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July/August 2026, Vol. 109, Nos. 7 & 8

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Jason Kelly

General Atomics' YFQ-42A Collaborative Combat Aircraft is helping to usher in a new era of autonomous weapons. See "Autonomy and the Short-Range Air Fight," p. 40.

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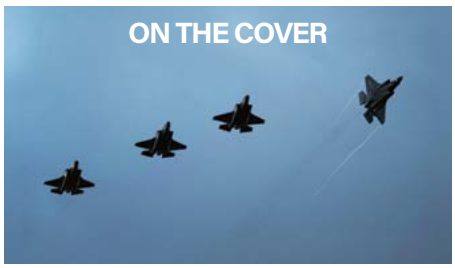

Four F-35As from the 4th Fighter Squadron at Hill Air Force Base, fly in formation in this 2021. photo by Staff Sgt. Alexander Cook.

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EDITORIAL

By Tobias Naegele

Drone Disruption

Much has been said about how drones are changing the character of war. Ukraine and Iran offer different versions of the same lesson: relatively inexpensive, precise, long-range weapons are democratizing attack. They allow states that lack a traditional air force—or cannot employ one freely—to reach targets once protected by distance and geography.

Ukraine has adapted with remarkable speed, using long-range drones to strike oil refineries, fuel depots, military production sites, and more deep inside Russia. Those attacks have not yet decided the war, and it is premature to say that the tide has turned. But Ukraine's adaptability is imposing costs, complicating Russian logistics, reducing energy supplies and revenues, and demonstrating that Moscow cannot insulate its population—or its war machine—from attack.

Ukraine's achievement is not replacing airpower with drones but rather adapting its means of strategic attack to what is available. Drones are a substitute for a larger, better-equipped air force.

Iran's campaign offers a different lesson. Its missile and drone attacks on U.S. bases, Gulf population centers and ports, and commercial shipping are an attempt to splinter regional alliances and pressure neighbors to back down. Striking key military enablers and infrastructure, Iran seeks to wear out Western political patience.

Drones drive up the urgency of defending air bases.

Despite major losses to its leadership and conventional forces, the Islamic Revolutionary Guard Corps appears to believe that time is on its side. That logic resembles the attrition strategies used by North Vietnam. Avoid decisive defeat, keep imposing costs, and wait for the adversary's political will to erode.

But Iran's reach is broader than Hanoi's or the Taliban's. Its proxies, missile arsenal, nuclear ambitions, and ability to disrupt the Strait of Hormuz mean its actions impose consequences far beyond its borders. Roughly one-fifth of the world's oil moved through the strait before the conflict, making freedom of navigation there a global, not merely regional, interest.

A durable settlement must address more than a cease-fire: It must constrain Iran's ability to threaten its neighbors and support terrorist proxies; end its pursuit of nuclear weapons; and dismiss, permanently, its claim to control the Strait of Hormuz.

Back to drones and airpower: What we are witnessing in Iran and Ukraine is the sudden democratization of precision attack. Commercial satellite imagery shared foreign intelligence, China's BeiDou space-based navigation as an alternative to U.S. GPS, and artificial intelligence can now enable almost anyone—whether a nation-state or even a well-funded terrorist cell—to reconnoiter and target fixed bases.

The cost of attack has diminished. Not only did Iran identify and strike military command centers, but it also monitored the locations where U.S. aircraft would be parked, to destroy them on the ground.

To be sure, the risk that Iran might strike its Gulf neighbors was always there. The Gulf is a compact geographic region, and U.S. installations have long been within range of regional missiles and aircraft.

What has changed is the combination of reach, precision, volume, and affordability. Iran's missiles and drones damaged aircraft, radars, satellite-communications nodes, command facilities, and other infrastructure at bases across Kuwait, Bahrain, Oman, Saudi Arabia, the United Arab Emirates, and Qatar.

Also clear is that Iran has effectively adapted elements of the anti-access/area-denial playbook often associated with China—persistent surveillance, precision strike, saturation, and attacks on command and control and logistics. Iran could not stop the U.S. and its allies from gaining air superiority, but it did impose real costs and constraints.

U.S. and allied missile defenses have performed impressively, intercepting the great majority of incoming threats. But no defensive system is perfect, and an attacker needs only a small percentage of weapons to get through to cause serious damage.

Large salvos also create an unfavorable exchange rate; cheap threats defeated with costly interceptors make for bad economics.

Confoundingly, some military theorists continue to misread the democratization of precision attack as somehow negating the value of airpower and air superiority. They get it backward: Drones are airpower in another form. By lowering the entry cost to conduct aerial attack, drones do not eliminate the need to control the air domain but instead make doing so even more essential.

Air superiority is not about platforms—it is about achieving the freedom to attack while limiting an enemy's freedom to do the same. While cheap precision weapons change the cost curves, they do not alter its strategic requirement.

The force that can integrate aircraft, missiles, drones, space capabilities, cyber effects, and surface-based defenses—and deny the enemy the same integration—will hold the advantage.

Here's what drones and missiles do achieve: driving up the urgency of defending air bases. For decades, many U.S. overseas installations operated as relative sanctuaries from sustained precision attack. That era is now over. Anyone can target an air base, in any number of ways.

Yet aircraft remain concentrated and out in the open and squadrons operate predictably from known locations.

Nearly five years after then-Air Force Chief of Staff Gen. C.Q. Brown signed the Air Force's first Agile Combat Employment doctrine, the service's ability to disperse, sustain, and protect forces from multiple operating locations remains uneven. Counter-drone and air base defense capabilities are improving, but still experimental, scarce, and insufficiently integrated.

The Air Force needs a new operating architecture that combines ACE and dispersal with hardened shelters, camouflage and deception, redundant communications, enhanced fuel and munitions distribution, rapid runway repair, layered active defense, and training to ensure USAF can operate while under attack. ACE is still a concept and unproven in combat.

At the Global Air and Space Chiefs Conference in London in July, Air Force Chief of Staff Gen. Kenneth Wilsbach spoke plainly: "Air and space superiority are fundamental to military success," he said. "The most effective airpower is combined airpower."

Operating together, Wilsbach said, creates "options, dilemmas, and effects that no nation can generate independently."

America's network of allies has long been among its greatest strategic advantages. But in addition to shared aircraft and intelligence, compatible tactics and command and control, access, basing, and overflight are essential components of partnership.

Partners that deny access during a crisis undermine the coalition's ability to defend them.

Access, basing, and overflight are the fundamental elements of shared defense and foundational for projecting airpower.

Modernizing to counter advances in drone warfare, from layered defenses and ACE to new weapons and capabilities, cannot escape this undeniable fact: Responsive airpower depends heavily on access, basing, and overflight rights. Flexibility may be one key to airpower, but access, basing and overflight are every bit as important.

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Note: MTS-3060A SmartCan currently deployed as a replacement for these test sets		

Table 1. O-Level Test Set Replacement Matrix

Today's armament maintainers are tasked with performing flightline (O-Level) maintenance with an assortment of legacy test sets that greatly limit the ability to quickly and efficiently verify armament system readiness, diagnose failures, and ultimately return the aircraft to full mission capable (FMC) status. Legacy test sets are typically utilized on only a single aircraft, or perform a single function supporting multiple aircraft, resulting in increased training and logistics challenges, and longer than necessary test and repair times. This not only impacts armament maintainer effectiveness, but limits the realization of Agile Combat Employment (ACE) and the development of Mission-Ready Airmen.

The widely deployed and combat proven MTS-3060A SmartCan™ Universal Armament Test Set addresses these issues and more. It has quickly become the warfighters armament test set of choice by eliminating the burden of multiple, aircraft-specific flightline test sets. A typical SmartCan kit, with all cables and adaptors in a single carry case, can replace the flightline test capabilities of over a dozen test sets across USAF fighters and UASs. It can also support a broader implementation to include other platforms including surface-to-air defensive systems.

Unlike legacy handheld test sets that are limited to stray voltage and continuity tests, the SmartCan implements functional/active MIL-STD-1760 for Smart weapons test and evaluation. Coupled with munitions communication channels supporting all existing weapons protocols, it provides a full system test for all legacy and Smart weapons. The SmartCan performs both pre-load and functional checkouts, testing of multiple squib signals, and implements a unique cross-fire algorithm superior to all other O-Level armament test sets in service today.

	Test Time Improvement			
	PYLON WITH MIL-STD-1760 UMBILICAL	LAU-129 WITH AIM-120 AND AIM-9	SETUP	WEIGHT (LBS.)
EFFICIENCY IMPROVEMENT W/ MTS-3060A SMARTCAN	85%	89%	91%	95%

Table 2. F-16 Setup / Test Time Comparison

The SmartCan's capabilities also extend beyond aircraft armament systems to encompass other platforms, such as surface-to-air missile defense systems including the widely deployed Norwegian Advanced Surface-to-Air Missile System (NASAMS). It supports comprehensive rail testing and fault isolation across all NASAMS rail configurations, including the LAU-129N, Common Ground Rail (CGR), and Legacy Rails. A unique test approach enables I-Level (Backshop) test in the field while fully disconnected from the launcher, activating and verifying all critical electro-mechanical assemblies to ensure full rail operation and preventing critical faults, for a more complete and comprehensive rail checkout.

Designed and qualified for extreme environmental conditions, the rugged design, ergonomic layout and small footprint enables field operation anywhere in the world, making it the ultimate tool for flightline armament test. Battery operation further enhances field usability; any AA batteries and an innovative power management system enable over 40 hours of test time without the need to replace the batteries.

Test setup and execution times are also significantly improved. F-16 setup times are reduced by 91%. Similarly, test execution times for a pylon utilizing MIL-STD-1760 and a LAU-129, tested for both AIM-120 and AIM-9X, also displayed substantial test time reductions of 85%, and an 89% respectively. Test results and measurement variances are displayed in real time, and include all parametric data which can be transferred via the removable SD card for printing or predictive maintenance analysis.

Deployed on 15 platforms in 22 countries, the SmartCan has also been endorsed by Lockheed Martin and the USAF F-16 System Program Office with SERD #75A77 and granted cybersecurity authority to operate (ATO). Test Program Set (TPS) development is streamlined and available to the warfighter utilizing the integrated development environment SmartCanEasy™.

Advanced cybersecurity features and protections further differentiate the SmartCan, making this the most cyber-secure O-Level armament test set available. Data encryption, a custom operating system, NIST Certified software for Test Program Set (TPS) development, and a removable secure data (SD) card all contribute to the enhanced cybersecurity performance available on this test set. When the SD card is removed, no sensitive data remains on the unit, meeting stringent DOD information assurance standards.

SmartCan is the most advanced O-Level armament test set available, capable of testing all Alternate Mission Equipment (AME) and Aircraft Armament Equipment (AAE) including pylons, launchers, bomb racks, guns, and pods. It delivers the quickest setup and execution times, reduced training needs, a small logistics footprint, enhanced cybersecurity, and superior active armament test capabilities that maximize warfighter readiness and combat effectiveness.

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LETTERS

KC-46/Transparency

I received my 2026 Air & Space Forces Almanac and was looking forward to seeing where my Air Force is currently standing. There were many new changes but the one that immediately caught my eye was the failure of the KC-46 Remote Vision System correction to be fielded.

There was no mention of an immediate plan to correct the ongoing system problems, but now there would be an additional delay of almost two years before the new RVS 2.0 will be fielded during the depot level maintenance process. This continuing slip is the latest in a long line of failed promises to correct this problem. My concern isn't for the politics or optics this creates but the men and women who have to fly this aircraft if we get into a real fight with a peer aggressor.

Our aircrew will be at the mercy of a system that is not 100 percent functional and in combat that could be fatal. This would not only affect the ability of the crew to do their job but the aircraft they are trying to refuel. If they can't be refueled, they can't execute their mission. In addition, the article addresses reliability issues and lack of spare parts as additional detractors of aircraft availability.

A single sentence in the article tells who is actually bearing the burden of keeping this aircraft flying, "the daily heroics from the crews on the ground." This aircraft has many of the issues the B-1B had during its development. To prove what the aircraft could do it had to perform a mandated test that was done at a deployed location. The deployment was 100 percent staffed, deployed kits were fully stocked, and parts availability was maintained throughout the deployment.

The results spoke for themselves. Mission capable rates were exceeded, more sorties were completed than scheduled and systems performed as required ensuring mission accomplishment. Yes, it was the daily efforts of the maintenance crews that ensured mission success during the deployment, but it was also due to them having a proven aircraft and the resources to get the mission done. We don't have all of this with this aircraft. We only have to hope that we don't get into a major confrontation before 2028, where we need to maximize refueling capably. Then we'll find out how well the KC-46 actually performs. We should also ask why this aircraft was allowed to be purchased even after these critical defects were identified.

Also in the 2026 Almanac, there was a statement on page 32, under "About this Edition," that indicated some data had been withheld by the Department of the Air Force. It did not say why.

Almost all of the data withheld related to issues that have been bones of contention or hot topics in several articles in past AFA magazines and in recent news articles. My personal favorites were the mission capable rates and average age of aircraft by command. These rates say a lot about the health of the aircraft, its logistics requirements and what we have ready to fight with.

I hope someone will come forward and explain why this data was withheld because old maintenance guys like me like to know how our aircraft are doing in the new operational environment we are living in.

CMSgt. John P. Fedarko,
USAF (Ret.)
Xenia, Ohio

Newsworthy

In 1987, President Ronald Reagan and I went to the Tuskegee Institute in Alabama, and I dedicated the F-4 (restored by the Alabama Air National Guard) that "Chappie" James flew in Operation Bolo, [See, Heroes/Leaders: Daniel Chappie James Jr," May/June, p. 176].

Reagan was a captain in the AAF during WW II, had enlisted in the Reserves in 1937, and may have been partial to USAF. He did a great job dedicating the new ROTC building.

Bill Plante of CBS News asked about a statement attributed to Reagan's National Security Advisor. The President said it should be raised in D.C., we're here to honor General James.

That evening's new had the Plante question and not a word about where Reagan was and what he was doing.

I lost all interest in TV news after that.

Lt. Gen. Truman Spangrud,
USAF (Ret.)
Tucson

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QUESTIONS & ANSWERS

NATO's Supreme Allied Commander Europe Gen. Alexus Grynkewich

Since U.S. Air Force Gen. Alexus G. Grynkewich became NATO's top military officer in July 2025, the alliance has contended with Russian drone incursions, hybrid warfare against its members, and Moscow's continued aggression in Ukraine. Now the Supreme Allied Commander Europe, the career fighter pilot is trying to guide a major transformation of the forces under his command. The NATO Force Model is being adapted as the Trump administration scales back the forces it would offer Europe in a crisis as a means of rebalancing toward Pacific threats. Members of the alliance, meanwhile, are ramping up spending and stepping into greater roles.

Grynkewich, who also heads U.S. European Command, recently joined Air & Space Forces Magazine for an interview in his office at Supreme Headquarters Allied Powers Europe near Mons, Belgium. The text of the interview has been edited for length.

Air & Space Forces Magazine: What are the NATO Force Model cuts and what are their implications?

Grynkewich: I won't get into specifics about which things have been adjusted in the NATO Force Model, since that is classified, but we have said that it's air and maritime capabilities, and we've said that allies should step forward and fill some of those requirements.

From my perspective as SACEUR, this makes me have a more realistic plan [in case of war]. What the U.S. is doing is accounting for other global contingencies that it might find itself in and not just promising something that it may not be able to give. I now have a signal from the United States on what capabilities they may have to withhold or that might be otherwise engaged. Therefore, allies have a realistic expectation of what they're going to need to contribute.

The United States has typically said that it would say "everything is available" to the alliance and then decide at the point of need. Other nations have withheld capabilities from the NATO Force Model that they need for their [own] national plans; this is just the first time the United States is doing that, based on other national interests.

Q: Polish and Finnish officials have expressed interest in nuclear sharing, a program in which nations would use dual-capable aircraft to employ U.S. nuclear weapons in a war. What are the implications of expanding the nuclear sharing mission?

A: In general, additional flexibility is never bad for a commander to have, but it is a political decision and there are some strategic implications of it.

Q: President Trump has said additional U.S. troops will be sent to Poland, but no forces have been sent. Do you have clarity on that?

A: All pre-decisional at this point. I've been given the order to do some planning and make some proposals and options, and we'll complete that process and get guidance from the Secretary on how he wants to proceed.

NATO

Supreme Allied Commander Europe Gen. Alexus Grynkewich arrives at a meeting of NATO's Military Committee in Brussels, Belgium, May 19, 2026.

Q: How do you assess the Russian threat?

A: On the Russian air and missile forces, I would say those have not been subject to the same level of attrition and attritional warfare that the Ukrainians have imposed on Russian ground forces. So they do still have the platforms and capabilities, whether it's bombers or fighters or ballistic missiles, et cetera. They, of course, are expending some munitions in Ukraine, but the platforms are there, and then their production for replacement ballistic missiles and cruise missiles continues. So they have considerable firepower and considerable potential in the [Russian Aerospace Forces] for capabilities. And you pair that with one-way attack drones, et cetera.

This kind of combined aerospace attack, if you will, is something that we're going to have to be ready to counter. Russia is doing some military modernization as well and building the Su-57 [fifth-generation fighter.] They've got their big six weapons programs. That continued modernization maybe hasn't continued at the pace that it was originally planned because of the war in Ukraine, but it does continue, and we're watching it very closely.

Q: What are the implications of shifting some long-standing U.S. commanded alliance headquarters to other NATO nations?

A: The big shift here has been that the allies are going to fill

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two of our four-star commands underneath SHAPE and in Allied Command Operations that traditionally have been filled by American officers. That's a good sign of Europeans stepping up and taking the lead in some very key positions across the alliance.

We have a combination of joint commands at the four-star level. And then we have domain commands at the three-star level. We have done some work to optimize how those different commands work together, how they're linked. The near-to-midterm plan is to really test that through our exercise program. Is there something else that we need to adjust in the future? I just don't know yet as we go through the process.

Q: Are NATO facilities sufficiently hardened to deal with a Russian attack, such as those launched by Iran across the Middle East with missiles and drones?

A: I won't get into the specifics of what's hardened and what's not, but we clearly account for the threat that you're describing. We think through a range of active and passive measures. Active measures being traditional air defense capabilities and nontraditional electronic warfare against drone attacks, et cetera. We also look at and exercise regularly the full suite of passive hardening—camouflage, dispersion, dispersal—that we'd be able to see to it in the event of a crisis.

Q: What's the goal for the Ankara Summit?

A: I think the best way to approach the Summit is to focus on pragmatic and realistic outcomes, hard outcomes that show progress. We ought to, as a team of friends, hold each other to account. Are we meeting our Hague Summit commitments? Are we meeting our capability targets? Do we have the right resilience that we're building into our force? How are our plans looking? And there will be some things, as we do that—in that honest and open discussion—to celebrate. And there'll be other things where we need to hold ourselves to account and get everyone to row a little harder. So, I think if we approach it from that perspective, we'll come out of it much stronger on the backside.

Q: On a high level, what do allies need to do?

A: The Hague spending commitments were not pulled out of thin air. The 3.5 percent is derived from the capability requirements that are resident in our plans, and the things that SACEUR needs to execute those plans. The first thing allies need to do is spend the money and ramp up quickly, so that we can keep pace with the evolving threat. The second is, as allies spend that money and ramp it up quickly, it needs to go toward their capability targets, and those capability targets need to be thought of in the context of the evolution of warfare.

In other words, don't build me an armored brigade today if you have a target for one that looks like one did in 2021. It needs to account for the evolution of operations, as we've seen. So the composition of that unit, the specific capabilities that will be different—and you could say that across any domain and any capability target. We get a lot of help from SACT, the Supreme Allied Commander for Transformation, on this. He's pulling the lessons learned out of Ukraine, helping to propagate them across the alliance. He runs a series of war games that look at future force structure, so it's not just SHAPE alone. We're part of a bigger system that does this, but it all comes back, and it's all relevant.

The reason our voice matters is that it's tied to the core task of the alliance, which is to defend every inch of alliance territory. I'm advising the heads of state and government, or their ministers, or their chiefs of defense across 32 nations on what I need them to do to make those plans work. And in a way, I'm holding them to account for that and I'm telling them when they're not doing enough. So it's grounded in military reality, but it's direct feedback to the political level across all the nations of the alliance.

NATO

"It's incredible to watch how allies are stepping up and taking more of a leadership role in the alliance," Grynkewich says. "There is this shift toward a much stronger Europe that will make a much stronger and durable alliance over time."

Q: What is your core message?

A: There are a couple things I want to get across. First, it's incredible to watch how allies are stepping up and taking more of a leadership role in the alliance, not just in fielding capabilities, but in some of the positions we talked about. There is this shift toward a much stronger Europe that will make a much stronger and durable alliance over time, a NATO 3.0.

The gift to me as SACEUR over the last year coming out of The Hague Summit is that we are getting more and more capable every single day, and so that's message number one. The burden shift is underway. Allies are really stepping up and taking the lead in many ways.

The second big point is we say we're transitioning to a warfighting headquarters, but we are ready today. We are ready. Will we be more ready after a few more exercises, and after a few more capabilities are about? Absolutely. So we'll be more ready tomorrow, and we're ready the day after that. But we are ready today, and it's serious business, and allies are taking that seriously.

Grynkewich spoke with Air & Space Forces Magazine after the Ankara Summit to discuss the outcome.

Q: What was your assessment of the outcome of the Ankara Summit?

A: President Trump said there was a lot of love in the room at the Summit. I was in the room, and it was an incredible display of unity in response to President Trump's leadership. Our allies are stepping up on their investments, and fielding and providing additional capabilities to Allied Command Operations. This will ultimately deliver the capabilities we need to better deter and defend every inch of alliance territory, not just today and tomorrow, but well into the future.

FACES OF THE FORCE

Staff Sgt. Jacob Derry

Col. Bob "Farmer" Hines was selected to train with NASA as an alternate Artemis III mission crew member. His unique capabilities qualify Hines as a backup for every spot on the four-person Prime crew. While training, he must maintain peak proficiency in all crew positions. He noted, "Early on in the training, my focus will be on the skills that the commander is learning, … make sure I'm branching off and understanding all the other crews' roles and responsibilities." Hines is an Air Force test pilot with more than 4,000 flight hours in 50 aircraft types and has also logged 170 days in orbit. NASA plans to launch Artemis III in 2027.

For the first time in 20 years—and first time in U.S. Air Force history—**two air commandos** have successfully completed the mountain warfare course at the Mountain Military School in Argentina. The commandos navigated the rigorous curriculum in Patagonia that pushes students to overcome mental and physical limits. Both mastered advanced rock climbing, rope safety techniques, and crossing dangerous mountain rivers across rope bridges. They were invited to stay for the instructors' course, which they also passed and were invited back as guest instructors for the course in the future.

Liz Easterling/USAF

USAF

Benjamin Faske/USAF

Benjamin Faske/USAF

Two pilots from the 99th Flying Training Squadron (FTS) became the first AETC pilots qualified to fly the T-7A Red Hawk. As part of the first T-7 squadron in the Air Force, **Lt. Col. Michael Trott (left)**, 99th FTS commander, and **Lt. Col. Phillip Bourguin**, 99th FTS director of operations, focused on fundamentals of the new aircraft: takeoff, landings, enroute navigation, and overall system familiarization, and will continue to fly seasoning sorties to gain more experience. "This moment marks a critical step in the overall process of fielding the new trainer fleet," Trott said. They will become the first T-7A AETC instructor pilots once the squadron reaches IOC, targeted for August 2027.

Civil Air Patrol

Cadet Chief Master Sgt. Sydney Otis hit a CAP milestone becoming the 500th student pilot to graduate from the Cadet Wings program with her private pilot's certificate on June 11. Otis, who is 17 years old, is part of the CAP's youth initiative working to help replenish America's pilot shortage. "The day I soloed a glider at 15 was the day I knew I wanted to pursue aviation seriously," Otis said. The Cadet Wings program gave her the financial support and community mentorship to help achieve her goals. Like all student pilots there were challenges along the way, and Otis overcame them with maturity, professionalism, and a positive attitude. She plans to become a certified flight instructor before she starts college in 2027.

Provided image

Air Force Col. **Alfredo Laboy** set a goal of become the only Active-duty service member to complete all seven Abbott World Marathon Majors in a single calendar year—and prevailed. The global races he completed were in Tokyo, Boston, London, Sydney, Berlin, Chicago, and New York. Only 44 athletes worldwide have conquered this endurance racing feat. Laboy, the Air Forces Southern liaison officer to U.S. Southern Command, challenged himself to test his discipline, consistency, and resilience, the same traits expected in his Air Force career. "Readiness isn't limited by age, but it's sustained by mindset. … When Airmen take care of themselves, they're better prepared to take care of the mission," Laboy said.

Trey Ward

The Ira C. Eaker Center's Warfighting Education Directorate earned the prestigious General Muir S. Fairchild Educational Achievement Award for 2025 by providing the Air Force's top contribution in military education and leadership. The directorate modernized the curriculum and overhauled 14 courses, saving the Air Force over $1 million and 1,000 man-days annually. They also initiated the first in-theater Combined Force Air Component Commander's Course for 20 general and flag officers. The team's Unit of Action staff course uses mobile education teams to deliver mission training directly to deploying units in the field, capping off an outstanding year of achievements.

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

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Paratroopers from the U.S. Army, Air Force and allied forces jumped into a drop zone at La Fière, France, on June 7, 2026, reenacting the courage and sacrifice of Allied Forces who landed on D-Day 82 years before. On June 6, 1944, more than 23,000 Allied paratroopers parachuted into Normandy in northern France, the vanguard of the invasion force. This year, more than 600 made the commemorative jump from a variety of planes, including this Montana National Guard C-130.

Tech. Sgt. Shawn White

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U.S. Air Force photo courtesy of UFC

The Air Force Thunderbirds' F-16s flanked the Navy Blue Angels' F/A-18s, as the demonstration teams partnered up to form a rare Super Delta formation. Flying over the White House, they kicked off a summer of festivities celebrating 250 years since the signing of the Declaration of Independence. The June 14 flyover marked Flag Day, President Trump's 80th birthday, the 251st birthday of the U.S. Army, and offered a preview of a once-in-a-lifetime series of flyovers above the National Mall, home to many of America's most iconic monuments.

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The view from the Lincoln Memorial toward the Washington Monument and the Capitol beyond frames a trio of U.S. Air Force bombers on July 4, 2026, the nation's 250th birthday. Among Western allies, only the United States has bombers and the unique capabilities embodied in each of these three iconic aircraft: the age-defying B-52 Stratofortress, reaching IOC in 1955; the stealthy B-2 Spirit, which entered service in 1997, and the speedy B-1 Lancer, which can carry more bombs than any other jet and joined the force in 1985. In 2027, the next-generation B-21 bomber will join the force, marking the first time the U.S. Air Force had four bombers in its inventory since the 1998 retirement of the F-111 Aardvark, whose primary mission was as a medium bomber.

AJ Bleyer

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VERBATIM

KEEP PACE

Cpl. Christian Varney/USMC

"If the adversary's training cycle is as little as six months and ours is five years ... we lose the cyber war before it starts because we can't scale our force as fast as the adversary."

—Retired **Air Force Col. Frank DiGiovanni,** former Defense Department director of training, readiness and strategy in a June 16 report "CSIS Commission on U.S. Cyber Force Generation."

USAF

Disconnect

"The farther we get away from Zeus 95, the more pressure there's going to be to downplay the connectivity needed for the mobility fleet. We don't dilute the connectivity need for any other part of the Air Force. We don't do it for the bomber fleet. We don't do it for the fighter fleet. But we continually do it for the mobility fleet."

—Retired Air Force **Gen. Mike Minihan,** a former commander of AMC, told Air & Space Forces Magazine that he worries that the KC-135 and crew of Zeus 95 lost in the March 12 crash will soon be forgotten, as will the support for increased battlefield awareness for tanker and airlift crews.

Airman 1st Class Gabrielle Hain

True Grit

"I would welcome anybody to talk to our Airmen that have been downrange on the ground fighting or in the air fighting. You know it's too bad that not everybody can see what they're doing and how hard it is, how physical it is, and how they have to have toughness, mental toughness, physical toughness, and grit to do what they do.
I want to change the impression of Airmen to a gritty, tough warrior versus the 'chair force.'"

— Air Force Chief of Staff Gen. Kenneth Wilsbach, interview with Air & Space Forces Magazine.

Criterion

"Every day, our Nation depends on the United States Air Force to deter aggression and, if called upon, to fight and win. Meeting that responsibility starts long before we launch aircraft or execute missions. It begins with the high standards we uphold. ... Standards are the foundation of discipline and readiness. Consistently holding ourselves accountable builds trust within our formations, reinforces confidence in our teammates, and ensures we are prepared to answer our Nation's call."

—Air Force Chief of Staff Gen. Kenneth Wilsbach in a July 13 letter to the force on standards.

Trust the Process

Staff Sgt. Wren Fiontar

"With partisan politics creating divisions between a multitude of stakeholders, I remind myself that military institutions in our democracies, particularly military leadership, serves as the ballast in the ship. While it may feel like the ballast slows progress as the ship of state attempts to quickly move towards its goals, the ballast creates stability when the inevitable storms arise. We as military leaders in our democracies must remember our roles, think long term, offer our military experience to decision-makers, and do what we can to provide a stability and be a calming presence."

—Gen. B. Chance Saltzman at the Global Air and Space Chiefs Conference in London on July 15.

Eight is Enough

Staff Sgt. Sarah Williams

"If you want to become a cyber defender, it's going to take me a little time to be able to train you and give you the experience. I can't do it in four years—maybe not even six—but in eight, I can give you training, experience, exercises and get you to become a non-commissioned officer where I need you."

—Chief Master Sergeant of the Space Force John Bentivegna announcing the Space Forces Initial Enlisted Bonus Pilot Program offering $25k for an eight-year commitment [July 13, Air Force Times].

MODEL BEHAVIOR

"China really has a very good chance to turn Russia into a kind of giant Laos, giant Pakistan. A country much more dependent on China, much more connected to China, much more looking up to China as a model and as a source of modernity."

—Alexander Gabuev, director of the Carnegie Russia Eurasia Center, to the Wall Street Journal, July 15.

WORLD

BOMBERS

B-52 Crew Lost in Deadly Crash

Mourners gathered for a tribute to the eight crew members killed in the June 29 crash of a B-52 during a routine testing mission for the plane's new radar.

Blaine Torres/USAF

By Stephen Losey

The B-52H Stratofortress that crashed at Edwards Air Force Base, Calif., on June 15 was testing a new radar planned as part of a major renovation of the six-decade old bomber. The cause of the crash remains under investigation.

Col. Thomas Tauer, commander of the 412th Test Wing, recalled the lost Airmen and civilians as "dedicated professionals, beloved family members and irreplaceable teammates."

Killed were:

Col. Gregory Watson, 53, a weapon systems officer. Watson was one of two Boeing contractors aboard the bomber and usually worked in Shreveport, La., where Barksdale Air Force Base and its B-52s are located. He was also an Air Force reservist who was assigned to the 10th Air Force at Naval Air Station Joint Reserve Base Fort Worth in Texas.

■ Lt. Col. Gabriel Estrella, 40, a weapon systems officer. Estrella was assigned to the Air Force Operational Test and Evaluation Center, Detachment 5, at Edwards.

■ Retired Lt. Col. Miles Middleton, 50, a pilot. Middleton was the other Boeing contractor aboard, who worked in Tehachapi, Calif.

■ Maj. Alexander Davis, 34, a weapon systems officer at the 419th Flight Test Squadron at Lancaster, Calif., near Edwards.

■ Maj. Robert Dee, 40, a pilot assigned to the 419th.

■ Maj. Brad Hovey, 35, another pilot assigned to the 419th.

■ Jeromy Smith, 32, a flight test engineer at the 419th in Rosamond, Calif..

■ Christopher Rischar, 41, a flight test engineer and contractor with JT4 in Lancaster. JT4 provides engineering and technical support to Air Force, Space Force, and Navy test ranges.

"These Airmen were more than coworkers," Tauer said. "They were friends, mentors, teammates, and valued members of our Edwards and Air Force family."

The B-52 crashed immediately after takeoff at around 11:20 a.m. local time and burst into flames that consumed virtually the entire aircraft. Edwards officials said the same day it was clear that the crash was not survivable.

The bomber was meant to fly a test sortie supporting an effort to upgrade the B-52 Radar Modernization Program, which aims to replace the mechanical AN/APQ-166 radar with an active electronically scanned array AN/APQ-188.

Combined with other upgrades, including replacing the legacy engines with new Rolls-Royce powerplants, modern avionics including an all-digital cockpit, new weapons, enhanced communications, and more. The planned updates will ultimately deliver a future configuration designated the B-52J.

The radar upgrade has been challenged by technical integration issues, rising costs and delays, triggering congressional

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notice and delaying projected initial operational capability by three years.

The crash leaves the Air Force with 75 B-52s in its fleet; it is unclear if another plane will be restored from inactive storage. Originally projected to fly for 20 years, the B-52 fleet is now on track to fly up to 100 years. The bombtrucks can haul as much as 70,000 pounds and remain the workhorse of the bomber fleet, with critical roles in the Gulf War, the wars in Iraq, Afghanistan, and against the Islamic State in Syria, and most recently in Operation Epic Fury against Iran.

The Commercial Engine Replacement Program, or CERP, is the biggest component of the modernization effort, and will replace the bombers' original Pratt & Whitney TF33 engines with Rolls-Royce's new F130s.

So far, no new F130s have been mounted on B-52s, and the biggest work on the engine replacements is still to come.

The Air Force announced in May that the CERP program had passed its critical design review, which finalized the program's design. Next, Boeing will modify the first two B-52s with new engines and other upgrades at its San Antonio facility, with the first arriving there later in 2026. Once upgrades on those two B-52s are done, the plan is to fly them to Edwards for extensive testing.

The crash at Edwards was the first loss of a B-52 since May 2016, when a B-52 skidded off the runway during an aborted takeoff at Andersen Air Force Base, Guam, following a suspected bird strike. In that incident, the crew safely evacuated, but the bomber caught fire and was a total loss.

Another B-52 crashed into the ocean northwest of Guam in 2008, killing all six crew members. The subsequent investigation concluded that the B-52's rear stabilizers malfunctioned.

Air Force Plans to Convert WSOs into Pilots

As 2027 Bed Down Approaches, Operational Testing Begins.

The B-21 Raider bomber, shown during flight testing at Edwards Air Force Base, Calif., is a cornerstone of Air Force modernization plans.

USAF

By Stephen Losey

The Air Force's next bomber will begin to form its first operational unit in early 2027, and as the force begins to ramp up its operational plans, it's expanding the pool of potential B-21 Raider pilots to include converting some Weapons Systems Officers (WSOs) and Combat Systems Officer (CSOs) into pilots.

Anticipating a need dozens of pilots to begin with—and hundreds over time—to man the B-21's two-pilot crew, officials said in July they are establishing a transition program to train WSOs and CSOs to fill some of those jobs.

The next-generation B-21, built by Northrop Grumman, will enter service in 2027. The stealthy bomber features a flying wing design similar to the B-2 Spirit, and will be capable of carrying both conventional and nuclear weapons. Plans call for a fleet of at least 100 B-21s, though Pentagon leaders increasingly suggest more are needed. Some have called for 145 or more.

The first B-21 Raider bomber will bed down slightly ahead of the original schedule at Ellsworth Air Force Base, S.D., and the first plane to arrive there is already flying test missions, said Air Force Secretary Troy Meink in an interview with Air & Space Forces Magazine.

"The test aircraft will be going there," Meink said referring to the B-21s now in flight testing at Edwards Air Force Base, Calif.

"We're going to actually turn the test aircraft into operational aircraft at some point in time. They'll be going there and starting to really do the things you need to do to prepare the base to get the long-term operational aircraft there."

An Air Force spokesperson declined to say whether both test B-21s at Edwards will move to Ellsworth, or exactly when in 2027 the first plane will arrive. Flight testing typically continues even after planes arrive at operating bases.

The Air Force studied options to man the B-21 with a pilot and a weapons system officer, splitting the roles, but critics said that would present challenges on long missions. Defense Daily and Aviation Week both reported last fall that Gen. Thomas A. Bussiere, then head of Air Force Global Strike Command, had recommended that configuration.

Recent missions like those supporting Operation Epic Fury and Operation Midnight Hammer, in which B-1B Lancer and B-2A Spirit bombers flew round-trip missions from the central United States to Iran and backs highlight the long hauls USAF bomber crews often undergo. The Midnight Hammer mission took 37 hours round trip. Both the B-1 and B-2 bombers operate with two pilots, who can rotate for rest breaks during long missions.

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The Air Force has not specified how many B-21 pilots it needs. As of the start of fiscal 2026, there were 497 bomber pilots with the 11B Air Force Specialty Code, and 141 bombers of all types, for a ratio of 3.5 pilots per bomber. That suggests a need for at least 350 bombers by the late 2030s

Earlier plans to retire the B-1 and B-2 sooner would likely have meant some of those slots could be filled by pilots trained for the older bombers, but with both now slated to remain for the next decade or so, tapping experienced WSOs and CSOs is seen as an effective way to build a pilot force quickly—and to retain talent that might otherwise leave the service as F-15Es and other jets are retired.

"To maximize the lethality and survivability of the Raider, it is imperative to retain the deep tactical and combat experience currently residing within the WSO and CSO communities," the Air Force said. "This deliberate talent management strategy secures the future of global strike capabilities, ensuring the Air Force remains postured to execute extended duration, long-range strike missions in highly contested environments."

WSOs will be drawn from the B-1, B-52, and F-15E communities, where they operate the planes' weapon systems and assist pilots with situational awareness and defensive operations. The Air Force plans to retire its B-1s by the late 2030s and has sought to retire more than half the F-15E fleet, although Congress has blocked that so far. The F-15EX will ultimately supplant the F-15E, and it also has a two-seat cockpit. But as designed, that plane can be operated by a pilot alone, and that remains the Air Force's plan so far.

CSOs also operate planes' weapon systems, but they can serve as mission commanders for electronic warfare and navigation systems.

The B-21's range and next-generation stealth capabilities are intended to make the penetrating strike jet capable of slipping undetected into enemy territory and then operating deep inside rivals' airspace. Northrop executives tout the bomber's data-sharing capabilities and its digital open-systems architecture as key features of its "sixth-generation" description.

The first operational pilot flew the Raider in June, marking a key milestone in its development and demonstrating the program's focus on moving quickly, a senior testing official said.

"We put an operational test member in the pilot seat with an Air Force Test Pilot School graduate in the other," said Col. Matt Guasco, commander of Air Force Operational Test and Evaluation Center's Detachment 5 at Edwards, in an Air Force release. "In the history of modern test, we've never done that so early in a program."

Flying with both an operational tester and a developmental test pilot at once blurs the line between the two phases of testing. Developmental testing ensures flight safety and that the jet meets technical specifications, while operational testing focuses on combat mission effectiveness. The Air Force said the combined testing environment "eliminates the gap between ensuring a jet simply works and ensuring it is ready for combat."

Gen. Dale White, who oversees the bomber program, said combining the tests for the B-21 "exemplifies the acquisition culture we're instilling throughout the force."

"It's a smarter and faster mindset that leverages modern production and test tools with the proper sense of urgency," White said. That urgency "challenges old processes and moves us to a more agile acquisition system. ... In the case of the Raider, it means we're now that much closer to placing asymmetric lethality into the hands of the warfighter."

The Raider Combined Test Force, comprised of Airmen and civilians from the 412th Test Wing's 420th Flight Test Squadron are leading the testing. AFOTEC Det. 5, and the 53rd Wing's 31st Test and Evaluation Squadron are also involved, along with representatives of prime contractor Northrop Grumman.

"Bringing operational testers onto the team at this early point now means we can evaluate the bomber's true combat utility, not just its flying characteristics," said Lt. Col. Matthew Gray, squadron commander of the 420th and director of the Raider Combined Test Force.

White held an all-call meeting with the test force team June 8, in which he stressed the importance of making sure the B-21 program has the correct resources and is not hampered by bureaucratic holdups. The program must move with "urgency," he said, without being "reckless."

SPACE

Space Force Names 9 New Acquisition Execs

By Courtney Albon

The Space Force has finalized a major reorganization of its acquisition structure, creating nine mission area-focused portfolio acquisition executives (PAEs) with broad authority over the service's development and procurement programs.

The service announced its first two PAEs in January, followed by four more in March. It finalized the remaining three in a June 22 memo signed by Acting Assistant Secretary for Space Acquisition and Integration Thomas Ainsworth. The complete list, as follows:

- Space Access, which covers launch delivery and range operations and sustainment, led by acting PAE Col. Eric Zarybnisky.
- Space-Based Sensing and Targeting, which covers battlespace awareness and environmental monitory, led by acting PAE Col. Ryan Frazier.
- Missile Warning and Tracking, which covers missile warning, tracking, and defense architecture, led by PAE Gurpartap Sandhoo.
- Infrastructure, which covers data and personnel management, and test and training, is led by Col. Corey Klopstein.
- Battle Management Command, Control, Communications, and Intelligence, which includes Space C2, data, networks, and intelligence capabilities, led by PAE Shannon Pallone.
- Satellite Communications and Positioning, Navigation, and Timing, which includes SATCOM and PNT programs, led by acting PAE Erin Carper.
- Advanced Capabilities, presumably a largely classified portfolio that includes systems to "enable joint warfighting operations," led by PAE Maj. Gen. Stephen Purdy.
- Electromagnetic Warfare and Cyber, covers systems that operate on the electromagnetic spectrum or in the cyber domain, led by acting PAE William Blauser.
- Space Combat Power, also a largely classified portfolio focused on "space warfighting" systems, led by acting PAE Col. Bryon McClain.

"These mission-focused PAE structures can and will cross

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Maj. Gen. Stephen Purdy, center, leads the Advanced Capabilities portfolio, one of nine new portfolio acquisition executive positions established by the Space Force.

Matthew Clouse

all domains," Ainsworth said in the memo. "Underpinning this construct, integration support to all PAEs remains essential to achieving success in delivering space capability consistently to the joint force for space warfighting."

SpaceNews was the first to report on the final PAE structure.

The transition to this new organizational structure is part of the service's plan to implement Defense Secretary Pete Hegseth's sweeping acquisition reform agenda and transform the way the Pentagon buys, builds, and fields weapons and platforms. Part of that transformation is a push to reduce decision-making echelons and delegate more authority to acquisition experts.

Space Force PAEs will report directly to the service acquisition executive, and the intent is to empower them to make requirements decisions and shift resources between programs as technology changes and threats evolve. Congress has yet to formally give PAEs the full slate of authorities the Pentagon's strategy envisions, but Ainsworth noted that the executives in charge of each portfolio have the ability to "pursue their assigned missions, build their organization, and drive accountability for results with the requisite authorities to capitalize on innovative technology and deliver capabilities."

In a recent interview with Air & Space Force's Magazine, Air Force Secretary Troy Meink said he's already seeing positive results from the acquisition reform efforts.

"We've delegated probably 90 to 92 percent of contracting authorities down into what we call these portfolio acquisition executives, so that they can make the decisions there, not only for contracting decisions, but for hiring decisions," Meink said. "Even though this acquisition transformation and this focus has only been a year or so in, we're already seeing the benefits and we're seeing really good performance across the board."

From Orders to Launch in Less Than 17 Hours

By Courtney Albon

The Space Force started its second live Tactically Responsive (TacRS) Space mission June 19, working with a contractor to launch a satellite to low-Earth orbit in less than 17 hours. That spacecraft is now conducting a series of maneuver demonstrations with another vehicle.

The mission, dubbed Victus Haze, launched from Rocket Lab's private spaceport on the Mahia Peninsula in New Zealand. In a release, Rocket Lab said its Electron rocket lifted off with its Puma satellite to low-Earth orbit early June 19, just 16 hours and 42 minutes after receiving launch orders from the Space Force—shattering USSF's previous record of 27 hours.

Puma, which uses Rocket Lab's highly maneuverable Pioneer platform, then began a multiphased rendezvous operation with a second satellite already on orbit—True Anomaly's Jackal, which launched in early May on a SpaceX Falcon 9.

"With launch complete, the team will now complete on-orbit checkout and vehicle commissioning, after which RPO operations begin (Rendezvous, Proximity Operations)," Space Systems Command said in a June 22 statement. "During these operations, the teams operating both the Rocket Lab and the True Anomaly space vehicles will conduct a variety of scenarios, demonstrating space domain awareness and characterization capabilities, each in dynamic engagements with the other."

Although the Space Force confirmed the mission days after it lifted off, the service's own space object database reported the satellite's arrival in orbit as soon as June 20, according to Jonathan McDowell, as an astrophysicist who closely tracks on-orbit activity. McDowell reported that Rocket Lab's satellite appeared to pass within about 100 kilometers of the Jackal satellite on the evening of June 19.

Space Force

A Rocket Lab Electron Rocket took off from New Zealand June 19 in support of the Space Force's Victus Haze mission.

In the days after the launch, both Rocket Lab and True Anomaly said their space domain awareness and maneuver operations

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are progressing faster than expected.

According to Rocket Lab, within 37 hours and 36 minutes of launch, Puma was fully activated and ready for its first orbital maneuver around Jackal. That timeline, the company said, was 34 hours ahead of the mission's target of 72 hours.

Meanwhile, True Anomaly announced July 1 that Jackal completed its first operational Victus Haze sortie. The company also had a 72-hour deadline, which it met in 61 hours. According to the company, the mission included multiple circumnavigations of Puma, which was acting as a "noncooperative target spacecraft." Jackal provided "multiaspect imaging and characterizations" to the Space Force and True Anomaly's Mosaic software platform planned the sortie, commanded the satellite's maneuvers, and processed the imagery.

"Jackal performed exactly as designed, demonstrating precise propulsion burns and nominal ingress, successful closed-loop tracking, precision pointing, imaging and characterization of the target before egressing to its base orbit," True Anomaly said in a statement. "From a new target's launch to finished imagery, the mission clock ran in hours, not months."

The company also said Jackal demonstrated precise propulsion burns and target characterization before returning to its "base" orbit.

The Space Force hasn't said how long Victus Haze will last. The service said it plans to use the satellites for live RPO training and that the successful mission could open the door to rapid satellite production contracts for both companies, but it hasn't discussed those plans in detail.

Lt. Col. Lincoln Miller, system program manager for Space Safari, said the success of Victus Haze could lead to "rapid production and fielding of follow-on vehicles" from both companies. In the near-term, though, Space Force operators will have a chance to use the satellites for live training.

"Not only does this mission open the door for acquisition of follow-on vehicles that allow our warfighters to close critical gaps and seams in a conflict scenario, it also presents a more immediate value by giving our current operators a crucial opportunity to exercise and improve LEO RPO tactics, techniques, and procedures," Lt. Col. Lincoln Miller, system program manager for Sapce Safari, said in the statement.

SpaceWERX and the Defense Innovation Unit awarded contracts in 2024 to True Anomaly and Rocket Lab to develop satellites for the mission. True Anomaly initially contracted with Firefly Aerospace to launch Jackal on its Alpha vehicle. The mission was scheduled for 2025 but was delayed after Firefly's Alpha rocket experienced multiple anomalies last year. Although Alpha returned to flight in March, True Anomaly opted to launch Jackal on a SpaceX rideshare mission.

A Firefly spokesperson told Air & Space Forces Magazine the firm will participate in future TacRS missions with its upgraded Alpha Block II rocket, which incorporates modifications it developed following the mishaps last year. Firefly is already on contract for an effort called Victus Sol, but the spokesperson indicated it will fly Jackal on a separate mission in the future.

"Firefly continues to actively support the U.S. Space Force and, at the direction of Space Safari, is moving to a future Tactically Responsive Space mission that will utilize Firefly's upgraded Alpha Block II launch vehicle and True Anomaly's Jackal platform," the company said. "This new mission will build on the lessons learned from Victus Nox, Victus Diem, and Victus Haze, and help shape the next generation of responsive space missions."

The Space Force set records in 2023 with its first TacRS mission, Victus Nox, demonstrating that it could work with satellite and launch companies to deliver a spacecraft in a matter of months and deploy it to low-Earth orbit just 27 hours after receiving launch orders. Millennium Space Systems built the satellite, and Firefly launched it.

Beyond Victus Nox and Victus Haze, Space Systems Command has scheduled at least three more TacRS missions aimed at further pushing schedule boundaries as well as demonstrating concepts and fielding new capability. Slated to fly this year or next, they include:

- Victus Surgo, a mission cosponsored by the Defense Innovation Unit that will feature a SpaceX Falcon 9 launching a highly maneuverable spacecraft built by Impulse Space;
- Victus Salo, another Falcon 9-supported mission that will carry a payload built by the Massachusetts Institute of Technology ; and
- Victus Sol, launched by Firefly's Alpha, which will carry an operational payload.

The service also conducted a two-part tabletop exercise and field excursion called Victus Diem between summer 2025 and early 2026. The effort was designed to help solidify its responsive launch processes, like rapid payload processing.

SDA Cancels Planned Communications Satellites

By Courtney Albon

The Space Development Agency (SDA) last year quietly canceled plans to launch 11 satellites meant to conduct communications experiments in low-Earth orbit, Air & Space Forces Magazine has learned.

The agency made the decision to "descope" the Tranche 1 Demonstration and Experimentation System late last year, according to an SDA official, as a deliberate move to focus on operationalizing its first satellites.

The Tranche 1 Demonstration and Experimentation System, known as T1DES, was initially envisioned as a 12-satellite experiment to reduce risk for future SDA missions by demonstrating that capabilities previously performed in geosynchronous or other orbits could be conducted in low-Earth orbit. In 2022, the agency awarded York Space Systems a contract worth up to $200 million for the effort and planned to launch the satellites this year.

In 2024, SDA asked York to accelerate the delivery of one of those satellites and prepare it to launch about six months ahead of schedule, in June 2025. The company met the challenge and the mission—dubbed Dragoon—met all of its objectives.

While the plan had been to launch the remaining 11 T1DES satellites this year, the agency opted to cut the program short and instead apply lessons learned from that single satellite to future missions. While cost was a factor in that decision, the official said Dragoon's success and the need to focus on SDA's operational objectives were the primary drivers for scaling back the demonstration effort.

"We were able to achieve sufficient risk reduction for Tranche 2 with Dragoon, and we wanted to ensure all vendor efforts and components were tightly focused on delivering viable mission capabilities to the warfighter," according to the SDA official.

The formal process to cancel T1DES began in December, and the official said the agency is negotiating the final details of the "award descope." A York spokesperson said the contract is being

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modified so that the remaining satellites "can be made available to York for the rapid deployment of future missions."

SDA was created in 2019 to develop a constellation of small satellites in low-Earth orbit—the Pentagon's first major attempt to shift toward a more proliferated architecture. The agency's focus has been on fielding data transport and missile warning and tracking satellites, with a strategy that emphasizes regular technology refreshes and competition. In 2023, it launched its first batch of satellites, Tranche 0, and it is now in the midst of putting its first operational spacecraft on orbit.

But the agency and its vendor base have faced challenges bringing those first Tranche 1 satellites online. After completing two launches last fall of what was supposed to be a steady 10-month campaign to field 152 satellites, the agency pressed pause on its launches. While that was partially driven by launch schedule issues outside of SDA's control, Director Gurpartap Sandhoo has also attributed the slow-down to scaling challenges.

Northrop Grumman

With its future as a stand-alone agency in question, the Space Development Agency has slowed some future plans.

"I think the biggest thing we have learned in this whole journey of a proliferated architecture is all the choke points that we have in the way we used to buy things when you had onesie, twosies versus at scale," he told Air & Space Forces Magazine in February. "You don't realize the weak points until you actually do it."

But perhaps looming larger than those growing pains are questions about SDA's future. The House and Senate Armed Services Committees have passed draft fiscal 2027 policy legislation that, if approved in the final National Defense Authorization Act, would give the Space Force the greenlight to dissolve the agency amid a broader acquisition shakeup. Officials, including Air Force Secretary Troy Meink and acting Space Force acquisition executive Thomas Ainsworth, have said they want to move away from rapid acquisition offices separate from the main enterprise and instead incorporate SDA's speed across all acquisition. Sandhoo was recently named as the head of the service's missile warning and tracking portfolio, which will likely absorb the agency's missile tracking mission. And the Space Force has said it doesn't plan to fund additional SDA transport satellites beyond Tranche 2.

That plan is not yet finalized, and in the meantime, SDA continues to focus on bringing its first satellites into operations and launching the remaining Tranche 1 and Tranche 2 satellites. Dragoon will inform that work, the SDA official said, providing "actionable and meaningful risk reduction for Tranche 2."

York—a key SDA vendor contracted to build 136 satellites over three phases of SDA's data transport layer—announced June 24 the demonstration successfully proved that its satellite in LEO could send and receive tactical data via Ultra High Frequency, a mission traditionally performed from GEO. Dragoon conducted five demonstrations over a three-month period and will remain available for additional testing over the next few months, according to both SDA and York.

"Two-way connectivity between a satellite and ground forces is operationally essential, and we've now demonstrated it on orbit," York's General Manager and Executive Vice President Melanie Preisser said in a press release. "That opens doors to mission sets that matter deeply to national defense."

China Going 'Breathtakingly Fast' with Space Weapons

By Todd South

"What they are doing with what I'll call counter-space and space superiority capabilities is breathtakingly fast," said Lt. Gen. Douglas A. Schiess during his July 16 confirmation hearing.

Asked by Sen. Roger Wicker (R-Miss.) what space threats China poses to the United States, Schiess rattled off a list of developments: anti-satellite tests from the ground, space capabilities that hold U.S. satellites at risk, and "very worrisome" new electromagnetic jamming capabilities now under development.

China is also using intelligence, surveillance, and reconnaissance satellites to target "our forces much farther than they ever have," Schiess sad. "They built a kill chain to be able to see our carrier strike groups, our bombers, at a much farther pace, speed, and distances, and they've also developed missiles and weapons systems to go after that. So the Space Force needs to be able to bring capability to deny [and] degrade that kill web to be able to protect the joint force."

GOLDEN DOME

Facing skeptical questions from Sen. Richard Blumenthal (D-Conn.) regarding the Pentagon's ambitious Golden Dome missile defense shield, Schiess defended the program.

"Is there a way to do the Golden Dome at a scaled-down version?" Blumenthal asked, referring to a program estimated to cost some $185 billion.

"What I would say is a lot of the things that we are doing in Golden Dome also provide us capabilities for space superiority, whether that's tracking, communications, data, those kinds of things," Schiess said. "So I do believe that we will continue to get good things from Golden Dome."

If confirmed, Schiess will become the Chief of Space Operations, following Gen. B. Chance Saltzman, who is to retire this summer, and the first Chief of Space Operations, Gen. John W. "Jay" Raymond, who led the force from it's launch in 2019 until fall 2022.

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Jud McCrehin/staff

Deputy Chief of Space Operations for Operations Lt. Gen. Douglas Schiess is set to become the third Chief of Space Operations later this summer.

Schiess is currently deputy CSO for operations at the Pentagon, and formerly led Space Forces-Space, the Space Force component to U.S. Space Command.

Commissioned as an Air Force second lieutenant in 1992 through Air Force ROTC at the University of California-Los Angeles, Schiess transferred into the Space Force in 2020.

The Space Force lost an estimated 780 civilian employees last year and is now trying to reverse some of those losses. "That was a significant cut to us, but we are working to bring those back," Schiess told lawmakers. "As a matter of fact, Space Systems Command is trying to hire 100 civilians a month."

"And are you able to find those hundreds?" asked Sen. Angus King (I-Maine).

"We are able to do that," Schiess said. "Some of those are in different locations, but the Space Force doesn't have a problem with people wanting to join. It's just finding the right spot for them."

If confirmed, Schiess faces the challenging task of continuing to grow the new force as it battles for budget dollars alongside its much larger, more well-established sister services.

Retired USSF Col. Charles Galbreath, director for Space Studies at the Mitchell Institute's Spacepower Advantage Center of Excellence, noted that the goal of doubling the service's size is "not a trivial matter."

In commentary for Breaking Defense, Galbreath recommended that Schiess consider restoring members separated for nondisciplinary reasons, interservice transfers, integrating the Guard and Reserve forces, and direct appointments to meet the doubling goal.

Only a handful of senators attended the confirmation hearing, which lasted a brief 40 minutes.

"General, I think you should take heart from the fact that not all of our members are here today; that's a compliment to you," King said. "The fact that we didn't have a large turnout is an indication, I believe, of the committee's confidence in you."

AIR BASE DEFENSE

ACC Battle Lab Seeks Counter-Drone Weapons

By Matthew Cox

The Air Force Point Defense Battle Lab is searching for more defense firms to demonstrate counter-drone capabilities at upcoming exercises designed to test base defenses against unmanned aerial attack.

For the second time this year, the Air Force is seeking input. The earlier requests for information (RFI) came out of the 319th Reconnaissance Wing at Grand Forks Air Force Base, N.D., in March. The wing is Air Combat Command's designated Point Defense Battle Lab, tasked with developing the tactics, techniques, and procedures (TTPs) Airmen will need to protect domestic Air Force and Space Force installations.

USAF

An Airman from the 319th Reconnaissance Wing at Grand Forks Air Force Base, N.D. pilots a drone during a recent Point Defense Battle Lab exercise to evaluate commercial counter-drone technologies.

The battle lab has held about a half dozen exercises this year, with two unidentified companies demonstrating counter-drone systems that detect, identify, track, and destroy unmanned aerial threats. One of the firms provided its counter-small unmanned aerial systems, or C-sUAS, technologies for four of the exercises. The Air Force Research Lab and Air Force Life Cycle Management Center have also each sent a system for evaluation, Senior Master Sgt. BreeAnn Sachs, a spokesperson for the 319th, told Air & Space Forces Magazine.

The battle lab reposted its two RFIs on Sam.gov recently, seeking additional participants for upcoming exercises in August and December, Sachs said.

One RFI seeks systems to detect, identify, and track drones. The other RFI focuses on kinetic counter-drone weapons, ranging from rockets to drone-on-drone interceptors, high-energy lasers, and high-powered microwave systems.

Exercises to date featured Airmen operating as "Red-Air" attackers, piloting small Group 1 and 2 drones on a test range against competing C-sUAS systems.

"The team is gaining a lot of really valuable data," said Sachs.

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"They have a whole data analysis team that's developing the tactics, techniques, and procedures—like what do Airmen do if they see a drone, what does that process look like?

The resulting TTPs will be compiled into a report that includes evaluations of how commercial technology performed during the exercises, Sachs said. The report is to be presented to ACC Commander Gen. Adrian L. Spain by the end of the calendar year.

Security forces specialists are the likeliest to operate counter-drone systems at Air Force and Space Force installations in the U.S. But Air Force leaders announced recently that a new enlisted job specialty for air base air defense is needed. Also, new "Point Defense Flights" at specific Air Force installations are being stood up to train for air defense responsibilities. These latest moves come as the U.S. military races to cope with the proliferation of low-cost quadcopter and jet-powered drones like Iran's Shahed that have increased the threat of attacks on air bases and other military installations.

Both of the RFIs are looking for rapidly deployable systems that can be set up by small teams of up to four Airmen within two hours to counter Groups 1-3 drone. Each system should be capable of operating in extreme temperatures and in winds up to 30 miles per hour.

Vendors have until July 31 to respond to either solicitation, and Sachs said additional opportunities will likely follow for companies whose solutions don't match current criteria. Innovations are welcome, he said.

"We have a dozen different forms for different kinds of technology that vendors can fill out," Sachs said. "If a vendor doesn't perfectly fit either one of those, we do have a way for them to apply. And then if we have an exercise come up that's more specialized than those two RFIs, we have their information."

USAF Explores New Job Specialty for Counter-Air Defense

By Matthew Cox

The Air Force is developing a new enlisted job specialty to defend bases against missile and drone attacks. Alarming damage to air bases across the Middle East during Operation Epic Fury focused leaders' attention on the requirement.

Air Force leaders convened for the semi-annual "Corona" meeting at Wright-Patterson Air Force Base, Ohio, in June were briefed on "the evolving threat" and the need for a "dedicated new Air Force Specialty Code" to ensure personnel are trained and equipped to defend bases from aerial attack, according to a June 26 release.

Air Force leaders will also establish new "Point Defense Flights" at "select Air Force installations" to train for air defense responsibilities, the release said. The units will draw from multiple career fields.

Airman 1st Class Albert Morel

U.S. Air Force 52nd Security Forces Squadron Defenders conduct a security patrol at the 86th Air Base, Romania, in support of NATO's enhanced Air Policing (eAP) capabilities.

The increasing availability of low-cost quadcopter and jet-powered drones like Iran's Shahed have increased the threat of attacks on air bases and other military installations, not only those forward based but those closer to home, as well. The Air Force came under congressional scrutiny after unidentified drones hovered unchecked over Langley Air Force Base, Va., in December 2023, and more drone incursions followed at bases in Ohio, Utah, and the United Kingdom.

Ukraine's 2025 "Operation Spiderweb" impressed, but also concerned U.S. commanders, who watched with surprise as video surfaced of remotely piloted drones crashing into and disabling Russian bombers parked on base runways. Pentagon officials launched a review of U.S. military base defense systems and former commanders called for developing robust new defenses for a critical mission too long ignored.

New Pentagon initiatives, such as the Replicator 2 counter-drone initiative and the Joint Interagency Task Force 401, established to quickly develop counter-drone technologies for all the military services, are part of the solution. But new systems and weapons require new specialists to operate them and doctrine and standards for employing them. Today, responsibility for protecting bases is left to local commanders to figure out for themselves.

The Air Force's Point Defense Battle Lab stood up last October to develop tactics, techniques, and procedures for Airmen defending domestic bases with commercial counter-drone technologies. Domestic bases and others in built-up civilian areas overseas are more limited in how they can react due to concerns about collateral damage to those living just beyond base boundaries.

In other overseas areas, such as air bases spread across the Middle East, most bases are in remote locations, though some, such as the Navy's 5th Fleet headquarters in Manama, Bahrain, border on built-up urban complexes.

Iranian forces' numerous drone and missile attacks during Operation Epic Fury killed an American Soldier at Prince Sultan Air Base, Saudi Arabia, and destroyed an E-3 Sentry Airborne Warning and Control aircraft, one of several aircraft damaged on the ground during the war. U.S. Central Command's forward Combined Air Operations Center at Al Udeid Air Base, in Qatar, was severely damaged, Air & Space Forces Magazine has reported, and the Wall Street Journal reported severe damage to the Navy's 5th Fleet Headquarters in Bahrain.

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Air base defense in the Pacific, where bases in Japan are well within reach of China's long-range weapons, continues to vex Air Force planners. The military's primary missile interceptor systems, such as Patriot, belong to the Army, and while the Army ostensibly is responsible for protecting Air Force bases from attack, there aren't enough systems to go around. The Air Force's fiscal 2027 budget request seeks about $1.4 billion for a missile defense variant of the Air Base Air Defense Systems (ABADS), but it will take time for such a system to become operational.

"Nuclear deterrence and cyber are some of the biggest threats that we face, but defending our air bases, not only overseas but in the homeland, has become an increasingly high priority," said Air Force Secretary Troy E. Meink, in May 20 congressional testimony. "I think we agree 100 percent that Airmen and Guardians have a responsibility to defend our air bases and defend our forces, regardless of where they are. We are focusing on electronic warfare to directed energy to kinetic capabilities to defend our Airmen and Guardians."

How soon the Air Force will roll out the new air base defense specialty code is unclear. Creating a new AFSC requires a training curriculum and career field management plan, and will take time to develop. Requests for more information were not answered in time for this article. Some Security Forces personnel at high-security installations, such as nuclear bases and airfields, already train to counter drone threats. It is not clear how the new role will fit into Security Forces operations.

CONGRESS

Department of War? Closer to Official Name Change

By Greg Hadley

Three of four congressional committees with influence over defense policy have voted to change the official name of the Department of Defense to the Department of War—but final approval of the Pentagon rebrand is months away and not yet assured.

The House Appropriations Committee voted on party lines to amend its version of the 2027 federal spending bill to remove all references to the Department of Defense, the Office of the Secretary of Defense, and other DOD-related entities in U.S. law. The House and Senate Armed Services Committees had previously approved similar measures.

The Pentagon began using the "Department of War" last September, after President Donald Trump issued an executive order allowing it as an authorized alternative name. The order also authorized "Secretary of War" as an acceptable secondary title. But the official name remained the Department of Defense in U.S. law, and only Congress can change that.

Congressional committees have continued to use the official name, as have most news organizations, including Air & Space Forces Magazine.

Petty Officer 2nd Class Aiko Bongolan

The Pentagon signs went up with "Office of the Secretary of War" in September 2025. But without legislation, the "Department of War" is only a nickname.

The Pentagon submitted a legislative proposal asking Congress to change the name in April, calculating that it would require changing nearly 7,600 references in U.S. law.

While some signage at the Pentagon and on department websites has already changed, the cost of updating buildings and signage on bases around the world remains unclear—but work is underway already. The department projects it will spend $51.5 million on the name change by the end of the current fiscal year, noting that "actual costs are being collected during implementation and will be available after FY26 execution is completed." The Pentagon said the changes are being made in "the most cost-effective and noninvasive ways," and that further costs are not anticipated in fiscal 2027.

The Congressional Budget Office (CBO) offered a wide cost range in a January estimate, between $10 million and $125 million. That $125 million figure has been cited widely by critics, and the CBO cautioned that its estimate was not for a formal, statutory name change, which it noted would require "updating regulations, directives, doctrine, websites and digital assets, contract templates, and signage."

"If phased in gradually and limited to OSD, incremental costs could be similar to the range of costs for an unofficial name change," the CBO report said. "If, however, implementing agencies chose to mandate an immediate change across all materials, costs could reach hundreds of millions of dollars."

Proponents of the name change argue it better reflects the mission of the department, to fight the nation's wars, and helps instill the "warrior ethos" championed by Secretary Pete Hegseth. He notes that for much of the history of the nation, the Army was part of the War Department. Critics counter that the change is costly and unnecessary, does not reflect the full scope of the department's role, and rhetorically deemphasizes the importance of deterring conflict.

The odds of the change being approved are rising. Republicans still control both houses of Congress and with language in both appropriations and authorization bills, there are two chances to get the change across the finish line. Although neither measure is likely to pass before the end of the fiscal year—since 2019, neither measure has made it to the President's desk before December—history shows that the annual National Defense Authorization bill is the more likely to be completed before this Congress ends.

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BUDGET

House Unveils $60B Reconciliation Bill

By Greg Hadley

House lawmakers unveiled a new funding bill July 15 that provides $60 billion for defense—$290 billion less than what the President's budget requested. The bill leaves President Trump's plans for a $1.5 billion defense budget in doubt for this year.

Dubbed "Reconciliation 3.0," the bill is intended to be pushed through under a process called reconciliation, a maneuver designed to circumvent the Senate's requirement for a supermajority of 60 votes to pass. Under reconciliation, the Senate merely needs a simple majority, so the Republican majority can pass it on a party-line vote.

The bill was the second legislative disappointment for the Pentagon in as many days, coming a day after the Senate failed to advance its version of the National Defense Authorization bill.

Senior Airman Adriana Jordan-Alcaniz

Among programs at risk of cuts under the House reconciliation plan is the F-35. The Air Force had sought 14 of the jets through reconciliation funding.

Republicans on the House Budget Committee released their "concurrent resolution" for a total $95 billion, including the $60 billion for defense. Their resolution directs the House Armed Services Committee to earmark how the $60 billion is to be spent, setting off a scramble as the Trump administration and the committee prioritize spending. The White House had sought $350 billion in the measure, which was to have come on top of a $1.15 trillion budget request to be funded through the normal legislative process.

Separately, the White House has also asked Congress to approve a $67 billion supplemental funding bill to pay for the war with Iran, along with a few additional needs.

The Air Force and Space Force would face acute shortfalls if the reconciliation package remains at its present size. Some 8.3 percent—or $28.2 billion—of the Department of the Air Force's $338.8 billion budget request was supposed to come through reconciliation, covering some of its planned F-35 fighter purchases, along with targeting satellites, and munitions.

Republicans passed their first reconciliation bill a year ago, officially naming it the "One Big Beautiful Bill Act." The measure included $150 billion for defense. They passed a second in June to fund immigration agencies, which is why this latest package has been called "Reconciliation 3.0."

Congress watchers have been skeptical that Reconciliation 3.0 would materialize at the scale the White House wanted. With narrow majorities in the House and Senate, Republicans in Congress can afford almost no defections as they seek to shepherd the bill through. Fiscal hawks oppose reconciliation funding without offsetting spending cuts in other areas, but moderates in competitive states and districts worry such cuts would cost them votes.

Byron Callan, managing partner and defense analyst at Capital Alpha Partners, has said for months that passing the $350 billion reconciliation package the White House wanted is "improbable," given the political calculus.

Republican leaders appear to have settled on a narrower package in hopes they can get it though. House Budget Committee Chair Jodey Arrington (R-Texas), who has coordinated the reconciliation bill with Speaker Mike Johnson (R-La.), said in a statement that his committee will mark up the new package July 16. Johnson applauded the package on social media:

Because the House Armed Services Committee must still formulate spending plans for the $60 billion in the new reconciliation package, exactly what's at stake isn't clear yet. A spokesperson for HASC Republicans and Rogers did not immediately reply to a query.

Meanwhile, Congress has yet to take any action on the Iran war supplemental submitted June 24. If Republican leaders decide they don't want to rely on Democrats' votes for that bill, they could choose to direct the $60 billion toward the needs outlined in that request, which included $21 billion for munitions, $17.3 billion for operational costs, and $12.1 billion for classified programs, plus $4 billion for two Space Force programs—Airborne Moving Target Indication and Space Data Network Backbone.

Doing that, however, would leave other priorities originally targeted for reconciliation funding without earmarks, including:

- $7.8 billion for the Air Moving Target Indicator program
- $4 billion for the Space Data Network
- $2.3 billion for 14 F-35s
- $1 billion for 330 extended range Joint Air-to-Surface Standoff Missiles
- $990 million for Joint Advance Tactical Missiles
- $953 million for up to 618 Advanced Medium Air-to-Air Missiles.

But lawmakers could also try to pass both a war supplemental and the reconciliation bill. In that case, they would have to choose from among the programs originally targeted for reconciliation funding and what can be paid for with just 17 percent of the requested funds. If spending was cut proportionally, the $28.2 billion the White House request had sought for Air Force and Space Force programs would be reduced to just $4.8 billion combined.

Pentagon leaders have largely demurred when asked about how they would manage this problem, although several have acknowledged on background the likelihood that the original ask would be reduced.

That's hardly surprising, Callan said. "I'd be shocked if they were somehow oblivious to this whole set of variables," Callan said. "I'm sure the comptroller's office and the services are kind of playing with" budget numbers. "That's why it's like a poker game. Why would you say, 'Here are my cards now' if it gave Congress an easy out to say, 'OK, we don't have to do reconciliation because they've got this other plan.'"

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THE FUTURE OF NATO

With U.S. pulling back, European partners face an urgent call to fill in the gaps—especially in the air.

Master Sgt. Sarah McClanahan

NATO fighter jets from the Czech Republic, Sweden, and France fly in a square formation over Finland in June during exercise Ramstein Flag, a complex, large-scale, tactical-level exercise.

By Chris Gordon

Brussels; Mons, Belgium; BODØ, Norway; Luleå, Sweden; and Rovaniemi, Finland—This is not your father's NATO anymore. It's changing. The question is whether it will make the alliance stronger or diminish its capabilities.

The North Atlantic Treaty Alliance is undergoing a major transformation, with European members taking more responsibility for their own defense and assuming airpower and other roles that, for decades, the United States had promised to fulfill. Trump administration officials claim the shift is necessary because the U.S. needs to allocate more forces for other commitments around the globe.

U.S. Air Force Gen. Alexus G. Grynkewich, NATO's top military officer, said that the alliance is looking for "pragmatic and realistic outcomes" to fill the gaps as the Pentagon shifts greater focus to deterring China in the Pacific and its operations in the Western Hemisphere.

"We ought to, as a team of friends, hold each other to account," Grynkewich, the Supreme Allied Commander Europe, known as the SACEUR, said in a recent interview at his headquarters near Mons, Belgium. "Are we meeting our Hague Summit commitments [to increase defense spending]? Are we meeting our capability targets? Do we have the right resilience that we're building into our force? How are our plans looking?"

"Achieving air superiority goes beyond just the air component."
—Britain's Air Chief Marshal, Johnny Stringer, NATO Deputy SACEUR

The Trump administration's pointed disputes with long-time European allies has shaken their confidence in America's commitment to the alliance. The disagreements have ranged from fights over military spending, threats about pulling out forces, trade and tariffs, and the war with Iran. Secretary of Defense Pete Hegseth has promised a comprehensive review of U.S. forces in Europe, worrying allies and Congress members in the U.S., who oppose further reductions of U.S. troops in Europe.

Grynkewich, who also leads U.S. European Command, said he and his NATO teammates are making progress. "And there will be some things as we do that—in that honest and open discussion—[partners can] celebrate," he said. "And there'll be other things where we need to hold ourselves to account and get everyone to row a little harder." It will not be easy for the Europeans to fill all the gaps. Former military officers note that the U.S. is the only member of the alliance with long-range bombers and has much greater resources in terms of air mobility, fighters, and aerial refueling.

The Trump administration put the alliance on notice in May that it would scale back the number of

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forces earmarked to help defend the alliance in the event of a crisis. The objective was to ensure sufficient U.S. assets could be allocated to the Pacific and the Western Hemisphere. The U.S. faces regional demands in Europe, the Pacific, and the Middle East, and must be able to defend the U.S. homeland. As available airpower has diminished and demands increase, that's become harder and harder, yet the Russian threat has not decreased.

Details about which responsibilities are shifting to European partners are being spelled out in classified discussions of the NATO Force Model. It specifies the forces and assets nations would provide during the first 10, 30, and 180 days of a conflict or crisis, including the numbers and types of aircraft that could be available to defend Europe in a contingency.

Adding to the challenge, U.S. officials stressed the reductions were immediate, with no transition period for European allies to adjust.

In an effort to fashion a workaround, allied officials say, plans are in the works to deploy more ground-based, long-range missiles and more fighter aircraft to take the place of strategic bombers. Replacing U.S. refueling tankers is trickier, requiring the allies to establish more airfields on the continent with fuel capacity.

To fill the gap, NATO is working to boost both air defense and the number of air-to-surface missiles in European arsenals.

Lt. Gen. Jason Hinds, the head of Allied Air Command and commander of U.S. Air Forces in Europe, explained his approach to helping allies adjust. "I drive them towards two things: The first is the right capacity and the right systems of integrated missile defense," he said. "We always need more defense capacity. I guarantee there's never enough, especially on the interceptor side. But we just can't spend all of our money, especially on the alliance side, on defensive kit alone."

Offensively—to combat an incursion into NATO territory—allies need "significant air-to-surface fires," Hinds said, such as the Joint Strike Missile or JASSM cruise missiles including "surface-to-surface fires that are coordinated by airpower. Maybe it's an F-35 communicating directly with the surface fire element, which we're doing already."

Hinds wants an effects-based approach. "I always ask them, don't look at it just through a defensive side, and not always just through an airpower side," he said. "You're looking for the effect that the nations need."

Some former officials question whether this will be good enough.

"Ground-based fires can act in some situations as a supplement, but they certainly cannot replace in any way, shape, or form the advantages that aircraft bring to a major conflict," said retired Lt. Gen. David A. Deptula, the Dean of AFA's Mitchell Institute for Aerospace Studies.

"The United States Air Force has the only bombers in the free world," he added. "Why does this matter for NATO? It matters for NATO because Russia is the largest geographical country in the region, and bombers provide range and payload that exceeds any other kind of vehicle."

The Trump administration is also reviewing the size and types of American forces deployed in Europe. The Pentagon has already reduced U.S. presence there by two Army brigades, both European and U.S. congressional leaders are complaining.

Rep. Don Bacon, a Nebraska Republican and retired Air Force brigadier general, told Air & Space Forces Magazine that the cuts in ground forces went too far and that the U.S. fighter force in Europe—a relative few F-16, F-15E, and F-35 squadrons at bases in England, Germany, and Italy—was limited compared to the airpower the U.S. deployed on the continent 30 years ago.

"It's a very small fighter presence," said Bacon, who was a wing commander at Ramstein Air Base while still in uniform.

Chris Gordon/staff

Swedish Air Force personnel prepare a Gripen fighter at Luleå Air Base, Sweden, during Ramstein Flag in June.

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"I think we probably cut too much. I surely don't recommend cutting more."

The U.S. was already planning to replace F-15E Strike Eagles with F-35 Lightning II fifth-generation fighters at RAF Lakenheath, U.K., Hinds said, but otherwise the U.S. Air Force is not planning further reductions. "If there are any, it's pre-decisional, but I'm not anticipating any—not at this moment in time," he said.

The need to act quickly to narrow the gaps in capability is clear, given the threat of Russian aggression in the region. While Russia's ground forces have been caught up in a grinding war of attrition in Ukraine, much of its air and missile forces are intact, Grynkewich said.

"I would say those have not been subject to the same level of attrition and attritional warfare that the Ukrainians have imposed on Russian ground forces," Grynkewich said. "So they do still have the platforms and capabilities, whether it's bombers or fighters or ballistic missiles.

"They, of course, are expending some munitions in Ukraine, but the platforms are there, and then their production for replacement ballistic missiles and cruise missiles continues. So, they have considerable firepower and considerable potential."

European officials are saying they are doing what they can to narrow the gaps. Allied officials say that European nations have committed all of their new fighter aircraft to NATO's defense instead of holding some back for their national missions.

Britain's Air Chief Marshal Johnny Stringer, the Deputy SACEUR at NATO Supreme Headquarters Allied Powers Europe, said European air forces should focus on increasing capacity, the ability to support both maritime and air operations, and on improving their ability to suppress enemy air defenses—a capability in which they have made great strides in recent years.

"Building out the capability on mission sets needs to genuinely be multi-domain," he said. "Achieving air superiority goes beyond just the air component, for example."

Britain's recently unveiled Defense Investment Plan includes funds for next-generation collaborative combat aircraft. The U.K. is pursuing its own sixth-generation fighter jets with other partners.

"As we continue to learn and apply the lessons of crewed and uncrewed systems, and you think of low-end capabilities in your force mix," he said. The low end is not simply something cheap. "Low is very often the product of very high conceptual thinking," Stringer continued. "It works because you've really thought about the capability it brings and you've integrated it with your more expensive, your more capable, your longer-range systems."

NEW PARTNERS

NATO officials praise the addition of Sweden and Finland into the alliance. The two asked to join NATO after Russia's invasion of Ukraine. Both nations have long practiced dispersed operations, used hardened facilities, and focused on austere operations. Now the rest of the alliance is learning from their experience—prompting some to see the additions in new light.

"NATO joined Sweden and Finland," quipped Vice Adm. James Morley, the British Deputy Commander of NATO's Joint Force Command Norfolk, which oversees alliance operations in the Arctic, U.K., and Nordic countries. "The combat power that these nations brought into the alliance was significant at the time; it wasn't that it was just an additional liability for NATO."

Europe's airpower was on display in June during Ramstein Flag, a NATO exercise where allied air forces practiced defending Europe's frontiers. Air & Space Forces Magazine observed the exercise, which was planned before the U.S. announced its European cutbacks.

With many U.S. air assets supporting the war and post-war operations in Iran, European air forces fielded most of the 200-plus aircraft that took part in the exercise, with Norway, Sweden, and Finland playing the principal role in the north. Of some 180 fighter aircraft, only 20 were American F-35s—including 12 U.S. Air Force jets and eight from the Marine Corps. The remainder belonged to other NATO members. Many of NATO's European allies are acquiring F-35s, including the United Kingdom, Italy, Norway, the Netherlands, Denmark, Belgium, Poland, Germany, Finland, Canada, the Czech Republic, Romania, and Greece. The scale of that buy across so many forces puts Europe in good position to pick up much

Senior Airman Christopher Campbell

Three Finnish Air Force F/A-18 Hornets, as seen from a U.S. Air Force KC-135 Stratotanker, during exercise Atlantic Trident 25 over Finland, in 2025. The exercise focused on integrating NATO allies in realistic operational scenarios.

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Tech. Sgt. Jessica Avallone

Three Romanian Air Force F-16s at RAF Fairford, U.K., during Ramstein Flag 2025. NATO allies have fighters and transports, but only the U.S. can contribute bombers and large-scale tanker capacity.

of the slack. But replacing other non-fighter American assets, especially air-to-air refueling, is another matter.

That tanker crunch was evident during Ramstein Flag. With much of the U.S. tanker and bomber force supporting operations against Iran, just one Air Force KC-135 tanker took part in the exercise.

European partners' Airbus A330 Multinational Multi-Role Tanker Transport (MRTT) aircraft picked up some of the slack, including ones operated by individual allies and alliance-operated aircraft. NATO's MRTT planes, which will eventually number a dozen aircraft, are part of a "pooling and sharing" arrangement among the allies. The alliance announced it is launching a similar plan for the Airbus A400 transport aircraft. To handle the rest of the refueling, operations took place on the ground, a model suited to the region's geography, provided more bases can be set up to support it.

"When you have a shortfall of tankers, then we take advantage of 40 air refueling points that are scattered throughout the Scandinavian [nations] and also scattered throughout the center part of Europe," said Hinds during the exercise, at a stop in Luleå Air Base in Sweden's Arctic Circle. "That gives you the benefit of being able to fight, enter the combat zone, land at a different location, refuel, potentially even rearm."

A short time earlier a Gripen fighter jet had been refueled and rearmed by a small team of personnel in less than 20 minutes, a demonstration of the kind of high-speed agile combat employment envisioned by U.S. forces, as well.

At the annual summit of alliance leaders in July in Ankara, NATO members reaffirmed their commitment to funding goals set a year earlier at The Hague, which committed NATO members to spend 3.5 percent of their gross domestic product on core military capabilities by 2035, plus 1.5 percent more for broader security needs, including cyber defense, hardening of critical infrastructure, and strengthening the industrial base.

Trump called the Summit "very successful" in comments to reporters after the meeting, an assessment Grynkewich said he shared.

"President Trump said there was a lot of love in the room at the Summit," Grynkewich told Air & Space Forces Magazine after the Summit. "I was in the room, and it was an incredible display of unity."

"Our allies are stepping up on their investments, and fielding and providing additional capabilities to Allied Command Operations," Grynkewich added. "This will ultimately deliver the capabilities we need to better deter and defend every inch of alliance territory, not just today and tomorrow, but well into the future."

OTHER CHANGES ARE IN THE WORKS

The JFC Norfolk commander is currently an American, but that role will rotate to the U.K. in the fall, part of a change in NATO's command structure in which European officers will lead all three Joint Force Commands and U.S. officers will lead three component commands: air, land, and maritime.

"NATO is adapting," said Italian Adm. Giuseppe Cavo Dragone, Chair of the NATO Military Committee. "Canada and European nations are taking more responsibility."

NATO officials have noted they are actively defending alliance territory. Allies have responded to Russian drone incursions with Eastern Sentry, a joint mission to protect NATO airspace.

"Eastern Sentry really marked, I think, a transition from air policing into the air defense mindset," Stringer said. "The activities we do are generating readiness and capability in forces. They reassure our nations and their people that actually the alliance is out there defending and deterring every day. And it's making sure that our adversaries get the message that whilst we are a defensive alliance, we are deadly serious about protecting all our people."

Another important shift, notes Gen. Markus Laubenthal, Grynkewich's German chief of staff at SHAPE, is allies' recognition of the urgency for change. The time for action is now, he said.

"Transformation for us never stops. This permanently continues—but as Chief of Staff, I need to give the staff and the [Allied Command Operations] commands clear direction and guidance," Laubenthal said. "Therefore, I declared the 'transition to warfighting headquarters' over. I said we are a warfighting headquarters—if you wish or not. If you are asked tonight, we must perform tonight."

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Interview: Meink Cites Progress After First Year as SECAF

By Courtney Albon and Stephen Losey

Just over a year after becoming the 27th Secretary of the Air Force, Troy Meink believes he's making progress on his top priorities—increasing Air Force readiness, modernizing its aircraft fleet, and growing the nascent Space Force.

Meink acknowledged continuing headwinds in a June 26 interview with Air & Space Forces Magazine, but said the proof of his progress shows in the fiscal 2027 budget now working its way through Congress. Though Congress may not appropriate all of the $338 billion the Air Force and Space Force asked for—the department's share of a proposed $1.5 trillion for fiscal 2027—he expressed confidence the two services are on a better glide path than before.

He cited plans to double the Space Force's size over the next five years and to accelerate development of the F-47 fighter, B-21 bomber, and semi-autonomous Collaborative Combat Aircraft as proof.

"We never get everything we want," he said. "I'm hopeful that we're going to get a lot more than we have maybe in the past, based on what we're seeing."

The Air Force and Space Force are implementing a slate of acquisition reforms directed by Defense Secretary Pete Hegseth last November. Among them: empowering new "portfolio acquisition executives (PAEs)" with unprecedented decision-making authority across entire mission areas. The Department of the Air Force has set up seven of 27 planned PAEs so far.

"We've delegated probably 90 to 92 percent of contracting authorities down into what we call these portfolio acquisition executives, so that they can make the decisions there, not only for contracting decisions, but also hiring decisions," Meink said.

Historically, many of those decisions were reviewed and approved at successive higher echelons, some rising all the way to the Secretary level. Stripping out multiple levels; simplifying requirements; demanding modular, open systems architectures that prevent decades-long vendor lock-in; and forging multiyear acquisition deals are all part of the underlying strategy and all areas of focus for the Secretary.

"Even though this acquisition transformation and this focus has only been a year or so in, we're already seeing the benefits and we're seeing really good performance across the board," Meink said.

That's come despite the DAF having the lowest budget, relative to the nation's gross domestic product, in the last couple of decades, Meink said, also noting that chronic underfunding didn't come without consequences.

"Corners have been cut," he said. "One of those corners was readiness—parts, things like that. And so, the readiness levels were quite low."

From 1994 to 2024, aircraft availability rates declined from 73 percent to 54 percent, then-Air Force Chief of Staff Gen. David Allvin said in March 2025 at AFA's Air Warfare Symposium.

Cuts to the maintenance force are being fixed, he said, a challenge that needs to be addressed before new aircraft enter the fleet, including the B-21 Raider, T-7A Red Hawk, FQ-42 and FQ-44 CCAs, and more come online.

Senior Airman Abigail Duell

Secretary of the Air Force Troy Meink sits in the cockpit of an F-15EX Eagle II before an orientation flight at Eglin Air Force Base, Fla., in 2025. Entering year two as Secretary, he sees opportunities to make long-needed changes to fix the Department of the Air Force.

The DAF's fiscal 2027 budget request would grow the department's "foundational readiness investments," Meink said, increasing funding for flying hours, weapon system sustainment and related categories by 34 percent, a figure he has touted in multiple hearings with lawmakers this spring and summer.

Additional funding for readiness is in the $67 billion defense supplemental request submitted to Congress last month, Meink said. He expressed optimism that lawmakers will support both the base budget and additional measures to bolster readiness. However, he noted that overcoming years of underinvestment "is going to be a long-term effort" for the department.

MODERNIZING

Both the Air Force and Space Force are facing a modernization crunch. Existing systems are not only old, but increasingly vulnerable. The Air Force needs new hardware, but so does the Space Force, which is moving to a more distributed and proliferated space architecture to ensure space capabilities are less vulnerable to attack and disruption.

The Pentagon is pressing for greater authority to sign multiyear procurement contracts for new satellites, missiles, aircraft—and spare parts.

The more contractors know in advance about government demand, the better they can plan and the more willing they will be to invest in expanding production capacity and advanced manufacturing technology.

"When the future is uncertain, it's hard for industry to make those investments to either modernize their facilities or do what they need to do to get to the production capacity we need," Meink said. "So those long-term deals are a huge part of that."

Multiyear weapons orders will help build fleets, he said, bringing prices down and theoretically enabling the services to buy more.

Meink said the Air Force is looking to slash missile prices by as much as "a factor of 10," or up to 90 percent, as it works to re-

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plenish depleted stocks.

"Stable production is really important," Meink said. "Buying things one year at a time is really not a good way to buy stuff. Nobody does that in the commercial world."

Meink acknowledged that the Defense Department has tried and failed to fully implement similar reforms in the past, but he argued that this time is different.

"We're really taking those things that we know work, and we're just applying them across the entire department, which has really never been done in any acquisition world," he said. "We've just decided we're going to take what we know works and apply it everywhere, and so we are already seeing that decision process is going much more quickly."

MORE OF EVERYTHING

While it will take time and resources to grow the size of the Air Force and Space Force fleets, Meink said he expects the DAF's focus on production will start yielding results in the next few years.

For the Air Force, Meink said that means by around 2029, it expects to bottom out its declining fleet size and start growing it again, slowly but surely.

The Air Force has already moved, along with Boeing, to increase KC-46 production rates and is working on doing the same with the B-21 and F-15EX. The Pentagon has provided Northrop Grumman with billions in additional funding to boost B-21 production and is considering whether to open up a second production line in Palmdale, Calif. And Boeing is moving to expand its F-15EX production line in St. Louis, as the Air Force signals it wants to more than double the planned Eagle II fleet to 267.

Meink pointed to the F-15 fleet—which is now sending older C and D model Eagles to the Boneyard, while bringing on the new F-15EX Eagle IIs—as a prime example of a jet where new procurements may start to balance out retirements.

"It's not going to be a massive growth in the number of F-15s we get out there, but we're trying to get to production rates—again, with congressional support—that essentially we are matching or maybe exceeding the retirement rate," Meink said. "We're not going to shrink. We're not going to grow a lot, but we're not going to shrink."

In addition to halting, and perhaps even reversing, the slow decline of the Air Force's manned fighter fleet, Meink views the CCA with its increased firepower and other combat capabilities as a force multiplier for the service.

In June, the Air Force announced it awarded production contracts to General Atomics Aeronautical Systems and Anduril Industries to move their CCAs into production, as well as awarding contracts to three companies to provide mission autonomy software.

The Air Force aims for CCAs to cost roughly one-third as much as an F-35, or somewhere around $30 million apiece.

"When you tie CCAs with manned aircraft, the combat effectiveness goes up way more than just the cost would indicate," Meink said. "The combat power they bring forward, you can almost think about it as a fighter. That's essentially what it is, it's an autonomous fighter that still needs a manned aircraft to guide it and tell it what to do."

Another growing mission requirement is air-moving target indication. Meink said Operation Epic Fury underscored the need for an all-seeing, survivable battle management solution.

The DAF's plan for achieving that coverage includes both airborne and on-orbit capabilities, with the Air Force fielding at least seven E-7s—he wouldn't specify how many the Air Force might ultimately buy—and the Space Force investing in the space-based sensing needed to successfully do AMTI from space.

Meink also said the U.S. can do more to leverage allies who also fly E-7s, as it did in Operation Epic Fury with Australia. The UK also flies the aircraft.

"There are already international partners flying the E-7," Meink said. "When we look at the number of platforms we need for any kind of conflict that we envision, … our international partners are … part of that. We expect E-7s to continue to be procured by some of our international partners."

However, the U.S.' shifting plans for the E-7 have already caused some allies and partner nations to consider whether they also want to buy the Wedgetail. On July 7, NATO announced it had chosen Saab's GlobalEye surveillance plane to replace its aging AWACS, instead of Boeing's Wedgetail.

The path ahead for space-based AMTI appears to be clearer. The Space Force's fiscal 2027 budget request asks for $7 billion to procure satellites that can track moving targets, and it awarded SpaceX a $4 billion contract in late May to field a constellation of AMTI satellites by 2028.

Meink indicated a sense of urgency to being able to transmit satellite data to air operators and provide a more complete battlespace picture. As if to underscore that urgency, an additional $4 billion for space-based AMTI and the satellite-based Space Data Network is included in the defense supplemental budget request submitted in June.

"You have to have that air picture, but you have to be able to get that air picture into every single cockpit," Meink said. "And there's a big push to deliver that on the space side of the house."

The planned AMTI constellation aligns with the Space Force's adoption of a more proliferated satellite architecture. SDN, for which SpaceX is also a lead contractor, is envisioned as hundreds of satellites in low-Earth orbit, and the service is also building out a missile warning and tracking fleet in both LEO and medium Earth orbit for the Pentagon's Golden Dome missile defense program.

Meink said both Pentagon and congressional leaders are broadly supportive of expanding the Space Force's satellite fleet and its Guardian and civilian operators. The service's $71 billion fiscal 2027 budget request represents a 124 percent increase over the prior year. Its research and development accounts are projected to grow to $40 billion, and its procurement funding to $19 billion—more than five times what it asked for in fiscal '26.

"There's a realization all the way up that some of the space systems that we're talking about delivering or already delivering and delivering into the future are really some of the most critical [defense capabilities] across the board—and you see that in the budget submission," he said. "That takes a Department of War-level decision to increase the budgets that much."

Still, many of the Air Force's and Space Force's top priorities hinge on passage of not one, but three defense funding bills. That includes a roughly $1 trillion defense appropriation; a $350 billion reconciliation bill; and the $67 billion supplemental, mostly to replenish arms and expenses tied to the Iran war.

The Air Force's fiscal 2027 reconciliation request includes about $16 billion for some of its most important programs, including $2.3 billion for 14 F-35s and nearly $3 billion for missile and munition production. Meanwhile, most of the Space Force's $12 billion reconciliation request would go to Space-Based AMTI and SDN.

Meink acknowledged that dependency, and said navigating this year's appropriations process, like most of the challenges the DAF faces, will require flexibility and collaboration.

"Flexibility is the key to airpower, right?" Meink said, quoting an Air Force mantra. "So, we're going to have to maintain flexibility."

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A Ukrainian FP-1 long-range drone built to strike targets on land or at sea deep in enemy territory. Ukraine has used the drones as one-way cruise missiles to strike depots, energy facilities, and other strategic sites.

Ukraine Reimagines Strategic Attack

Ukraine's long-range strike campaign successfully adapts classic airpower theory to its own present-day constraints.

By Lt. Gen. David A. Deptula, USAF (Ret.)

Since Russia's 2022 invasion, outside observers have measured Ukraine's prospects by a familiar yardstick: miles of territory gained or lost on the ground. By that standard, the war often appears static, attritional, and brutally expensive. But Ukraine is now demonstrating an alternative—and more effective—means to fight, taking the war deep into Russian territory not simply to punish Moscow, but to disrupt the systems that enable its military to continue fighting.

This is not a new idea. It is one of the oldest tenets of airpower: Attack the sources of an enemy's military power directly, paralyze the systems on which the enemy depends, and impose costs that change the adversary's strategic calculus. What is new is the means. Ukraine is executing strategic attacks with improvised, long-range, one-way uncrewed aircraft—more accurately described as low-cost cruise missiles. It is also employing special operations, maritime strike systems, cyber-enabled intelligence, and adaptive targeting.

One of the oldest tenets of airpower: Attack the sources of an enemy's military power directly, paralyze the systems ... impose costs.

One recent analysis suggests Kyiv pursue strategic neutralization: to shift away from measuring success solely by territorial movement on the ground and toward a broader objective of making Russia's aggression operationally futile. The concept is not simply to attrit Russian forces at the front, but to persistently disrupt the systems that allow Moscow to regenerate combat power, export energy, produce weapons, launch missiles, and sustain the political fiction that the war can remain distant from Russian society.

Ukraine's attacks on oil refineries, export terminals, military factories, command-and-logistics nodes, air defenses, airfields, semiconductor facilities, and cruise

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missile production centers are precisely the kinds of targets that make sense when the objective is not battlefield attrition alone, but systemic disruption.

That logic reaches back to the early Airmen of the 1920s and 1930s. Giulio Douhet, Billy Mitchell, Hugh Trenchard, and the Air Corps Tactical School all argued in different ways that modern states had become vulnerable because they depended on interlocking industrial, transportation, energy, and command systems. The Air Corps Tactical School's industrial web concept held that a nation's war-making potential could be attacked through critical nodes in manufacturing, power, transportation, fuel, and other essential sectors. In my 2001 monograph on how the Desert Storm air campaign was designed and executed, this point is highlighted explicitly: the Air Corps Tactical School favored the destruction or paralysis of national organic systems such as electric power, transportation, railroads, fuel, food distribution, steel manufacturing, and related industries vital to a state's war-making capacity.

The theory was first attempted on a large scale in World War II, but technology was not yet sufficient to fully exploit its potential. Strategic airpower could reach deep into enemy territory, but it could not reliably hit precise aimpoints without enormous mass. Even after Allied forces gained air superiority over Germany in 1944, precision bombing often required hundreds of aircraft to destroy a single target because only about 20 percent of bombs aimed at precision targets landed within 1,000 feet of the aimpoint. The strategic insight was real; the execution was only rudimentary.

That changed in 1991. The Desert Storm air campaign attacked Iraqi leadership, command and control, air defenses, electricity, transportation, oil, weapons production, and fielded forces in parallel to produce cascading effects. Much of Desert Storm's success is rightly attributed to stealth and precision, but what made the operation so successful was its effects-based approach to planning and execution. Starting with the desired strategic and operational outcomes, planners worked backward to identify the key systems and critical nodes whose disruption would produce those desired effects—paralyzing decision-making, blinding air defenses, isolating fielded forces, degrading mobility and logistics, and collapsing Iraq's ability to conduct coherent military operations. The objective was to orchestrate integrated attacks that would impose rapid, system-wide paralysis with speed, precision, and economy of force. It worked. The 43-day air campaign rapidly degraded Iraq's fighting capacity, paving the way for the removal of Iraqi forces from Kuwait once land forces were employed.

Operation Allied Force in 1999 reinforced these lessons under different conditions. Though politically constrained and not a pure example of parallel warfare, the defense of Kosovo from Serbian aggression demonstrated how precision attacks against selected systems could achieve coercive effects. NATO's own history describes Allied Force as an air campaign launched after diplomacy failed; RAND's assessment, "NATO's Air War for Kosovo," characterized it as a 78-day air war designed to compel Slobodan Milosevic to end ethnic cleansing in Kosovo. Allied Force combined global attack, parallel precision engagements, and elements of an effects-based approach to achieve those objectives.

Ukraine now finds itself under far harsher constraints. It lacks the air superiority achieved by the coalition in Desert Storm and by NATO in Allied Force. It cannot send large packages of manned aircraft deep into Russian airspace. It lacks the mass of a superpower air force. Yet it has recognized the same enduring truth: Modern war depends on systems, and systems contain vulnerable nodes.

That is why Russian oil infrastructure matters. Oil is Russia's economic engine, vital for revenue and political power, as well as for fuel, transportation capacity, industrial output. Ukrainian long-range cruise missile strikes against refineries, oil terminals, pumping stations, and export infrastructure are designed to reduce Moscow's freedom of action. Recent attacks against facilities near Moscow, Crimea, Krasnodar, and even Tyumen demonstrate how Ukraine is steadily expanding both the reach and strategic ambition of its long-range campaign.

NORAD

A Russian Tu-95 bomber, photographed inside the Alaska Air Defense Identification Zone in 2020. Russian bombers have had diminished impact on the war.

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In doing so, it is imposing costs: lower throughput, disrupted exports, higher repair and insurance burdens, diverted air defenses, and growing uncertainty inside Russia's political and industrial system.

This campaign has already shown strategic-economic effects, with Ukrainian President Volodymyr Zelenskyy asserting that in March alone, Russia suffered $2.3 billion in lost revenue as a result of intensified long-range attacks against Russian port and energy infrastructure. Sustained attacks on revenue, fuel, transport, and repair networks reduce Moscow's ability to finance, supply, and politically normalize the war.

The same logic applies to strikes on airfields, air defense systems, military production facilities, and electronics plants. Long-range strikes against facilities such as Angstrem Microelectronics in Zelenograd and MKB Raduga in Dubna are part of a campaign to reach the industrial and technological foundations of Russian military power. That is classic strategic attack: identify the systems that enable the enemy's war effort, find the critical nodes within those systems, and attack to produce operational and strategic effects disproportionate to the costs of the weapons used in the attack.

Operation Spiderweb, Ukraine's daring, covert operation to strike Russian long-range combat aircraft deep inside Russia on Russian bases with remotely operated drones, sharpened the point. The Center for Strategic and International Studies described how the operation delivered a major blow to Moscow's long-range bomber fleet; the Washington Post reported Ukrainian intelligence claims that up to 12 bombers, including Tu-95 aircraft used to strike Ukrainian cities, were damaged or destroyed. Even if final battle damage assessments vary, the operational message is unmistakable: Ukraine is attacking Russia's ability to project air and missile power, not merely reacting to it at the point of impact.

This is strategic attack adapted to account for the limitations of Ukraine's military. Desert Storm used stealth aircraft, cruise missiles, precision-guided munitions, airborne command and control, space-enabled navigation, and massive conventional combat aircraft and logistics capabilities. Ukraine is leveraging commercially influenced electronics, adapted airframes, distributed launch methods, maritime uncrewed systems, and intelligence fusion to the same kind of effects. Due to limits on what U.S. and European deep attack systems the West will provide, Ukraine is domestically producing its own unique long-range capabilities, such as the FP-1 Firepoint, RS-1 Bars, and Bars-SM Gladiator, to penetrate dense Russian air defenses and strike military related facilities in the Moscow region.

Ukraine is not replicating Desert Storm but rather translating the logic of that air campaign into a new context: a war in which neither side has air supremacy, and in which Ukraine lacks sufficient weapons and faces a nuclear-armed adversary with strategic depth. Its campaign is therefore more episodic, more improvised, and more constrained. But its essence is recognizable: parallel pressure against military, industrial, energy, and psychological systems; precision sufficient to attack specific nodes; and a theory of victory that seeks to change enemy behavior by making the cost of aggression increasingly costly.

That is also why the campaign should not be judged solely by whether it produces immediate territorial gains. Strategic attack only rarely achieves their objectives with a single blow. It accumulates effects. It forces the adversary to divert air defenses from the front to the homeland. It compels dispersal of aircraft and production. It raises insurance, transport, repair, and security costs. It reduces refinery throughput. It complicates military logistics. It imposes political costs, creating uncertainty in the minds of commanders, industrial managers, political elites, and citizens.

Russian Emergencies Ministry

Emergency firefighters battle a blaze at a Russian oil depot near Bryansk, following a Ukrainian drone strike on the facility, some 100 miles from the Ukraine-Russia border.

This is precisely the realm of effects-based operations. Strategy must be understood as the orchestration of means to accomplish ends and to optimize actualization of that goal target selection must focus not on the absolute destruction of a list of targets, but on the effects desired upon target systems. That sentence captures Ukraine's emerging approach. Kyiv is not trying to bomb Russia into submission in the crude sense sometimes associated with early airpower theory. It is trying to deny Russia the ability to wage war cheaply, confidently, and indefinitely.

The moral and legal distinction is essential: Strategic attack does not mean indiscriminate attack. In fact, the maturation of airpower from World War II to Desert Storm was, in large part, the story of moving from area destruction toward more precise attacks on military and war-sustaining systems. That distinction is visible today in the contrast between Ukrainian and Russian long-range strike. Russian attacks have repeatedly targeted civilian areas, apartment blocks, hospitals, schools, civil power grids, and other nonmilitary sites. These attacks suggest either deliberate terrorism, poor intelligence, weak target development, or a disregard for civilian harm. Ukraine's legitimacy depends on continuing to do the opposite: focusing on military objectives and war-supporting infrastructure, using accurate, precise, and timely intelligence, and applying disciplined target planning to minimize civilian harm.

Russia possesses proportionately greater long-range strike capacity, but it lacks the leadership, training, perspective, and doctrine required to translate that capacity into decisive strategic advantage. Ukraine has fewer means, but it is learning how to make them count. That is the fundamental difference between the two sides: one uses strike largely as punishment and coercion against society; the other is increasingly applying strike as a targeted means of disrupting the systems that sustain aggression.

There is an important lesson for the United States and its allies here. Ukraine's campaign demonstrates that long-range

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strike is not a luxury, but a strategic necessity. A state that can only defend at the front is condemned to absorb punishment indefinitely. A state that can reach the enemy's arsenals, refineries, command nodes, ports, airfields, and production base can change the war's logic. That is why sustained support for Ukraine's long-range attack capacity should not be viewed as escalatory. Properly bounded, legally employed, and strategically directed, it is a means of shortening the war by attacking Russia's capacity to continue it.

The West has too often treated long-range strike as a reward to be rationed rather than as a requirement to be integrated into a coherent theory of victory. That caution has carried costs. Every delay in providing Ukraine the means to hold Russia's war-sustaining systems at risk gives Moscow the gift of time to adapt, repair, disperse, and continue its assault. Recent allied steps to expand Ukraine-based and European production of long-range missiles and air-defense systems are welcome, but the strategic logic should be clearer: Ukraine needs the ability to impose recurring costs on the systems that sustain Russia's aggression. The objective should not be symbolic retaliation or indiscriminate punishment. It should be the systematic disruption of the military, industrial, logistical, energy, and command systems that allow Russia to keep fighting.

The Airmen of the interwar years of the 1930s understood the vulnerabilities of modern industrial states before they had the tools to exploit them effectively. World War II proved both the ambition and the limits of their theories. The Desert Storm air campaign showed what happened when precision, stealth, information, and operational design finally converged. Allied Force showed that airpower could contribute to coercive political outcomes under severe constraints. Ukraine is now writing the next chapter: strategic attack conducted by a nation without air superiority, using improvised but sophisticated long-range systems to impose systemic costs on a larger aggressor.

Technology alone has never won wars, but strategy determines whether technology matters. Ukraine's achievement is not simply that it has built longer-range weapons. It is that it is using them in accordance with a coherent strategic logic: attack the systems that sustain Russian aggression, complicate Moscow's choices, reduce Russia's ability to generate combat power, and improve Ukraine's position for an eventual settlement.

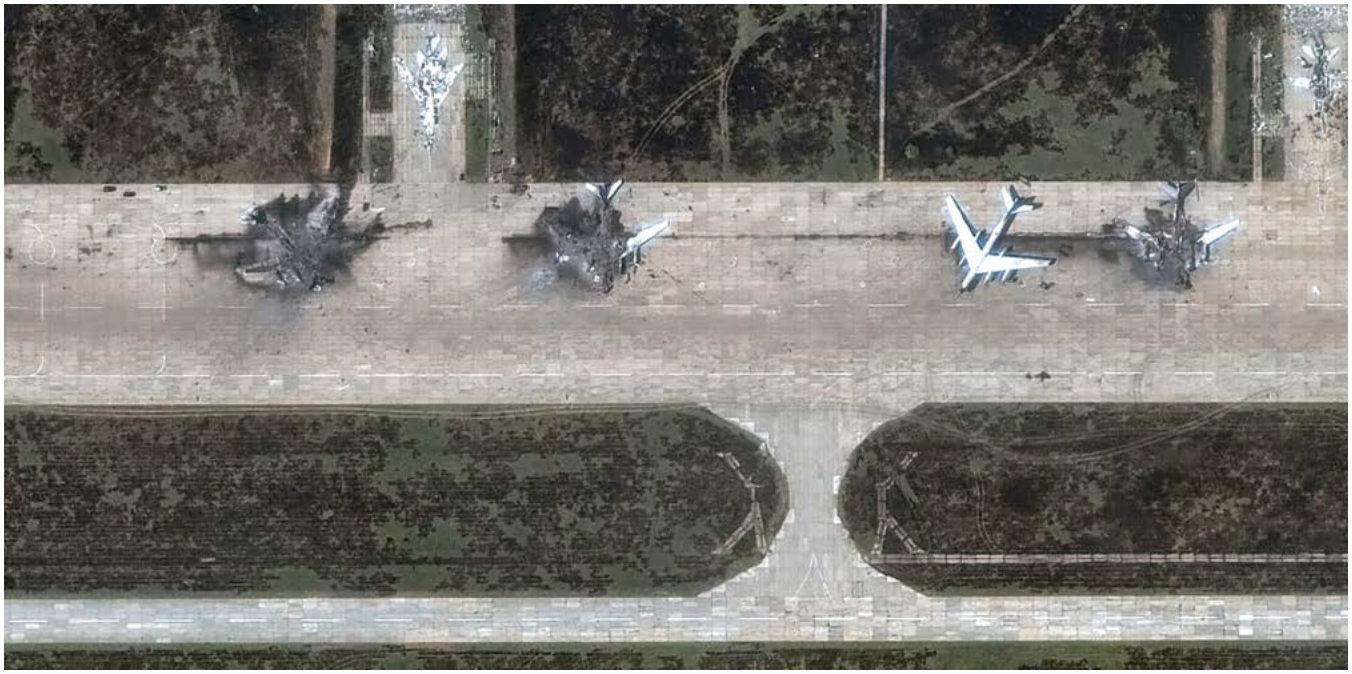
If the United States and its allies want this war to end sooner, they should help Ukraine expand that logic—not constrain it. Providing Ukraine the long-range attack means to hold Russia's war machine at risk could accelerate the conclusion of the war by making continued aggression more costly than negotiation.

But there is another imperative as well. Ukraine is paying in blood for real-world lessons about long-range strike, air defense, uncrewed systems, electronic warfare, targeting, intelligence fusion, resilience, dispersal, deception, and the operational art of fighting a larger adversary under persistent attack. Even a modest increase in U.S. and allied investment—including the placement of U.S. military observers in Ukraine—would yield lessons that could prevent American and allied forces from having to relearn them later at far greater cost. Supporting Ukraine is therefore not only about bringing this war to a faster and more favorable conclusion. It is also about absorbing the lessons of this war before the next one imposes those lessons on us.

The weapons have changed. The theory has endured. Ukraine is proving that even improvised means, when guided by sound strategic logic, can produce effects once reserved for great-power air forces.

U.S. and allied leaders must therefore recognize that helping Ukraine achieve its strategic attack objectives may be the fastest path to ending the war, turning battlespace strength into decisive leverage, bringing closure sooner than any other available course, and ensuring that the hard lessons Ukraine is learning are not paid for again by American and allied forces in a future conflict.

Lt. Gen. David A. Deptula, USAF (Ret.), *is the Dean of the Mitchell Institute for Aerospace Studies. He has been involved in planning and executing multiple major coalition air campaigns and was a Joint Task Force commander twice during his long military career.*



Maxar Technologies/Handout

A MAXAR satellite image shows destroyed TU- 95 bombers in the aftermath of Ukraine's Operation Spiderweb drone strike in June 2025 at Russia's Belaya Air Base in the Irkutsk region.

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Jud McCrehin/staff

As the second-ever Chief of Space Operations, Gen. B. Chance Saltzman focused on operationalizing the Space Force, getting operators to think more like warfighters and less like technicians and in pushing space expertise forward into regional Combatant Commands to ensure warfighting commands had native space expertise at the ready.

Bringing the Space Force into the Light

Saltzman looks back on 4 Years as Chief.

By Chris Gordon

Precision strike is an Air Force mission, but it's hard to be precise without the Space Force.

Reflecting on his tour as the nation's second Chief of Space Operations, Gen. B. Chance Saltzman pointed to Operation Midnight Hammer, where seven B-2 bombers struck Iran's nuclear sites in June 2025: Flying at a classified altitude, the bombers hit their targets with 14 perfectly timed blasts, each a 30,000-pound bomb, each set to explode in sequence with engineered precision.

Executing complex timed missions isn't like opening CarPlay and following the prompts. "If you think that you simply just turn GPS on and navigate like you're going to the store, that's not how Midnight Hammer goes," Saltzman told Air & Space Forces Magazine in an interview at his Pentagon office overlooking Washington, D.C. "We've got to do this in a specific time, and when is that time? When the aircraft releases the munition. … If you know all that and integrate, then you can backward-process it to make sure that the constellation is perfectly aligned to make sure you get as much accuracy as possible. …

"That synchronization is deliberate," Saltzman added. "It takes an operator that understands it. It takes them integrated into the planning: 'Hey, when are the B-2s going to be overhead? When is the release point? What's your time on target?'"

Space operators have long stayed mum about their contributions to U.S. military operations. But as the Space Force approaches its seventh birthday and the CSO prepares to retire later this summer—Lt. Gen. Douglas A. Scheiss has been nominated to succeed him—Space Force leaders are beginning to speak more openly about how access to space both informs and enables the American way of war.

OPENING UP

From Operations Midnight Hammer and Epic Fury against Iran to Absolute Resolve—the mission that captured Venezuelan strongman Nicolás Maduro—the Space Force has become increasingly open about how it contributed to the fight. And increasingly, those contributions go well beyond providing vital GPS and satellite communications links, to include disrupting integrated air defense systems and more.

"The adversary is using satellite communications to synchronize their situational awareness, and if we can disrupt that, then we can help create envelopes of protection for people going into harm's way—whether that's extracting pilots that are on the ground or protecting assets that are going into an IADS," Saltzman said. "If we weren't there, it would have gone far differently."

Much of the Space Force's technical capability was already in place in December 2019, when President Donald Trump signed the legislation that made it an independent military service and Gen. Jay Raymond became its first Chief of Space Operations. But

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the work that Saltzman undertook to shape, organize, inform, train and discipline the Space Force as a warfighting service in his four years as CSO transformed how those capabilities are applied and engaged.

"What we've been able to accomplish in Venezuela, and Midnight Hammer, and Epic Fury kind of proved—OK—we've got forces that are capable now," Saltzman said.

Then-Secretary of the Air Force Frank Kendall presided as Saltzman assumed the role of Chief of Space Operations. "Salty built the structure on top of the foundation" during his four years in office, Kendall said. At right is former Chief Master Sgt. of the Space Force Roger Towberman.

Andy Morataya

ADDING 'STRUCTURE'

Known universally as "Salty," Saltzman joined the Air Force 35 years ago as a missileer at an entirely different point in history. What he learned since shaped his thinking as a military leader.

"Jay Raymond built the foundation for the Space Force, and Salty built the structure on top of the foundation—and it's still being built," said former Secretary of the Air Force Frank Kendall, who led the Department of the Air Force across both CSOs' tenures. "It's a journey. It's not over with him. It won't be over with the next CSO. But he made a lot of progress in the time he was CSO."

Saltzman oversaw substantial budget growth over that time, the Space Force budget rising from $26.1 billion his first year to a fiscal 2027 request—still far from approved—totaling $71.2 billion. A significantly expanded budget is necessary, he argues, to ensure that the first new U.S. military service since the Air Force was established in 1947 can do what the nation needs it to do to control the space domain.

Whether Congress approves more than doubling Space Force spending remains an open question, but it's clear the budget will continue to increase substantially, even if it's not all in one gulp.

For Saltzman, one of the central pillars of his focus has been to "normalize" space operations as part of what the military does—and to lay to rest early skepticism over whether the Space Force needed to be and would remain independent.

The first step in that process was to fully integrate the Space Force into U.S. military operations, which are led not by the military services, but by the nation's regional and functional commanders.

Saltzman established component commands at every geographic combatant command, beginning with Space Forces Indo-Pacific Command just weeks after taking office in 2022. In recent operations in the Middle East, Space Forces Central has been an active participant throughout—just like the air, naval, and land components of CENTCOM. Previously, the space role resided in the air component.

"The joint force didn't know how to incorporate us because space operations weren't normalized into joint processes," Saltzman said. "We didn't have service components to do the planning. We had to normalize that because every service has service components in the combatant commands."

Similarly, the Space Force didn't rotate forces through typical operational readiness cycles and "present" them to joint force commanders in the same way the other services did. "We didn't have a force generation model where we trained our forces to get ready for high-end combat, so we had to normalize that because everybody else does," Saltzman said.

DEFINING DOCTRINE

Space warfighting doctrine also largely did not exist. Peter Hays, a professor of space policy at George Washington University, said Saltzman played a major role in advancing that doctrine. One of Saltzman's main achievements was declaring "that space superiority is job one, because that enables all other missions," said Hays, who taught Saltzman at Air University's School of Advanced Air and Space Studies at Maxwell Air Force Base, Ala., an incubator of future service leaders.

Saltzman codified his vision through a series of publications—2023's "Theory of Success" and "Competitive Endurance"; 2025's "Space Force Doctrine Document 1," which defined space as a warfighting domain, and the "Space Warfighting Framework"; and this year's future-focused "Objective Force 2040" and "Future Operating Environment."

"We need as many vested stakeholders helping us ... as possible, and by writing these documents out, it gives them a framework to have that discussion," Saltzman said.

While other leaders focus major speaking opportunities on rallying the troops with emotion and spirit, Saltzman took to the stage at major events, such as AFA's Air, Space & Cyber Conference or Warfare Symposia and delivered carefully crafted speeches with deliberate purpose, each one building on the last, each egging on the service to see itself not as technical specialists, but warfighters in a complex, competitive, and high-risk domain.

CULTURE CHANGE

To explain the transition he's trying to bring about, Saltzman and Kendall described the Space Force as being like converting the Merchant Marine of the 1920s into the naval force that helped win World War II. Both the Air Force's space capabilities that would become the Space Force and the Merchant Marine of that period were built to operate in benign and safe environments, free from military aggression, and both had to transition to a more volatile and dangerous era, in which enemy forces would pose rising threats.

That transition requires more than new equipment: It demands a different culture to approach a very different existence. Instead of silently executing work in the shadows, more of what the Space Force does is now on display—as much to declare what's possible to the other services as to the public they

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Weapons School's Space Course Grew and Changed Over Decades

By Courtney Albon and Chris Gordon

When Chief of Space Operations Gen. B. Chance Saltzman graduated from the Air Force Weapons School in 2001, he was equipped with academic knowledge about how to integrate space capabilities into Air Force operations.

But he only received limited hands-on experience with the systems themselves.

The Weapons School at Nellis Air Force Base, Nev., is the Department of the Air Force's graduate program for advanced warfighting, the place where top performers go to master their craft and drill with the best of their peers. The school boasts a long legacy of delivering practical skills in its training of advisors and tacticians.

But a quarter century ago, it lacked the resources to provide deep training in its space-specific course.

"Our training back then was primarily academic," Saltzman told Air & Space Forces Magazine in a recent interview. "Our primary role was to take space into air operations and try to educate people on how space could be integrated into their plans and operations more effectively."

The Space Superiority Weapons Instructor Course (WIC) looks a lot different today.

Its evolution over 25 years reflects the growing importance of space in joint military operations and the elevation of a once small cadre within the Air Force to lead a separate and distinct military service.

Saltzman, who spoke at the Air Force Weapons School graduation June 13—making him the first Guardian to do so—said the Guardians who move through the course today are trained on both defensive and offensive operations, with a focus on integrated mission planning. And, as he put it, they're part of a team rather than "an educator about the team."

"That's a pretty big shift," he said.

Col. Agustin Carrero, commander of Space Delta 11, which oversees the 328th Weapons Squadron at Nellis, said the Space WIC has changed in other ways, too. Established in 1996 for weapons officers, today's Space WIC is geared toward both officer and enlisted Guardians. Most of the students come into the class with either a solid understanding of Space Force systems, some "tactical knowledge under their belt," or both, Carrero said.

"The focus, especially since the creation of the [Space Force] is more on honing our warfighting skills and making sure that as a service we can meet our moral obligation to contest the domain in support of joint operations," he told Air & Space Forces Magazine.

To do that, the course leans heavily on aggressor training in a virtual environment, allowing Guardians to hone their tactics operating against a simulated adversary.

Carrero said he expects the course to continue to evolve as the Space Force prepares to potentially double in size in the coming years. That kind of expansion means more investment will be needed across the service's training enterprise, including to grow the weapons instructor course.

Some expansion is already occurring. The school is renovating an existing facility at Nellis to accommodate more students, with construction starting later this year. The 328th expects to move into the building full time in summer 2028. Carrero said the extra facility will allow the course to train as many as 100 students per year. Today, the Space WIC graduates about 25 students each year across two 23-week sessions.

Two new space course tracks will be launched in the coming years: an intelligence track in 2028 and a cyber track in 2029.

Carrero said the course will continue to increase training to prepare Guardians to operate in a contested domain, especially as the Space Force brings on new missions. And while today, Space WICs primarily train virtually, Carrero said he expects more training in the future could be performed using live satellites.

"One of the ways that the course is evolving is to develop those additional warfighting skills that we're going to need as we bring on board additional capabilities," Carrero said. "We definitely see the need to evolve the course."

serve. (And also to project deterrence to potential adversaries).

"If we don't talk about ourselves, who will?" asked Saltzman.

The majority of Space Force members today did not transfer from another service, as in the early days, but instead have never worn another service insignia. New processes are in place, and a long-awaited Guardian performance review system is nearing completion.

But creating a unique Space Force culture is not something he believes can be directed—it has to evolve organically, Saltzman said. "I think if you try to deliberately build a culture, you'll get more wrong than right," he said. "The culture is kind of the reflection—the outcome—of the collection of decisions and actions that you take as a service. What I'm conscious of is when we make decisions, when we build processes, when we take actions: There will be a culture that emerges."

UNUSUAL CAREER

At 57, Saltzman is ending his four-star career closer to the age of a typical incoming chief of staff, rather than one who is retiring. His career track is unique, and unlikely to ever be replicated. Saltzman never envisioned a space career, in fact, and asked why he chose the secretive space field, he is blunt: "Oh, I didn't."

The cause was the end of the Cold War and the military downsizing that followed. Saltzman was a missile officer and the Air Force was cutting back the missile force.

"They really just didn't have jobs for missileers," Saltzman recalled. "I had a buddy that was in the NRO, and he called and says, 'I think I can get you out to the NRO.' I said, 'What's the NRO?"

The National Reconnaissance Office operated the nation's spy satellites and was so secretive that its very existence remained classified until 1992. Its budget was hidden in the Air Force budget, and much of it remains hidden there even now.

Arriving at the NRO, Saltzman was assigned to OD-4—Operating Division Four—where he worked in a giant windowless building known as the "Blue Cube," in Sunnyvale, Calif., at the now shuttered Onizuka Air Force Station. When the Air Force subsequently combined missiles and space operations into a single Air Force Specialty Code, 13S, his future was set.

"Missiles and space merged into the same career field before it broke back out again," Saltzman said. "13 Sierra used to be ICBMs and space operations. And so, as an ICBM operator who had a job in the NRO, I was suddenly a space operator too."

Saltzman went on to attend the Air Force Weapons School and

Dave Grim/USSF

As Chief of Space Operations, Gen. B. Chance Saltzman visited then-Space Operations Command boss Lt. Gen. David N. Miller Jr. in 2025. Later, he did away with the clever-but-cute "SpOC" nomenclature, and renamed it Combat Forces Command.

to become an instructor there. He held jobs at the Joint Space Operations Center, then at today's Vandenberg Space Force Base, Calif. (then a USAF installation); at Air Force Headquarters in the Pentagon; operational roles at Buckley Air Force Base, Colo., Air Force Space Command, and as Deputy Commander of U.S. Air Forces Central Command and Deputy, Combined Forces Air Component Commander, U.S. Central Command—where he helped run and direct combat operations. He was Deputy Chief of Space Operations for Operations, Cyber, and Nuclear, when he was selected to succeed Raymond.

Younger than and junior to his competitors for the job, Saltzman got the nod because of his overall vision.

"Salty won the job in his interview," Kendall recounted. "We were open-minded going into interviews. But out of that process, Salty became a unanimous first choice for the job. He demonstrated the ability to very thoughtfully articulate what the Space Force needed to do to be successful, and we thought that was really important for the leadership of the Space Force and also for advocacy for the Space Force in the Washington arena."

Space had been seen as peaceful for so long that many space operators couldn't imagine anything else. The public struggled with the idea that America needed a military branch to defend it—if they even knew the Space Force had been created. Within the military, space had likewise been seen as something other than a warfighting domain—more as an enabler of air, land and sea operations, providing connectivity that helped those forces see and communicate.

Changing those perceptions was central missions for Saltzman. By openly discussing Russian and Chinese threats and U.S. efforts to counter them, he has sought to better inform the public. His references to "counterspace" capabilities, otherwise known as space weapons, broke a long-standing taboo about using destructive force in space.

By lifting the veil of secrecy just enough to more effectively explain the Space Force's role, Saltzman consciously strove to build awareness of, and congressional and public support for, the Space Force.

At the same time, Saltzman built on Raymond's efforts to expose the capabilities China and Russia have put in orbit. He talked about what the U.S. Space Force must do to counter, he said, their "on-orbit capability, whether it's grapplers or kinetic capability."

"We're talking about directed energy, we're talking about jamming, whether it's in Ukraine and the Black Sea, the jamming that occurs in Iran," he said. "We're talking about all that stuff. So, the threat is out there at the unclassified level. We didn't do that when I was a colonel."

Retired Lt. Gen. David Deptula, the dean of AFA's Mitchell Institute for Aerospace Studies, said Saltzman moved the Space Force "from its formative stage into a more operationally focused, combat-credible force."

Equally important, he added, was Saltzman's Competitive Endurance concept, which focused on three pillars: "avoiding operational surprise," "denying adversaries first-mover advantage," and then being prepared to conduct "responsible counter-space campaigning."

"This concept of competitive endurance gave the Space Force a clear strategic framework," Deptula said.

Saltzman's designated successor is Schiess, now the Deputy CSO for Operations. He is set to inherit an organization with a more visible profile and broader public support than Saltzman had, and with a budget profile intended to grow the force. Once confirmed, he will try to execute on Saltzman's plans to double the Space Force's size by 2030.

"As long as we are clear on what the plan is and what the requirements are across the board, the thousands of decisions that will have to be made below this office level can be made, and I think that's what we focus on," Saltzman said. "Keep giving the resources and be clear-eyed on what the requirements are and what the plan is to execute."

Wrapping up his final appearances on Capitol Hill during the Pentagon's fiscal 2027 budget rollout, Saltzman earned repeated plaudits from nearly every senator or U.S. Representative he spoke with. They opened their remarks in public hearings by thanking Saltzman and extolling his service. Significantly, the committees approved his budget requests without going into special classified sessions.

"When I first went to the Hill, they still didn't understand why there was a Space Force," Saltzman recalled. "I still had senators, I still had congressmen asking me, 'Why should we invest in the Space Force? What is it that the Space Force brings? Why is this so important?' We're not hearing those questions anymore."

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Autonomy and the Short-Range Air Fight

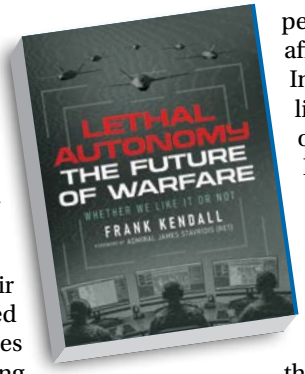
Imagining a future force of stealthy UAVs—and no manned fighters.

Jason Kelly

A General Atomics YFQ-42A Collaborative Combat Aircraft takes off during flight testing. As Secretary of the Air Force, Frank Kendall invested in the program, envisioning 1,000 CCAs in the future force.

By Frank Kendall

This article is excerpted from the book "Lethal Autonomy: The Future of Warfare, Whether We Like It or Not," by Frank Kendall, and published by Knox Press. The article has been lightly edited for clarity and continuity and is used here with permission.



When I became the Secretary of the Air Force in 2021, I believed we needed to consider some fundamental issues in the air domain that were not being adequately addressed.

First, in the short-range air subdomain, the dependency on a small number of fixed and very targetable forward bases for conventional takeoff and landing (CTOL) tactical-range aircraft (a few hundred miles) is becoming, and may already be, untenable. This is true whether the aircraft is manned or unmanned. Fixed land air bases and aircraft carriers operating close to an opponent's coast or border are not survivable enough against current and future threats. This is a development that has been coming for a long time; it was a major concern during the Cold War, even before the advent of long-range precision conventional ballistic and cruise missiles, to say nothing of hypersonic weapons.

"The manned 'fighter plane' as we've understood it since World War I will ultimately become obsolete."
—Frank Kendall, 26th Secretary of the Air Force

Second, the unit cost of modern tactical aircraft, for both long- and short-range air domain applications, their long production lead times, and their expected attrition rate against peer competitors, are prohibitive of the ability to afford a force that can conduct a long air campaign. In a protracted peer competitor conflict, the U.S. is likely to run out of airframes if it attempts to conduct operations over a period of weeks or months. The F-35 is a good example. I'm a big fan of the F-35; it's a tremendous machine and a major step forward over its predecessors, but only if it can achieve high net cost-exchange ratios with very low loss rates against the threats it will face for the next few decades. That means limiting losses on the ground as well as in the air. If it can be based in a survivable way, the F-35 (with adequate investments in continuous upgrades, electronic warfare (EW); command, control, and communications (C3); and air-to-air weapons coupled with attritable UAVs) will serve the U.S. well for a long time. Unfortunately, its high cost (including sustainment cost), long acquisition lead times, and basing limitations—except for the Marines' short takeoff/vertical landing (STOVL) F-35B model—will limit its potential to support a protracted conflict.

If these were the only challenges the U.S. already faces, it would be enough, but there's more. China, in particular, has been working to develop capabilities that challenge the U.S. directly in the air. This includes attempts to achieve stealth, improved fire control sensors on tactical aircraft (optical and radio frequency), and especially superior air-to-air missiles of various types and ranges that in some ways exceed the performance of current U.S. weapons. This last category includes missiles intended to attack standoff

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Close Quarters

The United States' dependence on fixed, targetable forward bases may already be untenable, argues former Air Force Secretary Kendall. Fixed land air bases—or aircraft carriers operating near China's coast, for example, "are not survivable enough against current and future threats."

Zaur Eylanbekov/staff

nonstealthy counterair and strike support sensor and C3 systems like the Airborne Warning and Control System (AWACS) and JSTARS. Even tankers, which traditionally have been able to refuel fighters outside of the range of enemy engagement, are becoming targetable at long ranges.

We don't have time to waste as we sort out the right concepts for the next generation short- and long-range air subdomain solutions, but it is also essential we make the right decisions about the future of the air domain. The future concepts I'll describe below can be thought of as the "force after next," the "next" being the one I initiated as Secretary.

The choices the U.S. makes now and in the near future, including the ones I made as Secretary of the Air Force, won't go as far as the concepts I'll describe, but they take us partway there and make the path to that future shorter and easier. Conversely, if we make poor decisions, we will not shorten this path but increase its length and difficulty. One of my decisions as the Secretary was to develop and field at scale (meaning in significant numbers) uncrewed Collaborative Combat Aircraft (CCAs). The first increment of these uncrewed lethal platforms is well on the way to fielding in operational units.

I believe the CCAs are an important initial step in the right direction. My provocative conclusion is that the manned "fighter plane" as we've understood it since World War I will ultimately become obsolete. Neither the combination of speed and maneuverability as a design driver nor the emphasis on relatively close-in duels between manned aircraft appears in the concepts I'll describe. Missile maneuverability and speed already dramatically exceed what a human is capable of, and future missile launchers or carriers can have similar characteristics—if they are not manned. Tactically required decision times, especially in engagements involving more than a very small number of opposing aircraft, will eclipse anything a human can ever accomplish. "Alone and unafraid" will not characterize aerial combat in the future. The systems carrying weapons (launchers) and the weapons (projectiles) themselves will not be alone, and inherent human capacity limitations will be an impediment, not an advantage.

In the short-range air subdomain, I see no alternative but to avoid as much as possible the long-runway dependency of current or projected crewed-aircraft conventional takeoff and landing fixed basing within range of enemy ground-launched precision missiles. Hardening, deception, rapid runway repair, and defenses (soft and hard kill), if we were willing to buy them at scale, can all improve the situation, but precision missiles will continue to make it highly problematic to operate from a small number of fixed and therefore easily targetable forward bases. Aircraft carriers can at least move back, and one can talk about using their mobility to do tactical "raids," but sustained carrier operations within range of shore-based missiles are equally problematic. An obvious alternative is the one the Marine Corps has adopted: short takeoff and vertical landing concepts like the Harrier and F-35B. This is a current option, not a future of warfare potential, but it does point us in the direction of flexible, proliferated, and concealable basing for the forward air domain assets.

If we accept this, what should the missions be for a future tactical short-range air domain force, and how might they be accomplished?

Classically, we would talk about missions like offensive and defensive counterair, strike, interdiction, and close air support, as well as a number of supporting functions or tasks like ISR, EW, the suppression of enemy air defenses (SEAD), operational-level or above-air defense, and airspace management. What I would propose for the future is off-loading as much of these tasks as possible to other domains, especially space, and focusing the forward-based assets in the concept on efficiently delivering weapons against air and surface targets of interest, while achieving enough resilience that attrition levels are acceptable.

Jud McCrehin/staff

As Secretary of the Air Force, Frank Kendall made Tactical Air Dominance one of seven "operational imperatives," and championed development of unmanned fighters.

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MC Seaman Dustin Drake/USN

For the short-range air subdomain, Kendall argues, I see no alternative but to avoid as much as possible the long-runway dependency of conventional fixed-wing aircraft. "An obvious alternative" is the Marine Corps F-35B, a short takeoff and vertical landing jet, that can operate without a standard runway.

Integration and optimization using AI tools would also be part of a future concept but focused on enabling sound automated decisions at the operational edge at the tactical level. AI would also be used to support higher-level operational decisions and decisions for the force as a whole, where human interaction is more viable and valuable.

What I envision here for the shorter-range air subdomain is a clean-sheet-of-paper force design. A future tactical air dominance organization with the missions of providing offensive and defensive counterair and strike (including interdiction and support to ground operations and units), would consist primarily of a group of unmanned stealthy tactical aircraft with modest runway requirements serving as weapons launchers. These reusable UAVs would have the core function to operate collaboratively and autonomously in small formations of nominally squadron size (tailored to the operational mission) to deliver weapons against aimpoints or targets designated by off-board sensors. Targets directly relevant to controlling the air domain would include enemy aircraft, air bases, and air defense units.

This force would also deliver munitions against ground or sea surface and subsurface targets of interest in support of operations in other domains. ISR, including targeting for both air and ground targets, would come primarily from a combination of space, standoff air, and some ground-based sensors, but as much as possible from sensors and C3 located in space. (In the near term, a mix of air- and space-based surveillance is needed. The Air Force E-7 program, which was intended to replace AWACS, would provide that capability and offer increased resiliency and redundancy while space-based capability matures. It would also provide critical C3 and battle management capacity.)

Standoff or penetrating unmanned aircraft would provide ISR information as well. Efficiency in the concept comes from relatively inexpensive multirole unmanned weapons carrier aircraft (launchers) that can operate with acceptable attrition rates, and from the ability of resilient space-based assets to provide wide-area threat coverage and timely targeting quality information. Survivable C2 at various echelons would provide optimized weapon-target pairing and tactical cooperation among sensors, UAVs (launchers), and weapons (projectiles). Some UAVs could also be employed as decoys and threat weapon "magnets" to draw enemy engagements, thus forcing exposure, reducing threat weapon loads, and forcing premature operational and tactical commitment of threat assets. In addition to weapons, some of the tactical UAVs could carry decoys and/or countermeasures, including anti-radiation missiles, sensors, and EW modules. A key to cost-effective concepts is deciding what part of the concept is reusable and what part is expended in use. It's the multi-sortie capacity and resilience against attrition that justify the high cost of current tactical aircraft. Uncrewed concepts can rebalance to lower-cost reusable platforms. (The very-low-cost drones that have proliferated in Ukraine are at the opposite extreme in cost and reuse.)

Once the need to try to keep every platform and pilot safe as much as possible is out of the equation, a whole new range of tactical options opens up. Operational analysis and simulations of CCAs have confirmed this. Heavy reliance on off-board sensors allows operation from greater standoff range for air-to-air weapons. Of course, adding range will raise the cost of those weapons. For the air-to-air problem in this domain, some sensing and countermeasure capability will probably be needed on the tactical weapons launcher UAVs. Passive sensors, working in bistatic and multistatic modes, would be attractive options to consider from a cost perspective. At this point, I would particularly try to solve the close-in air domain ground attack problem without relying heavily on target acquisition sensors located on the weapons delivery tactical UAV launchers. This might become necessary, but it significantly increases cost. It also means that those platforms, or a subset of them, have to operate close enough to acquire targeting quality threat data on ground targets from operational altitudes, a few tens of thousands of feet and with limited standoff ranges, implying much more challenging survivability features. This is the route to an unmanned progeny of the F-35—a penetrating multirole aircraft capable of operating independently.

If it is possible to rely on off-board space-based ISR plus a small number of penetrating, survivable, dedicated ISR plat-

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forms, this would be the preferable course of action. There is a whole new world ripe for exploration here, but the possibilities are quite different from current concepts. As the Air Force moves beyond the first increment of CCA, all these trades should be considered. (Australia is pursuing a concept that reflects my expectations and intent for CCA Increment 2—the Ghost Bat—developed with Boeing.)

Humans would be involved in C2, preferably at the equivalent of wing level, but possibly, and I think more likely, at squadron level, the numbers would be small, but multiple shifts would be required to support continuous operations. In the "next" force currently in development, crewed fighters provide tactical control of associated CCAs. Experimentation in simulators over the last few years has demonstrated that pilots in current fighters can control several CCAs simultaneously.

For reliable command and control, and because of the much better sensors they provide, I would expect teams of CCAs and crewed fighters to be the preferred configuration for the next several years at least. These C2BM cells, airborne or ground-based, would be high-value targets to an adversary, so tactics to provide resiliency and concealment would be of great importance. For the short-range air subdomain concept, I would expect these C2 cells ultimately to be ground-based, but limitations on communication networks might dictate airborne battle managers. For redundancy, some command and control might have to be airborne, but with as much standoff range as possible. For resiliency, it would be wise to have both options available in each case.

The job of command and control cells is to exercise human executive control over operations at the echelon where it becomes both necessary and practical. It can become necessary due to vaguely understood sensitive situations and to the limitations of communication networks, data integration, and force management algorithms. It can become practical where the speed needed for decision-making is relaxed enough that inserting humans is an acceptable time burden. The force concept would also include rapid refueling and rearming—also highly automated—to maximize sortie generation. Human fatigue should generally not be a factor that constrains operations.

For the shorter-range fight, forward air and missile defenses would be mobile and designed to support preferential defense of regional assets, both military and other high-value assets. Space-based and standoff airborne sensors would provide targeting and tracking data to support launch on warning or launch based on remote sensing depending on the threat. Operationally, air and missile defense systems would dynamically integrate subsets of sensors and launchers to optimally respond to an attack in real time. Ground-based launchers and sensors would be operationally mobile on short cycle times to enhance survivability. Directed energy is a possibility, but weather, threat hardening, and other factors make this questionable anytime soon against threats other than small UASs. Hardening and deception would be used extensively as would soft-kill (jamming and cyber) countermeasures for defense. I would envision at least a two-layer ground-based air defense arrangement with a higher-altitude regional or area defense coverage plus a terminal defense layer.

C3BM and airspace management would be fully integrated, and deconfliction between friendly air- and ground-based air defense would be significantly enhanced over current practice due to the elimination of concerns about human losses through fratricide. In my view, all air domain operations (offensive and defensive counterair and air defense) should be controlled by a single command using one highly automated C3BM system.

Both the short-range air dominance and the air defense concepts described should be subject to a host of design trades attempting to get the optimal mix and distribution of features across the elements of the force. These trades must include every design variable, but they will be driven primarily by cost and anticipated exchange ratios and other factors described earlier that determine operational effectiveness.

Frank Kendall *was the 26th Secretary of the Air Force from 2021 to 2025. Over the preceding 40 years, he held multiple jobs in the Pentagon, including as Assistant Deputy Under Secretary for Strategic Defense Systems, Deputy Director of Defense Research and Engineering, and Under Secretary of Defense for Acquisition, Technology and Logistics.*

James West

Secretary Kendall experienced autonomous flight firsthand aboard the X-62 VISTA, a modified F-16 operating with autonomous flight software. Sitting in the front seat for the hour-long flight out of Edwards Air Force Base, Calif., he experienced speeds over 550 mph and close-in flying conditions, operating within 1,000 feet of a human-piloted F-16.

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AFA IN ACTION

By Bob Hill

Steele Chapter Supports New Food Pantry

The Joint Base Anacostia-Bolling (JBAB) Food Pantry celebrated its first year of serving military-connected families throughout the National Capital Region. Sponsored by the JBAB Top 3 Council and supported by the D.W. Steele Sr. Chapter of the Air & Space Forces Association (AFA), volunteers, donors, and community partners, the pantry has become a vital resource for Airmen, Guardians, service members, federal employees, and their families.

"The Air & Space Forces Association exists to advocate, educate, and support," said Steele Chapter President Darian "DJ" Padilla. "Supporting the JBAB Food Pantry is one of the most meaningful ways we can fulfill that mission. By helping military families during challenging times, we strengthen readiness, resilience, and the sense of community that makes our Air Force and Space Force stronger."

During its first year, the pantry recorded more than 1,601 visits and expanded its reach through monthly Capital Area Food Bank Mobile Markets. Together, these efforts distributed more than 64,000 pounds of food, helping military-connected families cope with financial hardship, and periods of federal pay uncertainty.

The Steele Chapter has been the pantry's largest organizational supporter. Through grants from United Forces & Families program and matching chapter contributions, the chapter provided $6,000 in direct financial support during the pantry's first year. Chapter members also donated hundreds of pounds of food, commissary gift cards, and additional financial contributions to help keep pantry shelves stocked. The partnership reflects AFA's commitment to supporting Airmen, Guardians, and their families through local initiatives that directly strengthen quality of life and mission readiness.

The pantry proved especially valuable during the fall 2025 federal government funding shutdown and the spring 2026 Department of Homeland Security funding lapse.

Megan Rowley, pantry volunteer and Steele Chapter vice president military family matters, reflected on the pantry's first year of service.

AFA

Master Sgt. Ignacio Zamora of the Joint Base Anacostia-Bolling, D.C., Top 3 Council presents a community partner plaque to Megan Rowley, the Steele Chapter's vice president for military family matters and Bob Hill, Steele Chapter secretary.

"What began as advocacy around an observed need became a reality because of dedicated partners, volunteers, and leaders willing to listen and act. This year was only possible because of people like you. I am deeply grateful for all we have accomplished together and look forward to continuing this important work in the year ahead."

AFA Grant Supports Air Force Missileer Hall of Fame

The Air & Space Forces Association awarded a grant for new digital displays of the Air Force Missileer Hall of Fame at selected museums.

The grant, awarded by AFA's History & Heritage Committee, supports the Association of Air Force Missileers' Hall of Fame, which recognizes individuals who made significant contributions to Air Force missile heritage. The first members were announced in 2024.

Jim Simons, a former AFA vice chair of the board for field operations, identified the need for funding and worked to find a way to support installing electronic screens at the Strategic Air Command Museum in Nebraska and the National Museum of the United States Air Force in Ohio.

Each display will feature a honoree's photo and a summary of the accomplishments that led to their selection, with users able to search for specific individuals or browse the full list.

Airman 1st Class Teniya Caldwell

The blast door of a launch control center frames U.S. Air Force nuclear and missile operations officers assigned to the 490th Missile Squadron during an alert handover at Malmstrom Air Force Base, Mont., April 11, 2026.

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AFA Nominees
2026-2027

CANDIDATES FOR NATIONAL OFFICERS AND DIRECTORS

The Air & Space Forces Association Nominating and Governance Committee met by video conference in April 2026 and selected eight candidates to send forward for open National Officer positions and National Director positions on the Board of Directors. The Committee consists of a Chair and Vice Chair of the Committee, as well as the two current Vice Chairs of the Board and at least three actively serving AFA Directors. The Chair and the Vice Chair of the Committee shall be the two most recent past serving Chairs of the Board, unless the Board determines to elect a different Chair or Vice Chair by a majority vote of the Board.

VOTING WILL TAKE PLACE FROM

3:00 p.m. EST, Saturday, Sept. 12 - 12:00 p.m. EST, Sunday, Sept. 13.

Authorized delegates can cast their vote anytime, electronically, during this period.

VICE CHAIR OF THE BOARD, FIELD OPERATIONS

Chris Canada, Bellevue, Neb., is nominated for a second term as Vice Chair of the Board, Field Operations. Chris Canada joined AFA in 1980 through the Arnold Air Society and became an AFA Life Member in 1985. For the past 15 years Canada has served in elected Field Leader roles such as: Chapter Executive Vice President and President, served as two state Presidents, Region President for six years, and currently as Vice Chair of the Board for Field Operations. His AFA committee experience includes: Nominations; Bylaws; Awards; Nominating & Governance; and Executive, AIMS Steering Group, and the Field Council for five years prior to chairing it for the past three years. Canada's AFA service has been recognized with the Medal of Merit, Exceptional Service Award, and the Chair's Citation. He served in the Active-duty Air Force for 28 years as an aviator accumulating over 5,600 flight hours in 14 mission design series aircraft, as a staff officer at the Numbered Air Force, Major Command, and Joint Combatant Command levels, as a Commanding Officer at three levels, and as a Senior Military Advisor. Retiring from the Air Force in 2013, he continues defense service as a Senior Analyst at HQ U.S. Strategic Command. Canada was commissioned through AFROTC at the University of Tennessee.

Janelle Stafford, Shawnee, Okla., an AFA member for over 20 years, has held numerous AFA positions including National Director, Region President, and roles serving on the Strategic Planning, Membership, Advocacy, and AIMS Steering Committees, as well as Chapter President, Vice President, Secretary, State President, and Treasurer. She currently serves as National Director, Central Area, serves as Chair of the Membership Committee, Co-Lead of the Emerging Leaders Program, and sits on the Field Council, Advocacy, and AIMS Steering Committees. AFA Awards encompass Chapter and State Community Partner of the Year (2017 to 2020), AFA Medal of Merit and Exceptional Service Awards, Chapter Officer of the Year, Chapter and State Person of the Year, and National Member of the Year (2024). Stafford has nearly 25 years in the aerospace and defense industry, with strong ties to Tinker Air Force Base and Oklahoma's defense sector and believes in increasing membership and chapter participation, as well as increasing the involvement of younger members in our Chapters and Association.

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NATIONAL DIRECTOR, EAST AREA

Two National Director, At Large positions are open and each will be elected for a three-year term.

Linda McMahon, Yorktown, Va., an AFA Life Member, has held numerous AFA positions, including Virginia State President, Vice President for the Central East Region, Chapter President of the Steele Chapter, and as a member of the Field Council's Field Leadership Development Subcommittee, Field Tech Subcommittee, Nominating Committee, Region Presidents Subcommittee, and Space Working Group. She currently serves as Central East Region President and sits on the Education Council, Field Council, and the Heritage Committee. McMahon expertly led Virginia's AFA organization through the pandemic, extending her tenure as State President for an additional year when the State President-elect decided not to take the role, and was recognized with the AFA 2022 Member of the Year award. She is a former Arnold Air Society/Silver Wings member and strongly supports today's AAS/SW members as future AF/SF officers and AFA members.

NATIONAL DIRECTOR, AT LARGE

Two National Director, At Large positions are open and each will be elected for a three-year term.

Mark Douglas, Williamsburg, Va., an AFA Life member, is nominated for a second-term. Douglas graduated from the U.S. Air Force Academy with a degree in military history and he also earned his masters in airline operations from Embry-Riddle Aeronautical University. He served 22 years in the U.S. Air Force before retirement as a lieutenant colonel, flying as an EC-130 Aircraft Commander and Instructor Pilot and serving in command and staff roles, including Commander of the 505th Training Squadron and Deputy Commander of the 505th Training Group. Douglas also served as lead planner for air component post-conflict planning during Operation IRAQI FREEDOM. He served as AFA's Langley Chapter President, as state Aerospace Education Vice President, and Chapter Executive Vice President and Secretary. In 2016, he received the AFA Medal of Merit. Douglas, now serves in the Defense industry.

Taona Enriquez, Indialantic, Fla., is nominated for a first term, and is an AFA member whose connection to the Association began in 2012. Enriquez has made it a priority throughout her career to bring Airmen, civilians, enlisted personnel, officers, and spouses to AFA gatherings to provide future leaders direct exposure to senior leadership. She retired from the United States Air Force in September 2024 after 23 years of distinguished service, including roles as: Commander at Hanscom AFB, Mass., overseeing a $175M annual operations budget and liaising for four Program Executive Offices; Director of Contracting at Hanscom, leading a 525-member organization supporting a $43 billion portfolio; as a Defense Legislative Fellow; and as Aide-de-Camp to the Commander of USAFE/AFAFRICA. She currently serves as Founder and CEO of Space Coast Solutions, LLC, driving strategic growth for innovative technology and defense firms. Enriquez holds a Masters of Public Administration from the University of New Mexico and a Graduate Certificate in Congressional and Legislative Affairs from Georgetown University.

Todd Freece, Oviedo, Fla., is nominated for a first term. He currently serves as National Director, East Area, and has previously served as a Chapter President. Freece holds three master's degrees from the Naval War College, USAF Air Command and Staff College, and Troy University. He spent more than 26 years as a USAF officer with positions at all levels across a diverse set of organizations and assignments including Astronautical Engineer, Space Operations Officer, and Commander. His awards include: Best Electronic Warfare Squadron of the Year and the Bernard Schriever Fellowship Award for Outstanding Support to Military Operations. Following his service, Freece led the Continuing Education and Professional Development Department of the University of Central Florida which focused on professional certification & workforce education/re-education to expand opportunities. He is also the AFA Florida State and Region President and is currently working as a consultant.

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Bill Harding, El Segundo, Calif., an AFA Life Member nominated for a second term, has held numerous AFA positions including President of AFA's Schriever Chapter, helping lead the chapter to be named AFA's Outstanding Large Chapter in 2022, and co-chair of AFA's Space Working Group for more than two years. He currently holds the position of National Director, at Large. The Space Working Group was instrumental in providing AFA leadership with insight into space issues and influencing the ultimate rebranding of AFA to the Air & Space Forces Association. Harding served in the Air Force for 28 years and currently works as an independent consultant, continuing to prioritize AFA volunteer service because he believes in the mission.

Paul Weseloh, San Antonio, nominated for a first term, is an AFA Life Member. He is a retired Chief Master Sergeant with 29 years of Active-duty Air Force service. Weseloh is a past Texoma Region President, Texas State President, Alamo Chapter 234 President, and a 2015–16 Emerging Leader. He previously served AFA on the Emerging Leader Subcommittee, Field Council, and Field Leadership Development Team. His awards include the AFA Texas Medal of Freedom, AFA Texas Member of the Year, AFA Medal of Merit, AFA Exceptional Service Award, and the AFA Chairman's Citation. An intelligence analyst by training, he has extensive experience in intelligence, surveillance, and reconnaissance. He holds both a bachelor's and a master's degree from American Military University, where he majored in International Relations and Conflict Resolution. Weseloh deployed in support of Operations Desert Shield, Northern Watch, and Enduring Freedom. His military decorations include the Legion of Merit, the Defense Meritorious Service Medal with one Oak Leaf Cluster, and the Meritorious Service Medal with seven Oak Leaf Clusters. He is currently a Department of the Air Force civilian serving as Director of Safety for a Numbered Air Force at JB San Antonio-Lackland, Texas, responsible for the safety program which encompasses aviation, space, weapons, occupational, and risk management for more than 49,000 Airmen worldwide.

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HEROES AND LEADERS

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

Carl A. Spaatz

The USAF's first Chief of Staff.

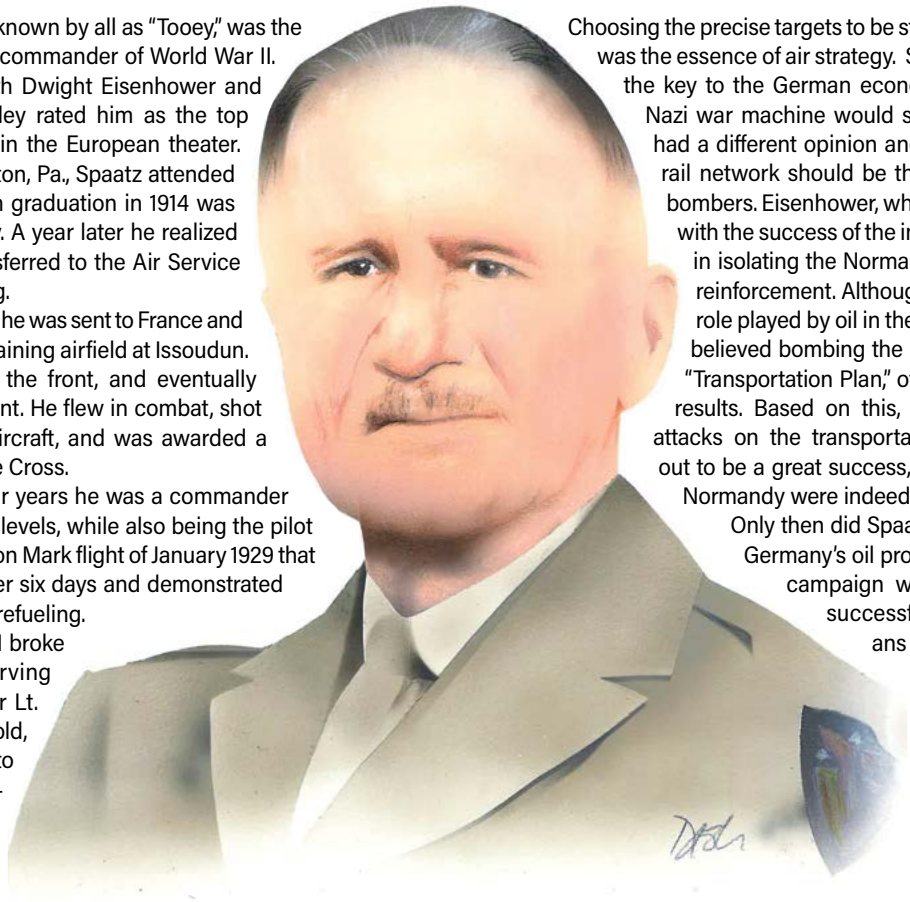

Illustration by Dash Parham/photo resource: USAF

Carl Spaatz, known by all as "Tooey," was the top U.S. air commander of World War II. Indeed, both Dwight Eisenhower and Omar Bradley rated him as the top combat commander in the European theater. Born in 1891 in Boyerton, Pa., Spaatz attended West Point, and upon graduation in 1914 was posted to the infantry. A year later he realized his mistake and transferred to the Air Service to attend pilot training.

During World War I, he was sent to France and put in charge of the training airfield at Issoudun. He wanted to go to the front, and eventually finagled an assignment. He flew in combat, shot down two German aircraft, and was awarded a Distinguished Service Cross.

During the interwar years he was a commander and staff officer at all levels, while also being the pilot on the famous Question Mark flight of January 1929 that remained aloft for over six days and demonstrated the promise of aerial refueling.

When World War II broke out, Spaatz was serving on the Air Staff under Lt. Gen. Henry "Hap" Arnold, but was soon sent to Europe. Initially in England as Eighth Air Force commander, he then moved south to command the American air forces for the invasion of North Africa. The Allied commander, Eisenhower, thought highly of him, so when he headed to England as supreme commander for the D-Day invasion, he brought Tooey with him.

It was then decided to form an unusual command echelon. Unity of command is a principle of war, but with the advent of aircraft that possessed range and speed dwarfing movements on the surface, new ideas and interpretations were needed. The Eighth Air Force was based in England, while the Fifteenth Air Force was based in Italy, two separate theaters commanded by two different men, but both air forces had the mission of bombing Germany. Believing that unity of command over the target area was more important than unity over the basing areas, a new organization was formed—United States Strategic Air Forces. Spaatz, now a three-star and soon to become a four-star general, was given command and thus was instrumental in directing the strategic air campaign over Europe. Although in that position he reported directly to the Combined Chiefs of Staff, Spaatz readily put the bombers under Eisenhower's targeting direction for the Normandy invasion.

One key to the strategic bombing campaign was targeting. Simply because aircraft now had the ability to attack virtually anything within an enemy country did not mean it should attack everything. Choosing the precise targets to be struck and in what order was the essence of air strategy. Spaatz believed oil was the key to the German economy—without fuel, the Nazi war machine would simply halt. The British had a different opinion and thought the enemy's rail network should be the prime target for the bombers. Eisenhower, who was most concerned with the success of the invasion, was interested in isolating the Normandy area from German reinforcement. Although recognizing the vital role played by oil in the German war effort, he believed bombing the railways, known as the "Transportation Plan," offered more immediate results. Based on this, Eisenhower opted for attacks on the transportation system. It turned out to be a great success, and German forces in Normandy were indeed isolated and cut off.

Only then did Spaatz focus on destroying Germany's oil production. That bombing campaign was also tremendously successful, and most historians now believe the combination of destroying both the German rail network and its oil industry was decisive in defeating Germany. The Army next sent Spaatz to the Pacific to command the strategic air forces there, and he was in charge when the atomic bombs were dropped on Japan.

When the war ended, Spaatz returned to Washington to take command of the Army Air Forces—Arnold had suffered four heart attacks during the war and was ready to retire. From this position, Spaatz took on the unenviable task of seeing the air arm demobilized—although disintegrated would perhaps be a more appropriate term. By then it was also apparent that given its dominant role in the war—in both Europe and the Pacific—the Air Force should become an independent service. In 1947, President Harry S. Truman directed the services to come together under a unifying Department of Defense, and the National Security Act made that so, despite Navy objections. This occurred in September 1947 with passage of the National Security Act.

Just eight months later, Spaatz elected to retire. He had enjoyed a very successful career at all levels getting things done in a quiet and unostentatious manner. Arnold commented that Tooey was the only major commander he knew who never made a serious mistake.

Spaatz did not write his memoirs, but there are two excellent biographies of this worthy Airman: David R. Mets, ***"Master of Airpower"*** (Presidio, 1988), and Richard G. Davis, ***"Carl A. Spaatz and the Air War in Europe"*** (Office of Air Force History 1993).

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