familiarization and Maintenance Qualification Training Program (MQTP) Phase I and II] are currently being conducted at McConnell AFB's Regional Maintenance Training Facility (RMTF).
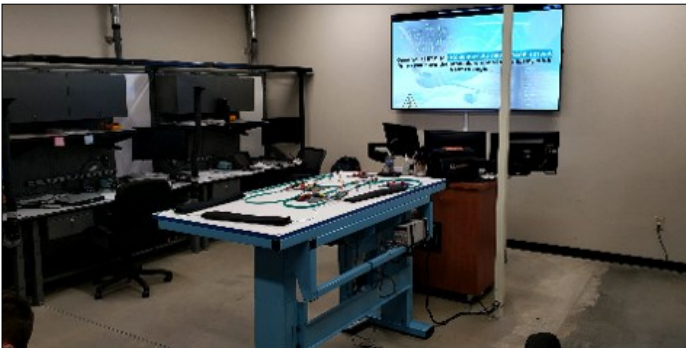

KC-46 Maintenance Training Systems

Delivery of a second suite of training devices and IMI/VMTS classrooms to Joint Base McGuire–Dix–Lakehurst, NJ is scheduled to begin February 2023 with a projected RFT date of October 2023 for IMI Classrooms.

The third suite of training devices and IMI/VMTS classrooms will be delivered in 4QFY23 to Travis AFB, CA. RFT is scheduled for 2QFY24. A separate contract action will have to be performed to cover installation, checkout and sustainment for this 3rd suite of training devices.

PROGRAM IMPACT

The KC-46 MTS will provide a blended solution of hardware and software, high-fidelity maintenance training devices and IMI to be used in conjunction with minimal dependence on the aircraft. The MTS provides total KC-46 maintenance training to include classroom instruction utilizing IMI, along with a suite of hardware training devices augmented with IMI capabilities. These AHTDs support instructor-monitored practice training leading to proficiency and certification. As a result, the use of operational aircraft for student certification is minimized and limited to those tasks which can only be accomplished on an operational aircraft. These on-aircraft

KC-46 Maintenance Training Systems

KC-46 Maintenance Training Systems

certifications will only be performed after the student has been qualified on the MTS. Certifying non-critical tasks and pre-training critical tasks in the classroom will alleviate an enormous training burden from the KC-46A aircraft and enhance the aircraft's operational mission effectiveness.

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SPECIAL OPS & TRAINING SYSTEMS

SIMULATORS

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AIR FORCE SPECIAL OPERATIONS COMMAND AIR COMMANDO TRAINING SUPPORT (AFSOC ACTS)

The AFSOC ACTS program was awarded on 08 February 2018, and provides training devices and support to prepare Air Force Special Operation Forces AC/EC/MC-130, and Air Combat Command's Combat Search and Rescue HC-130 teams to successfully conduct mission operations. Additionally, AFSOC ACTS has incorporated the Air Force's only Osprey tilt rotor training devices that provide highly trained aircrew support for CV-22 operations. The AFSOC ACTS contract is held by Lockheed Martin Mission Systems and Training and continues through January 2026.

CV-22 Flight Training Device (FTD)

The AFSOC ACTS program supports 74 training devices for eight different aircraft Mission Design Series platforms at eleven locations worldwide.

The Simulators Division has responsibility for program management, contracting, engineering, logistics, cybersecurity, financial management, and configuration management of each training system, along with all associated Contractor Logistics Support (CLS).

The CLS portion of AFSOC ACTS includes contractor staff personnel responsible for the support of rehearsal system hardware, software, courseware, student services, and instruction. The AFSOC ACTS program is also responsible for providing concurrent configuration between aircraft and it's the respective training system, supporting exercises, keeping pace with technological upgrades, and providing training campus administrative functions.

The program also provides database and Distributed Missions Operations (DMO) support throughout the Special Operations and Air Force communities. All training sites are responsible for producing mission-ready special operations aircrews. Special operations aircrew training is accomplished through a combination of state-of-the-art equipment, talented instructors, and an extremely dedicated support staff that manages everything from device maintenance to complex course-ware and DMO.

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JOINT TERMINAL CONTROL TRAINING AND REHEARSAL SYSTEM (JTC TRS)

The JTC TRS provides a realistic trainer/simulator for Joint Terminal Attack Controllers (JTACs) that enhances terminal attack control, tactical fires integration, effective targeting, battlespace awareness

and mission rehearsal. Mission rehearsal improves operational awareness and improves the capability to support time-critical targeting.

JTC TRS Combined Workstation (Vilseck GE)

The JTC TRS supplements field training to provide realistic introductory training, upgrade training, proficiency training, continuation training and mission rehearsal in a synthetic battlespace. The Joint Fire Support Executive Steering Committee (JFS ESC) accredited JTC TRS on 20 Jun 16 for Type I, II and III controls. This allows JTACs the ability to use the JTC TRS simulator to log controls for currency without the use of live-fly aircraft.

The JTC TRS is capable of processing and displaying an accurate air and ground scene locally, or representing Joint Live, Virtual, and Constructive forces generated in the Distributed Mission Operations environment. The JTC TRS Family of Systems (FoS) is comprised of fixed, partial dome systems immersing the trainee in a virtual environment with representative visual and aural cues; desktop systems providing the ability to conduct training requiring less than dome system capabilities; and the Joint Theater Air Ground Simulation System (JTAGSS), simulating the Air Support Operations Center (ASOC) environment training for personnel. This complex distributed system of systems employs technologies such as

intelligent agents with natural language interaction capability through speech, chat, and e-mail; intelligent agent control of SAF entities; and C2data and system stimulation.

CAE USA was awarded an 8-year production and sustainment contract in June 2021. The program is currently in full-rate production. 35 Dome systems, 28 Desktop Systems, and 17 JTAGSS have been fielded, with an additional 4 Dome systems and 16 Desktop Systems scheduled for delivery in 2022/2023.

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KIRTLAND, DAVIS-MONTHAN, ANDREWS, AND MOODY (KDAM) AIRCREW TRAINING AND REHEARSAL SUPPORT (ATARS)

The KDAM ATARS was awarded 1 Aug 2016 to produce mission qualified Personnel Recovery (PR) and Special Operations Forces aircrews. The KDAM ATARS users are represented by Air Education and Training Command, Air Combat Command, Air Force Global Strike Command, Air Force District of Washington (AFDW), and Air Force Special Operations Command. The KDAM ATARS mission is to provide the Formal Training Unit schoolhouse operations for unique crew positions across five Mission Design Series (MDSs) to include CV-22, HC-130J, MC-130J, HH-60G, and UH-1N. In addition, KDAM ATARS provides

refresher training for PR aircrews and training for Convoy Support and AFDW Vertical Lift Aircrews in Continuity of Government and Continuity of Operations.

KDAM ATARS's baseline requirements are for aircrew instruction (initial/mission qualification, refresher, upgrade, and currency), student services, Contractor Logistics Support, device modifications, Training Systems Support Center, courseware, support for Distributed Mission Operations events, Database Generation, and cybersecurity.

The KDAM ATARS program supports 34 training devices for five MDS platforms, at four locations. Training devices range in complexity from full-motion Weapon System Trainers to desktop trainers. The Simulators Division has responsibility for program management, contracting, engineering, logistics, cybersecurity, financial management, and configuration management of each training system, along with all associated contractor logistics support.

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AEROSPACE & OPERATIONAL PHYSIOLOGY (A&OP) TRAINING SYSTEM

A&OP Training System is comprised of two different devices – hypobaric altitude chambers and spatial disorientation devices. The chamber demonstrates an unpressurized flight environment, barometric pressure changes, decompression, hypoxia

recognition, aircraft oxygen system recovery procedures, and altitude effects on night vision and perception. There are 13 chambers at 11 locations.
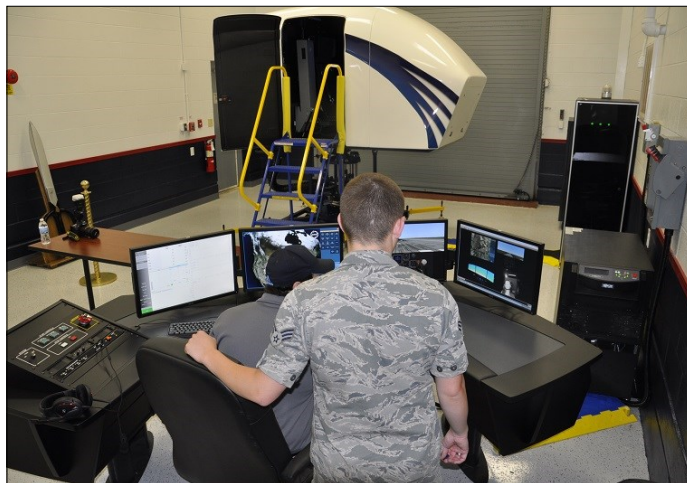
Spatial Disorientation Device

This program is currently under a Contractor Logistics Support contract. The effort includes regular and emergency maintenance, establishing a baseline configuration, and updating Technical Orders and drawings.

The spatial disorientation devices provoke spatial disorientation symptoms stemming from flight illusions. There are five devices currently in use at five different locations.

Users include Air Education and Training Command, Air Combat Command, Air Mobility Command, Air Force District of Washington, and Air Force Materiel Command.

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T-38C AIRCREW TRAINING DEVICES

The T-38C Aircrew Training Devices (ATD) are designed to fulfill requirements to prepare student pilots for U.S. Air Force fighters and bombers. The T-38C ATD fleet consists of 14 Unit Training Devices (UTD), 10 Operational Flight Trainers (OFT), and 12 Weapon System Trainers (WST) providing operational training at Columbus AFB, MS; Laughlin AFB, TX; Randolph AFB, TX; Vance AFB OK; and Sheppard AFB, TX. The ATDs at Sheppard AFB support the Euro NATO Joint Jet Pilot Training program. The T-38C ATD system is maintained by a Contractor Logistics Support contract which provides comprehensive ATD maintenance, logistics, and modification support and a Training System Support Center.

T-38C Operational Flight Trainer, Cockpit

The T-38C ATDs support a building-block approach to pilot production by providing students incrementally more advanced simulated experiences. The UTDs are the most basic of the T-38C ATDs and are designed for instrument, normal and emergency procedures training. One UTD consist of a cockpit, instructor operator station (IOS), single channel, out-the-window, 40-degree field of view (FOV) visual system, and associated electronics and computational system. The OFTs have full-fidelity replication, simulated

malfunctions, operational flight program commonality, dynamic cueing, aural cueing, a full 216-degree by 135-degree FOV, and an IOS. All OFTs within the same training site can be interconnected via a local area network, thus allowing simulated formation flight conditions. The WST expands upon the OFT design by providing a 360-degree FOV visual system which is used to provide training in Air Combat Maneuvering and Defensive Basic Fighter Maneuvers in addition to all the OFT capabilities.

Currently, the program is maintained by Contractor Logistics Support via Delaware Resource Group (DRG).

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VISUAL THREAT RECOGNITION AND AVOIDANCE TRAINER (VTRAT)

The VTRAT is an automated virtual intelligent instructional training aid designed to introduce and refresh visual scanners on their duties during an anti-aircraft threat engagement. This is accomplished by a combination of software and hardware that displays realistic visual characteristics of anti-aircraft weaponry.

The VTRAT system was designed from the loadmaster concept for the AC-130. It was developed by Air Force Special Operations Command (AFSOC) in coordination with the Air Force Research Laboratory at Brooks AFB, TX. In addition to AFSOC, the program grew to accommodate Air Mobility Command, and in June

2011 Air Combat Command. The program trains aircrews in both formal training units and Outside Continental US units across multiple sites worldwide.

The VTRAT system employs a powerful, simulation-based platform utilizing intelligent tutoring and an Air Intelligence Agency certified threat database. The system provides lessons on Anti-Aircraft Artillery and Surface to Air Missiles, including unguided infrared and radar guided threats. The target training population is crew members whose duties include visually detecting, initiating, and coordinating defensive and/or evasive maneuvers with and without Night Vision Goggles. This device identifies strong and weak performance areas of individual students and then emphasizes training on the weaker areas until mastery of the specific protocol is attained. VTRAT is a requirement for all crew members from loadmasters to pilots and requires annual refresher courses as well as training for all those about to deploy.

The Simulators Division at Wright Patterson AFB, OH has program management responsibility and is responsible for incorporating warfighter requirements, program funding and contract support. The program team ensures that system hardware is regularly tech refreshed, and training courseware content is updated twice a year for each of the three commands in order to assist aircrews in achieving current mission objectives.

The program is managed organically at Hill AFB Air Logistics Center, UT. The system has completed full production and allows for the purchase of additional units on an as needed basis.

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T25 SIMULATOR FOR ELECTRONIC COMBAT TRAINING (SECT)

The T25 SECT suite, which also includes a simulator for sensor operations training and a radar virtual task trainer, is the primary aircrew training device for Combat Systems Officer (CSO) training at Naval Air Station Pensacola, FL. The T25 SECT consists of 18 student stations and 9 instructor operator stations. The T25 SECT suite is organically maintained and supported by the 555th SWES.

The T25 SECT leverages high fidelity physics-based simulation tools to provide CSO students with a full-range of interactive electronic combat lab exercises and full-scale missions scenarios to include covert penetration, standoff jamming, electronic intelligence collection, and suppression of enemy air defenses.
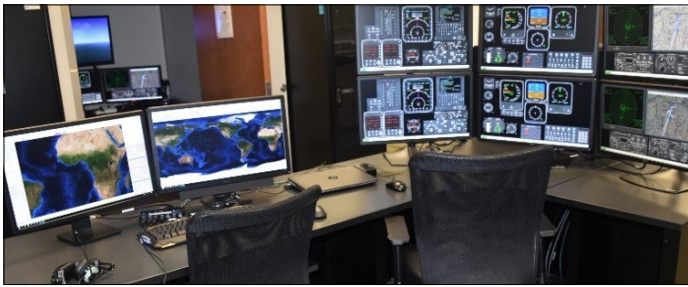

T25 SECT Student Station

T25 SECT Radar VTT

T25 SECT Instructor Station

The T25 SECT applications use a building-block approach to introducing complex electronic warfare concepts by allowing students to visualize and interact with electromagnetic threat indications within realistic integrated mission scenarios.

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UNDERGRADUATE RPA TRAINING (URT) GROUND BASED TRAINING SYSTEM (GBTS)

Air Education and Training Command (AETC) utilizes the URT GBTS to train new RPA pilots in the URT pipeline. URT GBTS consists of the Undergraduate Remotely Piloted Aircraft Training Instrument Simulator (URTIS) and the Predator Reaper Integrated Mission Environment Desktop Training Simulator (PRIME DTS) Aircrew Training Devices.

The URTIS is used to train new RPA pilots in contact flying and instrument flying procedures and qualifies the RPA pilots to operate in National and International airspace. The device is a non-motion, cockpit trainer,

based on the T-6 airframe, used to conduct instrument, communication and national airspace training. The system was developed by HQ AETC for RPA pilot trainees to utilize in their second phase of training to prepare for the final phase - RPA Pilot Remote Fundamentals Course. The system is a standalone network and does not interface/interconnect with any systems outside of its own architecture. There are 16 URTIS devices at Randolph AFB, TX.
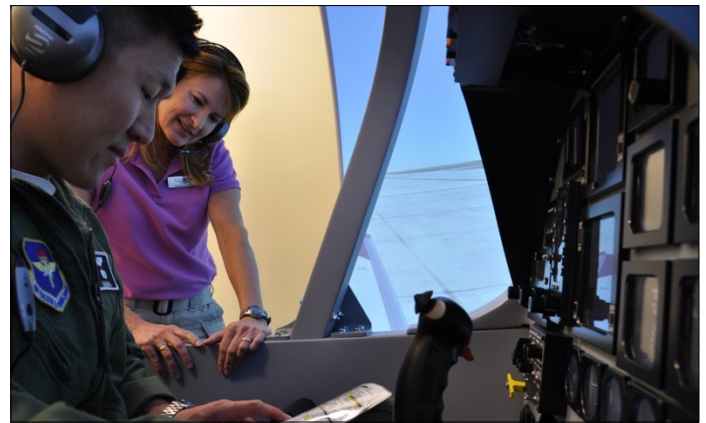
Undergraduate Remotely Piloted Aircraft Training Instrument Simulator (URTIS)

PRIME DTS is a desktop training system simulating the concepts, techniques, and procedures applicable to RPA operations. PRIME Desktop Training Simulator (DTS) is a desktop version of a MQ-9 Reaper based simulation that has been developed by Headquarters AETC for use in URT to train RPA pilots (officers) and sensor operators (enlisted). Both the RPA Pilot Remote Fundamentals Course and the Basic Sensor Operator Course utilize the PRIME DTS to prepare the students for their next training courses at the various RPA Formal Training Units. There are 182 PRIME desktops at Randolph AFB, TX.

The program is managed organically by the 555th SWEG at Tinker ALC. Recently, 19AF/CC gave approval to replace PRIME with a government owned

open-source software known as Vigilant Spirit. This will be developed by the 555th SWEG. This software will eventually replace URTIS.

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T-1A Jayhawk Flight Simulator

T-1A GROUND BASED TRAINING SYSTEMS (GBTS)

The T-1A GBTS program is in sustainment managing 16 Operational Flight Trainers (OFTs) and 14 Avionics Parts Task Trainers (PTTs). The T-1A GBTS provides direct, transferable pilot training in support of the T-1A aircraft. The student gains knowledge and experience with all controls and instruments during takeoff, landing, Visual Flight Rules and Instrument Flight Rules, flight, navigation and emergency conditions. The OFTs are supported by two Training System Support Centers (TSSCs). The TSSC at Joint Base San Antonio-Randolph, TX is responsible for providing maintenance, modifications, engineering support, and configuration/data management support for the undergraduate pilot training baseline configuration. The TSSC at Naval Air Station Pensacola, FL is responsible for the Combat Systems Officer (CSO) baseline configuration. The Technical Data Package consists of: software documentation, source code, hardware specifications, technical publications, Acceptance Test Procedures, engineering drawings, visual databases, maintenance and operation manuals/documentation, licenses, vendor documentation, and other related documentation required to maintain or enhance the training system.

Recently, T-1 aircraft upgrades have been incorporated into the T-1A GBTS OFTs and PTTs in support of the Air Force's Avionics Modernization Program (AMP). The updates include Pro-Line 21 avionics panel installation, equipment cabinets and raised flooring in the OFT cockpits to support the new avionics hardware. Additionally, the CSO OFT and CSO PTT will reflect the aircraft CSO configuration.

Currently, the program is maintained by Contractor Logistics Support via Aero Simulation Incorporated (ASI).

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T-6 GROUND BASED TRAINING SYSTEMS (GBTS)

The principal mission of the T-6 GBTS is to train entry-level U. S. Navy (USN), U.S Marine Corps (USMC), U.S. Coast Guard (USCG) and U. S. Air Force (USAF) student pilots in primary and intermediate flying skills. T-6 GBTS also provides primary and intermediate training

T-6A Egress Procedures Trainer (EPT)

flight instruction, and pre-flight instruction. The system also includes an integrated package of courseware, syllabi, academic training courses, and an automated data management system.

The T-6 GBTS is fully integrated to support all training as defined by the Instructional System Development process. The T-6 GBTS functions as an integrated part of the USAF Undergraduate Primary Pilot Training, Undergraduate Student Naval Pilot Training, Specialized Undergraduate Pilot Training, USAF Undergraduate Navigator Training, Euro-NATO Joint Jet Pilot Training, and Undergraduate Naval Flight Officer Training programs.

to entry-level USN Student Naval Flight Officers (SNFOs). Additionally, T-6 GBTS provides entry level USAF student navigators with a basic understanding of airmanship prior to their designation as USAF navigators. To meet these training needs, the USAF employs 86 T-6A Aircrew Training Devices (ATDs) while the USN employs 31 T-6B ATDs and 9 T-6A ATDs.

The T-6 Air Vehicle (A/V) and GBTS, commonly known as the Joint Primary Aircraft Training System (JPATS), replaced the USAF's T-37B and the USN's T-34C aircraft and their associated ground-based systems in support of USAF and USN flight training programs. Three variants of the A/V are operated; T-6A (USAF & USN), T-6B (USN), and T-6D (U.S. Army, four test range aircraft, no undergraduate training conducted). The T-6 GBTS has common components to meet common USAF and USN requirements. The system procured brings entry-level flight students to a level of proficiency so they can transition to advanced USN and USAF flight training systems. Elements of the system are the AV and the GBTS which are necessary to perform operational flight instruction, instrument

Both services employ separate Contractor Operated

T-6A Ejection Seat Trainer (EST)

Maintenance Services (COMS) contracts which provide both Contractor Logistics Support (CLS) and Contractor Operated and Maintained Base Supply (COMBS) services to meet all simulator maintenance and logistics needs.

The T-6 GBTS acts as a primary flight training platform. It possesses handling characteristics compatible with the primary student training environment. The T-6 GBTS possesses characteristics of reliability and maintainability that afford the student an opportunity to receive safe and effective training within the allocated period.

T-6A Operational Flight Trainer (OFT) Display

Currently, the program is maintained by Contractor Logistics Support via Delaware Resource Group (DRG).

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T-6A Unit Training Device (UTD) with Instructor Operation Station (IOS)

REMOTE SIMULATOR INSTRUCTOR

The Remote Simulator Instructor (RSI) Program developed and produced a hardware/software platform to connect AETC Aircrew Training Devices (ATDs) to a Remote Instructor Station (RIS) operating from a commercial facility at an off-base location. The initial phase of this effort connected one T-6 ATD to a Contractor constructed RIS located in Tampa, FL as a proof of concept. Once fielded, this remote capability will help AETC address pilot retention issues and modernize undergraduate pilot training.

Government acceptance testing was conducted in Sep 2022, in conjunction with a capability demonstration to senior leaders within AFLCMC/WNS and AETC/19AF. Upon completion of the prototype effort, the prototype RIS was delivered to Randolph AFB where 19AF Det 24 has assumed ownership of the program and will expand upon the current design.

This prototype effort was awarded to and developed by Aero Simulation Incorporated (ASI) via a completive Mid-Tier Acquisition (MTA).

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OPERATIONAL TRAINING INFRASTRUCTURE

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LIVE VIRTUAL CONSTRUCTIVE (LVC)

The Live-Virtual-Constructive (LVC) Training Network (TN) is a pre-Materiel Development Decision (MDD) program with the objective of developing, integrating, and sustaining USAF LVC training capability to support the full range of operational training resulting in combat mission ready operators. The program goals are:

- Develop unique systems necessary to implement the LVC training capability.

- Establish and maintain interoperability standards for live, virtual, and constructive systems to interact in a common domain.

- Integrate combat systems with simulators, ranges, and models to support training objectives.

- Coordinate acquisition planning and sustainment for new and participating programs to meet warfighter LVC training requirements.

- Advocate for necessary funding.

- Protect LVC training participants from compromise through the LVC TN interface.

- Require client systems' security classification guides to include guidance for sharing training data across dissimilar, joint, and coalition partners.

Figure 1: High-Level LVC Operational Concept

Figure 1 (right) gives an idea of the LVC concept. An LVC TN would give operators the capability to integrate synthetic and live entities in a common training environment in an effort to enhance the veracity and efficiency of training. An LVC TN will have the capability to generate a sufficient number of constructive entities, and present them with sufficient fidelity, to train 5th generation aircraft. This capability will require training data to be sent securely via range instrumentation at multiple levels of security. To meet training needs, the program will be introduced in an incremental form, with the first increment being range infrastructure and capability on at least one platform, then modification of other platforms, with the focus on 5th generation aircraft.

After the successful completion of the Secure LVC Advanced Training Environment (SLATE) Advanced Technology Demonstrator (ATD) executed by the Air Force Research Laboratory's (AFRL) 711th Human Performance Wing (HPW) in 2019, the LVC TN proposed an incremental implementation of the LVC architecture demonstrated in the SLATE ATD. Increment 1 included establishing the required LVC instrumentation of all USAF ranges and establishing DMO portals in support of the Live Mission Operation Center (LMOC) initiative lead by AFLCMC/HBZ. With the shift to the Joint Synthetic Environment (JSE) for the VTTC, WNS and HBZ will continue to follow JSE maturation efforts with the intent to include that in future LVC efforts. LVC TN, along with AFRL, are continuing to support the F-35 Joint Program Office with their F-35 Fusion study to determine the best path towards incorporating LVC capabilities into the F-35. The Fusion study is ready to entered Phase II pending funding. WNS is coordinating with HAF/A3 and ACC to develop LVC requirements.

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SIMULATOR COMMON ARCHITECTURE REQUIREMENTS AND STANDARDS (SCARS)

The Air Force Operational Training Infrastructure (OTI) 2035 Flight Plan lays out an ambitious future training enterprise built on a common operating environment in order to achieve and sustain full spectrum readiness while maintaining a thoughtful balance between readiness and affordability. Simply re-hosting the entire simulator enterprise would be prohibitively expensive, take years if not decades to complete, and still may not ensure the needed level of integration. Instead, the Air Force leveraged the success of the Distributed Mission Operations (DMO) program to establish a new, innovative sustainment approach called the Simulator Common Architecture Requirements and Standards (SCARS).

As one of many lines of effort in the OTI Flight Plan, SCARS plays a key foundational role in determining a future simulator common architecture. This architecture will establish common, open interfaces, standard processes, and technical specifications to create a truly modular system which promotes flexibility and innovation. With the common architecture in place, applications and models needed to achieve a common operating environment become much easier to implement. For example, the Simulators Division currently manages/maintains separate versions of the Sniper Pod for each training platform despite overlapping functionality. In the future, a single, modular Sniper Pod model could be used across the USAF simulator portfolio. Common architecture approaches such as this will free up time and resources so they are able to be spent on other

tasks such as improving training system concurrency. Given the size, scope, and complexity of all the training devices in the enterprise, transitioning to a modular system will be a complex, long-term endeavor.

In order to successfully address this transition challenge, the Simulators Division set up SCARS as an innovative solution. Unlike traditional acquisition programs, SCARS is a sustainment initiative that generates standards for simulators to incorporate, similar to DMO mission packages. DMO will still address simulator interoperability requirements while SCARS concentrates on components and internal networks. The simulator devices will still meet the warfighter training needs. SCARS helps those simulators transition components to a common environment while providing a common secure baseline. Similar to the DMO approach, that transition will be broken up into numerous increments to deliver functionality quickly and provide flexibility to address rapidly changing technology and training requirements. The first increment of SCARS established the initial common architecture and implemented third-party remote scanning, a critical cybersecurity control. Near-term increments will include common applications, common models, further cybersecurity controls, and other foundational standards. The ultimate objective for SCARS is to provide the approximately 2,400 USAF simulators which span across 300 locations with a common architecture.

In order to execute this innovative approach, SCARS relies heavily on a Prime contractor. The Prime contract leverages a Government chaired collaborative working group to help establish Government-owned standards. The collaborative working group includes current Air Force simulator support contractors, referred to as SCARS Affiliates, and simulator network providers, known as SCARS Partners. Both the SCARS

Affiliates and Partners have contractual requirements to update their respective systems to new SCARS standards, similar to the DMO approach.

SCARS Team Pictures 2022

On 26 June 2020, the SCARS team awarded the Prime Contract to L3Harris, now CAE. Ever since, both the contractor and government teams have been busy establishing the infrastructure and executing the program; this included the construction of a temporary Security Operations Center (SOC) and delivery of On-Premise Equipment (OPE). Within the SOC, there is a library that will host common applications and data. The SOC will schedule and create connections over an existing WAN(s) to sites as necessary, to accomplish its mission and remotely manage OPE. The OPE will be located at the training sites. Over time, the site OPEs will serve as standard platforms for hosting simulator applications and hardware useful for both cybersecurity and the training mission, as well as serve as the SOC's link to non-SCARS training equipment at each site. Initial changes to training systems are minor, but designs will evolve over time as SCARS standards are incrementally applied to adapt the SCARS architecture. On 21 September 2021, SCARS executed the first operationally representative remote vulnerability scan of an A-10 trainer at Davis-Monthan AFB from the temporary SOC. Also, eight additional

OPE installations have been successfully accomplished to date; during FY23, SCARS plans to deliver an additional 45 OPE to multiple sites.

Achieving the OTI 2035 Flight Plan vision will require continued focus on improving the training environment. As one of many critical OTI lines of effort, SCARS brings an innovative approach to efficiently and effectively help turn that vision into reality.

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DISTRIBUTED MISSION OPERATIONS NETWORK (DMON) 2.0

The DMON 2.0 program is now entering its twenty third year of delivering global distributed mission training to the warfighter. Northrop Grumman was awarded the DMON 2.0 indefinite delivery/indefinite quantity services contract in June 2013, which was a follow-on to the Distributed Mission Training Operations and Integration contract. The program provides the technical, managerial, and network support services required to ensure that warfighters in geographically-separated simulators can train together in a real-time, synthetic environment on a daily basis.

To satisfy increased user demand, the DMON has been installed to over 100 sites at over 70 separate locations in fiscal year 2022. The DMON connects to other locations and sites through network-to-network connections with the Air Reserve Component Network (ARCNet), ARCNet Coral, the Hurlburt Training and Exercise Network, the Distributed Mission Operations Center (DMOC), and the Mobility Air Forces Distributed Training Center Network. Over the last fiscal year, these sites conducted 4,147 training events totaling over 16,000 training hours over the DMON.

During the last year, the DMON program has added, two Air National Guard F-16 CM Mission Training Centers (MTCs) locations, five Joint Terminal Control Training and Rehearsal Systems (JTC TRS). Simulator Common Architecture Requirements and Standards (SCARS) Security Operations Center (SOC), two Development Test Network (DTN), one HH-60W Combat Rescue Helicopter, one HC-130J, one Ellsworth Range, and one F-15E location to the diverse list of operational training and development sites to the network.

Our current efforts provide the infrastructure and services to support distributed training for the following platforms: A-10 Full Mission Trainers (FMTs), B-1B Weapon System Trainers (WST), a B-2 WST, B-52 WSTs, Control and Reporting Center (CRCs); E-3G Mission Crew Training Systems (MCTS), E-8C MCTS, F-15C MTCs, F-15E MTCs, F-16CM MTCs, F-22 MTCs F-35 FMS, RC-135V/W MCTSs, JTC TRS, MJATs, and DBEARS35 training systems. In addition, there are 15 developmental sites connected to the DMON, which provide the technical support necessary to ensure that the operational sites can effectively train on the network. The DMON is also connected to the Distributed Mission Operations Center (DMOC) at Kirtland AFB, NM, the Combat Air Forces Distributed Training Center (DTC) at Joint Base Langley-Eustis, VA, the Distributed Training Operations Center (DTOC) in Des Moines, IA, the USAFE-AFAFRICA Warrior Center (UAWC) and live ranges such as Joint Pacific Alaska Range Complex (JPARC) for Live, Virtual, and Constructive (LCV) training. The DMOC
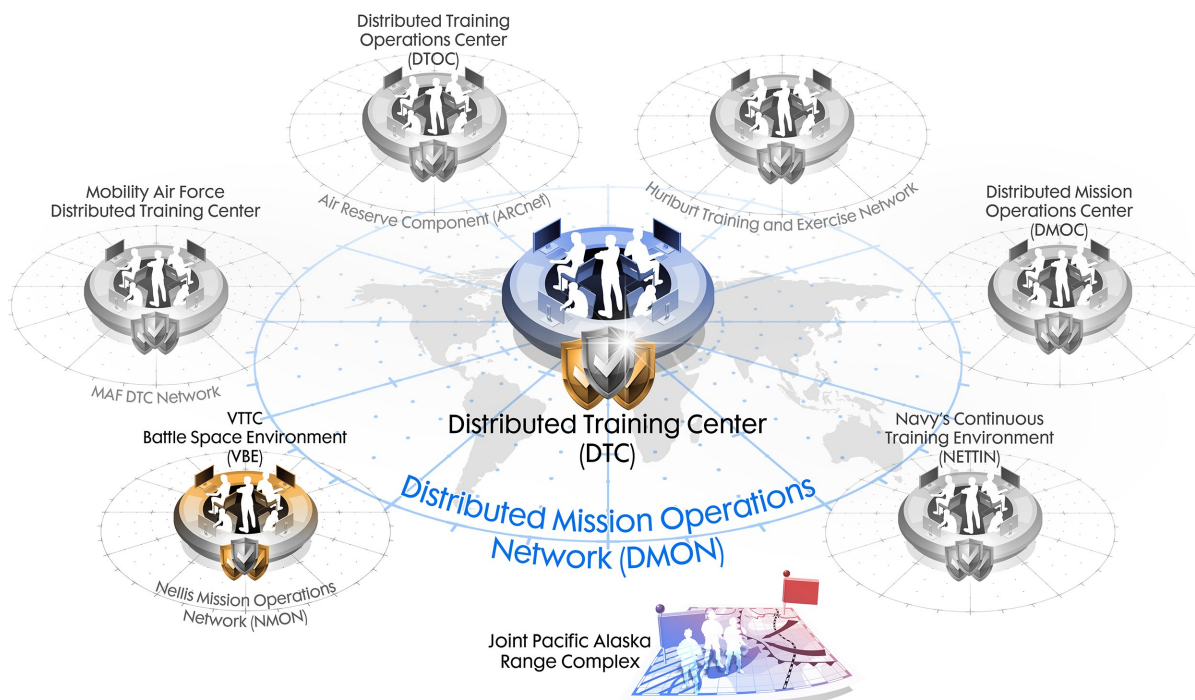
DMON Enables Realistic Training Mission Execution with Intra Air Force and Inter Service Simulator Connectivity and Interoperability.

facilitates the largest training events involving the DMON, such as VIRTUAL FLAG and COALITION VIRTUAL FLAG, while the DTC generates scenarios and executes up to three Large Force Exercises per day in addition to several other smaller events. A highly successful DMON Argonne IV event was executed by the DTC this year and was the largest DTC event in its history. The DTOC conducts up to 65 events per week, typically providing one-on-one white force support.

The DMON 2.0 team's core mission includes focus on collaborative efforts among DMO participants (both contractors and government) to establish, adopt, implement, and update common standards for Combat Air Forces simulation and interoperability. The program continues to address issues such as security considerations and systems interoperability through the unique collaborative technical integration team, known as the Standards Development Working Group (SDWG). Security constraints and Cross Domain

Solution (CDS) operations are managed in the Rule Set Working Group (RSWG). The DMON 2.0 program continues to evolve and achieve the vision articulated from the program's inception, providing a persistent virtual training environment to enhance operational effectiveness by integrating DMO as an increasingly capable training solution to meet the warfighter's needs.

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AIR NATIONAL GUARD OPERATIONAL TRAINING SUPPORT (ANG OTS)

ANG OTS is a 5-year program that was awarded in 2020 to Huntington Ingalls Industries to support and

expand the current capabilities at the Distributed Training Operations Center (DTOC) and the ANG distributed training enterprise. The principal mission is to provide expertise and staffing for the execution of Distributed Mission Operations (DMO) events and tests, and to provide technical and analytical expertise in support of networked operations. This effort includes the expansion of technical and program management, scenario development, DMO mission execution, data collection, data reduction and analysis, technical and analytical support of networked operations, cybersecurity, test planning and reporting, requirements definitions, system engineering, system software Quality Assurance / Configuration Control (QA/QC) tasks, and Verification, Validation, and Accreditation (VV&A) tasks. This ensures warfighters in geographically-separated simulators can train together in a real-time, synthetic environment on a daily basis.

United States Air Force (USAF) Distributed Training Centers (DTCs) have been established to provide technical, operational, security, and event support using Operational Training Infrastructure (OTI). The ANG's DTC is the DTOC, which has been established since 2003 as a primary DTC, not only for ANG units, but also for the USAF. ANG has established the DTOC as the 132nd Combat Training Squadron, Iowa ANG, located at the Des Moines ANG Base. There is an operating location in Duluth, MN, and planned expansion through additional operating locations.

The DTOC's primary customers are the ANG and Air Force Reserve Command (AFRC), commonly referred to as the ARC (Air Reserve Component). ARC DMO relies on the DTOC to network unit training systems and provide event control to meet warfighter training objectives.

The ANG OTS team continues to focus on collaborative efforts among DMO participants (both contractors and government) to develop, establish, adopt, implement, and adhere to DOD, Simulation Interoperability Standards Organization (SISO), and industry standards to provide interoperability. These standards, such as High Level Architecture (HLA) and Distributed Interactive Simulation (DIS), provide a common interoperability interface, allowing participants to interface with other models and simulations. In addition, common standards provided by the Combat Air Forces (CAF) DMO Standards Development Working Group (SDWG) and the Air Force Agency for Modeling and Simulation (AFAMS) enable high fidelity modeling of real world, intelligence based, threat and friendly weapons systems. The ANG OTS program continues to evolve and achieve the ANG Live, Virtual, and Constructive vision to maximize ANG readiness to conduct current and projected federal and state missions through efficient, frequent, integrated training in networked live and virtual systems.

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XCITE COMMON IMMERSIVE TRAINING ENVIRONMENT AND NEXT GENERATION THREAT SYSTEM (XCITE/NGTS)

Xcite Common Immersive Training Environment (XCITE) and Next Generation Threat System (NGTS) are threat generation systems used to simulate and stimulate high fidelity enemy and friendly targets to support effective training. These systems are used across several platforms such as the B-52, C-130, and

C-17; they are used extensively by distributed training centers such as the Distributed Training Operations Center (DTOC) and the Distributed Missions Operations Center (DMOC). XCITE is an Air Force, government owned system, and NGTS is a Navy, government owned system. As part of the Simulator Program Office's vision to move to common software and open architecture, in FY17 the Government initiated the merger of XCITE into NGTS to develop one highly capable and effective threat generation system. The development effort kicked off in FY18 with an incremental transition of XCITE capabilities into NGTS with IOC being met in the 2nd quarter of FY21.

The USAF and Navy continue to collaborate in FY22 to improve NGTS and reduce the number of disparate threat generators in use by the USAF. NGTS currently supports training on B-1, B-52, C-130J, C-17, F-16 ANG, F-35, CAF DMO, DTOC, DMOC, and MAF DMO systems. With the successful IOC and partnership between the USAF and the Navy's NGTS team, the AF operational training enterprise is now developing a long term strategy to continue to incorporate additional requirements from ACC, AFGSC, AMC, and NGB.

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MAN-IN-THE-LOOP (MITL) THREAT STATIONS

Man-in-the-Loop (MITL) simulators provide manned red-threat capability for high-fidelity training interactions with USAF flight simulators over the NMON and DMON networks, at the Virtual Test and Training Center (VTTC) at Nellis AFB. The cockpits are reconfigurable to represent a selection of high-fidelity red threats. MITL is under procurement through the Naval Air Warfare Center – Aircraft Division (NAWCAD) and will be built on the Joint Simulation Environment (JSE). MITL adversary stations are a key component of the VTTC effort to provide high-end advanced training and tactics development. Initial system delivery was completed Q1 FY22.

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VIRTUAL TEST AND TRAINING CENTER (VTTC) BATTLESPACE ENVIRONMENT (VBE)

The VTTC, hosted at Nellis Air Force Base, Nevada, is being established to deliver High-End Advanced Training and Tactics (HEAT2) capability for the Combat Air Force (CAF) operating under Air Combat Command (ACC) and the United States Air Force Warfare Center (USAFWC). Through a phased approach, the VTTC aims to integrate 4th- and 5th-generation CAF weapon systems, space, cyber, and joint systems in multiple levels of security environment to facilitate advanced training and integrated tactics development. VTTC underpins the 2018 National Defense Strategy's approach to achieving joint lethality in a contested environment.

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MOBILITY AIR FORCES DISTRIBUTED MISSION OPERATIONS (MAF DMO)

The mission statement for the MAF DMO Program is "To train in a secure, realistic networked environment while reducing risk and operating cost. MAF DMO capabilities will enable Live, Virtual, and Constructive (LVC) participation in a wide range of MAF, USAF, Joint and Combined exercises." The overall objective of this effort is to provide O&I support to facilitate persistent, distributed training for MAF Aircrew Training Systems (ATS) in support of Headquarters Air Force's Live, Virtual, and Constructive program.


MAF DMO DTC Building

Scope includes operating and maintaining the Distributed Training Center (DTC) and DTC Network (DTCN) in support of worldwide ATS training, and maintaining connectivity and interoperability between other MAJCOMs and organizations [i.e., Joint Training Enterprise Network (JTEN), Distributed Training Operations Center (DTOC), Distributed Mission Operations Center (DMOC), and Distributed Mission Operations Network (DMON), and the AFSOC Readiness Training Center (ARTC)]. Efforts under this Task Order span requirements development, site surveys, systems integration & test, operations sustainment, logistics, security and network support, defining interoperability standards, and change management.

The DTC is the "Hub" for the networked mobility training devices and is located at Scott AFB, IL. The DTC facility on base is currently undergoing construction additions to expand the square footage. The DTC consists of multiple Distributed Training Center Operator Stations (DTCOS) comprised of equipment required to support the interfacing of the DTCN connected trainers and allows an operator to monitor, manage, and troubleshoot the DTCN and associated equipment. The DTCOS allows information to be processed in plain text so they can interface with the DTCN through the wide area network (WAN). The DTC also has Event Control Centers providing manned constructive white force capabilities used to enhance mission accomplishment across a range of mobility missions.

The DTC has maintained a network reliability & availability of greater than 99% over the past 12 months while conducting daily MAF Mission Profiles (MMPs), Daily Persistent Training with C-17s and KC-135s, and coalition training exercises.
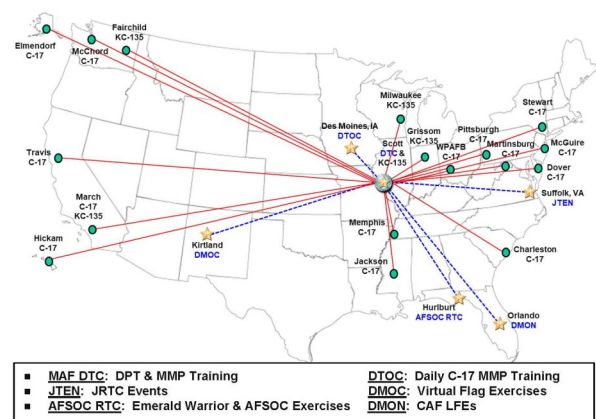
MAF DMO Network Connectivity (Current)

A significant increase in activity is expected over the next few years (FY22-26) with increased MMPs, Virtual Air Refueling (VAR) capability, and the connection of additional MAF Platforms and sites.

The MAF DMO Program awarded its next major sustainment contract to Huntington Ingalls Industries, which will continue towards achieving a full VAR capability as well as increasing DMO training capability across additional MAF ATS.

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SIMS INNOVATION TEAM

The Sims Innovation Team is a technology incubation process that infuses innovation in a systematic way across the Simulators Division. Our goal is to explore new game-changing technologies that enhance training and simulation and increase readiness across the training continuum. We work with industry partners, academia, other government entities, and MAJCOM organizations to identify early-stage demonstrations, experiments, and pilot programs, matching technologies to Air Force use cases. We work with programs across the Simulators Division Portfolio to transition these technologies into existing and future systems.

The Simulators Innovation Lab opened in May 2022 with Lt. Gen. Shaun Morris and ACS PEO Ms. Lea Kirkwood cutting the ribbon. The Simulators Innovation Lab is a space to explore, innovate, and prototype training and simulation technology. The Lab supports WNS' strategic vector of "Establishing an unmatched twenty-first century National Security Innovation Base that effectively supports Department operations and sustains security and solvency." by fostering and enhancing communication between AFLCMC decision makers and the innovative

businesses addressing AF problem sets. It sits at the intersection of AFRL, AFLCMC, Industry, and Innovation.

Innovation Lab

The Lab can host product demonstrations, digital engineering reviews, design sprints and other sorts of collaborative events for the Simulators Division. Currently, we have demonstrator versions of several Phase II and III Small Business Innovative Research (SBIR) projects. We are looking forward to using this lab for education and exploration as we strive to achieve new advances to support the USAF 2035 Flight Plan. To inquire about working in the Sims Innovation Lab, please contact us at: AFLCMC.WNS.Sims_Innovate@us.af.mil.

At I/ITSEC 2021, we hosted the Innovation Match

Game event, with plans for a repeat event at I/ITSEC 2022. The Match Game pairs up vendors who are vying to provide innovative solutions with actual real world Air Force needs. Training units that apply will identify a specific training concern for which they are seeking an innovative solution and will then receive pitches from 3 vendors with potential solutions. After presentations and a Q&A session, the audience will vote and select the best match to solve the Unit's problem. Last year, the WNS innovation team matched each Unit up with three applications that were received from vendors who had previous successful contracts with the government. Response to last year's event was great, and we look forward to another outstanding Innovation Match Game at I/ITSEC 2022!

An overarching concept for Sims Innovation Team is the Lightweight Simulator Ecosystem (LSE). The LSE targets devices and systems at the simple end of the training spectrum, that still strive to incorporate as much capability and fidelity as possible, starting simply and adding capability as experiments and development continue. These simulator systems should be based on commodity hardware, providing a low-cost, modular, and potentially deployable training system for aircrew positions.

The WNS Innovation Team participated in Pitch Days at I/ITSEC in 2019 and 2020. In FY21 four PD 2019 SBIR Phase II projects have transitioned into Phase III prototype developments. During 2022, all 10 SBIR contracts from Sims Pitch Day 2020 were successfully completed, with two successful transitions so far, and four more in progress.

Some of the new technologies supported by current and past WNS Innovation Team efforts in either Phase II or Phase III projects include:

- A Virtual Reality Procedures Trainer (VRPT) which provides immersive, skills training for the B-52, already saving hours of jet engine run time

- The Experiential Air Refueling Lightweight (EARL) simulator application, for B-52 training XR devices to fill training gaps

- Customized training content for USAF & AETC undergraduate pilot training units teaching and rehearsing Aviation Radio interactions and procedures as app on Tablet/Phone/Web

- High-fidelity Physics-Based RF/EW/Radar simulation module that can integrate into any flight simulator, providing realistic RF/EW/Radar scope output with realistic terrain returns

- Cyber readiness and efficiency through an

Innovation Lab

intuitive TurboTax-like interface for the ATO process

- A modular aircraft training cockpit integrating Gov't owned EEAGLES simulator, as well as commercial programs, for many single seat virtual flight experiences

- Computational Fluid Dynamics (CFD) modeling of KC-135 and B-52 refueling - this vendors toolkit has ability to integrate into any simulator

- Cloud implementation of the MUSE/AFSERS simulation, which scales in real-time to support any-size exercise across the globe without requiring onsite IT personnel or hardware

- Virtualized B-1 Aircraft Operation Flight Programs (OFPs) as used on the Weapon Systems Trainer (WST) – now being incorporated in a Reconfigurable Cockpit Trainer (R-CPT)

- Integration of a haptic glove into a MC-12w VR simulation

- Tablet-based system for communication training for E-3 crew training

- MQ-9 Virtual Reality Emergency Procedure and Techniques, and Procedures (EP/TTP) Trainer

- Artificial Intelligence Virtual Instructor provides no-instructor-in-the-loop training with detailed verbal instructions, dynamic real-time feedback, and objective grading for the T-6

As FY23 approaches, the group is planning for Sims Pitch Day 2023 in the SBIR 23.1/A Broad Agency Announcement expected in late November 2022. Look for information on 23.1/A at www.afsbirsttr.af.mil and on our Ask Me Anything sessions at www.aflcmc.af.mil/simulators. We will be seeking ideas that fit with the LSE concepts and also align with the Simulator Common Architecture Requirements Standards (SCARS) initiative.

Innovation Lab

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MR. DOUG ROGERS

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SIMULATORS DIVISION EXECUTES OVER 20 FMS CASES FOR 20 COUNTRIES VALUED AT $1.3B+; FURTHER, THERE ARE 10+ ADDITIONAL CASES IN VARYING STAGES OF IMPLEMENTATION WHICH WILL ADD TO THE FMS PORTFOLIO.

SAUDI F-15 PROGRAM

The F-15SA Fleet Modernization Program, the largest Foreign Military Sales program in USAF history, is upgrading the Royal Saudi Air Force (RSAF) F-15 fleet. The Air Force Life Cycle Management Center Simulators Division is responsible for the acquisition management of all training devices to support the fleet modernization effort. The program incorporates six types of training devices. Simulators will be located at six in-Kingdom locations.

Aircrew training device support consists of six Full Mission Trainers (FMT), six Egress Procedural Trainers (EPT), and two Integrated Avionics Trainers (IAT).

The FMTs and IATs will incorporate an advanced technology visual system. The FMTs will also incorporate a dual cockpit configuration and digital Joint Helmet Mounted Cueing Systems for both the pilot and the Weapons System Officer. A Database Generation System (DBGS), also being acquired under this contract, will allow the RSAF to develop realistic scenarios for the F-15SA FMTs and IATs.

The IATs will supplement FMT training by providing built-in test functionality, avionics systems checks, operational procedures for attack instrument and flight control, and communication, navigation, and penetration aids. The six EPTs will provide egress emergency procedures, fire and engine fire on take-off, ejection seat replication with operable ejection seat handle in a static environment, and a fully functional canopy. The Aircrew Training Devices are currently being acquired under contract with Boeing Training and Professional Services.

F-15 Mission Training Center (MTC)

Maintenance training support consists of one Virtual Maintenance Trainer (VMT), comprising ten Student Stations and two Instructor/Operator Stations, two physical Armament System Trainers, and two physical Jet Fuel Starter trainers. The VMT utilizes desktop stations for instructor and RSAF student interaction in a classroom environment. The student has the ability to fault isolate, analyze Fighter Data Link failures, simulate Line Replaceable Unit change-out, and perform other simulated major maintenance events on the aircraft. The RSAF student also learns aircraft locations and proper maintenance practices through 3D modeling scenarios, to augment on-the-job training. The physical trainers provide the RSAF student with hands-on training for armament load stations and additional 3D instructional and hands-on experience for intermediate level repair of the Jet Fuel Starter. The RSAF selected Lockheed Martin Rotary and Mission Systems as the Directed Sole Source for F-15SA Maintenance Training Systems. All Maintenance Training Devices are located at King Khalid Training

Center on King Khalid Air Base, Khamis Mushayt, Saudi Arabia.

All Aircrew and Maintenance training devices are supported by a five year Contractor Logistics Support effort consisting of on-site and on-call Contractor Field Service Representative support.

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JAPAN F-15 TRAINING DEVICES

PRIME CONTRACTOR:

Boeing

MISSION AND ORGANIZATION:

Provide the Japan Air Self-Defense Force four Weapon System Trainers, four Instructor Operator Stations IOS, four brief/debrief stations, a Database Generation System, and Training at Komatsu AB, Japan.

ACCOMPLISHMENTS/ACTIVITIES:

UCA awarded Dec 2021 for NREs + Long Lead items

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QATAR F-15 TRAINING DEVICES

PRIME CONTRACTOR:

Boeing

MISSION AND ORGANIZATION:

Provide Qatari Emiri Air Force three Weapon System Trainers, two Cockpit Procedural Trainers, one Emergency Procedures Trainer, one Database Generation System, two Virtual Maintenance Trainers and five years of logistics support.

ACCOMPLISHMENTS/ACTIVITIES:

RFT for WST 1 and 2 complete in-country

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F-16 SIMULATORS

The F-16 Foreign Military Sales (FMS) Simulators efforts cover the training requirements for 13+ FMS countries. Customers include the European Participating Air Forces (Belgium and Portugal), Egypt, Iraq, Bahrain, Bulgaria, Slovakia, Greece, Jordan, Japan, Morocco, Pakistan, Romania, Taiwan, and Singapore with additional potential case in-work to address the updates and requirements driven by the worldwide demand for F-16 aircraft.

The F-16 FMS countries order a variety of maintenance and aircrew training devices to include Full Mission Trainers (FMT) with varying fidelity of Visuals, Instructor/Operator Stations, Brief/Debrief

F-16 Fuels Trainer

Stations, Initial Spares, Support/Test Equipment, & Technical Data, and Contractor Logistic Support. These trainers support the F-16 aircraft block 15, 20, 40/42, 50/52, and F-16V/Blk 70 configurations.

CAE, Boeing, Lockheed Martin, and the 309th Software Maintenance Group at Hill Air Force Base have been instrumental in developing and delivering the capability for the F-16 FMS countries.

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F-16 Weapons System Trainer (WST), Exterior

F-16 Weapons System Trainer (WST), Interior

NATO C-17 TRAINING SYSTEM SUMMARY

The NATO C-17 Training System program will provide a Learning Center (LC) and associated C-17 training devices for North Atlantic Treaty Organization (NATO) Airlift Management Programme (NAMP) based at Papa Air Base (AB), Hungary. This effort is accomplished via a Foreign Military Sales case, with a directed source to The Boeing Company. Contract award was accomplished in May 2020. The NATO C-17 training system will provide continuation and refresher training to Strategic Airlift Capability (SAC) aircrews based at Papa AB, Hungary. Ready for Training (RFT) is scheduled to occur in late 2022. The main training devices to be used within this program include:

- Weapon System Trainer (WST), with Aircrew
- Vehicle Station (AVS) and Loadmaster Station (LS)
- Core Integrated Processor Task Trainer (CIP)
- Computer Based Training System (CBT)
- Spares

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RAAF C-17 TRAINING SYSTEM SUMMARY

The principal function of the Royal Australian Air Force (RAAF) C-17 Aircrew Training System (ATS) is to instruct pilots, copilots, and loadmasters on the procedures and techniques to safely and effectively operate the C-17 aircraft. The C-17 TS includes initial, difference, upgrade, continuation, senior staff, and requalification training. The main training devices used within this program include:

- Weapon System Trainer (WST) – (Aircrew Vehicle Station (AVS)-1, Loadmaster Station (LS)-1)
- Core Integrated Processor (CIP) Trainer
- Computer Based Training (CBT) System
- Visual Threat Recognition and Avoidance Trainer (VTRAT)
- Cargo Compartment Trainer (CCT)
- Virtual Cargo Load Model (VCLM)
- Training Evaluation Performance Aircraft Test Set (TEPATS)
- Portable Flight Planning Software (PFPS)

The RAAF C-17 Training Systems (TS) CLS contract is shared with the USAF C-17 TS program. The Boeing Company is the current contractor providing training for pilots, loadmasters and engine runners. Contract Management requirements that mirror the USAF are audits, monthly reports, contractor performance reporting against contract clauses, payment of contract, etc. Heavy Air Lift Systems Program Office (HALSPO), Defence Materiel Organisation, contract management requirements are Annual Training Plans, budget planning, monitoring and forecast, In-Service Fleet Reporting, etc.

Australia is effectively an out-posted USAF training site and operates in the same manner as any USAF C-17 training site. All training courses have been developed and approved in the US and are conducted in accordance with the USAF syllabus. Australia has adopted the complete USAF training package, including:

- Guaranteed student
- Based around an Ordering Period

- Contracting Officer Representative (COR) Requirement; Authorized by the USAF to manage the contract

The Weapon System Trainer (WST) is a full flight simulator manufactured by Flight Safety International and accredited by the USAF. It provides an artificial training and tactics environment for pilots to learn, improve, and integrate mission skills associated with their crew position. The WST includes motion and a high-resolution day/night visual system. It includes:

- High fidelity cockpit
- 6 Degree of Freedom (DOF) electric motion base
- High fidelity, collimated, wide field of view visual system, including worldwide databases, and On-board Instructor/Operator Station

The Loadmaster Station (LS) is a replica of the aircraft forward LS, which includes a visual simulation of aircraft loading and extraction, and an 'over-the-shoulder instructor station. It is electronically linked to the WST to support integrated crew training. It includes a stationary mock-up of the LS and a simulated visual display of the cargo compartment.

The Cargo Compartment Trainer (CCT) is a full-scale replica of the C–17 cargo compartment including an operational cargo door, ramp, and ramp toes allowing training in the loading and off-loading of cargo loads. It provides high fidelity training for loadmasters and other personnel who are required to work in the cargo compartment.

The Virtual Cargo Load Model (VCLM) is a computer-based model of the C–17 cargo compartment including simulated cargo (pallets, vehicles and aircraft). It provides a blend of 'Three Dimensional' (3D) and 'Two

Dimensional' (2D) simulations. The 3D encompasses the cargo compartment and external staging area, with sufficient accuracy to allow users to place load items and inspect fit/clearance between cargo load models and the virtual aircraft. Loadmaster control panels are 2D replicas with functional controls required for the conduct of training.

While maximum commonality with the USAF C–17 TS exists, some tailoring of the USAF courseware is necessary to meet the Australian legislative, regulatory, and procedural requirements, as well as USG-determined exportability. Where possible, this tailoring will be approved by USAF and included in USAF-approved courseware to prevent RAAF tailored courses being 'orphaned' from the USAF baseline.

Program Manager:
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NEW ZEALAND C-130J TRAINING DEVICE

PRIME CONTRACTOR:

Lockheed Martin Rotary Mission Systems

MISSION AND ORGANIZATION:

Provide the New Zealand Air Force one C-130J Weapons System Trainer to include Flight Deck, Augmented Crew Station, Load Master Station, Virtual Cargo Compartment Screen, Instructor Operator

Station, Brief/Debrief Station and 3 years of Initial Spare Parts

ACCOMPLISHMENTS/ACTIVITIES:

RFP Release – 16 Apr 21

Program Manager:
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F-16 Weapons System Trainer (WST), Interior

JAPAN KC-46 TRAINING DEVICES

PRIME CONTRACTOR:

Flight Safety International

MISSION AND ORGANIZATION:

Provide the Japan Air Self-Defense Force one Weapon System Trainer, one Boom Operator Trainer, initial spares, familiarization training and support equipment.

ACCOMPLISHMENTS/ACTIVITIES:

RFP Release – 26 Apr 21

Program Manager:
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SIMULATORS

SHARPENING THE WARFIGHTERS BITE

THE AIRMAN'S CREED

I AM AN AMERICAN AIRMAN.

I AM A WARRIOR.

I HAVE ANSWERED MY NATION'S CALL.

I AM AN AMERICAN AIRMAN.

MY MISSION IS TO FLY, FIGHT, AND WIN.

I AM FAITHFUL TO A PROUD HERITAGE,

A TRADITION OF HONOR,

AND A LEGACY OF VALOR.

I AM AN AMERICAN AIRMAN.

GUARDIAN OF FREEDOM AND JUSTICE,

MY NATION'S SWORD AND SHIELD,

ITS SENTRY AND AVENGER.

I DEFEND MY COUNTRY WITH MY LIFE.

I AM AN AMERICAN AIRMAN.

WINGMAN, LEADER, WARRIOR.

I WILL NEVER LEAVE AN AIRMAN BEHIND,

I WILL NEVER FALTER,

AND I WILL NOT FAIL.

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