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AIR & SPACE FORCES

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RETOOLING THE FORCES

Why SECAF and the Chiefs Are Prepping Big Changes for the Air & Space Forces. 19

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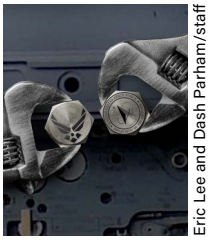
SpaceLogistics illustration

DEPARTMENTS

FEATURES

Northrop Grumman envisions its Mission Extension Vehicle (MEV) could deliver life-extending services to satellites in flight, such as adding fuel or performing attitude and orbit maintenance. See "Fast & Flexible Space," p. 43.

ON THE COVER



Eric Lee and Dash Parham/staff

Department of the Air Force leaders are embarking on an ambitious retooling to ensure the Air Force and Space Force are better prepared to compete and fight with a peer rival in the future.

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EDITORIAL

By Tobias Naegele

Re-Optimize Now

Flashback to 1986: America, at the peak of the Reagan military buildup, three years before the fall of the Berlin Wall, five years shy of the dissolution of the Soviet Union, 13 years after the end of combat operations in Vietnam.

The U.S. defense budget was $295.5 billion that year, and the following year it would exceed $300 billion for the first time ever. Defense accounted for 6.6 percent of U.S. gross domestic product in 1986, a level it has not even approached since. True, defense spending has nearly tripled since then—the 2023 budget was $857 billion—but the share of the overall economy invested in national defense is only half as much now as it was in the mid-1980s.

This is helpful context as we consider the far-reaching overhaul—or "re-optimization," as Air Force Secretary Frank Kendall III calls it—of the Air Force and Space Force and the Secretariat that oversees the two.

Kendall assumed his first Senior Executive Service job in the Pentagon in 1986, as Assistant Deputy Undersecretary for Strategic Defense Systems. Over the next eight years, in that role for two, and then as Deputy Director of Defense Research and Engineering for Tactical Warfare Programs, he served under three U.S. Presidents and six Secretaries of Defense during a time of momentous change: the end of the Cold War, the decisive victory in Operation Desert Storm, marking perhaps the pinnacle of American military might, and then the beginning of the post-Cold War drawdown, which set the stage for where we find the Air and Space Forces today.

In what may be his last year in public service—Kendall, who turned 75 in January, is already the oldest Secretary of the Air Force in history, and he has not committed to extending his tenure past President Joe Biden's current term—the Secretary is hardly taking a victory lap. Having focused the services' modernization efforts around seven Operational Imperatives designed to accelerate the injection of new capabilities into the force, Kendall is now setting his sights on organizational impediments to change and on what might be called organizational hubris.

"We're in a race. And we can't just hope we win."

—Secretary of the Air Force Frank Kendall III

The impediments are structural, he argues. They include institutional stovepipes, insufficient centralization and oversight over critical skill sets and areas of technology development, and also inadequate depth of talent and equipment to absorb combat losses and remain effective and capable.

"We moved away from a focus on staying ahead of an aggressive competitor to being efficient," Kendall says, "... but not postured or oriented on being currently ahead of and staying ahead of a peer competitor."

In the years after Desert Storm, the Air Force devolved from deploying squadrons and wings that had trained and operated together to deploying individuals and assembling units as if they were pick-up basketball teams on the theory that as long as everyone knows his or her job, they can meld as a team in an instant.

This worked well enough to sustain air support over Afghanistan and Iraq and to defeat the likes of ISIS, which had no airpower or anti-air capability to speak of. It will not work to defeat the likes of China, with its sophisticated air defenses, long-range air-to-air and air-to-surface missiles, anti-satellite weapons, and the home-field advantage in almost every Pacific conflict scenario.

The Space Force, meanwhile, is a an accelerating work in progress, converting bespoke capabilities—communications, precision navigation and timing, and various sensors—built for a benign environment to support various military and civilian requirements, into an integrated military capability that can operate through attacks, defend itself when threatened, and inflict harm if necessary.

Chief of Space Operations Gen. B. Chance Saltzman uses the analogy of converting the Merchant Marine into the U.S. Navy for World War II. It wasn't built for or trained for that new mission, so adapting to meet those new mission requirements demands different training, tactics, and equipment because it must now operate and survive in a contested domain.

Saltzman was 17 and thinking about where to go to college in 1986 when Kendall got his first SES job at the Pentagon. Air Force Chief of Staff Gen. David W. Allvin was starting undergraduate pilot training, Acting Undersecretary of the Air Force Krystin E. Jones was a freshman in high school. They represent Kendall's inner circle, the architects and masters of the four-month sprint to a set of changes they will unveil at the AFA Warfare Symposium Feb. 12.

Take note of their relative ages. These are highly accomplished and experienced people, but they are newbies in comparison to Kendall, whose unusually long and varied experience enables him to be mentor and professor, the wise man at the head of the table, imbued with the first-person experience and perspective to ask hard questions, challenge all assumptions, and effect real change inside the impossible bureaucracy of the Department of Defense.

Of course, years of experience do not equate to wisdom or brilliance. As a wise boss once made clear to me many years ago, don't be fooled by a number. "There's a difference between 20 years of experience and one year of experience 20 times," he said. Not everyone learns from what they've endured.

Kendall's experience is clearly cumulative. When he talks about China as an adversary, it's clear he's seen this movie before, understands the plotlines, anticipates the different ways it might play out.

"China is a thinking, well-resourced adversary. They're now thinking about the things we've said we're going to do and how they're going to defeat them. That's why we have to re-optimize. We're in a race. And we can't just hope we win. We have to actually do things to make sure we stay ahead."

What Kendall has done, says Saltzman, is to force a level of introspection that borders on the uncomfortable. That introspection has yielded a keener sense of urgency.

"We're out of time," Saltzman says. "We really have to double down on the tempo of what we're trying to do. And that puts things in a different perspective. That changes our resourcing strategies. That changes the expectations."

And what are America's expectations? Our nation has options. We can remain a superpower and the singular stabilizing force around the globe, enforcer of order, promoter of open and competitive markets, of freedom and individual liberty. Or we can fade from the world stage. Staying the course is not an option. We can invest our way back into a commanding lead in the midst of great competition or, as Allvin recently told this publication, we can become "a regional power in 2050."

One should not need 50 years of experience to answer that correctly.


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LETTERS

Public Service

In regards to the "Power Up" Editorial in the November issue, I have advocated for over 50 years to anyone who would listen, that every high school graduate serve in the military or other government service for two years. No exceptions. Such service would benefit them and our country in several ways.

They would provide much needed service to the country in many areas. Not all graduates are college material; those that are, will have matured, better prepared to study, and be serious college students. They will be there because they want to, not because it is expected of them. (Remember the GIs who went to school after WW II?)

Those that don't go to college, may continue their education in a community college, or any one of many trade schools. Employers are crying for people to work in the trades.

Some may continue in the military. All would benefit our nation and themselves.

Frank Henderson,
USAF (Ret.)
West Des Moines, Iowa

Grooming

In 2021, the U.S. Air Force took a commendable step forward by revising its grooming policies, allowing female service members to wear their hair in styles other than a bun and permitting them to shave their heads. These changes were initiated to address long-standing issues of discrimination, particularly against Black women and their diverse hair types. While these alterations have marked progress toward inclusivity and cultural sensitivity, it is essential to acknowledge that challenges persist for male service members, with grooming standards that may be perceived as outdated and discriminatory.

Male Grooming Standards: The strides made in allowing women greater flexibility with their hairstyles underscore the need to reevaluate and modernize grooming standards for male service members. The 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. By revisiting these standards, the military can further promote a more inclusive environment.

Native American Perspectives: Notably, the case of Senior Airman [Connor] Crawn highlights the challenges faced by Native Americans within the Air Force. Crawn's requirement to obtain a waiver for growing his hair for religious and cultural reasons raises questions about the accommodation of diverse practices within the military. The military should actively seek ways to accommodate the cultural and religious practices of all its members, ensuring that no individual is required to seek special permission for practices integral to their identity.

Addressing Stereotypes and Prejudices: The existing grooming standards for men may be rooted in traditional norms, but it is crucial to recognize and challenge these norms when they perpetuate stereotypes or prejudices. The Air Force should engage in open dialogue to assess the relevance of current grooming standards and their impact on fostering a diverse and respectful community.

The U.S. Air Force's decision to update grooming standards for female service members in 2021 was a commendable move toward inclusivity and cultural sensitivity. However, it is imperative to extend

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AFA's Mission

Our mission is to promote dominant U.S. Air and Space Forces as the foundation of a strong National Defense; to honor and support our Airmen, Guardians, and their Families; and to remember and respect our enduring Heritage.

To accomplish this, we:

- **Educate** the public on the critical need for unrivaled aerospace power and a technically superior workforce to ensure national security.
- **Advocate** for aerospace power, and promote aerospace and STEM education and professional development.
- **Support** readiness for the Total Air and Space Forces, including Active Duty, National Guard, Reserve, civilians, families and members of the Civil Air Patrol.

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this commitment to equality by revisiting and amending grooming standards for male service members, ensuring they align with contemporary values.

Moreover, addressing the unique challenges faced by individuals like Crawn emphasizes the need for a comprehensive review of policies to accommodate the diverse backgrounds and practices of all military personnel. By doing so, the Air Force can continue to set an example as an organization that values diversity and fosters an environment of respect for all its members.

Airman Hayden Perez, USAF
Ramstein AB, Germany

Compromising Standards

I took another glance at the two letters in the October issue ["Recruiting," p. 5] and the letter in December ["Rules are Rules," p. 5], and I agree with all three writers that the Air Force is compromising standards for the sake of recruiting. This isn't the first time the Air Force has thought of changing the rules by lowering the standards for the sake of trying to increase recruiting. Society's norms have no place in the Air Force or military. Having higher standards for everything from technical skills to grooming is what sets the military above its civilian counterparts.

Since the implementation of these new standards how has recruiting improved? From what I've seen recruiting might have improved but the social issues and grooming standards haven't. Discipline has degraded and a lot of Airmen have started looking at their profession as a job instead of a profession of arms. Beards are out of control and vary from base to base. In my travels I've seen beards that are trimmed in various contemporary styles and some that would make Santa Clause envious.

How are our current chemical warfare suits going to protect these folks? I've had at least six occasions where Airmen of various ranks were walking out of various facilities to their cars with no hats on and when this was addressed to them they said they forgot. This wasn't always brand-new Airmen who just got on station either. This is basic customs and courtesies, which should be drilled into every Airman who goes to basic training. Add in sloppy saluting and hearing more "yeahs and dudes" when you hear people talking, it makes you wonder what is allowed to happen in our Air Force. Two Airmen blew through a stop sign after flying past me and when I asked one why, he said, 'it wasn't a big deal, but he wouldn't do it again.' I'm sure he was just blowing me off but it's another example of some of our Airmen's lack integrity and respect for the Uniform Code of Military Conduct.

If the Air Force is serious about solving their recruiting issues, work on the issues that affect people the most, like good pay for what you're asking them to do and the sacrifices their families must make. Make sure their housing is in great shape and well maintained by people who have a vested interest in the quality of these homes, not just the money they get paid to maintain them and most of all quit trying to come up with ways to get more for less.

This issue, in particular, is one of the underlying reasons people are deciding to leave the service instead of staying the course. Involuntary retraining of Airmen from the career field they grew up in to fill holes in other career fields is a move that's flawed from the start. Folks get put into jobs they know nothing about and are immediate outcasts who increase the workload in the career field they are being forced into.

Their new trainers aren't going to be happy about their extra workload. The security forces continually take a beating, as well as other career fields. Instead of involuntary retraining, why not address the issues that are forcing these people

to leave. I dealt with these issues my entire career and on many occasions the reason given were just CYOA for shortfalls that could have been avoided by better planning, funding, and force projection requirements.

Technology improvements can only compensate for lack of manpower to a degree. If we get into an actual gunfight with a peer adversary and start losing people, where will the qualified backfills come from? It'll be too late for the draft. Our predecessors have got to be looking at our armed forces today and wondering what leadership is doing to cause all this turmoil.

This latest experiment in social incorporation and inclusion will also pass but not before the Air Force and its Airmen pays dearly for the lack of foresight.

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

Teaming

I understand the need to adjust recruiting needs to our current population, and meeting recruiting goals has been difficult.

However, just as promoting grade school and high school students who do not know how to read, write or do math is bad policy, it does nothing to make us a better nation; and, it fails our students. If they are not prepared with the tools necessary to succeed after school, we have failed them.

If we do not maintain a qualified Air Force, we will fail. Lowering recruiting standards is not the way to a qualified Air Force. Instilling pride in serving should be the road to service, not long-haired, bearded, and obese Airmen. Our recruiters should be up to the task, instead of taking the easy way out, by lowering the standards. I know, they only do what is asked of them.

I've recently seen pictures of the "new" uniform of the U.S. Space Force, and I am appalled. To me, they look like something worn by a theater usher, bell hop, or "Johnny" of Philip Morris fame. We should do better.

Also, the rank insignia on camos are ridiculous. Unless one is directly in front of the person, they have no way of knowing the rank of that person; a private or a general. It appears as if the Air Force is ashamed of rank designation. Be proud of your rank; display it on your sleeves or shoulders for all to see.

I respect a Muslim's right to want to wear a hijab, but, just as long hair, mullets or other hairstyles do not belong in the Air Force, hijab do not belong (by the by, "Hawkeye" of M-A-S-H fame could not have had the shaggy hair he wore). For men, being cleanshaven and proper hair dress instills pride in their service. Just as clean and pressed uniforms, and shined shoes do, also. Women should be free to wear a hair- style of their choice as long as it does not interfere with their job.

When one joins the service, they agree to abide by the rules and regulations of the service. If they do not agree, they don't belong.

Call me old-fashioned. I am an Air Force veteran of the Korean era, and proud of it.

Frank Henderson,
USAF (Ret.)
West Des Moines, Iowa

No Sale

I read "Selling the Space Force" in October [p. 37] with interest and concern. Both the cover and first-page photo depicted USAFA cadets obviously enjoying themselves experiencing zero gravity in the "Vomit Comet." Later in the article, the author cites critics objecting to any consideration of human spaceflight for future Space Force operations. Count me in.

At best, the focus of the Azimuth program is false advertising since the Space Force has no human spaceflight program. At worst, it may indicate a continued desire for the "Holy Grail" pursued by the USAF during most of my career: USAF astronauts, perhaps flying a space plane. Human spaceflight (we called it manned spaceflight then) served as bookends of my USAF career.

During my first assignment, I conducted graduate-level experiments in an earlier version of the zero-gravity aircraft in the early 1960s when the USAF was developing the manned X-20 Dyna Soar. When that program was canceled, the USAF replaced it with the Manned Orbital Laboratory. After more than a billion dollars spent, this program was also canceled and the USAF astronauts migrated to NASA, effectively lost as USAF assets.

The only unclassified positive outcome of these programs was the development of the large expendable Titan launch systems. In my last assignment, I managed a two-stage rocket system, the Inertial Upper Stage, to ride aboard the Space Shuttle and take national security satellites to geosynchronous orbit.

I'm convinced that system cost 10 times more than if it had been designated exclusively for an expendable launch system. Launch operations were neither rapid nor responsive as the foremost priority of every shuttle mission was the safety of the crew, even when the mission was to launch an unmanned satellite.

The Space Force should jettison any plans or dreams of human spaceflight. A human on the launch system of an orbiting system is completely at odds with the stated goals of the Space Force.

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

Recognition

I was surprised and proud of the recognition of the DOD Fire Academy in the December 2023 issue of Air & Space Forces Magazine [Airframes, pgs. 8 and 9]. The two-page layout and the accompanying paragraph made me proud and thankful.

It's one of the few times this career field has received this type of publicity. The takeaway, for me anyway, is that the career field is made up of enlisted Airmen. Thank you.

CMSgt. Bruce Sincox,
USAF (Ret.)
Glen Allen, Va.

Too Much Conjecture?

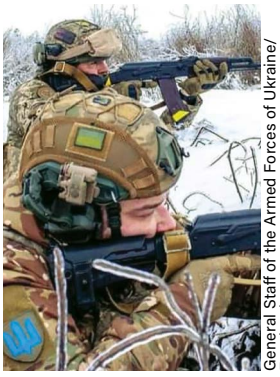
I had to chuckle at the conjecture ["1st Flight of the B-21 Raider," December, p. 18] about the recently revealed "features" on the B-21. I was in the F-117 program in 1988 when we transitioned from Black to Gray (that is, the existence of the aircraft being finally acknowledged, but still classified). The speculation in the media about what super-secret technologies might be ascertained given careful-enough scrutiny was a constant source of entertainment to us in the program. In reality, these observations had nearly always a much more obvious and mundane explanation.

One example I recall was a discussion in Aviation Week and Space Technology over a letter from someone who had observed an F-117 and reported it had a blinking red light which seemed to go out for short periods of time, then come back on. This resulted in much discussion in subsequent letters about whether the aircraft could be transmitting some type of coded signal to a ground station or what other new technology this might represent. In fact, it was the rotating beacon, which was being blanked out by the aircraft when the aircraft banked.

Lt. Col. Dale Hanner,
USAF (Ret.)
Loveland, Colo.

VERBATIM

Trench Warfare



General Staff of the Armed Forces of Ukraine/ Facebook

"It is something like a game of Ping-Pong. ... There is a portion of 100 to 200 meters of ground always being taken and retaken."

—Ukrainian National Guard Platoon Commander describing the stalemate in current operations against Russian forces, which have used recorded sound to try to scare Ukrainian soldiers into revealing their positions [The New York Times, Jan. 8].

Waiting Game

"You're trying to build tunnels into your enemies' infrastructure that you can later use to attack. Until then you lie in wait, carry out reconnaissance, figure out if you can move into industrial control systems or more critical companies or targets upstream. And one day, if you get the order from on high, you switch from reconnaissance to attack."

—Joe McReynolds, China security studies fellow, Jamestown Foundation, on China's ongoing cyber attempts to penetrate critical U.S. infrastructure systems [The Washington Post, Dec. 11, 2023].

Overcoming Obstacles

Fred Clingerman/Lockheed Martin

"The current and future strategic environment requires immediate, comprehensive, and decisive action in strengthening and modernizing our defense industrial base ecosystem to ensure the security of the United States and our allies and partners. As this strategy makes clear, we must act now."

— Deputy Defense Secretary Kathleen Hicks in the first-ever 55-page National Defense Industrial Strategy [Breaking Defense, Jan. 11].

PROSECUTING AI

Courtesy photo

"I care a lot about civil society and the law of armed conflict. ... Our policies are written around those laws. You don't enforce laws against machines, you enforce them against people. Our challenge is not to limit what we can do with AI but to find how to hold people accountable for what the AI does. ... Who do we hold responsible for the performance of that AI and what do we require institutions to do before we field these kinds of capabilities and use them operationally."

Secretary of the Air Force Frank Kendall speaking at the Reagan National Defense Forum on how to incorporate and legally defend against Artificial Intelligence on the battlefield [Dec. 2, 2023].

Smart Money

General Atomics; Quince Media/Pixabay

"Oh and by the way, everything has to be affordable. If it costs a million dollars a round to kill ... a UAS ... costing $100,000 or less ... they've won. ... That's the problem of our time. ... I encourage everybody to take a look at this problem."

—William LaPlante, Undersecretary of Defense for Acquisition and Sustainment, discussing the unique and mounting problems of uncrewed aerial systems for the U.S., allies and partners [Reagan National Defense Forum, Dec. 1, 2023].

Staff Sgt. Rachel Simones

Go Faster

"We have learned an enormous amount as a department about how to mobilize the industrial base in new ways in order to support the needs that we're seeing, for example, in Ukraine."

—Doug Beck, director, Pentagon's Defense Innovation Unit, on DOD's Replicator project to build an army of thousands of cheap U.S.-made drones to counter China's dominance in this market [The Washington Post, Dec. 2, 2023].

By John A. Tirpak

A Critical Year for CCA Milestones

Jan. 8, 2024:

The Collaborative Combat Aircraft (CCA) program—which is developing autonomous, robotic partners of crewed aircraft, essential to the Air Force's ability to generate mass in a future war—should take great strides in 2024, if Congress can approve a budget.

The first engineering and manufacturing development contracts for CCAs should be led this year, even as the Air Force continues to conduct heavy experimentation in human-machine teaming with surrogate systems. Lt. Gen. Dale White, program executive officer for fighters and advanced aircraft, reported in September that an acquisition strategy has been built and approved for CCAs, but it hasn't been shared publicly.

The CCA is envisioned as an uncrewed, relatively low-observable aircraft that can escort or coordinate with crewed aircraft, performing missions such as electronic warfare, defense suppression, as a communications node or as a flying extra magazine of weapons. Newly minted Air Force Vice Chief of Staff Gen. James C. Slife has also forecast CCAs will be used for transport, tanking, and other missions.

Air Force Secretary Frank Kendall has said that while there are things that can be done to move the CCA program forward—using authorized and appropriated fiscal 2023 funds—much of the program is considered a "new start," and on hold until funding limits now in place with the budgetary continuing resolution (CR) are lifted. A yearlong CR would stymie the CCA program and be "a gift" to pacing threat China, Kendall has warned in numerous forums and interviews.

On Jan. 7, House and Senate leaders said they had tentatively reached a budget deal that would move the defense bill to completion before Feb. 2, when a government shutdown could be triggered, but the deal will require bipartisan support to pass.

In its fiscal 2024 budget request, the Air Force is seeking $5.8 billion for CCAs over the next five years; $392 million in FY24 alone. That figure is a small down payment on what is shaping up to be an enormous program. While Kendall set 1,000 CCAs as the minimum number the service needs—a figure he said was meant to let contractors know how seriously he views the program—he told the McAleese defense conference last March that "at the end of the day, we'll end up with more than that. ...It could be twice that number or more."

Kendall has also said he needs the CCA to come in at no more than about a third of the cost of the F-35, which in the last acquisition lot cost about $80 million for the Air Force version, translating to a CCA unit cost of about $27 million. A force of 2,000 CCAs could thus be a $54 billion bill for the Air Force, not counting sustainment, upgrades, or inflation. Kendall also said that at those prices, the CCA is not meant to be expendable, but a workhorse system with an indefinite service life.

The Navy is pursuing its own CCAs, but White reported there is close cooperation between the services. The Navy could reveal new aspects of its CCA program in 2024, shedding light on joint efforts thus far.

While the Air Force intends to narrow the field of companies vying for CCA work this year, service officials said, they will do their utmost to preserve competition as long as possible.

Breaking Defense reported in December that besides major airframe powerhouses Boeing, Lockheed Martin and Northrop Grumman, General Atomics and Anduril are reportedly on the short list to develop the initial version of the CCA family of systems, although dozens of even smaller companies could get significant contracts for payloads, software, and upgrades. The CCA program has been touted from the outset as offering wide opportunities for "nontraditional" contractors, as it will depend on software, machine intelligence, and sensors available from commercial industry.

In September, Anduril bought Blue Force Technologies, which has been developing an autonomous and stealthy "red air" live-fly sparring partner for Air Combat Command's fifth-generation F-22 and F-35 fighters, called "Fury." General Atomics unveiled its "Gambit" series of uncrewed aircraft last spring, with optional external configurations optimized for sensing, fighter escort, defense suppression and ground attack, all using a common core to increase commonality and modularity.

Service acquisition executive Andrew Hunter has spoken of "on-ramps" for companies not picked in the initial rounds of the CCA

Anduril

An image from an Anduril video shows "Fury," which is designed to accelerate the development, testing, and fielding of mission autonomy into operational reality for the warfighter, delivering an unfair advantage for unrivaled deterrence.

CCA Milestones Expected in 2024

- Air Force contract award for an integrator of CCA "increment one."
- Human-machine collaboration tests with F-16s and the X-62 VISTA aircraft serving as surrogates for a CCA.
- Establishment of a CCA test workforce and dedicated test infrastructure.
- Continued competition for CCA concepts, modularity and mission equipment, with "on-ramps" for contractors not picked in the first round.
- Navy disclosures about how it will integrate CCAs with the carrier air wing and non-carrier aviation activities.
- First report to Congress on the overall CCA plan for development, test, manufacture, and cost.

program to participate in later stages or iterations.

But White has also said that competition will not go on forever. While he reported at AFA's Air, Space & Cyber Conference in September that CCA competition will run in a "continuous loop," he also said a single contractor will be chosen to be the integrator of the CCA. The first iteration is likely to comprise a common chassis, propulsion core, basic flight control computer and landing gear, around which will be built modular airframe and mission systems packages.

Kendall said at AFA's conference that the CCA will come in "two increments." After the first, more basic version, he said the second variant will be "more sophisticated" but didn't elaborate.

He wants the first fielded capability with CCAs in 2028, ahead of the Next-Generation Air Dominance (NGAD) fighter, expected to see operational service circa 2030. That timetable would allow less than 48 months to get the CCA from the prototype stage to initial operational capability, but senior service officials say prototypes have already flown and the initial design is likely to be fairly mature from the program outset.

Kendall and Hunter have directed that operators and contractors be tightly partnered with requirement-setting entities to ensure that the very first examples of CCAs are combat-relevant and have the open mission systems architecture to accept frequent software and hardware upgrades.

Without specifically addressing the CCA program, Pentagon acquisition and sustainment executive William LaPlante, speaking at the Reagan National Defense Forum in December, said he's pushing the services to compete new programs as long as possible, to get the most cutting-edge ideas and technology and the best possible prices from contractors.

"You want to get as many people to a preliminary design review as you can," he said, "however they get there: whether they're using their own money, government money, or combination thereof. And then, boy, if you can [get] more than one to a critical design review (CDR), that's even better."

A critical design review—which usually happens after a program is in engineering and manufacturing development—is the milestone at which program officials deem a design to be stable and able to meet specified costs and performance.

On the B-21 program, LaPlante said, "we got the two teams, with government funding, up to a CDR quality" before selecting Northrop Grumman as the winner. "We had reasonably mature designs, and it really made all the difference," he said. However, LaPlante acknowledged, "we live in a budget-constrained world. Our friends that are budget folks ... [will] come to us and say, 'Why are you holding two or three folks in that competition?'" to a critical design review. There will always be tension, he said, between budget demands and best practices.

"I would love to go back to where we were keeping multiple vendors on to ... a CDR but ... it's going to be all about money," LaPlante said. "When budgets are tight," prolonging competition is often "what they look at."

Hunter told DefenseScoop in late December that "our goal for CCA is continuous competition throughout the life of the program. So, you know, we're not looking to ever skinny down to just one CCA manufacturer. Our expectation is we'll have a range of CCA capability with continuous competition over time. And what we're seeing at this stage is there's enough capability in industry and there's enough interest in industry to make that strategy viable."

Lt. Gen. Richard G. Moore Jr., deputy chief of staff for plans and programs, told Congress in budget testimony last spring that the first iteration of CCAs will be to "augment the combat force as shooters." They would likely carry additional missiles for the F-22 and F-35, whose weapons bays can accommodate only a half-dozen, long-range air-to-air missiles. Kendall reported that the first CCA iterations will not depend on inventing anything new but will maximize existing technology and flight control algorithms explored and developed under the Skyborg program.

Gen. Mark D. Kelly, head of Air Combat Command, has urged the Air Force to put CCA technology "in the hands of the captains" who will have to fight alongside them, to both get fighter pilots comfortable with these systems and develop tactics to exploit their capabilities.

To that end, the Air Force is pursuing the Viper Experimentation and Next-gen Operations Model (VENOM) program this year, putting six autonomously configured F-16s in combat experiments with crewed fighters, to see how they can best collaborate.

VENOM is intended to generate thousands of software adjustments for each week of the experiments, dramatically advancing the rate at which software will be refined to be ready when CCAs join the force.

Maj. Gen. Evan C. Dertien, commander of the Air Force Test Center, said in October that he is building the test force that can bring all the various enabling elements of CCA operations together. These include Skyborg, VENOM, and the X-62 Variable In-flight Simulation Test Aircraft (VISTA), which will explore and vet the tactics developed by VENOM and see how the autonomous software interprets the lessons learned by the other experiments and provides insight into how CCAs might behave in real-world combat.

"The work we're doing on VISTA is really helping us advance autonomy and get after the workforce we need" to comprehensively test CCAs, Dertien said. Combined with data generated by the XQ-58 Valkyrie program, creating a data infrastructure and building the workforce, the Test Center is "starting the basics of fighter integration" of CCAs and human pilots. The first task will be to establish "the rule sets" that will keep experimenters safe while doing this work.

The Air Force requested $68 million for VENOM in fiscal 2024, while a collaborative experimental operations unit is slated for $394 million.

Hunter told DefenseScoop in late December that each iteration of CCA won't necessarily "be more sophisticated" or "more advanced ... than the last" but may focus on "different operational problems," meaning the same airframe may be tweaked to address related missions.

The Air Force's goal is "speed to ramp," he said, but "it doesn't mean we're going to shortcut any of the necessary stages of the acquisition process." The necessary engineering will be done to ensure "a viable, meaningful military operational capability. ... We're going to do them with a great deal of discipline on making sure that the requirements that we set are ones that we think are achievable in the near term to meet our projected fielding date. And then we're going to work through those in a rapid fashion to get there."

Although the CCA program remains highly classified at this point, Congress demanded an intense amount of oversight data about it in the 2024 defense spending bill, and more information could come to public light as those reports are submitted.

In the compromise House-Senate 2024 National Defense Authorization bill, the two houses directed the Secretary of Defense to provide updates every six months for the overall and unit costs of CCAs, and the estimated cost to operate both the fleet and each tail per year. Congress wants detailed assessments of the Technology Readiness Levels for all key subsystems on the jets, and a blow-by-blow listing of test events planned and executed, as well as specific reports on "major milestones" such as aircraft joins, first power-on, first flights, etc.

Lawmakers want the Secretary of Defense to provide "the highest acceptable cost" for each element of the program, as well as the "objective value indicating the lowest cost expected to be achieved."

The first such report is due midyear.

Icy winter weather blanketed the U.S. in January as a wave of Arctic storms threatened to break low-temperature records and dumped snow from coast to coast. At Selfridge Air National Guard Base, Mich., freezing snow and rain coated an A-10 Thunderbolt, but the base remained open.

Tech. Sgt. Drew Schumann/ANG

A year ago, the nation's 19 B-2 Spirit bombers were grounded due to safety concerns, but the B-2 was back in action over Rose Bowl Stadium in Pasadena, Calif., Jan. 2, wowing the crowd of 94,873 to see Michigan defeat Alabama 27-20. A week later, three B-2s joined in Red Flag 2024-1 at Nellis Air Force Base, Nev. The Spirit had been absent at Nellis last year, but the bombers did participate in Red Flag Alaska in August.

Tyler Leipprandt of Michigan Sky Media

A SpaceX Falcon Heavy rocket launched the Space Force's X-37B back into orbit in December. The X-37B's return to space came just two months after it returned to Earth in October—and two weeks after China launched its space plane into orbit. The uncrewed X-37 can carry a range of payloads—the Space Force did not disclose what it's carrying on this mission—and spend extended periods in space before it returns to Earth, landing on a runway like a conventional aircraft. Its compact size and efficiency comes from the fact that it is uncrewed, and therefore doesn't carry the extensive life support systems required to sustain life in space.

USSF

Getting Back to War Footing

From the moment he returned to the Pentagon as the 26th Secretary of the Air Force, Frank Kendall III was applying his Cold War experience to the challenges of modernizing the Air Force and Space Force and accelerating changes and enhancing operational effectiveness. China had replaced the Soviet Union as the pacing threat, but the art of countering a sophisticated adversary was the same. Kendall has held senior defense civilian jobs in the Pentagon since 1986, even before Chief of Space Operations Gen. B. Chance Saltzman graduated high school and the same year Air Force Chief of Staff Gen. David Allvin earned his commission. Now 75, Kendall's focus on China has only grown more urgent. He met with Air & Space Forces Magazine's Pentagon Editor, Chris Gordon, and Editor in Chief, Tobias Naegele, in January. This interview has been edited for length and, in rare cases, clarity.

Eric Dietrich/USAF

The Air Force and Space Force aren't as ready as they should be to confront China in combat, Secretary of the Air Force Frank Kendall III says. He plans to roll out an overhaul plan for the service at the AFA Warfare Symposium in February.

Q: You've had a pretty momentous run as Secretary, your focus on seven Operational Imperatives (OIs) has won wide acclaim. Now you are driving toward a major "re-optimization" of the Department of the Air Force. Why risk distracting from that success to try do so much, so fast?

A: The OIs were about modernization. When I walked into the job, I knew from my AT&L experience and my time in industry, that we needed to move forward with modernization pretty aggressively—that China was trying to field systems designed to defeat us, and we had to get to our next generation of capabilities. So we put a lot of effort into that, and we still are. We're still waiting for the '24 budget to pass, which is where a lot of the funding for the OIs is initiated. But over that period of time, working particularly with the service Chiefs, we've come to the realization that there were a number of other things besides modernization that we needed to address.

I go back to having had 20 years of Cold War experience. I was here [at the Pentagon] for the Obama administration, where we did operations in Iraq and Afghanistan, and we did the ISIS fight, and so on. And we didn't have any trouble executing the kinds of operations we had to do for those contingencies. So I had an assumption, walking in the door: That the Air Force and Space Force, despite its newness, were basically structured and ready for whatever conflict might happen. And the realization has come to me over the time that I've been here—and the Chiefs are 100 percent in agreement with this—that we're not as ready as we should be, for great power conflict today.

And the reason for that is that over the 30 odd years, since the Cold War ended, we have drifted away from preparing and assessing the readiness of the force or structuring the force or managing the force, so that it is truly ready for a short-notice great power conflict. And as you dig into that, and you start to investigate—how are we really structured and, postured today?—You discover more ways in which we are really not optimized for great power competition.

Let me give you a few examples. We've been supporting rotational deployments to the Middle East for decades now, and I just visited five of those bases. The way we've gravitated to do that is not to send fully operational deployable units to those bases, [but] ... send fighter squadrons, or some operational flying units, coupled with a large number of support organizations, which are crowdsourced. We basically asked people throughout the Air Force, OK, we're doing a rotation, we need some people of this type, who wants to go? ... Those are not fully trained ready operational units we're deploying. But if we're called upon to support an operation plan in the Pacific or in Europe, say, against a great power, we need ready deployable units, that can go do that job. And that's not what we have right now. ... The units themselves have got to be structured to have all the capabilities they need when they go, and you want to have unity of command for those units. We don't have that right now. You know, basically, when a new commander gets over there, his team does show up that day, and they just start to do what they're doing. And we've gotten used to that. It was an efficient way to do the kinds of things we've been doing for the last 20-odd years. But it's not the way you want to go into a great power conflict. And that goes across the Guard and Reserve elements of the force, as well. ...

The work that we did to create the Operational Imperatives, I came to the realization that we did not have organizations in place that were spending their time maintaining competitive advantage. So we want the units that are responsible for readiness to be responsible for readiness, and to be focused on that. And to be ready to go fight on a short notice, right? But we also need units, we need organizations that are focused on sustaining competitive advantage over time, from both the operational perspective and from the technical perspective of acquiring those capabilities and maturing technologies. And we found that we really didn't have either.

On the technical side, what we have is a number of program executive officers (PEOs) with buckets of programs they are trying to deliver. And they are focused entirely on delivering those buckets of programs. And then you had an [Science and Technology] organization, at AFRL, which was focused on advancing technology. In both cases, we did not have integrating organizations whose job it was to think about how we stay competitive over time, and to do the combined operational planning, and the technical planning, the maturation of technologies in a pipeline of continuously

improving capability, which is what you need against a competitor who's actively trying to field the ability to defeat you all the time and continues to modernize. ... Here in the headquarters, I had to bring in Tim Grayson and create an organization that was essentially a chief engineer of the Department of the Air Force. I didn't have that. So he has become the integrated capabilities chief technical person for me. I had to create [Gen.] Luke Cropsey's integrated PEO organization; I didn't have a C-3 systems command to go with a task commander to go task to do what Luke is doing. So we've had to do ad hoc things to complete tasks that should have had someone in place with that as their mission.

The nuclear side of the enterprise has become if anything more important, and more critical, given Chinese expansion of their nuclear force. So Global Strike Command is fine in terms of the operational side of that. We have the nuclear weapons center at the two-star level under [Gen.] Duke Richardson and we want to broaden that. We're looking at making sure we have a senior leader who is in charge of everything that supports the nuclear warfighting part of the force, both in space and the air. ... Electronic warfare is another area in which we need to be competitive continuously. ... The cybersecurity operational force, we have the cyber forces at 16th Air Force under ACC, that's critical, and that should be supporting the entire Department of the Air Force, not just the Air Force, but also the Space Force. So we have to look at is that in the right position, both on the operational side from the point of view of operational capability, and on the technical side, from the point of view of maturing, and staying competitive in that area. So we basically found a number of areas in which we had moved away from a focus on staying ahead of a an aggressive competitor, to being efficient. We went through 10 years of sequestration, of being efficient at doing the things we were currently being called upon—you know, the current rotational deployments, respond to individual regional crises like Ukraine and Gaza, but not postured or oriented on being currently ahead of and staying ahead of a peer competitor. So that's what we're trying to address.

Q: You talked a lot about structure just now. So is this re-optimization or is it a reorganization?

A: It's about more than organizational structure. It's also about how we train people. ... What kind of skill sets we want to have, what that mix of skill sets is. We're looking at how we fight. What are the units that we actually use, and how they're structured, particularly the units that are in CONUS, that are going to be called upon to go forward and fight with short notice. Those units already in theater, they have a combat mission, they're structured to do that mission, and they practice it—but one of the key things we're trying to do against peer competitors is Agile Combat Employment (ACE). We haven't actually done everything we need to structure the force to be able to use it effectively.

And we haven't been evaluating ourselves—how we assess and evaluate readiness and how we create readiness. You know, when the last time was we actually went to a unit and said, 'The war has started, show me you can go?' Decades—it's been decades since we did that. We should be doing that all the time.

Q. What happens if you leave at the end of this year?

A: I don't know if I'll leave in a year or not, but that doesn't affect this. The two service Chiefs are leading this, if not as much as I am, more than I am. They're fully on board. [Gen.] Dave Allvin and [Gen.] Chance Saltzman are both very enthusiastic about this. And whatever happens to me, they're going to continue with it. They're going to have prominent leadership roles ensuring that it has success. Allvin put out his initial letter to the force, talking about following up. That's what he's talking about. We're going to take "Accelerate Change or Lose," we're going to finish defining what the changes are that we need, and then we're going to execute them.

Q: You mentioned coming back from the Middle East and those forces built as part of the first AFFORGEN forces. What did you see and how can USAF improve?

A: We're experimenting with something called Air Task Forces right now, where we're forming the units that would be deployed several months before they go. So we're identifying them now, as opposed to [issuing orders and assembling the team in theater.] ... We're going to put those units together ahead of time, give them six months—at least—to prepare themselves for the deployment, so when they show up in theater, they're ready to function as a unit. This is for the specific rotational deployments we're doing now. [But] those are not the same forces we need in a contingency for a major combat operations against a peer competitor. ... What we need when we send units forward to let's say, Japan, or Guam, or to somewhere in Europe, are units that are ready to fight in that [specific] environment when they get there.

Q: So are Airmen and units going to be assigned to specific regions?

A: We have to go do all the detailed planning for this once we sort out exactly what those units look like. Then we have to go through the detailed planning. But, generally speaking, units in the AFFORGEN cycle will know, if there is a conflict, that it will be to a certain theater. We would like them to know what bases they're going to be operating from so that they're ready to go in and do ACE for the collection of bases where they would have to do it, how they would fall into the theater, so they can be prepared to fight as soon as they arrive.

Q: You mentioned ACC, AFGSC, AMC, you didn't mention PACAF and USAFE. They are structured differently, operate differently. How will this affect them?

A: They'll be the beneficiaries of this. We will work with the combatant commanders and component commanders for the Air Force, both, for any changes we need to make in theater to make sure that they're comfortable, and we will also work with them on what we're going to do in CONUS, to support them more effectively than we do now. So they're all going to be involved in this. I mean, in the case of Air Mobility Command, assets are already part of TRANSCOM for the most part. In the case of Global Strike, they're already part of STRATCOM. ACC is a little different, in that most of Air Combat Command's units would be deployed somewhere else to fight, into one of the theaters. So I think the greatest impact will be there.

Q: And that'll be additive?

A: I think it'll be more about restructuring. If you go to an air base today, and you've got a wing commander, and you've got a base commander, a base wing, a lot of the assets that are actually under the base would need to go with the unit if it deployed to fight. So we want to adjust that so that those units are already associated with the unit that will go actually into combat.

Q: What about the Space Force. How does this affect that service?

A: Space Force generally, fights deployed in place. But they're supported by Air Force units that operate the bases that they're on. So we have to sort out what happens to all of those assets if they're mobilized, and the base has to operate in conflict. You know, are there issues there with sensing the resiliency on the base, and how we ensure the resilience of the base, as well as whether we ensure

that the appropriate forces are there to provide physical security and other things the base needs to function against the threat.

Q: Does that change who owns those forces?

A: I don't think so. The Space Force has been focused on what it needs for operational reasons. With support largely coming from the Air Force, I don't think we're going to change that.

Q: AMC supports TRANSCOM, Global Strike supports STRATCOM. These organizations advocate for their own resources. They want their own stuff. But as you mentioned, this is a lot about reoptimizing to get everyone on one page?

A: I'm glad you asked that. Yeah, we have to have people who are thinking about integrated capability, and integrating capability, planning, modernization, and readiness. And so we need that on the operational side. And on the technical side, as well. So we're going to create some structures designed to have that mission. You can make an analogy to the Army Futures Command. We're not going to do that exactly, but we're going to do something that has some of the same roles.

Q: The Air Force had a Systems Command until 1992, which was combined with Logistics Command to create Air Force Materiel Command. Is that coming back?

A: There were also systems commands that were, for example, C-3. So we're not looking at things that have some connectivity to that or some functional resemblance to what we had before. We're trying to tailor it to what we need now. We've got to be modernizing quickly and competitively, which means we need to have a constant pipeline of new capabilities coming in out of the S&T base as efficiently as possible. We've got to have sound operational concepts that evolve as technologies change and opportunities arise to be more effective. We've also got to have the capability to deploy forces on short notice to deal with a major conflict somewhere. There are a lot of pieces of the puzzle.

Q: You've mentioned a lot of things where you could improve, but presumably, you're not going to be able to do everything you want. What's actually doable?

A: Well, we're resource limited, right? So the intent to not have a huge cost impact. I don't think the cost impact is going to be zero. [But] some things are very simple—staff relationship changes, for example. I mentioned Tim Grayson, chief engineer. We're looking at some capability focused on competitiveness across the department in the Secretariat, which is relatively minor organizational change. We're looking at some changes in how we train people. We've used the idea of multicapable Airmen for a long time, right? We've sort of encouraged people to learn more than one skill, and we've given them opportunities to do that.

What we're talking about now is something called Mission Capable Airmen. It's not going to be optional. It's going to be a requirement in certain roles, in certain commands, that when you go out to an ACE remote spoke or hub, that you'll be able to do more than one job when you get there. And it's not going to be an option for people. It's something we're going to tell them that they have to learn how to do.

We are looking at this because we're in a technological competition, we have to be good both operationally and technically. We're looking at career paths for people that are focused on technical expertise, and sustaining that over time. So we're looking at things like technical tracks for officers and NCOs, and possibly creating a something like a warrant officer track for people that are in technical fields like cyber, for example, where a lot of people don't want to do other than technical things, who would stay in a technical role and build up expertise over a career as a technical expert.

Q: And electronic warfare? Your top EW is a colonel. Even General Cropsey is a one-star.

A: One of the things we're working on is how we're going to elevate some of the things that are really important for a peer competitor, which have not been important against the kind of adversaries we have had in the past, and to make those more accessible across the breadth of the service and the COCOMs.

We've been working on this since about September, and it's been a sprint. I put a letter out to the force then saying we're going to do this. And we've had five lines of effort. And those teams have been working with a lot of very intense supervision by myself and the two service Chiefs and the undersecretary for the past few months.

Q: So why September? Why the rush now?

A: There was a period of learning for me of, you know, an understanding from interactions with people throughout the department about our current status and what we have, and also just some observations as I was doing the OIs and other things, and then a consensus among the senior leaders, the four senior leaders that, you know, we needed to move forward. And that, we could see the general direction in which we needed to go and what we needed to address. We're not in a period where we'd have the luxury of being complacent or taking our time. If we went at the normal Pentagon pace for these things, we'd be staffing things for two years.

We don't have two years. So we set up a four-month sprint roughly, we're going to make the key decisions and we're going to move forward. And if we find out as we execute that some things aren't exactly what we optimized, we'll make adjustments as we go. We don't have any time to waste. I was at [Gen.] Steve Whiting's change of command and promotion yesterday. He's taking over Space Command. Xi Jinping has told his military be ready to invade Taiwan by 2027. [Gen.] Steve Whiting will still be in command of the Space Command in 2027. I think we should get going. He agrees.

Q: What if the threat changes?

A: The threat is changing, and it will keep changing. China is a thinking, well-resourced adversary. They're now thinking about the things we've said we're going to do and how they're going to defeat them. That's why we have to re-optimize. We're in a race. And we can't just hope we win. We have to actually do things to make sure we stay ahead.

Q: Some past reorganizations went well. Others not so well. Change is hard. How do you get buy-in?

A: Change is hard, losing is unacceptable, right? We don't have a choice about this if we want to win.

The two service chiefs we have I think are the right people to do this. We talk every day. You'll hear from Dave Allvin and you'll hear from Salty about their intentions with this. And I think you'll find that reassuring. I do. We're not making any decisions or doing anything in this exercise that doesn't have the complete and total support of the service chiefs.

Q: How about the other four-stars?

A: They've been consulted as we've gone all through this, and I think that they'll be on board as well. I think there's a widespread recognition that we need to do this sort of thing. There may be different opinions about some of the details, but the fact that we need to reorient ourselves toward the pacing challenge? I don't think anybody disagrees with that.

COVER STORY

RETOOLING FOR CHINA

SECAF and the Chiefs Prepare to Unveil the Department's Biggest Reorg in Decades.

Mike Tsukamoto/staff

By Chris Gordon

The Department of the Air Force will unveil sweeping changes to its structure, organization, and training in February, buttressing the forces to better compete with and, if necessary, fight and defeat China and Russia should a peer conflict arise.

Having used his first two years as Secretary of the Air Force to focus the department on achieving seven operational imperatives and more effectively delivering operational capability to its warfighters, Frank Kendall ordered in September a sweeping review of five lines of effort across the department, seeking to uproot the impediments to current and future readiness and to enable the rapid development and integration of new technologies and capabilities into the services structure, tactics, and doctrine.

The Operational Imperatives sought to focus modernization efforts on critical needs: Ensuring a future Global Strike capability by delivering new B-21 Raider bombers and advanced long-range weapons; updating bases to be more resilient under attack and flexing fighter and mobility forces to operate from austere locations; and revamping military space assets into a proliferated satellite architecture too large and distributed to be crippled by one or a few anti-satellite weapons.

"China is a thinking, well-resourced adversary. They're now thinking about the things we've said we're going to do and how they're going to defeat them. That's why we have to re-optimize."
—Secretary of the Air Force Frank Kendall III

But as Kendall and the Chiefs of the Air Force and Space Force revealed in a series of preview interviews ahead of their February unveiling of their overhaul plans at the AFA Warfare Symposium, it became clear as those efforts progressed that there were other, systemic and organizational impediments to current and future force readiness, and that the service's ability to fight tonight is not what it needs to be to deter or, if necessary, fight and defeat China in a peer conflict.

Those conclusions drove what will be the biggest overhaul of the Department of the Air in decades, reshaping how the Air & Space Forces will operate in the future.

"I had an assumption, walking in the door, that the Air Force and Space Force which, despite its newness, were basically structured and ready for whatever conflict might happen," Kendall said in a January interview. "The realization has come to me over the period of time that I've been here—and the Chiefs are 100 percent in agreement with this—that we're not as ready as we should be for great power conflict today."

Kendall sees changes at his Pentagon headquarters, but also a substantial realignment within the Air Force major commands and significant overhauls of training, including exercises designed to stress-test that training to identify shortfalls.

"I've been in the Pentagon a long time," said Chief of Space Operations Gen. B. Chance Saltzman. "Bureaucracies struggle with change if the leadership at the very top of the organization isn't committed to it, isn't emphasizing it, isn't giving us the priority and top cover, and really pressing us with that sense of urgency—and so that's what he's done."

The Department of the Air Force houses two services of vastly different size, structure, and capability. But both face headwinds in their struggle to modernize and prepare for a more complex, capable adversary.

"The Air Force and the Space Force under the Department have the same goal here," Saltzman said. "We know fundamentally that we face a pacing challenge that is going to put us to the test and that neither service has been optimized for that—either completely or because they've been doing other things for decades"The Air Force will reimagine its deployment rotations and deployment preparation, better aligning training and planning with anticipated destinations. Technology development will be better aligned with efforts to deliver weapons more quickly to the warfighter and to integrate those capabilities into war plans more readily. The Space Force, meanwhile, is preparing for a new era in which it could find itself under attack, both in orbit and at home. It is seeking to be more operationally responsive, developing both defensive and offensive capabilities to fight, if necessary, in space and better protect its critical infrastructure at home. Individual training will expand and intensify, with expanded requirements for Airmen before they can deploy and more realistic training for Guardians. In short, every Airman, Guardian, and civilian employee of the Department of the Air Force is likely to be affected in some way, small or large.

"The re-optimization scope is broad," said Chief of Staff of the Air Force Gen. David W. Allvin. It is also strategic: "The issue is, you can't reorganize yourself out of a challenge," Allvin added. "But if you have an organizational structure that's inhibiting that change, then you need to address that." Among the first projects Kendall took on after becoming Secretary was where the Air Force was headed with a series of experiments under the banner of a future Advanced Battle Management System. The concept was central to the Air Force operationalizing the joint force concept of Joint All Domain Command and Control, but the investment strategy struck him as scattered: Too much experimentation, and not enough defined operational capability.

From the start, Kendall saw ABMS as failing to deliver "meaningful operational capability to the warfighter." Launched as a program to replace the legacy E-3 Sentry, ABMS had morphed from a platform-centered concept to a family of systems to a series of highly publicized experiments but had gotten no closer to delivering a product.

When Kendall defined his seven Operational Imperatives for the department seven months later, "Operationally Focused ABMS" was second on his list. But the department lacked an office or agency that could lead that effort department-wide. So he created integrated program executive office and named Brig. Gen. Luke C.G. Cropsey in September 2022 to oversee the DAF's command, control, communications, and battle management efforts (C3BM), something he defined then as among the hardest jobs he'd given anyone over his entire career.

"We've had to do ad hoc things to complete tasks that should have had someone in place with that as their mission," Kendall said. Now he will build on that concept. "We're going to create organizations to have those sorts of missions, both here on the Secretariat and in other parts of the force." However difficult these jobs are, Kendall sees Cropsey and Tim Grayson, now the Air Force's chief engineer, as providing exactly the high-level, centralized coordination necessary to drive faster results and more rapidly push out new capability to front-line units. "We got to have people who are thinking about integrated capability—integrated capability, planning, and modernization, and readiness," Kendall said. "We need that on the operational side, and we need it on the technical side as well."

Kendall says the nuclear enterprise has only grown more important as China rapidly expands its nuclear force, highlighting the need to better coordinate the Air Force's nuclear weapons modernization efforts. "Global Strike Command is fine in terms of the operational side of that," Kendall said. But he is concerned about modernization, with supply chain challenges, costs continuing to mount, and little margin for error. "We are looking at making sure we have a senior leader who is in charge of everything that supports the nuclear warfighting part of the force."

Prime on that list is keeping the new Sentinel intercontinental ballistic missile program on track. That program, encompassing the largest national infrastructure effort since the construction of the interstate highway system, includes developing the missile, new launch control centers, and 450 silos. In January, the Air Force acknowledged rising costs and delays put it in breach of the Nunn-McCurdy amendment, a 1983 law intended to curtail runaway weapons development costs. That means costs have risen at least 25 percent above original estimates and puts the program at potential risk of cancellation.

The Air Force is faring better in developing the B-21 Raider bomber, of which it anticipates acquiring at least 100 over the next decade-plus. The B-21 made its first flight in November. In the Pacific, Kendall and Allvin foresee accelerating and enhancing the changes necessary to enable Agile Combat Employment—the strategy of dispersing from central fixed operating bases and instead scattering air operations across multiple smaller bases with far less infrastructure. Though ACE has been doctrine since 2022, more must be done, from training to infrastructure, to ensure squadrons can actually execute the concept.

"We've been we've been talking and exercising Agile Combat Employment, but we haven't actually done everything we need to structure the force to be able to do it effectively," Kendall said. "You know when the last time was we actually went to a unit and said, 'The war has started, show me you can go?' Decades—it's been decades since we did that. We should be doing that all the time."

ACE has from its inception focused on "Multi-Capable Airmen," able to perform a variety of jobs to ensure the smallest possible footprint at remote air stations. Those mixed or secondary skills also anticipate operations where the Air Force suffers significant casualties, and the ability to continue operating despite those depends on Airmen able to do whatever is needed. As every Marine is a rifleman, and every Sailor has damage control responsibilities, Kendall wants to every Airman to able to contribute to launching aircraft. He sees the Multi-Capable Airman concept evolving to something less voluntary, and more plainly defined, calling them "Mission-Capable Airmen" instead, so that they are able to operate a forklift, help refuel aircraft, repair a runway, or assist with logistics.

"We've sort of encouraged people to learn more than one skill, and we're giving them opportunities to do that," Kendall said. Now it will be formalized. "It's not going to be optional. It's going to be a requirement in certain roles in certain commands, that when you go out to an ACE remote spoke or hub, that you'll be able to do more than one job."

New deployment models are taking shape, building on the Air Force Force Generation model unveiled under Gen. Charles Q. Brown Jr.'s tenure as CSAF. AFFORGEN was designed to help

the Air Force, combatant commanders, and the broader U.S. military better understand the implications of deployment decisions, how calling up a squadron for a set mission now may require gaps in other operating theaters or in the future, said Air Force Vice Chief of Staff Gen. James Slife, sworn into the job in December after a long delay. "It gives us a better ability to articulate capacity, risk, and readiness to the joint force," Slife said. "The service has a responsibility to think on a different time horizon than combatant commands do."

AFFORGEN is still a work in progress, and impacts the various major commands differently, but will impact Air Combat Command especially.

The Air Force is also rolling out a new Air Task Force concept, packaging forces that train, deploy, and fight together. The idea is to end the existing system, which had become almost a lottery, with individuals from dozens of disparate units assembling into a team only after they arrive in theater.

For now, the service plans three Air Task Forces: two for U.S. Central Command and one for U.S. Indo-Pacific Command. The first ATFs are scheduled to begin their AFFORGEN cycle this summer, the Air Force says. But ATFs are still a pilot program of sorts, officials say. "We're going to put those units together ahead of time, give them six months, at least, to prepare themselves for the deployment so when they show up in theater, they're ready to function," Kendall said. "So that will model it. This is going to be for the specific rotational deployments we're doing now. Those are not the same forces we need in a contingency for major combat operations against a peer competitor."

The Space Force is also changing. Space assets have long been a critical enabler for the U.S. military but have not been held directly at risk. However, a 2021 direct-ascent anti-satellite (ASAT) missile test by Russia and the 2015 standup of the People's Liberation Army Strategic Support Force, which focused China's military space, cyber, and electronic warfare capabilities, is evidence that space might become a conflict zone. The Space Force plans to evolve from an organization created to put military space capability under one service into a true fighting force.

"The Space Force is still largely the collection of activities that we had when we started the Space Force," Kendall said.

That on-the-fly construction was a necessity for a new service, Saltzman said. But now, four years on from its creation, re-optimization offers the service a chance to conduct a wholesale investigation of itself.

"There's things that we can look back on that we had to do fast because we had to establish ourselves fairly quickly. And now, with some hindsight, we can say, 'Did we get it right?' Are there areas we should have emphasized differently? Are there things that we're not satisfied with?'" Saltzman said. "I think we're going to be better as we come out on the other side."

Saltzman likened the change to converting the Merchant Marine into the Navy.

"The Space Force has been operating in a benign environment for a lot of this and we don't have warfighting experience in the space domain," Saltzman said. "So, we need to build those simulators, build those ranges, build the tactics, try to test them as best we can, give the rehearsals to our units."

The Space Force also relies on the Air Force for basing and logistics support. That model faces unique challenges—a power outage could do far more damage than a bomb.

"The Space Force does most of its work with employed-in-place forces, so we have to think about that base infrastructure," Saltzman said. "Space Force bases are the power projection platforms. If our computers in the ground network get hot, all of a sudden, we don't have the ability to command and control, we don't have the ability to receive data, and we're in real trouble. As odd as it seems, HVAC systems are a critical component for sustainment," he said, as essential as cyber defenses.

OPTIMIZING FOR THE TIMES

There is plenty of historical context for the changes now underway. Following World War II, the Air Force was carved out of the Army Air Corps and greatly downsized for what was hoped would be a new age of peace. But soon after came war in Korea, and then the Cold War with the Soviet Union, with the rapid expansion and formalization of the nuclear enterprise.

The 1960s and 1970s brought the Vietnam War, for which the Air Force was ill-prepared. Having structured a force around nuclear deterrence, it found itself fighting an air campaign with the wrong weapons and with severe restrictions on how it engaged the enemy. Suffering huge losses, that led to a massive rethink of how combat forces train and execute conventional war, bringing forth the introduction of radar-evading stealth technology and advanced, precision-guided weapons.

The Air Force focused on technological superiority through the 1980s, then proved those advances in air campaigns in the 1990s, beginning with Operation Desert Storm against Iraq and bringing Serbia to end its war in Kosovo with air power alone. But in the 1990s, with the Cold War over, the Air Force had to adjust again, this time for efficiency. Older platforms were jettisoned, and the force shrunk by more than one third. Modernization was delayed and put on hold as the Pentagon bet that, in a single-Super Power world, the U.S. could afford a "procurement holiday." Then came two decades of ground wars in Iraq and Afghanistan, in which air power was ever present, but little challenged. That led to heavy use of assets even as new aircraft were procured at record low levels, accelerating the aging and shrinking of U.S. airpower.

The Air Force prioritized efficiency in this period, collapsing and combining units to best meet continuing demand in the Middle East, while compromising its ability to engage in a high-end fight. The Air Force shifted away from deploying complete squadrons.

"In a relatively low-threat environment, where we were operating for years at a time out of large main operating bases, that model has been sufficient to our needs," Slife added. "We organized our Air Force to be as flexible as possible, break it up into as many small little things as we can, and deploy."

Now the U.S. faces two nuclear powers, Russia and China, rising nuclear threats from North Korea and Iran, a regional war in Ukraine, growing instability in the Middle East, and a growing risk that China will try to seize Taiwan militarily, threatening its other neighbors with its expansionist ambitions.

Russia has been determined to pursue its war of attrition in Ukraine, is playing the long game, and is calculating that it can prevail in that way by outlasting the West. China presents even more of a longer-term threat—a "pacing challenge," in the words of Secretary of Defense Lloyd J. Austin III.

"Every change in the strategic environment privileges different attributes," Slife said. "This is now a very different environment."

But the Air Force and Space Force are running out of time to adapt.

"Xi Jinping has told his military to be ready to invade Taiwan by 2027," Kendall said. "China is a thinking, well-resourced adversary. They're now thinking about the things we've said we're going to do and how they're going to defeat them. That's why we have to re-optimize. We're in a race. And we can't just hope we win. We have to actually do things to make sure we stay ahead."

Eric Dietrich/USAF

Secretary of the Air Force Frank Kendall, center, flanked by then-Air Force Chief of Staff Gen. Charles Brown, Jr. left, and Chief of Space Operations Gen. B. Chance Saltzman, testify before the Senate Armed Services Committee for the FY24 budget request.

Why Congress Told USAF to Spell Out its Force Design for 2050

By Greg Hadley

Congress directed the Air Force and Space Force to define their future force. The call to action, included in the 2024 National Defense Authorization Act, aims to force the services to articulate a long-term vision and the requirements to support that vision—critical insight that could lead to increased funding.

Rep. Don Bacon (R-Neb.), a retired Air Force brigadier general and ISR pilot, introduced the 2050 force design study legislation to make the Pentagon commit to a flight path from today's USAF—which he fears is retiring too many aircraft too quickly—to tomorrow's, which must be capable of deterring and, if necessary, defeating China's People's Liberation Army Air Force.

Office of Rep. Don Bacon

Rep. Don Bacon (R-Neb.) comments on the National Defense Authorization Act.

"We want the U.S. Air Force to lay out, 'OK, this is our plan, and this is what we need,'" Bacon told Air & Space Forces Magazine. "And then we should stand back and say, is this adequate? Do we need to provide the Air Force more top line money for acquisition?"

The force design study, due by Aug. 31, will give Air Force Secretary Frank Kendall, Air Force Chief of Staff Gen. David W. Allvin, and Chief of Space Operations Gen. B. Chance Saltzman a chance to offer more concrete visions for the future Air Force and Space Force.

The Air Force has for years retired more aircraft than it has procured—Bacon pegged the ratio at around 2.5-to-1. Retired service leaders and observers have frequently noted that the fleet is growing smaller, older, and less ready over time, just as the Pentagon pivots to great power competition with the likes of China and Russia.

"It bothers me," said Bacon, a member of the House Armed Services Committee and its Tactical Air and Land Forces subcommittee. "While we're trying to gear up for China, you've still got Russia, you've got to deter in the Middle East, having a 1-to-2.5 ratio means our force is continuing to get smaller."

Service officials say divestments are necessary to free up funding for modernization, and that the aircraft being retired would not survive in a near-peer fight anyway.

But while Bacon said he is comfortable retiring older, less advanced aircraft like the A-10, he believes USAF must be "the preeminent fighting force in the decades to come, especially with China." Therefore, it needs to grow, not shrink.

"We're going to have the B-21, we're going to have other long-range strike capabilities," Bacon said. "We're going to have a lot of the stealth capabilities. You got the nuclear deterrence end of it, we have two-thirds of the triad and because of that, we've got to have the strength."

In the competition for resources, however, the Air Force continues to lag behind the Army and Navy in terms of its direct share of Pentagon resources. Bacon sees the study as crucial to help articulate the need for spending increases.

"I want to be able to force the Air Force to say, 'This is what we want to look like,'" Bacon said. "I also think we need to discuss, is the top line sufficient for the Air Force? I'm of the opinion it's not."

It's a chance some former officers have told Air & Space Forces Magazine that Kendall welcomes, as it would allow him to explain the reasoning behind key decisions like retiring aircraft, re-optimizing the organizational structure, and adjusting personnel.

Indeed, Bacon said he expects the 2050 study to dovetail with other strategic projects now underway, including Kendall's push to "re-optimize" forces and the department to better align to modern-day requirements in competition with China.

The force design plan should offer an overarching vision that lawmakers and service leaders can compare to the department's budget and investment decisions, Bacon said. That will contrast with recent history, he said, where "every year, they have a little bit of a different plan, so we feel like it's a little bit of a moving target."

"We want to get them on record: 'This is what we want to have with a reasonable budget,'" Bacon added.

VCSAF Slife: New Force Generation Model Better Explains 'Capacity, Risk, and Readiness'

By Chris Gordon

Tech. Sgt. Isaac Garden

Deploying individuals rather than units has made it hard for the Air Force to articulate the impact to overall readiness when combatant commanders impose additional demand for forces.

As the Air Force plans to unveil sweeping changes to its structure, organization, and training to "re-optimize" for competition with China, one part of the service's overhaul is already underway: a new force generation model for how to deploy Airmen.

Known as AFFORGEN, the new force generation model is designed to help the Air Force, combatant commanders, and the broader U.S. military better understand how to deploy Airmen and Air Force assets, part of an effort first outlined in 2021.

"It gives us a better ability to articulate capacity, risk, and readiness to the joint force," Vice Chief of Staff of the Air Force Gen. James C. "Jim" Slife told Air & Space Forces Magazine in an interview shortly before his elevation to the USAF's No. 2 job.

Primarily driven by the need for airpower for America's fights in the Middle East, the Air Force has deployed Airmen from a myriad of bases to large, fixed sites, such as Al Udeid Air Base in Qatar. Service officials say this "crowdsourcing" model will not be applicable to a future fight as the Pentagon pivots toward its long-term focus: China and the Pacific. Instead, a more cohesive plan is required in the future.

"In a relatively low-threat environment, where we're operating for years at a time out of large main operating bases, that model has been sufficient to our needs," Slife said. "We organized our Air Force to be as flexible as possible, break it up into as many small little things as we can, and deploy. We're in a different strategic environment now."

The Air Force and all military services train and equip forces that deploy at the direction of the Secretary of Defense. Commanders want forces, while the services emphasize the need to maintain long-term readiness.

"That's the tension the Secretary of Defense has to deal with every single day," Slife explained. "There's an insatiable demand from combatant commands. There's a limited capacity from the services."

To balance this tension, AFFORGEN establishes a two-year cycle for deployable units. There are four six-month phases, which take the units from "reset," to train to maintain readiness to deploy before returning to reset.

"The service has a responsibility to think on a different time horizon than combatant commands do," Slife said. AFFORGEN will help explain that balance better to senior Pentagon leaders, he said.

AFFORGEN is being put to the test in the Middle East as tensions soar in response to attacks by Iran-backed militias on U.S. troops in Iraq and Syria, and on commercial shipping. Airmen were deployed to U.S. Central Command this fall under the AFFORGEN model, according to the Air Force. Secretary of the Air Force Frank Kendall visited those Airmen and Guardians in December to get a firsthand look at how the process works in action.

"As I got to know the Air Force and the Space Force more intimately, it became more apparent to me that we need to make some changes," Kendall told Airmen and Guardians at an all-call meeting at one base in the Middle East, according to a news release.

AFFORGEN is still being adjusted and service officials have indicated it will not be a one-size-fits-all approach. Units in commands such as Air Mobility Command, Air Force Global Strike

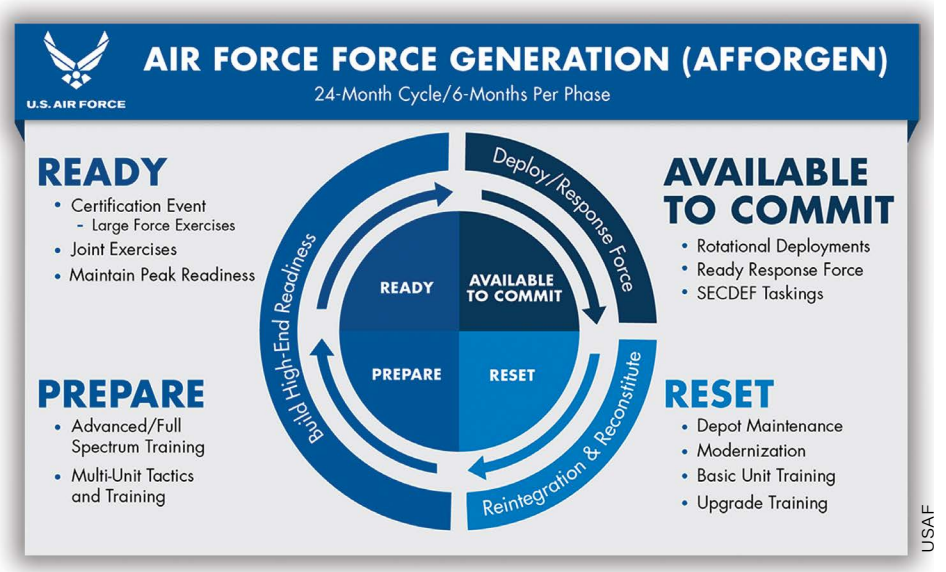
Command, and Air Combat Command likely will not deploy in the same way as those at the regional commands, U.S. Air Forces in Europe-Air Forces Africa (USAFE-AFA) or Pacific Air Forces (PACAF).

AFFORGEN will also be complemented by new Air Task Forces (ATFs), which will provide a package of forces that train, deploy, and fight together.

For now, the service plans three Air Task Forces: two for U.S. Central Command and one for U.S. Indo-Pacific Command. The first ATFs are scheduled to begin their AFFORGEN cycle this summer, the Air Force says.

Through these changes, the Air Force is aiming for a greater understanding of the long-term risks and benefits of deployments. But Airmen will still be ready if called upon.

"The Secretary of Defense gives us orders, and we execute those orders," Slife said.



The USAF Force Generation model moves units through four phases over a 24-month period, ensuring sustainable, deployable forces on a predictable cycle.

New F-15EX Fighters Arrive, Testing Accelerates

By John A. Tirpak

Two Boeing F-15EX Eagle IIs arrived at Eglin Air Force Base, Fla., for testing late last year, the third and fourth in a program expected to encompass a planned 104 jets. To hold the program schedule, six more EXs must be delivered between by July.

Dubbed EX3 and EX4, the two newest jets arrived at Eglin on Dec. 20. EX1, EX2, and EX4 belong to the 53rd Wing, while EX3 belongs to the 96th Test Wing. The first EX was delivered to Eglin in 2021. To compress the schedule, developmental and operational testing will take place simultaneously. Flight test data acquired from similar aircraft sold under the Foreign Military Sales program has also been incorporated into the combined test effort.

The two newest jets and the next two to arrive are earmarked for flight testing. The last two in the initial order will be operational aircraft assigned to the Oregon Air National Guard, which runs the Air Force's F-15 schoolhouse.

Aircraft Nos. 3 and 4 are about a year late, a situation Boeing has chalked up to supply line problems, manufacturing mistakes, and delays stemming from shifting some production work from South Korea to the U.S. The last four aircraft of the first lot are expected by the spring.

The F-15EX missed its objective initial operational capability (IOC) date last July but can still meet the minimum-required IOC deadline if the Air Force receives eight aircraft by July 2024; failure to do so would put the program in breach of the Nunn-McCurdy Act and require certifications from the Secretary of Defense to continue. Full operational capability requires 44 jets on duty, including trained pilots, spares, and support gear; that is now expected in 2027.

At $94 million per fighter, assuming the Air Force buys the planned 104 aircraft, the F-15EX and its Eagle Passive/Active Warning Survivability System (EPAWSS) jamming and electronic warfare suite was deemed the quickest way to replace worn-out F-15Cs. The F-15C fleet averages 38 years old. Severe structural fatigue, deteriorating wiring, and parts obsolescence are persistent problems, and the Air Force restricts speed, load, and maneuvering to minimize risk. The oldest USAF F-15C has been in service since 1979.

The EX is a modern variant based on the F-15QA developed for Qatar. It features fly-by-wire technology and a powerful new processor, along with two additional weapon stations, giving the Eagle II the largest combat load in the Air Force's fighter inventory.

Like the E model, the EX has two seats, but the Air Force plans to operate it as a single-seat aircraft. The EX is also supposed to be equipped with conformal fuel tanks (CFTs), like the F-15E. The CFTs also have weapon stations, and besides extending range, offer more air-to-ground weapon hardpoints. However, the service did not fund the CFTs for the first 50 or so EX models. Unlike the initial two jets, the new aircraft have cockpit pressure monitors and a warning system, along with a high frequency antenna for satellite communications. They also "feature a forward fuselage redesigned specifically for the U.S. Air Force," a service release said.

The Air Force said the 2023 annual report from the Pentagon's director of operational test "stated that the F-15EX is operationally effective, suitable, and survivable against threats likely to be encountered while performing its missions in threat environments." It added that this report "allows the program to move into a new testing phase."

The F-15EX has "met every challenge we've thrown at it," and is "on the cusp of being ready for the warfighter," according to Lt. Col. Christopher Wee, Operational Flight Program Combined Test Force commander.

The new deliveries pave the way "for not only the delivery of combat-coded aircraft to the U.S. Air Force, but also the continued development" of the aircraft, he said.

The Air Force plans to buy 24 F-15EX in fiscal year 2025. Negotiations between Boeing and the Air Force on prices for production lots 2-4 were underway in the fall. The company has considered production rates between 24 and 48 aircraft per year at its St. Louis facilities. Boeing has identified Indonesia as a possible EX customer, with an interest in buying 24 of the fighters.

Mass Communication Specialist 1st Class John Philip

Space Force Gen. Stephen Whiting replaced Army Gen. James Dickinson as the head of U.S. Space Command, the warfighting combatant command responsible for military operations beyond 100 km above sea level.

Space Command Reaches FOC—With a Guardian in Charge

By Christopher Gordon and Unshin Lee Harpley

Weeks after declaring full operational capability (FOC), Army Gen. James Dickinson handed over the controls of U.S. Space Command to Space Force Gen. Stephen N. Whiting, opening a new chapter in the command's rapidly developing history.

"Our highest priority is to preserve freedom of action in space," Whiting said, drumming home the importance of the command's mission. "The People's Republic of China and Russia consider space a warfighting domain, and their increasingly assertive actions have made space more contested. Their actions have created real threats to our national space power and the critical space infrastructure upon which our nation relies."

SPACECOM achieved FOC following an intense evaluation that affirmed the command's ability to function even on what Dickinson called "our worst day, when we are needed the most," and adversaries are working to thwart U.S. advantages in space.

Full operational capability is a significant advance, which includes:

- Accomplishing the Unified Command Plan mission alongside global campaigning, exercising, and responding to crises.
- Employing the personnel with all necessary skills across the full span of military, civilian, and contractor personnel.
- Possessing the infrastructure necessary to support command and control across all mission and business functions.
- Having all necessary command processes and functions in place.
- Being able to set the conditions and requirements for the future fight.

SPACECOM is still operating under a cloud, however, as its permanent home remains a controversial point of debate. President Trump sought late in his presidency to move SPACECOM to Huntsville, Ala., but President Biden revoked that decision. Rep. Mike Rogers (R-Ala.), chairman of the House Armed Services Committee, has vowed not to give up his quest to relocate SPACECOM from Peterson Space Force Base, Colo., to Redstone Arsenal, Ala., which is just north of Rogers' home turf—Alabama's 3rd Congressional District.

Now that SPACECOM has reached FOC, however, Colorado lawmakers can argue against moving from its provisional headquarters because doing so would set the command back in terms of readiness. Compromise language in the 2024 National Defense Authorization Act states that a new command headquarters cannot be built until government watchdogs

investigate President Joe Biden's decision to keep SPACECOM in Colorado, which reversed a decision made by former President Donald Trump in his final weeks in office.

"Maintaining the headquarters at its current location ensures no risk of disruption to Space Command's mission and personnel, and avoids a transition that could impact readiness at a critical time given the challenges we continue to face," National Security Council spokesperson Adrienne Watson told Air & Space Forces Magazine in July.

U.S. Space Command was established in the fall of 2019 as a geographic combatant command—actually, "astrographic," is SPACECOM's new terminology. Its operational domain is everything greater than 100 kilometers above sea level. Its establishment predates the U.S. Space Force by just a few months.

In taking command of SPACECOM, Whiting spoke of the growing threats facing U.S. military forces, which depend on SPACECOM for vital intelligence, communications, navigation, and timing.

"Our highest priority is to preserve freedom of action in space," Whiting said. "The People's Republic of China and Russia consider space a warfighting domain, and their increasingly assertive actions have made space more contested. Their actions have created real threats to our national space power and the critical space infrastructure upon which our nation relies."

The declaration of full operational capability "does not mean the command will stop developing capability or capacity," SPACECOM said in its announcement. "The command, like all others, will require additional resources to keep pace with competitors and evolving threats."

Whiting helped stand up the Space Force's Space Operations Command. As SpOC's first-ever commander, beginning in October 2020, he oversaw the command's first contributions to the joint fight, including vital intelligence during Russia's invasion of Ukraine and assistance to Israel before and after the Oct. 7 attacks on Israeli civilians by Hamas.

Whiting emphasized the close collaboration between SPACECOM and the Space Force and the challenges that can arise between military branches responsible for recruiting, training, and equipping the force and combatant commands, which have to execute war plans. "No doubt there are tensions between services and combatant commands," Whiting said. "But let me be clear, maximizing the outcomes for the nation in space ahead of any organizational equities will be my priority."

Deputy Defense Secretary Kathleen Hicks attended the ceremony in place of Defense Secretary Lloyd J. Austin III, who has been battling prostate cancer and was hospitalized in late 2023 and early 2024. She highlighted resilient space architectures—a new area of emphasis in space—as crucial to the U.S. response, asserting that "conflict is not inevitable."

"The United States of America is committed to preventing conflict through deterrence by making clear to our competitors that the costs of aggression would far outweigh any conceivable benefits," Hicks said. "Everyone at this command is part of how we do that."

Red Skies: Space Force Launches New Exercise

By Greg Hadley

The Space Force held its first-ever "Red Skies" exercise in December, some 48 years after the Air Force held its first-ever "Red Flag," and like the Air Force exercise, enabling Guardians to prepare for war in their domain.

Red Skies ran Dec. 11-15, challenging Guardians with simulated space threats in an exercise two years in the making. Some 45 Guardians from Deltas 2, 3, 7, 9, and 11 participated, said lead planner Capt. DeShawna Moore.

Lt. Col. Scott Nakatani, commander of the 392nd Combat Training Squadron, which led the exercise, told Air & Space Forces Magazine that the Space Force is no different than any other service trying to compete in its area of responsibility. "How do these systems respond? And what are the limits of their performance?" he said, explaining that the next step is more difficult: "Trying to survive when someone's trying to destroy you."

Leveraging concepts proven over half a century at Red Flag, where fighter pilots must survive under extreme pressure, Red Skies seeks to challenge space operators with realistic combat scenarios. "So just like a fighter pilot on the range out at Nellis flying at Red Flag, we are working on building up those same skill sets—the survivability skill sets, pursuing the mission through contested and dangerous environments, against observed and validated adversary tactics," Nakatani said.

Conceived two years ago under then-STARCOM commander Brig. Gen. Shawn N. Bratton, the exercise joins others in the Space Force's new training agenda, including "Black Skies," focusing on electronic warfare, "Red Skies," to highlight orbital combat, and "Blue Skies," to focus on cyber warfare.

Brig. Gen. Todd Moore, STARCOM's deputy commander, said the plans add to Guardians' experience. "We have been

Graphic by Ethan Johnson/USSF

Hosted by the STARCOM, through the 392nd Combat Training Squadron, Exercise RED SKIES is an orbital warfare-focused training for Guardians from Space Operations Command.

increasing the number of exercises and trying to increase the number of venues where we're able to give the Guardians access to scenarios to really train against an aggressor force."

While details on the scenarios and threats Guardians faced in Red Skies remain classified, Nakatani said the exercise sought to develop tactics and procedures to protect U.S. satellites while taking into the account the cost of burning satellites' limited fuel supplies.

"Just like an aircrew is trying to communicate to this controller back on the ground, how did the space crew flying the

satellite deal with their command and control and obey so they can use their fuel budget judiciously and still achieve their objectives?" he said.

The results were encouraging, Capt. Moore reported.

"I would say my favorite portion of the scenario in general was seeing the integration between the different [teams] and how we tackle those types of challenges innovatively in order to have mission success," Capt. Moore said.

This exercise was a simulation, but officials said they hope future Red Skies will incorporate live on-orbit assets.

"I'd love to see some real maneuvers performed, perhaps with a test asset, perhaps with a residual capability," Nakatani said. "When I think about what's real, and what's exercise, there's always a nuanced piece too. Going through your entire communications structure, I do think there are [things] on real systems that just can't be replicated in terms of readiness."

Plans call for the next Red Skies in fiscal 2025, Nakatani said, after which Brig. Gen. Moore said he hopes to increase the exercise's frequency and complexity.

"I genuinely believe we need to be able to replicate Red Skies no less than quarterly," Moore said. " The [other] place I'd take it is increased complexity. And what I mean by increased complexity is making it a truly multidomain in timing and tactics and command and control. Really having that increase in the complexity of what we're doing across domains, I think is really important."

Space Planes Now 'Most Watched Objects on Orbit'

By Greg Hadley

When the Space Force's X-37B Orbital Test Vehicle returned to orbit just before New Year's, riding a SpaceX Falcon Heavy rocket from Kennedy Space Center, Fla., after multiple scrubbed launches, it joined China's mysterious "Shenlong" space plane in space.

The proximity of the dueling space plane launches was "probably no coincidence," said Chief of Space Operations Gen. B. Chance Saltzman. "It's no surprise that the Chinese are extremely interested in our space plane. We're extremely interested in theirs."

The uncrewed space planes demonstrate both the ability to put something in orbit, to conduct operations in space, and to return to Earth. Amateur trackers reported that Shenlong had released six objects into orbit, some of which began emitting signals. Just how the U.S. uses its X-37 space plane is itself a mystery, with few details released publicly.

The Space Force has acknowledged this mission—the space plane's seventh—and said the spacecraft will test "new orbital regimes." It has previously operated in low-Earth orbit, some 110-500 miles above the ground, but Falcon Heavy can deliver payloads up to 58,860 pounds—far more than the X-37B—as far as geosynchronous orbit, more than 22,000 miles above Earth.

Saltzman said this mission would "expand the envelope," including "some good experiments [with] the primary goal of testing technologies."

In a release after the launch, the Space Force said X-37 would be "experimenting with space domain awareness technologies and investigating radiation effects to NASA materials." Other payloads remain classified.

Secretary of the Air Force Frank Kendall said in a release

Staff Sgt. Adam Shanks

The X-37B orbital test vehicle after it concluded its sixth successful mission in 2022.

that this new military space race evoked the 1960s' Gemini and Mercury programs.

The December launch was "an incredible event," Kendall said. "I think about the teamwork over all those decades that has led to what has been a revolutionary improvement in space travel capability. We have come so far, and it's been teamwork by the government; the Air Force and now the Space Force, which didn't exist until a few years ago; NASA; industry teams; and so many others that all contributed to what we saw tonight."

It could be a while before new details emerge about X-37. With each successive mission, the space plane has spent more time in orbit, including a record 908 days in space when it last returned in November 2022. At that rate, it may not return to Earth until June 2026.

SDA Selects a New Contractor to Build 18 More Transport Layer Satellites

By David Roza

The Space Development Agency, which is pioneering a new way of developing, buying, and deploying military satellites, awarded a combined $3.06 billion to L3Harris, Lockheed Martin, Sierra Space, and Rocket Lab for 72 satellites—48 for missile warning/missile tracking, 18 for data-transmission, and six for missile defense.

Rocket Lab's 18 satellites are part of the Tranche 2 Transport Layer-Beta segment and will launch no later than July 2027. L3Harris, Lockheed, and Sierra are all building 16 missile warning/missile tracking (MW/MT) satellites and two missile defense satellites for the Tranche 2 Tracking Layer, set to launch no later than April 2027.

All of the satellites will make up part of the Space Force's Proliferated Warfighter Space Architecture, a massive planned constellation in low-Earth orbit.

The total contract awards were:

- $919 million for L3Harris
- $890 million for Lockheed Martin
- $740 million for Sierra Space
- $515 million for Rocket Lab

The MW/MT satellites are designed to detect and track missile launches from space, using wide field-of-view infrared sensors. The missile defense satellites will have a mix of wide- and medium-field-of-view infrared sensors to generate high-quality fire control tracks to assist ground forces to intercept missiles, according to an SDA official. The data transport satellites will enable the Pentagon's joint all-domain command and control (JADC2) capabilities, rapidly moving and processing data between sensors and shooters.

Both Rocket Lab and Sierra Space are first-time contract winners for SDA, a fact Derek M. Tournear celebrated as milestones in his agency's efforts to expand the number of companies contributing space vehicles.

"The marketplace is responding to the demand signals for our spiral development model," Tournear said in a statement.

As the Tranche 2 contracts are handed out, Tranche 1 is scheduled to launch this fall, while the 23-satellite Tranche 0 is already in orbit. Tranche 0 was meant to demonstrate the feasibility of the Proliferated Warfighter Space Architecture. Tranche 1 provides regional coverage for tactical data links, advanced missile detection, and beyond line of sight targeting. Tranche 2 expands Tranche 1 globally, while Tranches 3 and 4 are meant to enhance their predecessors.

SDA now has 417 satellites on contract, in addition to the 28 in Tranche 0 that are either in orbit or preparing to launch. The agency is pushing for an ambitious schedule of "spiral development," with new tranches going up every two years and between 400 and 500 satellites constantly operational. Tournear is pushing for large numbers of smaller spacecraft in low-Earth orbit to create resilience by discouraging adversaries from trying to shoot down or otherwise disable any one satellite.

Senior Airman Trevor Gordnier/USAF

A CV-22 Ospreys assigned to the 21st Special Operations Squadron prepared for aerial refueling over the Sea of Japan, in March. Another CV-22 crashed in November, killing all six Airmen aboard.

Deadliest Crash in Years Highlights Concerns Over Osprey

By Greg Hadley and David Roza

Forty-three days after a U.S. Air Force CV-22 Osprey crashed off the coast of Japan for reasons still not explained, the Pentagon halted search and recovery operations with the remains of one Airman, Maj. Eric Spendlove, a flight surgeon, still missing.

The crew of the Osprey, call sign "Gundam 22," were on a training mission out of Yokota Air Base, Japan, on Nov. 29 when the tilt-rotor aircraft caught fire and crashed. It was the deadliest Air Force aviation mishap since 2018, when nine Air Guardsmen were killed in a WC-130 crash in Georgia.

Osprey safety concerns are not new. While the crash was the first fatal CV-22 accident for the Air Force since 2010, other services have suffered losses in recent years: In August 2023, three Marines were killed in a crash in Australia, and in June 2022, two Marine MV-22s went down in separate incidents, one killing five Marines in Southern California and the other killing four Marines in Norway.

The Air Force also grounded its CV-22 fleet briefly in 2022 after a series of hard clutch engagements—in which the clutch slips and reengages—caused USAF Ospreys to make emergency landings.

Following the November crash, the House Oversight Committee opened an investigation, requesting extensive documentation from the Pentagon, Committee Chair Rep. James Comer (R-Ky.) wrote in a Dec. 21 letter to Defense Secretary Lloyd J. Austin III. The Government Accountability Office will also conduct its own review after receiving a request from the House Armed Services readiness subcommittee.

While the investigations began, the search for the eight Airmen in Japan was extensive. More than 1,000 people, 46 aircraft, 23 vessels, and 21 unmanned aerial and underwater systems plied the waters over a 60,000-square-kilometer area, recovering the bodies of seven Airmen and most of the CV-22 wreckage.

"In times like these, where service to our nation is not just a personal commitment but also a legacy woven into the fabric of our families, the depth of sorrow is immeasurable," said Lt. Gen. Tony Bauernfeind, AFSOC commander, in a Dec. 5 statement.

Spendlove, 36, of St. George, Utah, was the oldest member of the team, a special operations flight surgeon and medical operations flight commander who led his medical team to improve readiness at the 1st Special Operations Squadron by 94 percent and at the wing by 25 percent, according to his AFSOC biography.

"When he had the opportunity to join a special operations group, he was all over that," Spendlove's older sister, Monica Murset, told news station FOX 13 in Salt Lake City. "It gave him access to traveling the world alongside some true heroes, and he absolutely loved serving his country."

Capt. Terrell Brayman, 32, of Pittsford, N.Y., felt a similar dedication to his job. The former U-28A Draco pilot became a CV-22 pilot in 2020 and was "a naturally talented pilot and officer," Lt. Col. Tyler Oldham, head of the 21st Special Operations Squadron, said in Brayman's biography. Daniel Bobry, a friend of Brayman, was impressed by his work ethic at Ohio State University, where Brayman studied astronautical engineering.

"He was up at 3:30, 4 o'clock every day at ROTC, always smiling, never complained," Bobry told New York news station WHAM-Rochester. "He just did his job and did it well and always had a smile on his face."

A fellow CV-22 pilot, Maj. Luke Unrath, 34, hailed from Riverside, Calif., where the triplet left a mark on his parents and siblings.

"It would be impossible for us to express in a few words what an amazing son Luke was," Unrath's parents told Southern California newspaper The Press-Enterprise. "Even though we raised him in faith, he taught us so much, what it is to live a Christ-centered life. He chose this path and career because he wanted to help people."

Oldham was also impressed by the pilot, who started his career as an engineer before cross-training into aviation in 2019.

"People gravitated toward him and would follow him due to his cool, calm demeanor and high standards," the squadron boss wrote.

The third pilot aboard 'Gundam 22' was Maj. Jeffrey Hoernemann, 32, of Andover, Minn. A Weapons Instructor Course graduate, Hoernemann was an instructor pilot and chief of weapons and tactics at the 21st Special Operations Squadron, where "his character was the benchmark of officership in the United States Air Force," Oldham wrote.

"Jeff was the best of us," he added. "His selflessness and leadership through example have left enduring marks upon the culture and values of the members of Air Force Special Operations Command."

In a statement published by CBS Minnesota, Hoernemann's family said the major "was proud to have been chosen to fly the CV-22B Osprey. He loved to fly the hybrid aircraft and was never afraid of it."

Despite being the youngest Airmen aboard, Staff Sgt. Jacob Galliher, 24, of Pittsfield, Mass., made a lasting impression on those around him.

"I looked up to Jake in more ways than one," Galliher's best friend, Air Force Staff Sgt. Edward Dobransky, told The Berkshire Eagle, a Massachusetts newspaper. "We lost a superhuman when we lost Jake."

An airborne linguist specializing in Mandarin, Galliher was an honor graduate or distinguished graduate of several Air Force schools, and his commander said he was just as distinguished as a teammate.

"With a ready smile, Jake brought the unit together on and off-duty through humor and an inexhaustible supply of energy," Maj. Gilbert Summers, head of the 43rd Intelligence Squadron, Detachment 1, said in a statement. "Everywhere he went, and everyone he met, was made better for him being there."

Staff Sgt. Jake Turnage, 25, of Kennesaw, Ga., was a special missions aviator and served as lead flight engineer and noncommissioned officer in charge of training at the 21st Special Operations Squadron. He had a lot of responsibility: Alongside his normal duties as flight engineer, loadmaster, and aerial gunner, he also managed the combat arms, survival evasion, resistance, and escape, and chemical, biological, radiological, and nuclear training requirements for the squadron. But he seemed to bear it well, according to Oldham.

"Jake's humor and zeal were contagious," the commander said. "His magnetic personality was always uplifting and lightened the load of his squadron mates."

Turnage's fellow special missions aviator aboard the Osprey was Senior Airman Brian Johnson, 32, of Cincinnati. In a statement published by Ohio news station Dayton 24/7 Now, Johnson's family described him as "an amazing and caring son, brother, uncle and friend to all." Oldham praised his "tireless work ethic … his knowledge, skill, and attention to detail inspired competence and trust amongst his fellow aircrew."

The eighth Airman aboard 'Gundam 22' was Tech. Sgt. Zachary Lavoy, 33, of Oviedo, Fla. A medical operations flight chief, Lavoy picked up a number of honors in training, and contributed to multiple unit awards such as the 2019 Air Force Medical Service Medic Rodeo Team of the Year. His commander, Lt. Col. Christopher Pellegrino, head of the 1st Special Operations Squadron, described him as "a compassionate medic with a steadfast devotion to supporting the needs of those around him."

Lavoy's mother, Gabriela, could not believe her son was gone when she spoke with Florida news station FOX 35 Orlando on Dec. 6.

"I didn't think anything could hurt my son," she said. "You think your kids are invincible. I didn't think anything could happen to him. I always thought he would be found alive."

The Air Force, Marine Corps, and Navy announced on Dec. 6 that they were standing down all Osprey operations as the Air Force investigates the cause of the crash.

The Air Force said initial findings suggested there was a "material failure" with the Osprey, indicating pilot error was likely not the primary cause and there was an issue with the aircraft itself.

"The stand-down will provide time and space for a thorough investigation to determine causal factors and recommendations to ensure the Air Force CV-22 fleet returns to flight operations," Bauernfeind said in a statement at the time.

Ellsworth B-1 Crashes, Pausing Flight Ops

By John A. Tirpak

All four crew members safely ejected before a B-1 crashed in a fiery incident at Ellsworth Air Force Base, S.D., in January, closing the base's runway as investigators searched for clues.

A team of investigators launched a safety investigation to identify any mechanical or procedural reasons to ground the entire B-1 fleet; while B-1 operations at Ellsworth paused, operations continued at Dyess Air Force Base, Texas, the other main B-1 base, and at Edwards Air Force Base, Calif., for test flights.

An Air Force Global Strike Command spokesperson said an accident investigation board chairman had been selected and that reviews of this sort take months. The investigation of Class A mishaps such as this, which can include loss of life, severe injury, loss of an aircraft, or other damage totaling more than $2.5 million, probes crew actions, health, rest and training; the aircraft's maintenance history; weather conditions; and other salient factors.

Weather conditions at the time of the accident were poor, with below-freezing temperatures and fog in the area. The mishap aircraft was the second in a two-ship formation returning from a training flight; the lead aircraft landed without incident.

Unofficial and unconfirmed imagery circulating on Facebook pages and other social media show a B-1 covered with snow or foam that has been severely burned and bent in a catastrophic manner in a grassy area off a runway. In one image, the B-1, photographed from behind, is resting on its engines and missing its tail cone, with its left elevator badly bent. Additionally, the flaps on the swept-forward wings appear to be skeletonized, likely from fire.

Another image attributed to a NewsCenter 1 webcam shows the aircraft severely damaged from just forward of the wing roots to the nose.

Satellite imagery of Ellsworth dated Jan. 6—taken by Planet Labs and shared with The War Zone—shows that the aircraft struck the ground beyond the overrun of runway 31/13, and after briefly staying on the centerline, veered left off the main runway and came to rest in the grassy area between the runway and the taxiway, leaving a heavy black trail in its wake.

The four crewmembers ejected successfully from the aircraft. Three were treated at base facilities and one at a nearby hospital. All are expected to make a full recovery.

The AFGSC spokesperson said it has not yet been determined if the Air Force will attempt to replace the mishap aircraft by resurrecting one from the "Boneyard" at Davis-Monthan Air Force Base, Ariz. That determination may have to wait until the Accident Investigation Board (AIB) makes its final report. The Air Force is authorized to operate 45 B-1Bs, but now has only 44.

The Air Force persuaded Congress in 2020 to permit the service to reduce the B-1B fleet from 62 to 45 airframes—but keep the same level of maintenance funding and personnel—in order to improve the mission capability levels of the type, which had been struggling to meet USAF standards after the B-1Bs flew extended duty in Afghanistan and Iraq, incurring heavy structural fatigue.

The Air Force justified the divestiture by saying, in part, that the B-1s identified for retirement would cost from $10 million to $30 million each to restore to full mission capability.

The last of the 17 B-1s retired in the divestiture went to Davis-Monthan in September 2021.

After the retirements, the remaining operational B-1 fleet saw an uptick in mission capability rates, with more spare parts and maintenance crews available for each one.

It's not clear whether the aircraft sent to Davis-Monthan were put into recallable—or "inviolate"—storage, or whether they have been used for cannibalization purposes.

Staff Sgt. Jake Jacobsen

A B-1B Lancer attached to the 34th Bomb Squadron at Ellsworth Air Force Base, S.D., departs for a Red Flag combat training exercise at Nellis Air Force Base, Nev., in July 2023.

Since 2012, the Air Force has been running an extended structural fatigue test on a B-1B wing and fuselage, "aging" the items with pulleys and bars to simulate years of flying. The service reported in 2021 that its goal is to accumulate 28,000 simulated flight hours on the wing and 27,000 hours on the fuselage, but it was at that time behind schedule, and had only "aged" the two test articles to about 16,000 hours on the wing and 7,200 hours on the fuselage. The tests are also paused from time to time to make changes and modifications to the test articles so they are representative of operational aircraft, which occasionally have stiffeners or other structural enhancements applied.

In 2021, the B-1 fleet averaged about 12,000 hours of flying time.

WEAPONS

Sentinel ICBM is 37% Over Cost

By John A. Tirpak

The new Sentinel intercontinental ballistic missile program being developed by the Air Force and Northrop Grumman will cost 37 percent more than expected and take at least two years longer than previous projections before achieving initial operational capability—compelling the service to extend the life of some of its Minuteman ICBMs, senior service and Northrop officials told Air & Space Forces Magazine.

Just before close of business Jan. 18, the Air Force sent Congress notification of a Nunn-McCurdy breach on the Sentinel program. The Nunn-McCurdy Act requires the Pentagon to inform lawmakers if a program incurs a cost or schedule overrun of more than 15 percent. Any breach over 15 percent is considered "significant," while a breach of 30 percent is considered "critical."

The Sentinel's Program Acquisition Unit Cost (PAUC)—which includes development, acquisition, and construction costs—is increasing by 37 percent, making its Nunn-McCurdy breach "critical," the senior official said. Its Average Unit Procurement Cost—which is focused on acquisition costs—will rise by 17 percent. The two figures are not additive.

An Air Force spokesperson said that when the program was baselined in 2020, the PAUC was $118 million. The 37 percent increase now puts that estimate at $162 million for the PAUC, the spokesperson said.

Under Nunn-McCurdy, programs in "critical" status are assumed to be headed for termination, unless the Secretary of Defense certifies there's no alternative. Defense Secretary Lloyd Austin is expected to make that certification, given the time it would take to start over and the urgency with which the 50-year-old Minuteman missiles must be replaced.

USAF

A U.S. Air Force illustration of the LGM-35A Sentinel. The new designation, approved by Secretary of the Air Force Frank Kendall, modernizes the intercontinental ballistic missile leg of the nuclear triad.

The estimated cost of Sentinel before the "program deviation" was $95.3 billion, indicating its new cost could be more than $125

billion. The Air Force expects to have a new cost and schedule for Sentinel by summer 2024, Assistant Secretary of the Air Force for Acquisition, Technology, and Logistics Andrew Hunter said. That assumes the Nunn-McCurdy process takes its full course and the program is allowed to continue.

The cost and schedule growth stems largely from the ground element of Sentinel. These include the command and launch segment—silos and launch control facilities, which will be "significantly bigger" than those for Minuteman—as well as the communications infrastructure the Air Force had hoped to reuse from the Minuteman, but which is too old and lacking in necessary bandwidth to do the job. A big element of that will be cabling and cable ducting which must be replaced, as well as land easements and other infrastructure expenses not well understood when the program baseline was set.

Inflation also played a role. Air Force Secretary Frank Kendall has also noted Sentinel has struggled with issues such as adequate labor and security clearances for workers.

While there is some escalation in the cost of the LGM-35A missile itself, it was not a major factor in the Nunn-McCurdy breach, Hunter said.

"There's been a little bit of cost growth on the missile side, but comparatively much less than what you see with command and launch segment. [The missile] would not probably, on its own, have triggered any kind of a breach in terms of cost," he said.

The schedule slip also adds cost to the program, since engineers and workers have to be kept on the project longer than expected. Moreover, some previously unexpected costs "were not included" in the Milestone B review of the program in 2020, a USAF official said.

Sentinel and Minuteman will also have to operate simultaneously for a time, creating challenges for the communications network.

In years to come, Hunter said, "there will be significant budgetary changes as a result of this cost growth, on both the Sentinel and Minuteman side."

Work continues on the program while the Nunn-McCurdy process plays out; no stop-work order has been sent to Northrop Grumman or its subcontractor team.

While no Sentinel-related financial changes are expected to the fiscal 2025 budget request soon to go to Capitol Hill, the cost increases will be reflected in the five-year program objective memoranda (POM).

According to the Sentinel's Selected Acquisition Report for 2022, procurement accounts for $61.6 billion of the program cost estimate, while research, development, test and evaluation is $25.5 billion and military construction is $8.7 billion.

In order for Sentinel to continue, Defense Secretary Lloyd J. Austin III must certify the program is crucially needed. The certification requires five conditions be met:

- The program must be deemed essential to national security.
- The root cause of the overrun must be clearly understood.
- New cost estimates must be validated by the Pentagon's Cost Assessment and Program Evaluation shop as reasonable.
- There are no lower-cost alternatives to the program.
- The program is a higher priority than other programs that must be reduced or eliminated to pay for the overrun.

A Nunn-McCurdy breach must also be addressed by restructuring the program in a way that corrects the root cause of the overrun, and new program milestones must be set.

Programmatically, the Sentinel is expected to go through a series of "rolling" critical design reviews in the coming months, a Northrop official told Air & Space Forces Magazine.

There may be ways to mitigate the two-year delay, he said.

"There's IOC and there's FOC," he noted, referring to Initial Operational Capability and Full Operational Capability. "IOC is when you get started and FOC is when you are done. What really matters for Minuteman III is when are you done. … FOC is obviously farther out in time. So there will be options to really look at to how do we perhaps keep [the] FOC date from moving as much as other parts of the program."

The Sentinel program calls for production of 634 missiles. Of those, 450 will replace Minuteman III missiles now in silos, 184 will be used to demonstrate periodically—to allies and potential adversaries alike—that the system works, and 25 will be developmental test vehicles

The program also calls for dozens of launch control facilities; maintenance and management buildings; integrated control centers at F. E. Warren, Malmstrom, and Minot Air Force Bases; weapons storage facilities; 56 loading and transport vehicles, and some 7,500 miles of cabling, a Northrop official said. Collectively, the massive program is "like five MDAPs (Major Defense Acquisition Programs) combined," he said.

In response to the Nunn-McCurdy notification, Northrop said it and the Air Force "continue to make significant progress on this highly complex program, achieving key milestones to mature the design and reduce risk." As part of its engineering and manufacturing development contract, "our team is committed to supporting the Air Force as it assesses and updates acquisition cost forecasts for the future phases of the program, to include construction projects, production, and deployment of the weapon system."

"We are focused on continuing to perform and meet our commitments under the EMD contract as we move toward delivery of this essential national security capability," a spokesperson added.

Northrop CEO Kathy Warden will preside over the company's fourth-quarter 2022 earnings call on Jan. 25.

USAF Orders 1,500 Small Diameter Bombs

By John A. Tirpak

The Air Force awarded Raytheon a $345 million contract to build more than 1,500 Small Diameter Bomb II/GBU-53/B munitions—called "StormBreaker" by the company—for the Air Force, Navy, and Foreign Military Sales users, under the 10th production lot. The work is to be completed by August 2028.

The SDB II is a smart bomb with pop-out wings that can be carried on BRU-55 and BRU-61 multiweapon racks and increase the loadout and targets struck per sortie by fighter aircraft. Certified for use on the Air Force F-15E and Navy F/A-18E/F and being integrated with the joint-service F-35, the weapon is planned to be fitted eventually for nearly all U.S. fixed-wing strike aircraft and bombers.

The munitions will be made primarily at Raytheon's Tucson, Ariz., facilities. The contract also covers containers and training gear.

The Pentagon's fiscal 2024 budget request asked for 920 SDB IIs for the Air Force, down from 1,214 in fiscal 2023 and 976 in fiscal 2022. The Air Force has also shifted from buying the bulk of its Small Diameter Bombs from the first iteration, made by Boeing, to the StormBreaker weapon made by Raytheon.

William Lewis/USAF

Small Diameter Bomb IIs are loaded on an Air Force F-15E Strike Eagle, which can be fitted to carry up to 28 SDB IIs.

The total planned acquisition of StormBreaker, according to budget documents, is 21,610 for the Air Force and 5,800 for the Navy. The Jan. 3 contract also covers Foreign Military Sales to Finland, Germany, Italy, and Norway, collectively worth $2.1 million. The contract includes $101.4 million from the Air Force's fiscal 2023 budget and $183.1 million for the fiscal 2024 budget.

Production of StormBreaker was paused in 2019 due to a parts quality issue. Raytheon retrofitted the weapons built to that point and production resumed in 2020.

Air Force budget documents say the service's goals for the weapon in 2024 include a technology refresh to change out "obsolete seeker components."

The 204-pound SDB II has a multimode seeker—including millimeter wave, imaging infrared, and a semi-active laser—with a 105-pound multimode shaped blast/fragmentation warhead. It can prioritize targets autonomously, and its GPS/INS guidance allows it to be retargeted after the weapon's release.

Stormbreaker is described by the company as a "network-enabled" munition. Its wings provide a standoff glide capability of more than 45 miles, according to Raytheon, reducing the launch aircraft's exposure to enemy defenses. The precision weapon can work in all weather or obscurants and can engage moving targets as well.

The F-15E can carry up to 28 SDB IIs by using seven BRU-61A racks, each with four weapons. With modifications, SDB II racks will be able to fit inside the F-22 and F-35. The weapon is 69 inches long. Raytheon reported that StormBreaker completed 28 test drops in 2023, across all user platforms.

The first operational use of the SDB II was with the 391st Fighter Squadron in 2021, which employed four of the weapons against moving ground vehicles at the Utah Test and Training Range in a Weapon Systems Evaluation Program (WSEP) test.

WC-135 'Nuke Sniffer' Upgrade Complete

By Unshin Lee Harpley

The Air Force took delivery on the third and final WC-135R "Nuke Sniffer" aircraft, completing its transition from its two-aircraft WC-135C/W fleet.

The new fanjet aircraft arrived at Offutt Air Force Base, Neb., on Dec. 4.

"Having this third jet really opens up a lot of options for us," said Col. Mark Howard, 55th Wing commander, in a release.

The aircraft sample the air for particles and gases indicating nuclear activities to ensure compliance with the Limited Test Ban Treaty of 1963, a global agreement to restrict nuclear weapons testing. There are few missions like it anywhere else in the U.S. military.

"Most people think of radiation and think 'avoid it,'" one Constant Phoenix crew member told Air & Space Forces Magazine in May. "With this jet we're able to go and actually do that safely, which I think is really cool."

Having three jets rather than two gives Constant Phoenix crew members much more flexibility to take samples in more parts of the world, which is especially important as the number of potential nuclear foes increases.

"For the first time in our nation's history we have the ability to respond to simultaneous events without mission degradation or diversion of assets," said Col. James Finlayson, commander of the Air Force Technical Application Center. AFTAC oversees the U.S. Atomic Energy Detection System, which monitors foreign compliance with nuclear testing treaties. The WC-135Rs are flown by the 55th Wing's 45th Reconnaissance Squadron, while AFTAC provides the special equipment operators who run the airborne sampling equipment.

The "new" WC-135Rs are converted KC-135R aerial refuelers. Their transformation from Stratotankers to nuclear-sniffers began in 2019 at the 645th Aeronautical Systems Group, a maintenance depot best known as "Big Safari." The third R-model, tail number 64-14829, was initially delivered to the Air Force in 1964 and most recently operated by the Arizona Air National Guard before its makeover.

The new jets feature a brand-new cockpit and CFM-56 turbofan engines, the same as the other two WC-135Rs. The earlier aircraft were dissimilar, so this will make training and maintenance more efficient.

"Having the same engines across the entire fleet is huge for our pilots as well as our maintainers," Howard said.

The new engines also fix a problem that afflicted the older WC-135W fleet, whose engines went out of production decades ago and often suffered dangerous failures.

The first WC-135R was delivered in July 2022, followed by the second aircraft last May. The 55th Wing retired the first WC-135C/W aircraft in November 2020, and the second one in fall 2022.

BAH Rises 5.4%, On Average

By Greg Hadley

Basic allowance for housing increased 5.4 percent on average as of Jan. 1, which combined with last year's stunning 12.1 percent jump, makes for a 17.5 percent increase in just 13 months.

Increases vary by location, paygrade, and whether members support dependents. Historic inflation drove skyrocketing housing costs in 2022 but moderated in 2023. The basic allowance for subsistence rose 1.7 percent for 2024.

The three Air Force and Space Force locations with the greatest increases are:

- Barksdale Air Force Base, La., about 13 percent
- Sheppard Air Force Base, Texas, also about 13 percent
- Joint Base Charleston, S.C., about 12 percent.

Other bases getting at least 5 percent increases after topping 15 percent growth last year include:

- Malmstrom Air Force Base, Mont.
- Hanscom Air Force Base, Mass.
- Ellsworth Air Force Base, S.D.
- Seymour Johnson Air Force Base, N.C.
- Shaw Air Force Base, S.C.

A few bases did see decreases in BAH, including:

- Nellis Air Force Base, Nev.
- Beale Air Force Base, Calif.
- Mountain Home Air Force Base, Idaho
- Patrick Space Force Base, Fla.
- McConnell Air Force Base, Kan.

BAH is intended to cover 95 percent of housing costs. For 2024, that means troops' out-of-pocket expenses for housing should range from about $85 to $194 per month. The Defense Department calculates BAH through annual surveys of roughly 300 rental markets across the country, determining the median price of rent and utilities for six different housing options in each of those markets.

Congress wants the Pentagon to reconsider its methodology. A year ago, in the 2023 National Defense Authorization Act, lawmakers directed the Pentagon to report back on the "efficiency and accuracy of the current system used to calculate BAH." With that report still pending, lawmakers declined to support a pilot program testing an alternative approach.

Pay Tops Bass' Concerns in Final Months

By David Roza

Chief Master Sergeant of the Air Force JoAnne S. Bass will retire in March after a historic tenure as USAF's 19th top enlisted Airman. Between now and then, compensation tops her concerns.

"Nobody joins the military to get rich, but they have to be compensated appropriately," Bass said Jan. 4 in a livestreamed discussion with Air & Space Forces Association president and CEO retired Lt. Gen. Bruce "Orville" Wright.

"If you look at today's pay and compensation model, specifically the pay chart, it really hasn't evolved since 1949," she added.

New technical career fields like cybersecurity do not align with the existing track for Airmen, she said. "If you grab someone who's 28 years old and they already have all of the certifications in the skill that we're going to do, we've got to give them some profession of arms training and skill sets. But do they come in as an E-1 or E-2 or E-3?" she asked. "I don't know."

The Air Force has a working group analyzing these and others quality-of-life and benefit issues, such as health care and child care.

"Today's military family looks different than it did 30 years ago," Bass said. "You have more dual-working parents, more dual-military parents, more single parents."

What's needed now is "unconstrained," out-of-the-box thinking to adapt and keep pace with the civilian competition, she said. Large national retail and restaurant chains provide health and dental care today for entry-level employees, she said, and that has altered the competitive balance.

"Again … nobody joins the military to get rich, at least I don't think so. But we can't be too far off when it comes to what is being offered in the economy today in America," she added.

Bass acknowledged that Air Force base commanders "are doing phenomenal things" to address child care needs at a local level. Overall, child care capacity has increased over the past year, there are more family child care providers and fewer families on waiting lists, she said.

Jud McCrehin/Staff

"Nobody joins the Air Force to get rich," says Chief Master Sergeant of the Air Force JoAnne Bass, who will retire in March. "But they have to be compensated appropriately." Improving pay and benefits in the civilian sector can make military service less attractive, she said.

"But we've got to take a look as a Department of Defense at 'how do we increase the capacity even more so that our service members can focus on the mission and know that their children will be taken care of?'"

The CMSAF plans on discussing these and other quality-of-life issues with lawmakers later this month as she and other senior military enlisted leaders press for more support for child development centers, youth centers, and other personnel programs.

"We've made a promise to America's moms and dads that if your son or daughter joins the military, we will provide a roof over their head … we will take care of our national treasures," Bass said. "And that starts with pay and compensation, health care, child care, all of those."

Kadena Maintainers Win DOD Honors

By David Roza

Maintainers with the Air Force's largest combat wing took home the Phoenix Award as the best field-level maintenance unit in the entire Department of Defense for 2023. The 18th Maintenance Group from Kadena Air Base, Japan, accepted the prize at the DOD Maintenance Symposium in San Diego.

The 18th wing's 2,400 Airmen generated 7,601 sorties and 17,600 flight hours in 2023, even as they worked to phase out aging F-15C/D fighters for their final trips back to the U.S. They also support KC-135 refueling tankers, HH-60 helicopters, and E-3 airborne warning and control aircraft among Kadena's 80 total aircraft, which fly air interdiction, combat search and rescue, aerial refueling, aeromedical evacuation, and command and control battle management missions across the Indo-Pacific theater.

Located on Okinawa, just 375 miles from Taiwan and 400 from mainland China, Kadena is a vital position and potential staging ground for U.S. operations in the region. As the base phases out its aging F-15s, a revolving door of fourth- and fifth-generation fighters have flown in to maintain a fighter presence there. In November, the wing hosted a 33-plane "elephant walk" where helicopters, tankers, Air Force and Navy fighters, an MQ-9 drone, and other aircraft taxied down the runway together.

Throughout 2023, the 18th Maintenance Group "provided intermediate-level maintenance, engine maintenance, and test equipment calibration for the entire Indo-Pacific region as the engine centralized repair facility," a DOD press release said. It also hosted the only active-duty Air Force base-level Precision Measurement Equipment Laboratory.

Another unit recognized for field maintenance excellence was the 912th Aircraft Maintenance Squadron at Edwards Air Force Base, Calif., in the small category. Out of a total field of six winners, only one can receive the annual Phoenix Award. The award is named after the mythological bird that, consumed by flames, is later reborn from its own ashes, a feat that evokes bringing a broken aircraft back to life.

OBITUARY

Robert D. Gaylor, Fifth Chief Master Sergeant of the Air Force, Dies

By John A. Tirpak

Robert D. Gaylor, who served from 1977-1979 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 non-trivial matter—the Air Force was suffering a brain drain of mid-career 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.

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CMSAF No. 5 attained the rank of master sergeant at 25, the highest enlisted rank at the time. Two new enlisted ranks were added. He became a Chief Master Sergeant in 1968.

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 (PME) 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.

MEET THE NEW CHIEF

Gen. David Allvin brings a different perspective to USAF's top job, but the mission and key priorities are unchanged. His watchword remains 'Follow Through.'

Eric Dietrich/USAF

Gen. David Allvin, who started his career flying tankers and airlifters, and also spent time as a test pilot and staff officer, is only the second non-fighter pilot to become Chief since 1982.

By Chris Gordon

Among the first things you see when you enter Air Force Chief of Staff Gen. David W. Allvin's office is a painting of a C-46 soaring across a foreboding sky as lightning flashes in the background. The picture tells a story, Allvin says: "There's some trouble ahead. We need to pierce that and get through it and get to the other side."

It is a not-so-subtle metaphor for the challenges facing the 23rd Air Force Chief of Staff as he leads the service into an uncertain future. In the midst of an ambitious restructuring of the Department of the Air Force, with rising conflict around the world and a dangerous peer competitor in China, yet an uncertain budgetary environment at home, Allvin is taking over at a pivotal moment.

Russia's ongoing war in Ukraine, skirmishes in the Middle East, and the emerging ties linking China, Russia, and Iran make already complex international situations fraught. Iran is fueling terror groups that threaten to expand Israel's war on Hamas in the Gaza Strip into a regional conflict on multiple fronts. Beijing is flexing its muscles in the Western Pacific and eyeing Taiwan, while Moscow is doubling down on its war in Ukraine, leveraging weapons made in Iran and paid for with oil revenue from China.

For the past two decades, "we didn't have ... a potential adversary and a pacing challenge. ... We have that now."
—Air Force Chief of Staff Gen. David Allvin

Norman Siegel/U.S. Air Force Art Collection

Lt. August Miller depicted flying a C-46 over the Himalayan Mountains in severe weather. "Flying the Hump" was a daring mission for cargo and bomber pilots in World War II, even in the best of times. This painting, "Bumpin' The Hump," hangs in Chief of Staff Gen. David Allvin's office.

"We're at a point where all of the things are there to go one of two directions," Allvin said in an interview with Air & Space Forces Magazine, his first interview as Chief. If the U.S. rises to the challenge, it can preserve its global role. But there is also a darker path in which the U.S. could be "ground down" and where rivals could start "taking advantage of that."

If the U.S. harnesses it's full array of economic, diplomatic, informational, and military capabilities, it can sustain the rules-based international order, Allvin said. But if it cannot, "we're at risk of becoming a regional power in 2050."

The end of the American era would be a major failure for the nation, let alone the military. But the choice is really in the hands of America's elected leaders, both in the White House and in Congress. Military power is never permanent but must be perpetually renewed, Allvin said.

"It will be a struggle for the rest of our instruments of power to maintain the freedoms and ambitions that this country holds dear if we don't do our part as a Department of Defense," Allvin stated.

Shaved headed and clean faced, gentle in manner and tone, Allvin can seem an unlikely choice to be Air Force Chief of Staff. His career path is hardly a textbook example of CSAF development. But as the eighth of nine children, he grew up watching and learning from others, and then applied that experience to a career as a mobility and test pilot.

About one in every six of his 4,600 flight hours came during a test flight, exacting missions in which he evaluated new systems and equipment, including test flights in the then-new C-17 and C-130J at Edwards Air Force Base, Calif.

Allvin never led an Air Force major command, having spent the past decade in senior staff jobs, completing his last command post in 2014 at the 618th Air and Space Operations Center (Tanker Airlift Control Center), at Scott Air Force Base, Ill.

Yet Allvin may be as well prepared for his role as any Chief in years, having worked closely with his three predecessors, on the Joint Staff and overseas. Current and retired officers say he is well positioned to be a difference maker at a critical time.

"What you flew or what you did in the first 10 years of your career is interesting, but I am less concerned about what someone did in the early years of their career than their ability to make decisions about what's in the best interest of the Air Force as an entire enterprise," said retired Lt. Gen. David A. Deptula, a former F-15 pilot who also spent extensive time on the Air Staff and is now dean at AFA's Mitchell Institute for Aerospace Studies.

Staff Sgt. Stuart Bright

In his 1999 graduate thesis, Allvin foresaw the Air Force's overreliance on large bases, a concern that faded in the post-9/11 world, but is again central to Air Force strategy, and to the ACE operating concept.

"His approach is a mature one and appropriate for the times."

As Gen. Charles Q. Brown Jr.'s deputy, Allvin worked quietly and for a while almost invisibly behind the scenes, focusing on Secretary Frank Kendall's operational imperatives and leading a task force that tackled recruiting challenges by removing barriers to service that barred some deserving candidates from joining. That work gave him an intimate understanding of the bureaucratic and institutional obstacles that may need to be flattened as the Air Force optimizes and adapts to the coming era. "General Allvin thinks on multiple levels at the same time," said retired Lt. Gen. S. Clinton Hinote, a former deputy chief of staff for strategy, integration, and requirements who retired last June. "His experience as Vice Chief is irreplaceable. And he is already deeply invested in many of the solutions identified and being pursued by the Secretary."

FORWARD THINKING

Allvin began thinking about the changing security environment long before it became fashionable to strategize about great power competition.

In his 1999 graduate thesis, "Paradigm Lost," Allvin argued the Air Force had grown dependent on its large bases and that it needed to become more flexible and able to operate in "austere" locations. A quarter-century later, his tome seems prescient. Allvin was arguing for how the Air Force could better support the Army's vision of a more agile future force—before that service got bogged down in ground wars in Afghanistan and Iraq.

Today, his thesis reads like something freshly penned by a four-star commander singing the virtues of Agile Combat Employment, now established doctrine, rather than a midlevel officer pondering the future. In it, young Allvin predicted "more reliance on information, dispersed forces, and increased dependence on maneuver," and anticipated "new logistical challenges will emerge, placing increased importance on the principles of flexibility and survivability."

Even now, Allvin harks back to his time as a graduate student at the School of Advanced Airpower Studies at Maxwell Air Force Base, Ala., when asked what drives his thinking.

Maxwell Field was the birthplace of the so-called "Bomber Mafia," the idealistic Army Air Corps Airmen who used the period between the world wars to devise airpower concepts and who envisioned an era of precision bombing, decades and decades before that was truly possible. In the 1990s, more than half a century later, Allvin was eager to pioneer his own legacy.

"I thought I was going there to become an airpower strategist and expert—that's where I wanted to do it," Allvin said. He emerged "a better critical thinker," he added, unafraid to explore alternative perspectives.

Asking questions of others, considering new angles, he can surprise colleagues, he said. "Sometimes people look at me and go, 'I didn't know you felt that way.' Well, I may not feel that way," Allvin said. "I just want to understand. I want to live in that world. ...

"I like to connect dots, so when I see a particular issue, I try and look at the unintended consequences of it, the advantage of it," Allvin added. "I know that sometimes your own wisdom

As a test pilot, Allvin helped put the YC-17A—which became the C-17 Globemaster III—through its paces. The aircraft faced headwinds early on, but has become a unique workhorse for the air mobility fleet.

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and experience can trap you in a century gone by."

Allvin's thesis became irrelevant in a sense on Sept. 11, 2001. Everything changed after that, not least the Army's and Air Force's modernization plans. War in Afghanistan opened the way to war in Iraq, and then two decades of "Forever Wars" that wore out Air Force platforms and starved the service of modernization funds. Allvin's first assignment as a general officer was to lead the NATO personnel training the Afghan Air Force in 2010-2011, a tough assignment. In the midst of it, an Afghan Air Force officer turned on his allies, killing nine Americans in a green-on-blue attack on April 27, 2011.

From there, Allvin moved through assignments on the Joint Staff or Air Staff, including multiple senior Air Force strategic planning posts before rising to become the JCS's director for strategy, plans, and policy (J5) before being picked as the USAF's No. 2 officer.

Meanwhile, the Air Force, operating with the presumption of air dominance, doubled down on large bases rather than the agile concepts Allvin outlined in the late 1990s. Al Udeid Air Base outside Doha, Qatar, symbolized the sprawling, multibillion-dollar bases that now seem vulnerable in other parts of the world, home to both a massive Combined Air Operations Center and the forward headquarters of U.S. Central Command.

Allvin sees the irony. One subheading in Allvin's thesis reads "Don't be killed," a clear reference to the risks posed by large static bases.

"He's able to think past the problem into a solution, and he can see all the second- and third-order effects pretty quickly," said a senior Air Force officer who has worked closely with Allvin. "He's always got a mind on the future and making sure that the decisions we make today aren't trapped in the environment of today."

CHANGING TIMES

Airmen argued long and hard for more focus on potential threats from China, dating back to the early 2000s. But as the wars in Iraq and Afghanistan deteriorated, such talk was dismissed by Pentagon leadership, especially by Defense Secretary Robert Gates, whose tenure overlapped the end of President George Bush's second term and the first part of President Barack Obama's presidency.

A year after President Donald J. Trump was inaugurated, Secretary James Mattis, a veteran of the Iraq and Afghan wars, issued the 2018 National Defense Strategy, refocusing attention on great power competition and on China in particular. The Biden administration's 2022 update further emphasized China, dubbing the People's Liberation Army "the pacing challenge."

Then-Chairman of the Joint Chiefs of Staff Army Gen. Mark A. Milley responded with a new Joint Warfighting Concept, updating it again in August 2023, just ahead of Milley's retirement and replacement by Brown.

For the past two decades, Allvin said, "We didn't have an environment—a potential adversary and a pacing challenge—against which to align all of the department. We have that now."

As Vice Chief, Allvin was immersed in the future requirements of the U.S. military as a member of the Joint Requirements Oversight Council (JROC), along with his fellow Vice Chiefs, among them the new Chiefs of his sister services: Chief of Naval Operations Adm. Lisa Franchetti, Army Chief of Staff Gen. Randy Alan George, and Commandant of the Marine Corps Gen. Eric Smith.

That group took the JROC and bent it more to their liking, Allvin said.

"It wasn't always a very muscular entity," Allvin said of the JROC. "But we flipped the script on that and are really

being more disciplined about putting joint requirements on capabilities. … By the end of it, we started finishing each other's sentences in terms of the value of how to do things."

As Chief, Allvin will try to bring that kind of collaborative spirit to the stovepiped Air Force structure, especially at the three annual CORONA summits that bring all the Air Force four-stars together. The meetings can sometimes be contentious affairs, but the fall 2023 CORONA held at the U.S. Air Force Academy in Colorado Springs, Colo., was an intensive problem-solving effort. (Having begun with Allvin as the Acting Chief, due to legislative delays, he was finally confirmed and sworn in half-way through the event.)

This CORONA was different for other reasons. Rather than brief preformulated decisions, the service's top officers debated the future of the service itself, according to those present—a direct outgrowth of Secretary Kendall's charge to "re-optimize" the service to more rapidly adapt for potential conflict with China.

"It was designed to be a roll-up-your-sleeves [session]," said the current senior Air Force officer. "Unlike previous CORONAs, where items are teed up … we went into this one wide-eyed, knowing that this was going to be a series of working sessions to understand where we were in all the great power competition efforts."

With Kendall having set a self-imposed deadline of early 2024 to study all the institutions, practices, and procedures that might need changing, top Air Force and Space Force officers had little time to waste. Allvin, the presumed next Chief, was not quite in charge, and it looked as if the congressional hold imposed by Sen. Tommy Tuberville (R-Ala.) might continue indefinitely. Tuberville lifted his hold and the upper chamber quickly confirmed the top leaders for the Air Force and Navy. Allvin was sworn in as Chief No. 23 on Nov. 2, 2023, in the press box at Falcon Stadium, overlooking the field where Allvin was commissioned 36 years before. Afterward, he gave a brief, impromptu speech, speaking without notes, as usual.

In the days after, Allvin crafted his first message to the force, emphasizing the need not for new ideas and new direction, but to complete the work begun under his predecessors, in particular Gen. Mark Welsh, Gen. David Goldfein, and Brown, all of whom Allvin served and all of whom advanced ideas that are central to his vision for the Air Force: integrated joint operations. Agile maneuver. Superior intelligence. His central message: "Follow through."

That resonates with Hinote, among others.

"I've watched Airmen give up on big things because a new Chief came in with different points of emphasis," Hinote said. "He didn't come in and present a new slate of priorities."

Instead, he is driving to stay the course, noting that the course he helped set already has the Air Force moving in the right direction. That has Hinote particularly hopeful. "If he is successful in doing the things he identifies in his initial letter, he will be the most consequential CSAF since [Gen. Merrill "Tony"] McPeak," Hinote said, referring to the Air Force's 14th Chief of Staff, whose 1990-1994 tenure upended the Air Force following the end of the Cold War and Operation Desert Storm, with controversial decisions to reorganize, downsize, and reconfigure the entire force.

The world was changing then, and McPeak saw the change as an opportunity to reimagine airpower. Allvin sees similar forcing factors today. The world is changing and the Air Force must change, too.

"The most important thing I would like all of our Airmen to understand is why we have to change," Allvin said. "Not in a way that says the sky is falling, and everything is terrible, but in a cautionary way. … It could be awesome if we get this right and it could be the Air Force that we want it to be. The environment has changed. The Air Force has been slow to catch up to it. But we've got all the good ideas. Now we just need to apply the gas to it and be not afraid to make decisions and fail forward."

The fact is no one has a crystal ball. No one knows what the future will bring. But not trying leaves a nation flat-footed. Effort is essential to avoid that fate.

"Everybody gets the future wrong," Allvin said. "Whoever gets it right quicker wins."

Eric Dietrich/USAF

Chairman of the Joint Chiefs of Staff Gen. Charles Brown Jr., left, and Air Force Chief of Staff Gen. David Allvin paired well, bringing distinct personality and experience to their work together. Brown's signature phrase—"Accelerate Change or Lose"—set the stage for the "Follow Through" that Allvin has called for since succeeding him as Chief.

Airman 1st Class Clare Werne

Staying alert on long-endurance refueling missions can be challenging. The Air Force is experimenting with tools to help crews better prepare for even longer missions in time of conflict.

Extending Endurance for Pacific Conflict

In a vast region, with long flights, better human performance can be the difference between success and failure.

By David Roza

Maj. Nate Mocalis was dog-tired. He and five other Airmen were a little over halfway through a 72-hour mission flying a KC-135 tanker back and forth across the country, refueling other aircraft. Mocalis and his copilot were landing the 130-foot-long bird amid a strong crosswind after a 16-hour stint in the cockpit. They were stable all the way through the final approach and into the flare—the moment where pilots point the nose up slightly to bleed speed before touchdown—when the copilot let out the crosswind controls, forcing the pilots to accelerate and lift back into the air to avoid a serious mishap.

"That's not something that this individual, with their high level of experience, would do on a normal day," Mocalis recalled. "This was simply a fatigue-induced error."

Fatigue is a common safety hazard. About 24 percent of Air Force Class A mishaps from 2003 to 2020 were fatigue-related, according to a study by Air Force scientists that was published in the May 2020 edition of the medical journal Aerospace Medicine and Human Performance. Mastering that challenge looms large as the Air Force eyes flying the vast distances that define the Indo-Pacific theater.

"The status quo is we just ask the crew, 'Hey, how's everyone feeling.' ... But as humans we are really poor judges of objectively assessing our actual fatigue and risk."
—Pilot, Maj. Nate Mocalis, 92nd ARW

To prepare, the Air Force's Air Mobility Command (AMC) hosted its first-ever Human Performance Industry Day conference in December at Scott Air Force Base, Ill., where Airmen and health tech companies shared the challenges and possible solutions for managing the mental and physical stresses of nonstop flying.

"To be clear, this is about the Pacific challenge," AMC Commander Gen. Mike Minihan told conference attendees. "We're going to max-perform humans, and I want all the insights and assistance possible. Nothing's off the table."

Minihan envisions air and ground crews training to

perform their jobs with minimal rest for 48 hours straight. He wants enablers that his troops can use now, whatever the cost.

"This is a 'now, get it done' thing for me," Minihan said. "It's not for us, it's for the joint team. This is to make everybody else successful."

STATUS QUO

The standard flight duty period for a single crew operating an Air Force aircraft is 16 hours, which includes two to three hours for travel to the operating location, briefing, and completing all the prerequisites before take off. The limit can extend to 24 hours or longer with extra crew members and a place to rest on the plane, or it can drop to 12 hours in cases of high-risk, high-stress missions, such as low-flying a C-130 through a combat zone.

The limits exist for a reason: Flying is hard and takes enormous concentration. Pilots must make thousands of decisions to keep their aircraft aloft, manage the crew, and complete their mission. The mental load is draining, said Maj. Melinda Marlow, a C-130 pilot, but the physical demands—ranging from extreme temperatures to noisy engines—also take a toll.

"What that all equates to is a significant cognitive load over a significant period of time, without the ability to do the things you might normally do to help relieve that," the way office workers might go to the gym or take a walk, said Marlow, chief of staff action officer at AMC headquarters.

Easing that load—or knowing when a break might be most valuable—is hard to pin down, largely because aircrews lack the diagnostics to assess their own levels of fatigue.

"The status quo is we just ask the crew, 'Hey, how's everyone feeling?'" Mocalis said. "But as humans, we're really poor judges of objectively assessing our actual fatigue and risk due to our levels of alertness."

The more fatigued one is, the harder it is to know just how tired you really are, and how much that affects response times and judgment, experts say.

"If you get just five hours a night for weeks and weeks, you will start to think that's normal, like 'This is how I feel, this is how I operate,'" said Maj. James Brown, chief of the support flyer training branch at AMC's operations directorate.

While smart watches, heart rate monitors and the like aren't essential to know when one feels tired, those sensors can gauge how tired one is and when. For example, a psychomotor vigilance test (PVT) can track alertness by measuring how long—in microseconds—it takes a participant to tap a screen when cued. The PVT can establish a baseline that can then be used to demonstrate when someone is under-rested.

Combined with other sensors, that data can help monitor performance and make well-informed mission decisions. It should also help Airmen build the habits necessary to minimize fatigue, predict when individuals will be most exhausted, and assign missions to those best suited based on data, not just gut judgment.

"That's a conversation starter for us to develop a game plan, like, 'Hey this guy is more of a night owl compared to this guy who is a morning person,'" Mocalis said. "It helps us be smart in how we delegate missions."

ENTER SANDMAN

Despite all the energy drinks on the market, "there really is no chemical substitution for sleep," said Col. Robert McCoy, AMC's chief of aerospace medicine. Once it's tired enough, the human body starts nodding off to grab microbursts of sleep, which can be dangerous for anyone operating a refueling boom, an aircraft, or any other vehicle.

While it may be impossible to get eight hours of uninterrupted sleep in the midst of a conflict, cat naps can do wonders for aircrew just trying to get through the next critical phase of flight. McCoy found that out for himself aboard a maximum endurance C-130 flight from Arkansas to the Philippines.

"A couple of the aircrew members had never taken a 15-, 20-minute nap, and they were amazed at how powerful a tool that could be," he said. "That's how most of us [physicians] got through medical school, those 15-, 20-minute naps."

While any sleep is better than no sleep, humans sleep better in places that are cool, dark, and quiet. Military aircraft are none of those things. The noise level in a KC-135 is around 90 decibels, Mocalis said—about the same noise level as a

Tech. Sgt. Heather Clements

Senior Airman Chris Neuman, 92nd Air Refueling Squadron in-flight refueling specialist, sleeps during his crew rest cycle aboard a KC-135 Stratotanker during a Phase 3 Lead Wing exercise in June 2023. Concepts such as crew resting on the aircraft and wearable devices to track real time fatigue/stress on the aircrew were utilized in this phase of Mobility Guardian preparation.

Tech. Sgt. Heather Clements

Tech. Sergeant Matt Hurless, 92nd Air Refueling Squadron in-flight refueling specialist, displays a Smart/Wearable Fatigue Tracking (SWiFT) watch during a Phase 3 Lead Wing exercise in June 2023. The device collects and reports biometric feedback into the Aviation Operational Risk Management (AvORM) process, enabling improved understanding of crew performance and alertness.

gas-powered lawnmower. The floor of that aircraft is cold, while the ceiling can be unbearably hot. Cabin pressure is typically higher and the air drier than on commercial airliners, further straining crews and accelerating dehydration.

One solution could be providing sleep pods—small compartments on a single palletized container that could enable Airmen to get a better, high-quality, restorative sleep.

Sleep pods are one promising technology, but the main emphasis of AMC's human performance effort is on helping Airmen better adapt to tiring circumstances.

"There is no real guidebook for aircrews on how to adjust their body clock and their circadian rhythm to perform on a different shift," said Mocalis. "Each individual is trying to navigate that on their own without guidance."

WARNING LIGHT

The 711th Human Performance Wing, the Defense Innovation Unit, AMC, and other groups are all working with off-the-shelf wearables and apps that can measure biometrics, including sleep quality, heart rate, stress, fatigue, and alertness. These tools could alert crew members before fatigue reaches dangerous levels.

"Inside your vehicle or your airplane, you have all these sensors that tell you how the airplane is doing or how the car is doing, but nothing on how you are doing," said Brown. "It's a mental check of, 'OK, I should probably take a strategic nap or use some caffeine or get something to drink.'"

One effort at the 92nd Air Refueling Wing at Fairchild Air Force Base, Wash., is called Smart/Wearable Fatigue Tracking (SWiFT) and seeks to leverage wearables to track how Airmen's fatigue levels change throughout the day and optimize their sleep and exercise patterns accordingly.

"Our crews can use this tool real-time in the cockpit to determine which pilot is best suited to fly a critical phase of flight, like taking the final landing after an exhausting multiday mission with multiple circadian rhythm swaps," said Mocalis.

The major hopes these tools can help Airmen advocate for themselves, since they can now point to data showing they are objectively too tired to safely perform a mission. The data could also track the impact of other factors, like when McCoy enjoyed a hot meal aboard his max endurance flight to the Philippines.

"It was amazing how much a cooked meal rather than peanut butter and jelly, which is my go-to, makes a difference as a morale booster and how much more alert I was after eating that," said McCoy.

The benefits may appear small at first: an hour of high-quality sleep here, a perfectly timed shot of caffeine there. In aggregate, those small edges could make all the difference in a future fight.

"We're talking about extremes. The scenario in which we need to utilize maximum endurance operations is an extreme," said Marlow. "So when we're operating in these extreme environments, how do we do it safely and smartly?"

At AMC, Minihan wants to move fast on maximizing human performance, but knows aircrews must trust the technology they will be reliant on. Building trust requires delivering results, and Mocalis saw one promising result at the tail end of his 72-hour mission.

A day after the go-around incident, the pilot and his crew were exhausted after multiple circadian rhythm shifts and countless miles.

"It felt very much like the end of a massive road trip, as if battling through a snowy interchange at night in a foreign city," he recalled.

Mocalis looked forward to letting his copilot handle the final landing of the mission, but first they decided to take a PVT. The test found that the copilot's alertness was well below that of Mocalis'. He chose then to take the landing and put the plane down safely himself. For the first time, they had objective data to help them make the safest possible decision.

"When you feel tired, it's a relief knowing it's the other person's turn to fly. But when you realize you're the one who is the most alert," the major said, "then it's like 'time to suck it up, let's go!'"

Fast & Flexible Space

From space to tankers to rapid launch, USSF looks to maneuver like never before.

Orbit Fab

An artist illustration depicts an Orbit Fab on-orbit fuel shuttle, center, as it leaves its fuel station, left, and prepares to dock and refuel a satellite outfitted with the company's Rapidly Attachable Fluid Transfer Interface (RAFTI) to significantly extend satellite mission life and return on investment versus expensive, inefficient one-and-done satellite missions and servicing and debris removal operations.

Mike Tsukamoto/staff

"Keeping track of a dynamically moving object is fundamentally different than anything we do now."
—Chief of Space Operations Gen. B. Chance Saltzman

By Greg Hadley

The Space Force and the Air Force have for decades followed the same tried-and-true method: Spend years developing massive, costly satellites and then schedule launches to lift them into orbit months or longer in advance. Once in place, those satellites mostly stay put in their orbits, preserving as much fuel as possible, because once that fuel is gone, the spacecraft's service life is over.

More recently, the Space Force is rethinking that formula by planning, building, and launching into orbit large constellations of much smaller satellites. The concept enables the service's resilience strategy.

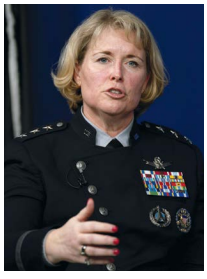
Now USSF is adding a new wrinkle: dynamic operations. Whether delivering satellites into orbit in days, maneuvering satellites more frequently and actively, or refueling them in orbit, the Space Force is starting to reshape its operational concepts to respond and stay ahead in an increasingly complex and unpredictable domain.

"We know speed to orbit and we know resiliency on orbit are fundamental principles that we want to adhere to," Chief of Space Operations Gen. B. Chance Saltzman told reporters at the inaugural Spacepower Conference in December. "Now how do we take advantage of it, if we were to have it? That's the work left to be done."

The urgency of these new requirements is driven by the threats operators see today, where China, Russia, and others have the ability to destroy crucial satellites, potentially blinding U.S. intelligence.

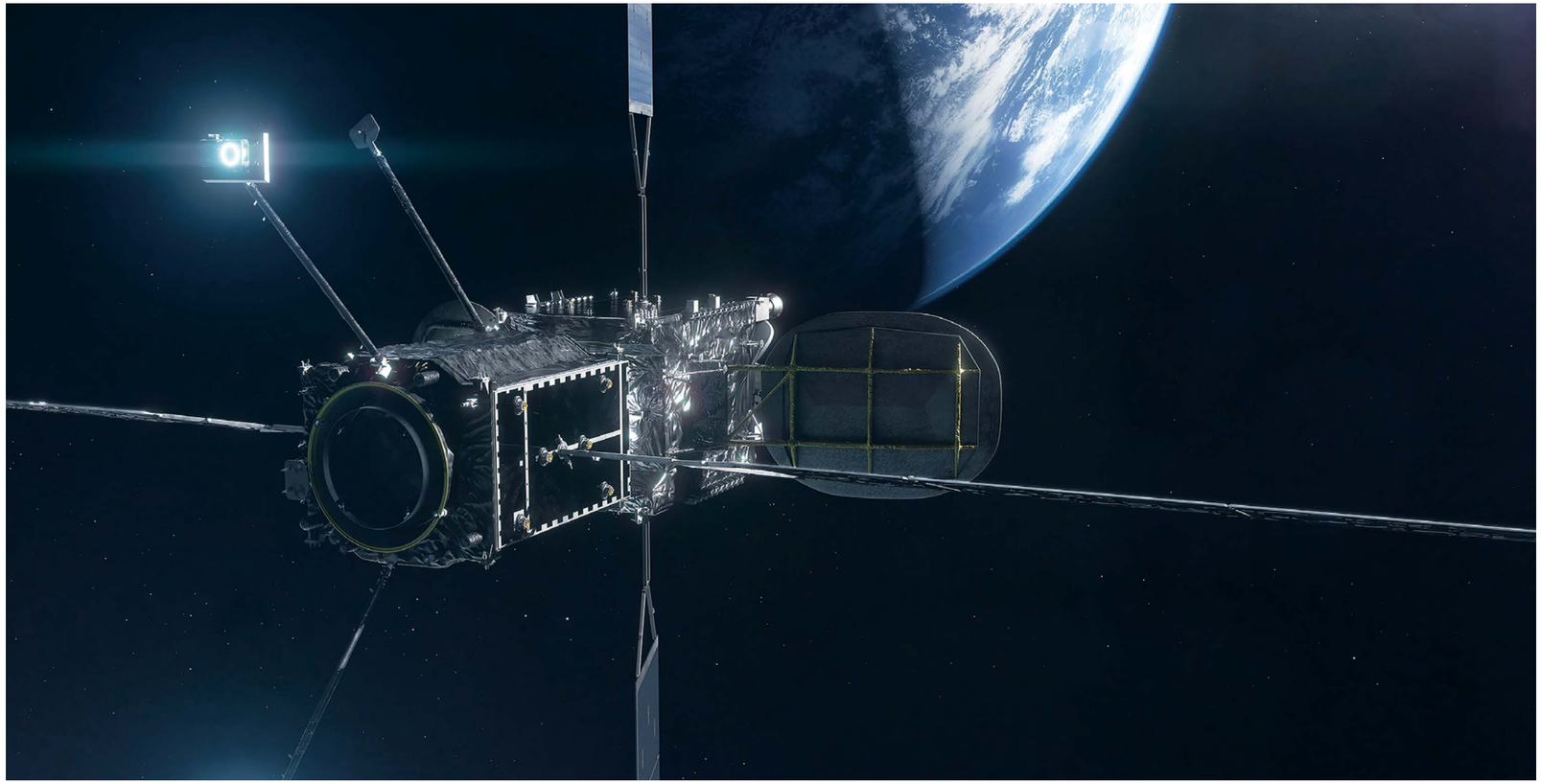
Retired USSF Lt. Gen. John E. Shaw made the case for "dynamic space operations" when he was still vice commander at U.S. Space Command.

"The way we've been doing space operations since the dawn of the space age, we've been doing it wrong," Shaw said in July 2023 during a discussion



Jud McCrehin/staff

"How do you normalize servicing or refueling" in space.
—Deputy Chief of Space Operations for Operations, Cyber, & Nuclear Lt. Gen. DeAnna Burt



SpaceLogistics illustration

An artist illustration of a Northrop Grumman SpaceLogistics Mission Extension Vehicle (MEV). MEV delivers life-extension services; docking with a client satellite running low on fuel and also take over attitude and orbit maintenance. With two ongoing commercial missions (MEV-1 in 2020 and MEV-2 in 2021), SpaceLogistics is the first and only company to successfully perform on-orbit satellite servicing of commercial geostationary orbit (GEO) satellites.

with AFA's Mitchell Institute for Aerospace Studies. "We're trying to articulate a requirement to the Space Force that we need to be able to have sustained space maneuver."

Indeed, that capability can be traced to the founding of the Space Force in the first place. The service's first doctrine document, published in June 2020, included Space Mobility and Logistics (SM&L) among five core competencies USSF needed to demonstrate. Crucially, SM&L included "the movement and support of military equipment and personnel ... through the space domain," as well as the ability to sustain, update, and recover spacecraft in orbit, the doctrine stated.

Still, the concept has evolved over time. At the Spacepower Conference, Saltzman described a future with "almost continuous maneuvering, so that the satellite from any one radar shot looks like it's maneuvering and it's just kind of constantly changing its orbit as it goes through—preserving mission but changing its orbit."

Such maneuvering is not possible with the satellites the U.S. currently has on orbit, which launched with only enough propellant to maintain their station and were never designed to be refueled.

"[Once] I run out of a consumable, then you technically, functionally kill me," said Deputy Chief of Space Operations for Operations, Cyber, and Nuclear Lt. Gen. DeAnna M. Burt in another Mitchell Institute event.

That limitation is untenable as Russia and China demonstrate the ability to harass satellites with their own maneuverable orbital assets. The more they can force fuel burns, the shorter they can make the lives of operating spacecraft. In addition to direct-ascent anti-satellite missiles, both countries have demonstrated additional anti-satellite capabilities in recent years:

- The Chinese launched an uncrewed space plane, which reportedly released six mysterious objects into orbit.
- A Chinese satellite with a "grappling arm" pulled another satellite out of its orbit.
- A Russian "nesting doll" satellite has deployed multiple spacecraft after reaching orbit.

Russian and Chinese satellites have also maneuvered into position near U.S. assets. U.S. space operators need to show "you can move, you can respond and do things," said Kelly D. Hammett, director of the Space Rapid Capabilities Office.

"Our commercial systems are watching what the Chinese, in particular, are doing on orbit right now," Hammett added. "They're practicing tactics and techniques. They're maneuvering, they're showing how they would ingress on potential targets. They're completing robotic maneuvers and rendezvous and [proximity] ops. How will we [respond] to address those threats and potentially fight the space war fight?"

Operators and leaders at U.S. SPACECOM believe dynamic space operations is the answer, and Space Force acquisition officials and futurists are working to flesh out and fulfill that vision.

"When we listen to the demand signal from U.S. Space Command and the need to do dynamic space operations, the need to be able to maneuver without regret, that capability is now coming from us," said Brig. Gen. Kristin L. Panzenhagen, program executive officer for the Assured Access to Space directorate. "It shouldn't be a surprise or anything—one of the principles of warfare is maneuver. So now here we are in the space domain with a need to do that."

The Air Force went through a similar process in the late 1940s, Burt said, recalling that USAF invested in and experimented with aerial refueling at that time precisely to increase the range and maneuverability of its strategic bomber fleet. Today, aerial refueling is central to Air Force operations—and those of the other services, as well.

The Space Force has a long way to go before space refueling is routine—Saltzman described the concept as still in the "good idea phase"—but to "our futurists, our people that are considering operational concepts that are several years down the road, this is one of the things that they're factoring in," he said.

SPACE TANKERS

Hammett said the Space RCO is now only building refuellable satellites, and Saltzman said the answer could also be equipping each small satellite with greater amounts of fuel. On Dec. 11, the Assured Access to Space directorate issued a request for information from industry on ideas of refueling and mobility.

"One thing we really need to understand fully is the concept of operations and the demand signals," Panzenhagen said. "So we appreciate from the program office side, we've had a lot of tabletop exercises, really trying to understand what those requirements are. We've now got satellite program offices that are starting to build for refueling capability. For the industry side of the house, what we really need to understand is one, the state of technology—and I think we're getting a much better understanding of that. ... But we also really need to understand the business case."

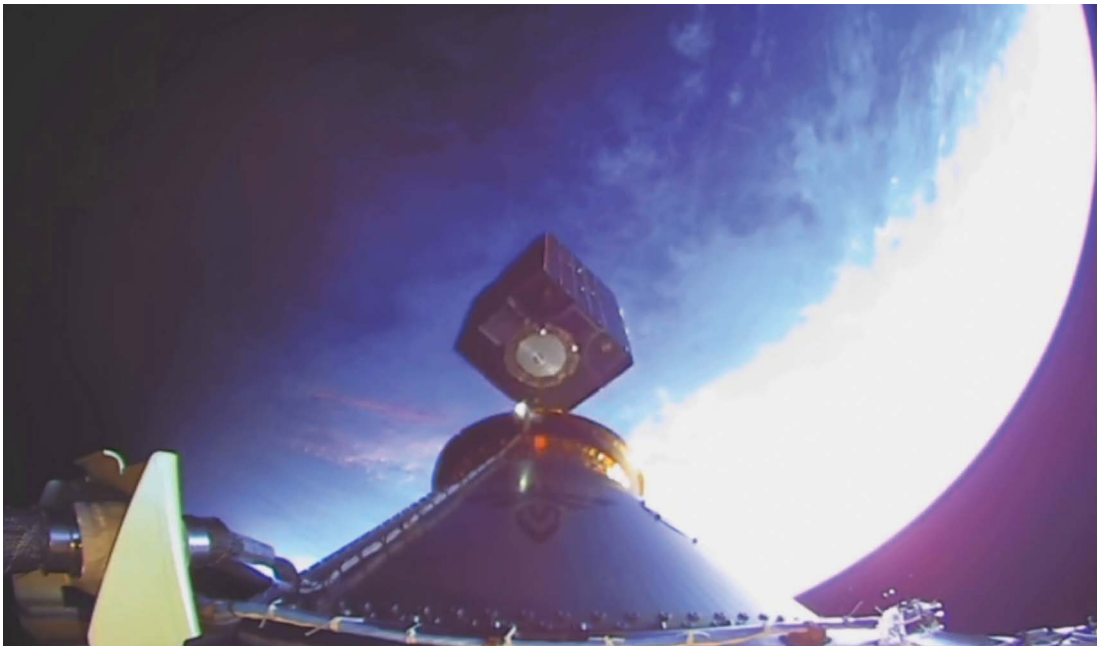
Industry interest is high. Startup Orbit Fab has proposed a standard refueling port that could enable satellites to dock into "gas stations in space." Its first refueler is scheduled to be launched into geosynchronous orbit in 2025.

Northrop Grumman is offering in-orbit refueling through its subsidiary, SpaceLogistics, and launch provider Blue Origin recently unveiled its Blue Ring, a new spacecraft "focused on providing in-space logistics and delivery," including fuel.

"The Blue Ring is going to offer a lot of on-orbit capability: several kilometers per second in Delta V, a hybrid propulsion solution, and thousands of kilograms of mass toward the capability and the ability to stay on orbit, the ability to maneuver on orbit, the ability to maneuver between orbits and beyond GEO into cislunar," said Blue Origin Vice President of Government Sales Lars Hoffman. "These kinds of capabilities that we're talking about here are going to complicate the calculus of our adversary. It's going to challenge their thinking. And it's opening up all sorts of new ideas for our Guardians to be thinking about, 'What would I do with that?'"

Blue Origin illustration

An artist rendering shows a Blue Ring spacecraft, developed by Blue Origin, focused on providing in-space logistics and delivery. Blue Ring will serve commercial and government customers and can support a variety of missions in medium-Earth orbit out to the cislunar region and beyond. The platform provides end-to-end services that span hosting, transportation, refueling, data relay, and logistics.



Firefly Aerospace

An image from video shows payload deployment as Firefly Aerospace successfully launched the U.S. Space Force's VICTUS NOX mission with 24-hour notice, demonstrating a critical capability for the United States to rapidly respond to on-orbit needs during a conflict or in response to a national security threat.

Burt says all this raises intriguing logistical questions.

"Do you do this as a service? Do you buy this capability?" Burt asked. "Or do I buy it as a service from the commercial piece, so I create space gas stations, or space gas trucks? What is your model and how do you get after that? I think that's what we're trying to determine, is what is the most efficient way to get after that in a way that gets us the capability as quickly as possible?"

In August 2023, a tabletop exercise dubbed "Parallax Rising" in El Segundo, Calif., brought together experts from Space Systems Command (SSC), academia, and industry to define the possibilities and challenges. The primary considerations for the exercise included:

- "What types of refuelers are preferred when conflict extends into space, and why?"
- How would commercial and military refuelers integrate?
- What refueling procedures from the Navy and Air Force can be applied to the Space Force?

SSC promised the findings from the exercise would inform future acquisition decisions. Burt raised another issue: "How do you normalize servicing or refueling or those kinds of things?"

RAPID DELIVERY

Refueling isn't the only major change coming in how the Space Force responds to new threats and requirements. The service is also pushing forward with its Tactically Responsive Space (TacRS) program, to deliver satellites into orbit faster than ever.

In September, USSF shattered records with a mission that built a satellite in less than a year, then sent it into orbit just 27 hours after receiving launch orders. Saltzman later likened the mission, dubbed "Victus Nox," to Chuck Yeager's breaking of the sound barrier in 1947.

"Chuck Yeager breaks the sound barrier. Big deal, it's one airplane. What are you going to do with it?" Saltzman said in October. "It opens the door. It shows the capability. It shows what you can do. It shows how you do it."

Expanding on that two months later, Saltzman said it is "cost-imposing capability that our adversaries will now need to prepare for."

More TacRS missions are coming as the Space Force builds on its capacity to respond "under attack," then-SSC commander Lt. Gen. Michael Guetlein said—Guetlein has since pinned on a fourth star and become vice chief of space operations.

Similar to dynamic operations in orbit, the ability to put new assets in space bolsters a central tenet in Saltzman's "Competitive Endurance" theory—denying first-mover advantage. For years now, officials have bemoaned U.S. satellites as "big, fat, juicy targets" and warned that an attack on any one of them could wreak havoc not only on military operations, but the global economy.

The ability to move those satellites around and, if necessary, replace them quickly, changes the cost calculations of any adversary.

Becoming more dynamic and responsive will come with potential challenges, though. Hammett noted that command and control in space is poised to become vastly more complex if satellites are going up faster than ever and moving once they reach orbit—especially given the catastrophic effects a collision in space can have.

"When you think about … all the systems that SDA, SSC, and we are building, there are a lot of things coming in the next three years, and now they can all maneuver," Hammett said. "Now they all need to maneuver to respond to threats. How do you synchronize those? How do you tell everything where to go and when to go there? You need more capability to C2 those things."

This more flexible approach changes "how you do space domain awareness," Saltzman said: "Keeping track of a dynamically moving object is fundamentally different than anything we do now." That poses challenges to USSF, but even greater challenges to potential adversaries.

Now, as the Space Force heads into its fifth year, Saltzman is focused on maintaining that momentum.

"Being able to put something on orbit in a matter of days, like we showed, the ability then to protect the satellite through dynamic maneuvering: How do these operational concepts support the theory of success?" Saltzman asked. "How do they help us either create resiliency, do responsible counterspace campaigning? How does it help us avoid operational surprise? … What are the potential possibilities for how all this fits together? And kind of the easy answer is … I don't know yet. We're asking all those questions."

FACES OF THE FORCE

Senior Airman Makensie Cooper

Tech. Sgt. Christopher Massey, a loadmaster with the 535th Airlift Squadron, demonstrated his lifesaving instincts not once but twice. During a family cruise off the coast of Waikiki, Hawaii, he noticed a person struggling in the water. Without hesitation, he jumped in to secure her and swam 50 yards to safety. Months before that, during a temporary duty assignment in Japan, Massey recognized a fellow Airman in distress in a hotel lobby. He offered help and soon discovered the individual was contemplating suicide. Massey united three wings from two major commands to aid the troubled member.

Historian **Robert Clark** of the 51st Fighter Wing was honored with the 2023 Department of the Air Force History and Heritage Excellence in History Program Award. When Clark first arrived at Osan AFB, Korea, in September 2022, he found a three-year vacancy in the history office with overdue command reports. Clark revitalized the program by filling a report and initiating an engagement plan to educate about the wing's history and heritage, all within a four-month window. Clark collected, interpreted, and disseminated Air Force institutional memory to improve the wing's combat capability.

Staff Sgt. Kelsea Caballero

Congratulations to Miss Colorado, **Madison Marsh**, a second lieutenant in a special Air Force partnership program at the Harvard Kennedy School, Mass., who is breaking barriers as the first Active-duty officer to win the **Miss America pageant.** Originally aspiring to be an astronaut during her undergraduate years at the Air Force Academy, Marsh found joy in pageants as a cadet. Alongside the competition, she advocates for pancreatic cancer research and education. Following her mother's tragic death from pancreatic cancer in 2018, her family established the Whitney Marsh Foundation, raising over a quarter-million dollars.

William Lewis/USAF

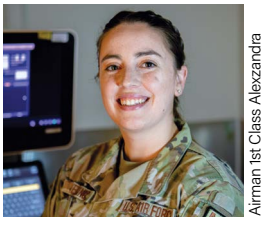
R. Nial Bradshaw/USAF

Airman 1st Class Brittany Kenney

In the spirit of the holiday season, Santa and Mrs. Claus, joined by the 28th Operations Group from Ellsworth Air Force Base, S.D., delivered over 220 gifts to children at the Youth and Family Services Child Development Center on Dec. 11, 2023. **Staff Sgt. Kayleigh Jacobs** brought joy as Mrs. Claus, witnessing children's excitement. The highlight included Santa, Mrs. Claus, and volunteers visiting classrooms, personally handing out gifts, followed by a countdown that signaled kids to open presents together. This 17-year-old annual **Angel Tree program** is a tradition reflecting Airmen's commitment to community service and bringing joy to local children.

Airman 1st Class Kyrii Richardson

The **20th Component Maintenance Squadron** at Shaw Air Force Base, S.C., introduced the branch's first mobile testing and repair capability for the AN/ALQ-184 ECM pod, enhancing electronic defense for F-16 and A-10 aircraft. This innovation allows immediate on-site repairs in remote locations, supporting the Agile Combat Employment initiative. The mobile capability, led by Senior Master Sgt. Jerry Rosario, is a compact setup using two pallets of gear and aligns with the Multi-Capable Airmen concept. This accomplishment aims to inspire other Air Force Electronic Warfare units to adopt similar capabilities.



Airman 1st Class Alexzandra Gracey

Senior Airman Sammi-Joy Severino, an ultrasound technologist with the 374th Medical Group, helped save lives during her mission in Pacific Partnership 24-1 aboard the hospital ship USNS Mercy from San Diego. Serving in Honiara, Solomon Islands, Severino and her team provided vital medical services, conducting 392 engagements and 94 surgeries over two weeks in November 2023. Despite encountering challenges, such as assisting patients without medical histories, she found the pathology practice rewarding. Severino focused on life-changing surgeries for residents lacking health care.

USAFA

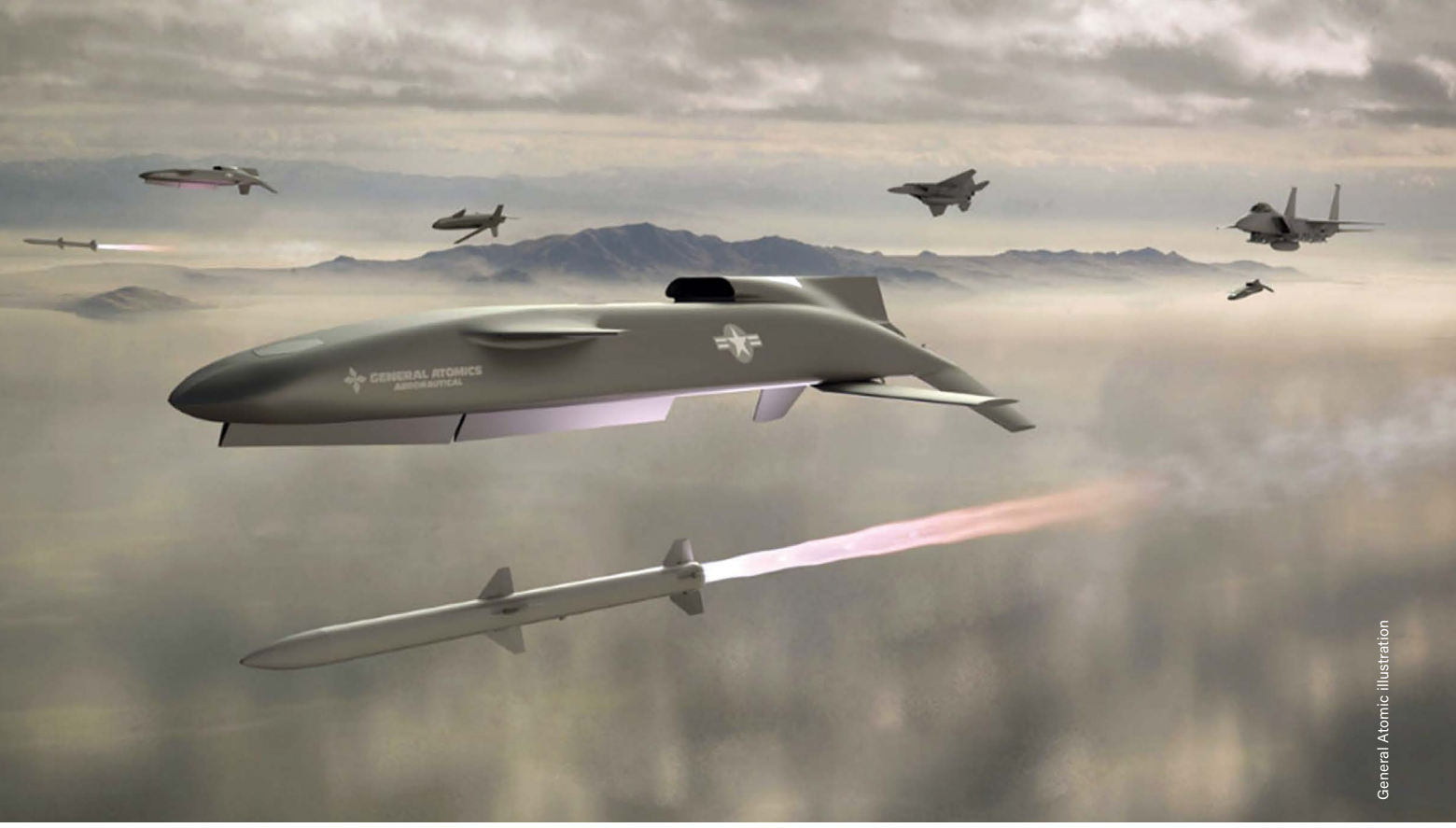
After facing a setback to his dream of becoming a pilot due to eyesight issues, Space Force **Capt. Dillon Duarte** discovered a new passion inspired by a Geospatial Science satellite imagery course during his years at the Air Force Academy. Post-Academy, Duarte served in various roles before transitioning to the 50th Operational Support Squadron as an executive officer and GPS payload instructor. He then seized a unique opportunity to contribute to the establishment of Space Delta 9. Now as the Chief of the Commander's Action Group, he coordinates strategic planning and executive communication for Delta 9.

Justin Pacheco/USAF

Stephen Roughton/USAF

Air Force Academy Cadets, **1st Class Madelyn Letendre** and **1st Class Owen Graham,** have won prestigious scholarships. Letendre, the 44th Rhodes Scholar from the Academy, secured full funding for postgraduate studies at the University of Oxford, pursuing a Master of Science in Therapeutic and Translational Neuroscience and a Master of Public Policy. Graham received the 24th Marshall Scholarship for a fully funded, two-year postgraduate education in the U.K., intending to specialize in quantitative climate and weather science at the University of Cambridge and Imperial College London. Both are set to commission as second lieutenants into the USAF in May 2024.

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



General Atomic illustration

Crewed and uncrewed aircraft attack targets in this conceptual illustration of DARPA's LongShot Collaborative Combat Aircraft (CCA) operating in concert with conventional fighter jets. Acquiring CCA sooner, rather than later, could be crucial to deterring China from attempting to seize Taiwan.

Collaborative Combat Aircraft for Disruptive Air Warfare

By Col. Mark Gunzinger, USAF (Ret.)

Advances in autonomy and uncrewed systems technologies offer a once-in-a-generation opportunity to combine the lethality of 5th-generation fighters with Collaborative Combat Aircraft (CCA) designed to disrupt and defeat China's counterair operations. And, unlike many advanced systems now in development, the Air Force could begin to acquire CCA at scale this decade instead of in a distant future that would be dangerously late considering China's rapid defense buildup.

The Mitchell Institute conducted a wargame and associated studies to assess how a family of uncrewed Collaborative Combat Aircraft could increase the lethality, survivability, and capacity of the Air Force's air superiority forces for operations in highly contested environments. Projecting decisive military power to distant theaters has long relied on the Air Force's ability to achieve air superiority by conducting offensive and defensive counterair missions to defeat an adversary's fighters, surface-to air missiles, battle managers, and other air defense threats.

Establishing effective air superiority is an essential, baseline requirement for any joint operation to defeat China's aggression in the Pacific. The U.S. Air Force defines this mission as achieving "that degree of dominance in the air battle by one force that permits the conduct of its operations at a given time and place without prohibitive interference from air and missile threats." Yet today, this hallmark of national power is at risk due to the nation's failure to modernize Air Force air superiority forces in recent decades to keep pace with China's unprecedented military buildup.

"Neither air superiority nor victory are American birthrights ... both are at significant risk."
—Gen. Mark Kelly, Commander Air Combat Command

After the success of Operation Desert Storm's air campaign, the U.S. Air Force continued to modernize its air superiority forces by developing the 5th-generation F-22 air dominance fighter along with new air-to-air weapons. Despite these efforts, force structure and program cuts severely eroded the Air Force's ability to dominate in the air. A series of Pentagon decisions beginning in the early 1990s essentially froze USAF's force modernization. The Department of Defense accelerated retirement of Vietnam-era capabilities like F-4s and at the time early model F-16s and also directed the Air Force to halve and then halve again its planned acquisition of the stealthy F-22, then the foundation of its future air superiority force.

The Air Force originally planned to buy 648 production F-22s, close to a one-for-one replacement of its F-15A/D inventory. The Bottom-Up Review reduced this target to 442 F-22s, and the 1997 Quadrennial Defense Review further cut it to 339 aircraft, primarily due to DOD's desire to reduce spending and achieve a post-Cold War defense budget "peace dividend." In 2008, Secretary of Defense Robert Gates ended the program after the Air Force acquired only 187 total tails, reasoning that F-22s were not needed for current operations and F-35s—then in development—would provide sufficient overmatch against lesser adversaries in the future. Gates argued China would not have a single stealth fighter before 2020, by which time contemporary plans projected the Air Force would have 400 F-35s and would still be acquiring some 80 more per year.

DOD also shifted its force design priorities in response to the 2001 terrorist attacks on the U.S. and subsequent counterterror/counterinsurgency operations. Instead of building new capabilities to deter peer adversaries, defense spending increases in the 2000s and much of the 2010s helped the U.S. Army sustain its security operations in Iraq and Afghanistan. DOD directed the other services to invest in capabilities like remotely piloted aircraft (RPA) to support these ongoing operations.

In contrast, China's rapid military modernization after Desert Storm created what is now the world's most sophisticated integrated air defense system. China tailored its warfighting strategy and its area access/area denial (A2/AD) strategy to take advantage of U.S. forces' limitations by enabling its own forces to:

■ Quickly achieve a dominant position in the battlespace before U.S. and allied military reinforcements can deploy from their homelands and other locations to engage in combat.

■ Inflict unacceptable loss rates on U.S. air forces, in the air by using advanced forces such as long-range J-20 counterair fighters carrying the world's most advanced air-to-air missiles, and on the ground by directly attacking U.S. theater air bases.

■ Focus its attacks on the rarest, most valuable, and hardest-to-replace U.S. air assets. This can be seen in the PLA's investments in a variety of weapons designed to attack U.S. aircraft carriers and airborne high-value airborne assets (HVAA) like AWACS.

■ Degrade U.S. airborne battle management and command and control networks and other means to gain information dominance.

■ Degrade U.S. sortie generation operations by striking their air bases and ground support capabilities. Another PLA air base attack objective is to compel opposing air forces to reposition their high-value assets from the Pacific's First Island Chain to more distant bases, increasing the ranges they must fly to the battlespace and reducing their sortie rates.

■ Take full advantage of China's "interior lines" to ensure the PLA's own high-value assets become high-risk targets for U.S. forces. For example, the PLAAF's KJ-500 radar systems provide early threat warnings and target cues to long-range air defenses on the PLA Navy's (PLAN) surface action groups. These surface action groups provide an outer layer of defenses for PLA forces in the Taiwan Strait while remaining under the umbrella of a network of long-range fighter aircraft and coastal SAMs.

A vital element of China's military modernization campaign was its development of new air superiority capabilities like the 4th-generation J-16 and 5th-generation J-20 "Mighty Dragon" stealthy fighter, plus the advanced missiles they need to complete long-range air-to-air kill chains. The Shenyang J-16 is a derivative of Russia's Su-30, upgraded with an AESA radar, composite materials for reduced weight, and the ability to carry indigenous Chinese PGMs. The J-20 is a long-range stealth interceptor designed to keep at bay U.S. 5th-generation fighters. According to a Royal United Services Institute (RUSI) report, "its combination of passive sensors, AESA radar, [low observable] features, range on internal fuel, and long-range missiles make the J-20 a qualitatively greater threat than any previous non-Western combat aircraft."

Meanwhile, 33 years after the end of the Cold War, the U.S. Air Force's air superiority force predominately consists of the same fighters, mission systems, and weapons that first joined the operational force during the 1970s and 1980s. While these

China's J-20 "Mighty Dragon" fighter jets, the People's Liberation Army Air Force's most advanced 5th-generation aircraft, were designed to hold U.S. forces at bay with advanced sensors, stealth features, and long-range air-to-air missiles. CCA could help mitigate the J-20 threat to U.S. Air Force fighters.

N509FZ

systems have continued to benefit from upgrades, this force is not sized for peer conflicts, and the average age of its fighter inventory exceeds 28 years, the oldest it has ever been. This high-risk force will struggle to operate effectively in highly contested environments of the kind that will exist during a conflict with China.

Yet a key objective of the U.S. National Defense Strategy is to deter China by creating a force capable of denying the PLA the ability to achieve its campaign objectives rapidly. To achieve this deterrent effect, the U.S. Air Force must develop and acquire disruptive, asymmetric capabilities and concepts for conducting counterair operations. The United States cannot afford to match China aircraft-for-aircraft, missile-for-missile, or ship-for ship. Even if that was a desirable approach, DOD would never have the resources—money and personnel—or the time to do so.

The Air Force's air superiority fighter inventory now consists of 179 aging 4th-generation F-15C/Ds and 185 5th-generation F-22s. Roughly 20 percent of these F-22s are training, test, or backup inventory aircraft that are not combat-coded. The service's slowly expanding F-35 force is capable of a range of offensive and defensive counterair operations, including airborne electronic attacks and air-to-air engagements, but remains small. The Air Force had only 334 F-35As in its inventory by the end of fiscal 2022, and in calendar year 2023 received about half of the 80 F-35As it had originally planned to acquire annually—again, in large part due to inadequate budgets. These forces are supported by E-3B/G AWACS that are in their fourth decade of service. In early 2023, the Air Force awarded a contract for an AWACS replacement that is based on the E-7 "Wedgetail" aircraft acquired by Australia and the United Kingdom, but these jets will take years to join the force.

As Gen. Mark Kelly explained in mid-2023: "We literally ate the muscle tissue of the Air Force in the form of reduced fighter capacity, reduced readiness, putting hard miles on older aircraft, driving more extensive sustainment efforts." The lack of fighter capacity due to aging aircraft and other reasons is why the Air Force was forced to withdraw F-15C/Ds from the strategically vital Kadena Air Base in Okinawa in late 2022 without direct, permanently assigned backfill aircraft. There just were not enough fighters available, so units must rotate to the base for the next several years until new jets can be stationed there.

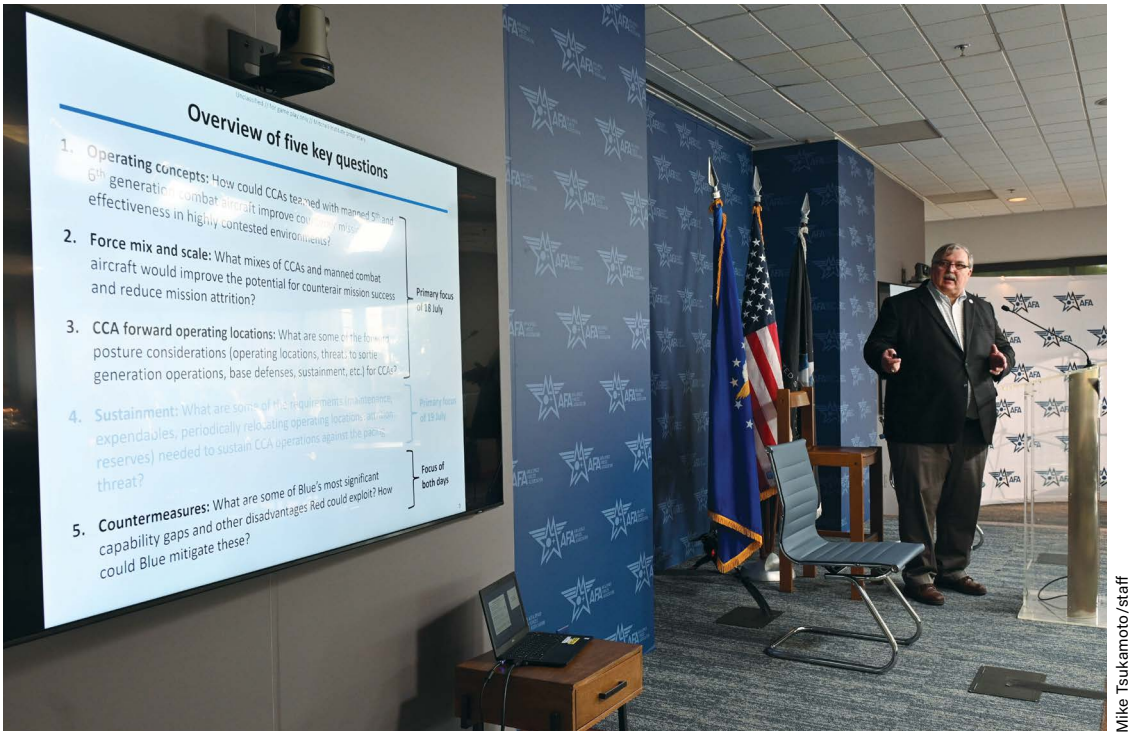
The Air Force's Next-Generation Air Dominance (NGAD) family of systems will be critical to maintaining its combat edge over China, but the crewed component of NGAD may not be available in significant numbers until the 2030s. But other parts of the NGAD family of systems—AI-enabled CCA—could be available sooner. That, plus maximized F-35A acquisition in the next Future Years Defense Program, would reduce risk this decade. "Extensive analysis unambiguously shows that the current fighter fleet will not succeed," Kelly has said. The Air Force "must change now to provide the capability and capacity in the most affordable way in tightly constrained budgets to meet the peer threat."

WARGAME INSIGHTS

During the July 2023 wargame, the Mitchell Institute tasked top-performing operators, technologists, and engineers from the Air Force and defense industry to assess how a mix of uncrewed CCA and crewed combat aircraft could achieve the degree of air superiority required to defeat peer aggression. Organized into three "blue" U.S. campaign planning teams, these experts proposed concepts and prioritized capabilities for CCA to conduct counterair operations during the first two weeks of a U.S. campaign to blunt, and then defeat a notional 2030 PLA invasion of Taiwan.

USAF

The Air Force Research Laboratory's XQ-58A Valkyrie, demonstrated its ability to launch a smaller uncrewed aircraft system from its internal weapons bay in 2021. CCA can add enormous complexity to a rival force's combat calculus.



Mike Tsukamoto/staff

Author Mark Gunzinger launched a two-day Collaborative Combat Aircraft wargame hosted by AFA's Mitchell Institute for Aerospace Studies by going over the central operational questions participants would address at the July 2023 event.

Each team explored how the Air Force could use mixes of lower-cost and moderate-cost CCA to disrupt a peer adversary's A2/AD operations and enable crewed and uncrewed aircraft to perform multiple counterair missions over long ranges with reduced attrition. CCA capable of operating from small, dispersed runways or even without runways could help sustain combat sortie generation rates while under attack and reduce the risk of aircraft attrition on the ground. Launching some CCA variants from mobile ramps or catapults and recovering them with parachutes and airbags may be feasible for smaller designs, where a less than 100 percent recovery rate could be acceptable. Alternatively, smaller aircraft could be designed for short takeoffs and landings using portable arresting gear, allowing them to operate independent of long runways, which are more easily located and targeted by adversaries. And because some CCA may not need to fly frequently to support pilot training, they could be postured in forward locations like other pre-positioned materiel, reducing the need to rely on long, costly supply chains that will be under attack at the start of a conflict.

The single most important insight from Mitchell's 2023 wargame is the potential to use a family of CCA as lead forces to disrupt and then help suppress China's advanced integrated air defense system (IADS). Experts agreed it is not feasible to match China fighter-for-fighter and missile-for-missile in the battlespace, given the Air Force's fighter inventory and the PLA Air Force (PLAAF) will have multiple "home team" advantages, including the ability to operate from air bases adjacent to the Taiwan Strait. Instead, all three wargame teams proposed concepts of operations that initially used CCA at scale to disrupt China's IADS and to level the playing field against the PLAAF. This mirrors the logic behind DOD's Assault Breaker initiative from the 1980s and its 2014 to 2018 Third Offset Strategy, which sought to develop asymmetric capabilities to offset a peer adversary's superior combat mass and proximity to the battlespace.

Importantly, all three wargame teams also chose to use a mix of CCA, including different variants designed as airborne sensors, decoys, jammers, or weapon launchers to disrupt and stimulate the PLA's IADS, locate its critical nodes, absorb fires, and begin to attrit threats in advance of crewed aircraft. Dispersing these functions across a mix of CCA can improve operational resiliency and increase the number of airborne "nodes" adversary forces must attack. Like remotely piloted aircraft (RPA) sensor-shooters that pioneered a new way of conducting precision strikes, CCA will be more than intelligence, surveillance, and reconnaissance (ISR) "information gatherers;" while lower-cost CCA may lack the mission systems and full functionality of 5th-generation fighters, an adversary has no reliable way of determining how CCA are equipped and must address them all as threats.

Another insight is that CCA can increase the Air Force's capacity to generate lethal mass for counterair operations. Appropriately equipped CCA can perform as force multipliers that increase the number of sensors and weapons the Air Force can project into contested battlespaces. They can also extend the sensor and weapon ranges of stealthy crewed aircraft they team with, increasing their lethality and survivability. Designing weaponized CCA with at least enough survivability to reach their air-to-air missile launch points was a critical wargame insight. Reducing attrition of Air Force fighters and their crews would be a major force multiplier over the course of an air campaign, given DOD-mandated force cuts over the last 30 years caused the Air Force to divest its combat attrition reserves. Needed to conduct extended combat operations in highly contested environments.

CCA will multiply the Air Force's diminished combat inventory in another way: by getting its non-stealthy combat aircraft into the fight for air superiority. For instance, notional CCA designs available to wargame experts included a long-range, air-launched design that carries two air-to-air weapons or four 250-pound class Small Diameter Bombs. The experts used 4th-generation F-15EXs and B-52 bombers to launch these weapon-carrying CCA while remaining outside the range of China's IADS. And since these CCA could also be ground-launched by rockets without the need to use runways, experts pre-positioned them at dispersed operating locations in the Philippines and Ryukyu Islands. Creating this dispersed pos-

ture had the added benefit of improving the resiliency of the Air Force's combat sortie generation operations.

Experts participating in Mitchell's wargame also preferred to use a mix of lower-cost CCA they classified as expendable systems and moderate-cost recoverable CCA that could be attritted if mission needs required in the highly contested battlespace that will exist for hundreds of miles around the Taiwan Strait. Experts chose to use expendable CCA in significant numbers during the first few days of their air campaigns as decoys, jammers, active emitters, and other ways that risked their loss in highly contested environments. As their campaigns progressed, experts shifted toward using a larger number of moderate-cost CCA capable of carrying larger weapons payloads and surviving to return to their forward operating locations and regenerate for additional sorties.

Finally, wargame experts suggested there is a need to develop concepts for operating CCA with other uncrewed aerial vehicles for counterair missions, rather than solely using them as adjuncts for crewed aircraft. Of note, operating CCA in this way would require providing them with more advanced autonomy and other technologies that would add to their cost. Militaries have a long history of attempting to use emerging technologies to marginally improve the performance of their existing systems, such as at the dawn of U.S. military aviation when the U.S. Army initially believed fixed-wing aircraft could best serve as artillery spotters supporting ground operations. Constraining CCA to supporting crewed aircraft operations only limits their warfighting potential. Collaborative autonomous CCA operations will increase pressure on an adversary, an essential requirement for peer conflict in extremely large theaters such as the Pacific. This said, experts unanimously agreed that CCA are complementary and additive capabilities that will not reduce the Air Force's 5th-generation fighter requirements. Both are needed to prevail over peer aggression.

RECOMMENDATIONS FOR THE AIR FORCE

Warfighting and technology experts from the Air Force and industry agree that fielding a family of CCA for offensive and defensive counterair operations should be accomplished as rapidly as possible. It will be a major challenge to achieve air superiority in a conflict with China today and will grow more difficult as the PLA fields its next generation of airborne and sea-based sensors, combat aircraft, and very long-range air-to-air and surface-to-air missiles. Developing CCA as part of the Air Force's force design in this decade is a fleeting opportunity to enhance capability in the near term to deter peer aggression. Yet rapidly fielding these aircraft will require coordinated and concerted support from lawmakers, DOD leadership, and industry, given the scale of changes required to integrate them into operational units.

Additional resources are needed to develop, acquire, operate, and sustain a mix of CCA. The following recommendations are based on insights from Mitchell Institute wargames and related studies:

■ **The Air Force should conduct trade-off analyses to determine an optimal mix of CCA in its future force design.** These analyses should seek to create an inventory of CCA types that balance their individual attributes, such as their sizes, low observability, ranges, mission systems, and unit costs, with their mission requirements. Determining the right trade-offs between these design features will inform the development of a CCA force design that maximizes the Air Force's combat effectiveness and return on investment. These CCA will be complementary and additive capabilities that will not reduce the Air Force's requirements for 5th-generation fighters and other advanced crewed systems.

■ **The Air Force should create operating concepts for using expendable and recoverable/attritable CCA as lead forces to disrupt China's air and missile defenses and other A2/AD operations.** These operating concepts should address how CCA could perform as lead forces to complicate the PLA's counterair targeting, identify its high-value air defense nodes, and cause PLA defenses to deplete their air-to-air and surface-to-air weapons on lower-cost uncrewed systems. This is not the same as using CCA to increase the Air Force's capacity to fight attrition-based warfare. Instead of relying on CCA to simply generate more mass, uncrewed systems combined with new, disruptive, cost-imposing operating concepts can create an asymmetric combination the PLA will find difficult to counter.

■ **The Air Force should acquire CCA at scale to increase its capacity to project affordable counterair mass into highly contested areas.** CCA can be force multipliers by collaborating

USAF illustration

This Skyborg conceptual design shows a low-cost attritable Unmanned Combat Aerial Vehicle flying in formation with an F-15. While accompanying crewed fighter aircraft during combat, it reduces risks to Airmen.

Staff Sgt. Tabatha Arellano

A General Atomics MQ-20 Avenger unmanned aircraft vehicle prepares to start employing the Skyborg Autonomy Core System during flight tests at Edwards Air Force Base, Calif., in a 2021 exercise.

with 5th-generation aircraft and other uncrewed systems, while also operating independently to increase the weapons and sensors the Air Force can project over long ranges into highly contested environments. CCA designs capable of performing as penetrating "weapon trucks" would help offset the PLA's growing counterair forces, improve the survivability of the Air Force's 5th-generation fighters, and multiply the number of weapons crewed fighters can bring to the fight. These CCA should have the survivability and range to ensure they will reach their weapon launch points. The Air Force's future force mix should also include CCA with long ranges that can be launched from non-stealthy bombers and fighters to disrupt the PLA's air defense operations and help pave the way for more capable counterair aircraft.

■ **The Air Force should field CCA that will reduce its dependence on large, fixed air bases in the Indo-Pacific and other theaters.** Reducing the Air Force's current reliance on main operating bases with long runways in the Pacific theater would improve its ability to generate combat sorties while under attack as envisioned by its Agile Combat Employment concept. CCA that can operate from short runways or launch without using runways would help create a more dispersed, resilient forward posture. A network of dispersed CCA operating locations would also complicate the PLA's ability to find, fix, and attack the Air Force's counterair forces when they are most vulnerable: on the ground and preparing for combat sorties.

■ **The Air Force should increase the lethality of its CCA over time by developing new munitions or adapting current weapons to take maximum advantage of their payload capacity.** As the Air Force iterates its future CCA designs, it should take advantage of technologies like smaller engines, compact rocket motors, and miniaturized components to design smaller weapons that would increase the number of targets CCA can attack per sortie. This will be critical to the success of operations to rapidly halt a Chinese offensive.

■ **DOD should work with Congress to increase Air Force funding to create a force design that combines uncrewed CCA and 5th-generation and 6th-generation combat aircraft for decisive counterair operations.** Decades of insufficient budgets have created a high-risk Air Force that lacks the force capacity, modernized capabilities, and readiness required for a major peer conflict. Reversing this decline requires growing the service's annual budgets by 3 to 5 percent for a decade or more to acquire CCA, increase F-35A acquisition, acquire other new counterair weapons systems, and improve air base defenses for peer conflicts.

■ **Analyses are also needed to determine capabilities and operating concepts to support and sustain a high tempo of CCA operations in forward theaters.** These analyses should address requirements to pre-position CCA and their logistics in the Indo-Pacific, appropriate dispersal locations for CCA launch and recovery operations, and materiel and personnel requirements to sustain CCA combat operations at scale during a peer conflict. Determining CCA theater logistics requirements will be a critical step toward determining the attributes of future CCA designs.

The Mitchell Institute's wargames and related research strongly support the Air Force's proposition that CCA will help mitigate the Air Force's existing—and growing—capability and capacity gaps that threaten its ability to achieve air superiority. CCA combined with crewed 5th- and future 6th-generation fighters have the potential to disrupt China's A2/AD operations and then deny and impose costs as called for by the National Defense Strategy. The stakes for creating this new, hybrid force design have never been higher, given China's unchecked campaign to field new A2/AD weapon systems and proliferate them to other actors that threaten the security of the United States and its allies and friends.

Col. Mark Gunzinger, USAF (Ret.) *is a former Deputy Assistant Secretary of Defense and the director of Future Concepts and Capability Assessments at The Mitchell Institute for Aerospace Studies.*

By Patrick Reardon

AFA's Recruiting Task Force 'Aims High' in New Partnership with AFRS

The Air & Space Forces Association and the U.S. Air Force Recruiting Service are teaming up to leverage AFA's nationwide Chapter network as influencers and ambassadors for the Air and Space Forces.

The partnership is an outgrowth of a year's work by a volunteer-led committee working in close collaboration with the recruiting service, yielding an official memorandum of understanding between the organizations announced January 12 at AFA's annual Field Leadership Summit in Arlington, Va.

AFA launched "AFA AIMS," a new recruiting support campaign, to spearhead the partnership. "AIMS" is short for "Advocates to Inspire Military Service."

This initiative comes at a crucial point in Air Force history. Last fiscal year the Air Force missed its recruiting goal for the first time in 24 years. Studies show only 23 percent of American youth today are eligible for military service; less than 10 percent of today's youth are even interested. In fiscal 2023, Active-duty recruiting fell short of the goal by about 11 percent, while Air Force Reserve and Air National Guard recruiting were even further behind—30 percent under goal.

Mike Tsukamoto/staff

Brig. Gen. Christopher Amrhein, Commander, Air Force Recruiting Service, and Chief Master Sgt. Rebecca Arbona, Command Chief Master Sergeant, Air Force Recruiting Service watch as Lt. Gen. Brian Robinson, commander, AETC, administered the oath during a recruiting ceremony at AFA's 2023 Air, Space & Cyber Conference.

"The current national security situation is as dangerous as we have ever known, and the recruiting crisis only exacerbates the worldwide risks facing our nation," said AFA President and CEO Lt. Gen. Bruce "Orville" Wright, USAF (Ret.). "AFA's new partnership with AFRS is an incredible opportunity to help inspire a new generation of young Americans to become Airmen and Guardians, and to 'aim high' by raising their hand to serve our nation."

AFA chartered its recruiting task force in 2023 to identify how AFA members and Chapters could support the Air Force Recruiting Service which has the smallest footprint among all the service branches. The new AFA-AFRS partnership and AIMS program will reinforce that footprint with the help of 200 AFA Chapters and more than 113,000 members across the country.

"AFRS is doing great work, but they're stretched really thin," said Lt. Gen. John Campbell, USAF (Ret.), the chair of AFA's recruiting task force. "We're looking for ways AFA members and Chapters can assist AFRS by reaching out to the community—our youth and their parents, teachers, coaches, and neighbors—and spreading the word what life is like in the military. There is a surprising lack of knowledge and a lot of incorrect information. Most of our young people and many of their parents may not have ever met anyone who served, and we can fill that gap."

"AFRS and AFA are natural partners," said AFRS Commander Brig. Gen. Christopher Amrhein. "[Our agreement] identifies areas where we can leverage AFA's national reach in the community to augment our recruiters."

Amrhein said his recruiters are challenged not only to locate and acquire talent, but to familiarize American youth about the benefits and opportunities of military service, including the importance of a strong national defense.

At AFA's National Convention and at the AFA Air, Space, & Cyber Conference last fall, Amrhein called on all Airmen and Guardians, past and present, to "tell their stories." Those stories can open the imaginations of young Americans, providing a new and enlightened frame of awareness. AIMS seeks to make it easier for AFA members and field volunteers to do just that.

"Our Chapters are the touchpoint with the communities and families where future Air and Space Force members live," said AFA Chair of the Board Bernie Skoch. "With nearly 200 Chapters nationwide, we can help carry the Air and Space Forces' messages. Our objective is to provide a consistent and modern set of programs that allow Chapters, and members, to complement the Air Force Recruiting Service mission."

To keep the AIMS campaign "consistent and correct," AFA's recruiting task force is developing an Influencer Toolbox (ITB), which will be an online resource hub for AFA Chapters and Field leaders where talking points, presentations, video clips, and other materials will be collected and maintained. The ITB will provide the tools to make sure members are up to date on current Air Force issues and are equipped to speak authoritatively about life in the Air and Space Forces.

"Much has changed since most of us served and we need to understand and be able to speak about issues that affect perceptions of life in the Air Force," Campbell said. "For instance, the Blended Retirement System is an enormous change, but few of us understand it well enough to tell a young man or woman how it affects them. The ITB won't be fully 'mission-capable' on day one, but we want to put the framework in place and gradually populate it as time and energy permit. It will always be a work in progress."

Amrhein said AFRS looks forward to working with the Air & Space Forces Association, its Chapters, and members in tackling today's challenging recruiting situation "Our partnership will highlight the benefits of service to this great nation and more specifically the benefits of serving the U.S. Air and Space Forces," he said. "It will also highlight the many ways an individual can serve in the Regular Air or Space Force, the Air Force Reserve, the Air National Guard, or as a Department of the Air Force Civil Servant. This partnership is the first of many that Air Force Recruiting Service will enter into to show what great opportunities await America's best and brightest."

By Janelle Stafford

How Chapters Can Effectively Partner with Air Force, Space Force Bases and Organizations

No two local Air & Space Forces Association chapters are alike, with each chapter taking on the missions and characteristics of the communities it serves. What is common throughout the AFA chapter structure, however, is the relentless pursuit of the AFA mission: to ADVOCATE and promote aerospace power as the backbone of U.S. national security; to EDUCATE the public on the critical need for unrivaled aerospace power and promote aerospace and STEM education; and to SUPPORT Airmen, Guardians, and the Families of the Total Air Force and Space Force.

AFA provides many opportunities for chapters to support this mission—particularly the Support pillar—through engagement with Active-duty bases, as well as Guard and Reserve units, which can benefit not only the Airmen and Guardians in uniform, but their families as well.

Here are three ways AFA Chapters can get involved in supporting their local military communities, as illustrated by three success stories of AFA's Central Oklahoma Gerrity Chapter, which participated in several social and educational events specifically designed to support the military family.

MILITARY FAMILY APPRECIATION

The Gerrity Chapter was able to coordinate military family attendance for a number of games at the Chickasaw Bricktown Ballpark in Oklahoma City, where the Los Angeles Dodgers' AAA affiliate plays each season. A dedicated Military Appreciation Suite kept military families cool throughout the hot summer games, including those from the Tinker Exceptional Family Member Program (EFMP) who attended a game in mid-July. Gerrity made the events possible through its relationship with the Tinker Military & Family Readiness Center and the Exceptional Family Member Program.

F2 GRANTS & STEM EDUCATION PROJECTS

Through AFA's United Forces & Families (F2) grant worth $1,000 and a chapter contribution of $500, Gerrity Chapter members presented a $1,500 check to the Exceptional Family Member Program (EFMP) during a monthly Tinker AFB Community Action Team (CAT) meeting. The funds are now being used to support Tinker's EFMP/STEM Adventures program.

Attendance at the CAT meeting gave Gerrity leadership the opportunity to talk about the AFA mission and Gerrity Chapter projects and activities, which include a heavy emphasis in STEM education programs like AFA's CyberPatriot and StellarXplorers. "With the availability of the F2 grant funds, EFMP/STEM Adventure activities will be ongoing," said Gerrity Chapter President Jeff James. "I can't think of a better use of those funds,"

The Gerrity Chapter is part of a strong Oklahoma STEM network, partnering with a number of different organizations that reach across the entire state. Among Gerrity's STEM partners are Oklahoma CareerTech, Starbase Oklahoma, and KidWind, an international competition that challenges students to use critical thinking skills to construct real renewable energy technology utilizing STEM disciplines.

"Aligning with STEM program opportunities like KidWind helps our Chapter expand our STEM outreach to different ages and populations," James noted.

Gerrity Chapter/Facebook

Several Gerrity chapter leaders and their families at the Los Angeles Dodger's Triple-A affiliate teams Chickasaw Bricktown Ballpark in Oklahoma City enjoy a game in the Military Appreciation Suite available for veterans.

PARTNERSHIP WITH AN AIR NATIONAL GUARD WING

In partnership with the Oklahoma Air National Guard 137th Special Operations Wing (SOW), Gerrity Chapter members supported the second annual Zoo After Dark at the Oklahoma City Zoo. The zoo was reserved for 137th SOW Airmen and their families, who spent the evening browsing resource tables from a variety of vendors (including AFA) and, most importantly, enjoying the time with their families and friends. Approximately 1,300 people attended the activity-filled evening, which included an elephant show, a dance performance celebrating Hispanic Heritage Month, and a scavenger hunt that took participants to resource vendors and animal exhibits.

Support of (and participation in) activities in partnership with Tinker Air Force Base, the 137th SOW, and others is nothing new to the Gerrity Chapter, however.

"Our partnerships with the 72nd ABW, the Air Logistics Complex, and the 552nd ACW, as examples, have been built over time, and are long and enduring," James said. "Not only do we support these programs and activities, but we receive chapter support and active participation from them."

There are a number of touchpoints any AFA Chapter can utilize to forge similar partnerships.

"As a starting point, we've built a strong Executive Committee by asking strategic partners to provide us with a representative willing to serve and to help shape and guide the direction of our Chapter," James said. "We have EXCOM members from JROTC, ROTC/Arnold Air Society, Civil Air Patrol, the 137th SOW, Tinker's Exceptional Family Member Program, and others, and we meet monthly over breakfast to plan."

Opportunities such as change-of-command ceremonies (and follow-up introductory meetings with incoming leaders); the presentation of scholarships and annual AFA awards to Airmen, Guardians, and civilian employees; building morale as a sponsor of the Annual 552nd Chili Cook-Off; or heritage events like the Chapter's annual Toast to the Doolittle Raiders are just a few ways the Gerrity Chapter has built its relationship with Tinker, the ANG, and the entire military community as it works to execute AFA's mission to Advocate, Educate, and Support.

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

Ira C. Eaker

Airpower pioneer and commander of the Mighty Eighth.

Ira Eaker joined the Army during World War I as an infantryman, but soon transferred to the Air Service and became a pilot. While at Rockwell Field, Calif., in 1918 he met Henry H. "Hap" Arnold and Carl "Tooey" Spaatz. The three became fast friends and would remain so for the rest of their careers and lives.

Eaker was an outstanding pilot. He led the Pan American Goodwill Flight to South America in 1927, winning the Mackay Trophy, and two years later piloted the record-breaking Question Mark air-refueling flight—Spaatz was also a pilot on that flight. The following year Eaker made the first nonstop transcontinental flight entirely on instruments.

Eaker had a degree in journalism, and he used that expertise to write and promote the cause of airpower. He coauthored three books with Arnold: ***This Flying Game*** (Funk & Wagnalls, 1938), ***Winged Warfare*** (Harper, 1941), and ***Army Flyer*** (Harper, 1942). All three were pitched to a general audience, explaining aircraft and how they would be used in war.

When war broke out, Arnold sent Eaker to England to command the Eighth Air Force. He protested, arguing that he was a fighter pilot, not a bomber pilot. Arnold responded that is precisely why he was giving him the job: He wanted Eaker to instill a fighter pilot spirit in the bomber crews.

American Air Museum in Britain

Lt. Gen. Ira Clarence Eaker, commander of the United States Army Air Forces in Britain and the Mediterranean.

It was a difficult challenge. America, typically, had not been prepared for war, and the air arm was in bad shape. The Army was dominated by ground-warfare zealots, and they had refused to purchase modern and powerful aircraft like the B-17. There were a scant two dozen in the service when war broke out, even though it had first flown in 1935. Rather, the Air Corps was forced to buy hundreds of medium bombers like the B-18—which never saw combat.

The buildup of the Eighth was slow and losses were heavy. Prewar doctrine was wrong: The "Flying Fortresses" were not self-defending. Escort fighters were essential, but such aircraft were not available in 1943. Short-range British Spitfires were used and P-38 twin-boomed Lightnings, but this was not good enough, especially for bombing raids deep into Germany.

The RAF had gone through this same dismal process, and its solution was to abandon its decades-long doctrine of daylight precision bombing, and instead resort to area bombing at night. It was safer. RAF leaders urged Eaker to go the same route, but he refused. At the Casablanca Conference in January 1943 he pled his case to British Prime Minister Winston Churchill, arguing that "around the clock bombing" of Germany with Bomber Command operating at night and his Eighth Air Force operating in the day would give the enemy no respite and would eventually bring him and his war industry to its knees. Churchill was convinced.

Even so, it was one thing to accept the concept and quite another to carry it out. In August 1943 the Eighth AF struck the ball-bearing plants in Schweinfurt, Germany. Prewar doctrine had postulated that such a target was a "bottleneck" whose destruction would have a major, cascading effect throughout German industry. The mission was a nightmare—60 aircraft went down, 20 percent of the attacking force. Five such missions and there wouldn't be an Eighth Air Force.

The savior would be new fighters, the P-47 and P-51, armed with the unglamorous drop tank that allowed escort deep into Germany. The culmination was "Big Week," when in late February 1944 the backbone of the Luftwaffe was broken. Air superiority was finally achieved, allowing not only an escalating bomber campaign that utterly destroyed German production, but also facilitated the successful landings in Normandy.

By then, however, Eaker was gone. Arnold was never a patient man. Although he deeply respected and trusted his old friend, he decided it was time for a change. Eaker was promoted to lieutenant general and sent to the Mediterranean theater to take command of the Allied Air Forces there. Eaker did not want to go and considered it a "kick upstairs." He was no doubt correct.

As the war wound down in Europe, Eaker was summoned back to Washington. Arnold had suffered his fourth heart attack and wanted him near to help run the Air Force. The two men discussed the future and decided that an independent Air Force, equipped with atomic bombs, would dominate the postwar military. It was the young generals who would have to get this done. For the pioneers, it was time to retire.

Eaker retired in 1947, but remained a staunch advocate for the new Air Force. In 1985, President Ronald Reagan signed legislation promoting Eaker to full general. He never wrote his memoir, but the three books noted above are an excellent starting point for understanding his thoughts. An excellent biography was written by former subordinate James Parton, ***"Air Force Spoken Here:" General Ira Eaker and the Command of the Air*** *(Adler & Adler, 1986).*