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AIR & SPACE FORCES

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A Falcon 9 rocket carrying the Starlink 10-50 mission successfully launches from Space Launch Complex 40 at Cape Canaveral Space Force Station, Fla., in July. See "Launch Boom," p. 54.

ON THE COVER



U.S. Central Command Public Affairs

U.S. forces participated in live-fire Patriot missile launches during an exercise in Kuwait last December. U.S. and allied Patriot batteries have expended hundreds of missiles since then to defend against Iranian ballistic missile attacks.

By Tobias Naegele

The Lost Quarter Century

When Al Qaeda terrorists turned commercial airliners into cruise missiles on Sept. 11, 2001, killing more than 3,000 people in New York, Washington, D.C., and Pennsylvania, our military was ready and ripe for the challenge.

The first American bombs struck enemies in Afghanistan 26 days later; five weeks after that, the Taliban government collapsed and Al Qaeda was in hiding.

Our allies rallied. NATO E-3 Sentry Airborne Early Warning and Control jets from Europe patrolled our skies in Operation Noble Eagle, the only time in history that NATO members invoked Article 5 of the treaty, which holds that “an armed attack against one or more ... [members] shall be considered an attack against them all.”

Though neither terrorists nor any foreign power again threatened American airspace at that time, their partnership brought us peace and reassurance. We felt better knowing they were there.

We needed NATO's help because we'd sent our E-3s to war. In retrospect, this was a canary in the coal mine, an indication that USAF lacked the capacity to defend our homeland while simultaneously supporting combat operations overseas.

The next 25 years were disastrous for our military air and space enterprise. Decades of nonstop military operations exhausted the Air Force, and the cost of ongoing ground operations led the Pentagon to delay and sometimes forgo modernization. The Air Force contracted as adversaries watched, learned, copied, and countered everything it did or could do.

Now the war with Iran has exposed even deeper fissures in U.S. military readiness. Both the Air Force and the Navy had to extend deployments to nine months or more because they lacked the ready forces to relieve them.

The Pentagon raided weapons magazines in every part of the world to ensure munitions didn't run out in the Middle East, leaving weapons inventories dangerously low while simultaneously increasing risks in every other region. The President's military options appear limited not just in the Strait of Hormuz, but worldwide.

Not since the hollow-force days of the post-Vietnam military have we suffered such a readiness deficit.

Yet there is reason for optimism. From those dark days in the '70s emerged a more confident and capable America and the military that broke the Soviet Union, expelled Iraq's army from Kuwait, and rescued Kosovo Albanians from Serbian genocide.

We can rise again, if we look to the past. In the 1980s, the Reagan administration worked closely with Democrats in Congress to accomplish much that seemed unimaginable at the time: ending years of double-digit inflation, solving a Social Security crisis, and rebuilding the military with weapons purchases on a scale our nation has not seen since. Along the way, they restored American confidence. It is notable that those problems are essentially the same as we face today.

Restoring our military strength and international standing is Job One and is a bipartisan concern. To deter Iran, North Korea, Russia and China, the U.S. must present a credible conventional as well as nuclear deterrent. We need the means to wage and sustain war longer than our adversaries. Right now, we can't, and it shows.

Though still superior technologically, our military forces are shrinking while others grow and innovate. China's air force is approaching technological parity and scale. Our Air Force needs both capacity and capability to regain the advantage in the air.

Training and readiness must be restored. Air Force leadership must back words with funding, buying the parts and driving the

schedule to ensure Airmen are training as they did in the 1980s. In those days, training was America's secret weapon, even more than technological prowess. Our forces weren't just better equipped; they were better prepared.

Congress returns to Washington in September having already given up trying to pass a budget in time for the fiscal year's start on Oct. 1. They've already approved a continuing resolution. These unpredictable stopgap spending measures contribute to the readiness crisis and delay needed solutions. CRs lock in prior-year spending levels, blocking new starts and increased investments exactly when speed is demanded.

The Air Force and Space Force are the cornerstones on which rest our entire defense enterprise. No joint force operations can be conducted without one or both of those services. Their health and readiness are foundational and must be prioritized.

In space, the U.S. can no longer claim unique advantage. Iran's access to space surveillance enabled its attacks on U.S. bases in the Middle East, inflicting pain on the U.S. that was not possible in decades past. China and Russia pose far more dangerous challenges, including the ability to attack our satellites in orbit.

A united Congress must appropriate the full \$71.1 billion the Pentagon requested for the Space Force in fiscal 2027, ensuring resilient space systems that can fight through attack as well as counter-space technologies that can disrupt adversary kill chains.

Revitalizing the Air Force is an even greater challenge. It has atrophied and will need a massive capital injection to recover. China's technological progress and its coming numerical superiority threaten USAF's standing as the world's biggest and best airpower. That's not a position America should be willing to surrender. The Pentagon's 2027

budget request increased by nearly 50 percent, yet somehow the Air Force's share rose only 22 percent—less than half.

Congress must therefore correct the Pentagon's misallocation:

- Buy at least 60 F-35A stealth fighters, ramping up to 100 annually, while also buying as many F-15EXs as possible. Mass matters.

- Replenish the MQ-9 fleet, directing the Air Force to acquire MQ-9Bs as replacements now rather than waiting for future promises to perhaps come true in five or more years. The airborne ISR gap needs combat-proven MQ-9s available now; we can debate next-generation alternatives while that's happening.

- Lay the groundwork to recapitalize the rest of its geriatric air fleet. E-7 Wedgetail Air Battle Management jets, new tankers, and a plan for next-generation airlift are all overdue.

- Buy weapons at scale. The Pentagon is rightly investing billions to develop new, less costly munitions and to commit to longer-term contracts to ensure a steady supply of both current and future weapons. Our fighters and bombers are ultimately only as good as the weapons they carry and only useful if those weapons are available.

- Don't forget the people. At the heart of every enterprise are the people who make it run. Recruiting has improved but is always fickle. Retention is dependent on families. Fixing structural problems with the basic allowance for housing and the shortage of affordable, quality childcare is crucial to long-term talent retention.

The Air Force went from broke to awesome in the 1980s, turning around the enterprise in a decade. We can and should today do that again today. In World War II, it took two years to field a force that could defeat the Axis Powers. In a future war, we won't have that time. Only by investing now can we hope to deter war tomorrow.

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LETTERS

The Guts to Try

I was heartened by the language Gen. Dan Caine used for the toast to the Doolittle Raiders ["Verbatim: A Hero's Toast," May/June, p. 12]—"They proved that if you have the guts to try, great things can be done by the United States of America."

I wonder if General Caine knows that "The Guts to Try" is the motto of the 1st Special Operations Wing, based at Kadena Air Base, Japan. This motto was adopted by the 1st SOW after their participation in the failed 1980 Operation Eagle Claw mission attempting to rescue the 52 American hostages held in Tehran.

The motto was taken from the handwritten note on the top of two cases of beer given to crews by a detachment of British airmen after they returned to Masirah Island the next morning. It read: "To You All, From Us All, For Having The Guts To Try." I was an MC-130E pilot in the 1st SOW, when it was at Clark Air Base, Republic of the Philippines, from 1983 to 1986.

The Doolittle Raid was one of history's greatest Air Force Special Operations missions. John Wayne once said, "Courage is being scared to death—and saddling up anyway."

The guts to try indeed.

Maj. Harold L. Gilbert,
USAF (Ret.)
Tampa, Fla.

History Repeats Itself

Regarding the May/June 2026 Almanac issue's editorial, "Go Big on Airpower, p. 2," I agree with your demand to fully modernize the Air Force's aging fleet. That is why I totally disagree with your statement that the B-52H Stratofortress bomber and KC-135 Stratotanker, which have both been flying for over 60 years, "remain crucial elements in American Airpower."

WRITE TO US

Do you have a comment about a current article in the magazine? Write to "Letters," *Air & Space Forces Magazine*, 1201 S. Joyce St., C6, Arlington, VA 22202-2066 or email us at letters@afa.org. Letters should be concise and timely. We cannot acknowledge receipt of letters. We reserve the right to condense letters. Letters without name and city/base and state are not acceptable. Photographs cannot be used or returned.

Both are Cold War relics that belong in the Davis-Monthan Air Force Base, Ariz., Boneyard, with occasional guest appearances on "Antiques Roadshow." I got a close-up and personal look at both aircraft while stationed at Loring Air Force Base, Maine, from 1964 to 1966.

As a public affairs officer for the Strategic Air Command's 42nd Bomb Wing, I accompanied reporters on KC-135 "orientation flights," and I flew on a B-52H as an observer after completing altitude chamber training at Westover Air Force Base, Mass. I'm glad the Air Force is retiring some KC-135s. But I'm stunned that the Air Force plans to extend the life of all 76 B-52s until 2050, at a cost of \$48.6 billion.

That money should instead be spent to buy higher volumes of new aircraft, like the B-21 Raider bomber. Trying to "modernize" the B-52 is like trying to transform a Ford Model T into a Formula One racing car.

The B-52H was a state-of-the-art warplane when I was in the Air Force, but the eight-engine behemoth is now a dinosaur of defense. It belongs in storage, not in flight.

The Air Force should spend its funds wisely on the newest aircraft, not on wasteful Cold War nostalgia.

Richard Reif
Flushing, N.Y.

Next-Next Generation

I disagree with much of Col. Kyle Pumroy's article, "Military Human Spaceflight is Key to U.S. Space Superiority" [May/

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June, p. 27], starting with the title. I found no compelling argument to support the title's premise, so I turned to the complete paper at Mitchell Institute. Not much joy there either.

It appears that the author's fundamental rationale for sending Space Force Guardians into space—military human spaceflight—is that the Chinese are doing it and they are ahead of us. He is backed by a Space Force leader who has stated that putting Guardians in space is on the service's "to-do list."

While I certainly agree with the national policy to maintain and defend our all-important space capabilities, and to achieve space superiority in both civil and military aspects, how we choose to do this is complex and evolving. To those ends, military space capabilities must deter, resist, and if necessary, employ offensive systems against an enemy. I strongly question that human military spaceflight is a "key" way to do it or that it should be a national security imperative.

While I can't imagine what might comprise lunar operations 30 to 40 years from now—including Chinese "Taikonauts" claiming territory and threatening civil space exploration—I can counsel the Space Force planners as they continue to contemplate military

human spaceflight, just as the Air Force did for over 60 years.

I note the author's statement, "Developing Guardians for human spaceflight must not compete with resources ... needed to develop remote systems to counter Chinese space activities in the near term." There will be no competition.

My human spaceflight experience (on the ground) assures me that the resources needed for military human spaceflight—near term or far term—will dominate all resources, just as they did and have always done in NASA. Some of this can be explained by our very culture, our DNA. We have demonstrated we will do everything in our power, spare no expense, and spend as much time as necessary to ensure there is no loss of life when conducting space operations. I don't know if the Chinese have the same culture.

Military human spaceflight runs contrary to the strategies being pursued by the Space Force since its inception. With the exception of resilience of unmanned on-orbit architectures, these strategies include assured access to space, rapid replenishment of space assets and others. Employing man-in-the-loop will either negate or, at best, seriously impede these strategies.

The military services have contributed immensely to past NASA human spaceflight programs by providing astronauts and other significant resources, from Project Mercury to the space shuttle. Some national security shuttle missions even employed all-military crews. The Space Force has continued this type of support on the International Space Station. The author recommends expanding this practice as a start of a Space Force military human spaceflight program.

My observation: Any astronaut who serves a NASA function is not available to perform his/her military functions, sometimes for the remainder of their careers should they elect to stay in NASA. The small Space Force workforce will be more impacted than the other services with each service member selected to be a NASA astronaut.

If the Chinese military wants to employ their humans in critical functions in near-space or even on the moon, we should cheer them on. The more Taikonauts the Chinese military employs, the more critical military space functions that rely on humans, the more vulnerable they will be to our unmanned counterforce systems.

Col. Dennis Beebe,
USAF (Ret.)
Solvang, Calif.

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A KC-46A Pegasus tanker from the New Jersey Air National Guard's 141st Refueling Squadron disappears into the summer sky over Wisconsin in August during an exercise with other Air Guard jets. The Air Force now has about 100 of 188 planned KC-46s—about 20 percent of the current tanker fleet. A follow-on deal for 75 more KC-46s is on hold until long-delayed fixes for the jet's remote vision system and boom problems are fully resolved. RVS 2.0, the upgraded camera system for boom operators, is now due next summer. The size and health of the tanker fleet continues to be a limiting factor in some combat operations.



Two U.S. Air Force F-35A Lightning IIs maneuver over desert terrain in the U.S. Central Command area of responsibility in July. The Air Force now has more than 500 stealthy F-35As, more than one of every four fighters in the inventory. With F-16 Block 40 and 50 jets showing signs of age, the Air Force will need to increase purchases of F-35s to maintain a ready combat force in the future. The Air & Space Forces Association is calling on Congress to fund a minimum of 60 F-35s in the fiscal 2027 budget.



The Air Force F-22 Raptor Demonstration Team performed at Joint Base Elmendorf-Richardson, Alaska's, Arctic Thunder Open House in August. The fifth-generation F-22 is the most powerful fighter in the U.S. inventory, and its stealth characteristics make it hard to pick up on radar. But advances in detection, especially the use of infrared sensors that can home in on the airplane's unique heat signature, are becoming more advanced and effective. Iran has used electro-optical sensors to target U.S. fighter aircraft, and Chinese researchers say they've developed IR sensors that, combined with artificial intelligence, can successfully identify and target U.S. stealth aircraft.

DOUBLE TIME



Andy Morataya

"What they are doing with what I'll call counterspace and space superiority capabilities is breathtakingly fast."

—**Lt. Gen. Douglas A. Schiess** on the threats posed by China's space efforts, during his July 16 confirmation hearing to become Chief of Space Operations.



Jud McCrehin/staff

More Please!

"We're losing ground on aircraft age and fleet size and are forced to extend some aircraft to the very last year of their engineered lifespan—and in some cases, we aren't. ... We have incredible systems, platforms, and munitions ... but we need more of just about everything. We have to keep the quality, increase the quantity, decrease the cost, and accelerate delivery."

—**Undersecretary of the Air Force Matthew Lohmeier** at the Air Force Life Cycle Management Center's annual industry gathering in July.



Jud McCrehin/staff

Ready or Not

"When General Wilsbach came in as the Chief of Staff of the Air Force, he made "fixing" one of the key elements of what we need to do, and put a spotlight on near-term readiness. ... That's driving conversations amongst the commanders back to the Air Staff about ways that we can improve our parts situation, the supply chain resiliency, weapon system sustainment, etc. ... The second piece of readiness that we're looking at is how we manage against all the other things that are going on around the world ... where we're going to take risk or how we manage the risks as we prioritize efforts in the CENTCOM region right now. ... We're taking a hard look at our exercises. ... We do 45 of those in PACAF, give or take, and that's a lot. They're all valuable. They all have benefits. But ... what are the ones that are readiness gainers? What are the ones that are maybe not ...? And then making some decisions ... just to make sure that we are preserving that readiness within our formation so that we can be responsive to our commander at PACOM as well as provide the Air Force options for other parts of the world."

—**Gen. Kevin Schneider**, Commander, Pacific Air Forces, at a Mitchell Institute Aerospace Nation event in July.

Blurred Lines

"As a transport aircraft platform, the Y-20 [airlifter] is unique to our country and will play an increasingly important role in the future. The boundaries between transport aircraft and bombers, early warning aircraft, or even electronic warfare aircraft are becoming increasingly blurred. It is possible that all these missions could be accomplished with our transport aircraft platform."

—**Pang Rongqi**, a member of China's Peoples Liberation Army Air Force, on adapting the airlifter for other roles [Global Times, Aug. 6].



Ministry of National Defense

ANYONE CAN DRIVE



Staff Sgt. Jake Jacobsen

"Not everybody that talks to a [collaborative combat aircraft] is going to be able to tell it to do everything. We come from the culture of [remotely piloted aircraft], where the pilot is in the loop between the air-plane and whoever is asking it to go do something. And with CCA, we're trying to remove that. So it'll get commands from different people—from maintenance, from air traffic control, from operators, from fighter pilots, from a lot of different folks—and then the autonomy will sort that out using its hierarchy, what we call role-based access, and then figure out exactly what action that the CCA needs to take. So ... I don't need to train every single person cradle to grave on CCA. I just need to train a few people that are already doing their jobs how to do it with CCA. So that's a huge opportunity ... but again, it's something that we haven't done before, and so it won't be without challenges."

—**Col. Scott "Cap" Dunn**, commander of the 53rd Wing, which is overseeing the Air Force's Experimental Operations Unit that is helping to develop the CCA operating concepts at Creech Air Force Base, Nev. [Mitchell Aerospace Advantage Podcast, episode 303].



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FACES OF THE FORCE



Courtesy photo.

Members of the **Alaska ANG's 176th Wing** at Joint Base Elmendorf-Richardson, Alaska, rescued the pilot of a single-engine floatplane that crashed about 25 miles south of Anchorage. An HH-60W Jolly Green II with the 210th Rescue Squadron, carrying two pararescuemen (PJ) from the 212th RS, was preparing to participate in the Arctic Thunder Open House Joint Force Demonstration on Aug. 9 when the base's Alaska Rescue Coordination Center received a signal from the 406 MHz Emergency Locator Transmitter on a Cessna 185 that crashed near Trapper Joe Lake. "The Cessna 185 basically ran out of lake on floats and went into the trees," said Master Sgt. Harry Bromley, a 212th PJ flying his last rescue before retiring. "It was upside down, and the patient self-extricated." The pilot, who wasn't named, had minor injuries.



Matthew Jurgens/USAF

Lael "Lolly" Cowell Anderson was named the 2025 Key Support Liaison of the Year at the squadron, group, center, and numbered air force levels. And that's just the beginning. She was selected as the Armed Forces Insurance Patrick Space Force Base Spouse of the Year and nominated as Air Combat Command's Joan Orr Air Force Spouse of the Year. Anderson provides support and normalcy for her family; her husband Lt. Col. Anthony Anderson, 709th Support Sq, AFTAC; and their three children, Collin, Cal, and Cami; and she also finds time to support and mentor others. Anderson authored an Air Force-wide resiliency guide that shaped lifesaving crisis intervention policy, and created an installation-wide food-aid communication strategy. "Military spouses are the silent strength behind our mission accomplishment," said Col. Gabriel Avilla, 709th Support Group commander.



Senior Airman Elise Faurote

U.S. Air Force **Senior Airman Eniola Oke**, 49th Aerial Port Squadron cargo representative, Grissom Air Reserve Base, Ind., was crowned Miss Indiana USA at the 2026 pageant. As a student, she founded the Military Outreach Society, which focuses on service, community building, veterans and their families, as well as providing mental health resources and support. Oke sees her passion for service as a key factor to her earning the title. "As a proud Nigerian American, I want to be an inspiration for young girls. It doesn't matter where you come from. You can absolutely achieve anything you put your mind to," she said. She is currently pursuing a degree in Community Health at Indiana University.



Photo illustration by Senior Airman DeQuan Simmons

Staff Sgt. Kyle Wirth, 375th Logistics Readiness Sq. fleet management and analysis journeyman, Scott AFB, Ill., pulls double duty, serving as a volunteer firefighter with the Swansea Fire Department 30 hours a month or more. After work at the 375th, he could be dispatched to a house fire, crash, or medical emergency. The parallels in both jobs are apparent. Teamwork, leadership and physical fitness, along with building trust in the community, help him live out the Core Value of Service Before Self. Wirth said, "Whether I am supporting global operations on base or responding to a local emergency down the street, my goal is to lead by example and show that we are here to support our community inside and outside the gates."



Master Sgt. Regina Young

Tech. Sgt. Andrea J. Reyes (center), an Enlisted Professional Military Education instructor supervisor, received the 2025 GEICO Military Service Award for the National Guard. Reyes, who works at the Chief Master Sgt. Paul H. Lankford Enlisted Professional Military Education Center at McGhee Tyson Air National Guard Base, Tenn., was selected from nominees representing the Army National Guard and Air National Guard nationwide. The annual award recognizes enlisted members in each of the military services and the National Guard for their achievements in their communities in addition to their work in the military. Reyes started the first Airman's Attic at McGhee Tyson ANGB, providing essential uniform items to students and staff. She organized VA home loan briefings for students, and worked on cultural and recreational events for Airmen, students, and families.

Tell us who you think we should highlight here. Write to letters@afa.org



Senior Airman Aden Brown

Prior-enlisted U.S. Space Force **1st Lt. Thomas Moriarty** takes the military's renewed emphasis on fitness seriously. At 48 years old, Moriarty set six USA Powerlifting records in April 2026 at the Hawaii State Championships. Three days a week he gets up at 3 a.m. and trains for more than two hours before reporting for duty as an operations officer. He believes fitness is about helping others realize what they are capable of. "To have the knowledge of fitness, weight management, strength training and just be able to pay that forward to everyone I come across" motivates him, Moriarty said. Consistency makes readiness sustainable.



Contributed photo

Wyatt Rabe (center) won the Air Force Institute of Technology Foundation's Civilian Young Alumni Award in July. Graduating from AFIT in 2023 with a master's in material science, he currently works at the Air Force Nuclear Weapons Center where he reviews contracts and contractor work as an acquisition engineer. Rabe ensures weapons requirements are met and Air Force dollars are being used efficiently. "I can't name very many engineers who have been able to do the things that I've done, especially so early in their careers," he said. "I've had opportunities to guide groups of subject-matter experts who have 20-plus years of experience. Being recognized [by AFIT] reinforces that I'm doing the right thing."

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SPACE

The Challenge of Funding Golden Dome

By Courtney Albon

HUNTSVILLE, Ala.—

The four-star general in charge of the Pentagon's Golden Dome program warned that uncertainty around the Pentagon's \$350 billion reconciliation request could slow progress on the homeland missile defense effort, a top priority for President Donald Trump.

To date, the Pentagon's strategy for funding the \$185 billion program has been to bypass the annual budget process and rely instead on a separate funding maneuver called reconciliation, which isn't subject to standard appropriations rules and can be passed by a simple majority in both chambers of Congress.

That approach allowed the program to hit the ground running last year after Trump signed an executive order announcing the initiative, according to Golden Dome Director Gen. Michael Guetlein.

As part of the One Big Beautiful Bill Act, which Congress passed in 2025, Golden Dome received \$25 billion—90 percent of which it has since obligated, Guetlein told an audience Aug. 11 at the Space and Missile Defense Symposium.

This year, the Pentagon requested \$17 billion for the effort as part of a proposed \$350 billion reconciliation package and just \$400 million in the normal "base" budget for fiscal 2027. This time around, though, there appears to be little political will to pass another spending bill via reconciliation, leaving Golden Dome without a clear path for near-term funding.

"We've got to figure out as a nation a different way of funding Golden Dome, at least for '27," Guetlein said. "Both sides of the aisle, as well as the House and the Senate, are working through the math about how do you do this in '27. I will tell you that if they don't figure it out, there is no Golden Dome because there is no funding."

For now, the reconciliation process is stalled in Congress. The House approved a slimmed down \$60 billion version of the White House's proposal in July. It's possible some Pentagon priorities initially included in reconciliation could be funded through a separate \$67 billion Iran war supplemental, though that proposal is also in limbo.

Meanwhile, the prospects of passing a standard appropriations bill by the end of the fiscal year on Sept. 30 have also dimmed. The House and Senate have passed separate versions of a continuing resolution that would provide stopgap funding to avoid a government shutdown. Guetlein noted that the continuing resolution—which freezes funding at the prior year's levels—doesn't provide relief for Golden Dome.

"A CR doesn't help me under Golden Dome because I don't have a top line to fall back to to get that percentage of the con-



William Busby III/USN

The entire Golden Dome project hinges on congressional funding, says Space Force Gen. Michael Guetlein, the program's director. "If they don't figure it out, there is no Golden Dome."

tinuing resolution," he said.

Speaking with reporters after his speech, Guetlein said the department is discussing contingency plans should reconciliation fail. One option is for the military services to take over funding some elements of the Golden Dome architecture. He pointed to the Space Force as an example, which has already invested heavily in Golden Dome-enabling capabilities like the Space Data Network and space-based missile warning and tracking satellites.

"Several of the space capabilities that we are investing in are also being invested in by the Space Force," he said. "So, if Golden Dome is not able to continue to invest in those type of capabilities, then the Space Force could decide at that time to continue the investments."

He added: "Because we have diversified execution of a lot of these capabilities, and a lot of these capabilities are already requested by combatant commands, there are some alternatives that we can pursue. We have not made any decisions on any pathway."

Guetlein said he's hopeful the department and Congress will find a way to fund the program in '27 given the urgency around bolstering U.S. defenses against missile threats and the capabilities he says the team has already proven.

During his speech, Guetlein highlighted recent milestones, which include breaking ground on the Golden Dome's first operational site at Joint Expeditionary Base Fort Story, Va., and a major test event it conducted in June at White Sands Missile Range, N.M. Of note, Guetlein told reporters the Pentagon's independent Director of Operational Test & Evaluation did not oversee the test; instead a "separate entity" is charged with leading validation efforts in close coordination with DOT&E.

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Guetlein also reported progress on one of Golden Dome's more ambitious technical lifts—demonstrating the integration of space-based interceptors (SBI) to defeat missile threats at various phases of flight. The Space Force is leading a prize competition among 12 companies to incrementally showcase SBI capabilities with the goal of an initial capability by 2028.

Contractors have completed the first of those increments, dubbed Gate One, which focused on solidifying a design and conducting component-level testing. Guetlein said it appears all of the providers will move to Gate Two, where they will build

a prototype. Those that progress to Gate Three must prove the capability works in space and then the Gate Four providers must show their interceptors can be integrated with the broader Golden Dome architecture.

“We have not put in any operational requests for production capabilities until after they prove through the prize-based competition that those capabilities are effective, but more importantly, that they're scalable and affordable,” he said. “At that point, we will then make a decision if we are going to move into production or not.”

USSF Awards New Tactically Responsive Deal

By Greg Hadley

The Space Force has tapped startup Impulse Space for two new tactically responsive space missions, the latest in a series meant to build the service's agility in orbit.

Impulse announced the \$28 million contract award Aug. 12, saying it will provide two of its Mira spacecraft for missions in low-Earth orbit dubbed Victus Salo 2 and 3. The firm was already awarded a contract in October 2024 to provide a Mira for Victus Salo 1.

Mira is an orbital maneuver vehicle, or OMV; it is prepositioned in space to carry payloads or other assets from one orbit to another. All three Victus Salo missions will involve Mira spacecraft carrying government-provided payloads in low-Earth orbit, the firm said in its release.

The first Victus Salo mission is set for launch in 2027, Impulse said. When the Space Force announced the contract for that mission in 2024, it said it was hoping to launch in fall 2026. The second and third Salo missions have no public time frame.

Impulse is also working on another tactically responsive space mission, Victus Surgo, that will involve a Mira spacecraft launching into a geostationary transfer orbit, with an end goal of ending up in geosynchronous orbit.

Victus Surgo and the Victus Salo series are expanding the scope of the Space Force's tactically responsive space effort. The initial mission, Victus Nox, focused on speeding up the process for preparing to launch a satellite, going from launch orders to liftoff in 27 hours in 2023. Victus Haze, which launched in June, cut the timeline to just 17 hours and added more maneuvers, as the Rocket Lab Pioneer satellite conducted rendezvous operations with a Jackal spacecraft built by True Anomaly and launched the month before.

These upcoming missions will focus less on rapid launches—Victus Salo 1 and Victus Surgo will hitch rides on SpaceX's Falcon



Impulse Space artist rendering

Impulse Space was awarded a contract to provide Mira spacecraft, an orbital maneuver vehicle, to test space missions in low-Earth orbit.

9 rocket—and even more on the ability of spacecraft to quickly respond to developments once they are in orbit.

In space, maneuverability is often described as “Delta-V,” or a spacecraft's ability to change its velocity. Mira has a Delta-V of 850 meters per second for a 100-kilogram payload.

“Mira's agile, high Delta-V capabilities can support the United States Space Force's work to increase the tactical responsiveness of assets on orbit through these missions,” said Eric Romo, Impulse Space President and COO, in a statement.

Impulse, founded by an early SpaceX employee, is growing its Space Force ties quickly. Just last month, the firm was added to the National Security Space Launch program. Its Helios vehicle, slated to fly in 2027, is a high-energy upper stage designed to transport payloads from low-Earth orbit to higher orbits—a first for the NSSL program. The company said in a statement that the plan is to partner Helios with a standard medium-lift rocket.

NATIONAL SECURITY

JB Charleston Gets a New Name

By Chris Gordon

CHARLESTON, S.C.—

A major East Coast military base that serves as a key Air Force logistics hub was renamed after the late Sen. Lindsey Graham Aug. 10 in a ceremony led by Secretary of Defense Pete Hegseth and Graham's sister, Sen. Darline Graham.

The new name of Joint Base Charleston is Joint Base Lindsey

Graham in honor of South Carolina's former senior senator, who died July 11 in Washington, D.C., at 71.

Darline Graham unveiled a sign for the base alongside Hegseth, South Carolina Gov. Henry McMaster, and Treasury Secretary Scott Bessent.

Darline Graham was appointed by McMaster to fill her brother's seat for the remainder of his term, which is entering its final months. She is now running for a full six-year term in the Senate with President Donald Trump's support. The

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ceremony occurred one day before the Republican primary.

Lindsey Graham, a 33-year Air Force veteran, was one of the most influential Airmen ever to serve in Congress. He served as a judge advocate general on Active-duty from 1982 to 1989, in the South Carolina Air National Guard until 1995, and in the Air Force Reserve until 2015. He retired as a colonel.

“Senator Lindsey Graham dedicated his life to serving this state and serving the armed forces of the United States. He served this nation both in uniform and in both houses of Congress,” Hegseth told the crowd that included members of Congress, local leaders, Airmen, and other service members. “But in both capacities, it was always the same mission. He knew the timeless truth that to ensure peace, we must be prepared for war.”

Graham was elected to the House of Representatives in 1994, where he served four terms before winning his Senate seat. He was approaching the end of his fourth six-year term when he died. He briefly ran for President in 2016, when he was a harsh critic of Trump, but he later became one of the President’s closest allies in Congress.

The installation—formerly Charleston Air Force Base before it merged with nearby Navy facilities in 2009—is the largest C-17 Globemaster III base in the world, forming a critical part of the U.S. military’s enterprise for moving materiel and people around the globe. Its C-17s carry a blue tail flash with the state’s palmetto flag design. Now, they will say “Graham” on the aircraft, according to the officials speaking at the ceremony.

“I believe that he will continue here and around the world to inspire Airmen for generations to come. And I say around the world, because ... those gray tails that say ‘Charleston,’ now, when they land in far-flung places, will say ‘Graham.’ The world will remember that name,” Hegseth said, putting it up with the namesakes of other South Carolina bases and units:

- Shaw Air Force Base is named for 1st Lt. Ervin David Shaw, a pilot who died in World War I;
- McEntire Joint National Guard Base is named for Brig. Gen. Bernie McEntire, the first commander of the South Carolina Air National Guard, who went down with his F-104 in Pennsylvania to ensure it did not crash into populated areas; and
- The 169th Fighter Wing of the S.C. Guard is nicknamed the Swamp Foxes for Francis Marion, a famed Revolutionary War commander.

Before his death, Graham was the chairman of the Senate Budget Committee and supported the Trump administration’s \$1.5 trillion proposed budget for fiscal 2027. The Pentagon’s budget remains in limbo in Congress.

Hegseth enlisted Graham’s memory to advocate for increased spending and the passage of a party-line reconciliation bill. The prospect of the funding getting through even a Republican-controlled legislature is murky. Hegseth said Graham wanted to increase the Pentagon’s budget even more than its \$1.15 trillion base budget request and \$350 billion reconciliation package.

“He looked at me and said, ‘How’s \$355 billion sound to you?’” Hegseth said. “He wanted to give even more than \$350



Chris Gordon/staff

Treasury Secretary Scott Bessent, Secretary of Defense Pete Hegseth, Sen. Darline Graham (R-S.C.), and South Carolina Gov. Henry McMaster unveil a sign for the newly renamed Joint Base Lindsey Graham in Charleston, S.C., Aug. 10, 2026.

[billion]. He wanted to ensure our military was as equipped as humanly possible, because he was thinking of places like this one right here,” Hegseth said. “This department pays tribute to Lindsey Graham in the naming of this space. But there could be no greater tribute than Congress could give than to invest in our warriors for the full \$1.5 trillion. ... Fully funding our warriors would be one last great accomplishment for Col. Lindsey Graham and a major part of his legacy.

“He believed in mission success. He believed in the troops. He believed in giving the troops everything they needed,” Hegseth added.

Bessent, a South Carolinian, also said Graham “believed that the first obligation of the federal government is to keep its people safe,” though he did not directly address the budget. Bessent said, “Joint Base Graham is the backbone of our Air Force’s C-17 fleet,” which is a “reminder that Senator Graham was America’s workhorse.”

During his visit, Hegseth recognized service members, particularly from the base’s 437th Airlift Wing, who operated under fire during Operation Epic Fury against Iran, including Airmen who took cover from missiles around two dozen times and helped evacuate the planes from more vulnerable bases such as Al Udeid Air Base in Qatar.

“I’ve been watching. I read the reports of how you iterate, do things faster, in congested logistics. It’s incredible, the backbone of what you have enabled in the theater,” Hegseth said. “The secret sauce of any successful mission—whether it’s Epic Fury, Southern Spear, Midnight Hammer, Absolute Resolve, Hawkeye Strike, you name it—are the logistics behind it.”

“All of it is enabled by all of you,” Hegseth told Airmen and other service members after the renaming ceremony.

GRAHAM’S STORY

While Graham’s domestic policies shifted over time, he remained a foreign policy hawk, pressing for tough U.S. policies toward Iran and Russia. He was also a strong supporter of Ukraine in its war with Russia. As part of that support, he was pushing for a sweeping sanctions bill on Russia at the time of his death. The Senate has since passed it in his honor.

Graham was the last surviving member of the Three



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Amigos—the other members were Sen. John McCain (R-Ariz.) and Sen. Joe Lieberman (I-Conn.)—who supported the invasions of Iraq and the continued presence of troops there and the surge of troops in 2007.

Graham's parents ran a pool hall, but both died while Graham was on an ROTC scholarship. To stay near home, Graham attended the University of South Carolina as both an undergraduate and for law school. He joined the Air Force Judge Advocate General Corps, deploying to Iraq and Afghanistan, and often traveling on official congressional delegations to war zones and other locations around the world.

Hegseth recalled meeting Graham roughly 20 years ago as a first lieutenant in the Army National Guard, and later as a captain while they were deployed to Afghanistan.

"That man had a schedule like nobody else," Hegseth said. "But he was there to hear from us because he wanted his ear to the ground from the troops on what was actually happening in the war in Afghanistan."

"Lindsey loved the Air Force," said Darline Graham, who became her brother's legal dependent after her parents' death.

"He loved its mission. He loved wearing the uniform of his country. His interest in foreign affairs and national security started with his service in the Air Force."

Graham first came to prominence in the mid-1980s when he exposed errors in the Air Force's drug testing, leading to an appearance on CBS' "60 Minutes." Graham left Active-duty in 1989. He then joined the South Carolina Air National Guard and was activated to support Operation Desert Storm. After his national political career started, Graham joined the Air Force Reserve and deployed during America's conflicts in the Middle East. He was promoted to colonel in 2004 before retiring in 2015 after 33 years in the Air Force.

"It was sometimes hard to tell if Lindsey was a senator who happened to serve in the Air Force or an Air Force lawyer who happened to serve in the Senate," Darline Graham said. "Such was his love for both. That's the man this base is named after—a man who loved his country, loved his state, and loved the United States Air Force. I could not be more honored or humbled for him to be recognized in such a fashion for his lifetime of service." ★

Permanent Task Force Takes Over Cartel War

By Todd South

As U.S. Southern Command shifts its counter narcotics mission to a permanent task force, the Air Force piece of the larger war on cartels in Latin America and the Caribbean is likely to grow.

SOUTHCOM Commander Marine Corps Gen. Francis Donovan announced Aug. 3 on X.com and official video releases that the command had ended the temporary Joint Task Force-Southern Spear and Operation Southern Spear. The command, he said, would shift its mission to the Joint Task Force-Western Hemisphere.

"Joint Task Force Western Hemisphere is SOUTHCOM's action arm for confronting threats across the hemisphere," Donovan said.

He called the task force a "purpose-built and task-organized" headquarters that "brings together tailored military capabilities and trusted partnerships to increase total systemic friction, operational tempo, impose sustained pressure on criminal organizations, and strengthen the security of the United States and our partners."

Donovan did not specify which forces would comprise the tailor-made task force, which will be commanded by Marine Maj. Gen. Kevin Jarrad, who has most recently led humanitarian relief efforts in Venezuela.

The task force will work with 18 partner nations, members of the 5-month-old Americas Counter Cartel Coalition, which includes El Salvador, Ecuador, and Honduras. Notably, Mexico and Colombia, both centers of cartel influence and drug production, are not included, even though Mexico is part of U.S. Northern Command.

The White House referred questions to the Pentagon, which deferred to SOUTHCOM, where a spokesperson said via email that the new task force "represents an evolution" from Southern Spear, reinforcing a "whole-of-government, multinational approach to defending the homeland and bolstering regional partnerships."

The shift from a temporary task force and operation to a permanent, broader-ranging structure within the command came as no surprise to experts on the region and its military mission who were interviewed by Air & Space Forces Magazine.



Tech. Sgt. Rachel Maxwell

Air Forces Southern foreign liaison officers attend a Combat Operations Division changeover brief at the 612th Air Operations Center on Davis-Monthan Air Force Base, Ariz., in 2025.

"This is going to be an ongoing, large-scale type of operation to support the strategic desires of the President," said retired Lt. Gen. Norm Seip, U.S. Air Forces Southern commander from 2006 to 2009.

That is likely to mean some more prioritization of assets for the SOUTHCOM commander, Seip said, and his air component lead—the 12th Air Force commander.

The 12th Air Force, out of Davis-Monthan Air Force Base, Ariz., played a key role in Southern Spear and will continue that work with JTF-WH.

"Our focus during Operation Southern Spear has been to provide rapid air mobility, comprehensive air domain awareness, and essential logistical support to joint forces, ensuring the overall success of the operation's strategic objectives in the region," an AFSOUTH spokesperson said in an email response.

The 12th Air Force executed 1,700 sorties, including transporting 27,000 tons of cargo and more than 4,500 personnel during the operation's 10-month duration, the spokesperson wrote. They conducted that work largely through the 612th Air Operations Center, also at Davis-Monthan, the "never



center” for all things air in SOUTHCOM.

That included a mix of airlift, air refueling, command and control, ISR, rotary wing, strike and tiltrotor aircraft to sustain operations.

At the peak of the operations, AFSOUTH oversaw 2,800 Airmen and 80 aircraft across seven operating locations. As the joint forces air component, the 12th had operational control over 150 aircraft across 15 separate land bases.

With the JTF-WH, AFSOUTH is integrating air, space and cyber capabilities to support the task force’s mission and provide agile combat support, ISR and interoperability with regional partners, the spokesperson wrote.

While components of Southern Spear’s work have included counter-maritime operations and drone strikes conducted by U.S. Special Operations Command assets with SOUTHCOM, a significant part of both the counter-cartel operation and overall tracking in the area depends on intelligence, surveillance, and reconnaissance platforms and personnel provided by AFSOUTH.

Those platforms, either in the fleet or assigned to SOUTHCOM missions, include the E-3 Sentry, the RC-135VW Rivet Joint, the MQ-9 Reaper drone, and the KC-135 Stratotanker for aerial refueling of the air assets needed to cover about 15 million square miles of territory.

“The number one thing we need in Latin America and the Caribbean is ISR, and air and space assets are absolutely critical for that,” Henry Ziemer, a fellow with the Americas Program at the Center for Strategic and International Studies, told Air & Space Forces Magazine.

Partner and allied nations in the region, such as Chile and Ecuador, have limited ISR capabilities, he said.

“So, if your partner forces can’t necessarily flag things for you,

they are often relying on the U.S. to provide that intelligence or go out and spot some of the trafficking or illicit activity themselves,” Ziemer said.

The CSIS fellow identified space assets as additional pieces of the larger ISR puzzle.

U.S. Space Force’s space component of SOUTHCOM became operational on Dec. 1, 2025, about a month before the Jan. 3 raid to capture Venezuelan President Nicolás Maduro, Air & Space Forces Magazine previously reported.

“This new organization reaffirms our commitment to address local threats of all shapes and sizes, ranging from malign state actors to violent extremist organizations and to transnational criminal organizations,” Chief of Space Operations Gen. B. Chance Saltzman said at a Jan. 21 ceremony marking the component’s activation.

That space piece helps SOUTHCOM address its burgeoning responsibilities in counter-cartel work through the new task force. Seip didn’t always have immediate access to satellites and other ISR assets when he led 12th Air Force and was jockeying for assets in SOUTHCOM while the wars in Iraq and Afghanistan drew much of the DOD’s operational resources.

At the time, his ISR assets were often assigned on a temporary basis for counternarcotics missions, said Seip, who now serves as president of the nonprofit American Security Project. That might change with a more robust task force and focus by the administration.

“It’s certainly a different world in SOUTHCOM than when I was there, based on force protection, security of the Western Hemisphere,” Seip said. “It was not written in the [National Defense Strategy] as it is now.”

The new task force and broader mission could help the com-

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mand, which has historically ranked last in the Pentagon's budget priorities for Unified Combatant Commands.

"SOUTHCOM is underresourced," Seip said. "It's getting better resourced now that there's such a focus on that area of the world."

And the command is always competing with other global theaters such as U.S. Pacific Command and U.S. Central Command.

Operation Southern Spear is estimated to have cost \$820 million between September 2025 and June, according to government reports.

Operation Epic Fury, by contrast, is said to have cost \$29 billion between March and mid-May, according to Pentagon figures, though other reports suggest the operation's real cost could be much higher, between \$50 billion and \$110 billion so far.

A GROWING MISSION

During his first term, President Donald Trump launched the Enhanced Counter Narcotics Operations deployment, which bolstered regional counter-narcotics enforcement.

The first reported strike on a suspected drug boat in international waters occurred on Sept. 5, 2025. In November, Secretary

of Defense Pete Hegseth announced the formation of JTF-SS and Operation Southern Spear.

From the outset, the strikes received bipartisan rebuke, but efforts in both the House and Senate to curtail the President's military actions in the region failed.

"What's notable about Southern Spear is that it begins right on Sept. 5, 2025, with a U.S. strike in international waters," Ziemer, the CSIS fellow, said. "There's no coalition. There's no notice, as far as we can tell, to our partners in the region."

Trump then released his National Security Strategy in December, shifting security focus to the Western Hemisphere as alleged drug boat strikes continued. On Jan. 3, during Operation Absolute Resolve, a separate but outgrowth of Southern Spear initiatives, U.S. forces captured Maduro and extradited him to the United States to face criminal charges of leading a decades-long conspiracy to flood the United States with cocaine.

The watercraft strikes continued under Southern Spear, resulting in at least 67 vessels struck, killing at least 221 people between September 2025 and June 2026, according to a July DOD Inspector General report. 

AIR

The 492nd SOW Lands at Davis-Monthan

By Stephen Losey

As the last few A-10 Warthogs leave Davis-Monthan Air Force Base, Ariz., Air Force Special Operations Command is accelerating plans to move a new wing to the Arizona base.

The 492nd Special Operations Wing, now located at Hurlburt Field, Fla., is expected to completely finish its move to Davis-Monthan in fiscal 2028, a spokesman for the wing said. That is almost three years earlier than the original plan of reaching full operational capability in fiscal 2031.

The 492nd is shedding its old mission as a training wing and transforming into a power projection wing, which will be able to carry out strikes; mobility operations; intelligence, surveillance and reconnaissance operations, and other special operations missions.

Davis-Monthan has also been identified as the preferred location for the 34th and 20th Special Operations Squadrons and the 20th Special Operations Aircraft Maintenance Squadron, although a final decision on those units has not yet been made.

An initial detachment for the 492nd stood up at Davis-Monthan in fall 2024 to pave the way for the wing's broader move, a wing spokesperson said. The new headquarters for the 492nd will stand up there in summer 2027.

Additional units—including the 492nd Special Operations Theater Air Operations Squadron, 319th Special Operations Squadron, and an Air Combat Command intelligence squadron that has yet to be activated—will follow in phases through 2028.

More than 1,300 positions will relocate to Davis-Monthan in the process, the spokesperson said. The phased approach to moving wing elements is being taken to minimize the effect on Airmen and their families, the spokesperson said.

Davis-Monthan has also been identified as the preferred location for the 34th and 20th Special Operations Squadrons and the 20th Special Operations Aircraft Maintenance Squadron,



Airman Najzee Kuzu

U.S. Air Force Airmen from the 357th Fighter Generation Squadron salute Lt. Col. Ryan Rutter, 357th Fighter Squadron commander, as he exits an A-10C Thunderbolt II aircraft for his final flight at Davis-Monthan Air Force Base, Ariz.

although a final decision on those units has not yet been made.

The 319th and 34th squadrons, which currently fly the U-28 Draco, will change their missions and start flying the OA-1K Skyraider II at Davis-Monthan. CV-22 Ospreys will also move to Davis-Monthan, the 492nd spokesperson said. The numbers of aircraft that will move are still being determined.

No units will be deactivated in the process, the 492nd spokesperson said, and the wing is in close coordination with Davis-Monthan's 355th Wing "to ensure a seamless transition."

"This process is by design as AFSOC develops the right mixture of capabilities in its wings to ensure alignment with the Department of War and the ability to meet National Defense Strategy priorities," the spokesperson said.

FIVE DECADES OF THE WARTHOG

While AFSOC moves its pieces into place, Davis-Monthan is closing its book on nearly five decades of A-10 operations. Davis-Monthan's A-10s—which at one point numbered 78—had their fini, or final, flight there in a July 29 ceremony.





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Discover More

Three of Davis-Monthan's four remaining A-10s flew to Moody Air Force Base, Ga., on Aug. 5, where they will replace older Warthogs that are being divested, said Maj. Claire Fittle, head of public affairs for the 355th Wing at Davis-Monthan. The final A-10 will join them at Moody sometime in the next few weeks.

All other A-10s at Davis-Monthan have already been retired as of mid-July and were sent to the 309th Aerospace Maintenance and Regeneration Group near Tucson, commonly known as the Boneyard.

The A-10 retirements are part of the Air Force's overall effort to reduce, and eventually fully retire, its fleet of the venerable attack planes. The A-10 was originally introduced as a tank-killer to fight the Soviet Union, but ended up seeing heavy action in Iraq and Afghanistan, where its low-and-slow flying style, armored frame, and punishing GAU-8 cannon made it ideal to provide close air support for ground troops.

But the Air Force has long feared the A-10 would not be survivable in a fight against a high-end adversary, and struggled

to get Congress' permission to retire the platform. In recent years, Congress agreed to allow A-10 retirements, and the service originally planned to divest its remaining roughly 162 Warthogs by 2029, if not earlier. After the launch of the Iran war, however, the Air Force announced it would keep three remaining squadrons of A-10s until at least 2030.

The 355th Operations Group now has a skeleton crew of fewer than a dozen Airmen remaining from the 550 it once had. The four units that used to have A-10 missions—the 355th, its 357th Fighter Squadron and 355th Training Squadron, and the 357th Fighter Generation Squadron—will inactivate on Sept. 18.

Lt. Col. Rodney Dwyer, commander of the 355th Operations Group, piloted the A-10 that made the farewell flight at Davis-Monthan. Family and friends sprayed Dwyer with water after he landed, in an old aviation tradition for celebrating final fights.

"We've always had A-10s on the ramp; for the last 50 years they've been on the ramp," Dwyer said in a July 31 statement. "To see the sunshades get torn down, to see the jets divest, fewer and fewer A-10s out there ... it's definitely bittersweet." ★

Battle-Damaged KC-135s Get Depot Repairs

By Chris Gordon and Stephen Losey

The KC-135 Stratotanker that lost part of its vertical stabilizer in a deadly midair collision over Iraq in March is among a group of damaged tankers that have returned to Tinker Air Force Base, Okla., to be fully repaired.

This Stratotanker is one of a handful of KC-135s that were damaged while supporting operations against Iran earlier this year. The tankers were repaired by Airmen from the 76th Aircraft Maintenance Group's expeditionary depot maintenance flight, which allowed the planes to fly back to Tinker for more comprehensive repairs.

Those aircraft are now going into the depot maintenance process, where those patches will be fully repaired along with their regularly scheduled maintenance that takes place every five years, according to an Air Force spokesperson.

The spokesperson said it is too soon to tell when these battle-damaged planes might return to service. Regular maintenance repairs typically take an average of 155 days to complete, the spokesperson said, but "it is reasonable to assume" these may take longer—particularly if inspectors find more hidden damage or engineering problems.

At least six KC-135s have been damaged but still left repairable since the start of Operation Epic Fury, and a seventh was destroyed, according to U.S. officials. Five of those damaged Stratotankers were hit during an Iranian missile strike on Prince Sultan Air Base, Saudi Arabia, in March. President Donald Trump



Staff Sgt. John Ennis

A U.S. Air Force KC-135 Stratotanker flies over the U.S. Central Command area of responsibility in 2025.

confirmed five Stratotankers sustained at least some damage in a Truth Social post.

The expeditionary maintenance unit completed more than 200 repairs over three weeks on the damaged tankers, enabling them to receive further repairs in the U.S.

The Air Force pulled at least one retired KC-135 out of the Boneyard after the March 12 crash.

Air Force Chief of Staff Gen. Kenneth Wilsbach told lawmakers in a June 9 hearing that all damaged KC-135s would eventually return to service. The most heavily damaged planes, however, might take a year or two to be fully repaired, Wilsbach told the Senate Appropriations subcommittee on defense. Wilsbach said some had already returned to service, but did not specify how many. ★

TECHNOLOGY

New Hypersonic Attack Cruise Missiles

By Greg Hadley

The Pentagon's top research lab is interested in developing a hypersonic cruise missile prototype that provides "a revolutionary leap in operational performance," as the first wave of U.S. hypersonic weapons enters production and service.

The Defense Advanced Research Projects Agency (DARPA)

released a notice Aug. 7 informing industry of a potential new program called the Next-Generation Hypersonic Cruise Missile and seeking information and ideas on the topic.

"The goal is to design, build, and flight-test a fully integrated hypersonic cruise missile system demonstrator," the notice states. "This demonstrator must establish the foundation for a next-generation capability that delivers a revolutionary leap in operational performance—specifically in range, cruise speed,

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and/or altitude. This capability must maintain technological superiority, enabling the U.S. to promptly strike advanced threats in highly contested environments.”

The notice also states that previous demonstrator programs have proven the technology behind air-breathing hypersonic weapons. But these concepts have provided only “predictable, incremental gains in isolated performance metrics” and are often expensive and complex, making them hard to transition to mass production.

Now, DARPA is hoping for a “quantum leap in overall system performance,” fueled by “high-risk, high-reward technologies,” though the notice doesn’t say what those technologies might be.

In addition to range and speed, the agency is interested in improved performance in areas like midcourse maneuverability and overall signature so that the new hypersonic missile can better evade adversaries’ integrated air and missile defenses.

DARPA previously explored hypersonic cruise missiles through its Hypersonic Air-breathing Weapon Concept in the early 2020s, developed with the Air Force and Lockheed Martin and resulting in several successful flight tests. Then the Air Force started developing the Hypersonic Attack Cruise Missile with Raytheon—the service is planning to start production on the HACM in 2027, according to budget documents.

These weapons use a “scramjet” air-breathing engine to reach hypersonic speeds, defined as above Mach 5. They’re different from other “boost-glide” weapons that use solid rocket boosters to power the vehicle to hypersonic speeds and then have the vehicle coast or “glide” to its target while being able to maneuver along the way. Air-breathing weapons are considered more efficient and can be smaller, allowing them to be carried on a greater variety of platforms.

Indeed, DARPA’s latest notice states that the agency is interested in different “classes” of next-gen hypersonic missiles, ranging all the way from weapons that can be carried internally and externally on fighters to ones that can be launched from pallets to ones that can only be launched from bombers or on the ground.

In addition to developing a new generation of weapons,



Raytheon

An artist's rendering of the Hypersonic Attack Cruise Missile.

DARPA wants to develop new test and evaluation technologies for hypersonic weapons—testing has been a persistent chokepoint in hypersonics development.

CURRENT HYPERSONIC WEAPONS

The Air Force is pouring most of its resources for hypersonics into the HACM program; the service’s 2027 budget request includes around \$1.01 billion for HACM, split \$404 million for production and \$806 million for research, development, test, and evaluation. Exactly how expensive each of these missiles is—and thus how many the Air Force is buying—remains secret.

The first aircraft HACM will be fielded on is the F-15E Strike Eagle, according to budget documents, and it could be carried by fighters and bombers alike.

But the service is also still pursuing the Air-Launched Rapid Response Weapon. ARRW is a boost-glide weapon that can only be carried by bombers. Despite a series of test failures several years ago, the Air Force recently revived the program and is requesting \$797 million for it in 2027: \$452 million in procurement, \$345 million in R&D mostly for a second “increment” of the weapon.

The Army and Navy, meanwhile, are working to field variants of the same boost-glide system called the Long-Range Hypersonic Weapon or Dark Eagle. ★

The Air Force’s New Standoff Strike Option

By Todd South

The Air Force awarded Boeing a \$75 million production contract to begin supplying long-range Joint Direct Attack Munitions (JDAMs) as the service seeks to expand its arsenal and extend the range of its key munitions.

The BSU-111 Payload Delivery Unit (PDU) creates a new JDAM variant, the GBU-75 JDAM-LR, with a standoff range of more than 300 nautical miles for a 500-pound payload, Boeing said in a release.

That’s a significant increase from the standard GBU-38 JDAM, at 15 nm, and the extended-range JDAM-ER, at 45 nm.

The long-range variant adds a Kratos TDI-J85 turbojet providing 200 pounds of thrust to enable jets to attack from a much safer distance. Improvements in adversaries’ air de-

fenses have made penetrating strikes by nonstealthy aircraft increasingly risky.

“This is a good decision, though long overdue,” said retired Air Force Col. Mark Gunzinger, Director of Future Concepts and Capability Assessments at the Mitchell Institute for Aerospace Studies. “This will give the Air Force new options to conduct strikes from medium-range standoff distances.”

The 2027 National Defense Authorization Act includes about \$277 million for 1,150 upgraded JDAM guidance tail kits with M-Code GPS for the legacy munitions.

Gunzinger said the new version will cost “far less than more exquisite standoff munitions, so they should be considered as an affordable mass capability.”

The JDAM-LR was developed through the Navy, and only completed flight testing in April, marking rapid development

by typical standards—recognition that fourth-generation aircraft need this capability soon, and that the Air Force and Navy need less costly alternatives to missiles for standoff attack.

Separately, the Air Force is developing its Family of Affordable Mass Missiles, to produce lower-cost missiles under a series of multiyear framework agreements signed in July with three defense newcomers—Anduril, CoAspire, and Zone 5 Technologies. The three companies are slated to produce a total of 8,000 missiles a year once production ramps up.

Munitions stocks were depleted during Operation Epic Fury, with U.S. forces expending an estimated 10,000 JDAMs, according to a June report from the Center for Strategic and International Studies.

The new munitions “will help the Air Force accelerate rebuilding its munitions inventories,” Gunzinger said.

While the Navy-led JDAM-LR program focused on delivery by fighters, Gunzinger said the weapon also has utility for bombers. “The Air Force should buy JDAM-LR at scale and integrate them on its bombers as well as fighters,” he said.

The Boeing contract letter authorizes initial production of the PDU with the Navy, according to the Aug. 5 Boeing release. JDAMs are a joint Air Force/Navy program.

“This first production contract is a major milestone for the JDAM LR program, demonstrating our ability to deliver long-range precision-strike capability at a significantly lower cost,” Bob Ciesla, vice president of Boeing Precision Engagement Systems, said in the release. “Scaling production of the GBU-75 will provide the fleet with an affordable, sustainable solution designed to eliminate long-range land and sea-based threats to U.S. and international forces and enable them to safely and



Boeing

Boeing was awarded a \$75 million production contract to begin supplying long-range JDAMs which will benefit pilots operating in contested environments.

effectively operate in a contested battlespace.”

The JDAM-LR system completed its first test flight off the coast of California on April 1 and a second test flight on April 3. During those flights, it sustained powered flight on a pre-defined test profile using M-code GPS, according to the release.

Both demos flew an estimated 200 nautical miles, according to a Navy release at the time.

“As Naval Air Forces in theater continue to rely heavily on JDAM systems, the program recognizes a critical need to provide the fleet with greater standoff range,” said Capt. Sarah Abbott, Precision Strike Weapons (PMA-201) program manager, in an April Navy release. “This new capability allows pilots to engage targets from significantly safer distances, maintaining a tactical advantage in contested environments.”

Navy teams are also doing testing for shipboard integration of the JDAM-LR.



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USAF Preps Next-Gen Engine Testing

By Todd South

DAYTON, OHIO—

The Air Force is preparing to move toward prototyping and testing a next-generation advanced engine and wants to be ready to integrate it onto an aircraft around 2030.

But while the Next-Generation Adaptive Propulsion (NGAP) engine has been closely associated with the Next-Generation Air Dominance fighter, now called the F-47, service officials have yet to determine which aircraft the NGAP powerplant will first go on.

John Sneden, the Air Force's portfolio acquisition executive for propulsion, told reporters at the Life Cycle Industry Days conference July 27 that the NGAP program has recently finished a readiness review and is ready to start moving toward prototyping, building, and testing adaptive engines.

That preparation is reflected in the Air Force's future budget projections, Sneden said, which show spending on NGAP growing sharply from \$326 million in 2026 to nearly \$906 million in 2028. That's followed by another big year of \$865 million in 2029, before falling back down to \$303 million in 2030.

That budget spike "is really about building engines, testing engines, and then we'll be rolling through that competitively over the next few years, and be ready for potential integration activities in the 2030 timeframe," he said.

GE Aerospace and RTX's Pratt & Whitney are working on so-called adaptive engines under the multibillion-dollar NGAP program. Adaptive engines are designed to shift to the most efficient thrust configuration for whatever situation a jet is in.

The Pentagon gave serious consideration to modifying the F-35 with adaptive engines under the Adaptive Engine Transition Program, but ultimately decided to instead upgrade the F-35's already-existing engines, an effort that Sneden said is also progressing toward a 2030 milestone.

Still, the work that was done on AETP has informed the NGAP program.

Sneden said both GE Aerospace and Pratt & Whitney have met the NGAP program's requirements and showed their systems are ready.

"That means initial hardware is procured, their design meets our standards, everything is clean from that end, and both vendors have been able to do that," Sneden said.

NGAP engines are also the first that have ever been designed digitally, Sneden said, which allowed the program to verify their design attributes digitally as well.

Sneden said the Air Force is still figuring out which platform it wants to integrate NGAP engines into. That could be the sixth-generation F-47 Boeing is working on, he said, or another platform.

Sneden said NGAP will be flexible enough to give the Air Force multiple paths forward for aircraft propulsion.



GE Aviation

GE's adaptive engine under AETP, called the XA100, completed milestone tests at the Air Force's Arnold Engineering Development Complex, Tenn., in August, projected for future use in the Air Force's F-35A.

"We built NGAP as essentially an agnostic system," Sneden said. "It was, build the system first, open up options for the future, and then when those options come to the forefront, we'll be able to take advantage of it. You have to lean into propulsion technology first."

Col. Timothy Helfrich, the PAE for fighters and advanced aircraft, emphasized that the F-47 is "still on track to fly this administration," underscoring former Air Force Chief of Staff Gen. David Allvin's promise that its first flight will take place in 2028.

Helfrich would not comment on propulsion plans for the F-47 in his own July 28 media roundtable, citing its high levels of classification.

However, since NGAP integration is not expected until 2030, it appears that the first F-47 flights will take place using a different engine.

Sneden acknowledged NGAP's schedule has slipped and said it was because the program wanted to keep working with two viable vendors who could provide advanced propulsion technology. With a fixed budget, he said that meant splitting resources between two vendors instead of one.

But that investment will pay off down the line, he said.

"The competition is the gateway that enhances productivity, drives innovation, keeps costs down," Sneden said. "So it's actually quite critical, and it's also critical to be able to maintain our advanced propulsion industrial base as we go into the future."

NGAP is a "host of technologies," and not a single unified system, Sneden said. That means the technologies could be broken out and integrated piecemeal on other platforms—even older aircraft.

"Not everything has to have an adaptive fan," Sneden said. "So we can actually take that backward as well and incorporate it in some of our legacy platforms. So there is a great utilization for this type of tech."

Sneden called NGAP a critical technology, that will help the United States maintain its air superiority in years to come.

"If you want to stay ahead of our competitors, then you have to lean into this technology now," Sneden said. ★

PERSONNEL

New Enlisted Recruiting Commander

Air Force recruits take the oath of enlistment at the San Antonio Missions Baseball military appreciation game at Nelson W. Wolff Municipal Stadium, San Antonio. Partnerships between the community and JB San Antonio enhance the quality of life for military families and veterans.



Marcus Robins/USAF

By Todd South

The Air Force appointed a colonel to head enlisted recruiting, more than 18 months after combining officer and enlisted recruiting into a single organization.

Col. Lacresha A. Merkle took command of Air Force Recruiting Services on July 30 at Joint Base San Antonio-Randolph. She will report to Brig. Gen. Jeffrey W. Nelson, who heads the Air Force Accessions Center, which combines AFRS and the Jeanne M. Holm Center for Officer Accessions into a single organization.



USAF

Col. Lacresha Merkle

The Holm Center, at Maxwell Air Force Base, Ala., used to be part of Air University before being folded into the Air Force Accessions Center (AFAC). Nelson has been dual-hatted for the past 18 months or so overseeing both commands.

“Today’s assumption of command represents more than organizational change; it marks our commitment to building a seamless, modern accessions enterprise,” Nelson said in an AFAC release.

The Air Force combined the accessions activities in December 2024 to “streamline” enlisted and officer accessions as it dug out of 2023, when it failed to meet recruiting goals for the first time since 1999. The Air Force met its goals in 2024 and 2025 and this year reached its target five months early, bringing in 32,750 recruits—the most since 2004.

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Merkle arrives as the Air Force and Space Force combined plan is to add 12,700 more uniformed personnel, including 8,900 Airmen and 2,800 Guardians. It's not clear yet how that breaks down between officer and enlisted accessions.

If funded by Congress and achieved by recruiters, the Air Force would end fiscal 2027 with 330,400 Airmen, the most since 2022. The Space Force would end the year with 12,795 Guardians, the most ever, en route to a doubling in size over five years, according to Space Force plans.

The Space Force has been the most officer-heavy of the

military branches, with a roughly 50/50 split between officers and enlisted.

In the release, Merkle said she wanted to “sharpen our recruiting pipeline.” Merkle comes to the post after commanding the 360th Recruiting Group in New Cumberland, Pa., where she oversaw more than 960 Airmen spread across 21 states and Europe, according to her official biography.

Joining Merkle at AFRS is Chief Master Sgt. Jake Fason, who took over as the new AFRS command chief during the same July ceremony. 

New Rules for ‘Grooming Standards Separations’

By Matthew Cox

The Department of the Air Force released new guidance telling commanders to begin separating Airmen and Guardians who have had medical shaving profiles for too long.

The July 28 memo, “Changes to Military Separations Incorporating Grooming Standards Separations,” was posted on the amn/nco/snco Facebook page. An Air Force official confirmed that Assistant Secretary of the Air Force for Manpower and Reserve Affairs Richard Anderson’s memo is authentic.

The memo updates a December 2025 policy issued after Defense Secretary Pete Hegseth announced a crackdown on deviations from military grooming standards. It directs commanders to consider

separating Airmen and Guardians who have held shaving profiles for more than 12 of the past 24 months and who remain unable to conform to grooming standards.

“Members accumulating more than 12 months of medical profiles for shaving within a 24-month period who remain unable to meet grooming standards must be considered for separation under this provision,” wrote Richard L. Anderson, assistant secretary of the Air Force for Manpower and Reserve Affairs.

Commanders must either initiate involuntary separation or submit a retention recommendation to their chain of command.

The policy change does not affect religious waivers for Sikhs, Muslims, and other religious groups permitted to wear beards under religious accommodations.

Service members separated “solely on the basis of the condition” and not for deliberate disregard of the policy will be discharged under honorable conditions, the memo states. The new policy should not be used to separate members who otherwise would be separated for unsatisfactory performance or misconduct, the memo states.

Commissioned officers considered for separation under the policy “must be formally counseled on their deficiencies and given an opportunity to correct those deficiencies,” the memo said.

Commanders “seeking to retain members unable to meet grooming standards due to facial hair” can refer their rec-



Senior Airman Greydon Furstenau

There are new grooming standards in the Air Force. Medical shaving waivers held for longer than 12 of the previous 24 months will no longer be accepted. Those who are unable to conform may be considered for separation, although there are certain exceptions.

ommendations to their chain of command. Retentions may be granted on a “case-by-case” basis, the memo states, and should only be approved if there is a “compelling government interest” for retention, such as:

- Low manning and retention rates in the Airman or Guardian’s career specialty;
- The Airman or Guardian has special experience or specialized training;
- The cost and time required to replace the individual is extensive; or
- The Airmen or Guardian is close to retirement.

The Air Force Surgeon General previously authorized profiles of up to five years in 2020. But in a Sept. 30, 2025, memo, Hegseth ordered the services to revise their policies, saying beards, goatees, and other facial hair that could interfere with a proper seal on a chemical protective mask or firefighter respirator would be prohibited. Service members suffering from conditions such as pseudofolliculitis barbae, also known as PFB or razor bumps, could no longer hold medical shaving profile for extended periods of time. PFB is a skin condition caused by ingrown hairs, which can become infected and make shaving painful.

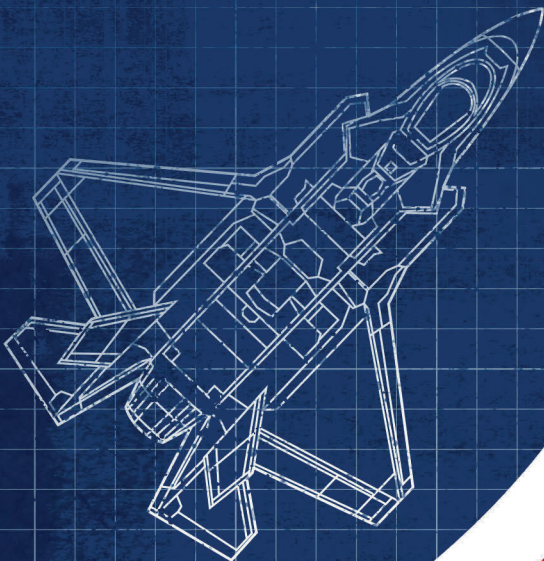
The Air Force updated its policy in December 2025, advising commanders and medical professionals to provide preventive education on appropriate shaving hygiene for Airmen and Guardians at risk of getting PFB. Treatments can include medication and laser hair removal. 

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Ray Bahner/USAF

The incoming U.S. Air Force Academy Class of 2030 began Basic Cadet Training on In-processing Day in June. Under the direction of upperclassman, they experienced a more physically demanding regimen than in past years.

Reinvigorating USAFA's Summer Training

Academy pushes fitness, discipline, and combat skills in emphasizing 'Airmanship for All'

By Greg Hadley

AIR FORCE ACADEMY, COLO.—

It's 0459, and Cadet 1st Class Abigail Anderson is already outside the door, hands poised, ready to pound. Up and down the hallway, at every door, other cadets mirror her stance.

As 0500 hits, the yelling and pounding begin. "Get up! Rise and shine! Shave your face! Make your bed!"

It's morning at the U.S. Air Force Academy, and Basic Cadet Training (BCT) is underway.

Inside the dorm rooms, 1,163 members of the Class of 2030—17- and 18-year-olds just a few weeks out of high school—scramble to make their beds, wash themselves, and don blue workout shorts, gray T-shirts, red caps, and CamelBaks. Their elder cadets—cadre in USAFA parlance—keep up their harangue until all the newbies are assembled in flights of 20 to 30 before them.

Some basic cadets woke up early to get a head start

"Our mission is to turn all ... of these basic cadets from civilians into military members. That is a daunting feat."

—Cadet 1st Class Sarah Price, BCT commander

before the chaos, but with cadre always on the lookout, such resourcefulness can be costly. Knowing sleep is a precious resource, they sometimes confiscate the basics' watches to ensure they sleep.

With the flights formed, cadre launch into correcting cadets' appearance and issuing instructions for the day ahead. When the BCT commander and cadet group commander pass in review, each basic cadet must yell in turn "Good morning, Col. Sarah J. Brehm! Good morning, Cadet 1st Class Sarah M. Price!"

Every error prompts a correction: Price blasts one cadet for not having his socks pulled up properly; Brehm notes a flight got her middle initial wrong.

DISCIPLINE AND FITNESS

The first half of BCT is about discipline: early wake-up calls, PT, march and drill, customs and courtesies, and the bureaucracy of distributing uniforms and equipment.

The second half, at the Jacks Valley complex a few



Ray Bahner/USAF

Class of 2030 cadets now spend 90 minutes on physical training daily, up from 60. At Jacks Valley during the second phase of Basic Cadet Training (BCT), cadets are pushed to their physical limits to build self-confidence, develop teamwork skills, and experience tactical and firearms training.

miles away, tests the basic cadets physically and mentally through a series of crushing obstacle courses and scenarios famed among Academy grads. The six-week program ended Aug. 5 with the Acceptance Day Parade, when the basics are formally accepted into the Cadet Wing and become cadets fourth class.

BCT is Basic Military Training for cadets, a rough equivalent to the training given to the enlisted force. Indeed, military training instructors from BMT actually roam BCT's morning formation, and BCT cadre visit Joint Base San Antonio-Lackland, Texas, to observe the instructors in their element at BMT.

And like BMT, BCT is an institution unto itself. Many in the "Long Blue Line" fondly recall memories from their time as basics, the trauma-bonding that forges deep friendships with their classmates and the common bond of overcoming the same challenges as their forebears. Many of the cadre who spoke to Air & Space Forces Magazine cited their own experiences in BCT as their motivation for returning to help lead it.

"Our mission is to turn all ... of these basic cadets from civilians into military members," Price said. "That is a daunting feat. It is also a great responsibility, because we are teaching them on military standards, teamwork, knowledge, and truly getting them to appreciate what our profession of arms is."

Yet BCT is not static. Price and other cadet leaders have been working for months to craft their specific vision for this summer's program, a vision informed by larger Air Force changes.

After the 0500 wakeup, cadets assemble on the Academy's "Terrazzo," divided into eight squadrons: Aggressors, Barbarians, Cobras, Demons, Executioners, Flying Tigers, Guts, and Hellcats. Each has five flights, designated alpha, bravo, charlie, delta, and echo.

After a brief inspection and the raising of the flag, warmups begin. This year, PT time was extended from 60 to 90 minutes per day—matching BMT.

"We've increased our PT duration and intensity to try to align with some of that broader military intent coming from the Secretary of War, our superintendent, all the way down to us," Price said.

But more time doesn't mean more situps or pushups. Cadets go through a series of detailed exercises led by instructors and cadets from the Academy's Physical Education Department—among them All-American gymnast Maggie Slife.

More warmups, recovery time, and sophisticated exercises are becoming hallmarks of Air Force PT, with the aim of minimizing injuries. Cries of "Hydrate!" punctuate the morning workout.

Price and Brehm join one half of the cadet group as they embark on a multilap run around the Academy's parade grounds, cruising past the junior cadets who are still adjusting to the thin mountain air—7,200 feet above sea level. Calling out, they urge the basics to keep moving.

WARRIOR SPIRIT

"Our main charge is to up the intensity," Brehm said of her summer training mission.

Price added that the work started months ago. "We looked at the incoming classes that we've seen, and we asked ourselves what we think we need," Price said. "What we believe we needed as a vision was re-grounding ourselves in our Air Force and Space Force core values."

The team came up with "enhanced" evaluations to imbue uniform standards and customs and courtesies, and added a new requirement that newbies learn the Constitution, Price said. And to keep the basic cadets from getting too comfortable, the cadre swap out halfway through BCT, shaking things up.

Commandant of Cadets Col. Brandon Tellez, who arrived this spring, said the key is to maintain intensity without letting it become destructive.

"My number one job right now, as I've been going around and watching everything, is to look at the attitude and the intent of all of our cadre and how they're approaching the engagements with these young basic cadets, making sure that you don't fall into the 'payback mode' or 'this is what happened to me,' kind of thing—and make sure we never get close to that," Tellez said. "Thankfully, I can tell you, we're not. ... Folks grab this as a marked experience in their cadet career, and want it to be as significant, if not more, for these new arrivals."

FORWARD, MARCH!

On a mid-July march, Price, deputy commander C1C Natalie Rupp, and Cadet Group Chief of Staff C1C Simeon Rate lead the basic cadets in camouflage uniforms, marching with rifles to Jacks Valley.

This training spot some 4 miles from the main cadet

ACCELERATE



area has played a key role in BCT since 1966. Today, Jacks is one part expeditionary base, equipped with tents, CONEX boxes, and low-slung metal buildings, and one part summer camp from hell. Cadets must overcome a series of courses designed to stress them both physically and mentally.

If their first weeks of BCT gave them a taste of military life, this second part will acquaint them with using those newfound skills in a harsher environment, said Lt. Col. Dexter Webb, commander of Jacks Valley.

“We’re pivoting from, ‘Hey, now you’ve gotten a few weeks under your belt of this is what it means to be in the military,’ to ‘Now let’s go apply those lessons,’” Brehm added.

There’s a “confidence course” to push basic cadets to overcome their fear of heights and an obstacle course to test their endurance. There’s a “leadership reaction course,” where teams of cadets must work together to maneuver through scenarios, and a chamber where cadets are exposed to tear gas in chemical, biological, radiological, and nuclear defense training.

Finally, there’s the famed “assault course,” complete with mud, barbed wire, “air cannons going off, [and] smoke grenades,” Webb said. The Academy features images from the assault course in its promotions, highlighting exhausted basic cadets caked in grime in front of a red sign declaring “ONLY THE STRONG SURVIVE.”

The grueling Jacks Valley courses are enduring, many of them the same challenges generations of cadets have overcome.

“Jacks Valley is kind of that great equalizer—to most of the alumni as well,” Webb said. “Everybody remembers their Jacks experience because probably it’s one of the hardest things they will ever do.”

That does not mean it’s all static: This year, Price said, basic cadets must “complete nearly 100 percent of those courses to pass and enter our cadet wing.” That’s a stricter standard than in recent years, she said.

The Combat Arms Training and Maintenance course requires cadets to qualify on the M4 carbine as well as the M18 pistol—the first time the Academy has required basic cadets to qualify on two weapons.

“That’s all part of getting us forward into the operational skills that we may need in combat,” Price said.

A 24-hour Foundational Expeditionary Skills Training course introduced recently pushes basic cadets to learn how to establish and defend a bare-bones base—similar to tasks given to trainees at BMT.

A “culminating exercise” introduced last year mirrors the Academy’s schoolwide “CULEX” event, making them apply lessons learned over the prior weeks in a series of challenges. Basic cadets awakened that morning with a surprise at 5 a.m., “air cannons and whistles, and a bunch of what you could expect if you were just getting shelled,” Webb said. “Put them in that warrior mindset of ‘all right, it’s real now, you’re disoriented, now you’re going to have to respond, get to your firing positions.’”

Drones flying overhead and simulated red force attackers force them to react and defend their positions while caring for combat casualties.

“This is really cementing the foundation for that warrior ethos for the rest of their time here,” Webb said.

COMBAT SKILLS

On a sunny morning, camouflaged cadets walk in formation across scrubby brown grass when the cry goes out: Get down, there’s a drone! The cadets scatter, ducking behind bushes, and burying themselves in the grass.

Then a bearded contractor from veteran-owned Touchpoint delivers a lesson: The drone is overhead, so look up—and next time, hide yourself more strategically.

A new Combat Skills Group now imparts the basics of survival, evasion, resistance, and escape (SERE) training to cadets, along with combat-casualty care; small unit movements and tactics; and countering small drones.

Former USAFA Superintendent Lt. Gen. Tony D. Bauernfeind, who retired Aug. 7, at the end of the summer training period, explained the objective: “We’re not trying to create Soldiers,” he said. “We’re creating joint warfighters.”

Giving all cadets a taste of combat fundamentals gives them more perspective on how to support and lead ground operations, said Tellez.

“It’s really wild that this is now bread-and-butter experience that these guys are getting,” said Tellez, a 2001 Academy grad. “When they walk into the larger service—not just the Air



Second-year cadets must now complete the Warfighter Advanced Course, a richer update to the former Combat Survival Training class. Here, instructors for the course identify a potential ambush site while training to conduct future courses.

Trevor Cokley/USAF



Ray Bahner/USAF

The Assault Course is among multiple sets of endurance and confidence-building drills that test cadets mettle during Basic Cadet Training. Much of BCT has been revised with an eye toward making it more useful and demanding.

[Force] and Space Force, but how that integrates into the joint force—the vocabulary we are giving them, layered with the experiences to actually bring those words to life is immeasurably valuable,” said Tellez.

The newest of the combat skills courses is the Cadet Warfighter Advanced Course, required for all rising sophomores (cadets 3rd class). CWAC replaces the former Combat Survival Training class, which taught cadets the basics of SERE. The new program is richer.

“They get to go out and spend five days in the field, where they sleep overnight,” explains C1C Kaleb Abouelghar, the cadet commander of the Combat Skills Group. “They’re given three MREs, and they have to survive, basically.”

It’s an introduction to the privations aircrew could face in combat, as in April when an F-15E crew dubbed “DUDE 44” was shot down over Iran, requiring rescue.

“They were using the exact skills that we’re teaching now,” Abouelghar said. “In order to survive and get home, they are using ridge lines and different isolated personnel techniques in order to stay low-observable and to stay alive.”

The course includes combat search and rescue, using the AN/PRC-163 Multi-channel Handheld Radios to call in air strikes, and dealing with mass casualty events.

Contract instructors—typically former military special operators—help oversee the training but most of the oversight is led by cadets in another course: the Cadet Warfighter Instructor Course (CWIC). Launched last year with the help of Active-duty Army Green Berets, CWIC is a next-level version of the “basic warfighting” skills course known as CWAC. Reinforcing those skills, it also teaches upperclassmen how to be instructors and how to staff a Tactical Operations Center (TOC), including briefing, commanding, and controlling all the action necessary to make CWAC work.

Previous classes weren’t exposed to these challenges, Tellez said. “I was a very successful, aggressive fighter pilot, leader, joint warfighter for a decade and a half,” Tellez added. “It wasn’t until I was a junior major that I could even spell TOC.”

Cadets who complete CWIC earn an “instructor” tab. In

addition to helping to guide CWAC, it will also help shape the military training cadets get during the academic year, Abouelghar said.

Between running a TOC or teaching a small unit, the idea is that cadets will gain a better understanding of how they can fit in and lead joint forces, regardless of where their career takes them.

“A lot of our cadets are going to work in career fields where they’re working with our other forces, and that’s one of the things that makes us so strong,” Abouelghar said. “And so instead of having to learn on the job and figure out what all these different things mean for joint functions, they’re able to learn now, so that way they have a better understanding when they commission.”

A third Combat Skills Group course, the Special Warfare Orientation Course, is for cadets interested in special warfare careers with more exposure to the skills they will need in those fields.

In addition to the “shoot, move, and communicate” basics and combat-casualty care, another combat skill USAFA wants every cadet to develop is drone operations.

“Our goal is to get every single cadet to have hands-on [experience with] as many drones as we can,” Abouelghar said. “We have about 60 to 70 drones that we’re flying nonstop, that we’re making sure that our cadets are all getting their hands on and getting experience with them.”

Cadets can learn to fly the small, inexpensive quadcopters in a day or two and then quickly demonstrate to other novices. Controlled using digital tablets, the drones are easy to fly and increasingly familiar to a generation that’s grown up with similar tech.

How cadets use these drones in the Combat Skills Group’s courses will evolve, leaders say. Automation will eventually be introduced, and CWAC Commander Maj. Edgar D. Acosta and Abouelghar expect the training will improve each year as cadets experience the classes and graduate into leadership roles, where they can refine the courses over time and build on their own experiences.

FLYING HIGH

The Air Force Academy has operated gliders since the 1950s, and today boasts the largest glider program in the U.S., with more than 15,000 flights annually—almost entirely led and managed by the youngest instructor pilots in the Air Force. And now it's getting bigger as USAFA aims to get every one of its cadets serious time in the air.

The new push echoes the “Soar-for-All” program in the 1970s, when every cadet got time in a glider. More recently, about half of every class—500 to 600 cadets—has gotten to take basic soaring, according to Lt. Col. Curtis Holtman, commander of the 94th Flying Training Squadron here.

USAFA also has a powered flight program, flying T-53A Kadett IIs; in recent years, about two-thirds of cadets participated in one or the other.

To get everyone airtime is the aim of “Airmanship for All.”

“Three years ago, we were sitting right around 300ish cadets coming through,” Holtman said. “We’ve incrementally scaled that over the last two years to we’re heading into fiscal year ’27, we’ll push over 500 to 600 cadets through our basic soaring program.”

Changes to the syllabus helped, as did “access to cadet time, operating hour increases,” Holtman said. “We can absolutely get to the 800 to 1,000 cadet throughput mark. If we can get to Airmanship for All through the soaring program, that is our end state objective.”

Each participating cadet gets eight flights—what study shows is needed for cadets to get comfortable in flight.

Those who go on to be instructors get far more. After completing basic soaring, some 70 to 80 percent apply to be instructors, a process that includes an interview and requirement that they demonstrate their teaching style. Here, anything goes: One cadet taught the board to change a diaper; another



Jonathan Suni/USAF

Some things never change. A forever part of In-processing Day, are the hair-cuts, an outward symbol of military discipline. Female cadets do not have their hair shorn, but must meet Air Force grooming standards.

how to use a yo-yo.

Out of hundreds, the best 60 are selected to earn their “G” wings—gliders who can pull 5Gs or more in certain maneuvers—and over the course of their careers they will fly hundreds of times. C1C James Callaghan estimates he has made more than 300 glider flights to date.

To get every cadet flying time, Holtman said USAFA will need to increase its ranks of IPs (instructor pilots) by at least 10. IPs get more than air time. They get a real taste of squadron operations, rotating through leadership positions and conducting morning safety briefs, running the step desk, and more.



The Academy's glider program is the largest in the country—and leaders want to make it bigger. Today, just half of every class gets glider time. Under a new Airmanship for All initiative, they aim to expand to everyone over the next several years.

Ray Bahner/USAF



Lt. Gen. Paul Moga (right) received the guidon from Air Force Chief of Staff Gen. Ken Wilsbach, becoming the 23rd Superintendent of the Air Force Academy on Aug. 7. Having previously served as Commandant, he takes over at a time when the emphasis on military skills, discipline, and fitness are getting increased attention.

Trevor Cokley/USAF

“Everything you see in this facility is what they are going to go see as soon as they go fly gray tails,” Holtman said.

Simulator time is another standard. The simulators here are the same immersive trainers used in undergraduate pilot training, incorporating virtual-reality headsets and controls that mimic the real cockpit.

AIRMANSHIP

Academy instructor pilots go on to bigger things. The 94th Ops Building halls display memorabilia from glider fliers who went on to become Thunderbird pilots, general officers, and astronauts. The skills they develop there can last a lifetime.

“I think gliders are unique in that they really do build situational awareness and energy management, which are things that we’re going to use throughout a career, no matter what platform we end up flying on when we graduate,” Callaghan said. “Those are values that take practice to build, and my bubble for both of those has increased exponentially. And then, on top of that, being an instructor pilot and being able to talk through your flying and get someone that has never touched an airplane before to basically learn how to fly has really helped with my communication skills.”

Not that flying a glider is the same as a powered aircraft, C1C Joseph Fitzsimmons said, but flying demands “soft skill and hard skills,” and gliders give cadets a jump start on the soft skills.

“The air awareness, the air-mindedness, the task management skills, all of those are baked into us now, and we will be able to carry that into whatever experience we have in the Air Force, whether it’s aviation or just leading Airmen,” Fitzsimmons said.

Adding glider time won’t solve the number of aircraft the Air Force has or change the number of pilots it can train. There are only so many slots for pilots, air battle managers, and combat systems officers. USAFA’s class of 2026 sent 53 percent to rated career fields, and 47 percent to nonrated roles.

Regardless of their future careers, what they get out of flying gliders is unique, Callaghan said. “I would argue that it is the most pure form of flying,” he said. “Truly, you feel every bump of air, every input of the stick, every move of your rudder—you feel everything.”

On the windy edge of the Rocky Mountains, handling the glider requires vigilance and constant adjustment—even flying while attached to the tow plane requires focus and touch.

Soaring in the thin air, it’s silent—no engine roar, no ear-splitting whine—and endless opportunity for maneuver. Glider fliers don’t just pull Gs, they learn to perform aerobatics, with some going on to compete nationally. USAFA cadets regularly bring home national championships.

The aerobatics lessons figure in at the tail end of the eight sorties in the basic program—as do sick bags, which are there just in case for cadets (and visiting reporters) who can’t quite stomach 5 Gs.

“You feel everything about flying and build such an intimate connection with aviation,” Callaghan said. It’s “flying in its purest form.”

END OF SUMMER, NEW YEAR

Summer officially ended at USAFA on Aug. 1, with all cadets required to report to campus by 7 p.m. The next nine-plus months will be a whirlwind of classes, studying, athletics, and extracurriculars.

Summer is a unique time to focus almost entirely on military training, unconstrained by competing academic, sports, and extracurricular priorities, many cadets said. But military training never stops. On “Silver Saturdays,” cadet squadrons hold training events, and two major exercises—a “Validation Exercise” in the fall and a “Culminating Exercise” in the spring—incorporate the entire cadet wing.

Bauernfeind, a few weeks before his retirement ceremony, said in an interview that a central goal during his tenure was to inject more of the summer’s intensity into the academic year.

“Our goal is to empower cadets to take ownership of year-round military training,” he said. “Our cadets are not only up to the task, but they are actively hungry for even more responsibility. In some cases, we’ve actually had to temper their enthusiasm a bit because their drive to lead is so strong.”

Bauernfeind retired a few days into the academic year, succeeded by Lt. Gen. Paul D. Moga, who previously led military training at USAFA as Commandant of Cadets. In that role, Moga reinstituted Combat Survival Training, which eventually grew into the CWAC, and started the “culminating exercise,” the CULEX, that Bauernfeind expanded to include the entire wing.

At the change of command where he became USAFA’s 23rd Superintendent, Moga pledged to “honor our history and our heritage—while ruthlessly preparing our graduates for the future fight.”





Staff Sgt. Michael Humsett

U.S. forces participate in live-fire Patriot missile launches during an exercise in Kuwait last December. U.S. and allied Patriot batteries have expended hundreds of missiles since then to defend against Iranian ballistic missile attacks.

ACE's Defensive Blind Spot

Dispersed operations are only as survivable as the defenses that move with them.

By Garrett F. Aziz

Over the past year, Iranian drone and missile attacks killed American Soldiers at air bases in Jordan and Saudi Arabia, destroyed an E-3 Sentry Airborne Warning and Control aircraft, and damaged other aircraft on the ground. The Combined Air Operations Center (CAOC) at Al Udeid Air Base in Qatar was also severely damaged, as were Navy facilities in Bahrain. The message is hard to miss: Airpower can be neutralized before it ever takes off.

Aircraft, weapon systems, fuel, munitions, and command nodes have always been part of the fight. Today, they are easier to find, easier to reach, and harder to protect. These vulnerabilities are precisely why Agile Combat Employment (ACE) is necessary. By dispersing forces, ACE complicates enemy targeting and gives commanders more options than concentrating combat power at a handful of large bases would. Major hubs are increasingly vulnerable to attack by missiles and drones, supported by persistent space-based surveillance, cyber exploitation, and long-range reconnaissance-strike networks. Yet distributed op-

ACE must plug into joint air defense when it is available, and bring its own organic capabilities, as well.

erations under ACE do not negate the need for fuel, munitions, maintenance, communications, security, and command and control to generate combat power. Unless those locations can detect, warn, conceal, absorb, jam, and defeat incoming threats, dispersal can become exposure by another name.

Air Force Doctrine Note 1-21, "Agile Combat Employment," provokes a sharp warning from retired Air Force Col. Mark Gunzinger, now Director of Future Concepts and Capability Assessments at the Mitchell Institute for Aerospace Studies: "The best place to kill an enemy's air force is on the ground." The danger is greatest, he argued, when that force is postured at bases lacking passive defenses, including shelters and decoys, and active defenses, including kinetic and nonkinetic interceptors, electronic warfare, and directed-energy weapons.

The April 2025 Air Force Doctrine Advisory, "Point Defense of Air Bases," plainly recognizes the challenge. Today's limited joint air defense capacity, when combined with ACE, "will stress air defense resources." Therefore, the advisory warned, "future unit-of-action commanders should not assume that joint capabilities will be available or sufficient." That is more than a

Airmen assigned to the 124th Security Forces Squadron, Idaho Air National Guard, participate in a counter-drone training exercise in June at the Saylor Creek Range, Idaho. Airmen must be able to respond to emerging threats like drones and small cruise missiles.

Staff Sgt. Jady Eisenbrandt



doctrinal footnote. It is the clearest signal yet. ACE is not only a basing concept; it is a force protection problem.

Iran's response to Operation Epic Fury sharpened the point. Losses at Prince Sultan Air Base, Saudi Arabia, and Al Udeid were significant. While operational control of air assets in the region had already shifted to Shaw Air Force Base, S.C., the loss of the CAOC demonstrated a fundamental fact: In a modern missile and drone war, sanctuary is disappearing. Geography is no longer a defense plan.

DISPERSAL OPENS NEW SEAMS

A force that remains concentrated at a few large bases gives the enemy valuable targets. A force that disperses without an organic defensive baseline does not solve this problem, but complicates it, giving the enemy more targets. The answer is not to abandon dispersal, but rather to make point defense a more integral part of ACE from the start.

ACE is often discussed in terms of movement: move the aircraft, people, munitions, fuel, and command post. That is only half the problem; the other half is whether the force that moved can remain operational after it arrives.

Air Force Doctrine Note 1-21, "Agile Combat Employment," describes base clusters built around an enduring location and one or more contingency locations. It uses hub-and-spoke distribution to explain how cargo moves between a hub and a spoke. The next step is to translate those location types into a defensive baseline. A hub, spoke, and temporary operating location do not carry the same defensive burden. A hub does not need the same package as a temporary strip. None should be defended by assumption.

ASSIGNED RESPONSIBILITY

If each location type carries a different defensive burden, someone must define who owns that burden before the force disperses.

Traditionally, when a base needed air defense, the Army was tasked with providing it. The National Security Act of 1947, Executive Order 9877, and the Key West and Newport Agreements of 1948 assigned the Air Force responsibility for air superiority,

air defense, and strategic warfare. Those agreements set the broad roles-and-missions backdrop, but they did not settle the specific problem of ground-based defense of Air Force bases. In 1956, Secretary of Defense Charles E. Wilson's roles and missions memorandum assigned the Army responsibility for point air defense and the Air Force responsibility for area air defense. In 1984, that division of responsibility was translated into air-base terms through an Army-Air Force memorandum of understanding (MOU).

The 1984 Memorandum of Understanding on United States Army and USAF Responsibilities for Air Base Air Defense did not assign air base air defense to the Army exclusively. Rather, it stated that air base air defense at USAF bases was a joint Army-Air Force responsibility, with the Air Force responsible for submitting air base air defense requirements to the Army, and the Army responsible for providing support. It also made the Army primarily responsible for ground-based air defense at Air Force main operating bases worldwide.

The MOU required biennial review and became void if two consecutive review cycles passed without one. It expired years ago.

In "Air Base Defense: Rethinking Army and Air Force Roles and Functions," a 2020 RAND report, researchers concluded that the Air Force "lacks clear authority to develop and procure surface-based air and missile defense (AMD) systems" to protect its own forces. The Army fields robust systems such as THAAD, Patriot, C-RAM, Avenger, and newer short-range air defense programs, while the Air Force has the greatest operational stake in defended air bases. Meanwhile, the Air Force lacks organic ground-based air and missile defenses of its own. The result is not an absence of base defense, but a gap between those with the equipment to defend airfields and those most dependent on them. An arrangement that was already fragile when the problem was defending a limited number of large, established bases becomes untenable under ACE. Dispersal multiplies the number of sites that must be defended without multiplying the Army air defense forces available to defend them. Every hub, spoke, and temporary operating location creates another point defense requirement. Meanwhile, Army

air defense remains focused on theater missile defense, maneuver-force protection, and other joint priorities.

JOINT, INTEGRATED, AND ORGANIC

ACE, however, turns operating locations into a form of maneuver. Airmen are no longer tenants on a fixed base waiting for theater defenses to appear, but maneuvering forces operating in and out of a network of smaller sites, sometimes with limited infrastructure, uncertain host-nation support, and compressed decision timelines. In that environment, commanders need more than a general expectation of joint support. They need a defined defensive package, delegated authorities, and a clear way to connect local defense to the broader Integrated Air and Missile Defense (IAMD) enterprise.

Joint integration remains essential. The Air Force cannot and should not try to recreate the entire joint IAMD architecture at every ACE site. Patriot, THAAD, Aegis, theater sensors, air defense command relationships, and the area air defense commander all remain central to the fight. Joint integration, however, is not the same as guaranteed availability. Army air defense capacity is finite. Priorities shift. Distances matter. Communications fail. Legal authorities differ between the homeland and overseas theaters. A commander at a dispersed site may be part of a larger architecture and still have no timely protection at the point of need.

The Air Force, therefore, needs a hybrid model. ACE sites must plug into joint air defense when it is available—but must also arrive with enough organic capability to survive when it is not.

THE THREAT HAS CHANGED

Increased drone incidents make the problem more urgent—both overseas and even in the United States. Unauthorized drone activity over JB Langley-Eustis, Va., in 2023, Royal Air Force bases hosting U.S. forces in the United Kingdom in 2024, and Barksdale Air Force Base, La., in 2026 has little to do with ACE, but it demonstrates that air bases everywhere can be watched, harassed, slowed, or forced into protective postures.

A drone loitering over a flight line, weapons storage area, or command facility does not have to strike to have an effect; it can force commanders to slow operations, protect exposed assets, and change risk calculations under pressure. At U.S. bases at home and abroad, especially near populated areas or allied communities, commanders also face tighter limits on their use of kinetic defeat options. The defensive problem is tactical, legal, political, and operational all at once.

Ukraine's Operation Spiderweb adds to the warning signs. Using low-cost drones launched from concealment inside Russia, Ukraine damaged or destroyed 41 military aircraft at four air bases thousands of miles from the Ukrainian border. Total losses were valued at approximately \$7 billion. For Air Force planners, the lesson is that a runway, fuel point, aircraft shelter, munitions pad, communications node, or parked aircraft need not be obliterated to create strategic effect. It only has to be disrupted at the wrong time.

PROGRESS WITHOUT A BASELINE

The Air Force is creating point defense teams, a new air base defense specialty, and is experimenting with counter-drone technologies. Air Combat Command's Point Defense Battle Lab is helping evaluate emerging point defense and Counter-Unmanned Aerial Systems (C-UAS) capabilities, integrate them into operational practice, and translate lessons into tactics, techniques, and procedures.

USNORTHCOM is doing its part to shore up domestic security. In his April 2026 written statement to Congress, Gen. Gregory M. Guillot said that, in the early hours of Operation Epic Fury, a deployed C-sUAS (Counter-small Unmanned Aerial Systems) Flyaway Kit "successfully detected and defeated sUAS operating over a strategic U.S. installation." While encouraging, that success also reveals the gap: A rapid-response kit is not the same as a standing point defense package. A kit is not a concept of operations. A sensor is not an authority. A defeat mechanism is not a command relationship.

The Marine Corps offers a useful comparison. Marine littoral regiments include organic air defense capabilities through lit-



A freeze-frame captures a drone exploding, disabling a Russian Tu-95 bomber during Ukraine's Operation Spiderweb, a covert drone attack in 2025. Ukraine's surprise attack unleashed small drones armed with explosives to destroy dozens of unprotected Russian aircraft at air bases across the country.

Airmen from the 319th Reconnaissance Wing prepare for a Point Defense Battle Lab exercise at Grand Forks Air Force Base, N.D., in February. The lab is a hub for developing tactical superiority against evolving threats.

Airman 1st Class Emma Teel



toral anti-air battalions, while systems such as the Marine Air Defense Integrated System reflect a service-level decision to integrate expeditionary maneuver with local air defense. That model is not a plug-and-play answer for the Air Force, which faces a broader challenge: defending bombers, tankers, fighters, mobility aircraft, command nodes, munitions, fuel, and maintenance spread across global theaters. But the principle behind the Marine Corps solution is transferable. Maneuver forces that expect to operate inside enemy reach need local defense as part of the formation—not as an emergency attachment.

The Air Force need not copy the Marine Corps, build a miniature Army air defense branch, or turn every ACE location into a fortress. It must, however, stop treating point defense as a support function. ACE is only credible if distributed teams can fight through surveillance, harassment, and attack.

FROM BLIND SPOT TO BASELINE

The solution is layered defense: integration with joint and theater air defenses where available, organic point defense integrated with conventional perimeter security at the site level, and commander-ready decision support that links data, authorities, and risk thresholds before the force disperses. At the enterprise level, the Air Force must define the doctrine, force design, and acquisition path. At the commander level, every ACE package must know what it can defend on its own, what capabilities it can or must request, who can authorize action, and when the site is too exposed to continue operating.

The strategic answer begins with ownership. ACE was introduced to solve a force-generation problem: how to generate combat power when fixed bases are fewer, more visible, and more vulnerable. The Chief of Staff of the Air Force should direct the Curtis E. LeMay Center to develop a point defense annex to ACE doctrine. Headquarters Air Force A5/7 Force Modernization, under the Chief Modernization Officer, should lead enterprise point defense force design and requirements for ACE. Working with major commands and relevant functional authorities, A5/7 should define what protection travels with ACE forces, what remains theater-provided, what depends on host-nation support, and what capabilities must be developed

or acquired. The annex should establish defensive expectations for hubs, spokes, and temporary operating locations; identify what protection must move with the force; and explain how local point defense connects to theater IAMD, host-nation support, and homeland defense authorities.

The tactical answer begins with a baseline. Every ACE location should have minimum planning assumptions for passive defense, camouflage, deception, warning, local sensing, communications, C-UAS measures, emergency repair, casualty care, and integration with higher air-defense authorities. Commanders should know five things before dispersal: what must be defended first, what can detect threats locally, what can defeat or disrupt them, who can authorize action, and when risk exceeds the site's ability to continue operating.

Every ACE package should also deploy with a point defense operational data package: a standardized, machine-readable, releasable, and interoperable data product that identifies the aircraft, weapon systems, fuel, munitions, and command nodes most likely to be exposed first; the local sensors and defeat options available; the authorities governing their use; and the joint, host-nation, and logistical dependencies required to keep the site operating under attack. The package should federate authoritative data from existing operational systems rather than duplicate or replace them, providing commanders and supporting air-defense nodes with a common, decision-ready picture. It should be integrated into the concept of operations, updated throughout planning and execution, exercised before deployment, and usable by commanders, joint air-defense nodes, and host-nation partners in both connected and degraded environments.

Force design should follow. The Air Force should create deployable force protection and point defense teams at the wing or expeditionary level, built to attach to ACE elements rather than remain tied to fixed-base routines. Security forces should be central to those teams, but the teams should also include communications, intelligence, civil engineering, emergency management, spectrum, logistics, and C-UAS expertise. Their purpose would be to help commanders integrate passive defense, local sensing, C-UAS options, communications, recovery,

and risk decisions into the maneuver plan from the start.

ACC's Point Defense Battle Lab can help inform that requirement. The lab is already part of the Department of the Air Force's broader C-sUAS effort and serves as a hub for developing and evaluating technologies to defend installations from sUAS threats. Its mission—developing and validating tactics, techniques, and procedures for C-sUAS detection, tracking, interception, and neutralization—fits the problem ACE will face at dispersed locations.

That does not mean the battle lab owns deployed-location defense, however. Those decisions remain commander dependent. It means installation-defense experimentation should inform dispersed-operation defense.

Training must make the concept real. ACE exercises should make point defense and force protection core events, not supporting assumptions. Commanders should be forced to operate with intermittent communications, delayed joint support, contested spectrum, limited interceptors, uncertain authority, and visible drone threats. If the first time a unit tests its local point defenses is during combat, the lesson will come too late.

Acquisition, meanwhile, should follow doctrine. Better sensors, cheaper interceptors, directed energy, electronic warfare, low-collateral defeat options, and automated command and control tools all matter. But the Air Force should not buy isolated point defense tools; it should buy systems that fit within a defined ACE defensive architecture. If the past is indicative of the future, buying hardware before defining roles, authorities, force packages, data standards, releasability rules, and risk thresholds will produce disconnected capabilities. The Air Force must define what an ACE site must be able to detect, decide, defend, repair, and report. Then it should acquire the tools necessary to support that operating concept.

This is both a doctrinal problem and an acquisition problem. Doctrine must define the operating concept. Acquisition must provide the tools. Training must make the concept real. Force design must put the right people in the right places before the first missile or drone arrives.

THE PRICE OF AMBIGUITY

The Air Force has spent years learning how to disperse. It now has to define how dispersed forces stay in the fight. Commanders should not be left to improvise point defense under fire, guess what support will arrive, or assume that joint assets will be available at the tactical edge. The lesson from recent air base attacks strongly suggests that ACE is the right strategy, but not yet a complete concept of operations. Distributing forces can reduce the payoff of any single enemy strike, but only if dispersed nodes can fight through pressure and attack. Otherwise, the Air Force merely trades concentrated vulnerability for distributed fragility.

Point defense must become a core element of ACE doctrine, and commanders must be given scalable organic protection, trained force protection teams, delegated authorities, interoperable point defense data packages, and defined links to joint IAMD before they disperse.

Doctrine cannot remove uncertainty from war, but it can reduce and simplify the critical decisions commanders must make under fire. For ACE, that means defining not only where Airmen will move, but how they will detect, defend, recover, and continue generating combat power once they get there.

The Air Force has built a concept for dispersing the force. Now it must build the defensive backbone that allows that force to survive, fight, and win. 

***Garrett F. Aziz** is a technology and defense leader with more than 20 years of experience across private industry, aerospace and defense R&D, enterprise modernization, and military operations. He was a foundational member and integration lead with Air Combat Command's Point Defense Battle Lab, helping move next-generation air base defense capabilities from concept through experimentation toward operational fielding. His work centers on advanced technology integration, rapid capability development, and future operational solutions that improve interoperability and enable decision advantage across U.S., allied, and coalition missions.*

U.S. Air Force Staff Sgt. Deante Edwards, 35th Security Forces Squadron, briefs 35th Civil Engineer Squadron Airmen after a counter drone exercise at Misawa Air Base, Japan, in May. Edwards gave Airmen a closer look at some unmanned aircraft threats.



Senior Airman Andre Medina



Airman Vinh Phan

U.S. Air Force Security Forces Airmen assigned to the 432nd Wing prepare to employ a counter-Small Unmanned Aircraft System device during a Combat Readiness Inspection at Creech Air Force Base, Nev., in May. The inject challenged defenders to respond to simulated adversary drone activity and protect installation personnel and assets.

Defeating the Drones

The Airman's Imperative to Defend from Small Uninhabited Aerial Vehicles.

By Brig. Gen. Houston R. Cantwell, USAF (Ret.)

The air base has become a central target set. Small drones have become one of the defining air threats of modern warfare, representing a structural change in the character of air base defense—and, by extension, in the way the United States Air Force must think about generating combat airpower.

Since the end of the Cold War, American Airmen have consistently operated from expeditionary bases where flight lines, critical infrastructure, and parked aircraft were free from persistent air attack. Not anymore. In response, the Air Force must integrate multispectral detection, kinetic and non-kinetic defeat mechanisms, resilient command and control, and passive defense into a coherent system. At the same time, combat forces must attack the systems that generate the threat: production facilities, supply chains, storage sites, launch points, pilots, datalinks, and command and control networks. Offense and defense must become mutually reinforcing elements of the same campaign.

Crucially, Airmen must once again embrace the ability to survive and operate (ATSO). Generating aircraft



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while under attack is a demanding operational skill, requiring training, realistic exercises, clear authorities, real-time threat awareness, and rapid decision making through command and control. The base defense operations center must evolve from a ground-security node into an integrated air base defense hub to achieve this goal in the face of new UAV threats. Air base commanders must have the tools, people, and authorities to fight the base as a weapon system.

MASS, ADAPTATION, AND SURPRISE

Small UAVs present a rapidly evolving and proliferating air threat. Rapid innovation cycles, massive numbers, low-altitude flight paths, and varied physical characteristics enable these small aircraft to evade detection; they can also overwhelm traditional air defense systems that were developed and optimized to defend against large aircraft and missile threats.

In July 2025, Russia attacked Ukraine with 741 small UAVs in a single day. Just two months later, however, that volume was becoming routine: Over the course of September 2025, Russia launched 6,900 drones against Ukraine. Six months later that volume had multiplied again, so that in March 2026, Ukraine reported having shot down 33,000 Russian drones.

What the USAF Is Doing to Counter the UAS Threat

By Matthew Cox

The Air Force is racing to create a "Point Defense" force of Airmen, specially trained and equipped to protect air bases from unmanned attack more effectively than ever before.

With attack drones now a constant threat to U.S. forces in the Middle East and having long been the weapon of choice in the Russia-Ukraine war, the Air Force's 2025 "Point Defense of Air Bases" doctrine gives air base commanders more freedom to identify threats and "secure air operations using organic PD capabilities."

The Air Force also established a Defense Task Force and Point Defense Battle Lab to identify and develop new training, equipment, and tactics for the new mission.

Point defense flights of specialized Airmen are training to rapidly deploy in the event of emergencies to defend remote air bases and a new job specialty for base defense is planned.

"We've seen that the adversary is evolving ... and we have to do the same," said Michael Sheehy, director of future operations on the Air Staff. "We're putting more emphasis into the point defense mission from an organize, train, and equip standpoint. One of the things that I'm driving after,

from an organizational perspective, is to professionalize this mission set for our wings and for our deployers."

The Air Force's Point Defense Task Force (PDTF) is developing training curricula and holding exercises to identify new capabilities for the counter-drone fight. Air Force Col. Cody Moore, the first task force commander, said the ACC unit is responsible for figuring out the "foundational capability that the Air Force has ... and how do we develop those tactics, techniques, and procedures."

Moore, now chief of future operations at ACC, described the task force's work as "running as fast as I can to make these solutions."

"We've spent a little over two years working on some of that problem, and now the Air Force has come out and said, 'Hey, this is going to be a flight underneath our operational support squadrons.' That was a recommendation that came out of the Point Defense Task Force," he said. "We did tabletop exercises. We did operational rehearsals, real-world experimentation [to determine] what kind of Airmen have these skills."

The Point Defense flights will include enlisted Airmen with aviation, battle management, and command and control experience. They will complete a three-week course at the Joint Counter Unmanned Aircraft Systems University, at Fort Sill, Okla.,

Russia is maximizing its small UAV production, with estimates reaching up to tens of thousands of units per month. Ukraine has responded by ramping up its own production of defensive interceptor drones. President Volodymyr Zelenskyy stated in late 2025 that Ukraine expected its production of interceptor drones to reach 600 to 800 per day, if production was not disrupted. That's far below replacement rate. Both sides are increasing not only the number of UAVs but also the types of UAVs used across the battlespace.

The same lesson has played out in the Middle East since the launch of Operation Epic Fury against Iran. Drones have played significant roles for both sides. The United States publicly acknowledged deploying one-way attack drones reverse-engineered from those Iran has employed. Iran expended nearly 1,000 drones in its attacks on U.S. and allied targets in the first six weeks of the conflict. And on March 27, Iran destroyed a USAF E-3 Sentry AWACS command and control aircraft in a combined missile and drone attack on Prince Sultan Air Base, Saudi Arabia. The attack also injured at least 10 allied service members and damaged several U.S. refueling aircraft.

Even six weeks after the start of the conflict, Tehran retained the ability to conduct 60 to 90 drone attacks per day against U.S. and allied targets. Despite extensive U.S. layered defenses, Iran continued to inflict damage on personnel, aircraft, infrastructure, and U.S. and allied bases' ability to launch aircraft.

The cost-exchange problem is a central element of the threat: First-person-view (FPV) drones can cost as little as a few hundred dollars each and are able to precisely strike targets from miles away. Shahed-class systems, which cost tens of thousands of dollars each, travel farther and carry a bigger punch, yet remain inexpensive compared with many of the systems used to defeat them. Long-range Shaheds can fly more than 1,000 miles and carry a warhead large enough to threaten aircraft, fuel storage, and command and control nodes. When launched in large numbers against single target areas, they can overwhelm defenses, enabling at least some to reach their targets.

Modern warfare has made clear that small UAVs are credible threats even to militaries equipped to defend against traditional fighters, bombers, and missiles. Traditional defensive systems still matter, but small UAVs add a new dimension to air combat. The United States must expand the scale and scope of its defensive arsenal to fill the gaps created by small UAVs. When it comes to new counters and traditional air defense assets, the answer is "and," not "or."

WHY TRADITIONAL AIR DEFENSE STRUGGLES

The physical characteristics of small UAVs—compact, plastic or Styrofoam materials, low infrared signatures, and low-and-slow flight profiles—present distinct challenges to traditional counterair detect, track, identify, and engage capabilities. They display small radar profiles and their electric motors generate comparatively little heat, reducing infrared signatures. Flying low to complicate detection, small UAVs can exploit radar blind spots, terrain masking, urban clutter, and slow airspeeds to resemble little more than birds or other wildlife, making detection among the hardest problems in the kill chain. If defenders detect a small UAV early, they likely have only minutes to classify it, warn the base, cue sensors, direct effectors, or take protective measures. If detection comes late, they may have only seconds. In a mass attack, time runs out quickly.

Small UAVs have proven highly adaptable. Antennas, receivers, datalinks, warheads, and software can be changed quickly in the field. Ukraine continually surveys the radio-frequency (RF) spectrum, identifying exploitable gaps, and adapting drones accordingly. Some UAVs are equipped with multiple receivers and antennas operating on different polarities to increase the chances of maintaining a secure datalink in heavy electronic warfare environments.

With both sides engaged in rapid innovation and counter strategies, the one that modifies its systems fastest gains the advantage.

to learn how to defend against enemy drone attacks and how to use counter-drone technology.

The Air Force is working with the Army school at Fort Sill on the formal technical training program. Eventually, the Air Force may need its own school, some observers say.

The PDTF has also created mobile training teams—one in the U.S. and one abroad—to travel to Air Force bases to provide point defense training to Airmen, Moore said. The two-week course, he added, is for “anybody that the wing commander deems would be involved with point defense.”

The mobile training teams include a command and control enlisted battle manager and an air traffic controller. “That’s one of the biggest points we hit with this mobile training team—you need airborne command and control understanding,” Moore said. “How do you deconflict airspace? Our air traffic controllers are heavily involved in that process.”

The teams also have a Security Forces Airman and an Airman that specializes in maintaining and sustaining radar, weather systems, and other air base equipment, Moore said.

Heather Penney, a former Air Force F-16 pilot and a senior fellow at Mitchell, applauded the Air Force’s recent moves to focus on training Airmen to take on this new mission but stressed that doing so demands a cultural shift across the entire service.

“This is about everybody needing to have this attitude to defend against and offensively preempt small UAS attack,” Penney said.

Control methods are likewise evolving. Early FPV drones used radio-frequency datalinks, but as jamming increased and the spectrum was contested, operators negated jamming effects by switching to fiber-optically controlled drones, covering cityscapes and countryside with miles of spent and tangled optical cables. Other drones exploit commercial cellular networks, enabling control deep into enemy territory. Still others reduce dependence on GPS by integrating cameras, terrain recognition software, and artificial intelligence. The sheer variety of control methods complicates defense, requiring a system-of-systems approach for countering these threats.

THE AIR BASE AS A WEAPON SYSTEM

The Air Force must reconceptualize air base defense to defeat this threat. Army air defense forces historically have provided critical protection for forward-deployed air bases, and that mission still matters—especially against aircraft, cruise missiles, and ballistic missiles. But those defensive capabilities are inadequate given the scale and scope of today’s growing small UAV threat.

The Army’s traditional air defense model relies on four pillars: trained Soldiers, effective command and control, advanced radars, and interceptor missiles, all optimized to defeat high-speed manned aircraft and ballistic missiles, not small, slow, low-flying drones. Even for larger one-way attack drones, Patriot-class systems may be effective, but the cost differential is prohibitive at scale.

What the Air Force needs is a parallel set of pillars to counter UAVs that is aligned with counterair doctrine. Airmen must be trained to plan air base defense and operate defensive systems. The Base Defense Operations Center (BDOC) must become the command and control hub for air base defense, and the Air Force must acquire interoperable systems for airborne early warning, tracking, identification, and defeat. In addition, passive base defense measures must be integrated into the entire defensive scheme.

Resourcing is a major concern, she said. “It’s also about educating Congress about the resources that the Air Force needs. It’s time for Congress and the [Pentagon] to provide the resourcing to the Air Force, not only to get healthy, but to begin to expand its mission areas.”

SUADS

The Air Force’s Small Unmanned Air Defense Systems (SUADS) is its program of record for counter-UAS defense. The system identifies and tracks enemy drones of all sizes and is equipped with an electronic warfare effector. Available in two variants, one for fixed air bases and another that’s deployable on a single pallet. Congress included \$51.8 million for SUADS acquisition in fiscal 2026, according to Air Force budget documents.

“We own that baseline system, and as we identify those new capabilities ... I can go out and buy that high-power microwave and plug it into my SUADS,” Moore said. “I can go out and buy that kinetic interceptor from company X and connect it to SUADS. [Having built] that foundational capability with the electronic warfare, the command and control, and the detect, track, and ID capability—now all I’m building is additional defeat options based on the location that I need to be in.”

An Air Force spokesperson said the service is acquiring and fielding additional, commercially available systems.

In effect, the air base must be viewed as a weapon system designed to generate combat power. Because small UAVs have the potential to disrupt aircraft maintenance, weapons loading, command and control, or aircraft launch and recovery, they can degrade airpower without defeating a single aircraft in the air. Air base defense, therefore, is not a separate force-protection task, but core to the base’s ability to generate airpower.

REBUILDING THE BDOC

Central to this change is transforming the Base Defense Operations Center, which today is part of the Air Force base security forces enterprise. The BDOC traditionally focused on ground security, law enforcement, and installation defense, but today it must take on a broader role to include defending against airborne threats. Most importantly, the BDOC must develop the capacity to execute the kill chain in a timely manner against a robust and ever-changing small UAV threat. That means incorporating an airborne common operating picture into daily operations, fusing data from multiple sensors, understanding threat identification, and directing defensive action under tight timelines.

To make this transition, Airmen staffing the BDOC will require new skills. Counter-UAV operations require airspace control, three-dimensional battlespace awareness, threat-identification matrices, and intercept geometry—skills residing not in security forces, but among air battle managers (ABM) and weapons directors (WD), Airmen who typically serve on AWACS aircraft or in control and reporting centers (CRC). Any future air base C2 center will require similar expertise.

The fatal attack at Tower 22 in Jordan in January 2024 illustrates why this matters. The base’s radar systems detected inbound UAVs, but the Soldiers in the BDOC failed to identify the tracks as viable threats before the attack, resulting in the deaths of three Soldiers and injuries to dozens more. The official incident investigation found that Soldiers were



Airman 1st Class Kacie Ramos

A 3D custom-built drone flies during the Threat Enhanced Emergency Readiness Exercise at Spangdahlem Air Base, Germany, in June simulating a realistic adversary platform to test base defenses.

distracted by the return of a friendly UAV and that battle drills were inadequate. Had the threat been recognized even a couple of minutes earlier, defenders might have been able to warn personnel to take cover.

LAYERED SENSING AND DEFEAT

Successfully defending air bases against small UAVs will require weapon systems capable of rapidly detecting and intercepting large numbers of aircraft. No single sensor can solve the problem alone. A defense-in-depth architecture combining ground-based radar, airborne radar, radio-frequency detection, acoustic sensors, and electro-optical/infrared systems, all tied to data fusion tools that feed a common operating picture to the BDOC is required.

Defending a Base: One Operational Concept

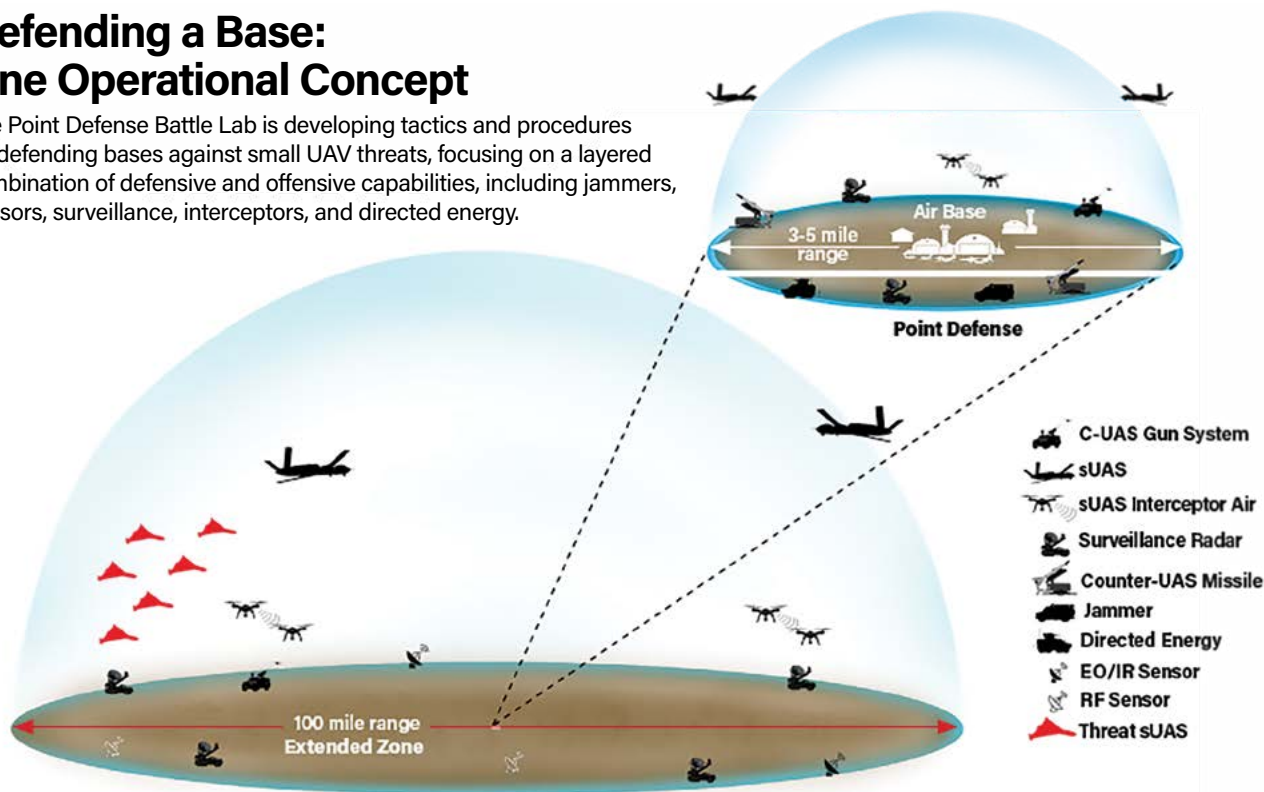
The Point Defense Battle Lab is developing tactics and procedures for defending bases against small UAV threats, focusing on a layered combination of defensive and offensive capabilities, including jammers, sensors, surveillance, interceptors, and directed energy.

Each sensor type brings strengths and weaknesses. Ground-based radar can provide wide-area surveillance but is vulnerable to attack and often limited against low-altitude targets. Airborne radar can look over terrain and shift position, but is limited in number and expensive to operate. RF sensors can detect and sometimes geolocate drones and operators, but they are ineffective against nonemitting or fiber-optic systems. Acoustic sensors are low-cost and passive, but short-range and susceptible to noise. Optical systems can support visual identification but require line of sight and are affected by weather.

The answer is layered sensing. Multiple sensor types, distributed across depth and elevation, maximize detection time and reduce coverage gaps.

Airborne sensors deserve particular attention. Land-based sensors have limited effective range against low-altitude threats because of terrain and obstacle masking. During the war in Ukraine, both Russian and Ukrainian UAV operators learned to avoid fixed ground radars, delaying detection. Airborne sensors do not remain fixed, making them harder for adversaries to avoid. Medium- and high-altitude long-endurance aircraft such as MQ-9 or RQ-4-type platforms could host specialized sensors to provide forward early warning against inbound small UAV threats, especially in lower-threat airspace.

But sensing is only half the problem. Defeat requires a layered mix of effectors. No single defensive system can address every signature, flight profile, and attack method. Defenders



Dash Parham and Eric Lee/staff



Senior Airman Amanda Jett

U.S. Air Force Staff Sgt. Dominic Thornton, 379th Expeditionary Security Forces Squadron, aims a Dronebuster at a quadcopter drone within the U.S. Central Command area of responsibility in 2025. Security Forces Airmen trained in C-sUAS piloted quadcopter drones, enabling explosive ordnance disposal technicians to detect and neutralize simulated explosive threats with greater precision.

must integrate kinetic, electronic warfare, directed energy, and low-cost interceptors across overlapping engagement zones.

Lasers offer low cost per shot and provide an almost endless magazine depth, but dust, smoke, and weather can degrade performance. High-power microwave systems can affect multiple drones simultaneously, but they are short-range weapons and require careful electromagnetic management. RF jammers are inexpensive and can be effective against many drones, but not against those that are preprogrammed or guided via fiber-optics. Guns can be relatively cheap, but they are difficult to aim precisely and risk creating collateral damage on base or to nearby civilians, in some environments. Surface-to-air missiles offer high probability of kill, but they are expensive and limited in magazine depth. Drone interceptors offer a promising combination of range and cost, but they require precise guidance through intercept.

The cost-exchange problem is central. The U.S. Navy's experience in the Red Sea against the Houthis showed that successful defense is not necessarily sustainable. Intercepting hundreds of drone and missile attacks with high-end interceptors, aircraft, and guns came at massive cost. Many of the weapons currently used to intercept small UAVs are an order of magnitude more expensive than the drones they destroy, putting U.S. forces on the wrong side of the cost curve.

The military has begun to shift toward lower-cost, more plentiful alternatives, such as APKWS rocket systems, but ultimately drone interceptors, high-power microwave systems, guns, electronic warfare, and directed energy must also be part of the mix. High-end interceptors should be preserved for high-end threats.

Standardization matters as well. As the military services acquire defensive systems, standardized data sharing is imperative to create a joint common operating picture. The Department of Defense's counter-UAV standardization efforts, including work through Joint Interagency Task Force (JIATF) 401, point in the right direction. Future Air Force systems must use standard data protocols and enable integration with sister-service systems.

PASSIVE DEFENSE AND THE RETURN OF ATSO

Even the best active defense cannot stop everything. Some UAVs will penetrate active defenses, making passive defense essential.

Camouflage and deception can prevent adversary UAVs from finding intended targets. Hardening can protect valuable assets from attack. Dispersal makes targets harder to find and can limit damage to aircraft or equipment. Decoys complicate adversary targeting and absorb attacks. Netting and physical barriers can prevent small UAVs from reaching their targets. None of these measures are glamorous, but they are cheap by comparison, scalable, and can be effective. They all require prior planning.

This leads to a larger cultural requirement: Airmen must revive their ability to survive and operate while under air attack. For years, Airmen have generated combat airpower at expeditionary bases with limited concern for persistent air threats. Warning sirens sounded, personnel took cover, and operations resumed after the immediate danger passed. Small UAVs change that calculus. Airmen must be prepared to work, adapt, protect themselves, and continue generating sorties under an active threat.

The Air Force already has a model for tiered response: mission-oriented protective postures (MOPP). MOPP taught Airmen to perform their regular duties while balancing force protection against mission accomplishment under chemical and biological threats. A similar construct should inform Drone Defense Postures (DDP), which can divide the base into sectors and set protection levels based on the number, proximity, and nature of inbound or expected UAV threats.

At low threat levels, Airmen may continue normal operations with protective equipment available. At medium levels, they could monitor air threat systems, wear protective gear, implement passive defenses, and prepare quick-reaction responses. At high threat levels, personnel could seek shelter, aircraft could be moved to hardened shelters, and commanders could even direct immediate launch to "flush" aircraft from the base before an attack.

Through disciplined, rehearsed options, commanders could balance force protection with aircraft generation—and keep the force in fighting form.

OFFENSIVE COUNTERAIR

Point defense of bases is necessary, but insufficient. The best defense is to reduce the volume of small UAV threats by destroying the adversaries' ability to launch in the first place. Sustained air base defense ultimately demands offensive counterair.

During World War II, Allied forces attacked aircraft factories, airfields, petroleum facilities, ball-bearing plants, and storage sites in a concerted effort to reduce the Luftwaffe's ability to generate sorties. Offense was used as defense. Defensive counterair remained vital, but it was complemented by attacks on the enemy's ability to generate airpower.

The same logic applies today. The joint force must target UAV production facilities, supply chains, warehouses, launch sites, pilots, and command and control networks. In Ukraine, both sides have targeted UAV operators and production infrastructure. Drone pilots have likewise become high-priority targets.

Ukraine has attacked Russian operating locations, factories, logistics hubs, and oil refineries connected to the drone enterprise. In the Middle East, the U.S. focused attacks on Iranian drone production and guidance facilities.

Factories and warehouses producing and storing batteries, motors, engines, circuit boards, composite materials, guidance systems, launch teams, and communication networks are all potential targets. Destroying or disrupting these nodes degrades the adversary's ability to produce weapons and generate flights, slowing production, forcing dispersion, increasing cost, and reducing the number of UAVs that ever make it into the air.

THE AIRMAN'S IMPERATIVE

The Air Force must lead a reconceptualization of small UAV defense as a doctrinal, organizational, operational, and cultural imperative.

The consequence of failure is measured not only in damaged equipment or lost infrastructure, but also in lost sorties, lost initiative, and lost combat effectiveness. In the age of proliferated UAVs, the ability to generate airpower from impervious air bases can no longer be taken for granted.

The Air Force should pursue five priorities.

1. The Department of Defense and Congress must provide the Air Force with the resources required to develop and field essential counter-UAV capabilities, including air base point-defense systems, integration with Army missile defense where appropriate, and systems for early warning, tracking, identification, and defeat.

2. The Air Force must adopt a layered system-of-systems approach that combines ground and airborne sensors, RF detection, radar, acoustic sensors, electro-optical/infrared systems, electronic warfare, directed energy, guns, missiles, and low-cost drone interceptors. These systems must be modular, interoperable, and adaptable.

3. The Air Force must transform air base command and control, evolving the BDOC from a ground-security node into an air defense command and control hub capable of managing the complete kill chain.

4. Airmen must learn to generate aircraft while under UAV attack and adopt an ability-to-survive-and-operate (ATSO) mentality. Drone Defense Postures should help commanders balance force protection, sortie generation, passive defense, dispersal, sheltering, and emergency launch decisions.

5. The Total Force must apply the full logic of counterair doctrine to the small UAV problem. Defensive point protection must be paired with offensive counterair operations against production, supply chains, launch sites, operators, datalinks, navigation systems, and command and control networks.

Failure to prepare for the growing small UAV threat exposes expeditionary air bases to an unrelenting air threat and jeopardizes their primary mission: generating airpower. The Air Force must therefore prioritize a counter-UAV campaign composed of both defensive and offensive counterair efforts. Airmen must learn to survive and operate while under persistent UAV threat.

By adapting procedures, integrating new technologies, transforming command and control, and training Airmen to defend the air base while generating sorties, the Air Force can continue to provide decisive airpower to joint force commanders, ensuring continued advantage over future adversaries. ★



U.S. Army Staff Sgt. Pablo Chapa, Echo Battery, 6th Battalion, 52nd Air Defense Artillery Regiment, searches for an unmanned aerial system using the Avenger air defense platform during a joint training scenario as part of Freedom Shield 26 at Osan Air Base, South Korea, in March. The Avenger is a mobile air defense platform equipped with Stinger missiles designed to counter low-altitude threats.

Staff Sgt. Tyler Meyer

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United Launch Alliance

A United Launch Alliance Vulcan rocket makes its way to Launch Complex 41 at Cape Canaveral Space Force Station, Fla., in March. Cape Canaveral supports the most launches of any U.S. spaceport for now, but needs additional construction to increase its launch capacity.

LAUNCH BOOM

Getting to space has never been easier.
Here's how the Space Force is managing the future of launch.

By Courtney Albon

America's launch enterprise has been outperforming expectations for more than a decade, steadily increasing the missions it can support, the pace of resetting launch pads, and the agility to launch on demand.

In 2025 alone, the service's two spaceports, at Cape Canaveral Space Force Station, Fla., and Vandenberg Space Force Base, Calif., more than tripled their total launches from 2022. In January 2026, SpaceX broke the record for turning around its pad at Cape Canaveral, launching two Starlink missions within 45 hours from the same pad. And in June, the Space Force oversaw a rapid launch mission in which a Rocket Lab Electron rocket lifted off from the company's private pad in New Zealand less than 17 hours after getting the order.

The Space Force's progress is a national response to commercial and military demand for greater lift capacity and speed—and USSF is readying the enterprise to handle even more.

The service expects to deploy thousands of satellites between now and 2031 for missile warning and tracking, communications, and space-based sensing and targeting missions. Commercial space providers

"We need to get to 'spaceport of the now,' so we can start getting to Spaceport of the Future."

—Lt. Col. Kyle Rowland, 4th Space Launch Squadron, who oversees Vandenberg's Spaceport of the Future initiatives

are also planning to grow existing constellations of low-Earth orbit satellites or deploy new ones. SpaceX, which already operates more than 10,000 Starlink satellites, plans to add another 1,000 spacecraft to its fleet within the next year. Others with space ambitions include AST SpaceMobile and Amazon LEO, which are building broadband constellations, and Google and SpaceX, which plan to put data center infrastructure in orbit.

That means the Space Force could oversee as many as 700 to 3,000 launches a year by 2036, according to commercial launch estimates and force structure projections the service published in April.

To achieve that, the Space Force needs more efficient launch operations and more capacity—perhaps even a third dedicated site.

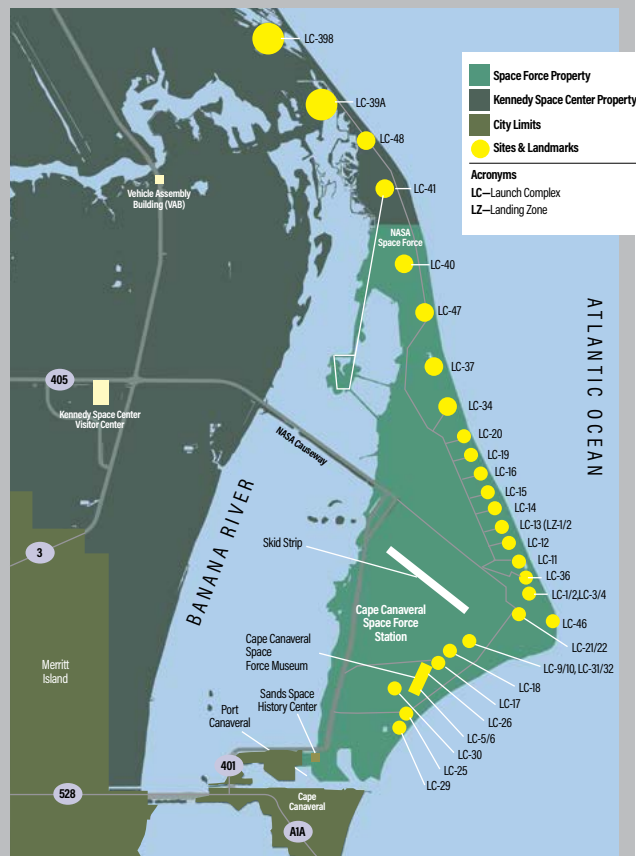
"We probably need another site that's capable of heavy and superheavy launch capability—both from a resiliency perspective and just, even at the Cape, limitations on how much space we've got," said Air Force Secretary Troy Meink testifying in May during a House Armed Services Committee hearing.

First, though, the Space Force must modernize its current ranges, officials say. Lawmakers have been supportive of spaceport upgrades, allocating \$1.3

Space Force's Crowded Spaceports

The U.S. Space Force operates two spaceports, on the Atlantic Coast at Cape Canaveral Space Force Station, Fla., and on the Pacific Coast at Vandenberg Space Force Base, Calif. Expansion and construction work to ease congestion at both are underway. Though there is less room to expand at Cape Canaveral, adding more roads there could help increase operational efficiency.

Cape Canaveral Space Force Station



Vandenberg Space Force Base



billion in 2024 for “Spaceport of the Future” range projects through fiscal 2028.

More funding is needed to add pads, facilities, payloads, and to hire more personnel. It also needs more roads, better access to commodities like propellant and water, and modern harbor facilities for the growing number of launch providers. At the Global Air & Space Chiefs Conference in London in July, Chief of Space Operations Gen. B. Chance Saltzman warned the Space Force will struggle to support a further increase in launches without additional funds.

“What we’re trying to do is expand that infrastructure as quickly as possible,” Saltzman said. “We don’t want to put a cap on the number of launches that we can support from our ranges, but we have to consider that our existing resources will fail if we don’t consider a cap.”

LIMITED REAL ESTATE

At the Cape, much of the past two years has been spent finalizing building plans and centralizing government workspaces to open up real estate for launch providers and make its layout more efficient.

By 2036, the Space Force projects the Cape will support between 500 and 1,000 launches annually—a fivefold increase in just the next 10 years. Space Launch Delta 45 Commander Col. Brian Chatman, who oversees Cape operations, told Air & Space Forces Magazine he wouldn’t be surprised if that increase comes much sooner.

Because the Cape is already dealing with congestion and limited real estate, the range team’s focus has been on streamlining and automating processes, eliminating bottlenecks, and making the most of what space it does have.

Construction on the first phase of its projects started this year and will continue for the next three years or so, Chatman said. Then the next set of upgrades will begin. The Space Force hasn’t quantified how much that work will cost, but it anticipates asking for those funds in the fiscal 2028 budget, which is due to Congress in the next six months.

One urgent need is for a transport lane dedicated to moving rocket boosters across the range, Chatman said. There is just one main travel route to get on and off the Cape today, and launch vendors use it to transport rockets to the pad and—as more companies transition to reusable vehicles—to bring spent boosters back to their processing facilities. Because it can take hours to transport a booster after launch, traffic capacity is suddenly a major limiting factor.

“I’ve got to have dedicated routes for those transports to happen to maximize efficiency for all operations happening now on the Eastern Range,” Chatman said.

The range is also considering changes to the way it provides utilities and delivers fuel to launch sites. Chatman said hundreds of trucks move fuel around the base and he’s seeing growing demand for power and wastewater treatment. Improved infrastructure is needed for all of that.

Another pressing need is people. Chatman said he has 450 approved billets that are unfilled due to lack of funds. Those positions will be crucial in the coming years to support everything from legal work and navigating environmental regulations to maintaining day-to-day operations.

“I need some additional bodies to be able to meet that cadence that we have going forward,” Chatman said. “We are methodically going through and executing as fast and as hard as we can, but within the constraints that we have.”

The base impressed in the face of a major test earlier this year when Blue Origin’s New Glenn rocket exploded on the pad



Staff Sgt. Kevin Hernandez

A crane is used to stack the stages of a Northrop Grumman Minotaur IV rocket at Space Launch Complex 8 at Vandenberg Space Force Base, Calif., in March. The base is working to increase its launch capacity as it ramps up launch activity.

while preparing for a launch. The explosion destroyed much of Blue Origin's infrastructure, but the base's safety precautions helped contain the impact on personnel and operations. In fact, SpaceX executed a launch within 12 hours of the incident.

SLD 45's response to New Glenn's explosion validated its safety procedures, Chatman said, but it also shed light on the need for more efficient traffic flow, better pad access, and improved commodity delivery—especially as the range onboards more new launch vehicles in the coming years.

ROOM TO GROW

Across the country, in California, Vandenberg Space Force Base is also growing its launch activities. The range supported 66 missions last year and leaders expect that to increase to 150 to 200 launches annually in the next five years. By 2029, its yearly cadence could surpass that of the East Coast range, according to a force design study the service released in April.

Range officials are planning to build new launch pads, payload processing and support facilities for launch providers, and to modernize the base's harbor so more companies can dock to load and deliver rockets and boosters.

Activity at the range is steady now, but Col. James Horne, commander of Vandenberg's Space Launch Delta 30, said it will be "bustling" by next summer.

In an interview with Air & Space Forces Magazine during a visit to the base, Horne listed the projects he expects to progress over the next year:

- Building a new entry gate at South Base and a vehicle inspection gate to better support the flow of construction and commodities vehicles onto and off of the base;

- Completing environmental reviews for Space Launch Complex 14, which Vandenberg recently leased to Blue Origin to support its New Glenn rocket, and new launch pad infra-

structure at SLC-6, which SpaceX is modifying for Falcon 9 and Falcon Heavy launches and landings;

- Breaking ground on new payload processing facilities and starting plans for hazardous operations infrastructure, administrative offices, new launch support complexes, and potentially even rocket manufacturing facilities; and

- Wrapping up planning and design for an expanded harbor at the southern edge of the base.

Lt. Col. Kyle Rowland, who oversees Vandenberg's Spaceport of the Future initiatives as commander of the 4th Space Launch Squadron, said he's focused on prioritizing the most urgent projects to ease the way for bigger projects like payload processing facilities, transportation lanes, and entry gates later.

"I like to say, we need to get to 'spaceport of the now,' so we can start getting to Spaceport of the Future," he said.

The fiscal 2026 National Defense Authorization Act gave the Pentagon more flexibility in how it manages military construction funds, which should keep Vandenberg's many infrastructure projects on schedule, Rowland said.

Vandenberg has allocated about \$614 million to improve its roads and utilities, Horne said, but other major projects—like the harbor expansion and a pipeline to pump fuel directly to launch pads will require more funding.

"We are approaching a point where it's going to become more difficult, and we do require additional resourcing and people to do the work," Horne said. "We have some pretty critical bottlenecks approaching, and we're engaging with the administration and Congress in the budget process to build the infrastructure we need to anticipate what's coming."

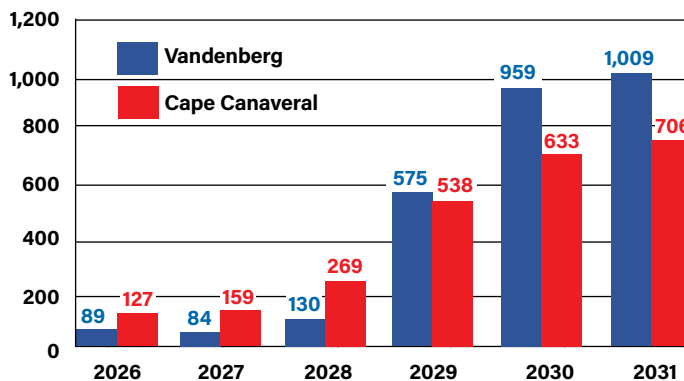
Vandenberg hosts 54 tenant units and expects its workforce to double over the next five years, from 10,000 to 20,000. The Spaceport of the Future upgrades will support that growth, Horne said, but he is also working with the Air Force—which provides base support—to make sure it can support the people coming to live and work on the base.

"It's going to require quite a bit of investment and facilities beyond just the launch piece to support those mission partners, like dorm rooms for students and office space for new missions," Horne said.

Vandenberg is one of the U.S. military's largest installations, spanning more than 99,000 acres of largely undeveloped land on California's central coast. The base features 470 miles of streams, 9,100 acres of sand dunes, and 7,800 acres of wetlands—and it's home to a number of heritage sites for indigenous communities,

Turning Up the Pace of Launch

The Space Force anticipates rapid, continued growth in launch demand, rising from 226 launches this year to as many as 1,700 in 2031. To get there, Vandenberg Space Force Base is set to become the major launch site, increasing its launches by up to twelvefold in just five years.



Source: U.S. Space Force Objective Force 2040, published April 2026



Launch Goes Mobile

The projected increase in launches over the next decade factors in both rising demand for access to space and launch providers preparing to debut new rockets.

SpaceX and, to a lesser extent, United Launch Alliance, dominate launch demand today, but Rocket Lab, Blue Origin, Firefly, Stoke, Relativity, and Northrop Grumman all have plans to roll out new launch vehicles in the next few years.

Jamie Morin, vice president of defense strategic space at Aerospace Corp., said new launch players will introduce options and change the launch business. They'll also be vying for limited space on the Space Force's ranges.

"That's going to clearly drive very serious competition among the companies over who gets access to what launch complexes or who gets access to what green field on which to build a new launch complex," Morin said in an interview. "There's going to be sustained competition as the growth occurs for the things that are really scarce, which are geography in the appropriate places and supporting infrastructure as we move to super heavy launch."

Some firms have already opted against building facilities at the Space Force's ranges—Cape Canaveral Space Force Station, Fla., and Vandenberg Space Force Base, Calif. Rocket Lab, Firefly, and Northrop plan to fly their new rockets from the Mid-Atlantic Regional Spaceport on Wallops Island, Va., in part due to space constraints and projected bottlenecks at the busier spaceports.

Others are exploring offshore options. SpaceX already uses a sea-based platform to land its reusable boosters after launch, and Blue Origin plans to do the same with its New Glenn rocket. This spring, Firefly and Lockheed Martin announced they would partner with sea-based launch company Seagate Space to develop infrastructure to launch Firefly's Alpha rocket from an offshore platform.

Both Firefly and Rocket Lab are also developing deployable launch systems designed to support lift-off from anywhere in the world. Rocket Lab's GHOST capability, unveiled Aug. 10, pack-



Virginia Spaceport Authority

A Rocket Lab Electron rocket lifts off on a classified mission for the National Reconnaissance Office from NASA's Wallops Flight Facility at Wallops Island, Va., in 2024. The Mid-Atlantic Regional Spaceport there, a tenant at the facility, is expanding its operations to support more national security launches in the future.

ages all of the launch infrastructure and commodities needed to support its Electron and HASTE rockets in portable shipping containers. The company plans to debut the system next year at the Pacific Spaceport Complex, where it will have two new pads for suborbital launch missions.

Brian Rogers, Rocket Lab's vice president for global launch services, told *Air & Space Forces Magazine* the system will enable the company to launch without the need for fixed structures.

"Nothing has to be permanent," Rogers said. "All of these things are very transportable. So, we'll install it, we'll go do a launch campaign or whatever the customer is asking for, but then we can move it at a pretty low cost."

including the Chumash, a Native American tribe that spans California's southern and central coast. Also sharing the base: a thriving population of marine mammals and 17 endangered or threatened species.

Operating and building on undeveloped land in a uniquely biodiverse region poses a host of challenges, and while Vandenberg's civil engineers have worked to mitigate environmental impacts, lawmakers, state agencies, and locals are concerned about what is to come.

Rep. Salud Carbajal, D-Calif., wrote to Department of Air Force leadership earlier this year requesting information about how construction and an increased launch cadence might negatively affect the environment and people in the region.

"Advancements in space technology must not impose undue burdens on nearby communities or come at the expense of the local environment," Carbajal wrote. "We must work to find a balance and compromise."

Horne and Rowland said base leaders meet regularly with community members and recently held a series of meetings

in cities along the coast to explain SLD 30's expansion plans.

"What we found is when they understand—which they did—the mission growth that's driving what they're seeing and experiencing, it helps them rationalize the impacts on their daily lives," Horne said.

Among their concerns: an increase in sonic booms, which rattle structures and can disturb wildlife. To better understand the problem, the base partnered with Brigham Young University and California State University Bakersfield to study sonic booms and how to reduce their impact on local populations, and Vandenberg has said it will minimize nighttime launches and try to be strategic about when certain vehicles fly.

"Any launch that's going to generate a sonic boom above a level that would be of concern is briefed to me, and then we do the analysis to understand the impacts and then mitigate them," Horne said. "Now that we know what's driving the phenomenon ... we can mitigate it."

Juggling competing priorities will get harder as the range gets busier, and Horne plans to continue the base's shoe leather

community engagement and supplement it with digital tools to identify potential pain points “before they become a crisis.”

“We’re doing a much better job driving data into decisions and pooling all of our data, leveraging modern tools like artificial intelligence and machine learning to analyze all that data to show us where the bottlenecks are, where the touchpoints with the community could become concerns, and then helping us to figure out more efficient ways to quickly mitigate those,” he said. “But it is a challenge. We really just have to put our shoulder to the plow and keep pushing forward.”

ALTERNATIVE LAUNCH SITES

With just the Cape and Vandenberg as in-house options, the Space Force is exploring how it can expand its partnerships with other spaceports for routine missions that don’t have enhanced security or mission assurance requirements.

The service already works closely with two commercial range complexes—the Pacific Spaceport Complex in Kodiak, Alaska, and the Mid-Atlantic Regional Spaceport (MARS), on Wallops Island, Va. Leaning more heavily on these sites could free up capacity at the Cape and Vandenberg.

During a recent visit to MARS, Virginia Spaceport Authority CEO Roosevelt Mercer told Air & Space Forces Magazine his range on NASA’s Wallops Flight Facility has room for more pads. The spaceport covers 27 square miles on land leased from NASA and is discussing options for leasing more.

MARS has four pads today—two active, and two more under construction—and its primary customers are either already flying national security missions or on a path to do so.

- Pad 0-A, designed for liquid fuel rockets, is being redesigned as a multiuse facility to support Northrop Grumman’s Antares, Firefly’s Alpha, and a third medium-lift rocket called Eclipse that the two companies are co-developing.

- Pad 0-B hosts small and midclass launch vehicles like Northrop’s Minotaur I, IV, and V rockets.

- Pad 0-C hosts Rocket Lab for launching its Electron rocket.

- Pad 0-D will support Rocket Lab’s larger Neutron rocket, which is expected to fly for the first time later this year.

Electron drives most of the cadence at MARS, which has supported seven launches between January 2025 and August of this year. As new vehicles come online from Rocket Lab and other providers, Mercer said he expects an annual rate of around 50 launches within the next five years. If the spaceport is able to expand to add more launch and landing pads, that rate could grow even higher.

Besides building more pads, MARS is also looking at ways to modernize its infrastructure. It plans to add payload processing space to support more missions and is considering bringing in a commercial telemetry capability that would allow it to turn around its pads more quickly, Mercer said. The spaceport is also eyeing upgrades to its harbor to convert it into a deep-water port, and it’s having early conversations with sea-based launch companies about building launch platforms off the coast of Wallops Island.

While the Defense Department provides some funding to MARS through what’s known as the Spaceport Enhancement



A SpaceX Falcon 9 rocket lifts off at Space Launch Complex 4 on Vandenberg Space Force Base, Calif., in 2025. The mission delivered into orbit Tranche 1 Data Transport satellites for the Space Development Agency.

Program, most of its resourcing comes from the commonwealth and the commercial companies that use its facilities. As activity at the range increases—much of it driven by national security needs—Mercer said the spaceport authority is working with Congress and the Space Force to secure more consistent government funding to support that growth.

“We are a national asset,” Mercer said. “The high 90th percentile of everything we launch is a government payload, a national security payload, and even those that are characterized as commercial have a government customer behind it. Why would the government not want to invest in this spaceport?”

The Space Force didn’t respond to questions about investing in improvements at MARS and the Pacific Spaceport Complex. But Col. Eric Zarybnisky, the Space Force’s program acquisition executive for space access, told Air & Space Forces Magazine he’s excited to work more closely with both spaceports. Kodiak’s isolated location and harsh weather would require modifications, Zarybnisky said, adding that his team is crafting plans for what the Space Force would need to enable more launches at both locations.

“We want to have thought through the basics that we need to have ready for them and then modulate as we understand [our customers’] specific requirements,” he said.

Both ranges are poised to support more national security missions. In late July, the Space Force awarded Rocket Lab a \$266 million contract to fly 12 to 18 missions, mostly from Kodiak.

Mercer said the Space Force has shown interest in gauging the MARS spaceport’s ability to support rapid-turnaround missions. Twice in the past year, the service asked the range to demonstrate that it could turn over a launch pad in less than 72 hours—and Mercer said his team did, with time to spare.

The Space Force has demonstrated it can quickly ship a satellite, launch it, and turn it on for operations—a concept it calls Tactically Responsive Space—and while MARS hasn’t participated in those, Mercer said he expects it may in the future.

“If you asked me, I’m expecting to see more of that coming,” he said.



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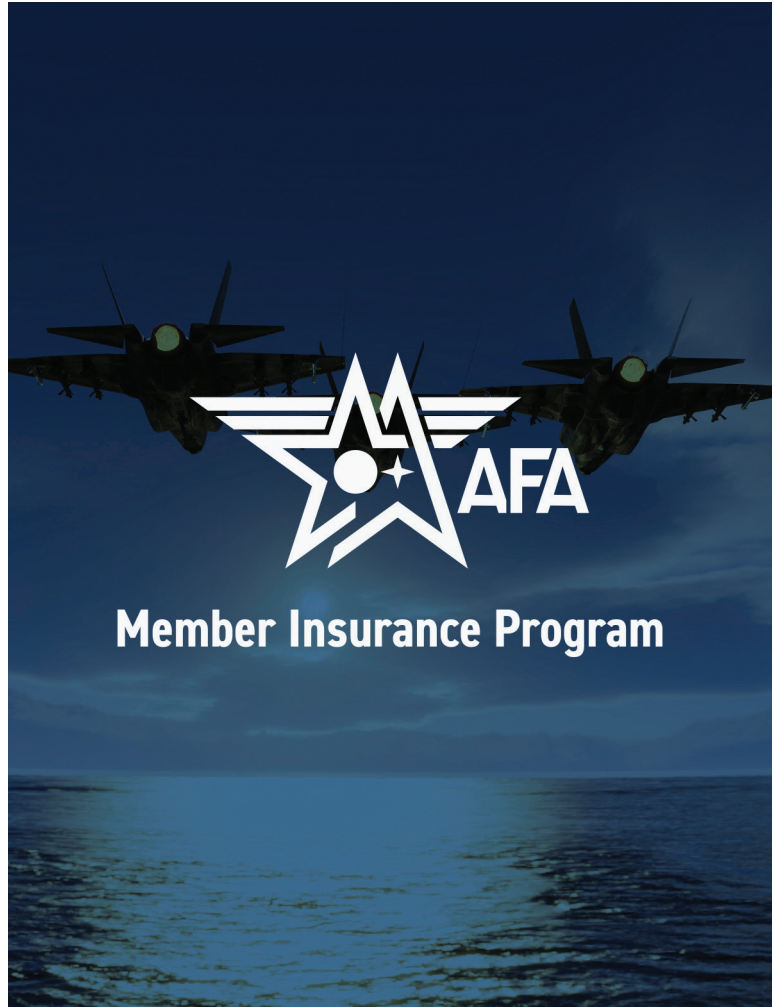
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Rebuilding the U.S. Air Force for Multi-Theater Conflict

Insights from the Mitchell Institute's 2026 Airpower Wargame



Jud McCrehin/staff

Wargame participants debate strategy midway through the three-day wargame held by AFA's Mitchell Institute for Aerospace Studies. The wargame presented players with a scenario in which conflicts arise in Europe, the Pacific, and North America simultaneously, forcing teams to compete for resources.

By Col. Mark Gunzinger, USAF (Ret.),
and Heather Penney

In June 2026, airpower experts from the U.S. Air Force, seven allied air forces, and industry convened for a three-day wargame designed to stress notional 2036 USAF combat forces in a series of concurrent crises: a Russian assault against NATO allies in Europe, opportunistic aggression by China in the Pacific, and attacks on the United States and Canada.

The scenario, conceived by AFA's Mitchell Institute for Aerospace Studies, led participants to the stunning conclusion that fielding today's planned modernization programs and modestly growing the U.S. Air Force's size will not provide the airpower the United States would need in the event something similar came to pass. Without major investments to dramatically accelerate and increase production of the next-generation F-47 air dominance fighter, B-21 bomber, and collaborative combat aircraft (CCA), the nation may find itself grossly unprepared for future wars. The result could mean choosing between losing a major conflict in Europe, the Pacific, or both—and potentially failing to defend the United States from air attacks at the same time.

The Mitchell Institute based its wargame on the premise that deepening alignment between China and Russia today heightens the risk of multi-theater conflict in the future. These great-power aspirants are coordinating their foreign policies and defense priorities to undermine U.S. security and

reshape the global order around their strategic interests. The likelihood is increasing that they will coordinate their actions to take advantage of a major U.S. military response to a crisis in Europe, the Pacific, or the Middle East. Today's U.S. Air Force—which now operates the smallest and oldest combat force in its history—is no longer sized to fight in multiple theaters simultaneously.

The wargame did not include U.S. Navy or U.S. Marine combat aircraft.

THREE TEAMS COMPETED FOR RESOURCES

The first two days of the wargame asked players to identify USAF forces they needed to defeat aggression in their theaters and the risks created by shortfalls in available resources. Seventy airpower strategists, planners, operators, and technologists divided into three regional teams. These teams then planned air campaigns to defeat a Russian assault on NATO, deter and then counter a Chinese joint island landing campaign against Taiwan, and defend North America at the same time. Team Europe, Team Pacific, and Team North America developed operating concepts for their campaigns and requested forces and munitions from a shared pool of aircraft, including F-47, F-35A, F-15EX, CCA, B-21, B-52, E-7A, and EA-37B aircraft; as well as legacy fighters, bombers, and tankers. Allied players added their air forces to the mix to conduct combined air campaigns.

As would be the case today, the teams' cumulative force requests far exceeded available combat aircraft inventories.

Even with the nominally boosted projected future Air Force, the number of combat-capable aircraft and munitions available to the teams was far too small.

Day 1 gameplay began when Russia launched an offensive to seize a land corridor linking its Kaliningrad enclave with Belarus and cut NATO's access to the Baltics. In the wargame's Day 2 scenario, the PLA took advantage of U.S. force deployments to Europe to launch a campaign to forcibly unify Taiwan with China's mainland. A third front emerged when Russian bombers launched a limited conventional cruise missile attack against targets in the United States to coerce the U.S. government into withdrawing from the fight in Europe and degrade its ability to deploy and sustain forces abroad.

On the wargame's final day, a "strategic choices exercise" tasked each team with independently investing in U.S. Air Force capabilities over the next decade to address the highest-priority operational risks identified during the game's first two days. The Mitchell Institute gave each team an identical 10-year budget profile that assumed the Air Force would receive annual plus-ups of \$25 billion to modernize and recapitalize its forces. Investment choices available to the teams spanned the Air Force's capability portfolios, including options to acquire additional combat and air mobility aircraft, munitions, personnel, basing infrastructure, missile defenses, and other capabilities essential to modern air warfare.

TEAM EUROPE

Team Europe's air campaign plan prioritized rapidly suppressing Russia's integrated air defense systems in Kaliningrad and Belarus to achieve air superiority and interdict ground forces invading Lithuania. As their campaign progressed, Team Europe planned to extend allied air superiority over the battlespace and ramp up penetrating strikes against enemy command and control nodes, logistics centers, and other high-value targets critical to Russia's offensive.

The team estimated they would have enough forces to launch up to five surges of fighters—complemented by CCA—per day, interspersed with two or three surges of bomber strikes. Team Europe used their stealthy fighters and bombers for penetrating strikes and employed F-15EX and other nonstealthy fighters for standoff strikes and to defend against UAV and missile threats.

The team assessed that they might have enough combat aircraft, munitions, and logistics to maintain their planned surges for about seven days, after which resource shortfalls would slow their tempo.

TEAM PACIFIC

After the PLA initiated a joint island landing campaign (JILC), Team Pacific allocated most of their fighter, bomber, and electronic warfare sorties toward blunting the adversary's offensive strikes and conducting preventive strikes to reduce long-range air and missile attacks against allied bases. The team's priority targets included AEW&C aircraft that are critical nodes in China's long-range kill chains, coastal IADS, PLA Navy surface action groups surrounding Taiwan, and ships transporting PLA troops to Taiwan's shores. The team also attacked targets on China's mainland, acknowledging that an effective integrated air and missile defense must include offensive strikes to degrade the adversary's ability to launch bomber sorties and missile salvos from operational sanctuaries.

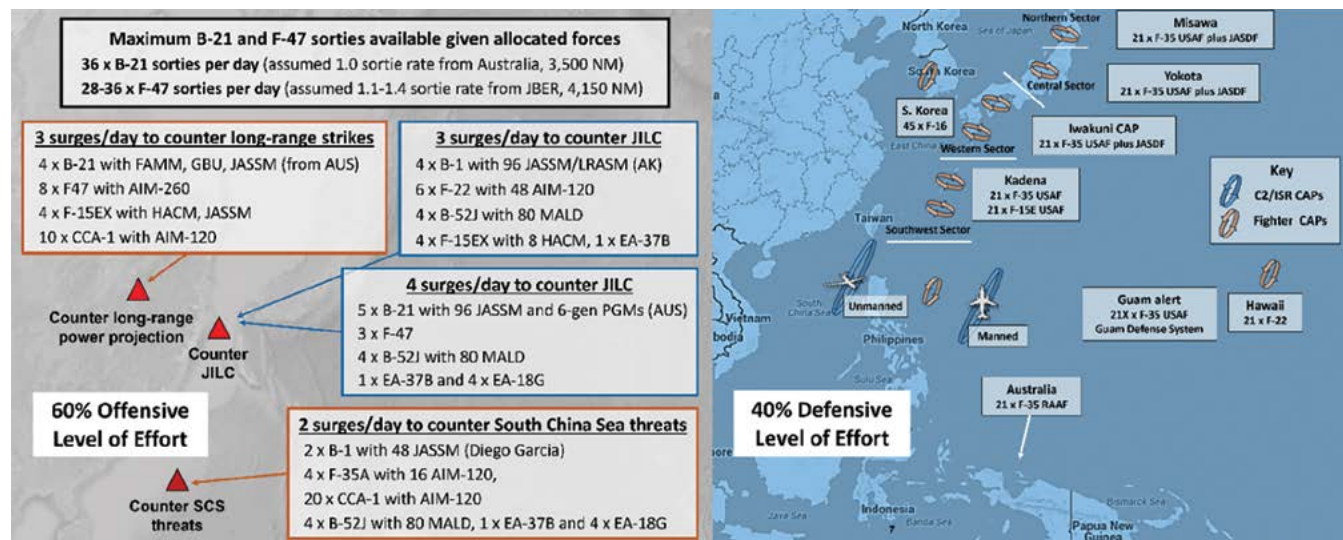
Team Pacific used their remaining fighters to defend allied air bases from air and cruise missile attacks and intercept threats to allied air refueling tankers, E-7A Wedgetails, and other high-value allied aircraft. The Air Force's E-7A and MQ-9 Reapers provided a picture of the battlespace east of Taiwan and overwatch of PLA air avenues of attack against Guam. However, air operations in Europe, homeland defense requirements, and combat attrition prevented Team Pacific from achieving the attack tempo, density, and mass needed to suppress PLA operations.

TEAM NORTH AMERICA

To defend U.S. and Canadian territory, Team North America prioritized offensive counterair operations to "kill the archers," before Russian bombers could launch their "arrows." The team used large numbers of expendable CCA as one-way, long-range aircraft to intercept inbound bombers before they could launch their cruise missiles. Given force structure shortfalls, Team North America worked across geographic boundaries to coordinate with Team Europe and Team Pacific to support the defense of North America, assigning B-21 bombers to strike bomber bases in northern and eastern Russia, respectively.

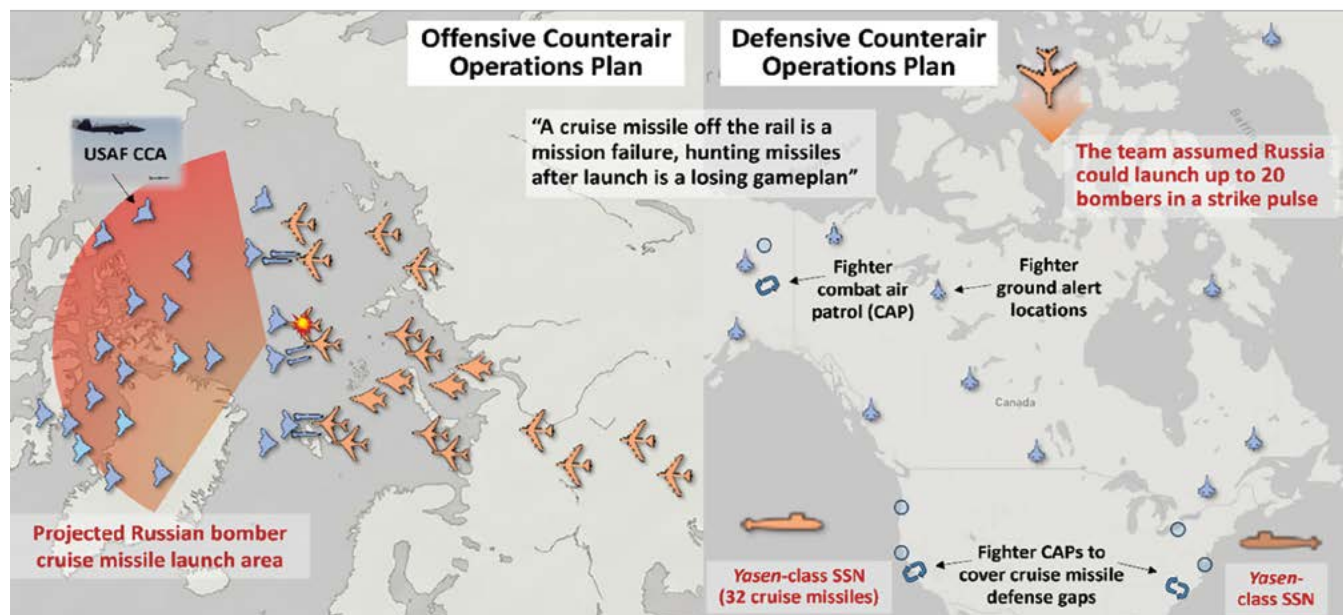
Team Pacific's Air Campaign Overview

Wargame participants were divided into three regional air campaign planning teams and were asked to develop concepts of operations and request forces from a notional 2036 USAF combat aircraft inventory to defeat aggression in their theaters.



North America's Air Campaign Overview

Defending the U.S. and Canada required retaining airpower to counter long-range missile and bomber threats, even as those same assets were called for to support operations in both Europe and Asia.



Team North America also deployed fighters across the United States and Canada to defend against air attacks. Originally, the team assessed they would need 19 continuous airborne fighter combat air patrols (CAPs) to cover gaps in cruise missile defense coverage along the southwest and southeast coastlines of the United States and over large areas in Canada's high north. But with U.S. and Canadian forces deployed to the crises in Europe and the Pacific, Team North America found they could sustain only three CAPs. To partially make up for the shortfall, the team distributed its remaining fighters to multiple locations in Canada and the United States to act as ground alert forces capable of quickly responding to attacks.

SHORTFALLS AND ATTRITION

The Mitchell Institute's wargame adjudication modeling indicated that allied air forces successfully halted Russia's attack in Europe. But due to shortfalls in the U.S. Air Force's fighter, bomber, CCA, and logistics inventories—combined with high combat attrition against a capable adversary—the allied campaign failed in the Pacific.

After two weeks of fighting in the Baltics, adjudication indicated that allied air forces had achieved air superiority over the Suwalki Gap and suppressed most of Russia's IADS in Kaliningrad and Belarus. Allied air operations were assessed to have reduced Russian air and ground forces engaged in the Baltics by more than 70 percent, bringing Russia's offensive to a halt.

The war in the Pacific, however, quickly ran into headwinds. By the ninth day of the campaign, allied air forces had destroyed only about 25 percent of the PLA's IADS, airborne aircraft, and naval forces supporting its assault on Taiwan. Air superiority was still in question, and China continued to reinforce its JILC. Meanwhile, the allied team's attrition and munitions expenditures had reduced their remaining air forces to the minimum they believed necessary to defend the first island chain and deter China from expanding its offensive. Team Pacific thus shifted their air operations to defend Japan, the Philippines, and other territory in the first island chain. This was a crucial decision. After failing to stop China from gaining Taiwan, the

team agreed that preventing China from dominating the Western Pacific should be their highest priority.

These outcomes were the direct result of the U.S. Air Force's capacity shortfalls: Its combat forces were simply too small to counter opportunistic aggression in a second theater.

The defense of North America also suffered from similar shortfalls. While Russia's Baltics campaign failed, it retained enough bombers and weapons to launch attacks against the United States and Canada. Team North America, meanwhile, lacked enough sensors, E-7A aircraft, fighters, CCA, and other forces to adequately cover against Russia's multiple avenues of air attack. The same would be the case for countering PLA bombers carrying long-range cruise missiles and hypersonic weapons with the range to strike North American targets.

RISKS OF AN UNDERSIZED AIR FORCE

During the wargame's first two days, Team Europe, Team Pacific, and Team North America assessed their most significant capability shortfalls and the risks those gaps would create in peer conflicts. There was a great deal of overlap in their independent assessments, most notably in the risks created by fighting on multiple fronts with undersized fighter, bomber, and munitions inventories and the Air Force's lack of air base missile defenses.

The U.S. Air Force's fighter force is hollow, players concluded. Both Team Europe and Team Pacific wanted to employ far more sixth-generation F-47s than were available in their projected 2036 forces. The inability to achieve air superiority over a peer adversary would affect all allied operations and lead to unsustainable loss rates in the air, on the ground, and at sea. Team Europe used both U.S. and allied F-35s and a much smaller inventory of U.S. F-22s to partially compensate for insufficient F-47 sorties. The Pacific team also employed F-35A and CCA to partially offset their F-47 shortfalls, but the vast distances in their theater constrained the effects that shorter-range fighters could create.

All three teams agreed that increasing the size of the Air Force's fighter force is the only viable approach to reducing

NOTIONAL 2036 AIR FORCE

FIGHTERS	2025 TAI	2036 TAI	ASSUMPTIONS
F-15E	217	110	Service-Life Extension Program
F-15EX	75	267	Faster, increased buy
F-16	826	600	Includes new-buy Block 70 models
F-22	184	130	Divest older Block 20s
F-35A	500	900	
F-47	–	54	Accelerated acquisition
TOTAL	1,802	2,061	
BOMBERS	2025 TAI	2036 TAI	ASSUMPTIONS
B-52J	76	76	Assumes full inventory is upgraded
B-1B	45	45	Extends B-1s through 2037
B-2A	20	19	Extends B-2s
B-21	–	100	Accelerated B-21 acquisition
TOTAL	141	240	
AEW&C and ISR	2025 TAI	2036 TAI	ASSUMPTIONS
E-3G	16	0	Retirement completed
E-7A	–	30	Accelerated acquisition
MQ-9	182	200	
RQ-4B	9	7	Retained for ISR missions in Pacific
RQ-170	Classified	12	Notional for wargame purposes only
ELECTRONIC ATTACK	2025 TAI	2036 TAI	ASSUMPTIONS
EA-37B	4	20	Accelerated acquisition
CCA	2025 TAI	2036 TAI	ASSUMPTIONS
"INCREMENT 1"	–	540	Recoverable
"INCREMENT 2"	–	350	Single mission
TOTAL CCA	–	890	

operational risks created by their fighter sortie deficits. As players observed, the U.S. Air Force's "current fighter shortfall [presents] too large a gap to meet the service's global operational requirements." Participants also volunteered that "a divest-to-invest fighter force development approach will not create a fighter force that can hold the line in multiple theaters simultaneously."

Wargame players agreed that CCA are needed at scale but will have operational limitations. The three allied air campaign planning teams cumulatively desired to use far more CCA than were available in the wargame's notional 2036 Air Force inventory. Overall, players believed the wargame's inventory of about 800 CCA might have been sufficient for a major conflict in one theater, but in a scenario where fighting turns into a multi-theater conflict, they lacked the volume of CCA needed to support their campaigns. CCA shortfalls limited the teams' ability to use both expendable single-mission CCA and recoverable uncrewed aircraft as force multipliers. They had too few CCA to achieve the weapons density they needed in contested battlespaces, and not enough munitions with the right sizes, ranges, and costs to pair with CCA. Moreover, they did not assess CCA as viable replacements for fighters, since CCA were less capable, and therefore less flexible aircraft. As a result, the teams employed CCA in novel ways that would disrupt and deplete the PLA's air defenses and otherwise complement, but not replace, allied fighter sorties.

The Air Force's range limitations reduced options. All three teams found the range limitations of their air forces significantly affected their campaigns. This was especially true for the Pacific

and North American teams, who prioritized attacking adversary air forces in the air, at range, and before they could launch their weapons. Even a modestly larger U.S. bomber force, which the Mitchell Institute projected to include 85 combat-coded B-21s by 2036, failed to meet the teams' cumulative needs for long-range penetrating strikes while maintaining enough bombers in the United States to deter attacks by two nuclear peer adversaries. The other allied air forces, lacking bombers, could not compensate for this long-range strike deficit. In 2036, as today, the U.S. Air Force will be the only military in the free world with a bomber force.

Constrained munitions inventories increased operational risk. The wargame teams were concerned that undersized inventories of long- and medium-range munitions would result in campaign failures. Players believed their planned operations would quickly exhaust available inventories of JASSMs, LRASMs, SiAWs, and the Air Force's Family of Affordable Mass Munitions (FAMM) well before they achieved their campaign objectives. In their words, "concurrent fights would empty the munitions magazine with no surge base," and some munitions "could be exhausted in less than a week of high-intensity combat and require four or five years to replace." Shortfalls of long-range munitions would leave the Air Force with little option but to use very-short-range weapons like the Joint Direct Attack Munition (JDAM), increasing the risk that aircraft could be shot down by IADS threats, raising attrition rates.

Overreliance on complex kill chains poses a risk. U.S. and allied players cautioned against becoming too reliant on sophisticated battle management, command, control, and ISR

(BMC2ISR) networks to cue long-range air-to-air engagements and standoff strikes. They argued that a future USAF force mix overly dependent on “inorganic” kill chain networks would play into the PLA’s warfighting strategy, which prioritizes attacking U.S. nodes, links, and other elements of U.S. information networks. As one team wrote, a future force dependent on small numbers of exquisite air, space, and terrestrial nodes could enable a handful of adversary nodal attacks to “collapse U.S. kill chains across every theater.”

Insufficient base defenses drove up attrition, participants found. The teams anticipated they would suffer significant losses of aircraft and personnel on the ground during wargame play due to their lack of air base missile defenses—and their fears proved correct. Adjudication indicated that U.S. aircraft losses on the ground in Europe were less than losses during aerial combat engagements, but in the Pacific, ground losses exceeded air losses. This result is consistent with findings from multiple wargames led by the Mitchell Institute and other think tanks. High attrition threatens the U.S. Air Force’s staying power in a major air campaign, especially since the service lacks both a viable combat attrition reserve and the depth of combat aircrew required for peer conflicts.

Air Force sustainment shortfalls could decisively shape future conflicts, wargame teams agreed. Participants said the Air Force now lacks the staying power needed for a war with peer adversaries. Decades of force structure reductions, underinvesting in munitions, and declining readiness created by insufficient funding have taken their toll. Moreover, the Air Force’s airlift aircraft inventory, air refueling tanker force, and other logistics capabilities are not sized to sustain the highly distributed force postures in Europe and the Pacific needed to reduce adversaries’ ability to concentrate missile and UAV attacks. These sustainment limitations would also encourage adversaries to pursue warfighting strategies designed to exhaust the USAF’s resources to the point where it loses the initiative in the air. This is exactly what happened to Team Pacific during the wargame.

North American defense requirements greatly exceeded fighter, CCA, and AEW&C aircraft sorties available in the notional 2036 force. The North American team determined they could not generate enough fighter and AEW&C aircraft sorties to cover major gaps in U.S. and Canadian ground-based sensing and air defenses.

The team stressed that North American defense is an additive force-sizing requirement for the U.S. Air Force that is not fully addressed in current planning. This means that fighters, E-7A, CCA, air refueling tankers, and other capabilities required for homeland defense must be added, not taken away from the USAF’s other warfighting requirements. The same is true for sizing the USAF’s bomber and tanker force to sustain nuclear deterrence. The wargame teams worried that recalling significant numbers of aircraft and aircrews to bolster U.S. homeland defense and nuclear deterrence during a crisis in the Pacific or Europe would invite disasters that could forever change the international order.

RETHINKING INVESTMENT

Presented with the opportunity to rethink future force planning with \$25 billion in annual additional budget capital, all three wargame teams invested in building a more resilient U.S. Air Force for multi-theater conflict. Their priorities included:

■ **Improving Air Force readiness.** All three teams prioritized investing in Air Force weapon system sustainment, spare parts,

operations and maintenance, and other foundational readiness programs. The teams were determined to increase the USAF’s mission readiness rates, which are now about 50 percent or lower for multiple types of combat aircraft. The teams viewed improving readiness as a fundamental force multiplier that would increase the Air Force’s capacity to deter crises in multiple theaters and respond decisively should deterrence fail.

■ **Creating a more resilient munitions inventory.** The wargame teams sought to increase the U.S. Air Force’s munitions inventories as rapidly as possible but faced the same roadblock the service faces today: The cycle of manufacturing, testing, and delivering advanced munitions can take many months to complete—even years for some weapons. The teams addressed this constraint by allocating Air Force funding toward expanding industry’s munitions production capacity. These investments allowed them to significantly increase their weapon acquisitions within a few years. Players also prioritized funding to acquire “fifth-generation munitions for fifth-generation aircraft” that are designed to maximize stealthy fighter and bomber payloads, including large numbers of lower-cost FAIM, anti-radiation weapons to counter IADS threats, maritime strike munitions, and a much smaller number of higher-cost air-launched hypersonic missiles.

■ **Accelerating the transition to the next-generation family of air combat systems.** The teams’ force design strategies accelerated the Air Force’s transition to the next generation of long-range, penetrating counterair and strike aircraft. These include multi-mission F-47s and B-21s complemented by large numbers of CCA for air-to-air engagements, air-to-ground strikes, electronic warfare, and other missions. These CCA investments mirrored results from earlier Mitchell Institute wargames where airpower experts sought to expand CCA functions beyond acting as “loyal wingmen” for fighters. To hedge against technological and production risks typical of new acquisition programs, the teams maximized F-15EX production and retained stealthy B-2 bombers and F-22 air dominance fighters now in the Air Force’s inventory. The teams also acquired more E-7As than currently planned and penetrating ISR aircraft to create a more resilient, layered airborne and space-based BMC2ISR system of systems.

■ **Growing the U.S. combat aircraft industrial base.** During the strategic choices exercise, the teams encountered industrial base production limitations that have constrained the number of new combat aircraft the Air Force has requested in its recent budget submissions to Congress. Instead of accepting these limitations, the teams invested in expanding the industrial base, including opening a second production line to double the Air Force’s B-21 acquisition rate. This allowed the teams to increase their B-21, F-47, and munitions acquisition rates within the first FYDP (Future Years Defense Program) of the strategic choices exercise and achieve fully accelerated rates during the second FYDP.

■ **BMC2ISR and electronic warfare were priorities.** The teams invested in larger inventories of E-7As, EA-37B electronic warfare aircraft, and CCA capable of more EW missions than currently planned. This runs counter to the Air Force’s current resource-limited plan that will barely acquire enough E-7As and EA-37Bs for a single conflict with a peer adversary. The wargame’s airpower experts understood that winning the fight for the electromagnetic spectrum and achieving information superiority will be critical to the success of future air campaigns. This conclusion is supported by lessons learned from Russia’s ongoing war of aggression against Ukraine and Operation Epic Fury.

The Air Force Wargamers Wanted

After the wargame, each team was asked to outline how they would spend an additional \$25 billion annually to enhance the Air Force in time for a 2036 conflict. The Combat Air Forces each team wanted by the end of 2036:

Combat Aircraft	2025 Inventory	Team N. America 2036	Team Europe 2036	Team Pacific 2036
Bombers	141	252	288	246
Fighters	1,988	2,265 (Includes 47 F-47)	2,085 (Includes 52 F-47)	1,683 (Includes 138 F-47)
E-7A, EA-37B	5 EA-37B	70	54	58
CCA	0	5,864 (Mostly Expendable)	1,448	3,808 (Mostly Expendable)

■ **Air base air and missile defenses for the U.S. Air Force.** To address concerns over potential U.S. Air Force losses to adversary UAV, ballistic missile, and cruise missile attacks, the teams bought kinetic and non-kinetic (directed energy) ground-based point defenses for the service’s theater air bases. Their intent was to acquire these defenses with Air Force funding and man them with Air Force personnel, since the U.S. Army continues to grossly under-resource its core mission of defending the US-AF’s air bases from missile attacks. The teams also invested in hardened shelters for aircraft and air base facilities, additional forward operating locations, and other capabilities to maintain the Air Force’s sortie generation capacity while under attack.

■ **All teams maximized the acquisition of KC-46s and accelerated the U.S. Air Force’s Next Generation Air-Refueling System (NGAS) and Next-Generation Airlift (NGAL) programs.** Although airlift and aerial refueling were not played in the game, all teams understood that the deployment and operations of their combat forces would depend on the USAF’s airlift and tanker forces. Team Pacific specifically noted that their combat operations would be impossible without increasing every element of their air mobility fleet, which also led them to restart the C-17 production line. Every team decided to maximize its KC-46 buy rates over both FYDPs and accelerate NGAS and NGAL development and production. The teams noted that without these investments, the USAF’s air mobility force will remain too old and undersized to support a single peer conflict.

DIFFICULT TRADE-OFFS

Two of the three wargame teams chose to retire the Air Force’s B-1B bombers to free their maintainers and aircrews to stand up a larger B-21 force. Team Pacific slightly decreased their planned F-35A buys and reduced the size of their F-16 inventory to acquire more F-47s.

The Pacific team ultimately bought more F-47s—138 by 2036—well over double the number of F-47s acquired by the wargame’s other teams. This trade-off was intended to create a future force with the greater range and persistence needed to achieve air superiority and conduct long-range penetrating strikes over vast distances of the Pacific. Overall, the teams’ trade-off decisions were driven by insufficient funding.

Even the \$25 billion annual plus-ups provided to the teams fell short of meeting requirements to increase the Air Force’s readiness, modernize and recapitalize its forces, rebuild an attrition base, and address other shortfalls created by 30 years of “trading capacity for future capabilities.” Despite insufficient funding, each team’s investments would have created a more ready, resilient U.S. Air Force.

Throughout the Mitchell Institute’s June wargame, U.S. and allied airpower experts offered their candid insights on priorities for sizing and shaping the future U.S. Air Force. Sizing the Air

Force for a single peer conflict will not cover warfighting requirements if concurrent conflicts occur in two or more regions. In the words of the experts, “this failure would invite opportunistic aggression.” Moreover, post-game analysis conclusively determined that the Department of War and Congress must substantially increase the U.S. Air Force’s budgets for at least a decade to address today’s critically low readiness, modernize its aging forces, and grow its combat capacity.

The wargame’s strategic choices exercise indicated that an additional \$25 billion per year over the next decade would be a step in the right direction, yet still fall short of what is needed to reverse the Air Force’s decline. The need to invest in air base defense will further increase budget requirements, as the Air Force assumes a mission that has long been the U.S. Army’s responsibility—defending the Air Force’s air bases from air and missile attacks.

The same is true for rethinking the Air Force’s nuclear deterrence forces, which are now sized for a single nuclear peer adversary instead of today’s threat from two nuclear peers. Doubling the amount provided to the teams—\$50 billion per year, as recommended by previous Mitchell Institute analyses, would help restore the service’s operational readiness and allow it to acquire new aircraft, munitions, and other forces at a scale that matches global demand for U.S. Air Force airpower.

The last 30 years were characterized by the lack of a credible peer threat to the United States’ status as the sole superpower, coupled with a myopic focus on low-intensity conflicts in the Middle East. These dynamics resulted in decisions to downsize the U.S. Air Force, defer and sometimes cancel core recapitalization programs, and shift Air Force funds to the Army—to the tune of over \$1.3 trillion—and nearly \$1 trillion to the Navy over that period. While the aggressive rise of China as an aspiring global power and pacing threat has drawn the attention of recent administrations and created a long-overdue sense of urgency, it also led to policies that restricted the Air Force to sizing its forces for a conflict with a single adversary in a single theater.

The Mitchell Institute’s wargame illustrated the dangers associated with decades of underinvesting in the Air Force coupled with a one-war force-sizing policy. Without sustained and significant additional resources over the next decade, the Air Force will not recover from the nosedive it has been in for many years, and the result will be an increasingly undersized, less ready force that cannot defend the homeland, cannot deter opportunistic aggressors, and cannot succeed in conflicts that span multiple theaters.

Col. Mark Gunzinger, USAF (Ret.), is the Director of Future Concepts and Capability Assessments and Heather Penney is the Director of Studies and Research at AFA’s Mitchell Institute for Aerospace Studies.

OUTSTANDING AIRMEN OF THE YEAR

The Outstanding Airman Program annually recognizes 12 enlisted members for superior leadership, job performance, community involvement, and personal achievements.



The Air Force Association drove the creation of the Outstanding Airmen of the Year program, which debuted at AFA's 10th annual convention in 1956. Airmen selected receive the Outstanding Airman of the Year ribbon with bronze service star device; they also wear the Outstanding Airman badge for a full year. This year's honorees were chosen by a selection board from among nominees advanced by commands in the Air Force and Space Force.

SMSgt. Michael J. Falleroni

Duty Title: Operations Superintendent

Organization: 1st Combat Communications Squadron, Ramstein Air Base, Germany

Home of Record: Ogden, Utah

Senior Master Sergeant Falleroni helped stand up a battlecab for USAF's Air Operations Center, developing real-time, top-secret intelligence for the CFACC and five general officers during Operation Midnight Hammer. His actions enabled the largest B-2 mission in history, executing strikes on Iranian nuclear sites. Falleroni then launched Air Combat Command's first real-world Distributed Intel



Communications Element kit in theater, connecting AFCENT C4ISR to USAF & 1 FW, supporting the rapid redeployment of 12 F-22s and protecting \$1.7B in assets from Iran's retaliatory strikes. He led a team of 87 NATO personnel using a top-secret military system in the Arctic for the first time, enabling 15 F-35 fighter jet missions that demonstrated joint interoperability to Norway's Minister of Defense. Falleroni organized a team to

close down operations at al-Asad Air Base, coordinating 174 aircraft missions to safely move 248 military personnel and \$4M worth of critical equipment out of the location.

MSgt. Peter J. Nunes

Duty Title: Command Armament Inspector

Organization: Office of the Inspector General, HQ Air Force Global Strike Command, Barksdale Air Force Base, La.

Home of Record: Warwick, R.I.

Master Sergeant Nunes demonstrated excellence under pressure in several combat operations. During Operation Rough Rider, he served as Wing Weapons Manager, leading 28 deployed Airmen. The team enabled 51 combat sorties and more than 790 weapons expenditures, despite having to overcome six technical data limita-



tions. Nunes was named the Wing's Armament Manager of the Year. During Operation Midnight Hammer, Nunes led six expeditors and 48 loaders in support of the largest B-2 strike package and the first operational use of the Massive Ordnance Penetrator against two Iranian nuclear sites, earning the Air & Space

Commendation Medal. As Maintenance Operations Senior Enlisted Leader, he led 124 Airmen across nine sections, modernized security clearance tracking, and earned the Group's Maintenance Support Professional of the Year award. He also led the Commander's Continuous Improvement Program, guiding a self-assessment team to zero deficiencies during the AFGSC Nuclear Surety Inspection.

MSgt. Andrew L. Schaeffer

Duty Title: Director of Innovation

Organization: 35th Fighter Wing Staff Agency, Misawa Air Base, Japan

Home of Record: Las Vegas

Master Sergeant Schaeffer, as the 35th Fighter Wing's first 91000 Futures Airman, led 15 engineers from four major commands in finding ways to reverse-engineer and recreate 42 aircraft parts for six different aircraft that could no longer be purchased. His efforts



earned DAF's sole field-level production approval and helped his team advance to the 2026 HAF Aether Sprint semifinals. As IN-DOPACOM's Project Arc Manager, he directed 12 scientists through 118 projects across two Numbered Air Forces, delivering 24 high-side AI and counter-drone solutions to 23 units. His teams generated \$29M in savings and established

two programs of record. Schaeffer also led research and development of SHADOWLANCE, DoW's first grassroots, low-cost, rapidly manufactured unmanned cruise-missile drone, radically reducing costs by 99%, from \$3M to a remarkable \$20K per system, strengthening forward-location defenses.

MSgt. Catherine L. Young

Duty Title: Superintendent, Logistics and Readiness

Organization: 4th Security Forces Squadron, Seymour Johnson Air Force Base, N.C.

Home of Record: San Diego

Master Sergeant Young, as the DAF Outstanding Electronic Warfare SNCO of the Year, advised wing leadership on USNORTHCOM security policies, safeguarding more than 22,000 personnel and \$2.9B in assets. She led the team recognized as AFCENT's Best



Medium Security Forces Unit, directing a \$212M radar initiative that defeated 49 drone incursions and protected 3,000 deployed personnel. As the Force Protection advisor for a major runway reconstruction effort, Young developed a relocation plan for 2,000 Airmen and 105 aircraft, pre-

serving \$358M in flight operations. Selected by PACAF to design a new integrated air defense construct, she redefined the theater's counter-small unmanned aircraft system (C-sUAS) kill chain. Young also directed security for her wing's 2025 Air Show, protecting 130,000 attendees, and earned 15th Air Force's GEICO Service Member of the Year for raising \$141K for community programs.



TSgt. Kailey L. DeLage

Duty Title: NCOIC, Clinical Services Administration
Organization: 320th Correctional & Rehabilitation Squadron, Joint Base Lindsey Graham, S.C.
Home of Record: Manteca, Calif.

Technical Sergeant DeLage enhanced the security and safety of more than 370 personnel at a DoW correctional facility, leading five sections responsible for more than 110 prisoner intakes and 730 therapy sessions. As acting Senior Enlisted Leader, she led eight NCOs with varying specialty codes, spread across geographical-



ly separated units. Her efforts enabled her team to earn three Navy Achievement Medals, two promotions, and six unit awards. DeLage overhauled operations at the Psychiatry Clinic, navigating through four major transitions, restructuring telehealth operations, and securing two permanent psychiatrists, a historic first for Naval Brigs. She developed a care plan oversight tool linking multiple units, saving the DoW

\$150,000 and helped restore telehealth services for 185 prisoners. DeLage led a year-long youth drug education program, directing 34 facilitators, delivering 168 lessons at 18 schools, and impacting more than 813,000 community members.

TSgt. George A. Distel

Duty Title: Superintendent, Plans and Programs
Organization: 49th Security Forces Squadron, Holloman Air Force Base, N.M.
Home of Record: Ambler, Pa.

Technical Sergeant Distel, while deployed as NCOIC of Operations, helped shape the future of Air Force combat operations during the Israel-Iran 12-day war. Stepping up to serve in a critical senior master sergeant role, Distel commanded 241 Defenders, protected 99 alert aircraft, and led Security Forces' first-ever kinetic kills of two



suicide drones during a massive attack involving more than 460 missiles and 77 drones. This exceptional combat leadership earned him the Air and Space Commendation Medal with "C" device and a Gallant Unit Citation. Distel also established the AOR's first Coyote missile reloading team, showcasing unprecedented technical adaptability. This rapid-reload capability dramatically shortened

weapon turnaround times and earned him the prestigious AFCENT Innovation Excellence Award. He spearheaded host-nation training to secure a 484-square-mile zone against 38 threats, authored the theater's first Joint Site Defense Plan, and was selected for the Wing Security Forces Functional Annual Award.

TSgt. Michael A. Roybal

Duty Title: Contracting Officer
Organization: 460th Contracting Squadron, Buckley Space Force Base, Colo.
Home of Record: Denver



Technical Sergeant Roybal, as the sole Contracting Officer in Israel, executed a \$30M portfolio while under the constant barrage of 429 Iranian ballistic missile strikes. During the 12-day war, he led a \$296K bunker upgrade to protect 500 coalition forces from traumatic brain injuries, resolving a 3-year AFCENT deficiency. Roybal filled in as the Senior Enlisted Leader, overseeing a \$282M augmentation program while training a team of seven company grade officers and three Senior NCOs. His efforts earned him the Army Commendation Medal. He leveraged his equipment operator expertise to transport a \$1.2B missile defense system and 9.6 tons of critical supplies. Roybal procured a critical \$1.3M site management and translation service, ensuring 17 DoW initiatives could continue without interruption. His efforts reinforced host-nation relations and bolstered the National Security Strategy. In less than 72 hours, Roybal delivered \$400K in essential supplies to support the United Kingdom's largest carrier deployment since 2021.

SSgt. Brianna D. St. Lawrence-Brody

Duty Title: Command & Control Systems Craftsman
Organization: 120th Airlift Wing, Great Falls, Mont.
Home of Record: Great Falls, Mont.

Staff Sergeant St. Lawrence-Brody, while deployed to the 406th Air Expeditionary Wing Regional Command Post, excelled as a Training NCOIC, implementing a groundbreaking initiative that resulted in certification of 662 members across two combatant commands and



four geographically separated units. She controlled 87 sorties, coordinating the movement of 536 passengers and 94 tons of cargo during the U.S. military's withdrawal from Niger. St. Lawrence-Brody overhauled more than 385 quick-reaction checklists and procedures protecting over 1,000 personnel and \$98M in vital ISR and counter-terrorism operations. Furthermore, she

showcased unparalleled composure and expertise during an in-flight emergency, applying her skills as a Registered Nurse to assess and stabilize a fellow passenger in acute distress, relaying vitals to a ground medical team.



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SrA. Alessandro Bianchini

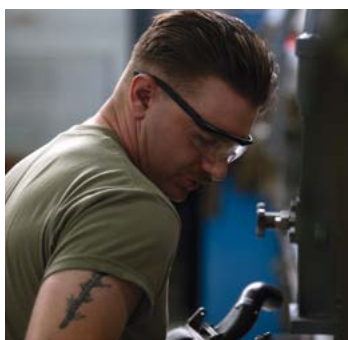
Duty Title: Commander's Support Staff Lead Personnel Technician
Organization: 371st Special Operations Combat Training Squadron, Hurlburt Field, Fla.
Home of Record: West Palm Beach, Fla.

Staff Sergeant Bianchini, as the lead personnelist at the 371st Special Operations Combat Training Squadron, distinguished himself through exceptional leadership of the A1 flight in a unique combat training environment, providing critical personnel support to Air Commandos across 20 expeditionary squadrons, eight groups, and two Joint Task Forces. He expertly orchestrated 92 temporary duty assignments, fueling the Air Commando Center's mobile training program and enabling command-directed training for Special Operations Task Groups executing critical U.S. Special Operations Command tasks. Demonstrating remarkable initiative and versatility, Bianchini excelled beyond the scope of his primary duties, earning two drone certificates and dedicating 48 hours in the field as an ISR Mission Sustainment Team role player, showcasing downrange operational capabilities. His exceptional administrative support for 26 center-level courses directly enabled joint force deployments and culminated in his selection as the sole AFSOC Airman to attend the prestigious Inter-American Air Forces Academy.

SrA. Nathan J. Carver

Duty Title: Centralized Repair Facility Journeyman
Organization: 48th Component Maintenance Squadron, RAF Lakenheath, U.K.
Home of Record: Davison, Mich.

Senior Airman Carver excelled while filling a position above his rank for more than two months, earning the 48th Maintenance Group Commander's waiver for advanced certifications to perform 7-level maintenance. As shift lead, he established 24-hour coverage, increasing engine production by 25% for Combat Air Forces'



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largest flying-hour program. Carver revolutionized throughput by fusing two major inspections, eliminating 1,200 tasks and 3,200 hours while reducing build times by three days. His initiative erased a Combat Air Forces deficit for two combatant commands, delivering 42 war-ready engines. Carver authored three Air Force technical

order changes and developed SOPs, training 17 maintainers on core rigging, eliminating 570 man-hours annually and earning Pratt & Whitney's "Best in Class" Award. As a certified Liberty Wing HOPE Airman, he leveraged a speech course to inspire 130 chapel patrons. Carver's leadership and impact earned him a 2-Star Air Force Chief of Chaplains coin and Below-the-Zone selection.

SrA. Logan A. Grindstaff

Duty Title: KC-46A Boom Operator
Organization: 924th Air Refueling Squadron, McConnell Air Force Base, Kan.
Home of Record: Wichita, Kan.

Senior Airman Grindstaff, as a KC-46A boom operator, logged more than 100 combat flying hours in support of Operations Midnight Hammer and Epic Fury, directly enabling long-range strike capabilities and sustained combat airpower. He executed high-stakes aerial refueling missions for joint and coalition aircraft, transferring critical fuel loads to ensure aircraft had enough fuel for



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sustained operations and rapid global mobility. Grindstaff spearheaded complex tanker integration during multiple Large Force Exercises, including Red Flag Alaska 2024 and Cope North 2025, enhancing joint readiness and interoperability in

contested operational environments. His superior airmanship and flawless mission execution during high-tempo deployments directly bolstered the 924th ARS combat effectiveness and reinforced the KC-46A's role as a premier power projection asset.

SrA. Sierra F. Mueller

Duty Title: Contracting Officer
Organization: 39th Contracting Squadron, Incirlik Air Base, Turkey
Home of Record: Schuylkill Haven, Pa.

Senior Airman Mueller excelled in an NCO role, managing more than 1/3 of her section's workload and securing authority to approve contracts valued at \$5M. She co-negotiated four high-visibility price targets under the \$32B DoW Housing program, saving \$2M and supporting more than 18,000 joint-service troops stationed at seven different bases. Mueller championed five source selection teams and engineered analysis models to evaluate a construction contract worth \$1B. As part of an Advanced Echelon team, she deployed to the Philippines, acquiring essential resources to establish operational sites for joint medical units. Mueller also directed the strategy for Project DentX, tripling air system capacity and increasing prosthetic production by 43%, enhancing operational capabilities and improving efficiency across 20 command medical facilities. She was handpicked for an aircraft recovery plan, sourcing technology 82% faster than standard timelines to safeguard \$2B in assets, resulting in her selection as DAF Functional Airman of the Year.



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Lisa Werner is AFA's 2026 Teacher of the Year

The Air & Space Forces Association, in partnership with Rolls-Royce, selected its 2026 Thompson-Mallett National Teacher of the Year, along with two runners up. The three were recognized for their extraordinary work in science, technology, engineering, and math education (STEM) and their focus on aerospace applications.

FIRST PLACE: LISA WERNER

Lisa Werner, a PreK-8 music and STEM educator at St. Bruno Parish School in Dousman, Wis., earned top National Teacher of the Year honors for her innovative approach to connecting music, science, technology, engineering, mathematics, and aerospace. Werner has created a nationally recognized program demonstrating that aerospace education can thrive in every classroom—even music education.

Through hands-on experiences in coding, robotics, engineering, flight, space science, and sound, she gives students authentic opportunities to solve problems, conduct research, and develop skills essential to America's future aerospace and STEM workforce. Her students have even designed experiments for zero-gravity flight, including research into how sound behaves in microgravity. Beyond St. Bruno, Werner works with NASA, Space Foundation, Space for Teachers, Limitless Space Institute, Fulbright Teachers for Global Classrooms, and other national and international organizations to bring real-world aerospace experiences into the classroom while helping educators replicate innovative learning opportunities. As the 2026 national winner,

Werner will serve as AFA's National Teacher Ambassador, representing the Association's commitment to inspiring students



Courtesy

Lisa Werner, the 2026 winner of AFA's National Teacher of the Year Award experiments with Zero gravity.

to pursue careers in air, space, cyber, and STEM and equipping educators with approaches that can expand America's aerospace workforce pipeline. "STEM education is for everyone," she says of her work—and capturing the mission of the AFA/Rolls-Royce Teacher of the Year program.

SECOND PLACE: ANTHONY "TONY" FRAZIER

Earning second place is Anthony "Tony" Frazier, an Aviation Technology instructor at the Arlington Career Center in Arlington, Va., who served nearly 20 years in uniform. He has spent nine years transforming a public high school aviation program into a proven pipeline for students pursuing military service, collegiate aviation, commercial flight, and unmanned aircraft systems careers.

Through FAA-aligned instruction, flight simulation, industry partnerships, and hands-on experiences, his students have earned FAA pilot certificates, entered Navy flight training, gained admission to leading aviation programs, secured airline internships, and launched aerospace careers.



Courtesy

Anthony "Tony" Frazier

THIRD PLACE: THOMAS SANDO

Thomas Sando, an aviation instructor at the Williston Basin Career & Technical Education Center in Williston, N.D., has built one of the state's premier high school aviation programs, giving rural students hands-on opportunities in flight simulation, engineering, drones, aircraft systems, aviation maintenance.

Through airport and air traffic control tours, university and industry visits, STEM competitions, and introductory flights, he connects classroom learning to real-world aerospace careers. His students have gone on to earn FAA certifications, pursue collegiate and military aviation, and launch careers throughout the aerospace industry.



Courtesy

Thomas Sando

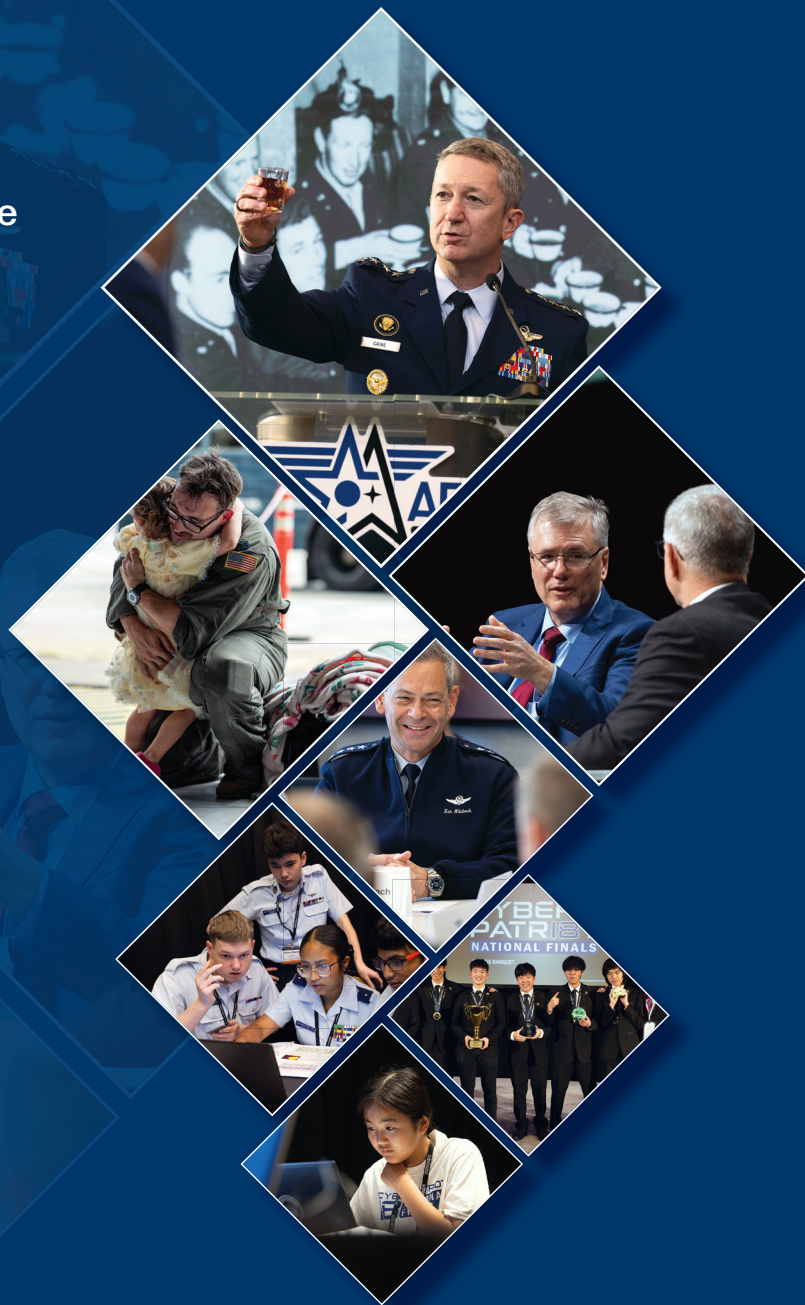
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HEROES AND LEADERS

By Col. Phillip S. Meilinger, USAF (Ret.)

Lance P. Sijan

Courage in the face of danger.

On March 4, 1976, President Gerald Ford presented the Medal of Honor to the parents of a remarkable hero.

Lance Sijan was born in Milwaukee in 1942. He was big, brash, handsome, and self-confident. In high school he played football (tight end), was a Boy Scout, and starred in two school plays. He received an appointment to the Air Force Academy in Colorado Springs, Colo., and quickly accepted.

As a cadet he continued to play football but never made first string. Moreover, academics were a challenge, so he gave up playing during his senior year to focus on grades. After graduating in 1965, he moved on to pilot training, eventually learning to fly the F-4 Phantom, after which he was posted to Da Nang Air Base in Vietnam. In those days, the F-4 was crewed by two pilots, and newbies like Sijan took the rear seat. It was not unusual for GIBs ("guys in back") to serve a combat tour, upgrade to the front seat, and then stay for another tour.

On his 52nd combat mission Sijan was flying with his squadron commander, Lt. Col. John Armstrong. Their target on Nov. 9, 1967, was along the Ho Chi Minh Trail in Laos. His Phantom rolled onto the target to release its six bombs, but immediately after the drop a large explosion engulfed the plane. Sijan ejected. Armstrong's remains were never found.

Sijan came down in rugged triple canopy jungle and karst—limestone rock formations. He had a cracked skull, a compound fracture of his left leg, and a seriously injured right hand. He had two water bottles, but no food. Sijan would later say he was certain the bomb fuzes had malfunctioned, and that his plane had been downed by its own ordnance.

On the ground, Sijan turned on his survival radio beeper and friendly aircraft immediately moved toward the site. Sijan established voice contact with those overhead and was told choppers were inbound. The HH-3 "Jolly Green Giants" were the rescue choppers, manned with pararescuemen, who when over a suspected site would lower a PJ on a penetrator, secure the downed Airman, and hoist him to safety. At the same time fighter aircraft would orbit overhead dropping ordnance on enemy forces in the vicinity. This was always dicey—the enemy knew the Americans would expend great effort to rescue Airmen, so they waited in ambush. Twenty aircraft sent to rescue Sijan were hit by enemy fire over the next two days, one of them going down.

Sijan heard the aircraft overhead, but due to the jungle canopy he could not see them—or vice versa. The Jolly dropped a penetrator, but Sijan was unable to crawl to it. He insisted they not send down a PJ to find him—it was too dangerous. The following day the batteries on Sijan's radio died, and he was unable to communicate. It was assumed he had been captured.

He had not. The rugged karst was sharp and cut his body to shreds as he tried to crawl. In addition, the ground was covered by thorny vines. He would attempt to cut the vines above his head using his survival knife and then scoot backward a foot. He did this for 46 days.

Finally, he managed to crawl onto a muddy road, where he was discovered by an enemy patrol.

He was barely alive. Taken to a local camp, he was fed, given water, and had his clothes changed. Astoundingly, Sijan had no intention of being a prisoner so feigning that he needed help. He lured a guard over to check him, knocked him out, and crawled into the jungle. He was recaptured that same afternoon and severely beaten.

He was then moved to a POW camp near Vinh and thrown in with two other Air Force pilots. They were stunned at his horrible condition, yet in his lucid moments he talked of further escape. He asked his buddies to study the fences and gates; were they secure, could they overpower the guards and get out?

Interrogations were a daily routine, but his cellmates stated that Sijan never gave anything more than his name, rank, and serial number, and was thus beaten—despite his severe injuries. He never stopped talking about escape. Finally, a doctor saw him but simply shook his head. He

contracted pneumonia and died within a week.

Sijan's remains were returned to the States following the war and are now buried in Milwaukee. At the Air Force Academy there is a pavilion honoring the 151 graduates who died in Vietnam. The focus of this moving display is a large bronze statue depicting Sijan on the ground, his leg in a splint he had contrived, bleeding and beaten up, but seeking to crawl away to freedom. The magnificent sculpture by Jim Nance is an enduring tribute. Sijan's incredible tale of courage and honor is told by Malcolm McConnell in *"Into the Mouth of the Cat."* ★



The bronze sculpture of Capt. Lance Sijan, USAFA's first Medal of Honor recipient, is displayed on the Plaza of Heroes at the Academy and is a tribute to his courage and perseverance in the Vietnam War.

Illustration by Dash Parham/photo resource: USAF

Sculpture by Jim Nance



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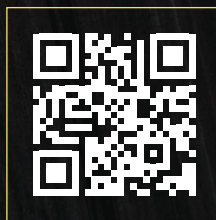
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