412TH TEST WING
TEST CAPABILITIES

2026

412TH TEST WING

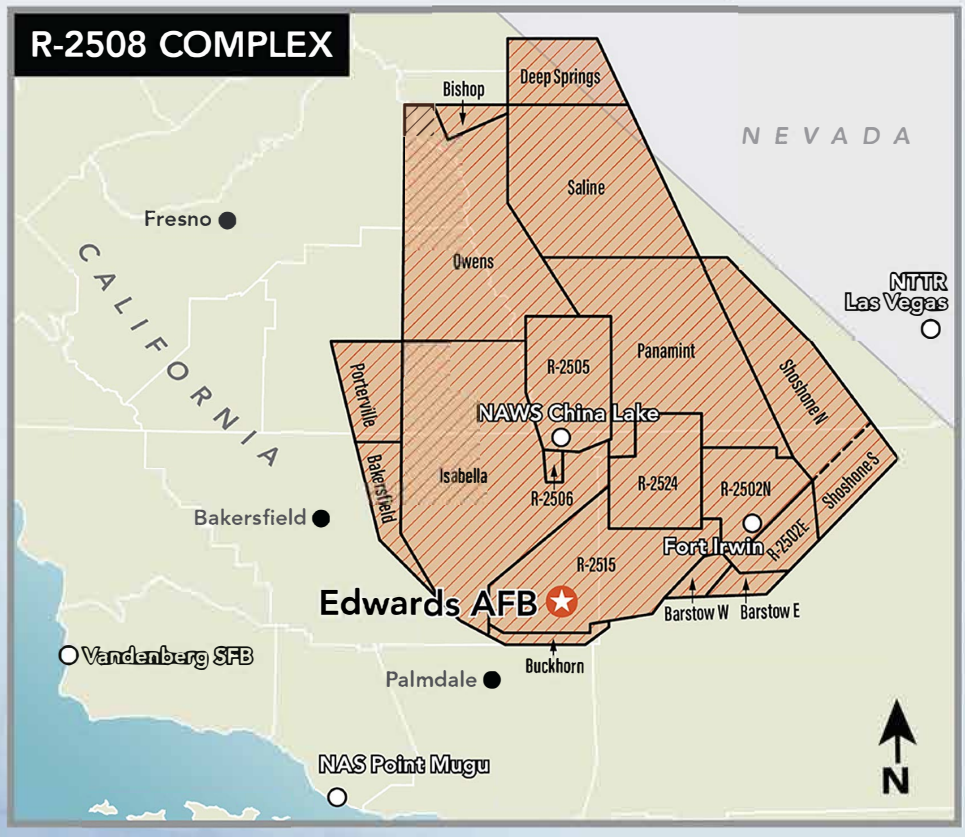
Edwards Air Force Base
California

412TH TEST WING
Edwards Air Force Base

MISSION: Sharpen American Airpower.

VISION: Victory ... Forged by Test.

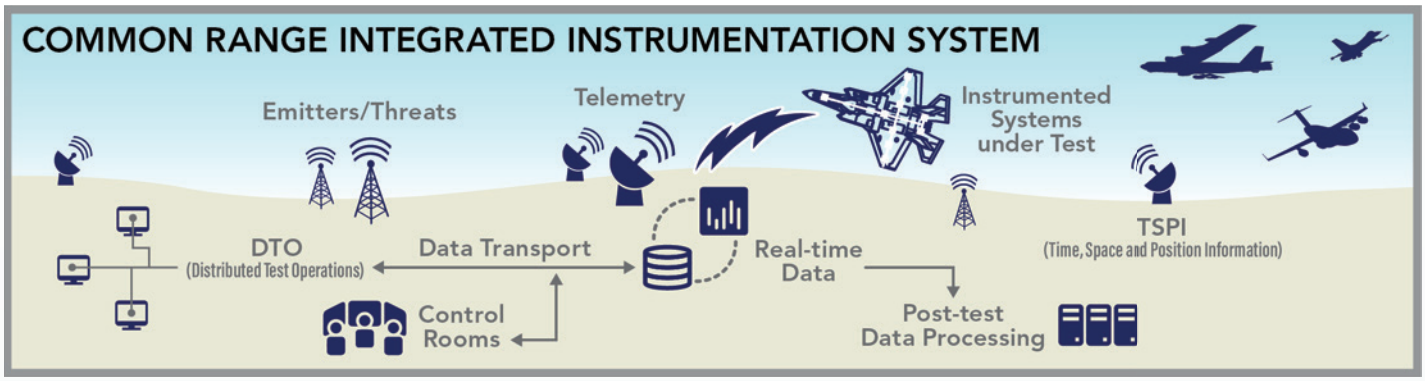
The 412th Test Wing at Edwards Air Force Base is designated a Major Range and Test Facility Base Activity under Department of War Directive 3200.11. The MRTFB provides robust and flexible test and evaluation capabilities to develop, acquire, field and sustain reliable and effective weapon systems to meet current and future warfighter needs. The MRTFB infrastructure consists of open-air ranges, test facilities, instrumentation data processing capabilities and other test resources that must be preserved as a national asset to provide test and evaluation capabilities in support of the DOW acquisition system. The test wing commander is the range operating authority for these assets at Edwards AFB.



The test wing partners with Naval Air Weapons Center, China Lake and the National Training Center at Fort Irwin to offer world-class restricted-use airspace – the R-2508 Complex. The complex is likely the most important multiple service special-use airspace in the national airspace system. The complex contains bombing ranges, supersonic corridors, low-altitude high-speed maneuver areas, radar intercept areas and refueling areas.

Edwards offers comprehensive range capabilities critical to successful test and evaluation execution, such as open-air signal emitters, threats, instrumentation systems, data transport systems, real-time mission control rooms, time-space-position information, distributed test operations, post-test data processing and decades of subject matter expertise in T&E. Edwards AFB is centrally located among several other DOW MRTFB locations: Nevada Test and Training Range at Nellis AFB, Nevada; Western Range at Vandenberg Space Force Base, California; the Naval Air Warfare Center, Weapons Division at Point Mugu, California; and the Naval Air Warfare Center, Weapons Division at China Lake, California. Data acquisition and transmission systems link Edwards to these neighboring ranges, which enables real-time data analysis and multiservice interoperability. Edwards' connection to the defense research and engineering network enables widely distributed test operations.

Edwards is known as the Center of the Aerospace Testing Universe because the time-tested expertise of the Edwards workforce, independent analysis and expert evaluation of performance against requirements set Edwards apart in turning test data



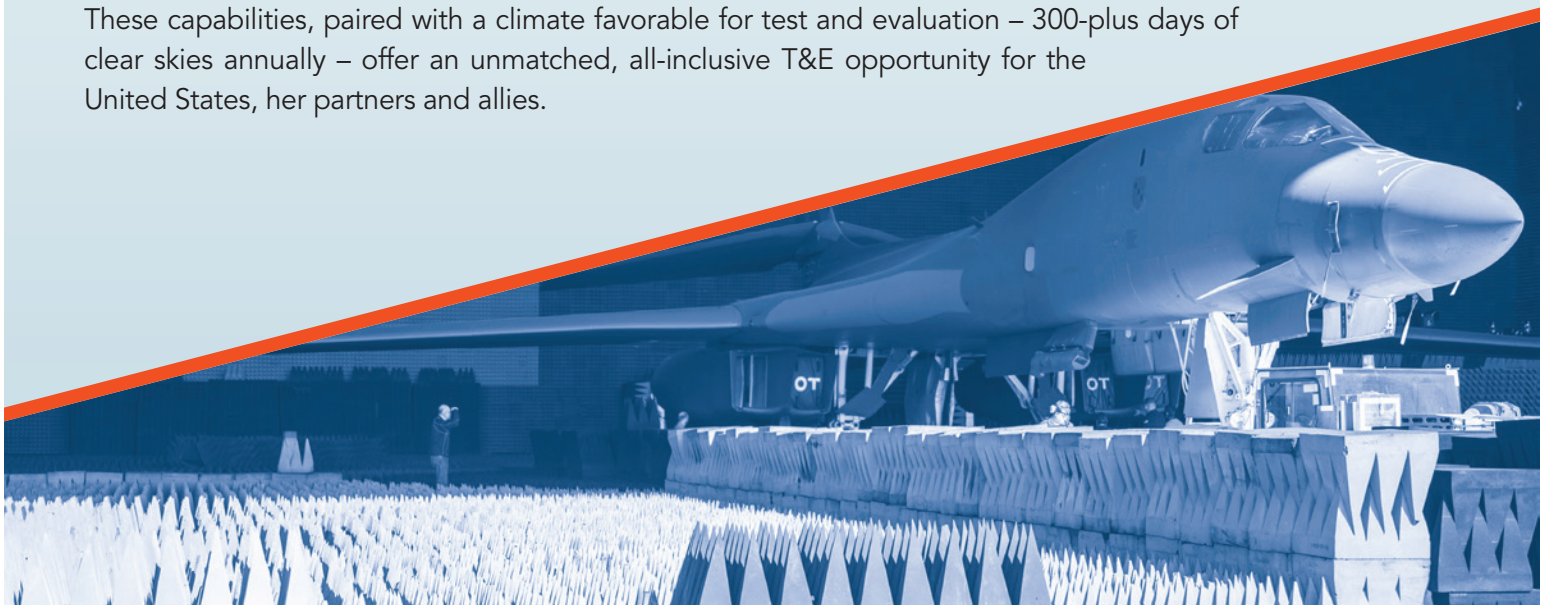
into actionable information. Edwards personnel are highly skilled and deeply experienced testers and evaluators with proven expertise in mission systems, aircraft and range instrumentation, electro-optical and infrared sensors, radio frequency systems, aircraft performance, flying qualities, telemetry test operations and many other T&E disciplines.

Edwards is home to the largest anechoic test chamber in the world, the Benefield Anechoic Facility. The BAF is capable of handling almost all DOW aircraft. Its primary purpose is to test and integrate avionics systems in a secure, repeatable and electromagnetically controlled environment using state-of-the-art simulation and stimulation technologies that closely duplicate actual combat mission environments.

Edwards offers T&E modeling and simulation at its Integrated Facility for Avionics System Test. This facility, IFAST, offers live-virtual-constructive environments for multi-ship operations based on unclassified and classified information up to top secret, sensitive compartmented information and special access program levels. The IFAST has multiple manned flight simulation laboratories supported by operational flight program and effects-based simulations including an F-16 Fighting Falcon system integration lab, an F-35 Lighting II mission systems simulator, an F-35 flight science simulator and an F-22 Raptor/F-16 emulation lab.

Edwards is the future home of the Digital Test and Training Range, enabled by the Joint Simulation Environment. The JSE is a government owned and operated immersive virtual simulation environment that supports fourth-, fifth- and sixth-generation mission systems research, development, test and evaluation. This environment provides integrated use of Navy and Air Force facilities, models, methods and tools, including man-in-the-loop and hardware-in-the-loop with the ability to link geographically distributed MITL and HITL assets. The JSE also leverages intelligence community models and an expandable architecture to support future growth and extension to other services.

These capabilities, paired with a climate favorable for test and evaluation – 300-plus days of clear skies annually – offer an unmatched, all-inclusive T&E opportunity for the United States, her partners and allies.



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LAYOUT AND DESIGN BY CAROL OTERO, 412TH TW PUBLIC AFFAIRS
ALL PHOTOS: AIR FORCE

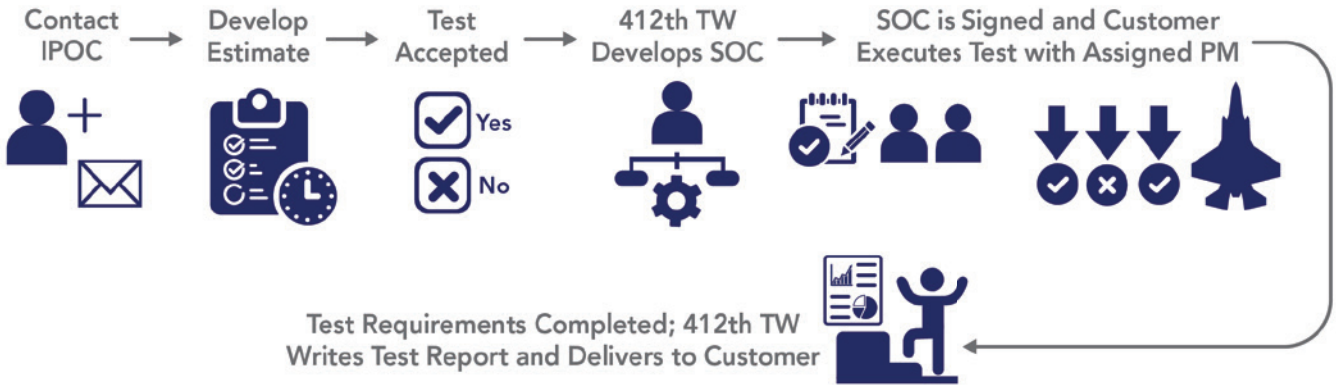
Photo by Bryce Bennett, 412th TW Public Affairs

CONDUCTING BUSINESS WITH THE 412TH TEST WING

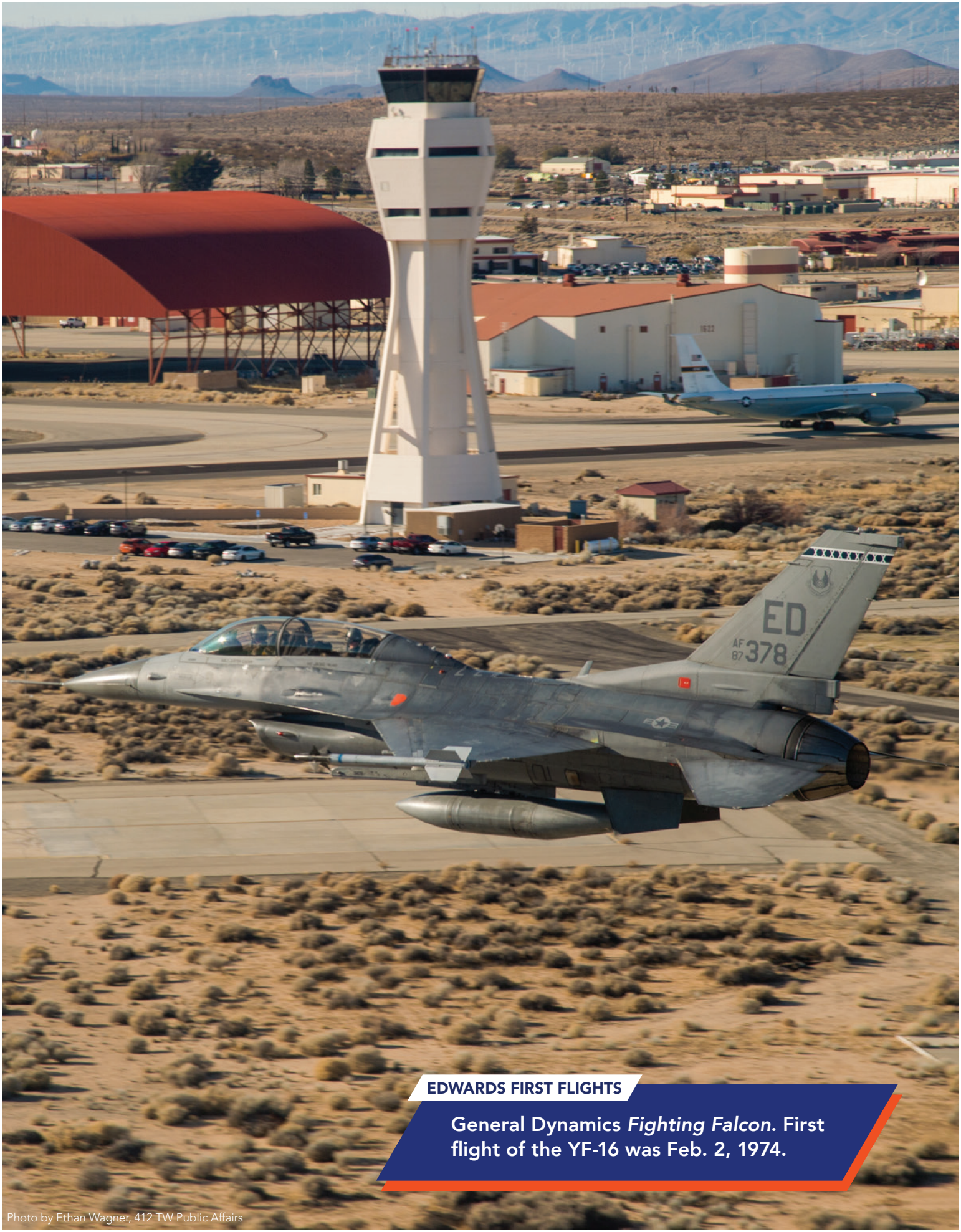
The 412th TW offers extensive test and evaluation capabilities, striving to provide high-quality data and a positive test experience for our diverse customer base, including government organizations, private industry partners and academic institutions. As a Major Range and Test Facilities Base and per DOW Financial Management Regulation 7000.14R, the 412th TW is required to recoup direct costs – those directly attributable to using MRTFB facilities and resources – from all users, DOW and non-DOW. Non-DOW users will also be charged an appropriate level of indirect or overhead costs associated with MRTFB operations.

The following steps summarize how the test wing plans and conducts test programs.

1. A potential customer contacts our initial point of contact, or IPOC, (see contact email link below) to inquire about test and evaluation services. Lead time for our testing services ranges from two to 24 months, depending primarily on test complexity.
2. The test wing provides a program introduction document template to assist in defining customer requirements.
3. The wing may provide an initial rough order of magnitude cost estimate and schedule availability for customer inquiries.
4. The wing sends the customer an advance funding request for initial planning funds.
5. Once initial funding is received, the wing prepares a test concept document for the customer's signature that establishes an understanding of customer requirements.
6. Using this information the test wing prepares a statement of capability, which becomes the formal support agreement between the wing and the customer for test requirements, scope, schedule, risks and estimated costs.
7. Once the SOC is signed, the test wing requires the remaining balance of test funding to proceed.
8. A test wing project manager then works closely with the customer during the test planning phase to review and finalize the test plan, test matrix and data reduction and analysis requirements. Together they also conduct safety planning, prepare the necessary documents to schedule test periods and configure all systems to support testing.
9. The project manager then assists the customer with obtaining access to the installation, test wing computers, long-distance access when at a test location and general wing and local area information. Customers are free to contact the project manager at any time with questions.
10. The customer is billed for actual charges and costs for labor and facility operations during this entire process.
11. Once the test is complete, the wing provides analyses and data products as detailed in the SOC or contract.



Those seeking assistance or additional information about the 412th TW can visit: www.edwards.af.mil. Those who want to test at Edwards, email: 412TW.IPOC@us.af.mil.



EDWARDS FIRST FLIGHTS

General Dynamics *Fighting Falcon*. First flight of the YF-16 was Feb. 2, 1974.

Photo by Ethan Wagner, 412 TW Public Affairs

412TH TEST WING

Test Engineering Group

412 TENG

MISSION: We own T&E … delivering decision-quality knowledge to maximize impact.

VISION: Accelerating and transforming T&E through intelligent risk-taking.

TEST RANGE

The 412th Test Wing hosts one of the premier open-air test ranges in the nation. The 412th Range Squadron provides a multitude of capabilities that stimulate the creation of critical data on our systems under test for further analysis and evaluation, while simultaneously facilitating seamless mission execution. The squadron comprises two major functional areas – engineering and operations – that ensure successful test conduct and creation of mission data. For every mission, the range squadron combines each element of the test together through a complex network of terrestrial and open-air communication, efficiently moving real-time data between the system under test and the mission control room, allowing flight test engineers to make real-time technical and safety calls. This backbone has been expanded to other ranges across the United States – Point Mugu, China Lake, Utah Test and Training Range, White Sands Test Center, Eglin AFB, Florida, Boeing facilities in St. Louis and others to extend mission execution capability through distributed test operations. These distributed test capabilities enable the data to be brought to the engineers and are a critical force multiplier for limited engineering assets. At the same time, squadron personnel support the range systems that stimulate mission data, including stationary and moving targets for increasingly complex sensors, positional truth data collectors and

video recordings of munitions and expendables. Range squadron capabilities allow the test wing to execute test missions of all types including, but not limited to, flight sciences, sensors, weapons and navigation as well as supporting large force exercises such as Orange Flag. The dedication and expertise of the personnel in the squadron ensure the success of the test wing's mission.

As warfighting capabilities become increasingly complex,

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the range squadron continues to evolve and adapt. To this end, the squadron is currently modernizing a control room while also building toward a large-scale common range architecture that will enable location-agnostic, near-real-time data analysis. The squadron also continues to investigate new telemetry technologies in the face of decreasing spectrum availability.

INSTRUMENTATION

There is no knowledge without information, and there is no information without data. The 812th Airborne Instrumentation Test Squadron empowers our workforce in delivering decision-quality evaluations to customers through the critical step of data collection. The squadron has developed, designed, delivered and maintained complex instrumentation for a diverse cross section of aircraft up and down the flightline, including B-1B Lancer, B-52 Stratofortress, F-16, F-22, F-35, C-17 Globemaster II, KC-46 Pegasus and others. These instrumentation systems not only passively collect aircraft bus data, but also independently collect orange-wire data from sensors installed at key locations throughout the aircraft to meet test needs. These critical parameters are transmitted via telemetry to mission control rooms for real-time mission calls, while also being bulk recorded for detailed post-mission analysis. As the instrumentation systems often require significant aircraft modifications, instrumentation engineers follow a rigorous process to ensure airworthiness is maintained.

As aircraft capabilities evolve, the airborne instrumentation squadron evolves alongside them, using cutting-edge technology to capture all critical parameters and meet growing demands on data collection capacity. Always innovative, the squadron continues to look for ways to be more efficient and effective and is currently exploring technologies like small-scale instrumentation in addition to working with the range squadron to provide an instrumentation interface for bi-directional telemetry.

DATA MANAGEMENT

The 812th Test Support Squadron serves several key functions in ensuring successful test and evaluation, the first being data management – taking the critical step of converting data into information. The test support squadron manages post-mission processing of data for multiple squadrons up and down the flightline, facilitating engineers' abilities to analyze and evaluate performance of the system under test. They also support the development of analytical tools to convert the data into

information that supports the broader set of disciplines. Additionally, the squadron plays a vital role in workforce development, conceptualizing and conducting training ranging from critical technical competencies to leadership and communication skills, ensuring our personnel are effective in all aspects of the job. The squadron also provides statistics experts to consult with engineers and ensure statistical rigor and confidence in our test plans, as well as a technical research library that provides a plethora of resources for engineers to further develop their knowledge base.

The squadron is a leading force in modernizing data analytics to empower our engineers to get more out of the data they collect. The squadron's efforts in incorporating artificial intelligence and machine learning into operational and analytical tools, creating a common data platform across the test enterprise, developing standardized software tools to be shared across the enterprise and improving network infrastructure all serve as key enablers in bringing data analytics to the next level.

TEST ENGINEERING

The final step to evaluating a system is converting information to knowledge, and this is where our engineers excel. The 773rd and 775th Test Squadrons possess extensive expertise across the flight sciences and mission systems disciplines, ranging from envelope expansion to weapons integration capabilities to autonomy. Our engineers develop and execute technically rigorous test plans and then analyze and evaluate system performance, providing this knowledge to key stakeholders to inform critical decisions.

As our engineers focus on executing today's mission and fielding critical capabilities, our experts look ahead to ensure the warfighter's needs continue to be met. As platform capabilities evolve, experts work to ensure test capabilities evolve simultaneously to adequately challenge aircraft capabilities. The electro-optical/infrared team currently uses cutting-edge technology to develop enhanced targets that will adequately challenge tomorrow's sensors, while simultaneously investigating truth data collection and modeling capabilities to improve analysis and reduce flight test time. The tactical data links group continues to develop tactical communication and data link test capabilities as these systems evolve on next-generation aircraft.

FLIGHT TEST ENGINEERING LABORATORY

The two-story 74,982 square-foot Flight Test Engineering Laboratory provides office space for over 200 scientists, engineers and support personnel. Included in the facility are compartmented, sound-rated and access-controlled spaces that can be independently configured to allow activities and data processing at multiple security levels simultaneously. The laboratory enables next generation test operations using tactical data link ground stations and joint large force exercise and data analysis efforts including Orange Flag events. Research and support include directed energy, laser, electrooptics and multi- and hyper-spectral targeting systems from an EO/IR lab that includes a light-tight lab and a pod bay. It also includes the integration of artificial intelligence into test and evaluation processes. The facility also hosts four training rooms, 10 conference and collaboration rooms, a modern technical research library and a 103-seat auditorium. ■

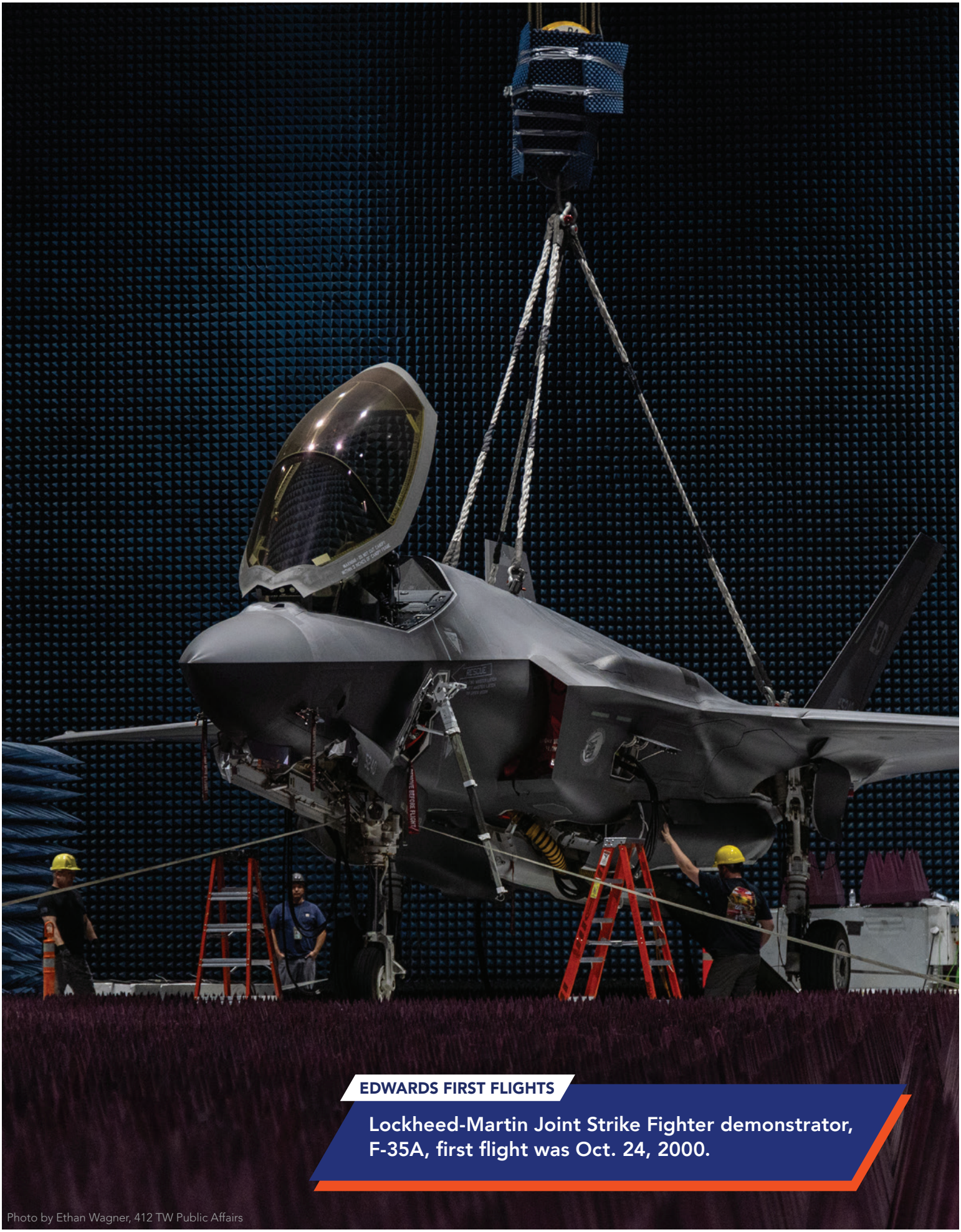
412th Range Squadron

773rd Test Squadron

775th Test Squadron

812th Aircraft Instrumentation Test Squadron

812th Test Support Squadron



EDWARDS FIRST FLIGHTS

Lockheed-Martin Joint Strike Fighter demonstrator, F-35A, first flight was Oct. 24, 2000.

Photo by Ethan Wagner, 412 TW Public Affairs

412TH TEST WING

Electronic Warfare Group

412 EWG

MISSION: Provide our nation and its allies expertise and credible capabilities to perform electronic attack and survivability test and evaluation, ensuring our continued worldwide air dominance.

The primary mission at the Air Force Test Center is to test aircraft systems to ensure that only safe, reliable and effective products are deployed to the warfighter. Electronic warfare test engineers at the center are trained and kept up to date on all EW systems, both new and old. Test engineers develop these emerging technologies while working side by side with some of the world's most experienced pilots, system operators and engineers.

There are six categories of EW systems that are tested at Edwards – radar/missile warning receivers, jammers, towed decoys, expendable countermeasures, directed energy and low observable technology.

BENEFIELD ANECHOIC FACILITY

The Benefield Anechoic Facility at Edwards is the largest anechoic test facility in the world, providing a virtual open-air range within an enclosed hangar. At the BAF, the 772nd Test Squadron provides comprehensive systems and test engineering applied to the developmental T&E of military and commercial radio frequency systems. The BAF can conduct installed systems tests on almost any DOW aircraft, testing their RF systems over a wide swath of the electromagnetic spectrum. The primary mission of the BAF is to conduct repeatable testing and integration of avionics systems in a secure electromagnetically controlled free space environment using state-of-the-art simulation and stimulation technology that closely duplicates actual combat missions. With the increased demand posed by integrated electronic warfare/information operations and net-centric RF systems that require greater interoperability and compatibility, the BAF is a valuable tool for today's highly integrated weapon systems.

PHYSICAL CHARACTERISTICS AND SUPPORT:

- The BAF measures 264 feet long, 250 feet wide and 70 feet high.
- It features a 175-ton 80-foot diameter turntable.
- It has two 40-ton hoists.

ANECHOIC CHAMBER RF CHARACTERISTICS:

- RF shielding from external environment ≥ 100 dB from 0.01-18 GHz
- Typical quiet zone isolation:
  - – 0.5 GHz* ≥ 72 dB
  - – 1.0 GHz ≥ 84 dB
  - – 2.0 GHz ≥ 96 dB
  - – 3.0 – 18 GHz ≥ 100 dB

CHAMBER APPLICATIONS AND FUNCTIONALITY:

- Complete end-to-end installed systems test in a free-space environment
- Dense, high fidelity RF threat simulation and verification
- Electronic warfare/information Operations
- Radar target return and electronic countermeasures collection, measurement and analysis
- Antenna pattern measurement
- Intra- and inter-systems electromagnetic interference and compatibility
- Electromagnetic environmental effects measurements
- GPS signal simulation and test

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* Below 0.5 GHz desirable quiet zones are achieved with case-by-case configurations and special techniques used to isolate the system under test from potential undesirable chamber reflections.

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- Proficient RF, EW systems and systems test engineering expertise and know-how
- State-of-the-art RF, digital, and video instrumentation infrastructure

TYPICAL MANNED AND UNMANNED VEHICLE SYSTEMS TESTED:

- SIGINT and ELINT systems
- Network-centric systems of systems
- Communications and navigation
- Identification friend or foe
- GPS – including anti-jam and controlled reception pattern antennas
- Radar systems
- Radar warning receivers
- Electronic countermeasures – on-board and off-board

EW RF THREAT SIMULATION AND GENERATION:

- Frequency range – 100 MHz-18 GHz
- High-fidelity, high-density** combat electronic environment, simulator based
- Direct injection or free-space radiation at the system under test
- Twenty-four individual channels – either dedicated or multiplexed
- Three hundred sixty-degree azimuth coverage
- Variable elevations based on SUT and chamber geometry
- Dynamic user-defined scenarios
- SUT receive antenna characteristics

COMMUNICATION, NAVIGATION AND IDENTIFICATION:

- Frequency range – 20 MHz-2 GHz
- Direct injection or free-space radiation at the SUT
- High-fidelity, high-density joint communications, simulator based
- Seventy-two simultaneous RF emitters – can be added as background, pulsed signals, time-shared, 2,000 emitters in a scenario
- IFF – interrogations and replies; AIMS certified – modes 1, 2, 3A, 4, 5 and S

DATA LINK CAPABILITIES:

- Ku-Band satellite communications link provides remote monitoring and control of unmanned aerial vehicles or remotely piloted vehicles from customer mission control centers
- Link-11/16 multi-link system test and training tool – includes error message generation
- Link-16
  - – Advanced communications environment
  - – Faithful time slot messaging
  - – Environment gateway simulator
  - – Management system (LMS-16) data capture of RF transmissions
- Commanders Tactical Terminal Integrated Broadcast Service – interactive

ELECTROMAGNETIC INTERFERENCE/ ELECTROMAGNETIC COMPATIBILITY:

- Source – Victim scenarios, antenna isolation or coupling
- High intensity radiated fields, radiation susceptibility
- Radiated emissions, conducted emissions

ANTENNA PATTERN MEASUREMENT:

- Stand-alone and installed antenna measurements
- Quantifies the system antenna's field of view in an installed configuration
- Large or fighter-sized aircraft
- Rapid automated phase and amplitude collection
- Polarizations – RHCP, LHCP, vertical, horizontal, slant and axial ratio

DATA PROCESSING AND INSTRUMENTATION RESOURCES:

- Real-time displays of data from SUT, chamber videos and data measuring/collecting systems in state-of-the-art test control room
- Monitor/record up to two PCM, RS422, RS232 and eight Mil-Std-1553B
- Threat generation activity files
- Time correlated data files
- Data formats and media as requested by customer

SUPPORT UTILITIES SYSTEMS:

- Aircraft electrical power:
  - – 400Hz AC
  - – 270VDC – supports F-22 and Joint Strike Fighter
  - – Twenty-eight VDC
- Instrumentation power – 28 VDC
- Liquid cooling: PAO, EGW and Coolanol
- Air cooling
- Two hydraulic systems

SECURITY:

The BAF is designed to meet any classification level. Additional security measures are implemented if your test program has special security requirements.

** The number of simultaneous threats depends on the duty cycle of the chosen emitters and the desired fidelity of the simulation – e.g., 1.35 million pulses per second with 10 CW emitters and a dropout of three percent.

DIGITAL INTEGRATED AIR DEFENSE SYSTEM

The 772nd Test Squadron has developed and maintains the Digital Integrated Air Defense System (DIADS). DIADS accurately simulates command and control system impacts on battle space and generates the enemy's perception of the air picture. The system incorporates real world trackers used by modern enemy air defense systems currently deployed throughout the world. DIADS sensor models generate perceived aircraft locations, which are fed into those trackers used by modern enemy air defense systems. The system can simulate the assets of a country or region that are currently deployed or projected to be operational soon. The simulation can be operated in stand-alone, faster than real-time for constructive use, or various man-in-the-loop/hardware-in-the-loop real-time modes.

This modeling allows testing against individual threats in a one-versus-one or one-versus-many scenario up to full mission-level testing to stress operational plans and supports both developmental and operational testing along with full-scale training exercises. DIADS provides insight into the total RF environment expected in combat by faithfully representing the signals that pilots and systems will encounter when facing the enemy.

DIADS has extensive interfacing capabilities and can be used in support of large-scale, distributed testing or training exercises using standard interfaces such as DIS, TENA and ASTERIX to interface with the customer's systems as required. Testing with DIADS can be completed either at customer facilities or the DIADS mission systems laboratory.

KEY FEATURES:

- Validated command and control models
- Flexible mission development
- Live, virtual, constructive
- Scalable to handle large simulations
- Continuous modernization efforts
- Multiple scenario databases
- Intel-representative models
- Aircraft blue/red
- Red radars and SAMs
- Multi-generational command and control
- Runs on RHEL 7/8
- WebUI allows Windows clients
- Standard interfaces:
  - DIS
  - TENA
  - ASTERIX

SIMULATES:

- Air surveillance radars
- Aircraft detections
- Track initiation and updating
- Identification friend or foe
- Filtering tracks of interest
- Present air picture
- Surface to air weapons control

DIADS FUNCTIONS IN:

- Constructive digital scenarios
- Real-time with MITL alongside synthetic operators
- HITL environments

SAMPLE CUSTOMERS:

- F-22A – air combat simulation increment 3.1 OT
- F-35 – operational test and evaluation at the JSE
- Red Flag – Nellis Test and Training Range and Joint Pacific Alaska Range Complex
- MALD/J – miniature air launched decoy/jammer operational test and evaluation
- 318th Range Squadron – cyber testing

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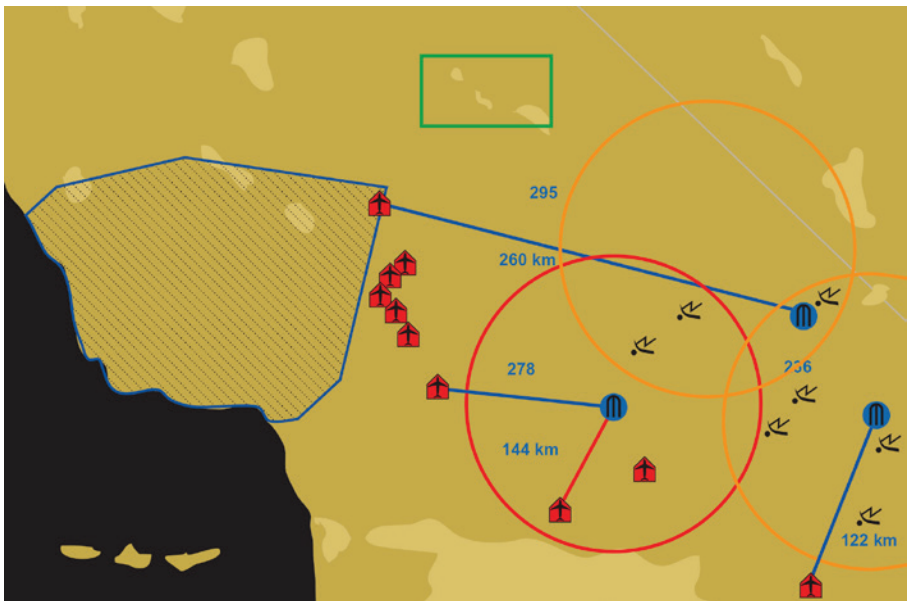

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INTEGRATED FACILITY FOR AVIONICS SYSTEM TEST

Simulators offer live virtual constructive environments for multi-ship operations at unclassified and classified levels.

F-22/F-16 EMULATION LAB:

- Three interactive cockpits
- Control room environment
- Emergency procedures
- Development training
- Departure characteristics
- High-risk envelope expansion
- AA/AG tactics and maneuver development
- Communication protocols
- Real-time data review
- Human factors/workload
- Flight/avionics familiarization
- High-risk flight dynamics
- Data analysis
- Multiple ship/multiple service
- Atmospheric sensitivity studies

F-16 SYSTEM INTEGRATION LAB:

- Full hardware-in-the-loop
- APG 68 v5 radar
- Pod and weapon connectivity/ integration
- Link-16 capable – DREN or RF
- Tactical communications
- Cyber test augmentation
- Flight/avionics familiarization
- Avionic system training
- DREN for distributed operations
- Line of sight to flightline and bomb ranges
- Roof antenna farm

F-35 MISSION AVIONICS SIMULATOR:

- Eight interconnected F-35 cockpits
- Configurable blue/red players
- Video monitoring and recording
- Validated AA and AG threats
- 3D data/scenario visualization
- AA/AG tactics and maneuver development
- Human factors/workload
- Control room environment
- Cockpit pilot-vehicle interface training
- Weapons training

F-35 FLIGHT SCIENCE SIMULATOR:

- Two cockpits/labs
- Control room environment
- High-risk envelope expansion
- Emergency procedures
- Two-ship operations
- Real-time data review
- Control room environment
- Flight/avionics familiarization
- High-risk flight dynamics
- Data analysis
- Multiple ship/multiple service
- Atmospheric sensitivity studies

SIMULATOR VERSATILITY:

These simulators can be configured as test surrogates for developmental or improvement and modernization initiatives.

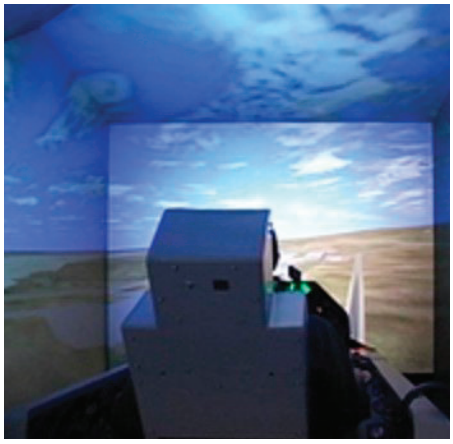
Past and current events include:

- Cyber test demonstrations
- RF countermeasures techniques
- F-16/F-18 LINK16 interoperation
- F-16/Global Hawk BACN interop
- F-16 improved data modem evals
- Weapon emulator development
- F-16/target pod compatibility
- Hardware/software integration
- Interoperability
- Distributed operations
- Multiple ship/multiple service
- Live virtual constructive

JOINT SIMULATION ENVIRONMENT

The Joint Simulation Environment enables fifth-generation-plus developmental test, operational test, high-end tactics training and experimentation in the world's highest fidelity, highest density threat environment. The JSE is an Air Force and Navy effort that provides a high-fidelity digital representation of an open-air test environment that incorporates physics-based models in concert with operational flight processor digital twins. The JSE is a transformative capability that leverages best-of-breed models to present high-fidelity, low-latency, large-force digital testing and training events. This unique capability offers a variety of services to a wide range of users from operational testers, developmental testers and engineers to program managers and decision makers at all levels.

The JSE consists of six major building blocks – software battlespace environment, physical computing infrastructure, own-ship system under test, pilot interface systems, mission facilitation rooms and overarching facilities for systems.



AFTC WILL HOST JSE FACILITIES AT EDWARDS AFB AND NELLIS AFB:

- Edwards JSE will host four F-22s, four F-35s and four configurable threat and friendly cockpits.
- Nellis AFB will host four F-22s, eight F-35s, eight configurable threat and friendly cockpits and two HITL labs with future growth for more in the coming years.

FULLY INTEGRATED WEAPON FLY-OUT MODELS TO INCLUDE SEVEN WEAPONS

HIGH-FIDELITY AND LOW LATENCY CAPABILITIES:

- Limited electronic attack and electronic protect models
- Multi-mission test platforms
- Three high-fidelity red air models
- Six virtual air threats hosted in medium-fidelity pilot-in-the-loop cockpits in domes for fair-fight
- Four red air missiles
- Seventeen high-fidelity surface-to-air missile models
- Separate blue, red and white force briefing and control areas
- Customizable denial zones
- Customizable scenarios
- Weather effects, night/day operations
- Physics-based environment for infrared and RF propagation
- Dozens of constructive blue and red models – F-22, F/A-18 Hornet, E-2 Hawkeye, etc.
- Full mission data capture, playback and post-processing

BUILT UPON MULTIPLE GOVERNMENT-OWNED MODELS:

- Government Reusable Interface Domain – physics-based interactions and propagation effects to all entities
- Weapons server common environment – nine real-time, high-fidelity kinetic weapon fly outs, blue countermeasures
- Visuals – synchronized out-the-window, targeting forward looking infrared and distributed aperture system and synthetic aperture radar map
- Analysis and reporting tool – data recording, analysis and playback
- Next generation threat system – synthetic environment generator models hundreds of threat and friendly constructive scenarios and hosts high-fidelity Missile and Space Intelligence Center and National Air and Space Intelligence Center models.
- Fifteen authoritative, high-fidelity MSIC SAM models
- DIADS – C3, data flows and operator displays of a threat IADS, early warning radars
- Simulation control executive – orchestrates simulation initialization and execution
- Extensible architecture for analysis generation of linked simulations effects-based simulation – seven high-fidelity NASIC red air and red air-air missile models
- Probability of removal – weapon/target pairing algorithm for kill removal
- Shot log – real-time and debrief tool that shows all shots taken during mission
- Government Simulation Interface – government-owned interface control domain for interfacing with the GRID ■

412TH TEST WING

Test Management Division

412 TMG

MISSION: Manage test projects to deliver timely, objective and accurate information for the warfighter.

TEST MANAGEMENT

The Test Management Division organizes, trains and equips approximately 100 personnel directly involved in day-to-day management of the test mission across the test wing's combined test forces. In addition, the division provides information systems, software and operating instructions for the field and ensures that the test wing's business and project management processes are defined and supported.

PROJECT MANAGEMENT

The project management branch delivers and sustains solutions to enable the management and execution of the test wing's test project portfolio. Our project managers provide support from project initiation to closeout, working to meet cost and schedule commitments and ensuring that high-quality, affordable, supportable and effective defense systems are delivered to the warfighter as quickly as possible. Our combined test force deputy directors provide senior civilian leadership and oversight of the test project portfolio and CTF directors in all aspects of unit operations.

RESOURCE PLANNING AND ANALYSIS

The resource planning and analysis branch provides personnel, tools and processes to enable the management and execution of the test wing's reimbursable and non-reimbursable business portfolios. Our business leaders provide financial, requirements planning and oversight support to the test wing CTFs. Our program analysts facilitate the program-introduction and statement-of-capability process to secure reimbursable business for the test wing.

PROJECT PROVISIONING

The project provisioning branch provides provisioning support for the test wing to include munitions allocations, project management and the initial point of contact process for new and prospective customers – see Page 3.

SPECIAL PROJECTS

The special projects branch supports all DOW and U.S. government classified, sensitive and unique test programs at the test wing in a secure, streamlined and effective manner. This includes special access program projects and business management, strategic planning and oversight of SAP facilities for the test wing and tenant organizations. It also includes SAP support staff assistance for test wing and AFTC leadership. ■

412TH TEST WING

Operations Group

412 OG

MISSION: Inform Air Force and DOW decision makers by safely and effectively planning, executing and reporting on ground and flight tests.

The 412th Operations Group is made up of an operations support squadron and seven flight test squadrons. The 412th Operations Support Squadron is responsible for airfield operations, runways, Space Positioning Optical Radar Tracking, airdrop and the test parachute program. Each flight test squadron aligns under a CTF or integrated test force to conduct full-spectrum test and evaluation.

412TH OPERATIONS SUPPORT SQUADRON SERVICES

AIRFIELD OPERATIONS – Services provided by the 412th Operations Support Squadron include weather, air traffic control, terminal airspace management, airfield, flight management, radar, airfield equipment, transient services, air traffic control and maintenance of the landing system and communications systems. Generally, the airfield is open for operations on weekdays with a control tower for the Class D airspace around Edwards AFB. Uncontrolled airfield operations require prior coordination with the airfield manager. Local weather services are available seven days a week.

RUNWAYS – There are 14 runways on base. Four are paved and 10 are on dry lakebeds. The two main paved concrete runways are more than 2.5 miles long. The unpaved runways span 59 miles on two dry lakebeds – Rogers Dry Lake, which provides a natural extension to the two main paved runways, and Rosamond Dry Lake. These lakebed runways occasionally become unavailable during the winter months when rain can leave standing water on the lakebeds, making them unusable for aircraft.

SPORT – This system generally operates during daylight hours on weekdays and helps control the restricted airspace around the base. Services include radar monitoring, radar traffic advisories, safety alerts, airspace boundary calls, radar vectoring, arrival sequencing, control of special use airspace like the spin areas, airborne flight safety assistance and more. When airspace R-2515 is not scheduled for DOW use, it is usually released to the Federal Aviation Administration and limited services are available through Joshua Approach.

AIRDROP – This includes services related to experimental research, development, test and evaluation of aerial deployment systems for personnel, cargo, vehicle and other systems. Other airdrop services may be available upon request and capabilities validation.

TEST PARACHUTE PROGRAM – This team provides RDT&E to help produce safe and effective personnel parachutes for the Air Force in support of the joint warfighter. Other services may be available upon request and capabilities validation. Program personnel apply their expertise, experience and adaptability to provide current and future parachute systems to the warfighter. Program experts leverage cutting-edge technologies across domains to deliver unique, value-driven solutions that make warfighters effective and lethal in any operating environment.

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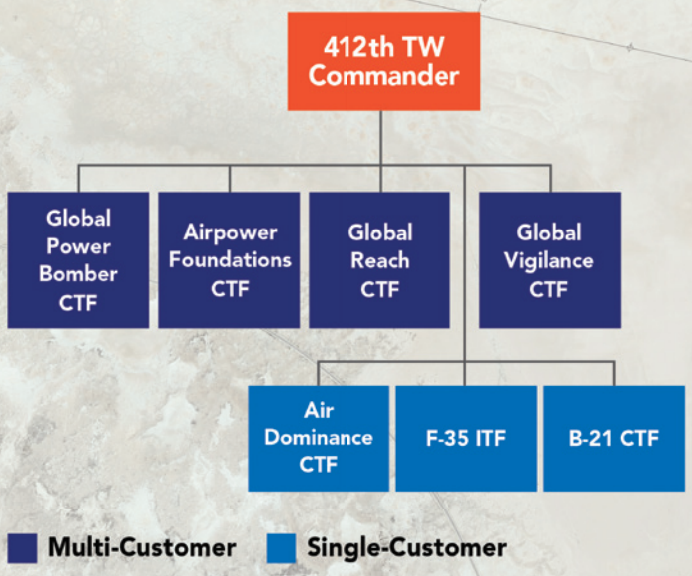
FLIGHT TEST SQUADRON OVERVIEW

Flight test squadrons are typically aligned under the umbrella of a CTF. The test squadron commander is also the CTF director. The 412th OG commander retains administrative control of the squadron commander and assigned operations personnel, which includes responsibilities such as direct supervision, training, administrative responsibilities and human resources support.



COMBINED TEST FORCE / INTEGRATED TEST FORCE OVERVIEW

CTFs and ITFs oversee the full range of developmental test and evaluation at Edwards AFB for their assigned aircraft. Responsibilities include program management, flight operations and test and evaluation. The CTFs and ITFs have day-to-day operational control over personnel that are matrixed to them from other organizations – e.g., TMG, TENG, EWG, etc. In most cases, a test squadron is aligned under each CTF or ITF and is staffed with operations group personnel. The CTF or ITF director is dual hatted as the squadron commander.

CTF DESCRIPTIONS

The Global Power Bomber CTF/419th FLTS tests and evaluates Air Force bomber aircraft – including B-1, B-2 Spirit and B-52 – to modernize the aircraft and integrate new weapons systems. The CTF also operates the C-12 Formal Training Unit with its C-12 Huron aircraft.

The Airpower Foundations CTF/416th FLTS comprises three integrated test forces – F-16 ITF, T-7 ITF and the Experimental Test Force. The F-16 ITF tests and evaluates Air Force and foreign military sales F-16 aircraft to include modernization, weapons systems integration and research and development projects. Additionally, the F-16 ITF is responsible for T-38 Talon modernization testing, F-16 chase and target support for test programs across the test wing and high-altitude departure recognition, avoidance and recovery training for U.S. and international F-16 pilots. The T-7 ITF tests the T-7A Red Hawk – the Air Force's newest jet trainer aircraft – to evaluate performance, flying qualities, loads, flutter, systems and propulsion test planning, execution and reporting. The Air Force plans to acquire 351 Red Hawks to replace the aging T-38. The Experimental Test Force provides agile, innovative flight testing and explores armed forces warfighting capabilities of tomorrow. Current focuses include small unmanned aerial systems for testing/operational use, autonomous systems development and implementation and industry partnerships that are exploring the development of electric vertical take-off and landing platforms and supersonic/hypersonic vehicles.

The Global Reach CTF/418th FLTS tests and evaluates Air Force airlift and refueler aircraft – including C-5 Galaxy, C-17 Globemaster III, VC-25 Air Force One, E-4B Survivable Airborne Operations Center, KC-135 Stratotanker, KC-46 and partner-nation aircraft – to modernize the aircraft and integrate systems. The CTF also partners with the 370th FLTS, an Air Force Reserve Squadron, to provide aerial refueling support for Edwards AFB.

The Air Dominance CTF/411th FLTS tests and evaluates F-22 aircraft during modernization efforts and integration of new weapons systems. This CTF is also responsible for the development of the NGAD family of systems.

The F-35 ITF/461st FLTS is DOW's lead developmental flight test unit for sensors, weapons and software on all three variants of the F-35. The efforts of the ITF will benefit the 826 fielded F-35 aircraft in the Air Force, Marine Corps, Navy and the other nations participating in the F-35 program.

The Global Vigilance CTF/452nd FLTS tests and evaluates Air Force remotely piloted aircraft to modernize the platforms and integrate weapons systems.

The B-21 CTF/420th FLTS is an integrated team of test professionals from Northrop Grumman, 420th FLTS and Detachment 5 of the Air Force Operational Test and Evaluation Center that provides support to the B-21 Raider flight test program.

ORANGE FLAG – LARGE FORCE TEST EVENT

Under the authority of the test wing, the operations group manages and executes Orange Flag – the largest operationally representative environment, all-domain test for infrared spectrum. The mission of these multi-domain large-force events is to enable next generation data-driven decisions at the engineering, tactical and operational levels and bring night one combat capability to warfighters at the speed of relevance.

CTF AND FLIGHT TEST SQUADRON LINKAGE

The combined test forces and the test squadrons are inherently linked. The squadron is responsible for operating the aircraft and providing administrative support, while the larger CTF provides a test team of engineers, project managers, financial managers, maintenance technicians and any other required personnel. ■

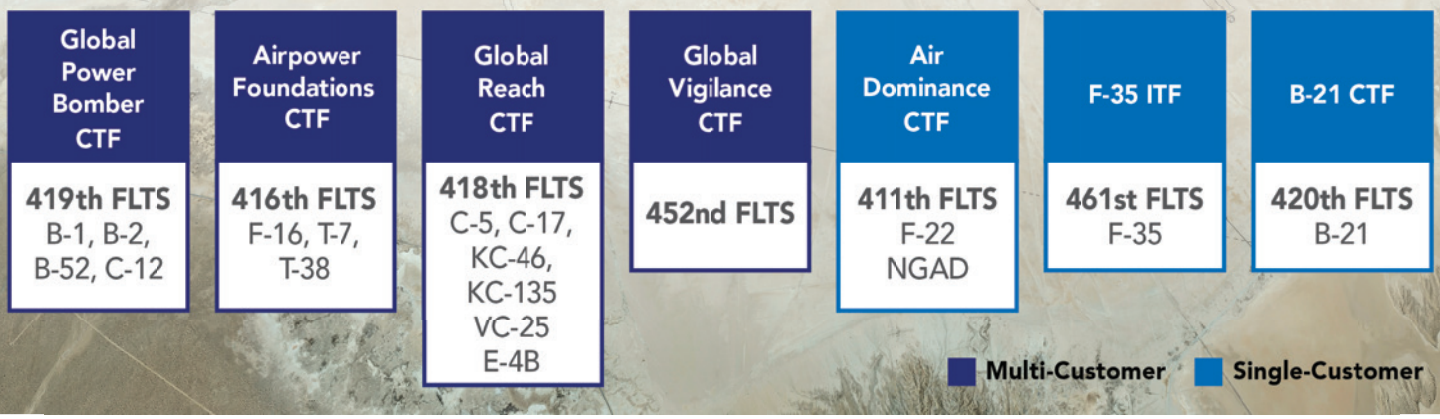


Photo by Kyle Brasier, 412 TW Public Affairs

412TH TEST WING

Maintenance Group

412 MXG

MISSION: Generate safe, reliable airpower with properly trained and well-equipped personnel ready to execute test and evaluation missions!

VISION: Continue to be the Testing Center of the Aerospace Universe.

The 412th Maintenance Group is the Air Force's most diverse maintenance group with over 1,900 Total Force Integration Airmen, 12 operating locations, five squadrons, maintenance operations, weapons standardization, quality assurance, 73 uniquely configured aircraft across 26 mission design series and 20 engine variants valued at $9.4 billion for test and evaluation.

The maintenance group sustains 284 facilities worth $3.3 billion. The long, proud history of the group dates to 1949 and continues today as it remains a recognized logistics leader in providing innovative solutions for complex logistics and ground test problems while providing outstanding flying mission support to America, its allies and partners. The group's personnel provide unequaled skill and technical expertise in working with advanced systems and technologies enabling top-tier support and supportability evaluations for the myriad aircraft and systems across DOW.

912TH AIRCRAFT MAINTENANCE SQUADRON

The 912th Aircraft Maintenance Squadron consists of three aircraft maintenance units – the 418th, 419th and 420th Aircraft Maintenance Units – performing safe and reliable maintenance executing world-class ground and flight test on 13 diverse aircraft representing the Air Force's portfolio of modified heavy aircraft.

412TH AIRCRAFT MAINTENANCE SQUADRON

The 412th Aircraft Maintenance Squadron employs 475 TFI Airmen that generate safe and reliable test aircraft in support of ground and flight testing on 51 uniquely modified T-38, F-16, F-22 and F-35A/B/C aircraft. Unit members deliver the future faster through a unified total force team that is capable of integrated operations with

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the largest defense contractors, providing cutting-edge capability to the warfighter. The unit also works in lockstep with the Air Force Test Pilot School to develop the world's premier test professionals for the United States and its allies.

412TH LOGISTICS TEST SQUADRON

The 412th Logistics Test Squadron ensures maintenance influence in early system design and is a subject matter expert for technical order development and verification. It also excels in test and evaluation of logistics capabilities, systems and equipment to ensure readiness and operational effectiveness. In addition, 12 operating locations across the United States – including some embedded within system program offices, aerospace and defense contractors – provide direct weapon system support to the warfighter.

412TH AIRCRAFT INSTRUMENTATION TEST SQUADRON

The 412th Aircraft Instrumentation Test Squadron provides test evaluators with the knowledge, understanding and support for non-standard and non-production data derived from acquisition instrumentation systems installed on aircraft, munitions and other DOW systems. Squadron personnel are experts in airborne Type II modification planning, designing, manufacturing, modification and the installation of non-standard and non-production data acquisition instrumentation systems for eight diverse flight test squadrons encompassing 17 different MDSs, systems and subsystems under test.

412TH MAINTENANCE SQUADRON

The 412th Maintenance Squadron provides maintenance support for over 81 modified aircraft, 26 MDSs, and 20 engine variants worth $9.4 billion. The squadron's 493 TFI Airmen manage 1,053 pieces of aerospace ground equipment, $93 million worth of munitions and 9,600 calibrations enabling five military branches and six allied nations to provide strategic capabilities in support of America's priorities. The squadron is composed of the following flights:

- The **fabrication flight** possesses unique manufacturing and modification capabilities specific to the manufacture, repair, overhaul, corrosion control and inspection of aeronautical and non-aeronautical parts and equipment. These highly trained personnel have a wealth of experience in various metals, composite honeycomb structures, thermoplastic materials, thermosets, ceramics and fiberglass. The flight's capabilities include paint and corrosion control, aircraft structural repair including composites, hazmat storage, hazardous waste and tool control and non-destructive inspection as well as having machine and welding shops. The covered corrosion aircraft wash facility is unique and large enough to accommodate C-5 aircraft with lighting for 24-hour operations. The facility also includes a soap foamer and two high-pressure hot water wash units.
- The **component repair flight** performs on- and off-equipment maintenance on highly modified test aircraft. It consists of the most diverse egress section in the world, an extraordinary electrical and environmental systems and electronic warfare avionics section in addition to a vastly diversified armament and support section. The flight offers maintenance and

testing for armament systems, ejection seats, avionic units, electronic attack pods and generators. It also contains an advanced integrated systems test station, electrical support of flight and ground training test, conventional avionics, egress, electronic warfare, aerial tow target shop, battery shop, a mechanical element and an armament area.

- The **test measurement and diagnostic equipment** Type IIC 68-degree laboratory supports RDT&E programs with specialized calibration services for boresight fixtures, linear measurements and weight measurements in a climate-controlled environment.
- The **munitions storage area** manages a wide variety of conventional and experimental munitions and equipment to support Air Force, DOW and foreign military sales customers.
- The **aerospace ground equipment flight** sustains, tests and evaluates a vast and diverse array of ground equipment in support of NASA, DOW and foreign military sales customers, including bombers, fighters, tankers, cargo aircraft, experimental platforms and unmanned aerial vehicles across numerous MDSs.
- The **propulsion flight** provides intermediate and organizational level maintenance on numerous production and prototype engines. The advanced technical expertise of our personnel allows us to provide full component improvement program capability and some depot-level repair capability. The flight also provides off-equipment repair and test.
- The **maintenance flight** is home to several distinct and diverse sections that are second to none. The fuels systems section repairs, functionally checks and inspects aircraft fuel systems, fuel tanks, hydrazine systems and related components on a highly diverse fleet of airlift, bomber, fighter, tanker and trainer aircraft. The F-16 phase and heavy maintenance repairs section performs major aircraft repairs, isochronal inspections and launches the aircraft they produce. The inspection section's T-38 phase, hydraulic, wheel and tire, crash-damaged disabled aircraft recovery, end of runway and transient alert functions provide major and minor isochronal as well as periodic and special inspection capabilities.

412TH MAINTENANCE OPERATIONS

The 412th maintenance operations flight oversees aircraft and munitions maintenance operations control, plans, scheduling, facilities, training, logistics, security, manpower, maintenance analysis, strategic planning, process improvement and the maintenance group's budget.

QUALITY ASSURANCE

Quality assurance provides oversight of aircraft and munitions quality assurance as well as aircraft weight and balance, including the only field-level pit scale designed to test and evaluate UAVs and DOW aircraft.

WEAPONS STANDARDIZATION

Weapons standardization consists of highly trained weapons loaders that handle one-of-a-kind munitions for DOW, allies and partner nations. This section provides training and certification to all test wing weapons load crews and validates new weapons load equipment and procedures. This section hosts the test wing's quarterly and annual weapons load competitions designed to amplify wing culture and connect members to the test and evaluation mission. ■

Photo by Carlo Casem, 412 TW Public Affairs

412TH TEST WING

Civil Engineer Group

412 CEG

MISSION: The 412th Civil Engineer Group lead-turns the future, maintains the present and protects the environment. Our experienced personnel provide installation, maintenance, construction and repair of Edwards AFB real property, while ensuring environmental stewardship and encroachment management of the installation. We plan and execute emergency management operations for local, regional and national emergency response, including contingency and mobility operations. We provide fire service support for real property and aircraft. Finally, the engineer group provides explosive ordnance disposal operational support to ranges and areas of operation in the stateside assigned area and deployment sites.

VISION: Innovators lead-turning the future

The Engineering Division is a lean cradle-to-grave project development and execution organization consisting of 41 engineering professionals from an array of disciplines including civil, structural, transportation, mechanical and electrical engineering.

This diverse engineering team provides:

- Planning
- Programming
- Comprehensive asset management plan
- Integration
- Execution of facility and infrastructure requirements that exceed the 412th Civil Engineer Squadron's organic capabilities

PROJECT MANAGEMENT BRANCH:

- Executes design, maintenance, repair and construction contracts
- Uses multiple execution methods including:
- Architecture and engineering service
- Indefinite delivery/indefinite quantity contracts
- Simplified acquisition of base engineer requirements contracts
- Multiple award construction contracts
- Blanket purchase agreements

EXECUTION SUPPORT SECTION, GEOGRAPHIC INFORMATION SYSTEMS:

Operates and maintains a comprehensive GIS that assists with:

- Dig permits
- Project siting
- Maintains all project design files such as as-built drawings
- Provides sophisticated mapping products and services to a variety of base organizations

PORTFOLIO OPTIMIZATION BRANCH:

- Single source for requirements integration and Base Comprehensive Asset Management Plan development

PROGRAM DEVELOPMENT SECTION:

- Performs base comprehensive planning, project programming and technical design to restore and upgrade base facilities and infrastructure systems
- Manages relocatable facility inventory including new approvals and extensions

PLANNING SECTION:

- Performs base comprehensive planning and space optimization
- Leads district plan development and updates as well as planning and design charrettes

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ENERGY MANAGEMENT SECTION:

- Leads efforts to improve energy resiliency
- Optimizes energy demand
- Ensures energy supplies

ENVIRONMENTAL MANAGEMENT DIVISION:

The Environmental Management Division is dedicated to protecting human health and the environment to support mission objectives. The division also ensures installation compliance with environmental regulations and efficient resource management, while fostering positive teaming relationships with external regulatory agencies.

Capabilities:

- Environmental compliance and permitting ensures installation activities comply with federal, state and local environmental regulations and permits to sustain mission operations.
- Natural and cultural resource management manages the installation's natural and cultural resources by implementing Integrated Natural Resource Management and Integrated Cultural Resource Management Plans. This line of effort includes compliance with the Endangered Species Act, Migratory Bird Treaty Act, National Historic Preservation Act and Archaeological Resources Protection Act in close coordination with federally recognized tribes.
- Environmental planning manages environmental planning documents required by the National Environmental Policy Act and the Environmental Impact Analysis Process.
- Pollution prevention manages solid waste, hazardous materials and related processes to efficiently reduce hazardous waste volume and toxicity.
- The Environmental Management System focuses leadership to prioritize key environmental issues.

- Interagency coordination maintains strong working relationships with federal, state and local regulatory agencies.
- Specialized support provides environmental technical advisory assistance to support mission stakeholders.
- Remediation – a tenant unit – manages the environmental restoration and military munitions response programs to address hazardous substance releases and to execute identification, investigation and remediation requirements in close coordination with regulatory agencies and the public.

INSTALLATION MANAGEMENT DIVISION

The Installation Management Division integrates the civil engineer group's management of real property, budget, force management, housing, dormitories, furnishings and provision of IT support.

The division's functional areas include the following:

- The real property office documents all real property and real property installed equipment gained, modified or disposed of. In coordination with the Air Force Civil Engineer Center, the real property section is also responsible for all real property instruments, including in-grants and out-grants for DOW and non-DOW organizations with a presence at Edwards and 12 geographically separated locations.
- The financial management office manages all centralized and decentralized operations and maintenance and RDT&E funds in support of facilities sustainment, restoration and modernization as well as facility operations for utilities, service contracts and material purchases.
- The force management office administers all personnel actions for over 300 civilian positions under the Acquisition Demonstration and Department of Defense Performance Management and Evaluation System annual assessment systems. The office also provides recruiting, security management and training support for all civilian and military personnel within the civil engineer group.
- The housing management office oversees the management and operation of 741 privatized housing units and provides housing referral services to all military and civilian personnel at Edwards.
- The dorm management office oversees 311 rooms in 12 dormitories for enlisted personnel with less than four years' time in service. They also provide furnishing management for all dormitory units and for general officer quarters.

412TH CIVIL ENGINEER SQUADRON

The 412th Civil Engineer Squadron's mission is to provide efficient and effective life-cycle operations, maintenance and repair of facilities and infrastructure. The squadron is authorized 193 positions and operates on a single shift but is on-call for after-hours emergencies. The squadron is organized into four flights – heavy repair, infrastructure systems, facility systems and operations engineering. Work is prioritized, executed and tracked in accordance with standardized prioritizations – emergency work, preventative maintenance, enhancement work and scheduled sustainment work, ranked high, medium or low. The squadron maintains and repairs all Air Force real property facilities and installed equipment. Responsibilities are truly daunting, as Edwards has the largest electrical distribution system in the Air Force, with approximately 800 miles of overhead and underground distribution, five switching stations, 15 substations augmented by 63 real property installed equipment generators and 402 fire alarm systems. The facility systems flight is also responsible for three sets of Barrier Arresting Kit-12 aircraft arresting systems. The water, gas and fuels system on base is the second largest in Air Force Materiel Command at 644 miles with 3.6 million gallons of petroleum, oil and lubricants. Our pavements team maintains four paved runways totaling eight miles, 14 lakebed runways totaling 60 miles, 284 miles of paved roads and 287 miles of unpaved roads. The squadron is augmented with contractors provided under approximately 27 service contracts, such as custodial, installation solid waste management, grounds maintenance and wastewater treatment plant to name a few. The squadron executes its functions according to management plans, such as the Base Support Plan, Antiterrorism/Force Protection Plan, Installation Barrier Plan, Energy Curtailment Management Plan, Hazardous Communications Plan, Snow and Ice Control Plan, Pest Management Plan, and Water Operations Plan to name a few, along with the annually updated Squadron Action Plan which includes six focus areas with measures of effectiveness.

812TH CIVIL ENGINEER SQUADRON

Within the 812th Civil Engineer Squadron, the fire and emergency services flight is staffed with 130 personnel – 55 military firefighters, 66 civilian firefighters and nine civilian emergency medical dispatchers. The flight responds to more than 1,200 emergencies annually. Equipment and personnel are postured to respond to a variety of incidents, including aircraft rescue, firefighting, structural fire suppression, wildland urban interface, emergency medical services, technical rescue operations and hazmat incidents involving chemical, biological, radiological, nuclear or explosive materials. Through its fire prevention

section, the flight also provides non-emergency services such as fire code inspection and enforcement, facility plans reviews and public education programs using virtual reality trainers. Due to the size of the base, the flight is distributed among five fire stations with its headquarters at Bldg. 2860. Flight headquarters includes the fire chief, deputy fire chief, fire prevention section, training section, health and safety section, flight logistics and the assistant chiefs for the operations section.

The flight maintains memorandums of understanding or mutual aid agreements with several internal and external emergency service agencies.

These agencies provide support beyond traditional fire suppression:

- California City Fire Department – MAA
- LA County Fire Department – MAA
- Kern County Fire Department – MAA
- San Bernardino County Fire Department – MAA
- 412th Medical Group – MOU for EMS

Each agreement clearly defines its purpose and terms. These interagency relationships provide a cost-effective method of maintaining adequate emergency services for the communities we serve while bolstering camaraderie and working relationships.

The FES flight has five fire stations as follows:

- Fire Station 1 is on the flightline in Bldg. 1223. This station provides aircraft rescue and firefighting, structural fire suppression, technical rescue, hazmat and EMS. It also hosts the fire alarm communication center. Demand zones within Fire District 1 include assembly, business, industrial, residential and storage facilities.
- Fire Station 2 is in Bldg. 5560 in the base housing area. This station provides structural fire suppression,

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technical rescue, hazmat and EMS. Demand zones within Fire District 2 include assembly, business, daycare, educational, health care, industrial, residential and storage facilities. Most facilities within this district have fire protection systems, fire suppression systems or both.

- Fire Station 3 is located on South Base in Bldg. 250. This station provides ARFF, structural fire suppression, technical rescue, hazmat and EMS. Demand zones within Fire District 3 include business, industrial and storage facilities. This district includes special mission hangars and munition storage and maintenance areas.
- Fire Station 4 is located at the Air Force Research Laboratory in Bldg. 8370. This station provides structural fire suppression, technical rescue, hazmat and EMS. Demand zones within Fire District 4 include assembly, business, industrial and storage occupancies.
- Fire Station 5 is located at North Base in Bldg. 4456. Resources from the station provide ARFF, structural, technical rescue, hazmat and EMS. Demand zones within Fire District 5 include business, industrial and storage facilities.

OFFICE OF EMERGENCY MANAGEMENT FLIGHT

The primary mission of the emergency management program is to save lives, minimize the loss or degradation of resources and continue, sustain and restore operational capability in an all-hazards physical threat environment at Edwards.

Emergency management has been tasked to:

- Manage the emergency operations center, which is the command-and-control support element that coordinates information and resources to support the installation's actions before, during and after an emergency.
- Use the EOC as a command-and-control incident management emergency response application as its common operating picture solution to interface with tactical first responders and emergency responders.
- Possess several specialized pieces of equipment to respond to and recover from an all-hazards event. We employ the incident command post, which is a mobile command and control trailer that provides office space for key personnel supporting the on-scene commander or recovery operations chief.
- Provide a large array of chemical, biological, radiological or nuclear detection equipment. This equipment allows CBRN teams to respond and test presumptive hazards, assist in determining local threat conditions and establish entry and mitigation plans. In addition to providing specialized equipment, all personnel assigned are subject matter experts in CBRN defense tactics, techniques and procedures.
- Assist all host and tenant organizations with establishing unit emergency management programs, developing emergency action plans, providing preparedness training, and collaborating on exercise development to test all facets of response and recovery actions to support mission continuation during an event.

EXPLOSIVE ORDNANCE DISPOSAL FLIGHT

The Explosive Ordnance Disposal Flight's mission is to mitigate hazards to personnel and property posed by weapons and explosive materials across all physical domains.

The flight has been tasked to:

- Provide an emergency response capability for Air Force and joint commanders to detect, locate, access, diagnose, render safe, recover and dispose of explosive ordnance.
- Be available for 24-hour emergency response support across 481 square miles – including Edwards and the surrounding communities of Rosamond, Tehachapi, California City, Mojave, Lancaster, Palmdale and Bakersfield.
- Support assigned aircraft and munitions testing, including priority test missions with same-day destruction of classified materials and destroying hazardous materials produced by the AFRL.

The flight's core mission areas include:

- Aerospace systems, vehicles and conventional munitions
- Counter improvised explosive devices
- Counter weapons of mass destruction
- Nuclear weapon response
- Unexploded ordnance recovery operations and operational range clearance
- Defense support to civil authorities and irregular warfare
- VIP protective support
- Military engagement, security cooperation and partner building ■

UNITED STATES AIR FORCE

Test Pilot School

USAF TPS

MISSION: Create test leaders, develop school staff and conduct test research to accelerate multidomain capabilities to the warfighter.

VISION: Testers, leaders, thinkers, innovators … in the mold of Jimmy Doolittle

AIR FORCE TEST PILOT SCHOOL RESEARCH DIVISION

The Air Force Test Pilot School is a world-renowned institution for flight test education, training and research. The school collaborates with organizations across DOW, industry and academia to advance the state of the art in test and evaluation. This research is a vital component of the school's curriculum, providing students with hands-on experience through test management projects.

These projects offer students a comprehensive test program experience, from initial planning to thorough reporting. Central to this is a fixed two-week flight test execution period where students tackle complex Defense Department problems by developing innovative testing techniques, collecting data and employing rigorous analysis to reach data-driven conclusions. The projects use a range of Air Force aircraft, including C-12s, T-38s, F-16s and the X-62A VISTA. Using Air Force-owned aircraft offers cost advantages for government sponsors – covering flight hours and student labor. However, projects involving other platforms may require customer support for flight costs and integration efforts. All the projects require a U.S. government sponsor.

Project selection occurs twice a year through a competitive process, prioritizing alignment with the school's educational objectives, warfighter and test community benefit as well as feasibility within the academic schedule and the fixed two-week test period.

Test Pilot School research is organized around four key focus areas:

1. Techniques and frameworks for testing AI control of aerospace vehicles.
2. Physics-based machine learning applications for data-driven test.
3. Techniques and frameworks for analysis and optimization of multi-domain kill chains.
4. Advanced infrastructure and test capabilities for emerging aerospace systems.

For more information on partnering with the test pilot school or exploring research opportunities within these focus areas, please contact us at usaftps.rd.workflow@us.af.mil or visit our website - TPS Research Division https://www.edwards.af.mil/Test-Pilot-School/TPS-Research-Division/ ■

412TH TEST WING

Air Force Plant 42

MISSION: Deliver timely, effective, efficient support, empowering development, production, flight test and sustainment for the world's most advanced aerospace systems.

VISION: Set conditions for innovative aerospace development, delivering next generation warfighter lethality!

Air Force Plant 42 is one of four Air Force plants located throughout the United States and is managed by the Air Force Life Cycle Management Center, Acquisition Environmental and Industrial Facilities Division at Wright-Patterson AFB, Ohio. The establishment of Plant 42 was directly influenced by the Defense Production Act of 1950, which aimed to ensure the United States could rapidly develop and produce advanced military technologies during times of national need. This law authorized the federal government to prioritize and accelerate the production of essential defense materials and systems, leading to the creation of strategic industrial facilities. As a result, Plant 42 was designed to support the nation's defense priorities by providing a secure, advanced industrial complex for the development, production and testing of cutting-edge aerospace systems.

Plant 42 is a government-owned, contractor operated industrial production plant located in the Antelope Valley approximately 60 miles northeast of Los Angeles with proximity to the concentration of the aerospace industry in Los Angeles, R-2508 restricted airspace and the resources of Edwards AFB. The plant's mission is to provide industrial facilities for the design, development, production, modification, depot maintenance and production flight test of U.S. aerospace systems. Plant 42 is unique in that it has a government operated airfield complex and hosts three major defense contractors – The Boeing Company, Lockheed-Martin Corporation and Northrop Grumman Corporation. Plant 42 supports an estimated 16,000 contractors and government employees, occupying more than 3.5 million square feet of floor space covering 5,700 acres with a replacement cost of $4.5 billion. The industrial production facilities are uniquely suited to fully support the nation's newest and most advanced military and commercial aerospace systems. Some of the world's most innovative and successful aircraft were designed, fabricated, assembled and tested at Plant 42. Examples include the following Collier Trophy winners: F-104 Starfighter, F-100C Super Sabre, space shuttle, U-2 Dragon Lady, SR-71 Blackbird, B-1, B-2, F-117A Nighthawk, F-22, X-47A Pegasus and RQ-4 series aircraft. Other examples include the F-5E Tiger II, XB-70 Valkyrie, X-32, X-35, X-51A Waverider, B-21 and other unmanned aerial systems.

412TH TW OPERATING LOCATION, PLANT 42 CAPABILITIES

Unlike the 412th Test Wing's designation as a Major

Range and Test Facility Base Activity, Plant 42 primarily functions as an industrial and production facility rather than a dedicated testing range. It does not have the same formal designation for extensive, large-scale testing activities, but it plays a critical role in supporting aircraft development and manufacturing.

The test wing operating location at Plant 42 enables the development, production and testing of cutting-edge aerospace systems and provides base operations support services for the manufacturers. The test wing provides command and control of the Plant 42 airfield complex and the personnel that support the industrial facilities. The organization provides airfield management, business integration, information technology, program management, civil engineering, airfield maintenance, environmental services, fire protection, crash, rescue, recovery, logistics, fuels support and security in addition to ground, weapons and flight safety for the common area of the plant. The common area includes the airfield with two 12,000-foot runways and an assault landing zone. The airfield complex is available for operations from 5:30 a.m. to 10 p.m., Monday through Sunday. Runway 4/22 is 150 feet wide, and Runway 7/25 is 200 feet wide, providing enhanced safety during aircraft testing. Airfield management supports flight planning, scheduling and airspace management with air traffic control provided by FAA-contracted air traffic control tower services. The Class D airspace is a 4.3 nautical mile radius up to 2,500 feet above ground level. Weather observation is provided by the 25th Operational Weather Squadron from Davis Monthan AFB. The typical annual aircraft traffic count is just over 30,000 operations.

As a production flight test installation, the test wing supports ground taxi test and first flight of manned and unmanned development and production aircraft from DOW contractors. ■

EDWARDS FIRST FLIGHTS

Northrop Talon T-38, first flight was April 10, 1959.

Photo by Carlo Casem, 412 TW Public Affairs

412TH TEST WING

Mission Support Group

412 MSG

MISSION: Warfighters delivering agile combat support enabling war-winning capabilities.

VISION: Breaking barriers to enhance mission execution.

The Mission Support Group conducts test-enabling installation operations for Edwards, its 50-plus mission partners and a population of over 14,000 people.

THE 412TH SECURITY FORCES SQUADRON provides integrated base defense and force protection for all Edwards people and missions, while simultaneously preparing and deploying defenders in support of worldwide contingencies and combat operations. Its combat arms section equips personnel from the 412th Test Wing, Air Force Plant 42, Los Angeles AFB, March Air Reserve Base, Marine Corps Air Station Miramar, six local Army units, Defense Criminal Investigative Services and NASA with cutting-edge, innovative marksmanship skills to enhance our nation's war fighting capabilities year-round.

THE 412TH COMMUNICATIONS SQUADRON operates and defends Edwards' cyberspace domain and is responsible for full-spectrum information technology capabilities to enable weapons system testing, evaluation and development to deliver war-winning capabilities to our nation's combat air forces.

THE 412TH LOGISTICS READINESS SQUADRON integrates transportation, fuel, supply and logistics planning to provide world-class support for the Edwards mission.

THE 412TH FORCE SUPPORT SQUADRON enables the human warfighter, providing exceptional personnel and manpower administration, as well as morale, welfare and recreation support programs and services for the entire base community.

412TH MSG

Security Forces Squadron

412 SFS

MISSION: Conduct persistent law enforcement and aggressive defense operations at Edwards AFB and Plant 42 to deter and defeat threats to the test mission while maintaining readiness to support operations worldwide.

VISION: A resilient, motivated, intelligent and cohesive defense force that sees first, understands first and acts deliberately.

1. INVESTIGATIONS

- Providing investigation services for the majority of crimes on the installation to include larceny, assault, domestic violence and drugs.

2. FLIGHT OPERATIONS

- Maintaining five-minute response times to security incidents and 15-minute response times to law enforcement calls across 302,000 acres of installation property with multiple military and civilian jurisdictions, supporting 55 tenant and partner organizations.

3. VISITOR CONTROL CENTER (VCC)

- Processing and distributing short-term passes, visitor access lists and entry authorization lists for 55 tenant units.

4. PASS AND REGISTRATION

- Answering customer service inquiries about pass and registration procedures and operations in-person and over the phone.
- Providing long-term visitor passes.
- Acting as restricted area badge issuing authority.

5. REPORTS AND ANALYSES

- Acting as unit administrative liaison between commanders and first sergeants for all base units and contractor agencies.
- Conducting local records checks for law enforcement and official government agencies.

6. ANTITERRORISM

- Providing local training and guidance on antiterrorism program management.
- Coordinating with special events points of contact.
- Conducting installation risk management actions.

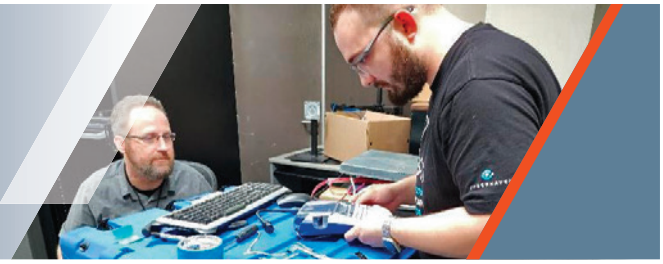
7. TACTICAL AIR BASE AIR DEFENSE

- Providing counter-unmanned aircraft system detection and intercepting operators.
- Liaising with the Office of Special Investigations and local law enforcement to cite offenders.

412TH MSG

Communications Squadron

412 CS



MISSION: To deliver flight test cyber power – anytime, anywhere!

VISION: Dominate the digital battlefield by forging cutting-edge capabilities to outpace adversaries.

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1. CYBER SERVICES

- Computer maintenance and help desk support
- Defensive cyber operations
- Commercial and DSN telephone services
- Communications security
- Frequency and spectrum management
- Land mobile radio service
- Network infrastructure – copper, fiber and antenna

2. MISSION PARTNER SUPPORT

- Freedom of Information Act and Privacy Act support
- Wing cybersecurity office and system accreditation
- Capability and resource estimates
- IT change and configuration management
- Secure internet protocol router café

3. TECHNOLOGY SOLUTION DESIGN

- Infrastructure planning and installation
- IT project management
- Software development and testing

SQUADRON ENHANCES CYBER TRAINING WITH VIRTUAL REALITY INNOVATION

The squadron recently procured an HTC Vive virtual reality headset using innovation funds to bolster cyber defense training. This technology allows the squadron to visualize network traffic and cyber threats in real-time, which enhances their situational understanding and response approaches.

412TH MSG

Logistics Readiness Squadron

412 LRS

MISSION: Warfighters delivering global logistics support for the Center of the Aerospace Testing Universe.

VISION: A professional, cohesive team ready to provide diverse on-target logistics

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The 412th Logistics Readiness Squadron's key duties include:

1. BASE SUPPORT VEHICLES AND EQUIPMENT MANAGEMENT, OPERATIONS AND PROCUREMENT

- Providing efficient and economical transportation capabilities to support mission requirements.

2. PETROLEUM AND CRYOGENICS

- Providing specification aviation, ground and alternative fuels to the installation and tenant organizations, including cryogenic products, to facilitate base operating support functions and aircraft sortie generations.

3. SUPPLY, STORAGE AND DISTRIBUTION – NON-MUNITIONS

- Implementing actions associated with storage and shipment of materiel and products in all classes of supply except Class V and Class VIII, as defined in Joint Publication 4-09.

4. INSTALLATIONS MOVEMENT

- Planning, managing and executing movement activities including movement of passengers, cargo and personal property.

412TH MSG

Force Support Squadron

412 FSS

MISSION: Develop and sustain a ready and resilient Team Edwards.

VISION: Deliver unmatched customer support, competent guidance and continuous innovation to enable and strengthen our total force community.

The 412th Force Support Squadron's key duties include:

1. MANPOWER, MILITARY PERSONNEL AND CIVILIAN PERSONNEL

- Common Access Card and Defense Enrollment Eligibility Reporting System customer support
- Appropriated and nonappropriated fund staffing and recruiting
- Manpower standards and determination
- Continuous process improvement program
- Unit manpower documents
- Organization change requests
- Employee management relations
- Military evaluations and civilian appraisals
- Deployment outprocessing and inprocessing personnel accountability

2. FORCE DEVELOPMENT

- Military and civilian college and career counseling
- First-term enlisted, officer and civilian orientation courses
- Airman Leadership School
- Enlisted development advisory services
- Base library

3. READINESS, BASE HONOR GUARD AND MORTUARY AFFAIRS

- Unit personnel deployment
- Emergency response planning
- Reception of forces
- Search and recovery operations
- Disposition, preparation and casketing of remains
- Next of kin entitlements briefing
- Transportation of remains
- Dignified arrivals
- Funeral travel
- Military funeral honors

4. FSS MARKETING AND RESOURCE MANAGEMENT

- Morale, welfare and recreation commercial sponsorship and advertising
- Private organization support
- Installation nonappropriated fund management
- Nonappropriated fund information technology support

5. CHILD AND YOUTH SERVICES

- Child Development Center and School Age Annex
- Youth programs – open recreation, teen programming, youth sports and instructional activities
- Family childcare and school liaison service

6. SUSTAINMENT AND COMMUNITY SERVICES

- Dining facility and fitness center complex
- Lodging facilities
- Official mail center
- Aero Club and outdoor recreation facilities
- Consolidated club complex
- Bowling and family entertainment center
- Arts and crafts, auto hobby shop and car wash
- Community activity center and information, tickets and travel office
- Installation UNITE program
- Basewide event management


TEST

412TH TEST WING

Medical Group

412 MDG

MISSION: Power readiness and innovation through healthcare excellence.

VISION: Unified medics fueling a ready, fit force to fly, fight and win... anytime, anywhere through modernized healthcare.

The 412th Medical Group comprises two hundred medics across two squadrons. In addition to traditional clinical medical services for active-duty service members, dependents and retirees, the medical group supports the test mission through a range of readiness and operational medical functions.

412TH OPERATIONAL MEDICAL READINESS SQUADRON

412th Operation Medical Readiness Squadron provides healthcare specialists in risk management for the full spectrum of unique operational test and evaluation requirements, hazards, risks, controls and interventions.

FLIGHT AND OPERATIONAL MEDICINE

The squadron delivers aerospace medicine services supporting a wide range of populations. Those services go to both military members and Department of Defense civilians in flying classes I, II and III as well as operational support flyers and non-flight populations that fall under the special operational duty categories such as air traffic control, special warfare airmen, explosive ordnance disposal, missile operators, personnel reliability assurance program, firefighters and other operational personnel as required.

The squadron provides urgent response in support of all test and evaluation flights within the R-2508 airspace complex with professionally trained aerospace medicine technicians and flight surgeons who have transport capabilities to Level 1 and 2 trauma centers and hyperbaric treatment options. During emergency responses, the squadron offers health risk assessments and protective measures for responders and the surrounding community.

The squadron also supports mission operations and flight test for NASA spaceflight, Air Force Research Laboratory and all other operations using Edwards facilities and airspace.

OCCUPATIONAL AND ENVIRONMENTAL HEALTH

The squadron offers additional support to monitor the industrial and environmental factors unique to the test and flight environments. It also provides surveillance for basewide safety and exposure programs.

The squadron:

- Evaluates air, water and soil impacted by biological, chemical or radiological agents.
- Evaluates installation drinking water to confirm it meets Environmental Protection Agency standards.
- Measures and manages surveillance programs for ionizing radiation, electromagnetic fields and noise exposure in all Edwards testing facilities.
- Provides oversight for built environments, including industrial and administrative workplaces, facilities intended for community use and housing.

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- Inspects and provides oversight to ensure safe water and sanitation facilities.
- Conducts public health food safety inspections for all installation food service venues.

412TH HEALTHCARE OPERATIONS SQUADRON

The 412th Healthcare Operations Squadron includes traditional primary care and ancillary services for routine and preventative beneficiary healthcare.

ROUTINE AND PREVENTATIVE PRIMARY CARE

The healthcare operations squadron provides:

- Full spectrum medical care for the 233 NATO partners enrolled at the test pilot school, including pharmacy, laboratory, radiology and immunization services.
- Routine and predeployment immunizations and supports multiple flu and deployment readiness lines in various locations across the installation.
- Plant 42 support via the ScriptCenter® pharmacy automated kiosk, which provides local prescription pickup for beneficiaries in the Palmdale area.
- On-call laboratory services for urinalysis and drug testing for in-flight emergencies and for vehicle accidents when illicit substances may be suspected.

PARAMEDIC AMBULANCE SERVICES

Squadron ambulances are staged at three strategic locations – the main clinic, Bldg. 5525; the flight medicine annex, Bldg. 3925; and Air Force Research Laboratory, Bldg. 8255. Each has the capability for advanced life support and provides care for all members of the Edwards community, regardless of employment or beneficiary status.

Additional medical information:

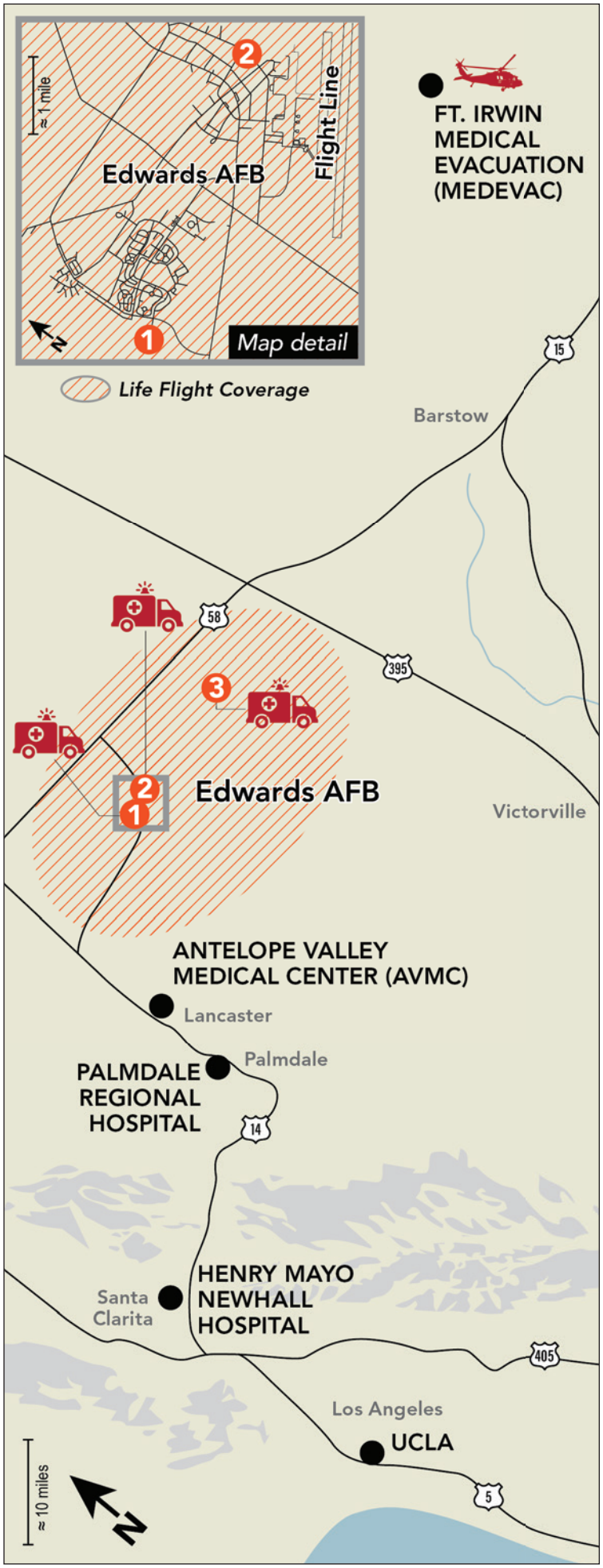
- In-flight emergency response – the ALS EMS crews respond to after-hours in-flight emergencies in conjunction with fire and emergency services. During duty hours flight medicine has primary basic life support response for IFEs.
- Acute care – Edwards AFB is not resourced to provide emergency services, but the medical treatment facility will dispatch an ALS ambulance for interfacility transportation as required by Kern County regulations and protocols.
- Air transport medical services – medevac services are coordinated through the emergency communication center and emergency medical dispatch, an off-base support network.

OFF-INSTALLATION MEDICAL SERVICES

Memorandums of agreement are in place with Palmdale Regional Hospital, Antelope Valley Medical Center and

Antelope Ambulance that establish procedures for joint emergency planning and emergency operations as needed. Fort Irwin medevac may also be used if local resources are unavailable. For more acute injuries or conditions, the local resources are:

- The nearest Level I trauma center – there are multiple Level I trauma centers in the Los Angeles area, which is about 90 miles and 100-plus minutes away.
- The nearest facility supporting decompression events – the University of California, Los Angeles, which is 98 miles and 100-plus minutes away.
- The nearest Level II trauma center, for emergencies like strokes, cardiac events, burns or pediatric trauma – AV Medical Center, which is 28 miles and about 35 minutes away. ■



412TH TEST WING

Public Affairs

412 TW/PA

MISSION: We support the commander by engaging internal and public audiences with credible, timely and accurate information and imagery to strengthen support for Team Edwards, leveraging information and imagery – while enhancing operational security – to achieve global operational effects, and producing multimedia products to advance mission objectives.

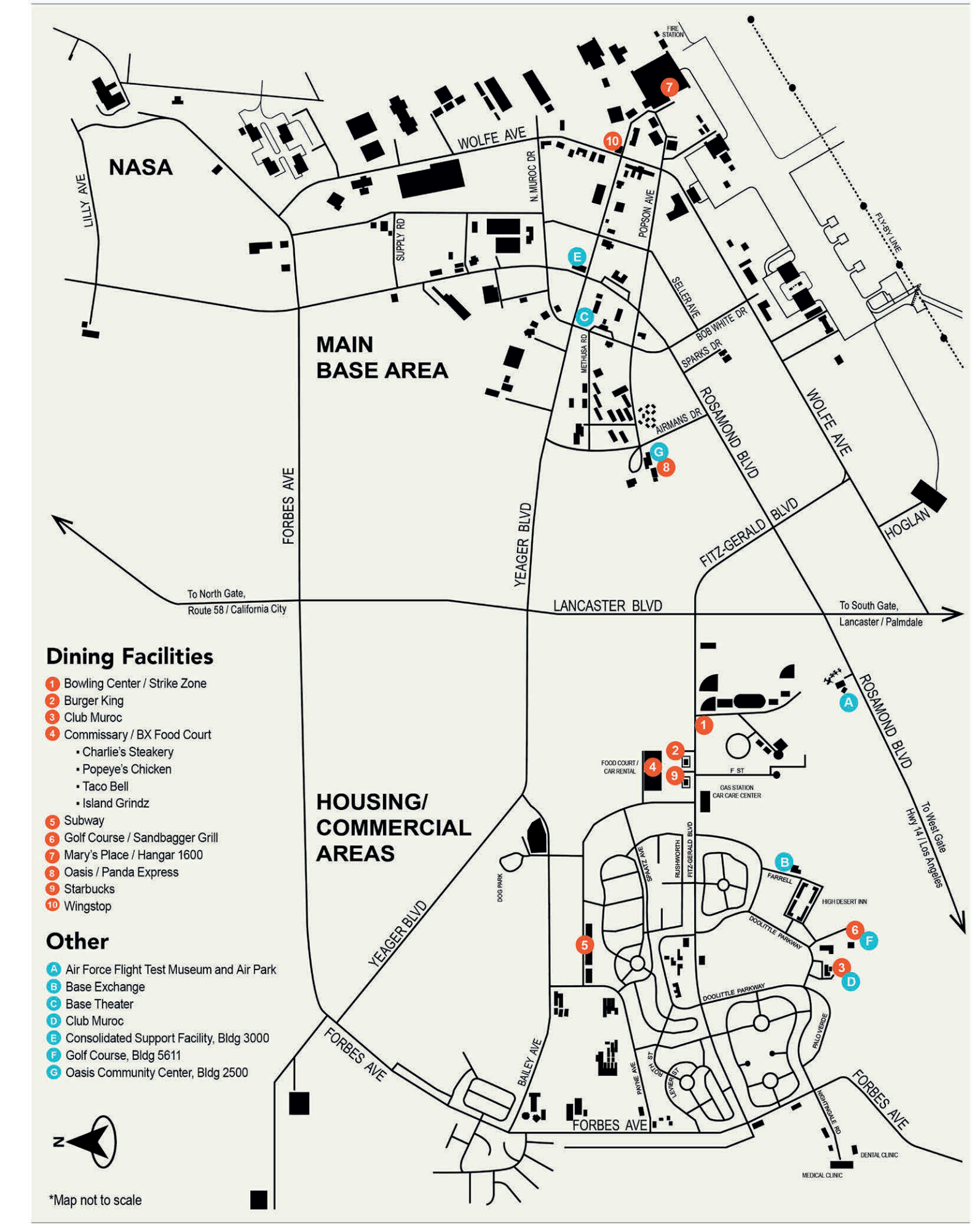
PUBLIC AFFAIRS

The 412th Test Wing Public Affairs Office features a robust and experienced team to meet the special requirements of diverse testing entities. Capabilities include boots-on-the-ground photography and video support for system program offices, ensuring both secure and adequate coverage. Public affairs is also the sole authority for assigning photo authorization letters for program offices that wish to have their own cameras on the base. The public affairs creative design team boasts world-class graphic design and printing capabilities. All R-2508 airspace maps are printed in-house at the public affairs graphics shop.

AERIAL PHOTOGRAPHY

Public affairs also manages the base audiovisual contract, which includes the Air Force's only civilian aerial photography team devoted to flight test documentation. PCI Productions provides in-flight photo and video services for the test enterprise. The team captures high-resolution still and video imagery for safety and data analysis by test engineers and teams. They also collect high-speed video that captures events at thousands of frames-per-second – events that are otherwise too fast for the human eye. This includes weapon separations, parachute or airdrop sequences and other aircraft functions. This data has a direct impact on each mission and helps tell a complete and accurate story of test wing and test center programs, saving the Department of Defense time and money through vital test documentation. The aerial photography team may be booked for most flight test efforts. ■

Photo by James West, 412 TW Public Affairs



Dining Facilities

1. Bowling Center / Strike Zone
2. Burger King
3. Club Muroc
4. Commissary / BX Food Court
   - Charlie's Steakery
   - Popeye's Chicken
   - Taco Bell
   - Island Grindz
5. Subway
6. Golf Course / Sandbagger Grill
7. Mary's Place / Hangar 1600
8. Oasis / Panda Express
9. Starbucks
10. Wingstop

Other

- A Air Force Flight Test Museum and Air Park
- B Base Exchange
- C Base Theater
- D Club Muroc
- E Consolidated Support Facility, Bldg 3000
- F Golf Course, Bldg 5611
- G Oasis Community Center, Bldg 2500

U.S. AIR FORCE™

For assistance or additional information about testing at Edwards,
scan the QR code, or email: 412TW.IPOC@us.af.mil

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