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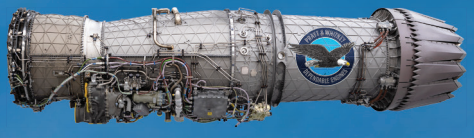

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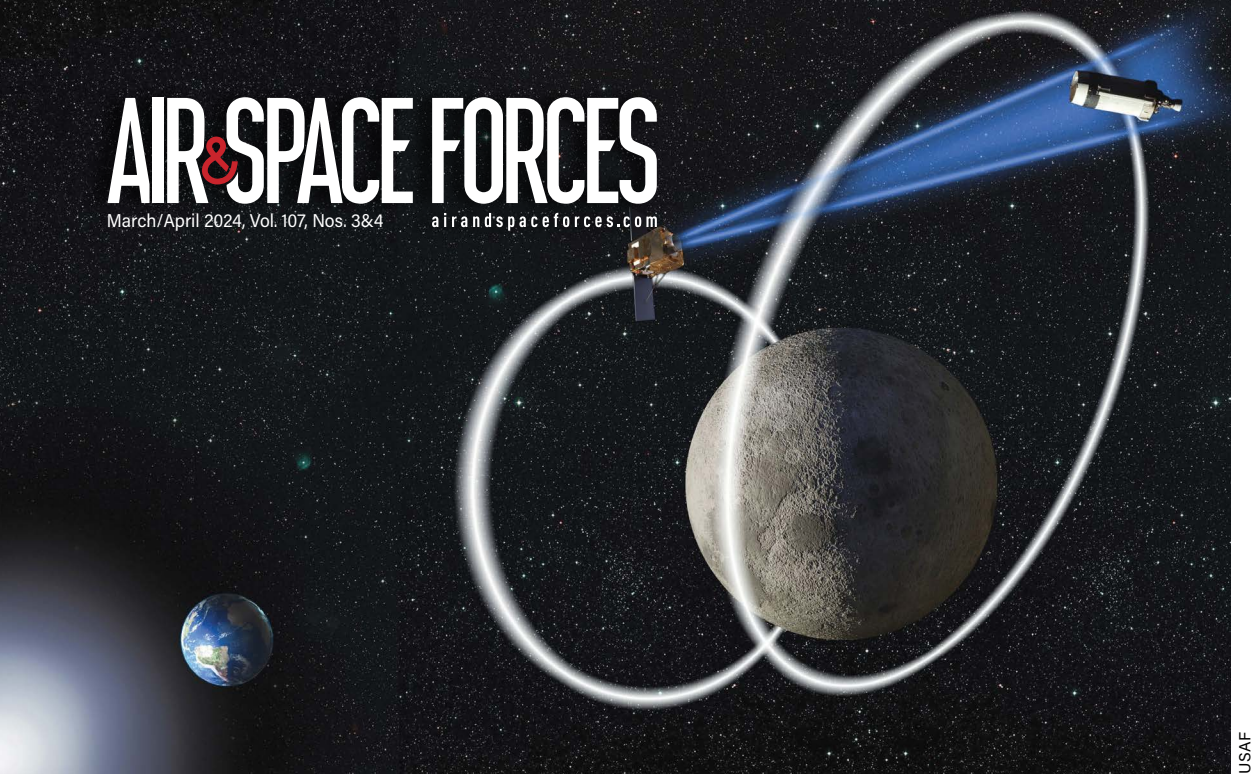

USAF

An Air Force Research Laboratory Oracle spacecraft, shown in a conceptual illustration, observes the region near the Moon. See "Why Cislunar Space Must be a Space Force Concern," p. 43.

DEPARTMENTS

FEATURES

ON THE COVER

Staff Sgt. Jessica Montano

Air & Space Forces Magazine enjoyed a rare press visit to the CAOC in February. Photos there are rarer still.

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EDITORIAL

By Tobias Naegele

Change and Shortchanged

Anticipation was high and the crowd was oversized as the AFA Warfare Symposium opened in February. Department of the Air Force leaders had been meeting daily since September to "re-optimize" the Air Force and Space Force to better compete with China.

Now, as the Secretary, two service chiefs, and undersecretary took the stage, more than 4,000 people crowded the ballroom. Thousands more tuned in for the livestream.

Over the next 60 minutes, one after the other, each made the case for overhauling how the services organize, train, and deploy operational forces, plan for and develop future weapons, retain, and attract technical talent, and ensure optimal operational and institutional readiness in the face of growing competition from China.

Supported by dozens more senior leaders, they spent the next two days drumming home the urgency and purpose of changes that will affect every member of the forces, no matter how junior. It was an electric moment and the buzz coming out of the conference magnified the excitement. After years of talk, the conversation had shifted from accelerating change and increasing agility to clear and specific actions.

Among the announcements:

■Realigning Air Force Major Commands, including renaming Air Education and Training Command as the Airman Development Command, with broader responsibilities; creating a new Integrated Capabilities Development Command to accelerate future weapons development; elevating Air Forces Cyber to a direct-reporting unit under the Air Force Chief of Staff; and giving Air Combat Command wider scope of responsibility for readiness across the force.

■Wings are back as the Air Force's units of action, a clear recognition that two decades of rotational deployments rendered much of the Air Force unprepared to pick up and go to war tomorrow; also back are spot inspections and readiness drills, throwbacks to the Cold War era that are once again relevant in an era of peer competition.

■Squadrons will be the Space Force's comparable units of action, and though they deploy in place, they too will cycle through operational and training rotations in order to maximize readiness.

■Warrant Officers are making a comeback in the Air Force as a specialized career track, initially for cyber and perhaps related information technology fields, but maybe later to other fields as well. This provides a means to pay and retain a corps of cyber specialists without having to take them away from their keyboards and screens—and to better compete in a world that cant produce enough of such talent.

■A new Space Futures Command, comprised of the Space Force's key technical centers, will focus on future systems and strategy development in space, where Russia now appears poised to deploy a nuclear weapon and where China and Russia have teamed up to focus on the moon in clear competition with the U.S. and its allies.

In all, 24 changes were released, and further details and adjustments will continue over the coming months.

And then the balloon seemed to burst. When the Pentagon released its fiscal 2025 budget request exactly one month later, reality descended like a de-orbited spacecraft plunging through the atmosphere.

All that readiness and deterrence costs money.

Approaching the half-way point in fiscal 2024, the Pentagon was still operating on Congress' third Continuing Resolution since Oct. 1, and the 2024 budget has not yet to been approved, yet here we were perusing a 2025 plan that was, like the Grinch's heart, two sizes too small.

The four-year-old Space Force, which like any good preschooler should still be on a high-protein diet for rapid and expansive growth, sustained a 2 percent funding cut; the Air Force, trying to recover after being starved of modernization funds for a generation, eked out a scant 1 percent increase.

That's looking at the bright side. After accounting for 3.4 percent inflation, both services suffered substantial losses.

While the Air Force budget finally surpassed the Army's—for the first time in 32 years—it was cuts to the Army rather than additions to the Air Force that made that possible. Indeed, USAF had to slash investment in new aircraft and weapons by $2.1 billion—5.9 percent—including cutting planned F-35A purchases by six jets, from 48 to 42, and cutting planned F-15EX buys from 24 to 18 jets. Munitions, always a convenient bill-payer—until war needs show there aren't enough weapons in stock and so they must be rationed—also took a hit.

So did combat capacity. The Air Force wants to retire some 250 planes of all sorts, while buying just 91 new aircraft—none of which will be flyable for another two to four years. For the first time in its history, the Air Force will dip below 5,000 aircraft—extending its decline as the oldest and smallest Air Force in America's history.

In contrast, China's military and airpower are growing, and its 2025 military budget is set to rise 7.5 percent.

Leaders will tell you that help is on the way. More F-35 fighters, new B-21 bombers, a super-secret Next-Generation Air Dominance family of systems, new autonomous Collaborative Combat Aircraft, a future stealthy refueling tanker known as NGAS, the new T-7A jet trainer, a host of new sensor-to-shooter integration technologies under the rubric of Combined Joint All-Domain Command and Control (CJADC2), and the Sentinel ICBM replacement—perhaps the most expensive military program ever.

We can't buy ... capability on a 1 percent budget increase.

But we can't buy that capability on 1 percent annual budget increases. Secretary Frank Kendall is focused on ensuring new capabilities can be developed in the future, and that is great—provided we buy enough, fast enough that we can deter China's worst instincts in the Pacific. He's trying to preserve the seed corn, but the future is threatened by drought and locusts.

"Change is hard," Kendall says with some regularity. "Losing is unacceptable." But in the budget discussion, another truism applies: "You snooze, you lose." It's time to wake up our country to that fact.

Three decades of underfunding and deferred modernization have left the Air Force ill-equipped for peer conflict, and there's only one way to fix that: Spend big.

The Air Force has overcome such deficits before. Just 50 years ago, in the wake of the Vietnam War, our Air Force was old and broken and not up to the Soviet challenge. But a generation of innovative Airmen answered the call, developing new aircraft, weapons, and training and altering the course of history. From the 1970s through the 1990s, America introduced the F-15 and F-16 fighters, the stealthy F-117 Nighthawk, the B-1 and B-2 bombers, the Global Positioning System satellite constellation, and laser- and GPS-guided weapons. These, together with new tactics and operating concepts, generated a true revolution in military affairs.

Properly funded, we could be on the cusp of another, similar revolution today. The new technology and concepts in the offing—manned-unmanned teaming, CJADC2, space-based moving target indicators—will raise the cost of both competition and conflict for our adversaries. It may well deter them in the future. But only if our leaders make the investment.

Somehow, this imperative is absent from our national politics. It shouldn't be. In a contentious presidential year, the candidates should debate how they intend to solve this puzzle. We must demand they do.

LETTERS

Alert Status

The article "Extending Endurance for Pacific Conflict" [January/February, p. 40] generated a lot of concern for me. Nowhere in the article was there a mention of the use by Air Mobility Command of highly effective, predictive modeling of fatigue effects. It was a Brooks City-Base, Texas (formerly Brooks Air Force Base) research division of the Air Force Research Laboratory (AFRL) that developed the Fatigue Avoidance Scheduling Tool (FAST) software from the Army's Safety, Alertness, Fatigue, and Task Effectiveness (SAFTE) model. That division of AFRL is now the 711th Human Performance Wing, mentioned in the article.

I suspect that the cause of the omission of the use of predictive modeling is the loss of institutional knowledge that occurred when the AFRL division's branches at Brooks were closed in 2007.

The SAFTE model and FAST software were used by Dr. Bill Storm of AFRL to help B-2 crews deal with their 33- and 44-hour missions. I used SAFTE/FAST in numerous fatigue consults with operational USAF units. In addition to SAFTE/FAST, there are other carefully developed and useful fatigue and sleep prediction models available: the Sleep/Wake Predictor Model, Sweden; the System for Aircrew Fatigue Evaluation Model (SAFE) U.K.; the Fatigue Audit InterDyne Model (FAID), Australia; and the Circadian Alertness Simulator Model (CAS), Harvard.

Models such as these need to be used not only to help aircrews, but also to help the operations and maintenance personnel who work 24/7 to keep the aircrews and aircraft functioning effectively. A multitude of cases have been documented in which fatigue-induced poor decision-making has led to calamities in all transportation modes and in 24/7 control rooms and maintenance. Fatigue modeling needs to be in the fatigue management toolbox.

Maj. James C. Miller,
USAF (Ret.)
Corpus Christi, Texas

Air Force Standards

I applaud Airman Hayden Perez's gumption for formally offering his opinion on male grooming standards in today's Air Force ["Letters: Grooming," January/February, p. 4]. It's one thing to chat about it in the workplace or over lunch but quite another to compose an opinion piece destined for this fine magazine and the Chief Master Sergeant of the Air Force's social media page as well.

Airmen have been challenging Air Force dress and appearance standards since Gen. Carl "Tooey" Spatz took exception to one of his admin clerk's haircuts back in our early days.

In the 1970s I was a young enlisted man. We questioned limits on hair and sideburn length and moustache width. Like many of my enlisted contemporaries, I protested by trying to game the system at every turn.

Later as a technical sergeant, my senior master sergeant supervisor took me aside and told me that his boss, Capt. K., said I needed to trim my moustache. It had been almost as obvious as the nose on my face for months that the ends of my 'stache were past the vermilion of my mouth. I worked in a well-traveled administrative area, yet the fact that it took an Air Force officer to point it out speaks volumes of the attitudes at the time.

That said, we didn't have failure "to promote an inclusive environment" to hang our hats on back then. It was all about just

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trying to look like a civilian when off-duty.

Airman Perez states that, "current restrictions on hair length and the prohibition of earrings for men appear inconsistent with the principles of equality and diversity embraced by the Air Force." He opines that today's grooming standards are outdated, discriminatory, stereotypical, prejudicial and disrespectful. Today's standards just don't fare well against today's "contemporary values." That's code for I just want to look like a civilian. Then why did he enlist?

Airman Perez could get his wish. In our current environment anything is possible. That doesn't make it appropriate or in the best interest of the Air Force. Whatever happened to maintaining "good order and discipline" or is that an outdated concept as well?

Col. Bill Malec,
USAF (Ret.)
O'Fallon, Ill.

Airman Hayden Perez's letter will no doubt receive significant replies from a host of officers and NCOs, both retired and active, and it should. Missing in Airman Perez's statements about grooming standards, and his belief they should be relaxed, was any mention of Air Force mission goals and requirements. His entire focus was on diversity, as though that is an Air Force mission standard. Is it? I sincerely hope not, or else the Air Force has sadly lost its focus on warfighting, much less winning wars.

Air Force grooming standards, as they have existed since the foundation of the force, have been about warfighting. Shorter hair length makes grooming in the field, and wear of essential equipment, far easier and quicker. In basic training, whether for enlisted or officer candidates, there remains an emphasis on early rise and quick preparation for the duty day. This was to educate the young to prepare them for duty in the field, where sleep is a luxury, and duty days very long and arduous.

If nothing else, anyone who refused to accept this timeline identified themselves as someone who perhaps doesn't belong in the Air Force.

This is because, in combat, there is an enemy out there dedicated to killing you, so they can secure victory through your defeat! To beat them and secure victory, our Airmen must perform better than them, must outlast them, and must defeat them.

The mission of the Air Force is to fly, fight, and win. It is not to engage in diversity sessions focused on creating different standards of personal grooming in the interest of placating a myriad of diverse cultural standards. Given this Airman's rank, one must surmise he has about six months of total service experience. He seems to have much to learn.

Perhaps reading the replies of many officers and NCOs, written largely by those who retired after careers that saw many combat deployments, might help him better understand the nature of his chosen profession.

Maj. Ken Stallings,
USAF (Ret.)
Douglasville, Ga.

Reading the letter by Airman Perez on the state of grooming standards has encouraged me to reminisce on my own experiences and maybe enlighten a younger generation on how bad life was under the old 35-10 oppression. I served as an RF-4 pilot at RAF Alconbury, U.K., from 1974-1976.

Being aware of 35-10 standards as a new second lieutenant pilot in USAFE was one thing, but experiencing the lengths of how this one regulation was used by command, was often career impacting, and many times comical.

The "no call, pilots brief." Our esteemed wing commander called for an all-hands pilots standdown brief one afternoon. As we all sat in the large briefing room awaiting enlightenment, the wing commander slipped in the back door with pencil and paper and took notes on which pilots had hair out of limits.

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After he left, his deputy announced the meeting was over.

"The perils of the podium." There was an all-day instrument class requiring all pilots to take a test and receive a certification for flying. I was encouraged to sign up as an instructor for OER (officer effectiveness report) fodder and command-level visibility. I had a one-hour block on Radar Precision Approaches. I did my thing for several days with one class having the wing commander in attendance. Several months later, I was briefed on my OER by my squadron commander. I noticed that my score on "Professional Qualities" was downgraded. When I asked why, my commander looked sheepish, and said when I taught at the instrument school several months prior, the wing commander noted that my sideburns weren't the same length. They were within limits but not exactly the same length. Of course there was no way to challenge this, and my commander was directed to downgrade my OER.

"The great military clothing scandal." Our military clothing sales were tucked in a corner of the exchange. On display was a mannequin modeling a Class A uniform with the rank of colonel. Then the Operational Readiness Inspection (ORI) descended upon us like a plague of locusts and stress. The way it came down was when a jet showed up on final and announced, "This is an ORI and you are now directed to execute."

The inspection team went to work over the next week and left no stones unturned. When it came time to tear through the exchange, the base received a write-up that the clothing sales' mannequin was modeling a uniform while the mannequin's hair was out of 35-10 standards.

Now, our base barber shop had the poor mannequin's head on the counter for a month while they tried to determine how to give him a 35-10 haircut. After the job was done, all the pilots took note that the mannequin was now on duty, but reduced in rank to an enlisted. The wing commander struck again.

And all this was happening as we routinely had pilots from Denmark stop by in their F-104s for an out and back cross-country jaunt. They'd show up at the Officers Club for lunch, sit down for a burger and we all noticed what nice ponytails they sported and thought, I can't imagine what kind of pilots they must be with hair like that.

Col. Don Parden,
USAF (Ret.)
Indianapolis

The ABCs of It

The Air Force should buy an F-15EX for every F-15C and F-15E [being retired] and tell Boeing to generate them in at least 25-per-year lots.

A sufficient number of combat systems officers for the F-15EX to replace F-15E's crew members should be trained and maintained as a career field. Settling on the two-seat configuration for the F-15EX would provide for the future unmanned force control.

As they are ready, replace the Cs and Es 1-for-1. The replaced jet going to Guard and Reserve units for rehab and upgrades. This will reduce the cost per unit and provide homeland defense/backup forces using the older jets.

All the Cs should receive A/G software and equipment to provide additional attack forces.

This will allow the F-35 community to perhaps fix their program-long ECS and engine problems, as well as address their landing accident rates.

Charles McCormack
Danville, Calif.

Military Living

There is another side of military life that I have never seen publicized and which I think could be a positive factor in recruiting. I'm referring to the benefits to family life. I spent 20 years as an Air Force pilot. I married just before going to Korea in 1952 and started family life upon my return in 1953. My first stateside station was Pinecastle Air Force Base near Orlando, Fla. While there we visited many of the tourist attractions in central Florida and fully enjoyed the Atlantic coast beaches.

My next assignment was McConnell Air Force Base in Wichita, Kan., which I'll admit was a bit boring. We did visit a restored western town at Dodge City and even drove to the zoo in Oklahoma City. Meanwhile, we added two more children to our family for a total of three.

In 1959, we were transferred to Little Rock Air Force Base, Ark., and our first experience with on-base housing. It was great; a three-bedroom, two-bath ranch style home with all utilities paid (except phone) for my meager housing allowance of approximately $250. We bought a fiberglass boat with a 40-horse engine and picnicked and water-skied almost once a week for the five summers we were there. We also visited Hot Springs and the first-class entertainment there. We visited a large cave and spent several pleasant visits to Petit Jean Mountain, swimming and horseback riding.

In 1959 I was transferred to Castle Air Force Base in Merced, Calif., for B-52 training. Enroute to Castle, we stopped at Meteor Crater and the Grand Canyon, toured Hoover Dam, and spent a wonderful night in Las Vegas. From there, we went to Disneyland and Sea World of the Pacific before heading north to Merced. While at Castle, we lived in a brand-new apartment right next to the elementary school my children attended and were within sight of Yosemite National Park. We visited there and several other attractions to the north. We even drove through the General Sherman giant redwood tree seen on many postcards. We visited San Francisco, Fisherman's Wharf, the Golden Gate Bridge, and Pebble Beach golf course. And, meanwhile I learned to fly the B-52.

My wife and family got to see the rest of the northern United States as we drove all the way to Loring Air Force Base in Maine. Loring was very isolated, but the folks we met both on and off base were warm and friendly and there was a beginners' ski slope right on the base. We could rent skis, poles, and boots for only 25 cents a day. So, of course, we learned to ski. We actually made an ice rink in our backyard (on base housing) and ice-skated.

After 18 months at Loring, we were transferred to Plattsburgh Air Force Base, N.Y., another far northern base. That put us within a one-hour drive of some of the best skiing in the country. We visited Lake Placid, N.Y., where my two boys and I got to ride a bobsled down the Olympic bobsled run. WOW!!! What a thrill. And, we all skied on White Face Mountain, the same place that the Olympic skiers use, except we went a lot slower. During our four-our-and-a-half years there, we visited eastern Canada many times, saw the huge tides at the Bay of Fundy and shared a drink with Frankie Laine (for you younger folks, a very famous singer of the 1940s and '50s.) at the Playboy Club in Montreal. Because of a labor shortage in the fall and winter, my wife and several of her friends helped the local apple growers harvest their crops. As a result, we met several influential local folks and ac-

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tually got a guided tour through Expo 67 while it was under construction in Montreal.

Once at Plattsburgh, I asked the principal of my children's school if I could take them on a week's leave during regular school. We agreed and he told me that he had been very pleasantly surprised when he was assigned to the school on base. He believed that military children were not too bright, but soon learned that, instead, they were much better educated than most civilian children because they had traveled so much and seen so many things that other students only read about.

I retired from the Air Force in 1970 and people still thank me for my service and for my personal sacrifice. I thank them and, time permitting, tell them that it was no sacrifice. I enjoyed all of it. We have been places and done and seen things that most folks can only dream of. This is a part of military life that most people aren't even aware of. The retirement pay is not bad either.

Lt. Col. Alfred J. D'Amario,
USAF (Ret.)
Hudson, Fla.

Undercover

An idea for defending our facilities against these drone attacks: erect a huge tent of material over the entire camp, perhaps using the material used for golf driving ranges, then cover that with something opaque.

The enemy would be unable to select aimpoints, it would provide shade and lower temperatures over the entire camp, and any type of cheap, small drone used to attack would likely be stuck up in the netting. Larger drones that could penetrate the netting would by nature have a larger signature and therefore be easily targetable by our defenses.

This is the same concept as the "cope cages" being used by both sides in the Ukraine conflict to defend against small drones. We should assume that any of our facilities in the Middle East or Africa could be attacked the same as Tower 22.

Please pass this on to whomever you think could act quickly on this. With a crash project involving our Red Horse Civil Engineering squadrons, we could protect all our vital facilities in a few months.

MSgt. Chris Dierkes,
106th Rescue Wing, NYANG
Westhampton Beach, N.Y.

Chief Tool Nerd

Well, well … after 40+ years of life membership I am writing my first letter to you fine folks—and it's about wrenches.

Remember, always turn an adjustable wrench toward the adjustable jaw. I think your [January/February] cover page depicts otherwise.

Lt. Col. Norm Komnick,
USAF (Ret.)
Tacoma, Wash.

Editor's note: Thanks for helping us tighten the screws!

VERBATIM

More With Less

Ralph Alswang/Courtesy photo

"It's cost-prohibitive to be able to say that we're going to build enough Air Force to do it the way we did before and have air superiority for days and weeks on end. That's probably not affordable. It's also not necessary."

—Air Force Chief of Staff David W. Allvin speaking at the Brookings Institution [Feb. 28].

Just Do It

"You don't need to wait for somebody to tell you what to do about readiness. ... Start thinking now about, what do we need to do to be more ready—and then do it. You don't need to wait for that. The conflict can happen at any time, and we need to be as ready for it as we possibly can. ... Buckle your seat belt. Don't sit still. Go ahead and move forward. ... Don't wait for guidance on this. ... We don't have any time to waste."

—Secretary of the Air Force Frank Kendall on the DAF re-optimization at the AFA Warfare Symposium Feb. 14.

De-Sapping Space

"Space has been overclassified for years and I want to applaud what Dr. Plumb and the OSD staff just recently produced as far as being able to 'de-sap' a lot of our space capability. ... From an operator's perspective, the lower the classification level the better I can integrate into a fight. ... You don't want to be that person going to a combatant commander at the 11th hour with a briefcase and going, 'Hey sir or ma'am, I've got something that's going to help you with your fight.' We have got to integrate these capabilities early on into the campaign."

—Brig. Gen. Devin R. Pepper on the value of reducing the number of programs under Special Access Program (SAP) restrictions, during the AFA Warfare Symposium, Feb. 13.

Mike Tsukamoto/staff

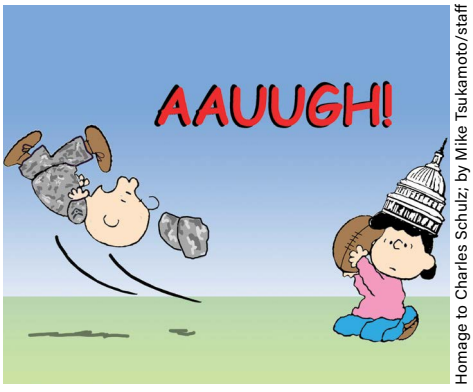
INFO OPS

"I'm not concerned about TikTok as a thing to look at videos and cats, but what I am worried about TikTok, ... is the information in the way the algorithms can push specific things to each of us ... to shape our perceptions, that type of disinformation and misinformation, that really, we're allowing ourselves to be influenced by the PRC."

—Lt. Gen. Kevin P. Kennedy, commander of Air Forces Cyber, which is being elevated to a direct-reporting unit to the Chief of Staff, in recognition of the growing role information and cyber plays in great power competition.

LUCY AND THE FOOTBALL

"Many of you have seen the famous chart of precision munitions in the first Gulf War. ... Saddam invades Kuwait, all of a sudden, production shoots up, peaks, and then two years later, plummets. People are laid off, the line shuts down. 9/11 happens, boom: 2003, peak, 2005, crash. ... It's Lucy and the football. Let's try this time not to do that. ... We're trying to be smart about this in the future ... that we have the ability to surge. It's not a new concept."



Homage to Charles Schulz; by Mike Tsukamoto/staff

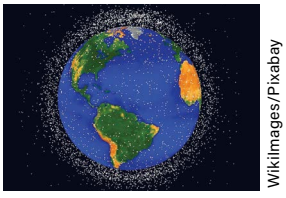
William LaPlante, undersecretary of defense for acquisition and sustainment, on the need to end boom-and-bust cycles for munitions production [March 7].

Low Blows

Mike Tsukamto/staff; Pixabay

"China's hackers are positioning on American infrastructure in preparation to wreak havoc and cause real-world harm to American citizens and communities, if or when China decides the time has come to strike. Low blows against civilians are part of China's plan."

—FBI Director, **Christopher Wray,** testimony at House Subcommittee on China, warning that China was ramping up an extensive hacking operation geared at taking down the United States' power grid, oil pipelines, and water systems in the event of a conflict over Taiwan [The New York Times, Jan. 31].



WikiImages/Pixabay

End Game

"We would potentially be looking at a cascade of collisions of defunct satellites that would render large bands of low-Earth orbit effectively unusable for all of humanity."

—Ankit Panda, nuclear policy expert, Carnegie Endowment for International Peace, commenting on Russia developing a space-based capability to attack satellites using a nuclear weapon [The Washington Post, Feb. 16].

By John A. Tirpak

Even as New Jets Remain Parked, the F-35 Program Hits New Milestones

Chris Hanoch/Lockheed Martin

The F-35 production line seen from crane monorail at Lockheed Martin Plant 4, 1 Lockheed Boulevard, Fort Worth, Texas.

The 1,000th F-35 rolled off the assembly line late this winter. It was a major program point of arrival, but there was no gala rollout for VIPs and press at Lockheed Martin's Fort Worth, Texas, plant to mark the milestone.

There wasn't even a mention.

The reason: While Lockheed continues to produce F-35s, they're being built with the Tech Refresh 3 (TR-3) hardware and software, which has yet to be proven out in flight test. The government won't accept them until that testing concludes, so the completed jets are piling up at an undisclosed location. Some 70 or so airplanes are waiting to fly off to their operational units, but the 1,000th jet, though complete, remains undelivered.

Despite that situation, the Pentagon cleared the F-35 for full-rate production in March—something of a formality since the enterprise is already operating at capacity—but one that paves the way for money-saving multiyear orders.

Lockheed and the F-35 Joint Program Office (JPO) said last year that the TR-3, essentially a massive processor and software modernization on which the F-35 Block 4 and later upgrades depend, would clear testing in "mid-2024." But in January, Lockheed CEO Jim Taiclet reported in a quarterly earnings call that "we now believe that the third quarter may be a more likely scenario for TR-3 software acceptance."

Taiclet said he expects between 75 and 110 F-35s will actually be delivered in calendar 2024, versus a goal of 156.

MILESTONE C

"Full-rate production" represents official recognition that the Block 3 F-35 has satisfactorily completed development and initial operational testing. Also known as "Milestone C," this status empowers the JPO to negotiate multiyear procurement of the F-35.

The F-35 program has "control of the manufacturing process, acceptable performance and reliability, and the establishment of adequate sustainment and support systems," according to a Defense Department press release.

The F-35 is "stable and agile, and ... all statutory and regulatory requirements have been appropriately addressed," Pentagon acquisition and sustainment executive William LaPlante said in the release. He called the fighter the "premiere system that drives interoperability with our allies and partners," and is "well-positioned to efficiently produce and deliver."

LaPlante said there's been "significant improvement" in the program over the last decade, and program leaders can now "focus on the future of the F-35, instead of the past."

Some issues remain, said Raymond O'Toole Jr., the Pentagon's acting director of test and evaluation. The program still needs to improve the test infrastructure and ensure its "readiness to test ... the upcoming Block 4 capabilities."

Multiyear procurement should enable Lockheed to get better prices from its suppliers by giving them greater certainty about future orders so they can buy materials in economic quantities. The savings should pass on to the U.S. taxpayer.

International F-35 partners, unconstrained by U.S. acquisition milestones, have already begun making what the JPO calls "block buys" of the fighter. Production Lots 18 and 19 are already being negotiated, but Lot 20 is likely to be the first in which the U.S. will benefit from the full-rate declaration.

Programs historically hit Milestone C at about the seven-year

point, but for the F-35, it took 23 years.

The delays in approving Milestone C over that period ranged from production challenges and testing deficiencies to software and maintainability issues. The final hurdle was integrating the F-35 into the Pentagon's Joint Simulation Environment, a wargaming system that helps planners find the numerical sweet spot for every combat platform in terms of force size and weapons for a given conflict scenario.

But Milestone C is in many ways moot: Lockheed and its partners are already effectively at full-rate production. The company said its factory, tooling, and workforce is sized to make 156 jets a year. That number flattens the ups and downs of U.S. and foreign orders to a steady production tempo. Building faster would require more workers, tooling and expense, and that would risk intermittent layoffs, should orders decline between peaks.

Still, Lockheed has yet to build 156 F-35s in a single year. It expects to by 2026, and to then hold steady at that number for five years, according to Greg Ulmer, Lockheed's executive vice president for aeronautics.

In a press statement, Lockheed said it was pleased with the full-rate decision, but acknowledged "production can vary from delivered jets." Milestone C does not affect [the production] rate but is an important milestone in a program's maturity."

HOW MANY JETS IN 2025?

When the Air Force released its fiscal 2025 budget request in March, the number of Air Force F-35s included was just 42, down from the 48 it had planned to acquire in last year's Future Years Defense Program (FYDP). The Navy and Marine Corps also reduced their appetite—the Navy from 16 to nine, the Marines from 16 to 13—so, all told, U.S. purchases would be just 68 aircraft in 2025, rather than 83.

Pentagon officials said that since Lockheed won't deliver all the F-35s it planned to this year, the services could "defer" funding for some jets to later budgets. Acting Air Force Undersecretary Kristyn Jones told reporters the Air Force remains committed to its program objective of 1,763 F-35s.

"We want the planes that we want," Jones said. "And the TR-3 Block 4 capabilities have been delayed. So, our approach to minimize the impact of that [is] by procuring fewer of those in the first years of the FYDP. And then, as you'll see from our more detailed budget exhibits, that we will start to come back toward the end of the FYDP, hopefully, with all those capabilities that we need in place."

Under this budget plan, the Air Force would acquire 42 aircraft in both fiscal '25 and '26, followed by 47 each in '27 and '28, and 48 in fiscal '29. By then, the program will be halfway to its numerical goal, with 946 jets left to go of the 1,763 aircraft planned.

That obvious slowdown goes beyond the Block 4 delay. Air Force Secretary Frank Kendall told reporters he didn't want to make the reductions, but was forced to by the Fiscal Responsibility Act, which compelled the service to find 2 percent in cuts after the '25 budget was already built. He chose to preserve research and development for future programs over buying systems already in production. Trade-off, Kendall said, between "the mid-term force" and "the longer-term force.

"What we're doing, essentially … is buying options for people to procure things in the future," he said. Research and development of upcoming capabilities, like the Next-Generation Air Dominance fighter or the Collaborative Combat Aircraft (CCA), "doesn't give you anything immediately, it gives you an option to then exercise for production later," he said. He wants future administrations to have a choice between building new things or more older things.

PAIN NOW

The delay in getting new F-35s is "hurting already," Kendall said. "We really need [the TR-3 and Block 4 upgrades] "to stay competitive" with China, he stated at a March defense conference.

"We're going to need them in quantity, so getting on with that is really important to us."

Not getting new jets upsets the timetable for retiring older aircraft, which "affects cost," he said.

Jets bound for retirement like the A-10 and F-16 will have to be retained "for longer than we had planned," Kendall explained, and this adds expenses for maintenance and training, and disrupts the transition of pilots and maintainers to the new aircraft.

But it's "the operational capability impact" that's most significant, he said, because the F-35 offers such a leap in capability beyond the fighters it's replacing.

The JPO said the F-35 partners have considered accepting jets with "truncated" capability, something less than the full TR-3. But as of mid-March, no decision had been made.

Kendall said his prior business relationship with Northrop Grumman, which makes the Block 4 AN/APG-85 radar, means he must be recused from such decisions, and that he'd deferred that call to Joint Chiefs Chairman Gen. Charles Q. Brown Jr.

"It's a judgment call," according to Kendall, though his instinct would be "to hold industry responsible for delivering what they promised." But while he would prefer "to not accept" a lesser capability, the operational argument has merit, he said.

Ulmer said flight testing is showing "improved performance" of the TR-3, with better software stability and "significant" new weapons capabilities. He left it to the JPO to decide "what the deliverable release will be," and said Lockheed will "align" to its decision.

NUCLEAR LIGHTNINGS

One other major milestone that came to light in March is that the F-35A is now certified to carry the B61-12 nuclear weapon.

The declaration, made in October but only acknowledged in March, makes the F-35 the first fifth-generation aircraft to be declared nuclear-capable since the B-2 bomber, some 30 years ago, and marks the climax of more than 10 years of effort involving 16 government agencies, a JPO spokesman said.

The U.S. and NATO now have "a critical capability that supports U.S. extended deterrence," the spokesman asserted. The B61-12 has an estimated yield of 50 kilotons.

Joining the U.S. in the nuclear mission will be Germany, Belgium and the Netherlands, all of which have or will have F-35As.

All USAF F-35As are eventually expected to have the necessary wiring and software to deploy the B61-12, but for now, only certain units are so equipped; neither the TR-3 nor Block 4 are required to deploy it. The Air Force will not identify which units will have that capability. However, Air Force squadrons at RAF Lakenheath, U.K., have been assigned the nuclear mission in the past and nuclear-certified weapons igloos are already there.

INTO THE FUTURE

With F-35A purchases as slow as they are, and newer technologies emerging, few expect the Air Force to ever acquire the full 1,763 F-35As originally planned. When that goal was set, early in the program, China was not yet viewed as a peer military competitor. Given that the Air Force is now well along with the Next-Generation Air Dominance fighter and its "family of systems," which includes plans for "thousands" of Collaborative Combat Aircraft, the F-35 may never get close to its objective force.

At 48 aircraft a year, it would take more than 20 years to get there, and the design is already 25 years old. The CCA will also be far less costly; according to Kendall, it will cost only a third as much as an F-35.

That said, Mitchell Institute for Aerospace Studies' Heather Penney noted that in a series of recent wargames, CCAs proved "most effective" when "paired with crewed fighters." Time and budgets will tell.

Two F/A-18 aircraft and two B-1 Lancer bombers fly in formation during Operation Noble Defender, an air defense exercise along the Eastern Seaboard in February. Weeks later, head of North American Aerospace Defense Command and U.S. Northern Command Gen. Gregory M. Guillot warned that Russian bombers had recently crossed into the North American Air Defense Identification Zone from the east, in addition to their usual tracks near Alaska to the west. Guillot also signaled concern about China's growing ability to reach U.S. airspace with military aircraft.

Staff Sgt. Zoe Wockenfuss/ANG

Seven F-35A Lightning IIs await takeoff at Nellis Air Force Base, Nev., home to the Air Force Weapons School. The Air Force now has about half of the 1,763 F-35As envisioned, and the Pentagon in March cleared the jet for full-rate production, paving the way for more cost-effective multiyear orders. Despite that good news, dozens of F-35s are lined up at Lockheed's plant in Fort Worth, Texas, as the manufacturer and its customers wrangle over acceptance of the Block 4 software suite, which is still in testing. And hopes that the Air Force might accelerate F-35 purchases have faded, as budget limits forced the service to cut its planned 2025 purchase from 48 to 42 jets.

William Lewis/USAF

RE-OPTIMIZING THE FORCES

Leaders Roll Out Big Changes for Air Force & Space Force

By Tobias Naegele and Chris Gordon

AURORA, COLO.

Air Force and Space Force leaders rolled out sweeping changes to the services' organization, manning, readiness, and weapons development at the AFA Warfare Symposium in February, aiming to ratchet up readiness and gain a warfighting edge in the face of intensifying great power competition with China.

Secretary Frank Kendall, Acting Undersecretary Kristyn Jones, Air Force Chief of Staff Gen. David W. Allvin, and Chief of Space Operations Gen. B. Chance Saltzman detailed 24 action items and an aggressive schedule for implementation in a joint presentation to open the conference.

"All of these are intended to make us more competitive and to do so with a sense of urgency," Kendall said in a speech unveiling the changes.

Citing the prospect of conflict—either through a military move by China on Taiwan or miscalculation that could escalate—Kendall said it is well past time to make changes. "We are out of time," he repeated several times during his remarks.

The Air Force will reorient its major commands to focus on combat readiness, peeling off their requirements and weapons development functions and consolidating those into a new Integrated Capabilities Command. Headed by a three-star general and reporting directly to the Chief and Secretary of the Air Force, it becomes a new power center for current and future programs.

The idea is to have leaders be able to define requirements and build programs without having to manage a competing focus on today and tomorrow.

"We need to both be ready today with the force that we have. We need to approach that with a sense of urgency," Allvin said. "But we also need to update—re-optimize, dare I say—the processes, the policies, the authorities, and in some cases, the structure to be competitive for the long term. We need to do both of these at the same time. And that's the goal of these decisions."

The Space Force will create a new Space Force Futures Command with a similar objective.

It will be the Space Force's fourth Field Command, the service's equivalent to the Air Force's Major Commands.

"Over the first four years in the Space Force, we focused on some of the systems … we didn't really have the mechanisms to evaluate all the other components that have to be in place," Saltzman said, citing everything from identifying the number of facilities needed to handle classified information to forming the USSF's operational concepts. "That is what a futures organization can provide for you."

Planned changes span the services and technologies. Cyber and electronic warfare will be elevated—what is today's 16th Air Force, the information warfare arm of Air Combat Command, will be elevated to Air Forces Cyber, reporting directly to the Chief and Secretary with responsibility for operational cyber, information, and electronic warfare. It will continue to be led by a three-star general as it is today, but its rise to direct-reporting status suggests added stature and visibility.

Jud McCrehin/Staff

"We are out of time," Air Force Secretary Frank Kendall told thousands of Airmen at the AFA Warfare Symposium. To better prepare for potential conflict with China, he said, we must enhance readiness today and modernize for tomorrow.

FOCUS ON READINESS

Operational Air Force wings will be restructured as "units of action," with each designated as a Deployable Combat Wing, an In-Place Combat Wing, or a Combat Generation Wing.

Each wing type will be designed and structured for its purpose. Kendall and Allvin want to clarify the blurred lines between operational units and base support and will designate Base Commands to support combat wings and keep bases operating during conflicts or crises. "We're going to make sure that our deployable wings have everything they need to go fight successfully as a unit," Kendall said.

In parallel, the Space Force will set up new Space Force Combat Squadrons as its units of action, supporting U.S. Space Command on a rotational basis. Additional Space Force component commands will be established, building on those already created and aligned to U.S. Indo-Pacific Command, U.S. European Command, and U.S. Central Command.

Additional Space Component Commands could include U.S. Cyber Command, U.S. Transportation Command, U.S. Northern

Command, and U.S. Southern Command.

The reorientation of Air Combat Command, Air Mobility Command, and Air Force Global Strike Command to focus almost exclusively on combat readiness aligns with plans to further refine the Air Force Force Generation (AFFORGEN) Model, which will evolve to support each type of combat wing.

"What has happened over time is that we basically took a lot of what could be headquarters or could be specialized command functions and farmed them out to various Major Commands," Kendall explained in an interview. "The list of additional duties got pretty long. … And these aren't core jobs for these commands. What we want fundamentally is to have the major force providers—Air Combat Command, Air Mobility Command, and Air Force Global Strike Command—with responsibilities across the Air Force—focused on readiness for the forces that they have."

To do that, he and the Chiefs are digging into the Cold War playbook and re-introducing large-scale combat exercises and no-notice operational readiness assessments and inspections. These hallmarks of the days of Strategic Air Command, Tactical Air Command, and Military Airlift Command all but disappeared over the past three decades, as the Air Force focused on supporting continuous operations in the Middle East.

"We're talking about preparing units of action, which are fundamentally a new construct," Kendall added of the changes across the Department. "We're going to make sure that our deployable wings have everything they need to go fight successfully as a unit. And once we have that and they have a chance to train, then it's reasonable to commit and start evaluating their ability to do that."

The Space Force will implement new readiness standards for operating in contested environments and when under attack, will introduce its own exercise program nested within the Department-level exercise framework.

The Space Force has heretofore operated as if space was a benign environment, and its leaders are rapidly confronting a future in which the service needs new training—everything from ranges and simulators to large joint force exercises.

"Unfortunately, over the last decade or so what we've seen, is now we have to recognize that space is a fundamentally different domain," Saltzman said. "It is a contested domain. Now if we're going to be successful in meeting our military objectives, we have to fight for, contest the space domain, and achieve some level of space superiority if we're going to continue to provide the services that the military needs, that the joint force needs."

Saltzman likened the shift to transforming the Merchant Marine into the warfighting U.S. Navy.

But "you can't just tell" the Merchant Marine they need to suddenly be able to fight a war, Saltzman said. "They don't have the right training; they don't have the right operational concepts to do the task that they've been given."

The same is true for the Space Force, he said.

"I feel like that's what we have to embrace," Saltzman said. "We have to understand that we have to transform this service if it's going to provide the kinds of capabilities, to include space superiority, that the joint force needs to meet its objectives. That's the transformational charge that's at hand."

Kendall is determined not to let staffs slow-roll these changes. "We've got to do this with a sense of urgency," he said. "The threat is not a future threat, it is a current threat. And it's getting worse over time. And we've got to start orienting ourselves on that and behaving as if we have a deep appreciation for that."

PEOPLE

"The Airman Development Command commander will be the sole [individual] responsible for integrating requirements to ensure that, when an Airman goes from one part of our Air Force to another, they don't need to relearn the systems and the tools, and they can develop faster," Allvin said. "By integrating this, … we believe we're going to have a more coherent, single Air Force that can move rapidly to the future."

Mike Tsukamoto/Air & Space Forces Magazine

"We are in a competition for talent, and we understand that technical talent is going to be critical to our success," said Air Force Chief of Staff Gen. David Allvin. Adding a warrant officer technical career track is one way to better compete, he said.

Air Education and Training Command will be reborn as Airman Development Command, with a mission to better prepare Airmen for the range of duties they can expect in the more expeditionary future, where Agile Combat Development is no longer just an emerging concept, but the standard operating procedure.

More than just a renamed command, Kendall said the change will also encompass increased responsibility and oversight of programs like NCO academies, "wherever they might be to ensure that we're getting the type of training across the force that we need."

The concept of "Multi-Capable Airmen" will be formalized as "Mission-Ready Airmen," with new skills taught at every level in the training pipeline, beginning in basic training and continuing at wings and at each level of advanced training.

"We're going to be more deliberate about what training people get so that they are fully prepared to do the jobs we're going to need them to do," Kendall said in an interview.

The Air Force will stand up several Air Task Forces this summer, which will go through a full Force Generation cycle, but the wider vision is that wings will be the future unit of action in the Air Force. How fast can these new structures stand up and spread across the force? "My answer to timeline questions is as quickly as we can," Kendall said. "We need these units now—we don't need them six years from now or two years from now. We need them now."

The Air Force will create a new Warrant Officer track for highly skilled IT and cyber talent, enabling those Airmen to not only be paid competitively, but to choose a career path that enables them to focus exclusively on their specialties, bypassing the typical officer leadership track.

"We need mass, people," Allvin told the audience. "We need to be able to have technical talent of a very specific variety, now and into the future. … We anticipate that will drive that talent

Jud McCrehin/Staff

China and Russia have made space "a fundamentally different domain ... a contested domain," says Chief of Space Operations Gen. B. Chance Saltzman. The Space Force must adapt and train to that new threat picture, he said.

in and help us to keep that talent. There's something specific about this career field, why it's attractive; and it's a nice match for a Warrant Officer Program."

Additional focus on technical tracks for officers and noncommissioned officers is in the works. Warrant officers are approved for IT and cyber "initially," Kendall said. The Air Force must start somewhere, Allvin explained in his remarks.

"The first thing is, we have to try in this particular career field before we even consider rolling it out across the Air Force to other career fields," Allvin said.

No plans are in place for the Space Force to adopt warrant officers at least for now.

WEAPONS DEVELOPMENT

The most far-reaching of the changes, however, may be in how Kendall is reorganizing the work of creating and developing new warfighting capabilities. These changes go well beyond the centralization of requirements and integrated development in the new Integrated Capabilities Command and represent the culmination not only of his 30 months as Secretary but nearly 50 years of defining operational requirements and developing weapons in the Pentagon.

A new Integrated Capabilities Office will oversee all capability development for the department, centralizing resource decisions that had previously been determined by individual Major Commands in the Air Force and Field Commands in the Space Force. Two other new offices will be established within the Secretariat to further centralize oversight: an Office of Competitive Activities will oversee and coordinate sensitive programs, and a new Program Assessment and Evaluation Office will apply a common strategic and analytical approach to program performance and associated resourcing decisions.

"We want our fighters and operators to be ready to go to war," Kendall said in an interview. "That's what they should be focused on: being ready to go to war now. We want other people thinking about the future."

Removing oversight of fighter requirements from ACC, for example, or mobility requirements from AMC doesn't mean disconnecting them entirely from the process, however.

"The current force will certainly have a strong voice," he promised. "There's going to be a lot of interaction. "I saw a quote the other day about 'extreme teaming.' You know, 'One Team, One Fight' has been my mantra since I got here. We're trying to break down stovepipes as opposed to create new ones. So collaborative processes, involvement of stakeholders—the people who are going to be operating the Future Force have a huge stake in what that future force is. They are not going to be isolated from this. They're going to be very involved."

Operators will move into the requirements game, he suggested, and in the future, some experienced operators could move into that game full time at the senior levels. But the key is that the people focused on the future and those focused on the present will not have to split their attention between the two.

Air Force Materiel Command will be reorganized and structured as well, with new and reoriented centers and offices to better oversee critical technical areas:

Information Dominance Center: A new three-star command that will focus on Command, Control, Communications, and Battle Management (C3BM), as well as Cyber, Electronic Warfare, and the enterprisewide information systems and infrastructure that support those and other Air Force and Space Force capabilities.

Air Force Nuclear Systems Center: Another new three-star command, it will expand the existing Nuclear Weapons Center to better support nuclear forces and the command will include a new two-star Program Executive Officer for ICBMs to oversee the overhaul of the ICBM enterprise.

Air Dominance Systems Center: The Life Cycle Management Center will be redesignated and directed to focus on synchronized aircraft and weapons development and support.

Integration Development Office: This organization within AFMC will be responsible for technology assessment and technical expertise to assess the feasibility of new operational concepts and technology insertion.

"We're going to align the science and technology pipeline," Kendall said.

GETTING BUY-IN

The 24 changes outlined Feb. 12 are the culmination of five months of intense effort, during which department leaders took in ideas and inputs from across the services. Among the many proposals, some of the more dramatic ones—such as combining multiple Majcoms into a single Forces Command, much like the Army and Navy—were discarded and refined.

"We worked really hard to make sure everybody's voice was heard," Kendall said in an interview. "And we did make adjustments because of things we heard from people. I think there was a widespread perception that change was needed, and what this process has done is identify what exactly we need to do differently. ... This has been a mechanism to surface a lot of things that have kind of been on the table, but not necessarily addressed."

Now comes the hard part—implementing the ideas and making them real.

"We've made the major decisions about direction, and we're going to be working next on all the details of that," Kendall said ahead of the rollout. "There are still a lot of details to be worked out. It's going to be a heavy lift. But I think we're ready to do it. ... We're taking an approach which is designed to overcome bureaucratic resistance. We're going to put responsible leaders in charge of each of these things. We've already figured out generally who they're going to be. And we're going to give them the mission of making these things happen."

None of those changes will need much funding in the near term, Kendall said. Most will be cost-neutral or can be accomplished through the usual process of reprogramming funding from other lines. That's important, because these changes come

too late for the still-not-completed fiscal 2024 budget, as well as the already programmed—but not yet requested—fiscal 2025 budget request. That means that funding for significant changes, like new construction, or large-scale moves, won't come until the fiscal 2026 budget cycle, which is just beginning to be bent into shape now.

But the Department of the Air Force's re-optimization efforts have buy-in across the DOD, from Secretary of Defense Lloyd J. Austin III, Deputy Secretary Kathleen Hicks, and other service secretaries, Kendall said.

"If you're going to make some major changes in your organization, even if you have all the authorities you need to do them, it's a good idea to tell your boss before you do," Kendall said. "I went to both the deputy secretary and the Secretary and basically briefed them, and also briefed my counterparts in the other military departments. There was not a single question asked about the appropriateness of anything we were doing. It was essentially a thumbs-up, you're on the right path, go get it done. And that's where we're going to go.

We're going to move out on this stuff."

The Future of Deployment Starts Now

By Greg Hadley and Tobias Naegele

When three Air Task Force elements begin taking shape this summer, they will be laying the groundwork for the new Combat Wings now seen as the Air Force's deployable "units of action" for future operations—a multiyear process to realign the way the service presents forces to the Department of Defense's 11 combatant commands.

The aim is to create predictable workup schedules and unit cohesion for Airmen while enhancing the service's ability to define risk and resourcing requirements to the Joint Staff and Secretary of Defense.

The Air Task Forces forming are the first of at least six planned to form, go through workups together, and deploy as units in fiscal 2026. Each task force will consist of a Command Element and staff, an Expeditionary Air Base Squadron for base operating support, a Mission Generation Force Element to project air power, and a Mission Sustainment Team to enable remote operations under the Agile Combat Employment concept of operations.

"The Air Task Forces ... really spoke to an evolution of rotational forces," Deputy Chief of Staff for Operations Lt. Gen. Adrian Spain said at the AFA Warfare Symposium Feb. 14. "But it is also applicable to standing forces and theater forces. Combat Air Wings speak to the remainder of the force. ... What we're trying to do is build warfighting effectiveness over time with coherent teams."

Like the ATFs, the Combat Wings will be led by a command element with an air staff to execute command and control; a mission element, such as a fighter, bomber, or airlift squadron, for example; and a combat service support element to run the air base and airfield and care for the needs of wing personnel.

These models seek to replace the "ad hoc," "piecemeal," and "crowdsourced" deployment system that evolved over the past 20 years, where small teams pulled from dozens of locations arrived in theater and had to instantly form up and integrate with others they had never met or worked with before.

"Our current paradigm in how we deploy forces often is that we will take one of the mission elements—a fighter squadron or a bomber squadron or a tanker squadron, or what have you, and we'll take the rest of the forces and sort of crowdsource it from amongst our Air Force, and they will meet in theater," Chief of Staff Gen. David W. Allvin said. "That does not work against the pacing challenge."

Mike Tsukamoto/staff

"We're trying to build warfighting effectiveness over time," said U.S. Air Force Lt. Gen. Adrian Spain, deputy chief of staff for operations.

Mike Tsukamoto/staff

"Greater predictability for Airmen and families is a key objective of the new approach to deployments," said Brig. Gen. David Epperson, director of current air operations at the Pentagon.

To better prepare the force for the kind of intense matchups possible should conflict with China arise, Air Force leaders want to create predictable workup schedules and unit cohesion for Airmen while enhancing the service's ability to define risk and resourcing requirements for the Joint Staff and Secretary of Defense.

To get there will be a multistep, yearslong process.

"This is a kind of spiral development," said Brig. Gen. David Epperson, director of current operations at Headquarters U.S. Air Force.

EXPEDITIONARY AIR BASES AND AIR TASK FORCES

The move away from individual deployments toward teams has been in the works for years, noted Deputy Chief of Staff for Operations Lt. Gen. Adrian Spain.

"Ten years ago, as a group commander, we were talking about it in terms of ... how do we provide more predictability for our units," Spain said. "Five to seven years ago, we started talking about it in terms of, hey, how do I deploy in teams to build up mutual support, camaraderie, warfighting ethos before I get there."

In 2021, then-Chief of Staff Gen. Charles Q. Brown Jr. outlined the new Air Force Force Generation (AFFORGEN) model, developed to standardize how teams of Airmen train, certify and exercise their skills, then deploy and reset over a series of four six-month cycles.

For rotational forces, the Air Force launched AFFORGEN with Expeditionary Air Base (XAB) teams, built to provide base support and command and control downrange and to combine with combat elements in theater. The first

Combat Squadrons: USSF'S New Units of Action

By Greg Hadley

Just as the Air Force is defining its "units of action" as Combat Wings, the Space Force is designating "Combat Squadrons" as its units of action. The two are related, but different, reflecting the very distinct operating tempos and conditions of Airmen and Guardians.

Space Operations Command presents forces to U.S. Space Command and other joint force combatant commands, typically as squadrons and deltas. But unlike Air Force units that typically deploy, the Space Force fights from home. So unit commanders are forced to juggle operations—flying satellites, gathering intelligence, conducting cyber work—with all the day-to-day training and administrative issues that others units might leave behind when they deploy.

"If I need this number of elements to do the mission 24/7 and I force-present them, well, then you need a number of elements over here to get ready to do that [when the first unit is done]," said Space Forces-Space Commander Lt. Gen. Douglas A. Schiess. "What we've done in the past is they're both doing that all the time. And so that gets to … exhaustion—'I just came off a shift and now I've got to go to training.' And 'I've got a new person coming in, and I've got to get them ready.'"

By designating Combat Squadrons, the Space Force will break down those traditional units into smaller crews and rotate them through phases, using a new Space Force Generation Model. Like the Air Force Force Generation model, AFFORGEN, the new Space Force version will designate phases units must cycle through, demonstrating an advancing level of maturity and readiness as the cycles progress.

This way, when a squadron is presented to SPACECOM, it would no longer work for Space Operations Command, Schiess said. "They work for the Space Forces-Space and they're doing the mission for that." During this time, "they don't have to worry about bringing on new capabilities, they don't have to worry about training new folks to get ready to feed into the mission to be able to do that," Schiess said. "They have their crew that is ready to do their mission."

Brig. Gen. Devin Pepper, vice commander of Space Operations Command, said SpOC intends to follow an "eight-crew model."

"So five of the crews, whatever system they're operating, will be in what's called the combat period, and the other three crews will be in what we call the Prepare and Ready phase," Pepper told reporters. "Those are all the phases you need to take leave, go to school, do life, so to speak, and then also do the training that you need to get ready to prepare for the combat period."

The Space Force already follows a similar system for its electronic warfare teams, and it's similar to the Air Force's four-phased AFFORGEN system.

The commander of a combat squadron "may be a captain or a lieutenant now who's responsible for that crew that's in the combat period," Pepper said. Meanwhile, regular squadron and delta commanders can focus completely on readiness and training.

When troops aren't physically deploying, the change is partially just about a mindset shift said Schiess, who compared it to his first job in the Air Force, when he was as a missileer.

"I was part of the squadron, I got prepared, I would do training," Schiess said. "But when I went to the alert facility, I didn't work for the Air Force anymore, I worked for Strategic Command."

Yet just as the Air Force is still working on the details of classifying wings, Schiess noted that the USSF is still working on the naming conventions for Combat Squadrons.

"We're still working through, does that become the 2nd Combat Squadron or 2nd Space Operation?" he said.

XAB team deployed to the Middle East about a week after Iran-backed Hamas militants attacked Israel on Oct. 7, setting off an Israeli invasion of Gaza. That air base element, drawn largely from the South Carolina Air National Guard, included a core nucleus that trained together beforehand, plus additional personnel that joined in theater.

"They were able to operate at the speed of trust from the second they got on the ground," Epperson said.

Air Task Forces represent the next step in that evolution. The first three will take shape this summer, with the goal of at least six that will deploy over the course of fiscal 2026.

"It had to be slow and steady over time to build this up, and the XABs were a natural evolution of that," said Spain. "And the Air Task Forces were really a clean sheet look from the XABs to figure out a better way to consolidate more, fewer locations, bigger teams, train them together for a distinct period of time before they all went to the same place and executed a warfighting mission."

Each task force will consist of a Command Element and staff, an Expeditionary Air Base Squadron for base operating support, a Mission Generation Force Element to project air power, and a Mission Sustainment Team to enable remote operations.

Teams of 100 to 250 Airmen will come together during the "prepare" phase of the AFFORGEN cycle, a full year before they're available to deploy.

"They will train together at that unit," Epperson said. "They'll develop those Mission Ready Airmen skills, they'll learn the different tasks that their entire team is working on."

Sustaining elements will come together from two to three base locations.

"During the 'certify' phase, the vision is that those combat service support teams from different installations will come together and operate during exercises and certification events," Epperson said. "So the whole team of that ATF will come together at some point multiple times before they deploy."

COMBAT WINGS

Air Task Forces will be applicable to rotational forces, such as in the Middle East, where the Air Force has built up a large presence over time.

Combat Wings are intended to be deployable operational components built and trained for great power competition. They will be steeped in Agile Combat Employment operational concepts and be seen as operational units of action by the Joint Staff and Pentagon officials.

That's what's needed in potential peer conflicts with China or Russia. "Aggregating from 100 different places, literally, as we've done in CENTCOM, to descend upon a problem and figure it out when you get to that location, will not work in this environment," Spain said.

A generation ago, wings were constructed to be able to pick

up and deploy to fight anywhere, but over the past 30 years or so, wing and base operations were increasingly consolidated for efficiency. That was prudent then, but must be changed now, Allvin said.

"We need to ensure," the Air Force Chief of Staff added, "that our Combat Wings are coherent units of action that have everything they need to be able to execute their wartime tasks."

Combat Wings build on the Air Task Force concept, positioning the entire deployable team in a single location, to the maximum extent possible, living, working, and training together throughout the AFFORGEN cycle.

That will not be possible in every case, however, because not all wings are built or operate the same. So the goal is to sort every operational wing into one of three categories:

■ Deployable Combat Wings (DCW): Entire wings that can "pick up, deploy, employ, generate, and sustain power in theater," Allvin said. Spain cited the 366th Fighter Wing at Mountain Home Air Force Base, Idaho, as one potential example, and said such units must be resourced to do so, leaving behind only those capabilities necessary to maintain the base in their absence.

■ In-Place Combat Wings (ICW): Complete units with command, mission, and support elements that fight from home stations, such as the 341st Missile Wing at Malmstrom Air Force Base, Mont., Spain said. "We need to ensure that where they reside, where they project power from, they have all that they need," said Allvin.

■ Combat-Generation Wings (CGW): Wings that "we may not expect to deploy as a wing, but [that] provide combat power that can plug into those combat wings," Allvin said. That could include elements like command and control; mission elements, such as fighter, mobility, or intelligence, surveillance, and reconnaissance squadrons; or service support elements that could be "bolted on" to a deployable combat wing. "A combat-generation wing is a little different," Spain said. "You have elements that would deploy, but the whole wing isn't going to deploy and it won't be resourced to do that."

By design, each DCW and ICW must be sufficiently manned to deploy without leaving a dysfunctional base in its wake that can't maintain security or keep up facilities needed by those left behind.

"In this future fight, we cannot expect that there will be a benign environment in the installations that are here after the deploying wing is gone," Allvin said. "We have to be able to not only fight forward, but understand what it takes to continue to defend and operate the base at home."

The CGWs, meanwhile, provide modularity and flexibility to meet real-world needs.

"What if the combatant commander wants different combinations of airpower to come and support a particular crisis or conflict?" Allvin asked rhetorically. "So let's say, for example, we're going to deploy an F-15E wing, that Deployable Combat Wing needs to be ready to take those forces and deploy forward with all the C2 and all the sustainment. But what if we also would like an F-35 squadron, as well? That F-35 squadron should be able to plug into that unit and go. What if we want to use tankers to be able to generate sorties or C-130s to be able to have theater airlift in there? Those mission layers at the squadron layer should be able to plug into this deployable combat wing."

Combining multiple kinds of aircraft and missions into a standing operating wing proved too costly when the Air Force experimented with so-called "composite wings" in the 1990s. Wings that co-located fighters, bombers, and tankers proved inherently inefficient. But building around a deployable wing such that, for a given deployment, additional squadrons or operating units can be attached gets around that problem—as long as units are built to be plug-and-play compatible.

Deployable Combat Wings are "designed to fit into any C2 structure and fall in on the prevailing command and control apparatus of the combatant commander," Spain said. "[They have] the elements required to both take orders and to give orders and operate off of mission command and commander's intent if disconnected."

A peer rival's ability to deny satellite connectivity or use cyber to disrupt communications will depend on that kind of independent thinking, and may become the norm under Agile Combat Employment, where smaller teams of Airmen may spread out from a main operating base to complicate an adversary's targeting. ACE is especially vital to USAF strategy in the Indo-Pacific, an expansive region with hundreds of small islands, all of them within reach of long-range missiles from mainland China.

BUILDING UP TO IT

Adapting to that future requirement will take time, Epperson said. "We'll try to do things as efficiently as we can, but realize that it's not going to be perfect from the get-go," he said. "It's going to take some evolution as we move through this process to make sure we know where all the right resources are, and how much they need."

That starts with evaluating each operational wing and designating it as one of the three types, then adapting its staffing to ensure it has all the elements it needs to fulfill its mission. Leaders did not give a timeline for when that process would take place.

While it's clear some units will need additional personnel, Spain offered that the process could yield excess billets, as well. Once that is completed, manning requirements will be adjusted to ensure wings can support their new mission requirements.

By standardizing its wings, the Air Force will have a force-sizing construct that aligns with the Army's Brigade Combat Teams, the Navy's Carrier Strike Groups, and the Marine Corps' Marine Expeditionary Units—a key asset in explaining to joint force leaders how deploying one or more units today will impact readiness tomorrow.

"We can articulate it more effectively and advocate for a particular method or means" in response to an emerging requirement, Spain said. The construct will also help the Air Force explain how employing a given unit for one contingency could impact other requirements in the future.

Finally, the change is meant to improve stability for Airmen who even now, under AFFORGEN, face uncertainty. Many Airmen may know they are in "a bucket" that says they could deploy, Epperson said. But "they don't know what unit, what location, and whether or not they'll get tapped. As we move forward, they will have that predictability, because they will go into a combat service support team [and will] know, in one year, I'm going to deploy. And they'll know exactly what location they're going to deploy to."

That contributes to a better quality of life for Airmen and their families as well as a better trained and prepared force for the nation and joint-force partners.

"This is about warfighting effectiveness," Spain said. "The next fight is not going to be the same fight as the one that we've executed for the past 30 years."

"Today's Airmen and Guardians want different pathways to serve," said then-Chief Master Sergeant of the Air Force JoAnne Bass, in one of her final public appearances as CMSAF. "We need a model to be able to retain our technical experience." The Air Force wants to add warrant officers, but the Space Force is not considering that at this time.

Mike Tsukamoto/staff

USAF Embraces Warrant Officers for Cyber

By David A. Roza

Among the most talked-about news at the AFA Warfare Symposium was Air Force Chief of Staff Gen. David W. Allvin's announcement that the service will try bringing back warrant officers in the cyber and information technology career fields.

The move comes 44 years after the last Air Force warrant officer retired in 1980. The Air Force and Space Force are the only military services not to include warrant officers, who fill technical rather than leadership functions in the other military branches. The Air Force has long mulled whether to bring them back, said retired Chief Master Sgt. of the Air Force Gerald Murray.

"I made an off-the-cuff statement during the time I was Chief Master Sergeant of the Air Force: 'over my dead body,'" Murray said in a panel with CMSAF JoAnne Bass and Chief Master Sgt. of the Space Force John Bentivegna.

But now, Murray sees the need for warrant officers in high-demand, highly technical fields such as IT and cyber. Bass echoed that opinion. When she was asked if the Air Force needed warrant officers earlier in her tenure, she said her original answer was no, "but I do know that we need a model to be able to retain our technical experience."

"What it gets back to is: today's Airmen and Guardians want different pathways to serve, and we are in an organization that has got to keep some of our deep technical expertise," she said.

Indeed, Secretary of the Air Force Frank Kendall said about 100 Airmen joined other branches in recent years so that they could become warrant officers in IT and cyber. Current career tracks often take Airmen out of their specialty for long durations: Kendall recalled meeting officers returning to cyber after three years in a completely different field.

"Now I don't know about you, but if I had a doctor who had not been doing medicine for three years and who was about to do surgery on me, I would be a little nervous," the Secretary said on the final day of the symposium. "We need continuity in some of these people."

That need is more acute in the cyber and IT fields, where technology moves particularly fast, Allvin explained in his keynote address at the symposium. A document posted anonymously on the unofficial Air Force amn/nco/snco Facebook page and the Air Force subreddit directs Air University to develop a concept of operations for establishing a training pipeline at Maxwell Air Force Base, Ala.

The initial cohort, according to the document, would consist of 30 prior-service personnel, but a separate planning document obtained by Air & Space Forces Magazine says the pipeline could scale up to 200 junior warrant officers and 50 senior warrant officers a year. Director of the Air National Guard Lt. Gen. Michael Loh told Air & Space Forces Magazine that his troops will be among the initial cohort.

"The folks that bring the predominant force structure from a cyber, IT perspective is the National Guard; over two-thirds of the Air Force capability resides in the National Guard," he said.

Continuity is already a selling point in the Guard, he said, but "we need some technical expertise in the Active component that we tend to lose."

Success may involve measuring how long warrant officers stay in the service, what level of talent they develop as warrant officers, and how much they increase productivity and effectiveness in the IT and cyber arenas. Those metrics may take years to collect, but Allvin cautioned against expanding the program too quickly.

"We're still a force that develops leaders, so we're not going to relegate the entire force to warrant officers," he said. The same goes for the enlisted force, which he described as "the envy of the world and it scares the [blank] out of the adversary. We need to make sure we maintain that."

Kendall further emphasized the need for caution before possibly expanding the program.

"I don't know if it'll be a year or two years or whatever, but I think at some point we'll want to think about 'are there other fields this will make sense in too,'" he said. "But the emphasis right now is on getting cyber and IT right."

The Space Force is considering several changes to better recruit and retain talent, such as offering full-time/part-time status to Guardians, but top service leaders passed on introducing warrant officers.

"Because of the way we were designed, all of our enlisted personnel have very technical paths," Chief of Space Operations Gen. B. Chance Saltzman told reporters at the symposium. "And so we feel like there's other avenues to provide them the compensation they need."

The Space Force already provides a model where Guardians

who 'just want to do my job,' can keep doing that, Bentivegna explained. Plus, the service's small size, at just 9,400 Guardians, makes having a third category of Guardian "just not feasible for us from the logistics perspective," he added.

The reintroduction of Air Force warrant officers was one of several programs announced at the symposium that are meant to gain an edge in the competition with industry and other services for technical talent. Others include expanding technical tracks for Air Force officers, creating technical tracks for enlisted Airmen, and "tailored career categories" for "critical technical areas, notably cyber and IT," according to an accompanying Air Force document.

Air Education and Training Command will also be expanded and renamed Airman Development Command, a move meant to better align education and training efforts across the service. To make sure those Airmen are ready for deployment, the Air Force is emphasizing a new concept called "Mission Ready Airmen," which is meant to train Airmen to work in small groups on difficult problems under contested conditions.

"I think there's more to come in terms of 'how do we retain the force that we're going to need,'" Bass said. "It's not going to be by policies from the '90s or the 2000s. We really do have to reimagine what that looks like."

Meanwhile, the Space Force plans on doubling its special pays to $8.3 million for enlisted Guardians in fiscal 2024 over last year's $4 million. Saltzman said he also wants to get Guardians out into the private sector so that they don't feel as if they are falling behind their peers in technical knowledge.

Though many of these changes are still in the works, Airmen on social media forums were pleased to see the return of warrant officers.

"Everything we've discussed about warrant officers in our shop so far has been positive," one anonymous cyber Airman told Air & Space Forces Magazine.

The corresponding pay bump would not go unnoticed. DOD's 2024 pay scale offers $5,792 in basic pay per month to warrant officers in the W-2 grade with 10 years of service, compared to $4,886 for an E-7 with the same level of experience.

The money alone probably is not enough to entice new recruits or convince them to stay, the Airman said, but "this at least makes it less insulting/painful for folks to stay and incentivizes those who really love the military-unique things you can't do as a civilian or contractor, much less the commercial sector."

The cyber expert anticipated plenty of questions and messiness as the Air Force actually puts rubber to the road, "but still all-around goodness." More details would, "I'm sure, help those folks interested in making the jump."

BUDGET

Air Force Gets Bigger Slice of Budget

By Greg Hadley and John Tirpak

The Air Force would a get a bigger budget than the Army in fiscal 2025, a marked shift as the Pentagon invests to counter China in the Indo-Pacific region.

President Joe Biden's fiscal 2025 budget request released March 11 seeks $188.1 billion for the Air Force, $2.3 billion more than the $185.8 billion it seeks for the Army. The White House is seeking $203.9 billion for the Navy, the most among the military services.

The Air Force request marks 1.6 percent growth, or $3 billion over the fiscal 2024 budget request, while the Space Force request marks a decline of $600 million, or 2 percent. All figures are in constant dollars, not adjusted for inflation, indicating both services would actually see a decline in buying power.

"We are not quite keeping up with inflation," Acting Air Force Undersecretary Kristyn Jones told reporters.

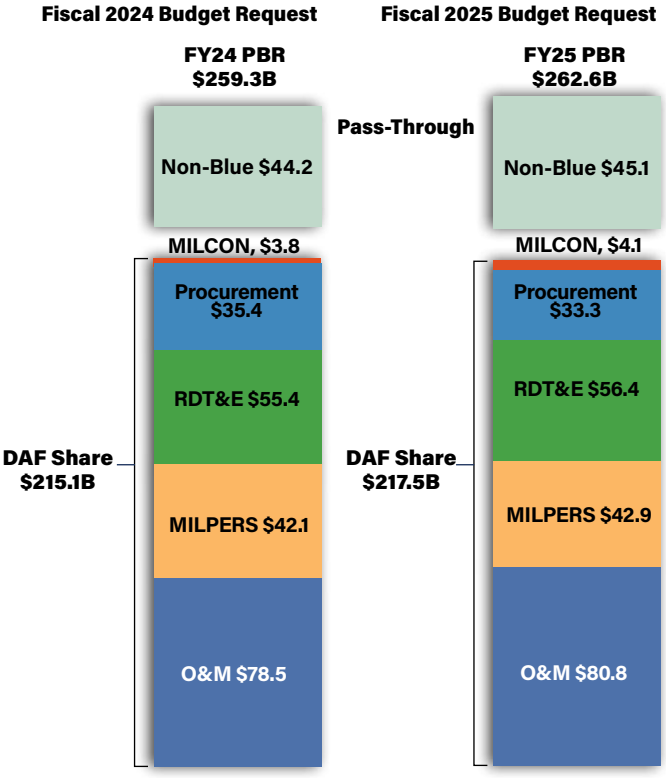
The overall top line for the Department of the Air Force would be $262.6 billion, the most among the military departments. But that figure includes $45.1 billion that the department will never see; this so-called "pass-through" funds classified programs primarily in the Intelligence Community. The pass-through dwarfs the total $29.4 billion sought to fund the entire Space Force in fiscal 2025.

"I consider this to be an acceptable budget, I can defend it," said Air Force Secretary Frank Kendall. "It's moving forward on the things that we prioritize. I'd like to be able to move faster, but you know, we do have constraints."

But a macro view does show some progress. Removing pass-through funds from the equation, the nation spent less on the Air Force than either the Navy or the Army for the past 32 years straight, according to the Mitchell Institute for Aerospace Studies. But, if approved, the Air Force would move ahead of the Army,

How the DAF Budget Stacks Up

Non-Blue "pass-through" expenses—which are never touched by Air Force or Space Force programs—are growing almost twice as fast as the Department of the Air Force's budget as a whole. In the 2025 request, the pass-through would grow by 2 percent, vs. 1.1 percent for Air Force and Space Force spending, combined.



Source: Department of the Air Force

Numbers may not add due to rounding

while still remaining behind the Navy in the race for funds.

The Fiscal Responsibility Act, passed by Congress last summer, imposed some $2 billion in reductions on the Department of the Air Force cuts; budgets were already largely complete. Kendall said that forced "us to make some hard choices to fit within those boundaries."

Harder choices will come in the next few budgets, Kendall said. "We've got some tough choices … when we get to [FY] '26, which we're building now," Kendall said. Among the challenges in that budget will be accommodating a nearly $40 billion overrun on the Sentinel intercontinental ballistic missile program, although the Air Force is looking for economies and that bill doesn't have to be paid in a single year.

In making choices, Kendall said his priority "is to get to a next generation of capabilities" to offset China's military advances. As a result, the budget seeks to "protect" Kendall's seven Operational Imperatives—the key modernization investments he first outlined in 2022. Consequently, there was "a trade-off" between what he called "the mid-term force"—things that are already developed and which the Air Force is buying—and research and development of "the longer-term force."

"What we're doing, essentially … is buying options for people to procure things in the future. So all that research and development essentially doesn't give you anything immediately, it gives you an option to then exercise for production later," he said.

The Air Force and Space Force are racing to "re-optimize" for a great power competition—that is, to better prepare to stave off and fight, if necessary, against a peer threat like China. Air and space power will be essential in such a conflict, whether it plays out in the air, in space, on the seas, or on land.

The Army's slice of the budget has been in a slow decline for several years. As recently as the 2022 budget request, the Pentagon sought $172.9 billion for the Army compared to $156.3 billion for the Air Force; the gap has only narrowed since then.

Yet the Air Force faces a mounting numbers crunch in the years ahead. Air Force Secretary Frank Kendall and Chief of Staff Gen. David W. Allvin both made clear in the days leading up to the budget release that the numbers aren't what they'd like. But both also indicated the squeeze on the service's future will only grow as it seeks to modernize in the years ahead.

Modernization plans include the Sentinel intercontinental ballistic missile, perhaps the single biggest modernization program in military history comprising the entire ground leg of the nuclear triad; the stealthy new B-21 bomber; the T-7A trainer; continued purchases of the KC-46 tanker to enable long-range strike operations in the Pacific; uncrewed Collaborative Combat Aircraft (CCA) to complement the manned fighter fleet; ongoing purchases of the F-35A as older F-15s and A-10s are divested; and the coming Next-Generation Air Dominance (NGAD) family of aircraft are all moving into procurement at the same time.

"[Fiscal] '25, while difficult, is at a level that we can accept," Kendall said March 7 at the McAleese defense programs conference. "[But] we see very big problems for '26. We're looking at a number of things."

To fund everything the Air Force has in store could add $10 billion or more to the budget at a time when Congress has shown a disinclination toward growing defense spending. Some Air Force advocates have argued that the pass-through makes their case harder, because it effectively inflates the budget by more than 20 percent. But while some lawmakers have tried to legislate the pass-through out of the Air Force budget, others have shot down such plans.

Meanwhile, the pass-through is only getting larger. The fiscal 2025 request includes $45.1 billion in pass-through funding, up 2 percent over last year's request. Indeed, pass-through growth is outpacing the Air Force (up 1.6 percent), not to mention the Space Force, which saw its budget request decline by 2 percent.

Kendall said he could accept that this year because some funding in the pass-through does help answer Space Force requirements.

"We're working very closely with the Intelligence Community, particularly with NRO," he said, referring to the National Reconnaissance Office. "And there are dual-use capabilities that can be fielded in space that are valuable both for intelligence and military applications. And that's why I'm saying that some of the things that are in the pass-through are beneficial to the Space Force."

Constraints impose reductions in planned fighter aircraft and continued divestment of older aircraft, both of which will be hard sells in Congress. But unless Congress adds funds to pay for those, the pressure on other programs, both for people and systems, will continue to mount.

As an example of leadership's thinking, the budget purchases of F-35 and F-15EX fighters, preserves previously planned developmental funding for the Next-Generation Air Dominance fighter and CCA.

Funding of NGAD and CCA development amounts to $3.3 billion in 2025, up $815 million and $165 million, respectively. But for both programs, "life gets a lot harder after '25," Kendall said.

Jones said it will cost about $1 billion extra to achieve the same levels of readiness and flying hours in fiscal '25 as it did in '24. This drove "difficult decisions" in munitions, for example, where "we are buying, in some cases, slightly fewer munitions for the same price" as in fiscal 2024, she said.

Space Force Faces First-Ever Budget Cut in 2025

By Unshin Lee Harpley

The Space Force budget request declined for the first time in its brief history as the Pentagon unveiled a $29.4 billion request for Space Force funding March 11, a 2 percent drop from last year's ask, and a reversal after years of dynamic growth.

Air Force Secretary Frank Kendall and other leaders highlighted fewer planned satellite launches as a key reason for the smaller budget. In a briefing with reporters, Kendall pointed out that "payloads have not been ready," leading to delays in launches and resulting in a smaller number of launches than initially planned for the fiscal year.

"Last year, we had planned 15 total space launches, and that will be 11 in the '25 budget plan," he said.

Maj. Gen. Michael A. Greiner, deputy assistant secretary of the Air Force for budget, said the reduction "was not necessarily due to [spending] caps or having to make tough choices, that's really just how we look through the long-range strategic satellite launch manifest. These are the capabilities in the launches that we need, in order to get the satellites on orbit that we need as well and those that are ready to go."

Of the 11 launches planned within the National Security

Space Launch program, four will be designated for deploying satellites in low-Earth orbit for the Space Development Agency's constellation. FY25 will mark the first year of NSSL Phase 3 procurement, which is meant to increase competition and open the door to smaller launch providers through a so-called "dual-lane" approach.

Kendall said the spending caps set by the Fiscal Responsibility Act limited what he could do to protect the Space Force's budget, which is skewed heavily toward research and development.

"We're not moving as fast there as we would like to, but we didn't have any place to make any adjustments," he said.

Accordingly, the Space Force's research, development, test, and evaluation (RDT&E) and procurement budgets would decline, while operations and management and personnel funds rise modestly.

USSF Budget Asks

2021	$15.4 billion	N/A
2022	$18.05 billion	17.21%
2023	$26.1 billion	44.60%
2024	$30 billion	14.94%
2025	$29.4 billion	-2.00%

With the Space Force trimming $500 million from its research and development budget in fiscal 2025, the service is prioritizing the modernization of existing infrastructure to enhance defense and surveillance capabilities.

Missile warning and tracking (MW/MT) funds would reach $4.7 billion, including $2.1 billion for the Next-Generation Overhead Persistent Infrared (Next-Gen OPIR) constellation, and $2.7 billion for the Tracking Layer of the Proliferated Warfighter Space Architecture.

Satellite communications spending would include a little more than $1 billion for the Evolved Strategic Satellite Communication network, for nuclear command, control, and communications, and almost $600 million for Protected Tactical Services (PTS), a jam-resistant system.

The service plans to expand its total workforce by 4 percent to 15,084, combining military and civilian personnel. That will include 9,800 uniformed Guardians, an increase of 400 over last year. That jump will come primarily through interservice transfers. That, combined with raises in pay, Basic Allowance for Housing, and Basic Allowance for Subsistence, contributed to the Military Personnel account inching up $50 million from 2024, to a total of $1.2 billion.

While the overall budget is slightly down, Kendall did note that the "pass-through"—a section of the budget not controlled by the Air Force that goes to classified intelligence programs—does have funds that will enhance the capabilities of the Space Force.

Kendall declined to elaborate, however, on whether the Space Force's budget reduction was directly related to the pass-through increase.

Shrinking Further, USAF Aims to Divest 250 Aircraft

By Chris Gordon

The Air Force plans to shrink its total aircraft inventory next fiscal year, reducing the number of new aircraft it buys while accelerating divestments. The fiscal 2025 budget plan would divest 250 aircraft in a year, reducing the total inventory below 5,000 aircraft for the first time since before World War II.

The aircraft divestment plan will save more than $2 billion annually, said Deputy Assistant Secretary of the Air Force for budget Maj. Gen. Mike A. Greiner.

"We need to start moving the funding into the modernization programs," Kristyn E. Jones, the acting undersecretary of the Air Force, told reporters March 11.

A-10 and F-15C and E fighters lead the divestments and come as little surprise. Nor is it surprising that the Air Force is trying, for the third year running, to retire its 32 Block 20 F-22s, its oldest fifth-generation fighters.

"Block 20 airframes lack many of the enhanced capabilities of the Block 30/35 jets," an Air Force spokesperson said of the rationale. "Upgrading them to Block 30/35 is not feasible due to cost and time constraints."

The aircraft are not combat rated. Used for training, they are among the Air Force's most expensive jets to operate. But giving them up would increase the reliance on combat-rated aircraft for initial training and reduce combat capacity, a risk Congress has refused to accept in the past two legislative cycles.

The Air Force's decision to reduce new fighter acquisitions did come as a surprise to many. The service plans to buy just 42 F-35As, down from last year's plan to acquire 48 in 2025; it also reduced from 24 to 18 the number of new F-15EXs it would buy, ending the program six short of its previously planned total.

Proposed 2025 Divestment

Aircraft Type	No.
F-22	32
HH-60G	12
F-15C/D	65
A-10	56
F-15E	26
F-16C/D	11
C-130H	6
EC-130H	1
CV-22	2
E-11	1
KC-135	16
T-1	22
TOTAL	**250**

That total of 60 new fighters falls short of the service's stated long-term goal of acquiring at least 72 new fighters annually. It also falls far short of the 91 F-15 models that it aims to retire. In all, the Air Force plan calls for retiring a total of 190 fighters against 60 new fighters that wouldn't reach the force for at least two to three years, a major reduction in fighter capacity.

The Air Force is moving toward awarding the first contracts for Collaborative Combat Aircraft (CCA), semi-autonomous aircraft that will accompany the manned fighter fleet. CCA will "rethink our definition" of the USAF fighter fleet, Air Force Chief of Staff Gen. David W. Allvin said on March 7.

"The numbers are going down in the near term," said Jones. However, she said CCAs could change that calculus in the long term. "We are ramping that program up as much as we can—if we have [fiscal] '24 appropriation, even faster—to try to get that affordable mass capability to mainly offset those divestments of our old fleet," she said.

Jones said on March 11 that the decrease in the planned F-35 buy was due to budgetary constraints and delays in the

fighter's planned F-35 Technology Refresh-3 (TR-3), a significant but lagging software upgrade. However, the change does not mean the service is less committed to the F-35 in the long term, she said.

"Given the fiscal constraints this year, as well as the delays in getting the capabilities that we need, we re-phased the program, but we haven't cut off the total numbers," Jones said.

Congress has long balked at the prospect of retiring any models of what many see as the world's best air-superiority fighter and passed legislation prohibiting any such retirements until fiscal 2028. However, the Air Force has held firm in its desire to retire the old Block 20 aircraft—reducing the F-22 fleet from 185 to 153 aircraft—for several years.

Proposed 2025 Purchases

Aircraft Type	No.
F-35A	42
F-15EX	18
KC-46	15
MH-139	8
T-7A	7
C-40	1
TOTAL	**91**

"We'll comply with the law, obviously, but we're putting those F-22s back on the table in order to fit in the other things we think are higher priority," Kendall said.

A low-rate initial production of seven T-7A Red Hawk trainers is funded, which will help alleviate the aging T-38 fleet, which has been increasingly hard to maintain to keep training flying hours up, though the T-7 has faced significant delays. The Air Force also plans to add 15 KC-46 Pegasus tankers and to move forward with its long-term plan to bring in the Next Generation Aerial Refueling System (NGAS). "We will work to define and finalize an acquisition strategy this year," Greiner said.

PEOPLE

Meet the New CMSAF, David Flosi

By David Roza

On his first day as the new top enlisted Airman, Chief Master Sergeant of the Air Force David Flosi urged Airmen not to waste a moment as the Air Force races to better prepare for possible conflict with China or Russia.

"Every day matters, and we must make every day count," said Flosi at a change of responsibility ceremony at Joint Base Andrews, Md., where he took over for former CMSAF JoAnne Bass, the first woman to serve as a military service's senior enlisted adviser. The ceremony took place on her 31st anniversary of joining the Air Force.

Chairman of the Joint Chiefs of Staff Gen. Charles Q. Brown Jr., who hired Bass as CMSAF in 2020 when he was Air Force Chief of Staff, praised her service. "She blended vast experience, expertise, empathy, an impeccable moral character, and a resolute will to succeed," he said.

Bass' relief brings his own wealth of experience to the role; but his road to CMSAF was hardly smooth. Flosi was 22, engaged to be married, studying finance, and working full time when it struck him there might be a better way. He was running low on money, and needed something to change.

Andy Morataya/USAF

"Our ability to get things done [as Chiefs] is completely dependent on our ability to build relationships with people," says Chief Master Sergeant of the Air Force David Flosi.

"I had a friend who enlisted right out of high school and was coming to the end of his contract, and we went on like a two-hour drive and talked," he told Air & Space Forces Magazine. Suddenly it was clear: "I saw the Air Force as a means to an end. Get the GI Bill, finish my degree debt-free, and support a new family."

"That's why I enlisted," Flosi said. "It's not why I stayed."

Now the 20th Chief Master Sergeant of the Air Force, Flosi credits mentors who helped him grow and make a career of his Air Force tenure, earning a Legion of Merit and Bronze Star over the next 28 years.

Flosi initially thought he'd apply his finance skills to his Air Force work, but wound up instead as a nuclear weapons specialist. "[Explosive ordnance disposal] was what I wanted to do initially and that scared" his then-fiancee, Katy. "Nuclear weapons did not. So that rose up on the list."

It wasn't easy. Flosi took a while to buy into living the Air Force core values 24 hours a day. "Like most chiefs, I did not walk this completely clean path," he said. "There were a few moments where maybe I wasn't as disciplined as I should have been. I had to grow up a little bit."

Flosi asked a lot of questions. "I asked 'why' so much that [one boss] started making me pull out my [leave and earnings statement], and he'd look at it and say, 'That's what I thought Airman Flosi, you ain't getting no thinking pay,'" he said. "So I grew up in that era. But my immediate supervisor was very patient. He was like, 'All right, come here knucklehead,' and he would walk me through the why, which I really needed. He figured me out and what I needed to be successful."

That kind of support helped turn the Air Force from a job into a profession for Flosi. But he had a lot more to learn, especially as a brand-new staff sergeant leading other Airmen for the first time.

"Boy, do I feel bad for that first senior Airman, because I just smothered this poor guy with all of my new leadership skills," he recalled. "I learned a lot from that: I learned that leadership isn't taking the book and dumping it on them. I needed to connect with this person, meet them where they're at, and hopefully bring them to the right."

Flosi had another big break when a senior NCO told him

about the Air Force Institute of Technology, which offers graduate degree programs for enlisted and commissioned service members and government civilians. Flosi earned a master's degree in logistics and supply chain management, a move which he said changed the course of his career.

"I cannot believe I got the opportunity to go to graduate school and get paid to do it," he said. "That would have never happened if I didn't have these good leaders in place who actually were trying to take care of me."

Flosi paid it forward by serving with distinction on deployments in support of Operations Southern Watch, Iraqi Freedom, Inherent Resolve, and Freedom's Sentinel. He received the Bronze Star for his work during a tour in Afghanistan, and from 2017 to 2019, he was the command chief master sergeant of "DATA MASKED," according to his resume, which drew interest on the unofficial Air Force subreddit.

"You can tell them that it was very cool," he said when asked about the assignment.

Flosi's latest post was as Command Chief Master Sergeant of Air Force Materiel Command at Wright-Patterson Air Force Base, Ohio. Over the course of his years as command chief of various units, Flosi picked up a few lessons about executing commander's intent.

"Commanders have statutory authority. Chiefs don't," he said. "This is about relationships for us. And so our ability to get things done on behalf of the command, or to implement the guidance and commander's intent, no matter where you're at in the organization, is completely dependent on our ability to build relationships with people."

Flosi's new boss, Chief of Staff Gen. David Allvin, wants to make a long list of sweeping changes fast in order to prepare the service for a possible conflict with China or Russia. Flosi was involved in the conversations leading to those changes and agrees that speed will be a key factor in the effort.

"We are out of time," he said. "The department, both the Air and Space Force, are not optimized for great power competition. And we must get there."

Flosi flagged readiness as an area he particularly looks forward to helping change. Allvin said at the AFA Warfare Symposium that the service has metrics for each squadron's ability to execute mission essential tasks, but there is no overarching assessment showing how well the service can, for example, re-operate, which means "the fight to get outta town, and a fight to get into theater, and a fight to get airborne," Allvin said.

"Only when you have assessments can you really find out the details and put resources against them," he added.

Quality of life, including pay and compensation, health care, and child care, is an underlying part of warfighting readiness, Flosi said.

"It's a foundational item," he explained. "Our quality-of-life issues impact all of the other things that we're trying to do."

While his predecessor, former Chief Master Sergeant of the Air Force JoAnne Bass, was active on Facebook, Flosi is still working out his social media policy, acknowledging that the vast majority of service members use some form of the technology.

"We're not going to ignore that," he said. "We might do it a bit differently."

One thing that will carry over from CMSAF #19 is a love for the Kansas City Chiefs football team. Though he was born in Florida, Flosi grew up in Kansas City and picked up a knack for barbecue.

"I tell people sometimes I have a smoking problem," he said. "I'll smoke vegetables, deviled eggs. It doesn't have to just be pork."

That skill set could prove a handy outlet over the next four years, which may be the most challenging of Flosi's career. Part of a CMSAF's job is to serve as the personal adviser to the Chief of Staff and the Secretary of the Air Force on the welfare, readiness, and morale of more than 600,000 Airmen across the force.

"I feel the enormity of the responsibility of the job: It's important to not take for granted the opportunity that's being presented," he said. "Therefore I genuinely want to execute to the commander's intent."

He has a few guidelines to light the way. Flosi keeps a paper on leadership that he wrote for an assignment at the Senior NCO Academy back in 2011. Listed there are the values he holds dear, including integrity, accountability, direct feedback, transparency, fairness, and "seek first to understand."

"I am constantly reminded that things are not always as they seem," he wrote about that last value. "Sharpening this leadership trait sets the framework for trusting relationships focused on personal and professional success."

OBITUARIES

Fifth CMSAF, Robert D. Gaylor, Dies

By John A. Tirpak

Robert D. Gaylor, who served from 1977 to 1979 as the fifth Chief Master Sergeant of the Air Force, died Jan. 17. He was 92.

Gaylor was appointed to the service's top enlisted job by Chief of Staff Gen. David C. Jones—for whom he had served as senior enlisted adviser in U.S. Air Forces in Europe. He also advised Jones' successor, Gen. Lew Allen Jr., and Air Force Secretary John C. Stetson.

During his tenure as CMSAF, Gaylor focused on leadership training and development in the noncommissioned officer corps—working to open 70 leadership schools across the Air Force—as well as reducing management levels, and bread-and-butter issues, such as assignment choice and travel for enlisted families.

He was also instrumental in bringing about uniforms for pregnant women, a nontrivial matter—the Air Force was suffering a brain drain of midcareer women in the mid-1970s because they had no way to serve in uniform. Retention of women rose significantly afterward.

After his retirement in 1979, Gaylor continued to talk to Airmen across the Air Force about leadership and his experiences in the service, until just a few months before his death. In retirement, he taught leadership and management at USAA, a private insurance firm that focuses on Active-duty and veteran customers.

Gaylor entered the Air Force in 1948, just a year after the

service was created, and after graduation from basic training, chose to be a security policeman. In his early career he was assigned to bases in Texas, Mississippi, Louisiana, and South Korea. In a 2017 interview, Gaylor said that only a small handful of those in his basic training class had a high school diploma, and having one helped him excel in his early career.

He attained the rank of master sergeant in 1956 at the age of 25, after just seven years in the service. In the interview, Gaylor said he never had any formal professional military education before becoming a senior master sergeant, and observed that in those days, if a command had no NCO academy, its NCOs went without. He was later determined that Airmen have equal access to PME.

In 1958, master sergeant was the highest enlisted rank in the service, and Gaylor wanted to advance, so he applied to become a warrant officer. His application was returned without action, but he was encouraged to stay in service because the Air Force would be creating two further enlisted ranks: senior master sergeant and chief master sergeant. He reached the new highest enlisted rank in 1968.

When NCO academies were created, Gaylor was invited to be among the first instructors.

During the Vietnam War, Gaylor served in Thailand, back in the military police field, after which he went to Strategic Air Command and helped re-establish its NCO academy.

At USAFE, starting in 1971, he traveled around European bases teaching management techniques. The following year he established the USAFE Command Management and Leadership Center, an in-residence 60-hour NCO course. The year after that, Jones chose him as the USAFE Senior Enlisted Adviser.

At the highest ranks, he often had to invent his own duties. While at the Personnel Center, he assigned himself the job of being a leadership mentor and evangelist for the Air Force, traveling widely across the service, and creating NCO academies in as many organizations as possible.

Speaking at Joint Base San Antonio-Lackland, Texas, in August 2023, Gaylor told Airmen that the "three words" that are key to an Air Force career are "'aptitude' and 'attitude' ... which leads to 'opportunity.'"

Sarayuth Pinthong/USAF

Surviving former Chief Master Sergeants of the Air Force, led by CMSAF No. 19, JoAnne Bass, stand at attention as the remains of CMSAF No. 5 Robert Gaylor are prepared for burial.

His formula for success, he said, was "every day, every day, every day: attitude, aptitude, head on straight, team player. There is no magic formula. It is a simple process."

Gerald R. Murray, the 14th Chief Master Sergeant of the Air Force from 2002 to 2006, said Gaylor was "the most beloved" among the former CMSAFs and had an unrivaled "love for our Airmen and Guardians, and families."

Gaylor was "a gifted orator" who, with "ever-refreshing messages and delightful humor always uplifted the spirit of all who were in his company, or had the opportunity to hear him speak, whether individually or in a large audience," Murray said.

Gaylor "remained an active Airman ... leader, advocate, supporter, mentor and dear friend to the very last day of his life, leaving a legacy like no other before or after. A legend among us, he was truly one of a kind," Murray added.

In 2006, the NCO Leadership Academy at Lackland Air Force Base, Texas, was named in Gaylor's honor.

Tom Stafford, Apollo Astronaut, Dies at 93

By John A. Tirpak

Lt. Gen. Thomas P. Stafford, a U.S. Air Force test pilot, an astronaut on two Gemini and two Apollo missions, and an important figure in the development of stealth technology, died on March 18 at the age of 93.

Stafford "wrote the book" on basic test-flight techniques still taught today, and his space flights were all highly significant. As commander of Apollo 10 in 1969, Stafford led the dress rehearsal for Apollo 11's moon landing, taking his lunar module within nine miles of the moon's surface, and proving out nearly all other flight aspects of the landing missions that followed. As commander of the July 1975 Apollo-Soyuz Test Program, Stafford pioneered international cooperation in space with the Soviet Union, laying a foundation for the two countries to later jointly build and inhabit the International Space Station.

Astronaut Thomas Stafford in 1971.

After leaving NASA in 1975, Stafford returned to USAF, commanding the Experimental Flight Test Center at Edwards Air Force Base, Calif., where he supervised testing of the A-10, F-15 and F-16 fighters, and the B-1B bomber. He also oversaw secret aircraft activities at Groom Lake, including development and test of the Have Blue experimental stealth aircraft, and later wrote the requirements for the F-117 attack plane, which resulted from it. While at Edwards, Stafford continued to fly, including surreptitiously acquired Soviet fighters. Having learned Russian for the Apollo-Soyuz program, he was also a key debriefer of Russian pilot Viktor Byelenko, who de-

fected to the West with a then-new MiG-25 in 1976.

In his last Air Force job, Stafford was deputy chief of staff for research, development, and acquisition. He drafted the requirements for the F-117, as well as the AGM-129 stealth cruise missile and the B-2 bomber. He also outlined the Advanced Tactical Fighter, which eventually became the F-22. He retired from the Air Force in 1979.

Born in Oklahoma, Stafford served with the Oklahoma National Guard in high school. In 1952, he graduated near the top of his class from the U.S. Naval Academy with honors in engineering. To get access to the hottest airplanes, however, he opted for an Air Force commission.

He earned his wings in 1953 and went into fighters, flying the F-86D in Florida, South Dakota, and Germany. Sent to test pilot school, he graduated first in his class in 1959. Soon he co-wrote the manuals "Pilot's Handbook for Performance Flight Testing" and "Aerodynamics Handbook for Performance Flight Testing," which are still assigned today.

Stafford was a finalist for the Mercury program but was an inch too tall to fit in the cramped capsule. He re-applied to be an astronaut, but while waiting, was accepted at Harvard Business School. When he got word he'd been chosen for the "New Nine" astronaut group, he accepted the assignment with NASA. That group would earn their space spurs in the two-man Gemini craft, and those who survived all went on to command Apollo moon missions.

Gemini 6, in December 1965, was Stafford's first space mission. He and mission commander Wally Schirra made the first rendezvous—but not a docking—with another crewed spacecraft, Gemini 7. Rendezvous was the critical element in the plan to go to the moon.

Six months later, in May 1966, Stafford commanded Gemini 9, flying into space with pilot Gene Cernan. They replaced the prime crew after astronauts Elliot See and Charles Basset were killed in a T-38 crash.

The mission was fraught with problems, with the loss of their Agena target vehicle in a launch pad explosion, and the substitute vehicle unable to jettison its launch shroud in orbit. Stafford aborted the rest. When the guidance computer failed, Stafford calculated re-entry with paper and pencil. The difficulties pushed NASA to create an underwater spacewalk rehearsal capability.

Three years later, in May 1969, Stafford commanded Apollo 10, and, reunited with Cernan, was the first to pilot the lunar module, nicknamed "Snoopy," in lunar orbit. The two mapped landing sites in the Sea of Tranquility for Apollo 11, and contended with a faulty guidance system, but safely re-docked with the command module, nicknamed "Charlie Brown." On the return, along with command module pilot John Young, the crew set a reentry speed record of nearly 25,000 miles per hour. Together, they had performed all elements of the moon landing, which took place two months later in July 1969.

After Apollo 10, Stafford served as head of the astronaut office, managing astronaut assignments and specialties for the Apollo and Skylab programs. He then served as deputy director of Flight Crew Operations at Johnson Space Center, Texas, bearing the rank of brigadier general, the first astronaut to serve at that rank.

Stafford was the co-commander of the Apollo-Soyuz program in 1975, learning Russian and helping develop the adapter that made it possible for the two highly dissimilar craft to dock. Along with astronauts Deke Slayton and Vance Brand, Stafford docked with a Soyuz bearing cosmonauts Alexei Leonov—first man to make a spacewalk—and Valeriy Kubasov, who shared mementos and conducted experiments for 44 hours before undocking and making their separate ways back to Earth. The mission lasted nine days and Stafford was the first U.S. general officer to make a space flight.

The mission helped lay the diplomatic foundation for the ISS 20 years later.

Stafford and Leonov became close friends over the ensuing decades, and Stafford delivered the eulogy, in Russian, at Leonov's 2019 funeral.

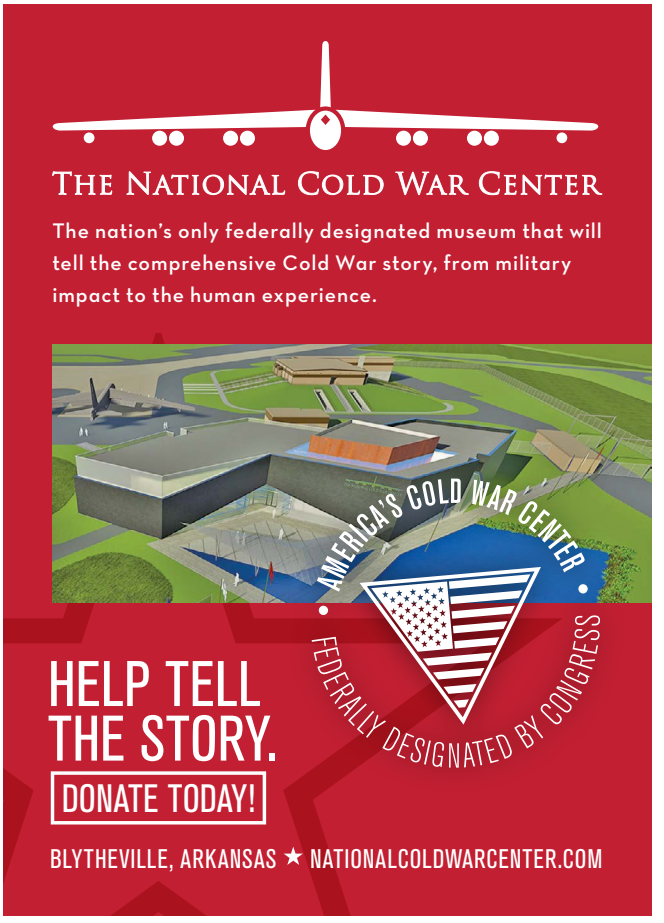
Stafford returned to the Air Force from NASA and was promoted to major general at Edwards. In 1978, he became deputy chief of staff assignment for research, development, and acquisition. He retired from the Air Force in 1979.

During his years with NASA and the Air Force, Stafford amassed nearly 7,000 flying hours and more than 507 hours of spaceflight, flying more than 100 types of aircraft and spacecraft.

In retirement, Stafford was an aviation consultant for many companies, and served on the board of Gulfstream Aerospace, as well as others. He headed many blue-ribbon commissions for NASA to map out future human space exploration, and advised NASA on the Shuttle-Mir program, during which space shuttle missions STS-63 and STS-71 docked with the Russian Mir space station. He also served on the Return to Flight Task Force after the 2003 loss of the Columbia shuttle.

He published an autobiography, co-written with Michael Casutt, titled "We Have Capture: Tom Stafford and the Space Race," in 2002.

The Lt. Gen. Thomas P. Stafford Air & Space Museum, a National Air and Space Museum affiliate, opened in Oklahoma in 1981, and today exhibits many of the artifacts from Stafford's space and USAF career.



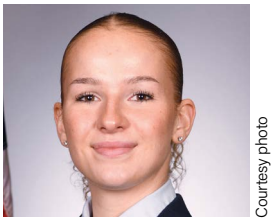
FACES OF THE FORCE

Trevor Cokley/USAF

USAFA **Cadet Jabari Bowen** was awarded the Student Leadership Undergraduate Level Award at the 2024 Black Engineers of the Year STEM Conference in February. Bowen consistently demonstrated a passion for leadership. Overcoming stiff competition, he was selected as part of the Cadet Summer Research Program at the NRO, earning recognition in the engineering division and also being recognized at NSA's annual Cyber competition. Bowen said, "I am extremely grateful to the BEYA conference for this award and all my mentors and peers at USAFA who helped make me who I am today."

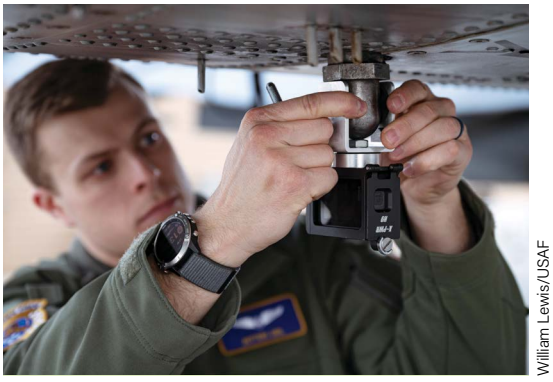
Staff Sgt. Julian Kemper/ANG

While driving in Baltimore last Thanksgiving, Maryland **ANG Staff Sgt. Brook Parks**, a recruiter assigned to the 185th Force Support Squadron, noticed a man passed out in the median. She called 911 and surveyed the area, realizing the man had most likely overdosed. Parks administered Narcan from her first-aid kit—no results. Recalling her Tactical Combat Casualty Training, she said, "let me try the sternum rub they talked about." The man came to. "The actions taken by Staff Sgt. Parks that day are a testament to the person she is and the ultimate example of being a Citizen-Airman," said Col. Richard Hunt, 175th wing commander.



Courtesy photo

Senior Airman Joelle Fialkowski, a signals intelligence analyst with the 51st Intelligence Squadron, was named the 363rd Wing's 2023 Female Athlete of the Year. Fialkowski, from out of Shaw AFB, S.C., has been playing volleyball for eight years. She said when joining the military, she "didn't realize that participating in sports would be so widely available." Winning the 2023 CONUS Women's Volleyball Championship was one of the biggest sports accomplishments. She said, "To my unit I bring a goal-driven education and passion to become an expert on the tasks at hand."



William Lewis/USAF

First Lt. Jacob Geil set out to create a cost-efficient, quickly made in-flight camera pod for the A-10C Thunderbolt, and came up with OTTER Cam (Operational Test & Training Exterior Recording Camera). With the help of leadership and the A-10 Systems Program Office, Geil, a flight engineer assigned to the 59th Test & Evaluation Squadron, created a $700 fix, while saving millions and solving the problem. OTTER Cam can record any of the 11 pylons in flight, ultimately ensuring safe separation when testing new stores. "This is a perfect case of empowering … Airmen to cut through existing inefficiencies, shorten mission critical timelines, and reduce … cost," said Benjamin Bauman, 59th TES A-10C Test Director.

Senior Airman Elizabeth Davis

Sgt. Anastacia Lange, 333rd Training Squadron, Cyber Warfare Operator Course instructor, became the first Guardian, and also the first female instructor, in the course's history. Seeking to incorporate Space Force needs into the existing technical training courses, one "Rock Star" student stood out as a possible new instructor, Lange—who came from the Air Force to the Space Force. She is intelligent, motivated, and well-spoken according to her peers. Airmen and Guardians must be able to change as rapidly as the cyber field changes. "I've had some fantastic instructors and teachers in my life. The ones who stuck out to me the most, I've tried to emulate," she said.

Senior Master Sgt. Ted Daigle

Courtesy photo

307th Bomb Wing Medical Airmen **Senior Master. Sgt. Charles Johnson**, medical squadron senior enlisted leader, and **Master Sgt. Erin Chitwood**, superintendent for the 489th Aeromedical Flight, became the first medical personnel to earn Air Force Reserve Command awards in the same year. Johnson earned outstanding Air Reserve Technical SNCO of the Year and oversees the Personnel Reliability Program of AFRC's only nuclear-capable squadron. Chitwood earned outstanding SNCO assigned to a medical unit. Despite being at different bases, Johnson at Barksdale Air Force Base, La., and Chitwood at Dyess Air Force Base, Texas, the two Airmen work closely together.

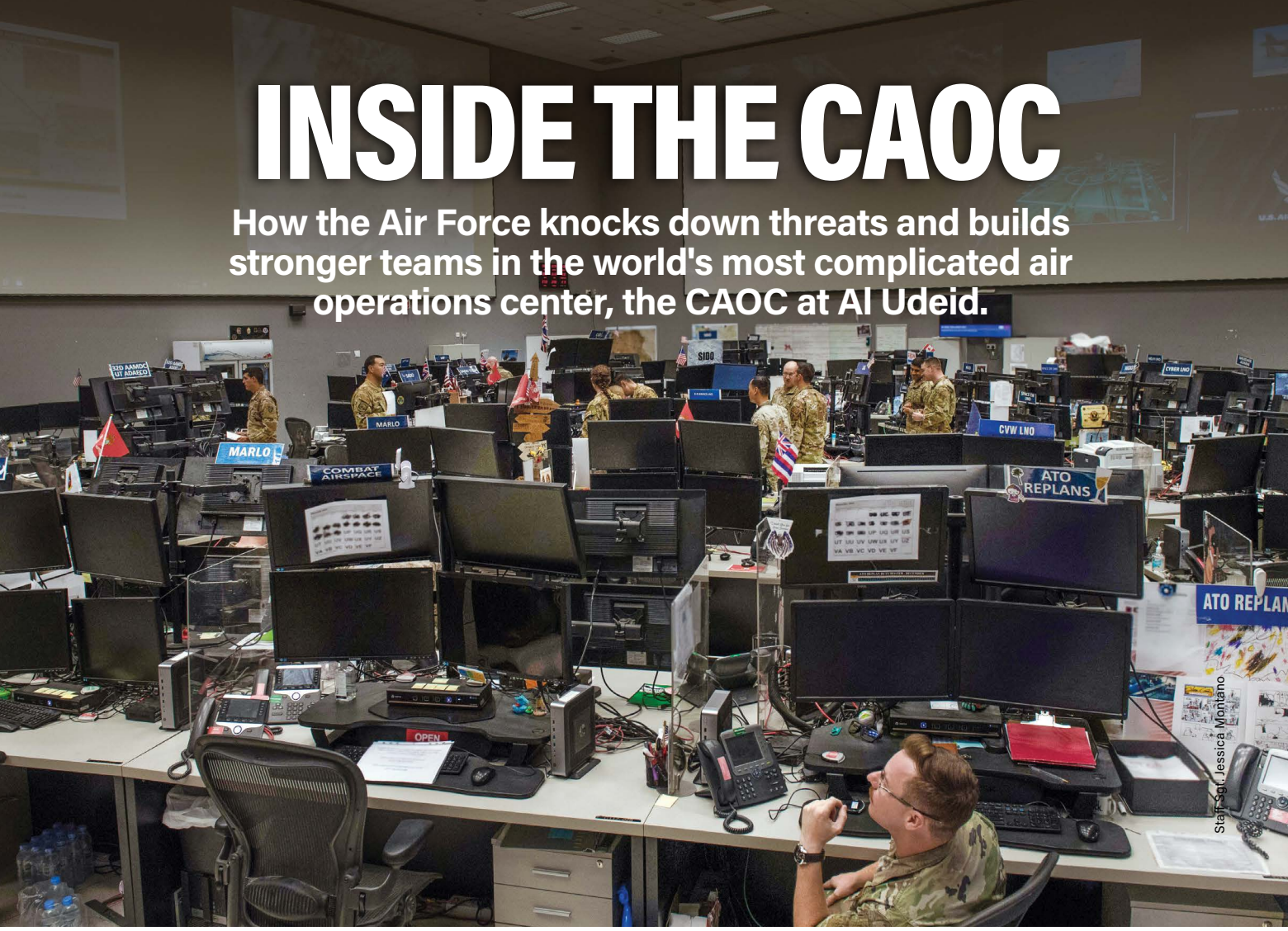
Staff Sgt. Michael Bowman

Tech. Sgt. Erik Johannes, 1st Fighter Wing, a weapons safety representative, became the first Airman to graduate from the Marine Corps Designated Marksman Course. The training focused on the M110 Semi-Automatic Sniper System, which will be useful in garrison and deployed areas. The course included classroom academics, weapons familiarization, observation, and marksmanship exercises. The training can be used for base security and Bird/Wildlife Aircraft Strike Hazards. Johannes said, "This incredible opportunity gave me a glimpse of the power of joint warfighting. … To sharpen our competitive edge we must learn and grow from each other's best practices."

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

INSIDE THE CAOC

How the Air Force knocks down threats and builds stronger teams in the world's most complicated air operations center, the CAOC at Al Udeid.



Staff Sgt. Jessica Montano

U.S. Central Command's Combined Air Operations Center (CAOC) at Al Udeid Air Base, Qatar, as seen in 2021. The CAOC is the regional nexus of command and control, diplomacy, and airpower in the Middle East.

By Chris Gordon

AL UDEID AIR BASE, QATAR

A speedboat loaded with explosives barrels toward commercial shipping lanes on video screens as Airmen gather around to watch in the theater-sized command center at this desert base 45 minutes from downtown Doha.

The vessel, unmanned and festooned with antennas, is on a remote-controlled one-way mission to attack maritime commerce. The Airmen here are doing everything they can to make sure that doesn't happen, following a live video feed from an MQ-9 Reaper drone approaching the target.

It's not easy, but it's quick: Within 15 minutes of being alerted to the threat, the Reaper finally locks onto its target and the game is over. Airmen remotely fire a Hellfire missile, which is unleashed with a puff of white smoke, followed moments later by a flash of light as the missile detonates, momentarily whiting-out screens on the computer terminals.

It's just an ordinary day here at the Combined Air Operations Center (CAOC).

The CAOC is the Air Force nerve center in the Middle East, responsible for planning and executing air operations across the U.S. Central Command (CENTCOM) area of operations, which spans from the Red Sea to the Turkish border and from Syria to Afghanistan. Although political leaders have sought for a decade or more to tilt their attention more to the Pacific, CENTCOM and the CAOC remain the busiest of commands in one of the most complex regions of the world. Air & Space Forces Magazine was granted unusual access to the CAOC in action in early February.

"One of the things that the United States Air Force ... does better than most is that we deliver operational-level command and control capability."
—Air Forces Central Commander Lt. Gen. Alexus Grynkewich

Since Hamas' surprise Oct. 7 raids in Israel, the command center has overseen airstrikes against Iranian-backed militias in Syria, Iraq, and Yemen, where crewed aircraft, drones, and Tomahawk cruise missiles have been used to punish attackers and deter further aggression in the region. The CAOC continuously monitors militia and Iranian military activity and maintains a wary eye on Russian warplanes operating in Syria, which have displayed a penchant for harassing U.S. aircraft and even troops on the ground.

"One of the things that the United States Air Force ... does better than most is that we deliver operational-level command and control capability," Air Forces Central (AFCENT) Commander Lt. Gen. Alexus G. Grynkewich told Air & Space Forces Magazine amid the roar of C-130 propellers as he shuttled between

visits to regional allies. The CAOC is at the heart of that.

Grynkewich, who is also the Combined Forces Air Component Commander (CFACC), the top joint air boss in the Middle East, said the CAOC is one of the centers with which the U.S. connects Arab and European partners against the aggressive tendencies of their common adversary—Iran and its partners in the region. Though formally based at Shaw Air Force Base, S.C., Grynkewich spends more than half of his time in the Middle East, working out of the CAOC and hopscotching the region to meet with allies, build cooperation, and assess changing threats.

"Long term in this region, one thing all our partners are concerned about is air and missile defense, particularly with the Iranians having proliferated missiles and UAVs around the region—up in Iraq, in Syria, with the Houthis," Grynkewich said. "All of these countries recognize the threat that poses."

DESERT OASIS

Al Udeid, a base on a beige expanse in the Qatari desert, is home not only to the CAOC but also to the forward headquarters for U.S. Central Command. It hosts Air Forces Central, Space Forces Central, and Special Operations Command Central.

Owned by the Qataris, the base has hosted fighters, bombers, mobility aircraft, and tankers over the past quarter century, supporting operations in Afghanistan, Iraq, Syria, and elsewhere in the region. The U.S. and Qatar recently agreed to extend the U.S. lease on the base for another 10 years.

Hosting the formidable U.S. presence is something of a balancing act for Qatar, which also provides sanctuary for Hamas' political leadership and is home to the headquarters for the Al Jazeera media network.

Within the confines of Al Udeid, however, the host nation politics is put aside and the focus is on the mission. A visit to Al Udeid's control tower reveals a vast expanse of concrete, living quarters for over 10,000 Airmen and the bunker-like CAOC building, rising out of the desert like an upturned bathtub surrounded by razor wire.

"This location has been a critical nexus of airpower since 2002. But the interest in CENTCOM isn't where it was when we all first came here two decades ago," said Brig. Gen. Douglas D. Jackson, commander of the 379th Air Expeditionary Wing, the main unit here that employs some 3,000 Airmen. "Sometimes Al Udeid gets this reputation, which is just like this giant, concrete swath that nobody really knows what's going on."

After 20 years, however, Al Udeid is now a multibillion-dollar base with numerous hard structures and permanent facilities, a far cry from those days three decades ago when Airmen ran missions out of tents in Saudi Arabia as they planned Operation Desert Storm.

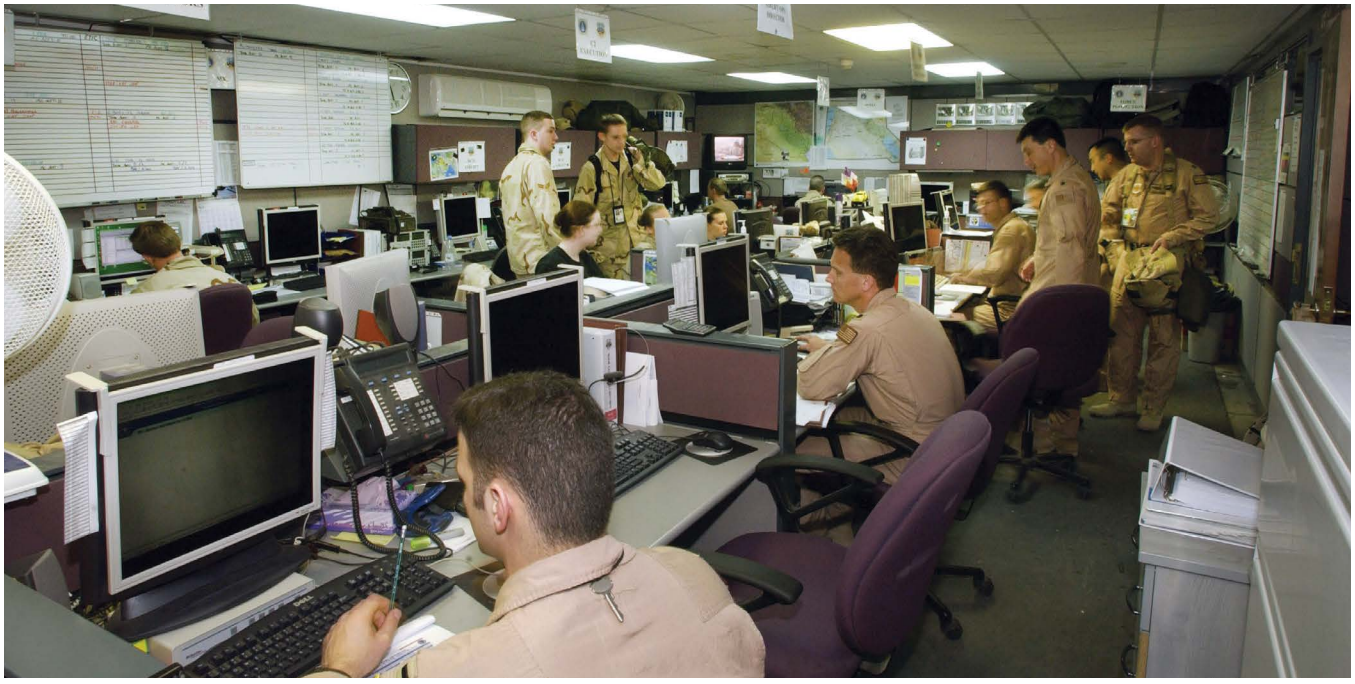
"The original CAOC was built out of tents out in the parking lot behind the Royal Saudi Air Force headquarters in downtown Riyadh," said retired Lt. Gen. David A. Deptula, a key attack planner for the operation. "We moved into the basement of the Royal Saudi Air Force headquarters where Desert Storm was executed."

Later, Deptula would be the CAOC director during the opening months of Operation Enduring Freedom in Afghanistan.

For years, the Air Force sought to improve on the humble arrangements, finally achieving a breakthrough when Gen. Charles Wald, then the AFCENT commander, secured access to a new command center at Prince Sultan Air Base near the Saudi capital. Dubbed Falconer, the command center was completed just a few months before the Sept. 11, 2001, terrorist attacks, and was used to run the air war in Afghanistan and, a year and a half later, to run the air operations for the invasion of Iraq in 2003.

Shortly after Saddam Hussein was toppled, the CAOC was moved to Al Udeid to a $60 million facility, fed by 67 miles of high-capacity fiber-optic cable. The CAOC got a $3 million upgrade in 2020.

With so much invested and at stake here, Al Udeid is well defended. An array of Patriot anti-missile batteries protect the base and its occupants, an understandable precaution given Iran's ballistic 2020 missile attack on U.S. forces at Al Asad Air



Master Sgt. Michael Best

The previous CAOC at Prince Sultan Air Base, Saudi Arabia, pictured in 2003, was used to run the air war in Afghanistan after Sept. 11, 2001, and air operations for the invasion of Iraq. Operations shifted to a new CAOC at Al Udeid Air Base, Qatar, in 2003.

AFCENT/Instagram

Lt. Gen. Alexus Grynkewich, commander of Air Forces Central, pictured in 2023, has years of experience in the Middle East, serving as director of operations for U.S. Central Command and deputy commander of operations for the anti-ISIS campaign. He took over as the air boss for U.S. forces in the Middle East in July 2022.

Base in Iraq and its 2019 cruise missile and drone attacks on Saudi oil facilities at Abqaiq.

The CAOC—despite being a possible target itself—coordinates air defense for the entire region. Yet no location is invulnerable, which is why then-CENTCOM Commander Gen. Kenneth F. McKenzie in 2019 ordered that a duplicate facility be constructed at Shaw far from harm's way, and able to take over at a moment's notice if necessary.

PROVING GROUND

Over two decades of military operations in the region, the CAOC has served as a proving ground for Air Force leaders and introduced several innovations.

Retired Gen. Jeffrey L. Harrigian was AFCENT commander from 2016 to 2018. During his tenure, he leveraged DIUx and Pivotal Labs software experts to digitize the CAOC's tanker mission planning, converting it from a human-powered whiteboard system to a largely automated computer application.

AFCENT has a level of control over its network that is unique in the Air Force. That gives the commander "some increased flexibility to get after the key problems inside the AOC," Harrigian said.

"We were building applications to make the job easier for our Airmen,"Harrigian added. "When we had a new app or wanted to change some part of our network architecture ... because we 'owned' the network, I was able approve it and have them move out. I don't think there's anybody else in the Air Force that can do that." Harrigian built on the work of his predecessor, Gen. Charles Q. Brown Jr., who led AFCENT from 2015 to 2016, turning the tide against ISIS, and went on to become Air Force Chief of Staff and now Chairman of the Joint Chiefs of Staff.

Then-Air Force Maj. Gen. B. Chance Saltzman—now the four-star Chief of Space Operations—was the deputy commander at AFCENT when the backup CAOC stood up at Shaw.

And Brown's predecessor as Air Chief, Gen. David L. Goldfein, who commanded AFCENT from 2011 to 2013, drove the expansion of the CAOC to include representatives from the Gulf Cooperation Council (GCC) countries—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

"I assessed that we needed to raise a generation of officers that understood the essence of integrated air and missile defense and the C2 needed to execute a defense of the Arabian Gulf," Goldfein told Air & Space Forces Magazine. "The vision was to create a cadre of young officers who had a common experience at the CAOC who could go back to their operational headquarters and help improve our interoperability."

That work opened Goldfein's imagination to wider possibilities, he said. Indeed, "It was this experience that became the foundation of my argument for what became JADC2," he said, referring to what is now called combined joint all-domain command and control, a Pentagon-wide concept for integrating all domains and all command elements into a seamless, unified whole.

Goldfein worked for Marine Gen. James Mattis during his AFCENT command tour, and Mattis, who would go on to became Secretary of Defense during Goldfein's time as CSAF, was equally committed to increasing the participation of the United States' Arab partners in the CAOC.

All that flew in the face of standard practice from just a few years before. "Never in my life did I ever think I'd see some of the GCC partners [willing to work with other nations for] regional stability," said Col. Julie Sposito-Salceies, now commander of the 609th Air Operations Center, the first woman to hold that command in a socially conservative region.

After Moscow sent Russian warplanes to Syria in 2015, the CAOC took on the challenge of deconfliction, opening up a

communications channel with the Russian commanders at Khmeimim Air Base in Syria so the two countries could try to avoid inadvertent clashes, even as Moscow carried out air operations in support of Syrian President Bashar al-Asad and the U.S. military pursued Islamic State militants in the same country. At the start, the channel consisted of nothing more than a phone line backed up by a Gmail account.

USAF

The bunker-like exterior of the Combined Air Operations Center at Al Udeid Air Base, Qatar, as pictured in 2020.

UNIQUE DIPLOMACY

Managing the diplomatic sensitivity of information-sharing among such a disparate U.S.-led coalition, however, requires some attention. Giant screens display the hotspots around the region; every partner representative in the command center can see it all, though some more-sensitive information is held more closely and shared only with specific partners. There are 19 nations represented in the Al Udeid CAOC, with 150 embedded partner-nation personnel. Around 300 to 400 personnel are assigned to the 609th Air Operations Center at Al Udeid. Back at Shaw, the U.S. staff is roughly in line with Al Udeid, with about 20 coalition personnel.

The entire operation is joint and international. Indeed, the CAOC is currently directed by a Canadian, and the position will rotate to the British this summer.

"I think it's a testament to how well it works that they trust a Canadian or a Brit to be the director, and overseeing all of that," said CAOC Director Royal Canadian Air Force Brig. Gen. Sid Connor.

Of course, sharing data among Five Eyes partners Australia, Canada, New Zealand, the United Kingdom, and the United States is "particularly easy," Connor said. "It gets a little more challenging as you get away from that. But we do integrate anywhere we can. Any AOC is designed to supply airpower to multiple operations at once. So for any given operation, we'll have a different group of nations that have decided to participate."

Recent U.S. air operations in the region have presented challenges to the coalition. In October, a U.S. F-16 shot down a Turkish drone that was threatening American forces in northeast Syria.

AFCENT juggles numerous missions, including its Task Force 99 project, established to explore new ISR, kinetic and electronic warfare options, and its involvement in naval operations, such as when the USS Carney shot down a swarm of Houthi drones on Oct. 19 over the Red Sea. For one three-hour-long engagement on that day, some CAOC personnel earned the Joint Service Commendation Medals for helping take down a dozen drones while having to deconflict airspace. "We're going after things that we haven't necessarily seen before, in environments that we don't have the luxury" of having local boots on the grounds, as the U.S. had in Iraq, Syria, and Afghanistan, said an Air Force intelligence officer. "There are a lot of unknowns."

THE CAOC IN ACTION

A Feb. 3 operation against Iran-backed militia groups in Syria and Iraq—the largest single set of airstrikes launched in the Middle East during the Biden administration—also showcased the CAOC's central role.

The mission began half a day earlier, when B-1B Lancers took off from Dyess Air Force Base, Texas, flying over Canada and Europe before joining U.S. Air Force planes based in the Middle East to attack targets in Iraq and Syria. In all, more than 125 precision munitions struck 85 targets as the U.S. retaliated for a deadly drone attack in Jordan that killed three American Soldiers days before.

Radar tracks indicating the progress of the air armada lit up computer screens as Grynkewich and his international battle staff monitored and watched intently. The strike package—the aircraft and munitions—was hand-written on a dry-erase board on the wall inside the Battle Cab, a windowless high-tech command center inside the CAOC, where Grynkewich went through the final checks on video conference with his boss, Army Gen. Michael "Erik" Kurilla, calling in from U.S. Central Command's headquarters in Tampa, Fla.

A half hour before the action was set to start, a cable news channel reported from Washington that the attack had begun. The media, aware of the bombers' flight, jumped the gun; the attack was yet to unfold.

Then, precisely at midnight local time, the first of the bombs struck facilities used by Iran's Islamic Revolutionary Guards Corps and Iraqi militia groups backed by Tehran. The hours of planning and monitoring had reached their climax; now, as targets crumbled, the staff on the command center floor clapped and cheered.

Yet for Grynkewich, the future of the CAOC is something more than a combat operations center. "We want it to become a campaigning headquarters and think more long-term about how to insure and deter in the region," he said. "At the same time, certainly, since Oct. 7, we realized that we absolutely have to be able to continue to run combat operations—not just as a supporting command to others but being able to do those on our own. I think we've seen the fruits of those labors."

Autonomous, Armed and Dangerous

USAF launches its most ambitious new aircraft program in a generation. Can Collaborative Combat Aircraft tilt the numbers game in America's favor?

The Boeing MQ-28 Airpower Teaming System shown during a low-speed runway taxi test. The MQ-28 is a new uncrewed aircraft that uses artificial intelligence working as part of a smart team, along with existing military aircraft, to complement and extend airborne missions.

By John A. Tirpak

The Air Force will soon award contracts to two or three suppliers to develop its first Collaborative Combat Aircraft (CCA). Narrowing the initial five competitors is the next step in the rapid evolution of the biggest Air Force combat jet program since the F-35. Soon after, a second set of contracts will follow, as little as a year later, on a pace that could yield the first production contracts before 2026.

The ambitious goal: Initial operational capability in as little as five years.

Air Force leaders think that's possible because production-representative prototypes already have flown, and because the urgency to field combat mass is intensifying as China gets closer to its stated goal of having the military capability to take Taiwan by force in 2027.

To counter China's growing military might, the USAF envisions acquiring at least 1,000 and possibly up to 2,000 CCA by the mid-2030s. That would make the autonomous combat jets among its most numerous assets. By contrast, the Air Force has only a little more than 400 F-35s today out of a total planned buy of 1,763—a number it can't achieve at present acquisition rates before 2040.

If their promise bears out, CCA could restore the Air Force's combat mass—eroded by overuse and slower-than-anticipated acquisition over the past two decades. It could also stimulate a host of new entrants into the service's industrial base.

"We can never afford" ... enough crewed combat airplanes to sustain a numerical edge [over China].
—Secretary of the Air Force Frank Kendall

Secretary Frank Kendall and other senior Air Force leaders outlined their CCA plans at the 2024 AFA Warfare Symposium in Aurora, Colo., in February. They declared there's "no time to lose" in fielding these new assets. More mass is needed to counter the growing numbers and capability of China's air arms and counter-air capabilities, as well as those of other potential adversaries. USAF's combat fleet is the smallest and oldest in its 77-year history. The U.S. can't win a numbers contest against China's military, which can build equipment at practically whatever rate it wants, with no Congress or free press to answer to.

"We can never afford" enough crewed combat airplanes to sustain a numerical edge, Kendall said.

Uncrewed, autonomous aircraft can be cheaper to build and operate than those with pilots on board because they don't need life support, control devices, or escape systems. Those add up to more weight, and weight adds cost. A pilot also imposes performance limits: While an uncrewed aircraft can easily take a 10-plus-G turn, a human pilot generally can't.

By contrast to an F-35A, costing $80 million to $100

million apiece, each CCA is targeted to cost only about 25 to 30 percent as much. That's still about $30 million per aircraft, but a huge savings overall, especially when purchased in volume. CCA will generally cost too much for many one-way missions—although service leaders say that will be up to the tactical commander to decide—but compared to a crewed fighter, they'll be a bargain.

Lockheed Martin illustration

"Speed Racer" is one of Lockheed Martin's modular, uncrewed aircraft ideas, shown here in concept artwork flying with an Air Force F-35. The ghostly outline suggests a decoy mission. It was developed under what the company says is a $100 million investment in "Project Carrera," a suite of manned-unmanned teaming technologies.

FAST PACE

The contracts awarded this spring will be for a basic "Increment 1" CCA with sensor, targeting, and munition systems similar to those on crewed fighters and bombers. CCA missions could include jamming, suppression of enemy air defenses, and as decoys to "soak up" enemy missiles and enable crewed fighters and bombers to reach their targets.

"Increment 2" CCA will follow next year, with the aim of greater stealth and autonomy.

Maj. Gen. R. Scott Jobe, director of force design, integration, and wargaming and deputy chief of staff for Air Force Futures said Increment 2 capabilities, cost, and relative sophistication will depend on what industry offers in the coming year. While a high-end, "exquisite" platform could result, so might an inexpensive solution oriented around a single mission, Jobe said, adding, "nothing has been ruled out."

It's possible two distinct solutions could emerge from this stage, one high end, the other more basic.

Andrew Hunter, assistant secretary of the Air Force for acquisition, technology, and logistics, said Increment 2 could have "a very different set of requirements" compared to Increment 1. He said the Air Force is coordinating its development with the Navy, Marine Corps, and foreign partners, and that those wider partnerships could yield a future "Increment 3."

Progress thus far has been rapid. Brig. Gen. Jason D. Voorheis, program executive officer for fighters and advanced aircraft, credited the close collaboration among Air Combat Command, the Air Force Research Laboratory, Air Force Materiel Command, and industry with shortening the development cycle.

"They've … developed market research, they've done operational analysis," he said. "They've done concept refinement, defined operational attributes, got an acquisition strategy approved, and then went on contract for building production-representative test articles in under two years, which is a pretty phenomenal pace."

This "extreme partnership will be the norm going forward," he predicted, especially after the formation of the Air Force's new Integrated Capabilities Command, announced during the AFA Warfare Symposium in February.

"Government-owned open architectures for both mission systems and autonomy" will be crucial to these systems, Voorheis said. That central ownership of the common elements will free the Air Force from historical "prime and sub-vendor lock," where the initial contract fixes a single supplier of all future revision and upgrade contracts. Without proprietary intellectual property, competition can continue with each successive increment, enabling future upgrades from a host of competitors.

These architectures "enable rapid technology insertion and rapid fielding of software-defined, platform-agnostic capabilities over time," Voorheis said. The CCA ecosystem is already extensive, with more than 30 industry participants involved in "autonomy, air vehicles, mission systems, and software development." Continued competition can keep those players in the game, and potentially attract new entrants in the future.

Hunter said digital design and modeling are making it possible to understand "daily" the evolving configurations and options, and he suggested that choosing winners should be comparatively obvious when the time comes.

"We … have really gotten [that] right," he said.

In place of the conventional, rigid requirements process, Hunter described how CCA development is fueling "continuous daily engagement" among the government and its vendors. By the time the competition reaches the endgame, Hunter said, industry will not be guessing what the government wants, and the government will have a clearer understanding of which vendors best deliver on the goal.

TEAM EFFORT

A "slew" of contractors are developing the software that will fly the CCA, building off of the Air Force Research Laboratory's Skyborg program, the "foundational architecture" for a standardized autonomous flying algorithm.

Companies in the running for Increment 1 are Anduril, Boeing, General Atomics, Lockheed Martin, and Northrop Grumman. Those not picked, such as Kratos, which had been a key player in earlier development, will be able to compete later, in Increment 2, or after. Kratos has said it plans to compete for Increment 2.

"Don't read too much into that short list," an Air Force official said. "We are not ignoring any expertise that is out there."

All the Increment 1 competitors have done extensive work on both remotely piloted and autonomous aircraft, and on manned-unmanned teaming of aircraft systems.

"We're going to go to at least two" designs for the next stage of development, Kendall told reporters at the conference. "Our preference" is to carry three contractors into the next phase, he said, but that will be "difficult, because of the level of funding we have in the budget."

Whether more players stay in the game could depend on how much they might be willing to share in the cost of development. The Air Force wants to preserve competition on CCA for as long as possible, to keep contractors focused on innovation, fresh ideas, and driving costs down.

Even after the competitive development phase, though, Kendall revealed that the Air Force could, if funding permits, greenlight

Tech. Sgt. James Cason

A U.S. Air Force F-22 Raptor and F-35A Lightning II fly in formation with the Kratos XQ-58A Valkyrie low-cost unmanned aerial vehicle over the U.S. Army Yuma Proving Ground testing range during a series of tests in 2020.

two Increment 1 designs for production.

"How many we will carry into production is uncertain," he said. "We will definitely do one." That contract is targeted for 2026. There's "a possibility we could do more," he added, indicating the service is "working out some way to do that."

Increment 2 could involve international partners, Kendall said. Boeing is expected to offer its MQ-28 Ghost Bat, developed under contract with Australia, for Increment 1 and/or Increment 2. Though Kendall didn't identify allies that might participate in CCA, any that do will be among "our closest partners."

AUTONOMY

Hunter said the technology demonstrated so far provides "a high degree of confidence that we can deliver a useful degree of autonomy" in the first increment, but not as much, perhaps, as originally hoped for.

The Air Force wants hardware it can deliver into the hands of operators as quickly as possible, Kendall said, indicating he anticipates doing so in 2028.

To further expedite delivery, Air Force Chief of Staff Gen. David W. Allvin said questions about development, basing, and training are all being addressedconcurrently, and experimentation with surrogate aircraft and platforms is happening now to "shape how we would use" and integrate CCA when they join the force.

AFA's Mitchell Institute for Aerospace Studies concluded, after a series of wargames last year, that large numbers of more basic, less-costly CCAs would yield a greater impact than fewer, high-end systems in a battle against China.

The wargames, which included Active-duty operators and others, found that rather than using CCA as uncrewed "escorts" for manned aircraft, they could instead be sent out on their own to tackle missions independently. They could also operate semi-independently, taking off from their own location to meet up with crewed aircraft for one phase of a mission, then continue on their own afterward, or potentially cover the escape of crewed aircraft heading back to base.

Concerns that fighter pilots could be task-saturated managing CCAs in addition to their primary mission proved unfounded, Jobe said. F-22 pilots in such experiments demonstrated they can comfortably manage "up to six" CCAs without interfering with their other tasks.

Robert Winkler, Kratos vice president of corporate development for national security, said the Mitchell wargames showed CCA would have the greatest impact operating "inside the first island chain," a reference to the first string of islands off the coast of mainland China. Spreading them out in that region gave "the enemy a much harder targeting solution," operating from austere locations "or being air-launched."

Introducing CCAs "completely trashed, for lack of a better term, the enemy's scheme of maneuver and strategy," Winkler said. "It disrupted their ability to do [defensive counter-air]. It disrupted their pulsed operations, and it made our … operations … an order of magnitude more effective. It made manned aircraft more survivable and unmanned aircraft more survivable, and it reduced the overall tanker requirements."

In fact, CCAs "proved out" the Agile Combat Employment model, he said.

But the notion that CCAs might be expendable has not been borne out so far. Jobe said CCAs could be used on one-way missions if the target is considered important enough, but that the plan is not to do so routinely. Once thought of as platforms that would not be sustained long-term, it now appears they will require maintenance, even if some remain crated up—possibly pre-positioned at forward bases—until needed.

Jobe said CCA "really changes … our capability, our resourcing, … and our topline investment."

Because of that, it can reduce the incremental cost of gaining new capabilities, he noted. "It's really disruptive over multiple

areas."

CCAs also present "a lot of dilemmas to the adversary or potential adversaries," he said. With them in the mix, the scheme of maneuver will change, and the enemy will have to adapt. "It presents a lot of options," Jobe said, for things "we just haven't been able to do before because of the … risk levels and force packaging that we would have had to do in the past."

David Alexander, president of General Atomics Aeronautical Systems, said industry offerings for Increment 1 will likely wind up looking similar and having comparable capabilities. Speaking on the Mitchell Institute's "Aerospace Advantage" podcast, he praised the clarity of the Air Force's vision.

"There's definitely a crystal-clear mission, crystal-clear requirements," he said. "And I can't speak for the other four [competitors] but physics is going to drive us all into something very similar. I think when [the Air Force] gives you a range … an altitude and … a speed and so on, that requires airframes to be designed for those; what we would call a 'point design.' And to meet that point design, … I would expect them to be very similar … across the five."

The companies are all working to "the same requirements," Alexander said, but there is room for "interpretation." As a result, "some slightly different offerings, perhaps in the systems, sensors, and payloads" are possible. But "airframe-wise" the overall mission "is the same for all."

COST-EFFECTIVENESS

General Atomics was picked in February by Air Force Research Laboratory to design and build the Off-Board Sensing Station (OBSS) aircraft, which will explore data-sharing technologies hosted on an autonomous drone. Given an "X-plane" designation—the XQ-67A—the aircraft made its first flight in late February. General Atomics beat Kratos for the work, after both developed platforms all the way through a critical design review.

The program is one of several efforts in AFRL's Autonomous Collaborative Enabling Technologies program.

Winkler said CCAs will need new, smaller, and lower-cost weapons and sensors optimized for them, or to rely on off-board systems. If the Air Force wants a "reasonably costed" CCA system, "we can't go with exquisite sensors" such as those now deployed on fighters and bombers. "We have to figure out how to bring the sensor cost down."

That approach must be applied across the board to hold costs down. Otherwise, he added, "if you try to build a CCA like a manned aircraft, it's going to cost like a manned aircraft."

This approach will flow through all the subcontractors, including the engine makers. Mark Rettig, vice president and general manager of business development at GE Aerospace's "Edison Works," said his company is investing "heavily" in new classes of engines specific to CCA applications.

"We're partnered with another low-cost provider to give us a comprehensive team to address the needs of these platforms," he said, but did not disclose the name of the partner company.

Tom Jones, Northrop Grumman's aeronautics sector president, said there are "two different time scales" for the CCA: first to get the technology to operators so they can "start to experiment with it and understand what the technology brings," and second, scaling up to high-rate production.

That means reusing "as much technology as you can," Jones said. As a result, he added, "I view this as an integration program rather than a development program."

Northrop built the first B-21 bomber on production tooling, having worked out the bugs before production began, Jones remarked, and Northrop aims to follow a similar approach to the CCA.

By using digital engineering, participants can "burn down risk, … iterate significantly faster," and avoid the pitfall of building bespoke one-offs and then having to think about manufacturing as an add-on at the end.

"We have much more opportunity to bring in manufacturing engineers, bring in logistics people and make sure we get those things baked in, which means a smoother transition into production," according to Jones. That makes the Air Force's timetable "doable."

Once deployed, Alexander said CCAs must be designed to operate with fewer people and to require less scheduled maintenance.

Cost and time will be saved, he said, by keeping "that focus on production."

Courtesy photo

The XQ-67A Off-Board Sensing Station—an Air Force Research Laboratory project—takes off on its first flight Feb. 28, 2024, from Gray Butte Field Airport in Palmdale, Calif. Built by General Atomics, the aircraft will conduct flight tests and experiments to collect and disseminate information in the battlespace; one of many autonomous aircraft paving the way for the widespread use of CCAs.

Rethinking Medical DQ's

Each year hundreds of candidates are medically disqualified from military service. Is the Air Force off target in assessing future health?

Senior Master Sgt. Emily Beightol-Deyerle/ANG

Physical fitness is crucial to military readiness, but in examining prospective recruits, the Air Force medical board tries to peer into the future to determine whether candidates can fulfill their obligations over a four- or six-year initial obligation. Although many waivers are granted, USAF doesn't track how those individuals perform over time.

By David Roza

Megan Brown was in her second year in the Air Force Reserve Officers' Training Corps (ROTC) at Clemson University when she learned in an email that her childhood shellfish allergy disqualified her from military service. Brown hadn't had an allergic reaction to shellfish in seven years, but when she asked for a waiver, she was turned down.

Brown is among hundreds of seemingly fit, academically qualified, high-performing officer and enlisted applicants whose quests to serve in the Air Force are shot down each year by an opaque and confusing medical review process. Allergies, anxiety, ADHD, astigmatism in one or both eyes, and numerous other minor conditions can render otherwise qualified candidates unfit for duty in the Air Force—and, at the same time, often still able to serve other military branches.

Senior officers, military retirees, and even members of Congress field hundreds of complaints annually from applicants who feel wronged by what they see as a random and inconsistent system. In many cases, the same conditions that disqualify them as cadets would be waived were those conditions diagnosed after their induction into the military.

"We want a screening process that catches disqualifying medical conditions, but ... [is it] creating unnecessary barriers to enrollment?"
—Gen. John "Jay" Raymond, former Chief of Space Operations

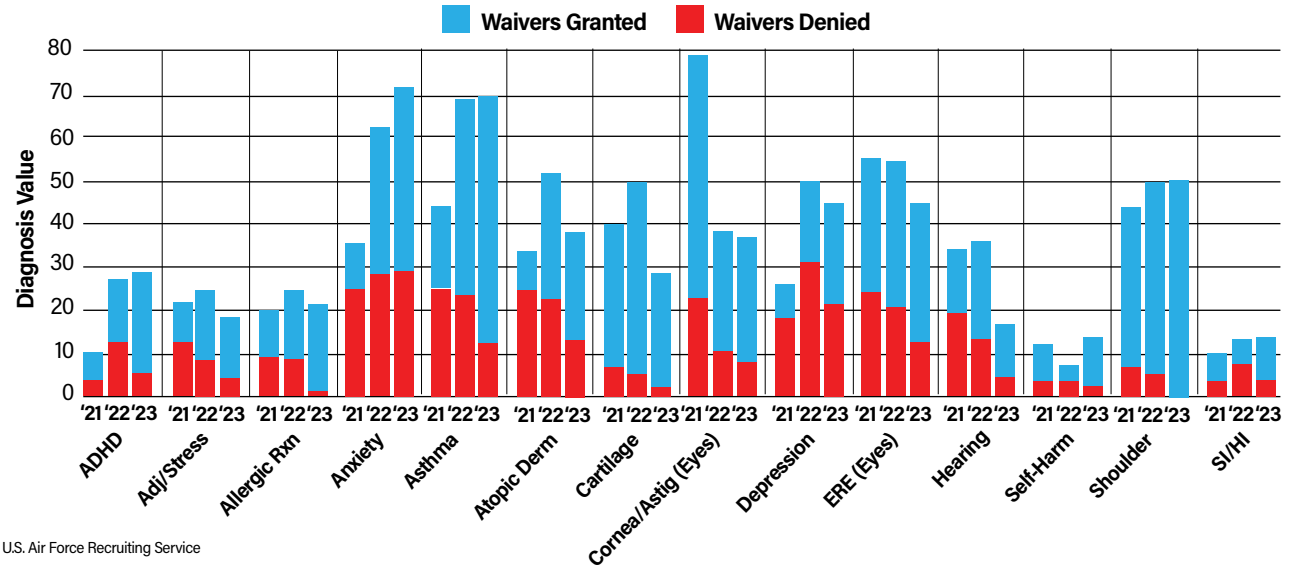
Sen. Elizabeth Warren (D-Mass.), chair of the Senate Armed Services Committee's personnel subcommittee, took up the issue at a Dec. 6 hearing. "One otherwise healthy applicant had to wait an extra two months to enlist while she proved that a childhood wrist sprain was not a disqualifying medical condition," she told the heads of each military recruiting service. "Now, obviously we want a screening process that catches disqualifying medical conditions, but ... [is it] creating unnecessary barriers to enrollment?"

Former Chief of Space Operations Gen. John W. "Jay" Raymond, now retired and the Chairman of the Board for the Arnold Air Society/Silver Wings (AAS/SW), thinks the review process imposes unnecessary barriers on young people who want to serve their country. AAS/SW is a national honor society made up largely of ROTC cadets.

"Our nation needs a well-trained, ready force, and there are medical standards that need to be upheld," Raymond told Air & Space Forces Magazine. "I really believe, though, that we need a shift in [the medical review] culture. I think we are currently in a culture

Medical Conditions and Waivers for Officer Candidates 2021-2023

The 14 most common medical conditions that can disqualify officer candidates seeking entry into the Air Force range from injuries to skin, eye, and psychiatric conditions. When a condition is identified, waivers can be sought, but are accepted in varying numbers.



U.S. Air Force Recruiting Service

Medical Condition Legend: 1) (ADHD) Attention-Deficit/Hyperactivity Disorder; 2) (Adj/Stress) Adjustment disorder; 3) (Allergic Rxn) Allergic Rhinitis; 4) Anxiety; 5) Asthma; 6) (Atopic Derm) Atopic Dermatitis; 7) Cartilage; 8) Cornea/Astig (Eyes) Cornea Astigmatism; 9) Depression; 10) ERE (Eyes) Excessive Refractive Error; 11) Hearing; 12) Self-Harm; 13) Shoulder; 14) SI/HI) Suicidal ideation/Homicidal ideation

that starts out with a 'no' and tries to get to a 'yes,' rather than starting with yes and working hard to get the person in the service where it makes sense to do so."

DIGGING INTO THE DATA

Waiver approvals for officer candidates increased steadily over the past three years, from 56 percent in fiscal 2021 to 64 percent in fiscal 2022, and 74 percent in fiscal 2023, according to data shared by the Air Force Recruiting Service (AFRS). That data lists the 14 most common categories for diagnoses and waivers each year. The likelihood of a waiver being approved varied by condition. For example, in 2021, only 26 percent of the applications for eczema waivers were successful, compared to 84 percent for shoulder conditions. A single candidate can apply for multiple waivers if multiple conditions are found.

The most common disqualifying conditions in this period included asthma, poor vision, depression, eczema, anxiety, shoulder and knee conditions, allergies, ADHD, poor hearing, adjustment and stress disorders, self-harm, and suicidal or harmful ideation.

Among all prospective enlisted applicants, the military services approved 77 percent of 54,206 medical waiver requests received from fiscal 2021 through 2022, according to a 2023 Department of Defense Inspector General report. But the approval rates varied by service branch: The Air Force was lowest at 65 percent, while the Marine Corps had the highest waiver approval rate at 98 percent. Because the figures combine two fiscal years, it's difficult to see a direct correlation with officer candidate waivers shared by AFRS.

Still, waiver recipients do make up a substantial part of today's Air Force and Space Force. Tech. Sgt. Jonathan Neff, who works at the Accessions Medical Waiver Division at AFRS Headquarters at Joint Base San Antonio-Randolph, Texas, said in a YouTube video published in September that 26 percent of all accessions in fiscal 2023 required a waiver. Most of those—some 20 percent of all accessions—needed medical waivers, while the other 6 percent required other matters waived, such as moral waivers for past criminal conduct, for example.

"We need these waivers more than ever," Neff said. "We need to reduce these barriers to service everywhere we can. And our leaders are doing their absolute best to get after that."

EXPLAINING THE PROCESS

Air Force enlisted applicants and officer candidates commissioning through Officer Training School go through their medical exams at Military Entrance Processing Stations (MEPS), while officer candidates commissioning through the U.S. Air Force Academy and ROTC are medically examined by the Department of Defense Medical Examination Review Board (DODMERB).

Academy hopefuls do not set foot on campus until they have been awarded a scholarship, for which they need to clear a medical exam, said senior flight surgeon Col. Ian Gregory, head of the Accession Medical Waiver Division at Joint Base San Antonio-Randolph, Texas. Likewise, most Air Force ROTC cadets were traditionally required to clear a medical exam before they could get scholarship funds, and most enjoyed four-year scholarships.

Nowadays, however, two- or three-year scholarships are more common, so a student may enroll in ROTC as a freshman or sophomore. Most ROTC cadets go to field training between their sophomore and junior years of school, Gregory said, and to do that they need to clear a medical exam. Cadets at the Academy and ROTC who are interested in flying must complete an additional physical their junior year.

By whatever means the medical exam occurs, however, if a disqualifying medical condition is identified, they must apply for a waiver to serve. And in the Department of the Air Force—whether the active Air Force, the Space Force, Air Force Reserve, or the Air National Guard—every waiver must be approved by Col. Gregory's command, the Air Force Accession Medical Waiver Division.

The unit employs about 40 people, most of whom are enlisted or civilian medical technicians. The enlisted are noncommissioned officers trained as flight and operational medicine technicians and with work experience equivalent to at least a licensed practical nurse, Gregory said. Most of the civilians are GS-9s with prior military experience, Gregory said. They do not typically have expertise in the medical fields that routinely emerge in waiver decision requests, such as pulmonology, immunology,

dermatology, and psychology.

The Accession Medical Waiver Division has five branches, three of which determine medical waivers. The largest branch evaluates enlisted medical waiver requests, the next largest evaluates officer medical waiver requests, while the third evaluates requests for aviation, special warfare, and other unique medical waiver requests. The fourth branch helps the other three with education and other support functions, while the fifth is made up of physicians who provide advanced technical expertise for the three production branches.

The division uses an internal document called the decision guide, which lists hundreds of medical conditions, the medical record information needed to make a determination regarding each one, and the criteria for disqualifying or accepting a candidate. The technicians use the guide and consult physicians on difficult cases.

RISK TOLERANCE

As part of the Air Force Recruiting Service, the Division shares the objective of meeting recruiting goals, Gregory said. "But we also want to bring in the right applicants, the ones who can do their job, which is to help the Air Force fight wars," he added. "That sometimes involves going overseas and undergoing stress."

Baseline medical standards for general accession are the same for officers and enlisted, regardless of service branch. The regulations are defined in Department of Defense Instruction 6130.03, Volume 1. But each military service can layer additional requirements on top of that baseline, establishing more stringent standards for specific career fields such as aviation and special operations.

The Air Force does not apply a more stringent blanket standard for Airmen, Gregory said: "We wouldn't want to do that anyways, because that's going to limit our applicants."

But regulations allow each service to handle its own waivers, which can change over time, based on each service's operational requirements and recruiting needs. In the Air Force, the guiding light for waiver decisions is whether an applicant can serve one deployment in a tour of duty—typically four years—without causing excessive stress to themselves or the mission, Gregory said. "We don't expect someone to be perfect for a full 20 years."

That means candidates must be able to withstand challenging climates, changing diet, stress, lack of hygiene, and harsh working conditions that may have unpredictable health effects.

"We look at the medical records that our applicants provide and compare it to the medical literature to say, 'OK, within this condition, are they likely to have a recurrence of a problematic medical issue? And how does that compare to what will be expected of them while in the military?'" Gregory said. "It's not as much the concern about office jobs versus physically demanding jobs, as it is the living environment and what that does to your condition."

One example is food allergies, because avoiding allergens and treating exposures could be more difficult while deployed.

"In a deployed environment, you're not able to control exactly what you eat," the colonel said in a 2023 YouTube interview with AFRS. In very hot environments like the Middle East, epinephrine pens tend not to work as well, he added, and even if they do work, the service member would still need to be taken immediately to an emergency room, "which are not always easy to access."

"We have to explain to people that just because they have a well-controlled condition in the civilian setting doesn't mean that it's appropriate for the military environment," he told Air & Space Forces Magazine.

Jerome Tayborn/USAF

ROTC cadets do plenty of physical training, and while past shoulder and knee injuries can be reason for disqualification, waivers for these are common. Waivers are less common for factors such as vision conditions or a prior history of asthma or learning or mental conditions.

Waiver calculations are relatively straightforward for candidates heading off to Basic Military Training or Officer Training School. For ROTC and Academy cadets, however, Gregory's office must project their health further into the future, because they won't finish college for three or more years. And because the Air Force tends to meet its officer accession goals, medical reviewers apply a lower risk tolerance when reviewing officer candidates.

This variable is generally not well understood. The Air Force adjusts its risk calculus based on supply and demand; as the Air Force has struggled to find enough recruits in recent years, its risk tolerance—that is, its willingness to issue a waiver—has increased.

"We're looking to kind of open up the aperture a little bit more compared to previously," Gregory said, referring to the current outlook. "But the pendulum doesn't really swing back and forth, at least it hasn't," he noted. "Doesn't mean that it couldn't, but it just hasn't really because historically that has not been the need."

The Air Force's risk tolerance rises for members who develop or discover health conditions after joining the service. The logic is that the Air Force has already invested in training them, and that more experienced Airmen who develop conditions have already proven they can do their jobs. There are different medical standards for accession and retention, Gregory explained.

"If someone develops a condition, we have some time to say, 'Yes, we think it's worth it to retain this person because they have shown that they can do what we need them to do in the Air Force,'" he said. "Whereas if someone has not been trained, they've never been in the Air Force, the risk and value equation changes such that the risk seems to outweigh the value."

At least, that's the way the process works on paper.

"THE AIR FORCE IS MISSING OUT"

Rejected cadets tell a different story.

Raymond's Recipe for Fixing Waivers: Change the Culture

Anecdotal evidence and the personal experience of military leaders suggest that much can be done to improve the medical review process. Gen. John "Jay" W. Raymond, the first Chief of Space Operations, recommended six steps to help healthy, qualified candidates serve their country without letting medical evaluations become too restrictive:

- **Change the culture.** Shift the approach to where "it is okay that we are working with folks to get them qualified rather than just defaulting to no."
- **Clarify standards.** Use up-to-date medical evidence to ensure disqualifications are not based on outdated science.
- **Apply standards consistently.** Ensure standards are uniform across the officer and enlisted spectrum, so that an applicant cannot be denied a commission but still be able to enlist.
- **Use like standards for like jobs.** The requirements for flying fighter jets in the Air Force should be the same as those for flying fighter jets in the Navy and Marine Corps, for example.
- **Ensure consistency across Military Entrance Processing Stations.** "I have heard relatively frequently that not all MEPS are created equal when it comes to getting approved." The standards should be the same no matter the region and no matter the applicant.
- **Communicate standards clearly.** Applicants should not be caught off-guard.

Raymond cited his decision to help two people with Type 1 diabetes into the Space Force, a military first.

"Diabetes can be well-monitored and controlled," he said. "Allowing folks to serve if their jobs allow them to serve in areas where they can access proper medical care, as is the case in the Space Force," he said. Most Guardians serve near robust medical centers. "I'm not saying that's the right answer for everybody, but it should not be a disqualifier for everybody right off the bat."

Other conditions that deserve further review and consideration include eczema, childhood asthma, and even some mental health conditions, the former CSO said.

"I think we need to be a little bit more open to individuals who in the past have sought counseling to manage stress," Raymond said. "On the one hand, we are encouraging those currently in the service to seek help, while on the other hand, we are making it difficult for those that have done so prior to coming on Active Duty to serve."

Raymond said the Office of the Secretary of Defense should initiate changes and ensure consistency among the services, but that each military branch should step up its own efforts to communicate standards more clearly.

"I don't think it will be easy, but I think it's necessary," he said. "It will take some out-of-the-box thinking and a willingness to change the culture."

Levin Brandt was at the top of his cadet class, commander of the Honor Guard, and earning excellent physical fitness scores at the University of North Dakota's ROTC program when, in his second semester, he was disqualified for hay allergy-induced asthma.

"I was beyond frustrated," Brandt said. "Unless in a hay loft, I am completely unaffected. I don't believe the military has a hay loft and if they did, I could easily work in a department without a hay loft."

Brandt applied—unsuccessfully—for a waiver. He acknowledged that his medical "resume" is very long—but noted that asthma was the only disqualifying condition. The Marine Corps turned him down for the same reason.

"It's crazy that a blanket policy about asthma was what got me," he said. "That it's not even waivable and there are no subsections with more specifics as to the certain types or severities of asthma that they are trying to avoid."

Brandt nevertheless got involved in the Silver Wings Society, a national organization that promotes civic leadership through community service and education about aerospace power.

"Medically disqualified [cadets] make up a good portion of the Silver Wings leadership, meaning that the Air Force is missing out on a lot of great leaders," said Brandt, who served as the society's national president for a year.

Indeed, among 13 former AFROTC cadets who shared their medical disqualification stories with Air & Space Forces Magazine, several were active in Silver Wings. All shared a strong desire to serve in the Air Force but were medically disqualified.

"I want to serve our country, in uniform, in any capacity the Air Force sees appropriate," said Brandon Weide, another former cadet. "I stand ready to serve at least a full 20 years."

Weide was diagnosed with Crohn's disease, an inflammatory bowel condition, when he was 12. Though he achieved remission two years later, at 14, he continues to take medication to manage the condition. He already has an FAA Commercial Pilot Certificate, the highest-possible medical clearance from the FAA, and consistently achieves excellent physical fitness scores.

"None of these factors, including extensive exposure to aeronautical operations and physically demanding military training, has worsened my Crohn's disease or generated any negative symptoms," he said.

Attempts to gain a waiver and multiple congressional inquiries proved fruitless. Nor would the Air Force offer any additional insight into their decision process.

"The clearest answer given was that I did not meet the 'level of exceptionality' reserved for issuance of an exception to policy," he said. "When I asked for more information via additional congressional inquiries, conditions required to meet the 'level of exceptionality' could not be accurately defined."

Yet Crohn's and other bowel diseases are not disqualifying for members already serving, even in flying billets. In 2021, Air Force Lt. Col. Josh Nelson returned to flying C-130s after having his colon surgically removed due to ulcerative colitis. In 2023, Capt. Charles Boynton was declared fully mission-capable in the F-16, despite a diagnosis of testicular cancer five years earlier. In 2020, Col. Todd Hofford became the first pilot to fly the F-15 after undergoing cervical disc replacement surgery four years prior.

All three spent years battling the Air Force medical bureaucracy to regain their qualifications, but eventually succeeded. That makes cases like Weide's even more confusing.

"I was essentially told there was no AFSC [Air Force Specialty Code] or position, rated or non-rated, which I could hold in a uniformed capacity because of my medical condition, and I was being told this while officers continued to fly in the operational Air Force with Crohn's disease, even after multiple surgeries," he said.

Other cases are even more perplexing. Justin Tasca hesitated while filling out his DODMERB paperwork, hovering over the question "Do you have Dyslexia?"

Tasca was an A student and had made the dean's list at Northern Arizona University multiple times. While he read a

little slower than others, he had essentially overcome a childhood diagnosis. But rather than lie, he checked "yes," and was medically disqualified.

"Becoming a pilot, navigator, or special forces might be out of the question," Tasca acknowledges. "But why couldn't someone [with dyslexia] serve as an aircraft maintenance, logistics, acquisitions, services, or security forces officer?"

Hadn't he already proven that he could excel despite the condition?

In other cases, candidates found themselves confounded by the seemingly different standards between the military services or between officer and enlisted accessions. One Air Force ROTC cadet told Air & Space Forces Magazine that she was disqualified from AFROTC for a hip tear suffered in a car accident—but told she could enlist or apply to Officer Training School after getting treatment.

Another ROTC cadet said the Air Force classified a childhood upper respiratory infection as "mild asthma," even though she had never been diagnosed with asthma. She went to see a civilian specialist, who explicitly stated that she did not have asthma. But the Air Force refused to waive the matter.

The cadet later joined Army ROTC.

Megan Brown, the Clemson University AFROTC cadet disqualified because of a shellfish allergy, said the waiver process kept her hanging, giving her false hope.

"If the DODMERB office will not waive an allergy no matter what, then I think they should tell cadets that so that they do not go through the waiver process," she said. "I had to pay for the appointments out of pocket for them to mean nothing. I think that the policy could provide more set rules or answers for cadets to look at, as the DODMERB process is very extensive, and can be very confusing."

'IT'LL NEVER BE PERFECT'

As executive director of Silver Wings and its partner organization, Arnold Air Society, retired Brig. Gen. Dan Woodward hears many such stories from highly motivated cadets.

Keith Lewis/USAF

Asthma and other respiratory ailments are common causes of disqualification. While some of those factors may not be of concern, continuous research at the AFRL's 711 Human Performance Wing, Wright-Patterson Air Force Base, Ohio, testifies to the respiratory challenges of flying at all altitudes.

"For more than a decade, I've been fortunate to work with some of the most outstanding students in AFROTC," he said. "They are patriots who want to serve their country. Some have exceptional academic credentials, are otherwise physically qualified, and have the highest recommendations from their ROTC detachment commander."

Yet many are disqualified for conditions that have not affected them for years, he said, "or which would have been waived were they six months downstream having raised their right hands. It's really difficult to see them having problems with deployments or anything else once they wind up in the Air Force."

And while ROTC cadets are supposed to be medically cleared before receiving scholarships, Woodward said it "absolutely" happens where cadets receive scholarships but are later disqualified anyway, sometimes just months away from commissioning.

"We're bouncing some really stellar people out of the United States Air Force and Space Force for reasons that seem really, really questionable," he said.

Woodward called for a comprehensive look at the medical standards, with a particularly close eye toward conditions that would be waived for Active-duty Airmen.

"When was the last time we've really taken a look at this?" he asked. "Because the circumstances have changed over time."

Particularly dismaying is when cadets are disqualified from one service ROTC program, then end up joining another. Woodward, who served 29 years in the Air Force, was disqualified from the Army due to flat feet. He agrees he may not have been cut out for marching tens of miles with a 100-pound pack, but his condition never affected anything he did in the Air Force.

Similarly, Woodward said he's seen anecdotal evidence that military children can be disadvantaged in a system where their medical histories are more accessible to military evaluators.

"When do these conditions become moot?" Woodward asked. "I find it really frustrating when a cadet is disqualified for something they have not had since they were 12."

The review process will never be perfect, "because it's run by people," he added. "But we really should take a look at this, because we're bouncing great people."

'MORE TO THE STORY'

Why are so many candidates being disqualified for seemingly no good reason? Gregory insisted there is more to the story.

"You'll hear a part of the story, I'll have a part of the story. And then the truth is somewhere in between," he added. "Occasionally when we get these complaints through various mechanisms, we will change our mind because we miss something, or there is new information. But most of the time, we're considering something else that the applicant either doesn't know, or the applicant isn't aware of our perspective."

When the Accessions Medical Waiver Division provides a disqualification "we have to match up the reason they were disqualified to whatever MEPS or DODMERB disqualified them for," he said.

For example, if MEPS disqualified an applicant for asthma because they used an inhaler, the waiver division may request further testing which finds the applicant does not have asthma, but they may have another lung condition that disqualifies them.

"In the response they get disqualified for that same reason they were disqualified in the first place," Gregory said. "But really, our logic is, well, they have some other kind of lung condition."

Because the waiver division chooses to limit how much of its homework it shares, such as the exact standards for passing a

lung function test, the disqualified applicant is left in the dark.

"I don't want to give someone the answers to the test so that they can just provide the answer that they think I want to hear," Gregory explained. "They need to provide the answer that is true for them."

The concern is more pertinent for subjective conditions, such as how much pain an applicant feels from chronic headaches, since there is no way to validate someone's pain, Gregory said. If an applicant knows they can get a waiver if they require prescription pain medication for headaches just twice a year, for example, then "they're going to say exactly what we want to hear, whether or not that's their real situation."

If allowed into the service, "and then they start having their headaches again, and then they need more care, then that can affect their ability to do their job," he explained.

Still, Gregory said there is room for improvement in how a rejection is communicated to applicants. Delivering the bad news falls to recruiters and ROTC detachment commanders. The ideal message would be sensitive to the pain an applicant experiences. "We will always come up short, because someone wants a certain answer, and in these cases we're denying it," Gregory said. "That hurts, that's hard, and I'm sympathetic to that. Therefore it's not just what the message is, but how it's delivered, and that's just communication."

ACCOUNTABILITY

Each month, the chief of each branch in the Accession Medical Waiver Division reviews about 10 random cases from each technician to ensure their decision-making is sound. The division also reviews its decision guide "continuously," Gregory said. There is no formal external audit, however. "We get picked all the time by various congressional complaints or general officers or retired family members," he explained.

"We get all the time people saying, 'Hey how come this person got DQ'd? Can you look at it again?'" he said. "And so we go back and look at things again. And that happens multiple times a week."

Rarely, a second look results in a different decision from the waiver division, but most of the time, the division stands by its initial choice. The colonel said he would not be opposed to an audit, because "I'd feel confident that in general we do good work." But if anything affects the accuracy of their decisions, it's the pace of work, he said.

"I know that maybe if we don't do things 100 percent accurately, part of that is because we've been asked to do things quickly, and certainly anytime there is an increase in pace, there's a risk of doing things less precisely," he explained.

The ramped-up pace is due to the Air Force's recent recruiting challenges. After taking the helm of AFRS in 2023, Brig. Gen. Christopher Amrhein identified long medical processing times as a barrier to service. In fact, Senator Warren grilled him and the other top military recruiters about it in the December hearing. AFRS hired about 60 contractors to work in and around MEPS locations to help with medical paperwork, buying two or three hours a week back for each recruiter.

When a waiver request arrives at Accessions Medical Waiver Division, it usually takes about three days for a technician to get to it, Gregory said. In the past, insufficient staffing has stretched the backlog as far as three weeks. Once a technician gets to the waiver, they usually decide either to close it or ask for more information that same day.

The division does not track the total time it takes to close a case, "because plenty of times we send a waiver back to ask for more information, and then it could take days or weeks to get that information," he explained. "It's out of our hands."

The goal is to minimize how many times that happens, so the division is refining its processes to make sure MEPS and DODMERB send in all the relevant records the first time around.

FUTURE CHANGES

The military's medical standards are not set in stone. Gregory is part of the Accession and Retention Medical Standards Working Group, where he and experts from other services meet every month to see if any standards need to be updated. For example, regulations were recently changed to reduce the number of applicants disqualified for having a history of gastrointestinal bleeding, or for conditions where their eyes do not track and focus together.

The Air Force has also gradually refined its waiver tolerances. Eczema used to be a medical disqualifier, but in 2017 the service began issuing waivers for the condition. ADHD medications still are not allowed in the Air Force, but in 2017, the service reduced from 24 months to 15 months the amount of time applicants must have been off those medications before they can be considered.

Another recent change: Body fat composition standards were loosened last year, raised from 20 percent to 26 percent for men and from 28 percent to 36 percent for women. The change made it possible for nearly 700 applicants to become Airmen in 2023 alone.

Diabetes used to be an automatic disqualifier, but even that is changing now. In 2021, the Space Force commissioned Air Force Academy wrestler Tanner Johnson as a second lieutenant, recognizing that his Type 1 diabetes need not disqualify him from serving because the Space Force fights from its home bases, rather than deploying to isolated bases overseas. How the services evaluate candidates is ripe for review. Gregory acknowledged the open secret that some MEPS locations are easier than others.

"There are 65 different MEPS out there, so inherently, you're going to have some variability in the processes, the population, the staffing," he said.

U.S. Military Entrance Processing Command, which oversees MEPS, wants to boost staffing levels at some stations, which should shorten the timelines for evaluations and processing there, the colonel added. Six stations are also trying out a new search tool within the health information exchange which should make the process of finding disqualifying conditions in someone's medical records faster and more accurate.

In the meantime, Gregory wants better data to inform his team's waiver determinations. The Air Force does not specifically track how waiver recipients perform over the course of their careers. Did they deploy successfully? Did problems emerge? Did the member fulfill their service obligation? And how much medical attention did they need while in uniform?

"What I want to know is 'are my decisions accurate?'" he said. "We have some superficial data, but we don't have the kind of granular data that we need to know, with precision, that our decisions are correct."

Gregory estimates the analysis would cost several million dollars a year.

"When you use data from the past, you evaluate it and you say, 'Aha, I can probably make a different decision moving forward,'" the colonel explained. "Maybe that decision is to open up the waiver tolerance or maybe it's to close it. That's what we want to know."

Why Cislunar Security Must Be a Space Force Concern

Think of the Moon as the First Island Chain Off the Coast of Earth.

Joshua Conti/USSF

A United Launch Alliance Vulcan VC2S rocket launched the first certification mission from Space Launch Complex-41 at Cape Canaveral Space Force Station, Fla., in January. The test carried two payloads: the Peregrine Lunar Lander and the Celestis Memorial Space deep space Voyager mission, known as the Enterprise Flight.

By Col. Charles S. Galbreath, USSF (Ret.)

Global powers and new space entrants are racing to the Moon and the cislunar regime, an area extending beyond geosynchronous orbit out to more than 275,000 miles. In this region of space, spacecraft trajectories are influenced by the gravitational pull of both the Earth and Moon. There, few established norms exist to govern the multinational players and their scientific, economic, and geopolitical objectives.

Several countries are planning robotic missions, and some are pursuing a permanent human presence on the Moon. All told as of this writing, some 106 missions are planned for cislunar space this decade, representing the efforts of 19 countries and the European Space Agency.

Unlike the race to the Moon between the United States and the Soviet Union in the 1960s, this new space race involves dozens of countries, dynamic geopolitical tensions, and technical capabilities associated with sustained presence. That added complexity increases the urgency to view this regime in a new light: The U.S. Space Force and U.S. Space Command must begin taking steps today to ensure free and open access to cislunar space—or risk ceding the region to others who move more quickly.

Already in 2024, we've seen three missions head to the Moon. Japan's Smart Lander for Investigating the Moon (SLIM) saw the nation became the fifth nation to land on the lunar surface, though it suffered a power issue after landing. The U.S. commercial effort Peregrine, the country's first lunar landing attempt in decades, suffered a propellant leak once in space and burned up as it reentered the Earth's atmosphere. Finally, Intuitive Machines reached the lunar surface, marking the first successful commercial mission to the Moon and the return of the United States to the Moon's surface after over 50 years. All of these efforts encountered problems, underscoring the complexity and challenges of this new space race.

Col. Charles S. Galbreath, USSF (Ret.), Senior Resident Fellow for Space Studies, Mitchell Institute for Aerospace Studies. Download the entire report at *http://MitchellAerospacePower.org.*

Even with the diverse set of nations heading to the Moon, there are now two main teams involved in the current race. On one side is the United States and an extensive group of aligned nations who have signed the Artemis Accords. This agreement reaffirms the peaceful intentions of space exploration and contains provisions on transparency, interoperability, emergency assistance, registration of objects, sharing scientific data, preservation of space heritage, extraction and use of space resources, deconfliction of activities, and debris mitigation. Many of these aligned countries enjoy advanced space programs, like Japan and India. They are joined by non-space-faring nations that support the peaceful and transparent approach outlined in the accords.

On the other side of this equation, China and Russia have partnered in the International Lunar Research Station (ILRS), along with Venezuela, Iran, the United Arab Emirates (UAE), and the nations of the Asia-Pacific

Space Cooperations Organization (APSCO). Plans call for the ILRS to consist of a facility near the South Pole of the lunar surface and a station in cislunar space used to aid communication and transportation to the lunar facility.

In this race, either the United States and its partners arrive first and establish customary practices of safe and responsible collaboration, or they risk relinquishing key interests and governing principles to China and Russia. Given the lack of established international norms, this will be just like any other era of territorial exploration and expansion—those who arrive first set the terms. China's ambition to supplant the United States as the world leader means it sees this race as an opportunity to shift the global balance of power. So, losing this race could seriously disadvantage the U.S. in the future.

UNDERSTANDING THE CISLUNAR REGIME

Cislunar space is an incredibly dynamic region influenced by numerous forces and having caustic conditions. Mastering it demands collaboration from civil, commercial, and national security entities.

Unlike operations in Earth orbit, which are predictable and follow stable paths due to the Earth's powerful gravitational force, spaceflight dynamics change dramatically as objects move beyond geosynchronous orbit and begin to come under the gravitational pull of the Moon. These competing forces greatly complicate spacecraft trajectories.

In the cislunar regime, there are five special locations where the gravitational pull of the Earth and the Moon balance and an equilibrium is attained. Known as Lagrange points, their gravitational equilibrium enables spacecraft to remain near the points and transit between them while using only minimal fuel. Their positions relative to the Earth and Moon also offer a commanding vantage of the cislunar regime, making them highly valuable to future domain awareness, communication, navigation, and scientific activities.

Another important aspect of the cislunar regime is its massive size. The average distance from the Earth to the Moon is 238,900 miles. To put in perspective, if the Earth were the size of a basketball placed directly under one hoop, the Moon would be the size of a tennis ball placed at the top of the 3-point line. In this comparison, the L4 and L5 Lagrange points would be just beyond the 3-point line roughly in line with the free-throw line. By contrast, the geocentric regime—where most satellites operate today—would be a small territory just beyond the rim.

That's why maintaining domain awareness in the cislunar regime will be so difficult. It's just a matter of sheer volume. That far from Earth, ground-based radars are far less useful; indeed, most existing space surveillance radars are useless for monitoring cislunar space. An entirely new architecture built from new technologies and models is needed to depict motion in this region to achieve situational awareness. These observations are essential to establishing and enforcing norms and standards.

The Moon poses its own unique challenges. With no appreciable atmosphere, there is nothing to block or absorb radiation. Earth's atmosphere and magnetic field protect us and our equipment from solar and cosmic radiation. On the Moon, no such protective barrier exists, so personnel and equipment must be shielded. A second lunar hazard is regolith—lunar dust—formed from billions of years of meteor impacts and interaction with charged plasma from the Sun. Unworn by atmospheric or water erosion, regolith is fine, jagged, electrostatically charged silica particles covering the entire surface of the Moon. These particles caused electrical, mechanical, and even respiratory issues during the Apollo program. Future Moon missions could spread regolith hundreds of miles across the lunar surface, contaminating scientific instruments and experiments—or even causing damage to economic or historic sites, such as the Apollo landing locations. A third lunar challenge is the Moon's extreme temperature ranges. Moving from a two-week lunar day to a two-week lunar night can see temperatures vary from 250 degrees Fahrenheit to minus 208 degrees Fahrenheit. Such an extreme range can leave materials brittle, and slash equipment life expectancy.

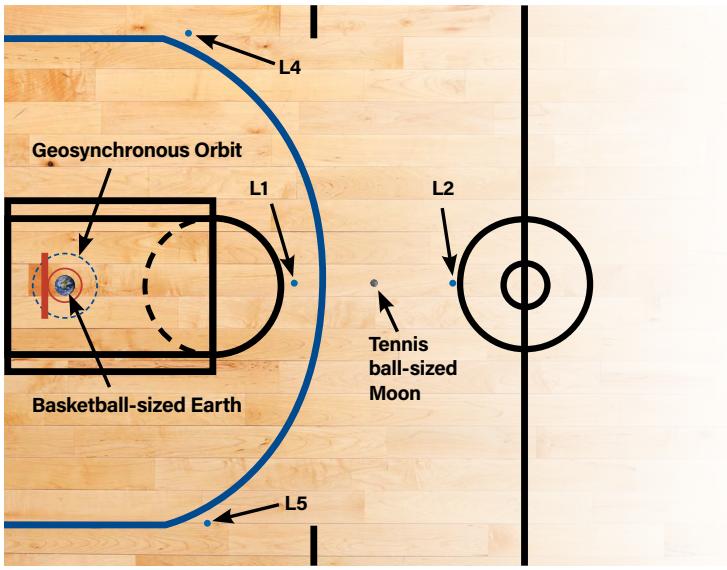
CHINA'S APPROACH

China's view of the Moon was made clear nearly a decade ago by Ye Peijian, then the lead for the Chinese Lunar Exploration Program. "The universe is an ocean, the Moon is the Diaoyu Islands, Mars is Huangyan Island," he said in 2015, referring to disputed islands in the Western Pacific. "If we don't go there now even though we're capable of doing so, then we will be blamed by our descendants. If others go there, then they will take over, and you won't be able to go even if you want to. This is reason enough."

Expert analysis of PLA programs and doctrine makes clear that China seeks to be the preeminent global power in space. Overtaking the United States and "establishing a commanding position in cislunar space" is a vital step toward that objective. And while China claims the United States misrepresents its peaceful objectives in space, Peijian's comparison of the Moon to the disputed islands in the Western Pacific heralds a confrontational intent. China's aggressive actions in the Pacific can be seen as laying bare its ambitions in cislunar space, as China views national power in terms of territorial control. China has repeatedly signed bilateral agreements regarding disputed territories in the Western Pacific, only to break those agreements in an effort to control more territory. The fact that the PLA also controls China's space

Building an Outside Game

To get a sense of the scale of cislunar operations, think of a basketball court: Satellites in geosynchronous orbit—22,000 miles from Earth—would be directly below the rim, while the Moon—238,900 miles away—would be at the top of the 3-point line.



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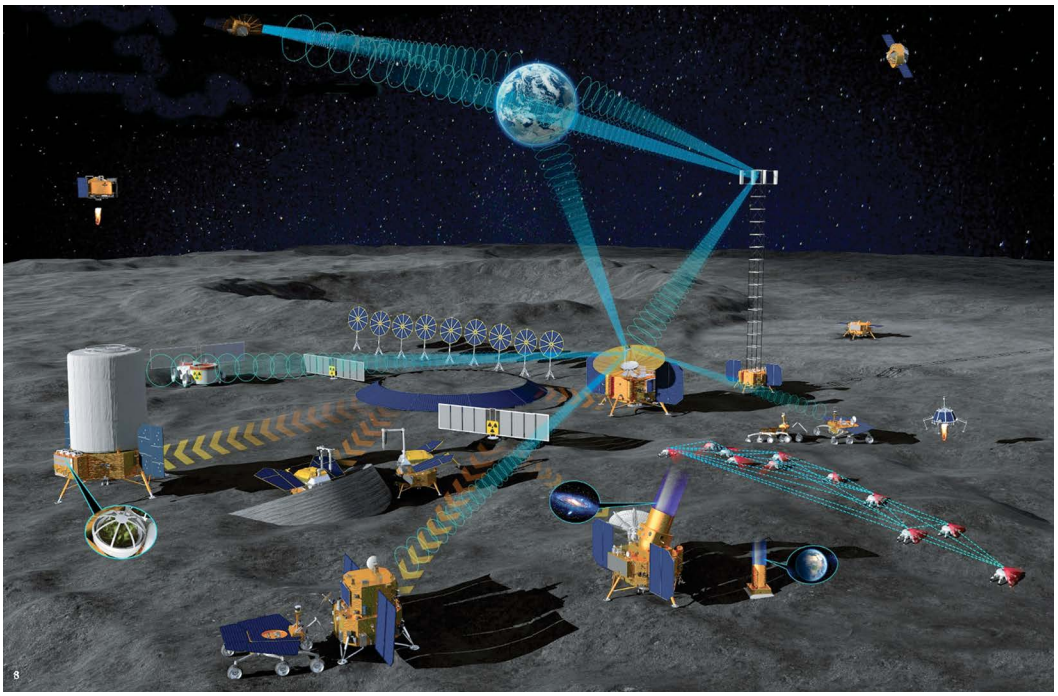


China and Russia are working together on an International Lunar Research Station near the South Pole of the Moon, joining with Iran, the United Arab Emirates, Venezuela, and others. Such research bases on the Moon could be used to try to close key regions from exploration by the U.S. and its allies.

China National Space Administration

program suggests that pattern will continue in space.

Consider how that might play out in a research scenario: If China were to establish a "scientific" station on the moon in an area rich in lunar ice, it might then require a keep-out zone to prevent others from interfering with their scientific research. Such a zone, however, could effectively commandeer the entire region and the resources in it, while denying access to other nations. Note that China is the only country to land on the far side of the Moon, and it intends a sample return mission from there in 2024. Importantly, using the gravity of the Moon, China could also conduct offensive operations against U.S. and partner space capabilities in the Earth orbit from an unobservable vantage point.

THE MILITARY IN CISLUNAR SPACE

Cislunar activities are a new mission for the Space Force and Space Command and requires growth in funding and personnel. An initial budget of about $250 million annually for five years would be sufficient to establish the cislunar infrastructure critical to the race to the Moon, accelerating delivery of needed capabilities with the sufficient scale and effectiveness to support civil and commercial activities. It will also establish the necessary military means to secure those activities.

DOD must develop a cislunar strategy to define the military's role and relationship to civil and commercial objectives in the cislunar regime. A DOD cislunar strategy would also define the military's primary objectives as promoting a safe and stable environment, with the secondary benefits to enable or accelerate civil and commercial cislunar space development. DOD should also detail specific military objectives, such as assuring safe operations at Lagrange points or unfettered access to the lunar surface. This strategy would inform Congress in its resourcing, guidance, and oversight roles and encourage industry to invest.

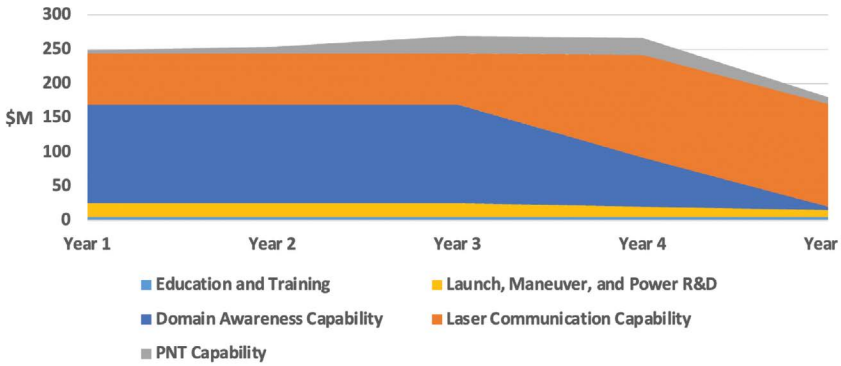
The Space Force would build on that strategy, developing the skills and understanding to properly resource cislunar missions, beginning with the math, science, and expertise required. All Guardians would benefit from some familiarization with "cislunar basics," but a small cadre must specialize in cislunar operations. This calls for about 200 cislunar-focused Guardians, to be added and developed over the next five years, and to facilitate the rapid transition of new capabilities from research to operations. They would be divided into four roughly equal lines of effort: supporting ongoing R&D efforts, acquiring and fielding capabilities, conducting operations, and training and staff assignments.

DOD must also develop new doctrine, concepts of operations (CONOPS), and requirements. Like the DOD cislunar strategy, new and/or updated doctrine, CONOPS, and requirements should include direct support to civil and commercial activities along with unique military requirements. Additionally, new requirements for navigation, maneuverability, and communication data rates will also be necessary to establish the needed cislunar infrastructure. CONOPS for achieving domain awareness or the exchange of information among military, civil, and commercial entities will advance transparency and cooperation. Within this scope of doctrine, CONOPS, and requirements, U.S. Space Command can identify how they will attribute potentially harmful or threatening behavior to promote stability and preserve interests.

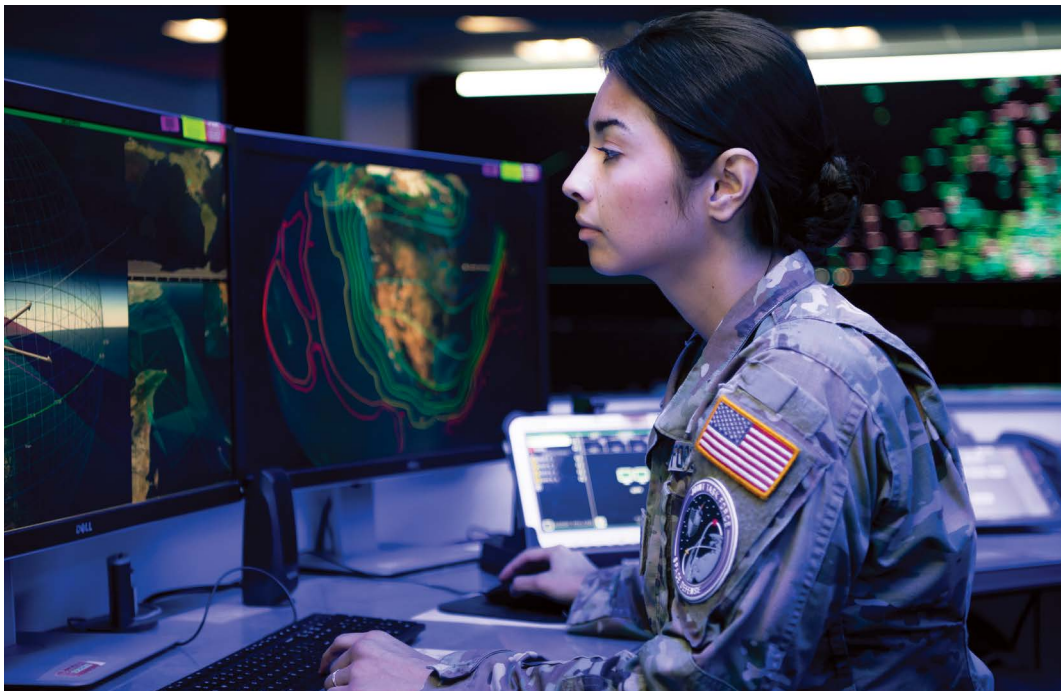
To date, the Defense Advanced Research

Investing in Cislunar Space

Investing about $250 million a year for five years would give the Space Force the tools it needs to compete in the cislunar regime, the Mitchell Institute estimates.



Mitchell Institute



Tiana Williams/USSF

The Space Force should develop a cadre of Guardians steeped in math, science, and expertise in cislunar space. This should start with a familiarization of "cislunar basics" for all Guardians, move to an expanded training regimen for a group of Guardians "minoring" in cislunar, and conclude with a small set of Guardians with a deep understanding or "majoring" in cislunar.

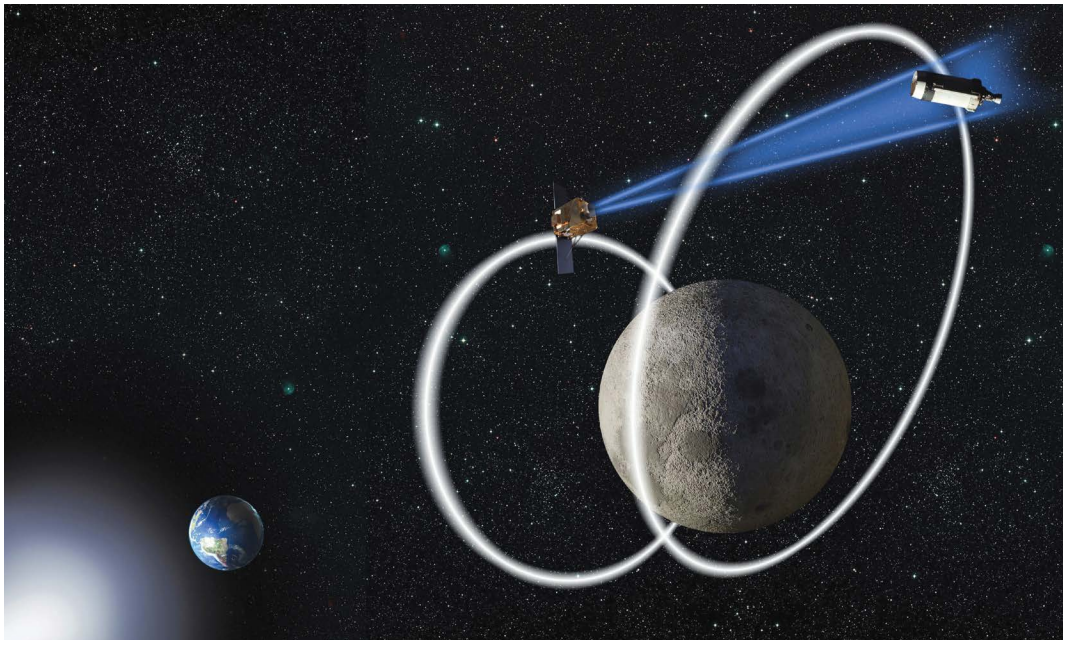
Projects Agency and the Air Force Research Laboratory have made the most notable DOD investments in this area. Early USSF participation in these efforts, and additional attention from the USSF in key areas will increase the probability of successful transition to operational capabilities.

DOMAIN AWARENESS

AFRL's Oracle program will be vital to monitoring the vast cislunar regime and key areas of interest such as Lagrange points and transfer orbits. Unfortunately, due to its complexity and funding challenges, AFRL recently announced a delay in the Oracle program from a 2025 to a 2027 launch, reducing domain awareness for some 100 missions to the Moon planned in the next seven years and delaying the establishment of a robust domain awareness infrastructure for the coming decades. This delay drives risk at a time when adversary actions in this realm call for enhanced situational awareness.

HIGH-SPEED COMMUNICATION

Assured, high bandwidth communication is another major infrastructure challenge DOD should tackle. Existing communication networks struggle to support the current mission load and will not be able to support the increased capacity required for the Artemis Accord's purposes. Laser communication seems an ideal choice because it can be used for high-capacity data transfers. But this won't be easy. The vast distances of the cislunar regime will require precise pointing accuracy to establish the links. The new network must also overcome challenges related to the relative positions and orientations of the Earth, Moon, and Sun, which will create eclipse periods and solar exclusions that necessitate multiple paths to assure uninterrupted communication. A series of relay satellites at Lagrange points, in lunar orbit, and in geosynchronous orbit will likely be necessary to meet the expected demand. A clear example of the viability of this approach is the recent achievement of a successful test



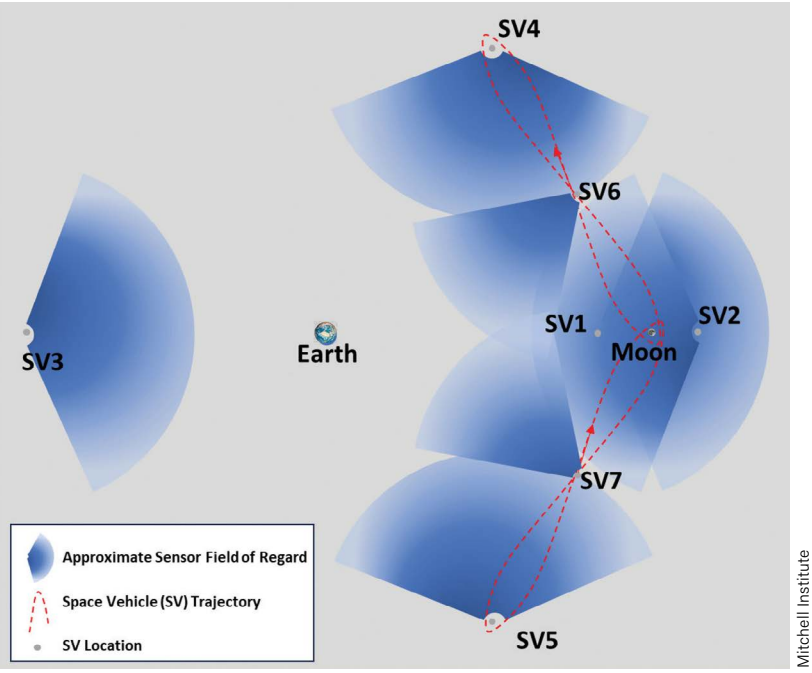
AFRL

An Air Force Research Laboratory Oracle spacecraft, shown in a conceptual illustration, would observe the region near the Moon and potentially beyond.

message across nearly 10 million miles by the Deep Space Optical Communications (DSOC) payload aboard the NASA Psyche spacecraft.

Eyes on the Prize

To ensure full situational awareness in the cislunar region, the Space Force would need sensors aboard space vehicles with wide fields of regard.



Mitchell Institute

POSITION, NAVIGATION, AND TIMING

Assured position, navigation, and timing (PNT) for the cislunar regime is another area requiring R&D and the establishment of standards. Leveraging its experience with GPS, the USSF is in an ideal position to lead and shape this area. Ongoing commercial, civil, and international efforts would benefit from the unifying voice of the USSF to establish a cislunar PNT standard. This will require reviewing existing and proposed methods as well as additional research to ensure operational requirements and interoperability among Artemis Accord partner nations meet actual needs.

PROPULSION AND MANEUVERABILITY

Given the longer travel distances and challenges required to lift spacecraft higher out of Earth's gravity well into the cislunar regime, it will be necessary to field vehicles with considerable propulsion and maneuverability. Like the Navy's transition to nuclear powered submarines and aircraft carriers, nuclear propulsion will likely be a critical enabler to empower future USSF cislunar operations. DARPA's DRACO is a good example of research into nuclear propulsion for cislunar. Because of the criticality of both rapid and efficient maneuver, an additional research effort into nuclear propulsion may be necessary to assure the delivery of viable nuclear propulsion options for future decision-makers. This will also reduce the risk of being tied to a single vendor or supply chain.

POWER GENERATION AND DISTRIBUTION

Power generation and distribution will be another critical enabler for future cislunar activities. The ability to provide uninterrupted power to scientific, economic, or life-sustaining equipment will be indispensable. Options from solar to nuclear power are worth exploring. AFRL's Joint Emergent Technology Supplying On-orbit Nuclear Power (JETSON) is a good example of an effort exploring alternative spacecraft power generation. The DOD must also consider other novel forms of power distribution. For example, the concept of beaming power to remote users will be instrumental in supporting a variety of cislunar missions. This could come from a solar- or nuclear-powered spacecraft that could beam power to a rover operating in the two-week lunar night or from a lunar surface station to a spacecraft in orbit around the Moon.

LUNAR SURFACE LAUNCH AND LANDING

Finally, USSF and other DOD entities will need to deliver equipment, supplies, and astronauts to the lunar surface while limiting the spread of harmful regolith. Realizing these goals requires new and responsible methods to land on and launch from the Moon. One potential option is the creation of launch and landing pads such that rocket thrust is not directed at loose surface rock and dust. Another possibility could employ a tether from the lunar surface as an elevator to move payloads down to and up from the Moon. A third option, specific to launch, could be an electromagnetic rail system. Similar systems are already in use today on aircraft carriers and roller coasters. On the Moon, a system could propel a payload to a predetermined altitude off the lunar surface so that once rocket motors or attitude thrusters engage, they will not dislodge regolith.

FIELD OPERATIONAL CAPABILITIES

As technologies mature in the areas previously described, the USSF must rapidly transition to the acquisition and fielding of operational capabilities to present to U.S. Space Command for employment and synchronization with civil and commercial efforts. It will be important for the government and industry to maintain the expertise and talent generated during R&D efforts to streamline the transition and prevent harmful delays due to workforce loss. Early decisions on architecture and steady, consistent funding are required to realize this vision.

Consider that Oracle or an Oracle-like system is intended to be a main element of the overall cislunar domain awareness architecture; it will likely require seven vehicles—one at each of the five Lagrange points and two transiting between L4 and L5 locations and the Moon. Deciding quickly and building it into the USSF planning, programming, and budgeting process early will increase the likelihood of fielding the capability before it is too late to support upcoming civil and commercial missions.

CONCLUSION

The window to make meaningful contributions in the race to the Moon and cislunar region is closing rapidly. It is time to act now. This involves Congress, the Space Force, Space Command, international partners, and civil actors seeking to operate in space. The prospects of ceding the advantage to an authoritarian and territorially minded Chinese and Russian program would create an even greater disadvantage—one increasingly difficult for the United States to overcome.

Early additive investment by Congress to the Space Force will enable the development of capabilities, which will accelerate the civil and commercial use of the cislunar regime and enable the establishment of the desired norms of cooperation, transparency, and responsible behavior for the Moon, cislunar regime, and beyond.

Mike Tsukamoto/staff; Airman 1st Class Alexander Cook; Mark Avino/National Air and Space Museum

A photo illustration depicts U.S. Army Air Forces Lt. Rex Barber's P-38 Lightning, immediately after firing the fatal blow that sent Japan's Imperial Navy Chief Adm. Isoroku Yamamoto to his death at Bougainville Island during Operation Vengeance, on April 18, 1943. Who shot down the G4M1 Betty bomber has been a point of contention for decades. Now a full analysis of all available evidence points to a clear answer.

THE MAN WHO SHOT DOWN YAMAMOTO

Reexamining the record, there is now conclusive evidence that credit for the historic shootdown should go to a single Airman.

By Daniel L. Haulman

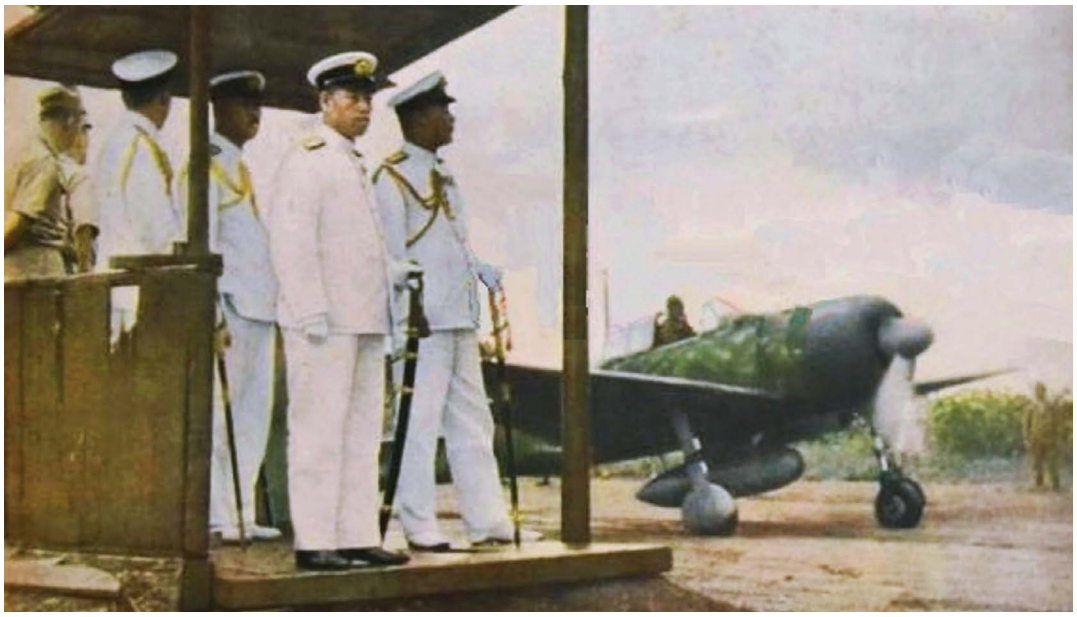
In the 1962 classic Western "The Man Who Shot Liberty Valance," Jimmy Stewart plays a U.S. senator whose life and legend are largely built on his having shot and killed a notorious bully, Liberty Valance, played by Lee Marvin. Only later does it come clear that it was not Stewart's character, but a small-time rancher played by John Wayne who fired the deadly round. The wrong man got the credit—and the fame and fortune that went with it.

The shootdown of Adm. Isoroku Yamamoto provides a similar case study. Yamamoto was a star in the Japanese navy, a Harvard-educated visionary who championed aircraft carriers over battleships and conceived the idea to bomb the U.S. fleet at rest in Pearl Harbor on Dec. 7, 1941. Capt. Thomas G. Lanphier Jr. claimed to have shot down Yamamoto's plane, killing him in the process, but the evidence indicates it was not Lanphier, but his wingman, Rex Barber, who deserved the credit.

Approaching Bougainville, the P-38s encounter two bombers and six escorts, not one bomber and escorts as expected. Unsure which carried Yamamoto, they had to attempt to destroy both.

The mission to shoot down Yamamoto was launched on April 18, 1943, exactly one year after the Doolittle Raid on Japan. It was also the anniversary of Paul Revere's famous midnight ride in 1775. American code-breakers in the Pacific theater had discovered that Yamamoto, who had planned the Pearl Harbor and Midway attacks in 1941 and 1942, was scheduled to fly to the vicinity of Bougainville in the Solomon Islands. The Army Air Forces had P-38 Lightnings at Guadalcanal with auxiliary fuel tanks, giving them the range to fly the more than 400 miles round trip to Bougainville, and therefore the ability to target Yamamoto.

Maj. John Mitchell commanded the mission. He planned to launch 18 P-38s from Guadalcanal, 14 to fly top cover for an attack flight of four. Two of the planes aborted, leaving 16 Lightnings on the raid. They flew low, in radio silence, changing course several times to avoid flying over Japanese island bases in the Solomons. When the P-38s approached Bougainville, 12 of them climbed to provide top cover for the four-plane attack flight under Lanphier. The other three pilots were Lt. Rex T. Barber, Lanphier's wingman, Lt. Besby



Imperial Japanese Navy

In this colorized photo from the Imperial Japanese Navy, Commander-in-Chief Adm. Isoroku Yamamoto, center, and Vice Adm. Matome Ugaki, right, inspect Zero fighters at Lakunai Airfield, Rabaul, New Britain, prior to taking off for Bougainville. U.S. P-38s intercepted their flights, shooting down both planes. Yamamoto was killed, but Ugaki was one of three survivors.

F. Holmes, and Lt. Raymond K. Hine.

Approaching Bougainville, the P-38s encountered the Yamamoto flight. Meticulous planning, along with Yamamoto's fulfilled reputation for punctuality, benefited the raiders. They had expected to see one Japanese G4M1 Betty bomber with Yamamoto aboard, escorted by six fighters. Instead, the six fighters were escorting two Betty bombers, one carrying Yamamoto and the other some of his staff. Unsure which one carried the admiral, the American attackers had to attempt to destroy both Japanese bombers.

Lanphier flew toward one of the Betty bombers but first had to engage in a dogfight with the escorting Zeroes before he could attempt to shoot it down. He reported shooting down a Zero before circling back. Lanphier's encounter with the Zeroes allowed Barber to chase one of the bombers, firing at it from behind and scoring several hits. Barber momentarily lost sight of the bomber, then spotted a crash and assumed he had shot the plane down over the island. But after Barber scored hits on Yamamoto's bomber, Lanphier saw and attacked it from the right side, claiming to have shot off the plane's right wing before it crashed. What he witnessed might have actually been the result of Barber's having previously fired on the plane.

Holmes and Hine, the other two members of the attack flight, had been delayed. Holmes turned violently to shake off a fuel tank, and his wingman Hine had followed him. Coming into the fight, they concentrated on the other Betty bomber, which was heading out to sea. They fired at the plane and soon after Barber joined them in pursuit. Barber then finished off the second Japanese bomber.

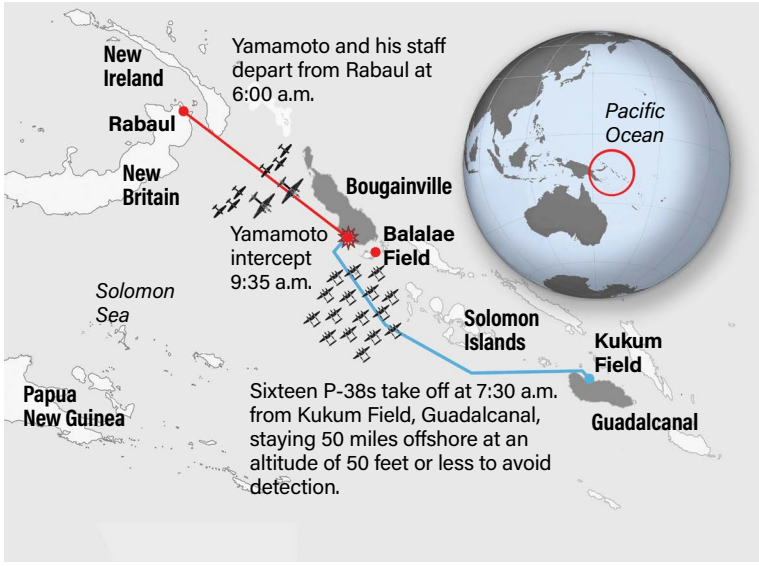
Only three of the members of the four-plane attack flight returned to Guadalcanal's Henderson Field. Hine was lost, perhaps shot down by one of the escorts on the way back. Arriving at base, Lanphier, Barber, and Holmes all claimed to have shot at Betty bombers on the mission. Lanphier claimed to have shot down one that crashed on the island. Holmes claimed to have shot down one that crashed in the sea near the island. Barber claimed to have shot at both bombers before they went down. Apparently, they had no gun camera footage to bolster their claims. The gun cameras must have been left at Guadalcanal to save weight on the extremely long interception mission.

At first, intelligence evaluators thought that instead of two Japanese bombers over western Bougainville that day, there might have been three. They credited Lanphier, Barber, and Holmes with one bomber kill each. But Lanphier continued to claim that he got the bomber that Yamamoto was on, though Barber noted that no one knew which of the bombers carried Yamamoto. It seemed possible that Barber might have gotten him instead, since two bombers apparently had gone down over the island. Early publications seemed to favor Lanphier's version of events.

In the 1970s, USAF historians gathered documents to produce a listing of Army Air Forces aerial victories during World War II, attempting to assign credit consistently for all theaters. USAF Historical Study No. 85, published in 1978, assigned official credit for shooting down Yamamoto's plane to both Lanphier and Barber. By then, Japanese evidence confirmed that there were only two Betty bombers in the Yamamoto flight, that one that went down on the island while the other went down in the sea. Reasoning that since Lanphier and Barber both claimed to have shot at a bomber that went down over the island, and that Yamamoto was on that plane, they should share credit for shoot-

Operation Vengeance

When U.S. intelligence indicated an opportunity to exact revenge for Pearl Harbor on the man who conceived the operation, 16 P-38s were dispatched from Guadalcanal to intercept him at Bougainville, the largest of the Solomon Islands.

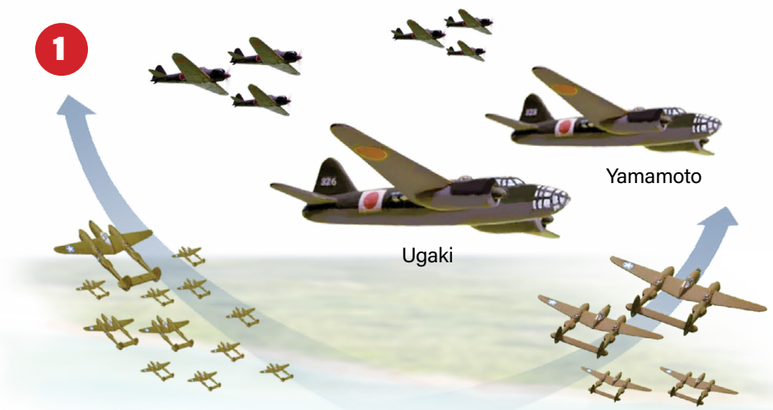


Shooting Down Yamamoto: Six Stages of Victory

The April 18, 1943, Operation Vengeance which sought to intercept and shoot down Admiral Yamamoto, mastermind of Japan's attack on Pearl Harbor, has been examined and reexamined over the years to determine who, in fact, deserves credit for the kill.

In this most recent analysis, historian Daniel Haulman concludes that Rex Barber was responsible for downing both Japanese Betty bombers that day.

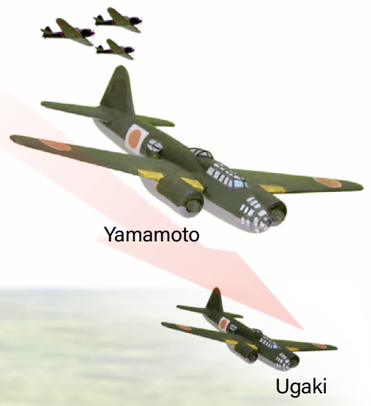
1



Sixteen USAAF P-38s arrive at the intercept point at 9:34 a.m. At 9:35, they spot two Japanese G4M1 Betty bombers transporting Adm. Isoroku Yamamoto and Vice Adm. Matome Ugaki, and an escort of six Zero fighters. Twelve P-38s climb to 18,000 feet to provide air cover while the four-ship kill team of Capt. Thomas Lanphier, Lt. Rex Barber, Lt. Besby Holmes, and Lt. Raymond Hine climb to attack the bombers.

2

The Japanese see the U.S. P-38s climbing to attack. The Betty bombers dive as the closest three Zero escorts engage the kill team. Not knowing which Betty is carrying Yamamoto, both must be attacked and destroyed.



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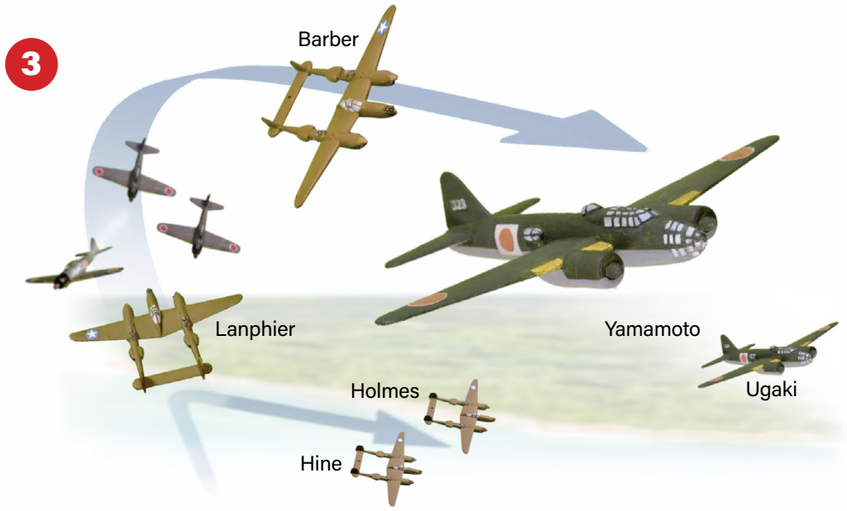

Lanphier attacks three Zeros, freeing Barber to go after the Betty transports. Meanwhile, Holmes has trouble freeing his aircraft's drop tank so he breaks off from the kill group. His wingman, Hine, follows to protect him as he attempts to free the tank.

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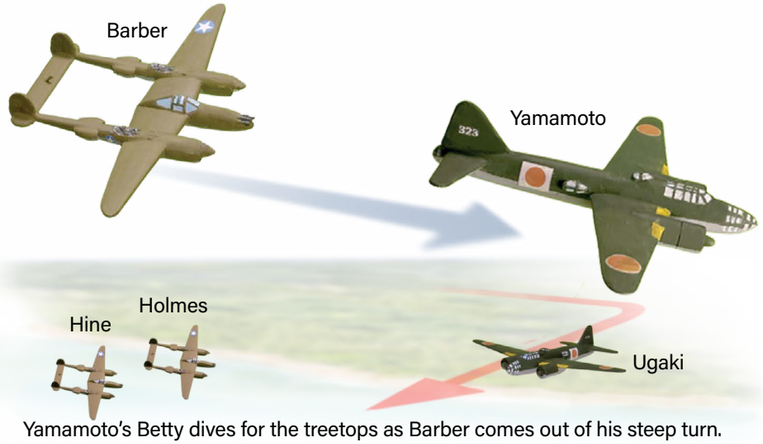


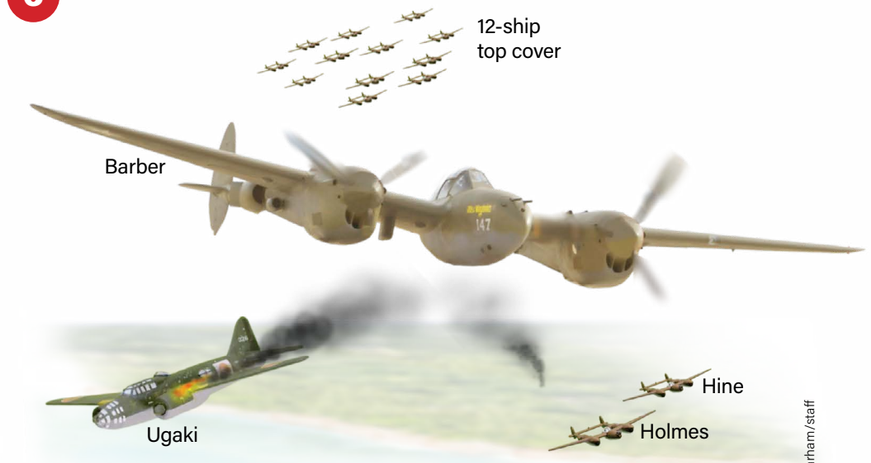
Yamamoto's Betty dives for the treetops as Barber comes out of his steep turn. The Betty carrying Ugaki races out to sea to escape the ambush. After freeing his drop tank, Holmes and Hine spot Ugaki's aircraft and pursue it.

5

Barber attacks Yamamoto's Betty and the right engine begins to smoke. He continues firing as he closes the distance. The Betty slows and drops left, but Barber does not see the aircraft crash. Later he sees black smoke rising from the jungle.

Yamamoto is dead. Lanphier claimed he shot down Yamamoto, hitting his aircraft on the right side. But evidence from contemporaneous accounts, physical records, and damage suggests that account was false.

6



After attacking Yamamoto, Barber is jumped by three Zeros—but P-38s flying top cover chase them off. Barber sees Hine and Holmes make a firing pass at Ugaki's Betty, scoring hits, before breaking off and heading back to base. Barber attacks the Betty, which catches fire and explodes, hitting the water. Ugaki and two others survive. Hine was the only American casualty, perhaps shot down by one of the Zero escorts.

Sources: U.S. Air Force; U.S. Army; Naval History and Heritage Command; National Archives; National World War II Museum; Daniel Haulman, Robert Dorr, Rebecca Grant, Air & Space Forces Magazine 2006

Mike Tsukamoto and Dash Parham/staff

USAF

The men of the 339th Fighter Squadron of the 347th Fighter Group, 13th Air Force, who flew Operation Vengeance. Back row, left to right: Lt. Roger J. Ames, Lt. Lawrence A. Graebner, Capt. Thomas G. Lanphier Jr., Lt. Delton C. Goerke, Lt. Julius Jacobson, Lt. Eldon E. Stratton, Lt. Albert R. Long, Lt. Everett H. Anglin. Front row, left to right: Lt. William E. Smith, Lt. Douglas S. Canning, Lt. Besby F. Holmes, Lt. Rex T. Barber, Maj. John W. Mitchell, Maj. Louis R. Kittel, Lt. Gordon Whitakke. Not pictured is Lt. Raymond K. Hine, MIA and presumed dead.

ing down Yamamoto. The record was revised to give each pilot half a credit. The historians also decided to split the credit for shooting down the other bomber between Holmes and Barber.

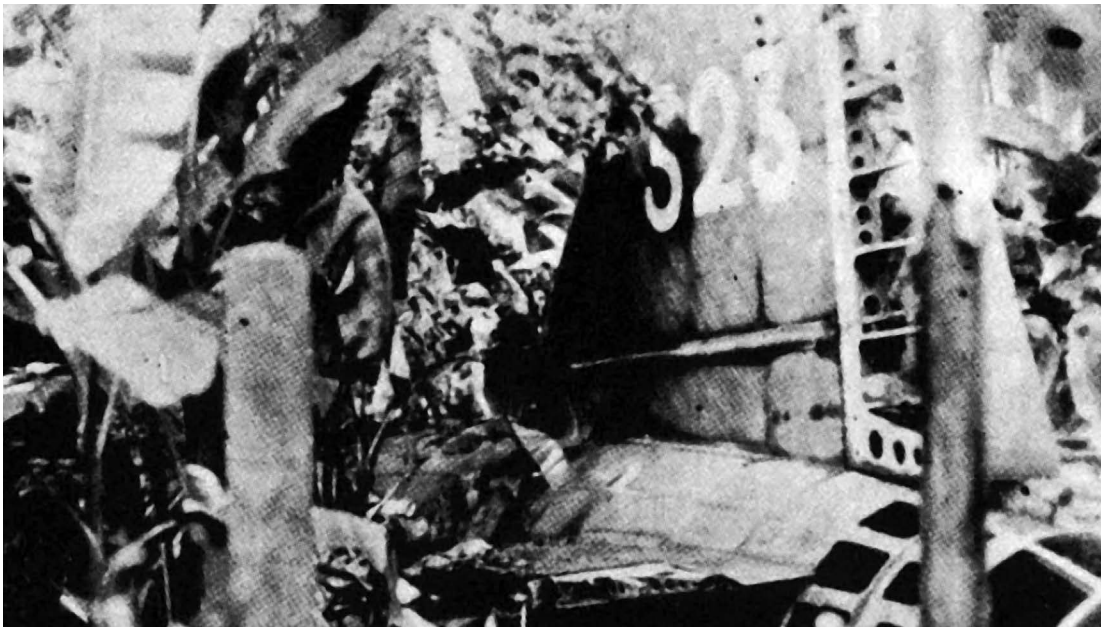
When Lanphier discovered that the Air Force was officially splitting credit for shooting down Yamamoto between him and Barber, he was upset. Lanphier demanded that the Air Force reconsider the case, and award him full credit. In March 1985, the Air Force reopened the matter, calling together a six-person review board to reconsider the case of who shot down Yamamoto. The six members of the review board were Lt. Col. Frederick E. Zoes, Lt. Col. Donald B. Dodd, Maj. Lester A. Sliter, Col. Benjamin B. Williams, R. Cargill Hall, and myself, Daniel L. Haulman. The board's members were told to consider only the original evidence and no new evidence. This time the board concluded the evidence showed that both Lanphier and Barber had shot and hit Yamamoto's plane, at different times, and that therefore credit should remain split between them. Once again, Lanphier and Barber each received half credit for shooting down Yamamoto's plane. That decision was upheld.

Lanphier died two years later, in 1987. By then, Rex Barber and his supporters had determined that new evidence supported Barber's claim to the full credit. An examination of the wreckage site on Bougainville showed Lanphier could not have shot off the right wing of Yamamoto's plane while it was still in the air, as he had claimed, because while the right wing had come off the wrecked plane, it was laying right next to the fuselage, probably ripped off when the plane crashed into the trees on its descent. If Lanphier had shot off the wing, it would have ended up much farther away. Their examination cast doubt on other aspects of Lanphier's account. After dealing with at least one of the escorting Zeroes, Lanphier had little time to catch up with the Yamamoto bomber and get it in his range. And if he were shooting from the side of a rapidly moving target, he would have had very little chance to hit his target even if it was in range. The wreckage also showed that Yamamoto's bomber had been shot at from behind, aligning with Barber's account, as he was the one who claimed to have shot down the bomber from behind.

Additional new evidence bolstered Barber's case. The Japanese autopsy report on Yamamoto showed the admiral had been killed from bullets fired from his rear, again consistent with Barber's account. A Japanese fighter pilot escorting the plane also noted that Yamamoto's bomber had been shot at from behind. All the new evidence supported Barber's version of the kill, and none supported Lanphier's account.

Many of those following the controversy wondered if Lanphier had knowingly claimed the kill due his wingman.

Of course, by then Lanphier was no longer among the living. In 1991, the Air Force called a new Board for the Correction of Military Records to review the case of who shot down Yamamoto. This time, the board faced fewer restrictions, and was able to review evidence not available to previous researchers. The result was split. While none of the members concluded that Lanphier alone had shot down Yamamoto, the new board remained divided on whether the credit should be shared between Lanphier and Barber, or whether Barber should get sole credit for the kill. Deadlocked, the matter was forwarded to then-Secretary of the Air Force Donald B. Rice, who ruled in 1993 that the credit should remain split between Lanphier and Barber.

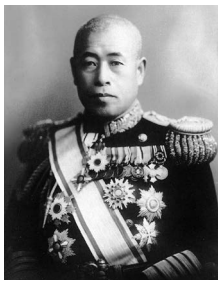


Hiroyuki Agawa

The wreckage of Yamamoto's battle-damaged Betty bomber lays in the jungle on Bougainville in this circa 1944 photo.

UN

Imperial Japanese Navy Commander-in-Chief Adm. Isoroku Yamamoto, left, salutes pilots at Rabaul Air Base hours before his death on April 18, 1943. Vice Adm. Matome Ugaki survived the attack. He died Aug. 15, 1945, on a failed kamikaze mission from Okinawa, after the emperor had conceded defeat.



National Diet Library of Japan

Yamamoto

Chiran Kamikaze Peace Museum

Ugaki

Even then, the controversy continued. Barber and his supporters challenged Rice's authority to make the final decision in a lawsuit, filing suit in federal court. The court found in 1996 that the Secretary of the Air Force did have the authority to settle the issue, effectively leaving Rice's decision in place and credit for the shootdown evenly split between Lanphier and Barber.

Now outside organizations took up the cause. The American Fighter Aces Association and the Veterans of Foreign Wars, both independent nonprofit entities, objected.

Having been a member of the 1985 official USAF panel to look at the Yamamoto kill case, and having reviewed new evidence since, I have become convinced that, despite the panel decision and the subsequent Rice decision, credit for shooting down Yamamoto's plane really should go to Rex Barber. Thomas Lanphier does not deserve credit for shooting down Yamamoto. The original evidence suggested that since only one of the Japanese Betty bombers went down on Bougainville, and that both Lanphier and Barber had claimed to have shot at a Japanese Betty bomber that crashed on the island, both should have credit. New evidence shows that Barber was the only American P-38 pilot to have hit the plane. Lanphier was too far away, and his angle would have not allowed him to destroy such a fast-moving target from the side.

Even if he had been close enough to the bomber for a few of his bullets to have hit it, they would have done little damage, and certainly not enough to take off a wing. The wreckage evidence and the Japanese autopsy evidence showed that Yamamoto's plane was hit from the rear, which is consistent with Barber's version of events. Barber alone should have credit for having shot down Admiral Yamamoto's plane, which deprived the Japanese of one of their most important military leaders. If Barber was the only American pilot to have shot down Yamamoto, he deserved a Medal of Honor for doing so. At least that is what Maj. John Mitchell, commander of the mission, thought.

Learn More

Daniel L. Haulman was head of the organizational histories branch of the Air Force Historical Research Agency and participated in several reviews of Operation Vengeance. The author of several books, including "Killing Yamamoto," published in 2015. His conclusions here, based on the full body of evidence, differ from those in that book.

For this article, the following primary sources were consulted:

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By Patrick Reardon

Mike Tsukamoto/staff

An honor guard presents the colors during the start of "A Celebration of Character & Courage, Vietnam War 50th Anniversary" event at the National Cathedral in Washington, D.C., Jan. 13, a special commemoration of the service, courage, and legacy of Vietnam War Veterans and Gold Star Families, and a renewal of American commitment to account for those heroes who remain missing 50 years after the war's end.

AFA's Yearlong Vietnam War Commemoration Reaches Powerful Conclusion at National Cathedral

Hundreds gathered at the National Cathedral in Washington, D.C., on Jan. 13 for a special ceremony honoring Vietnam veterans, former prisoners of war, Medal of Honor recipients, and Gold Star families. The event, titled "A Celebration of Character & Courage," was the long-awaited climax to AFA's yearlong commemoration of the 50th anniversary of the end of combat operations in Vietnam and the return of American POWs in 1973.

A year in the making, the celebration was turned into a reality by AFA's Vietnam War 50th Anniversary Committee, a volunteer task force comprised of AFA Field and Committee Leaders who led the effort to fund the event and coordinated with 40 partner organizations, including the Gary Sinise Foundation and Wreaths Across America, to bring the commemoration to the National Cathedral.

"We're here to honor the service and sacrifice of the 6 million, in all military services, who answered our nation's call, especially the 58,000 names that appear on the Wall, the over 1,800 still missing and unaccounted for, the 300,000 who succumbed due to their service, and over 2 million who are no longer with us. We also honor all other military members and civilians who supported those who served in theater. We are … honored to be here with Gold Star wives and families, as well as the many other families who endured hardship and absence of loved ones who served," said Bernie Skoch, AFA's Chair of the Board, in his opening remarks at the convocation.

The ceremony also featured addresses from former Army Chief of Staff Gen. Dennis Reimer, USA (Ret.), who served two tours in Vietnam, and Colleen Shine, the Gold Star Daughter of Air Force Lt. Col. Anthony C. Shine who was shot down in North Vietnam on December 2, 1972. Shine was missing in action for 24 years until his remains were repatriated for honorable burial in 1996. Since then, his daughter Colleen has been a vocal advocate for military, veterans, and Gold Star Families of POW/MIA veterans.

"It's been said that there were a million Vietnam wars—each family had their own, each one a parable. Yet from that place of unfathomable trauma, isolation, and loss, through great resilience, community, and connections, in the aftermath of sorrow, you focused on your blessings, steeled your resolve and persevered. You are the living legacies of your loved ones strong and of good courage," Colleen Shine told the congregation. "Those of us impacted by the Vietnam War are a powerful force of extraordinary experience, character, courage, and patriotism. We are also a support for one another. You are never alone."

A prerecorded message from Secretary of Defense Lloyd J. Austin III was also shown, during which Austin shared how his uncle, who served in Vietnam as a Green Beret, has been a symbol of character and courage throughout his own career.

"[My uncle's generation] served in difficult circumstances and divided times and, all too often, they came home to heckling and insults, and not to the hugs and thanks that they deserved," Austin said. "After the war, many Vietnam vets did their country another service: They hung in there, and they worked to build bridges, and to strengthen the bonds of citizenship, and to ensure that Iraq and Afghanistan veterans like me came home to the embrace of a grateful nation. … I see over and over how America's military

today was shaped and strengthened by those who came before. So, to our Vietnam veterans, we thank you again. And we again salute your service. May God bless you."

The ceremony was accompanied by music and hymns sung by the West Point Glee Club. The choir was conducted by Col. Len Vernamonti, USAF (Ret.), a veteran of the Vietnam War and the Chairman of AFA's Vietnam War 50th Anniversary Committee.

"Most of the members of the West Point Glee Club Alumni were my fellow Vietnam veterans. They had all made a special effort to participate because of the importance of the event to them personally," Vernamonti said. "Perhaps my most meaningful moment occurred when I led the combined choirs and the congregation in the singing of the fourth stanza of our national anthem. I'd like to believe that Francis Scott Key wrote that verse especially for occasions such as these."

Mike Tsukamoto/staff

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After the ceremony at the National Cathedral concluded, the assembly proceeded to the Washington Hilton for a reception. Vietnam veterans received official commemoration pins, shared their stories with Wreaths Across America Radio, and bonded with fellow service members and families over their shared experiences.

The "Celebration of Character & Courage" marked the end of a year of AFA-led Vietnam commemorations around the nation. Since the start of 2023, AFA's Chapters have been hosting events to honor Vietnam-era veterans and families, living and past, in their areas—from Linden, Texas, where AFA Texoma memorialized the last enlisted Airman killed in Vietnam, to the coasts of Vietnam itself, where two AFA members organized an impromptu ceremony aboard a cruise ship for more than 100 veterans of the war.

On the national level, AFA participated in the national "Welcome Home!" event in May on the National Mall in Washington, D.C., when AFA assembled three full days of interactive panel discussions featuring firsthand accounts from Vietnam veterans and family members. At AFA's 2023 Air, Space & Cyber Conference, five Vietnam POWs—all Airmen—were honored on the main stage and featured in panels and talks throughout the week.

"I truly feel that we achieved our primary purpose of helping our veterans and their families come to understand and believe that the phrase 'Welcome home and thank you for your service' is not just a common pleasantry, but an actual expression of appreciation from a grateful nation for their service and sacrifice," Vernamonti said.

To learn more about AFA's commemoration of the 50th anniversary of the end of the Vietnam War and submit your own stories, visit www.AFA.org/Vietnam50.

Mike Tsukamoto/staff

Secretary of Defense Lloyd Austin delivers a televised address to the crowd during "A Celebration of Character & Courage, Vietnam War 50th Anniversary" event at the National Cathedral in Washington, D.C.

By Howard Mansfield

Jimmy Stewart

The Movie Star Turned Bomber Pilot and his Wonderful Life.

Seven days after winning an Academy Award for "The Philadelphia Story" in March 1941, Jimmy Stewart enlisted in the Army, months before the country was at war. He had been turned down on his first try for being 10 pounds underweight. One of the most famous movie stars in America was now a buck private in the Army, his monthly salary reduced from $6,000 to $21. Stewart really wanted to fly. He had logged more than 300 hours as a private pilot and had his own airplane, but he was close to 33 years old, far older than the 20-something aviation cadets then earning their wings. The Army treated him as a celebrity and refused to let him fly. Transferring to the Army Air Forces, Stewart qualified to fly twin-engine and four-engine aircraft and trained other pilots to fly the B-17, but while others were assigned to bomber crews and sent overseas, he was held back. The Army didn't want to lose a movie star.

He finally made it to England in November 1943 as a squadron leader in the newly formed 445th Bomb Group. He flew a dozen missions as a B-24 pilot and was officially commended for his good judgment under fire. He flew often and did not cherry-pick the easier missions, saying, "I just can't sit here and send these fellows to death, without knowing myself what I am sending them into." Jimmy Stewart became known as a "lucky squadron leader."

Major Stewart was promoted to Group Operations Officer and sent down the road 9 miles to the 453rd Bomb Group. When Airmen were told they were getting a movie star, they were not impressed. They worried it might be a publicity stunt—a star turn for an actor to fly a few missions and get shipped home pronto. But Stewart was serious, working nights to plan missions for the 453rd, staying in the tower until the last crew had returned. He flew tough missions—more than the commanding officers wanted—and was said to wipe from the board missions he flew so he wouldn't reach his limit.

Few men really knew him. They saw him in the mess for breakfast and he would show up at the officers' club, sometimes playing the piano and singing "Ragtime Cowboy Joe." He's there in a few posed photos, looking tall, rangy, and smart in uniform, Hollywood handsome.

Stewart refused all publicity. He turned away the Air Force public relations staff who wanted stories. He made his base off limits to the press until they convinced him he was denying his men the chance to be in their hometown newspapers. After that the press was allowed in, but only to write about the men of the 453rd.

He was a "superb briefer," said Starr Smith. Like any good actor, he rehearsed. Sgt. Walter Matthau used to sneak into the briefings just to see Jimmy Stewart "do his Jimmy Stewart." At first the men were a little star struck, but soon "he was one of the boys. He was marvelous to watch," said Matthau. Stewart concluded his briefings, saying, "Well, fellas. This is it. I ... uh ... I want you all back here safe. That understood? Fine."

The war aged him. Stewart struggled to eat and sleep. "I was really afraid of what the dawn might bring," he said once when he was a squadron leader. "I got to imagining what might happen, and I feared the worst. Fear is an insidious and deadly thing. It can warp judgment, freeze reflexes, breed mistakes. And worse, it's contagious. I felt my own fear and knew that if it wasn't checked, it could infect my crew members."

He returned to church for the first time in years and reread the 91st Psalm, which his father had shared in a parting letter: *"I will say of the Lord, He is my refuge and my fortress: my God; in him will I trust."*

American Air Museum in Britain

Maj. James Stewart (center) with members of the 453rd Bomb Group who flew the B-24 Liberator, "Male Call," after a raid.

"I tried with all my might to lead and protect them," he said of his Airmen. "I lost a few men—all my efforts, all my prayers couldn't stand between them and their fates, and I grieved over them, blamed myself, even. But my father said something wonderful to me when I came home after the war. He said, 'Shed all blame, shed all guilt, Jim. You know you did your very best, and God and fate, both of which are beyond any human being's efforts, took care of the rest.'"

Stewart came home a changed man. His parents were upset by how much he had aged. He was thinner; his face looked tighter. The press asked about his gray hair. He said: "It got pretty rough overseas at times."

He moved in with his friend, Henry Fonda, home after three years in the Navy. They sat quietly, intensely building model airplanes out of balsa. Stewart didn't make a movie for a year. He refused to glamorize his war service, refused to make a film: "The Jimmy Stewart Story. "I saw too much suffering. It's certainly not something to talk about—or celebrate."

His daughter, Kelly Stewart Harcourt, said, "My father's experiences during World War II affected him more deeply and permanently than anything else in his life. Yet his children grew up knowing almost nothing about those years. Dad never talked about the war. My siblings and I knew only that he had been a pilot, and that he had won some medals, but that he didn't see himself as a hero."

"It's a Wonderful Life" was the first movie he made after the war. His anger in the film is raw, edgy, breaking the confines of the sentimental story. In a scene where he breaks down and prays for help—"I'm not a praying man but if you're up there and you can hear me, show me the way. I'm at the end of my rope. Show me the way, God."—he's overcome, crying in an unscripted moment, surprising the director. "As I said those words," Stewart said later, "I felt the loneliness, the hopelessness of people who had nowhere to turn, and my eyes filled with tears. I broke down sobbing. That was not planned at all." His anger and upset surprised audiences, and "It's a Wonderful Life" failed at the box office. That anger, said one biographer, was Stewart's PTSD—but that is an overreach. There are no medical records to check. Like many who served, he came home older and exhausted, and he kept his sorrows and remorse to himself. He, too, hid the psychological terrors of the war.

Adapted from the new book, "I Will Tell No War Stories: What Our Fathers Left Unsaid About World War II," *by* ***Howard Mansfield*** *and published by Lyons Press, an imprint of Globe Pequot. The book debuts in April 2024.*

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