



X-57 project to end with advances in electric aviation



NASA photograph by Carla Thomas

NASA's X-57 all-electric aircraft in the Mod II configuration undergoes high-voltage testing in 2021.

by **NASA Armstrong Public Affairs**
and Aerotech News staff

NASA's X-57 Maxwell all-electric aircraft project will end operational activities by the end of September, with documentation and close-out activities continuing for several months afterward.

While the project at NASA's Armstrong Flight Research Center, which began in 2014, stopped short of flight, its work has made significant progress in the electrification of aviation. In a recent press conference, Bradley Flick, NASA Armstrong's director, explained some of the challenges the program faced.

"It was a bold plan, based on the belief that component technologies were commercially viable and available to be integrated into a flight vehicle," Flick said.

"What we learned was that many of those necessary subsystems were not sufficiently mature for safe flight.

"In 2021 NASA adjusted the project objectives, recognizing

that the technical lessons being learned in the electrification of the aircraft were ultimately more critical to the advancement of the industry than the demonstration of the high-lift technology we set out to do," Flick said.

The project was funded until the end of fiscal 2023 to advance the technology and share the information publicly, yielding more than 100 scientific papers. NASA thought that would get them to flight, but they discovered "a potential failure mode in the propulsion that posed an unacceptable risk to pilot safety and safety of those on the ground," said Flick. Mitigating the risk would take the project well beyond the proposed date, so they decided to end the project on time.

"NASA's goal is to drive innovation through groundbreaking research and technology development. The X-57 project team has done just that by providing foundational information to industry through lessons learned, and we're seeing the benefits borne out by American commercial aviation companies that are aiming to change the way we fly," said Flick.

"I'm incredibly proud of their tenacity and ingenuity as they

led the way in advancing electrified propulsion. The future of electrified propulsion is possible because of their contributions."

Kate McMurtry, deputy director of Integrated Aviation System Program, discussed how NASA's knowledge sharing have impacted the industry: "Over the years the team's technical achievements have served as a pathfinder towards the means of compliance for the design, integration and airworthiness for electric aircraft that informs standards, bodies, regulators, and industry," she said.

"The industry's electrification challenges are not the same today as they were when we started."

Finalizing aircraft operations by September 2023 will not incorporate first flight of the X-57 aircraft. The project encountered several challenges to safe flight, including mechanical issues late into its lifecycle and a lack of availability of critical components required to develop experimental hardware.

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Edwards bids farewell to Global Hawk



Air Force photograph by Bryce Bennett

An RQ-4 Global Hawk assigned to the 452nd Flight Test Squadron flies in the skies above Edwards Air Force Base, Calif., May 23, 2023. The 452nd FLTS recently completed its test campaign on the Global Hawk.

by **Giancarlo Casem**
Edwards AFB, Calif.

The 452nd Flight Test Squadron held a “sun-setting” event for the RQ-4 Global Hawk flight test program at Edwards Air Force Base, Calif., June 9, 2023.

The event marked the completion of the squadron’s test campaign for the aircraft.

“Today, we celebrate the heritage of the Air Force RQ-4 test program and we establish its legacy at Edwards Air Force Base,” said Maj. Mark Johnson, 452nd FLTS, RQ-4 Test Team Lead. “We take time to remember the many sacrifices that were made and to consider the impact they are presently having on future test programs.” The event included guest speakers from the U.S. Air Force and Northrop Grumman who gave insight into the Global Hawk’s test campaign history and legacy. It also featured a Q&A panel where current RQ-4 operators provided their



Air Force photograph by Todd Schannuth

Fire trucks from the 812th Civil Engineer Squadron provide a water salute to an RQ-4 Global Hawk, assigned to and operated by the 452nd Flight Test Squadron, at Edwards Air Force Base, Calif., May 23, 2023. The water salute was in honor of the 452nd FLTS’s final test flight of the RQ-4.

thoughts on the Global Hawk’s mission in real-world operational scenarios.

“The RQ-4 joins the likes of the X-1, the X-15, and the XB-70 as boundary breakers and record setters. Much like these well-known aircraft, the

RQ-4 was indeed an experimental aircraft and one that challenged aviation standards,” Johnson said. “In its time, the RQ-4 introduced us to new concepts, new capabilities, and new challenges. No longer were pilots constrained by flight duty period and fatigue, nor were aircraft constrained by landing visibility.”

While the Global Hawk test campaign at Edwards AFB may have concluded, the RQ-4’s Global Vigilance mission continues. Production and flight test on the RQ-4 family of aircraft continues at 412th Test Wing’s Air Force Operating Location Plant 42. The RQ-4 and its related variants are anticipated to serve the U.S. and allied partner nations in a variety of roles throughout the coming decades.

Air Force photograph by Giancarlo Casem

Fire trucks from the 812th Civil Engineer Squadron provide a water salute to an RQ-4 Global Hawk.



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“When we started this project, my personal impression of this industry was ‘We’ll package these batteries and accept that they will fail once in a while, and you might have damage to aircraft or even more critical failure,’ but the X-57 team couldn’t accept that,” said Sean Clarke, Principal Investigator.

“We’ve got NASA pilots sitting with these batteries right behind their seats.”

Clarke said the team pushed the battery industry to deliver a more reliable product, and as a result, batteries have improved. He said that their industry partners like Empirical System Aerospace and Joby Aviation “continue to innovate” and that “the risk of battery failure is greatly reduced.”

The primary goal of the X-57 project was to provide knowledge about the aircraft’s electric-propulsion-focused design and airworthiness process with regulators. NASA employees share their knowledge and participate in industry standard groups and other technology groups working to create certifications

“We did not set out to build an aircraft ... we want to build an industry,” said Vince Schultz, deputy project manager for the X-57 Maxwell. “We want to help a young industry to form industry standards.”

Knowledge from the X-57 project has, and will continue to, impact the development of advanced certification approaches for electric propulsion in emerging electric aircraft markets. The objective was not to develop a prototype, but to develop a test platform for technologies and design methods. And the team did, documenting and publishing the technology gaps and their solutions as they were discovered so that industry stakeholders could take advantage of those lessons as soon as possible.

“They did things that had never been done before, and that’s never

easy,” Flick said. “While we prepare to finish this project later this year, I see a long list of achievements to celebrate and an industry that’s better today because of their work.”

Although most of the X-57’s development will be complete by September 2023, the team will officially conclude its work several months afterward with additional technical publications.

The X-57 is part of NASA’s commitment to supporting the U.S. climate goal of achieving net-zero greenhouse gas emissions from the aviation sector by 2050. Since 2016, the project has shared lessons learned about battery technology, electromagnetic interference, motor controller design, and so much more. NASA will continue its research into electric aircraft through other projects, including its Electrified Powertrain Flight Demonstration.

The aircraft was built by modifying an Italian Tecnam P2006T to be powered by an electric propulsion system. Using an existing aircraft design allowed the team to compare their data to that of a baseline model powered by traditional combustion engines.

Early in the project, the X-57 team members found they would need significant developments in battery technology. The lithium-ion batteries installed on the aircraft warm up as they discharge energy and too much warming could result in overheating. The project worked with Electric Power Systems in North Logan, Utah to address this issue. Engineers demonstrated that the new battery system design would stay within acceptable, safe limits while powering the aircraft.

The design of the cruise motor controllers is another success of the X-57 project. These controllers convert energy stored in the aircraft’s lithium-ion batteries to power its motors, which drive its propellers.



NASA photograph by Lauren Hughes

NASA’s X-57 lithium-ion batteries are installed in the aircraft in 2022.

The controllers use silicon carbide transistors to deliver 98 percent efficiency intended for high power take-off and cruise, meaning they do not generate excessive heat and can be cooled off by the air flowing through the motor.

The team designed inverters to meet demanding mass and thermal requirements and are sharing these designs in technical publications so that industry can use them as a launchpad for new aircraft products. Most recently, the cruise motor controllers went through successful thermal testing.

During the integration phase the team encountered electromagnetic interference that affected the operation of onboard systems and re-

quired a solution. After extensive research the team designed, developed, and installed filters that resolved the issue. The approach will be added to the technical papers and shared with industry and the electric propulsion community.

The value of the pathfinding work done on the X-57 project is

well established and recognized by industry. Additional research findings will continue to be published and shared with the technical community. A list of the contributions X-57 has made to-date can be found at the technical papers site at <https://www.nasa.gov/aeroresearch/utm-tech-docs-papers-presentations>.

“We did not set out to build an aircraft ... we want to build an industry,” Vince Schultz, deputy project manager for X-57 Maxwell.



NASA photograph by Carla Thomas

NASA’s X-57 all-electric aircraft in the Mod II configuration undergoes high-voltage testing in 2021.



NASA photograph

NASA Glenn’s Susanah Kowalewski prepares a cruise motor controller for testing.

Universal Hydrogen lands at Mojave Air and Space Port

by Cathy Hansen
special to Aerotech News

Universal Hydrogen successfully completed a ferry flight of its hydrogen fuel cell-powered turboprop aircraft to the Mojave Air & Space Port from Moses Lake, Wash., on June 26, 2023. The company plans to build a substantial presence in Mojave to continue its test flight efforts.

"In our relentless pursuit to decarbonize aviation, moving our flight testing to Mojave brings us closer to our headquarters in Hawthorne, Calif., ensuring optimal coordination with the team," says Mark Cousin, CTO of Universal Hydrogen.

Dash-8 is a modified 40-passenger regional airliner, powered on one side by a hydrogen fuel cell powertrain. The test aircraft has been dubbed "Lightning McClean" and flew down the West Coast with four stops across Oregon and California, covering 800 nautical miles before landing at Mojave.

A few Mojave tenants were told in advance of the historic flight and were on hand to welcome the crew and aircraft to Mojave Air and Space Port.

Universal Hydrogen said in a press release that they are making hydrogen-powered commercial flight a near-term reality. The company takes a flexible, scalable, and capital-light approach to hydrogen logistics by transporting it in modular capsules over the existing freight network from green production sites directly to the airplane anywhere in the world. The company is targeting regional and narrowbody/

single aisle airplanes as the near-term and most impactful decarbonization opportunities. Universal Hydrogen is also working to certify a powertrain conversion kit to retrofit existing regional aircraft to fly on hydrogen.

According to the company, they are achieving true zero-emission aviation with renewable hydrogen, and have selected the Mojave Air and Space Port to be their new flight test center. The plan is to conduct additional test flights gearing up to enter commercial service in late 2025.

This move signals the next phase in its extensive flight-testing regimen. Since its initial successful flight test on March 2, earlier this year, Universal Hydrogen has achieved four subsequent test flights, maintaining its planned trajectory for the two-year flight test campaign expected to culminate in 2025.

During its second flight, the converted aircraft achieved a 30-minute flight at 170 knots of indicated airspeed (KIAS), ascending to 5,000 feet. Further strides were made in the third and fourth flight tests completed on June 12, where the aircraft reached altitudes of 10,000 feet.

"We extend our gratitude to Washington State and specifically Moses Lake for their invaluable support as we began our historic test flights with the largest hydrogen fuel cell-powered aircraft. Our calculated testing strategy guarantees the safety of our converted aircraft, propelling us towards our goal to have it in service within the next two years," said Cousin.

Moving closer to Universal Hydrogen's global headquarters in Hawthorne, and moving the aircraft and flight test activities to Mojave represents a substantial increase in its presence



Universal Hydrogen photograph

in the state and will allow the company to take advantage of a strong engineering talent pool in Mojave as well as nearby Los Angeles.

"Bringing Universal Hydrogen to the Mojave Air and Space Port is a big win for us and the local community," said Tim Reid, general manager of the facility. "With their research and development, Universal Hydrogen's technology will be a total game changer for zero emission flight within the next decade, meeting the environmental goals of California while advancing the industry with a new, sustainable

energy source. We are extremely excited to have Universal Hydrogen testing their concept at the Space Port."

California is a leader in both renewable hydrogen production as well as sustainable aviation, the press release said. The state has announced its participation in the U.S. Department of Energy Hydrogen Hubs competition through the creation of the Alliance for Renewable Clean Hydrogen Systems (ARCHES), of

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which Universal Hydrogen is a partner and sponsor, and the state has previously provided the company with a \$5 million development grant through the California Office of Business Development – aka “GO-Biz”. The move of the company’s test flight efforts to California is greeted with anticipation and excitement from California officials.

“Universal Hydrogen is proving that true zero emission is achievable with renewable hydrogen even in a sector like aviation, which is difficult to decarbonize,” said Chair David Hochschild of the California Energy Commission. “Basing their test flight operations in Mojave will supercharge a site of significant aviation and space history and create good-paying jobs for Californians as we ramp up our efforts to combat climate change.”

Dee Dee Myers, GO-Biz director and senior adviser to California Governor Gavin Newsom said, “Universal Hydrogen expanding their footprint in California will help us achieve our ambitious targets on carbon reduction while bolstering our nation-leading, green economy,” said. “We welcome these types of innovative companies growing their presence here and look forward to watching their exciting progress in the coming years.”



Universal Hydrogen photograph

The Universal Hydrogen Dash-8 aircraft sits on the flightline at the Mojave Air and Space Port June 26, 2023. Universal Hydrogen will soon start flight testing their concept for hydrogen-powered commercial flight. The Dash-8 is powered on one side by a hydrogen fuel cell powertrain.

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Three generations of breaking barriers: T-7A Red Hawk soars with U.S. Air Force test pilot

Maj. Bryce Turner, a test pilot from the 416th Flight Test Squadron at Edwards AFB, Calif., has achieved a historic feat by becoming the first Air Force pilot to fly the T-7A Red Hawk.

On June 28, 2023, the aircraft lifted off at 11:51 a.m., CST, during a test flight at the Boeing aircraft delivery center in St. Louis, Mo.

The T-7A is a brand-new, state-of-the-art pilot training system created specifically for the Air Force, with the purpose of training future fighter and bomber pilots. The aircraft is the first digitally designed tactical aircraft, finessed using model-based systems engineering and 3D design tools.

The aircraft will replace the 1950's era T-38 Talon, providing the next generation of warfighters the training capability needed to face current and emerging threats. The T-7A is affectionally crimsoned "Red Hawk" as a homage to the iconic Tuskegee Airmen.

The accomplishment of flying this unique aircraft adds another chapter to the Turner family's rich legacy of aviation firsts.

As a third-generation Air Force fighter pilot, Turner follows in the footsteps of his grandfather, Lt. Col. (Ret.) Alexander Parker Turner, one of the first African American jet pilots in 1956, and his father, Col. (Ret.) Bryan Turner, the first African American F-22 pilot. His call-sign, affectionally known as "Triple," reflects these three generations of Airmen.

Turner's journey is a testament to his exceptional aptitude for aviation and unwavering determination. From an early age, his passion for flying was ignited as he watched his father perform with the Viper Demo Team at Misawa Air Base, Japan. With a strong affinity for problem-solving and mathematics, Turner pursued engineering studies at the Uni-



Boeing photograph

Maj. Bryce Turner, 416th Flight Test Squadron became the first Air Force pilot to fly the T-7A Red Hawk, following a test flight at the Boeing aircraft delivery center in St. Louis, Mo., June 28, 2023.



Boeing photograph

A T-7A Red Hawk, piloted by Maj. Bryce Turner, 416th Flight Test Squadron, takes off from St. Louis Lambert International Airport, St. Louis, Mo., June 28, 2023. During the flight Turner became the first Air Force pilot to fly the T-7A.

versity of Virginia, ultimately earning a degree in Aerospace Engineering while participating in the Reserve Officer Training Corps.

His aviation career took off when he was selected for Air Force pilot training,

progressing through various programs that included flying the T-6, T-38 and F-16. Turner's journey took a poignant turn when he had the opportunity to fly the same T-38 tail number his father had flown decades earlier.

After serving in operational assignments as an F-16 fighter pilot at Kunsan Air Base, Korea, and Aviano Air Base, Italy, Turner set his sights on attending the prestigious United States Air Force Test Pilot School to pursue his dream of testing cutting-edge technology. With the counsel of a close friend from the University of Virginia ROTC, who had previously attended TPS, Turner successfully navigated the application process and earned admission.

Joining class 20A at TPS in January 2020, Turner excelled in all aspects of the program, developing a particular passion for flight sciences. The Qualitative Evaluation program, a highlight of the curriculum, exposed him to a wide range of aircraft, including the T-33, the same jet his grandfather had learned to fly in 1958.

Following his graduation from TPS, Turner was assigned to the 416th FLTS at Edwards, where he conducted flight tests on the F-16. It was during this time that he discovered a close connection to his family legacy when he met Mark Sherrier, a long-time civilian pilot at the 416th, who had flown alongside and fought in Operation Allied Force with Turner's father. The tight-knit community at Edwards ensured Turner contin-

ued to find connections to his family's aviation heritage.

As his career progressed, Turner seized the opportunity to work on the emerging T-7A, a chance to apply his aerospace engineering expertise while conducting flight sciences testing. This

opportunity perfectly aligned with his experience in high-angle-of-attack flight tests and pilot training on the F-16.

"The T-7A program combines my engineering problem-solving abilities with the ability to carry on my family's aviation legacy," Turner said. "The T-7A

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Boeing photograph by Todd Schannuth

Maj. Bryce Turner, 416th Flight Test Squadron trains in a flight simulator before becoming the first Air Force pilot to fly the T-7A Red Hawk, prior to a test flight at the Boeing aircraft delivery center in St. Louis, Mo., June 28, 2023.



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July 16, 1969: The Apollo 11/Saturn V launch vehicle launched from Launch Complex 39A, Kennedy Space Center, Cape Canaveral, Fla. On board were Neil Alden Armstrong, Mission Commander; Michael Collins, Command Module Pilot; and Edwin E. Aldrin, Jr., Lunar Module Pilot. Their destination was Mare Tranquillitatis, the Moon.



July 17, 1989: The Northrop B-2A Spirit stealth bomber made its first flight at Air Force Plant 42, Palmdale Calif. The crew was Northrop Chief Test Pilot Bruce J. Hinds and Air Force Col. Richard Couch. This marked the first time that a flying wing aircraft had flown over the Mojave Desert in nearly four decades.



July 20, 1982: The first flight of the F-16XL took place. General Dynamics modified a FSD F-16 to answer a U.S. Air Force requirement for a dual-role, longer-range fighter to support future air combat requirements. The F-16XL featured a cambered, cranked-delta wing with a sharp leading-edge sweep with twice the area of the original wing.

July 17, 1965: The second North American XB-70 Valkyrie 2 (62-0207) arrived at Edwards Air Force Base, Calif., following its maiden flight from Air Force Plant 42 in Palmdale, Calif. The Valkyrie was designed as a Mach 3+ strategic bomber, capable of flight above 70,000 feet, with intercontinental range.



July 21, 2001: The XCOR EZ-Rocket, flown by Dick Rutan, made its first flight. The EX-Rocket was a test platform for the XCOR XR-4A3 rocket propulsion system. The airplane was a modified Rutan Long-EZ, with the propeller replaced by first one, then later a pair of pressure-fed regeneratively cooled liquid-fueled rocket engines and an underslung fuel tank. The engines were restartable in flight, and were contained within Kevlar armor shielding. The EZ-Rocket was registered as an experimental aircraft.

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is breaking barriers by accommodating a broader range of aircrew in terms of cockpit and ejection seat dimensions.”

According to Turner, aircraft design has historically excluded many women and non-standard body types from becoming tactical pilots due to inadequate ejection seat dimensions. Turner has a personal connection to this issue from his great aunt, who was best friends with Lt. Col. (Ret.) Theresa Claiborne, the first African American female pilot in the Air Force. In addition to its agile design, the T-7A will accommodate a much broader range of physical dimensions in the cockpit. The re-designed cockpit and ejection seat represents a significant step towards inclusivity, while eliminating barriers

that prevented many from pursuing tactical pilot training.

“To the next generation of aviators, I can safely say I am jealous” notes Triple. “This aircraft’s performance, commitment to pilot safety, and ground-based training system is something I could only dream of during my time in flight training. The T-7A performs like a fighter!”

With his remarkable achievements and dedication to pushing boundaries, Turner embodies the spirit of innovation and excellence that defines the Air Force. An integrated team of 416th FLTS and Boeing personnel will continue initial flight testing of the T-7A in St. Louis before ferrying the aircraft to Edwards later this year.



Boeing photograph

Maj. Bryce Turner, 416th Flight Test Squadron, conducts a walk around of a T-7A Red Hawk at the Boeing aircraft delivery center in St. Louis, Mo., June 15, 2023. Turner became the first Air Force pilot to fly the T-7A Red Hawk, following a test flight at the Boeing aircraft delivery center in St. Louis, Mo., June 28, 2023.



Boeing photograph

Maj. Bryce Turner, 416th Flight Test Squadron, takes a photo with his family after becoming the first Air Force pilot to fly the T-7A Red Hawk, following a test flight at the Boeing aircraft delivery center in St. Louis, Mo., June 28, 2023.



Boeing photograph

Boeing test pilots conduct taxi tests of the T-7A Red Hawk at the Boeing aircraft delivery center in St. Louis, Mo., June 22, 2023. Turner became the first Air Force pilot to fly the T-7A Red Hawk, following a test flight at the Boeing aircraft delivery center in St. Louis, Mo., June 28, 2023.



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Edwards stands up Air Dominance CTF for next-gen testing



Lockheed Martin photograph by Kyle Larson

F-22 Raptors assigned to the 411th Flight Test Squadron, 412th Test Wing, out of Edwards Air Force Base, Calif., conduct a test sortie over the Pacific Ocean, Feb. 3, 2023.



Air Force screenshot

Lt. Col. Michael Coleman formally assumed command of the 411th Flight Test Squadron from Lt. Col. David Schmitt, during a change of command ceremony on Edwards Air Force Base, Calif., June 9, 2023. The transition showcased another milestone for Edwards AFB.

The F-22 Raptor Combined Test Force has formally transitioned into the Air Dominance Combined Test Force and will be tasked with flight testing the Next Generation Air Dominance (NGAD) Family of Systems.

While the Air Dominance CTF will continue to test enhancements for the F-22 to maintain lethality against immediate threats, work will also include planning and execution of integrated flight test campaigns for the NGAD Family of Systems.

“The establishment of the Air Dominance CTF shows that we are becoming more integrated and more lethal, while also shaping the future of air combat. We do not fight as individual platforms, but rather we leverage a system of systems approach across the entire kill chain. We will be an integral part of fielding a family of innovative platforms and systems through NGAD that will enable the Air Force to control the skies in a highly contested environment,” Coleman said.

The mission will utilize Edwards’ established ability to leverage shared resources across the test enterprise to ensure safe and cutting-edge capability for the warfighter. “In April, we celebrated 70 years of having zero combat losses due to an aerial attack,” Coleman said. “This CTF is laser focused on ensuring that legacy continues”.

The Air Dominance CTF is comprised of representatives from Developmental Test, Operational Test, the program offices, and support contractors. The convergence of DT and OT allows the CTF to test systems against contracted design, while simultaneously testing for real-world operational environments. This combined test environment allows capability delivery at the speed of relevance for the war fighter.



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Seeking Volunteers
for Base Advisory Board Positions

Edwards Air Force Base officials are seeking volunteers to represent the

Boron, NASA Armstrong, North Base, North Edwards and South Base communities

on the Restoration Advisory Board. The RAB facilitates two-way communication between the public and those responsible for environmental cleanup at Edwards AFB. Volunteer representatives are not expected to be environmental experts.


Responsibilities
A RAB public representative acts as a conduit for environmental cleanup information. Responsibilities include distributing a quarterly newsletter and meeting flyers, in addition to attending semiannual meetings. Applicants should be accessible within their respective area and willing to publicize contact information. Community concerns or questions can be addressed by the representative or referred to the Air Force Civil Engineer Center's Installation Support Section at Edwards AFB.

Requirements
Individuals interested in serving on the RAB must be at least 18 years of age and work or live in the area they seek to represent. Terms of service are two years in length. Military members, civil service and contract employees are welcome to apply.

Applications
Applications are available by contacting Gary Hatch, 412th Test Wing Public Affairs, at (661) 277-8707 or by e-mailing 412tw.rab@us.af.mil.

Applications will be accepted until the positions are filled.
For additional information, contact Gary Hatch or Alexis McCadney (BB&E) by e-mailing 412tw.rab@us.af.mil.

Air Force Civil Engineer Center, Installation Support Section, Edwards Air Force Base, California



Paid Public Announcement

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Willie the Whale

by Bob Alvis
special to Aerotech News

Many aircraft over the years made their way out to Muroc/Edwards AFB for flight testing, and the Douglas Aircraft Company was a constant presence out at the lake as their inventory of aircraft and test flight programs grew over the years.

One such aircraft that today is pretty much in the shadows was the F3D Skyknight.

The Skyknight was not intended to be a typical sleek and nimble dog-fighter, but as a standoff night fighter, packing a powerful radar system and a second crew member. It originated in 1945 with a U.S. Navy requirement for a jet-powered, radar-equipped, carrier-based night fighter.

Pictures of my dad at the base from back then show one of the prototypes behind the flight-test crew and pilots, back when the trips to the base from Clover Field, Long Beach and El Segundo required temporary housing and long trips back and forth on the old two-lane road out to the base.

The first flight of the XF3D-1 was on March 23, 1948, at the Douglas El Segundo, Calif., facility with test pilot Russell Thaw at the controls. Further flight testing followed at El Segundo until October 1948.

Three prototypes were then taken to Muroc Air Force Base for service trials. These units were powered by two Westinghouse J34-WE-24 turbojets of 3,000 lbf thrust, mounted under the roots of then-standard straight wings of the early jet era. A production con-



Courtesy photograph

My dad and the flight test crew at Edwards with the Skyknight.

tract for 28 F3D-1 J34-WE-32 powered production aircraft was issued in June 1948 with the first production aircraft flying on Feb. 13, 1950.

The F3D-1 had a very successful test program and with another war brewing over in Korea, the design started to get some real hard looks from the Navy and Marines. The changing landscape of aerial warfare was taking a new direction and a jet nightfighter was needed to offset the development of next-generation jet fighters from foreign nations.

At the time, the Skyknight and those developing it probably didn't realize their creation would play a part in over

two decades of American combat involvement.

The Douglas F3D Skyknight entered its first combat service during the Korean War, where it served extensively. The aircraft was mostly pitted against the propeller-driven fighters as well as normal jet-power fighters of the era. When it was not used for nighttime patrols or striking missions, it was used as an escort for the Boeing B-29 Superfortress.

For the standard armament configuration, the Douglas F3D Skyknight was fitted with four of the 20 mm Hispano-Suiza M2 Cannons that were fitted in its lower fuselage's forward section.

The world's very first jet-powered nighttime fighter kill was recorded on Nov. 3, 1952, by a U.S. Marine Corps Douglas F3D Skyknight. The aircraft went on to destroy four of the Soviet-built MiG-15 Fagot jet fighters.

Douglas produced 268 Skyknights, including several conversions to special-duty variants. One Marine Corps night fighter squadron went on to rack up the best nightfighter record of the Korean conflict.

After 1953, Skyknights were converted as trainers for radar intercept officers and for use as electronic reconnaissance and countermeasure aircraft during the Cuban Missile Crisis and the Vietnam War. The Skyknight was the only Navy/Marine fighter to fly combat missions in both Korea and Vietnam, and the last was retired in 1978.

Being a Navy Marine aircraft for its operational life towards the end of its career, I bet it never thought it would end up flying the colors of another branch of the military, but it did.

In 1968, three Skyknights were transferred to the U.S. Army. These aircraft were operated by the Raytheon Corporation at Holloman AFB, N.M., where they were used for testing at the White Sands Missile Range into the 1980s; they were the last flyable Skyknights.

Looking back at the old bird, the

sleek lines of evolving aircraft after World War II made this design gain the nickname Willie the Whale. But its design proved to be the correct one as it met all the requirements the Navy was looking for in one package. It would never win a beauty pageant, but it sure won a lot of air-to-air victories and had an outstanding record of bringing its crews home safe.

The Edwards Flight Test Museum has tucked away one of the few survivors of the Skyknight program to someday become part of their new museum complex. Willie the Whale didn't have sexy lines like many of those futuristic looking craft at the base. But this old survivor that never really got much press, became one of the most successful aircraft designs ever to fly in defense of our country.

The production of the Douglas F3D Skyknight started back in 1949, and the day it retired there were only a total of 265 of these manufactured in all their variant forms. The reason for developing the Douglas Skyknight in such low numbers was that it was not exported outside of the United States, and truly became an American-only champion of the sky and another part of our local history at Edwards that flew in our skies as it stretched its wings.

Until next time, Bob out ...



Courtesy photograph

The Skyknight in flight at Southbase, Edwards Air Force Base, Calif.



Courtesy photograph

A glamour look of the proven night fighter from the Korean war.



Courtesy photograph

A very tough old bird showing a lot of wear on its airframe.

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Business & Professional Code Section 21700-21707

Notice is hereby given by the undersigned that a public lien sale of the following described personal property will be held at the hours of **12 noon on the 19th day of July 2023** or thereafter. The auction is being held at **www.selfstorageauction.com** by competitive bid. The property is stored by **Nova Storage located 825 W Avenue L12, Lancaster, CA 93534.**

The items to be sold are generally described as follows: Furniture, clothing, tools and or other household items stored by the following persons.

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0149 Stine, Robert
0265 Crumb, Amy
0067 Scott, Alfred
0301 Vargas, Paulina
0573 Vasquez, Stephanie
0426 Corbett, Michael
0559 Crumb, Amy
0560 Winston, Ylonda
0611 Crumb, Amy
0557 Crumb, Amy

June 23rd, 2023 Signed NOVA STORAGE

This notice is given in accordance with the provisions of section 21700 et seq. of Business & Professional Code of the State of California. The owner reserves the right to bid at the sale. All purchased goods are sold "As Is" and must be paid for and removed at the time of sale. Sales subject to prior cancellation in the event of settlement between owner & obligated party. Auctioneer: Nova Storage

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E398 Payton, Florence
B107 Mahoney, Kaitlyn
E396 Lopez, Justin
D155 Arella, Elynita
G608 Gallardo, James
G586 Duran, Tracy
B102 Sarran, Kester

June 23rd, 2023 Signed NOVA STORAGE

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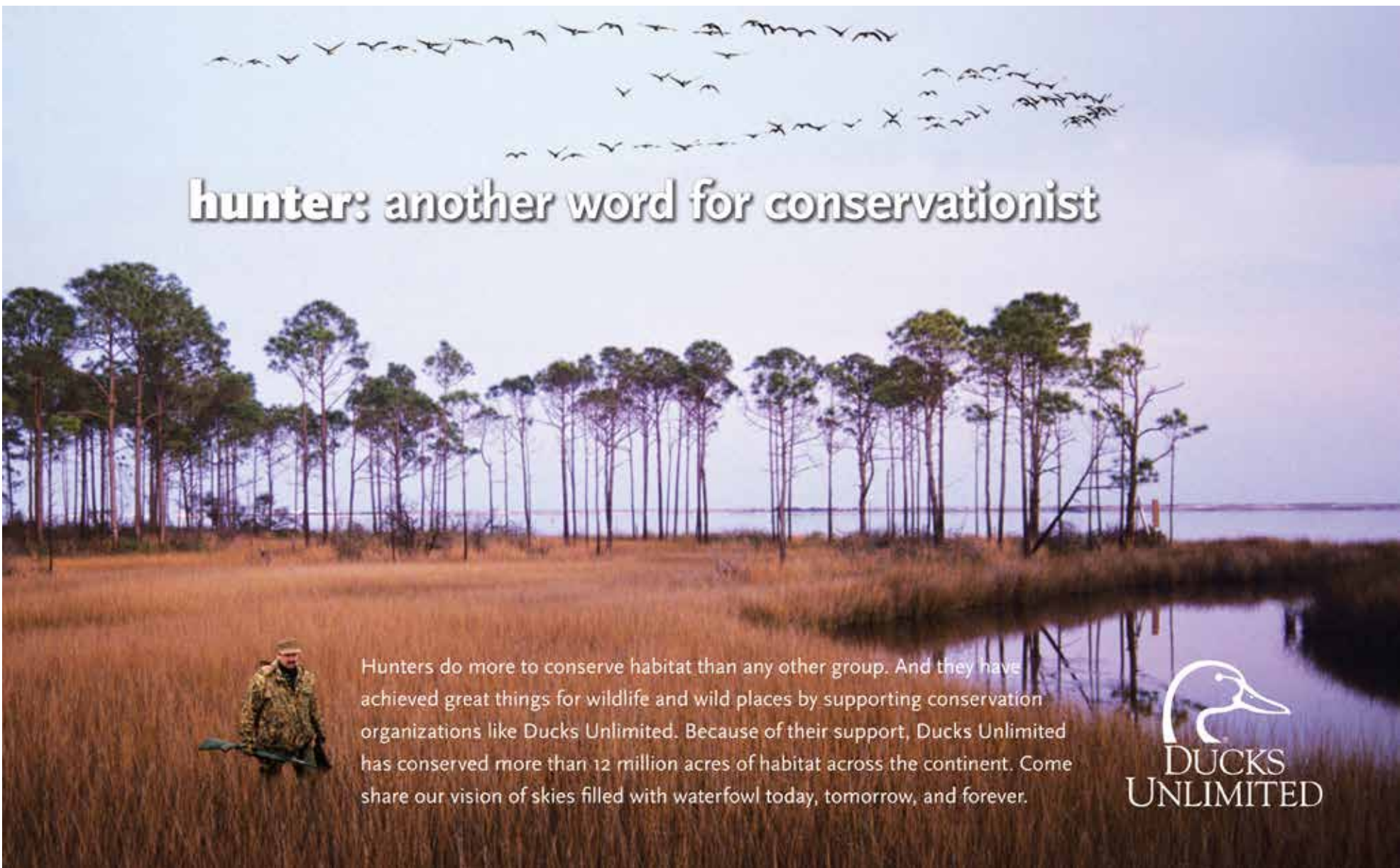
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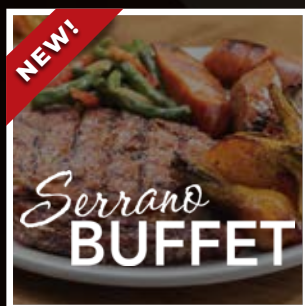
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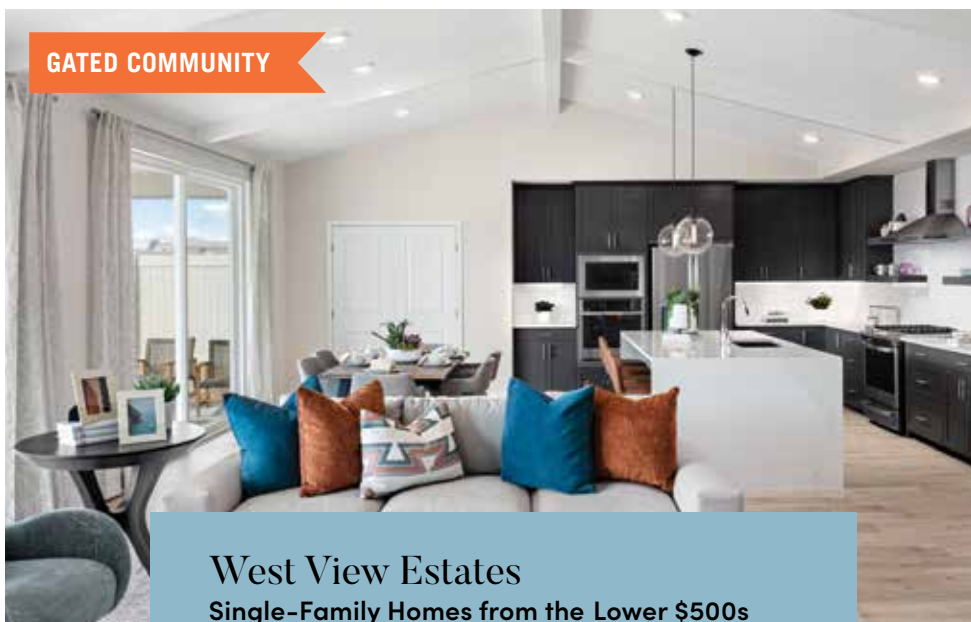


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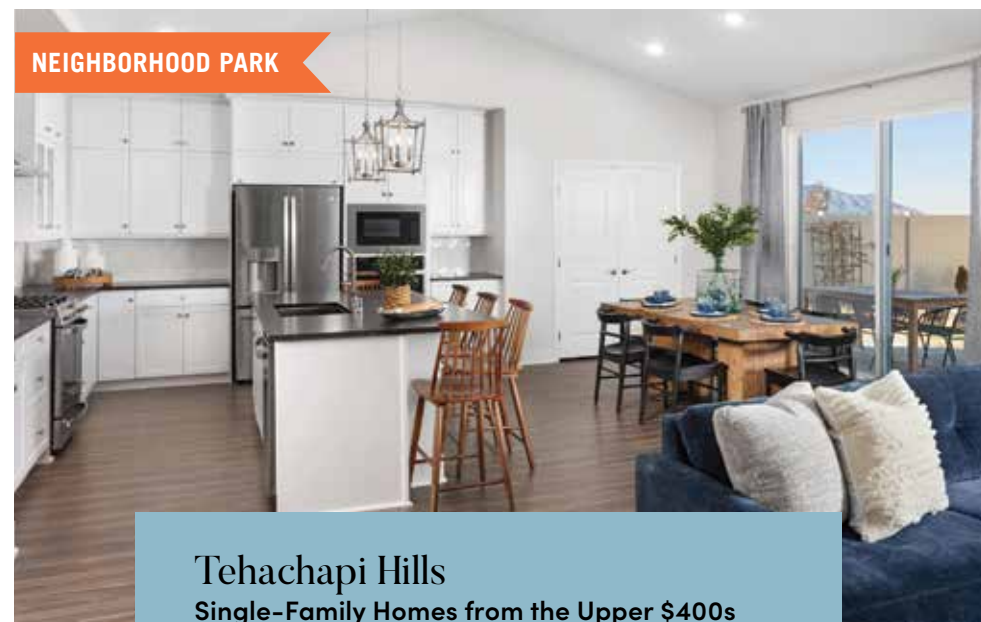
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