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Airman Mason Hargrove

AIR & SPACE FORCES

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Airman 1st Class Olivia Gibson

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Why Recruiting is in Crisis

The U.S. military is facing a recruiting crisis. It's worse for some branches than it is for others. But the fact is, the Air Force barely met its Active-duty recruiting goal last fiscal year, and now half-way through fiscal 2023, it's clear it will miss targets this year by 10 percent or more.

Leadership concern about recruiting was a persistent theme throughout the AFA Warfare Symposium last month in Colorado. The Air & Space Forces are retaining members who have already raised their right hands, but getting new volunteers in the door is growing increasingly difficult.

It is tempting to view this as another in a long series of predictable blips, the familiar boom-and-bust cycle of the recruiting business. After all, we have all seen shortfalls before: After the Cold War in the early 1990s, when the military shrank; during the dot-com boom later that decade, as military pay fell far behind the private sector; in the 2000s when the Iraq War dragged into its third year and beyond, and stop-loss orders, deaths, and repeated lengthy deployments ground down the force.

Yet the current crisis and ongoing national trends suggest the Air & Space Forces—indeed all the military services—face continued headwinds well into the future.

Today's nationwide unemployment rate is running at 3.6 percent. That matches the lowest rate ever in the 50 years of the All-Volunteer Force. Since 2015, unemployment has only exceeded 5 percent just once, in the midst of the COVID-19-induced nationwide shutdown of 2020. By contrast, in the prior 20 years it exceeded that figure 35 of the 50 years since the All-Volunteer Force was established.

That suggests the military is in a more competitive environment than ever, at a time when other societal changes are also working to the services' disadvantage:

■ Americans are having fewer children. The first 18-year-olds to come of age during the All-Volunteer Force era were born in 1955, when the U.S. fertility rate was 3.42. By 2005, when today's 18-year-olds were born, that rate was down to 2.05. Today, it's 1.78.

■ Americans are more protective of our children. In 1983, 46.2 percent of 16-year-old Americans were licensed to drive. In 2018, that number was just 25.6 percent, even though cars today are safer than they've ever been. A parent with one child has more time and more incentive to guard their only child than one with three; that's common sense. According to the Pew Research Center, 40 percent of American parents characterize their own parenting as "overprotective."

■ More 18- and 19-year-olds are going to college. In 1974, 33 percent of Americans this age were enrolled in college; in 2020, that number was 49 percent. There are many reasons for this, including that with fewer kids, parents focus greater attention, resources, and hopes on those they have. But the bottom line is that further erodes the population of young Americans willing to enlist in the military.

■ College is more expensive, but easier to pay for. Here's a quandary. In 1973, a year in college for a student perusing a four-year degree was \$1,900; adjusted for inflation to 2018 dollars, it was \$11,400. By 2018, the cost was approaching \$25,000. In 1975, average student debt at graduation was \$1,000 (about \$5,000 in today's money). In 2021, the average student graduated with \$31,000 in debt. Parents in many cases also carry loans on top of that figure. Easy access to college loans short-circuits the military's traditional pitch: join the military today, and we'll give you money for college later.

All of this is to say that today's recruiting challenges are systemic to our national circumstances. What's more, while they are unique to our times, they are not unique to our military.

Consider that the construction industry is facing the same challenges at the same time. Like the military, construction jobs skew heavily toward young males. According to the online publication Construction Dive, the industry anticipates a labor shortage of some 500,000 workers as older workers retire. America is not producing enough new plumbers, electricians, heavy equipment operators, carpenters, and technicians to match demand.

The military can't solve this issue the way construction firms do, however. In Washington, D.C., and much of the nation, construction crews are increasingly made up of Spanish-speaking immigrants. That's a demographic shift over the past 30 years, but one defined by choices. Young American men aren't choosing those dirty, grubby, grinding jobs. So no surprise they're not as interested in taking military jobs, either.

In 1970, 1.7 percent of Americans of all ages were serving in the military. Today, that percentage is less than 0.38 percent, not even one-quarter of the percentage from 50 years ago. The population is up 70 percent in that time, and our military is less than half what it was. Project those figures out and you will see diminishing returns. This picture won't get better without major changes.

Here's the heart of the problem. Americans don't know their military.

Increasing numbers never meet anyone who serves. They see a few military people in airports, perhaps, or maybe they see a Guard or Reserve convoy on the highway now and then, but they don't have a relationship like they did a generation ago. Baby Boomers all knew what their dads did "in the war," because almost all our dads did time in uniform.

Today, that's only true of a select population of military "brats." For much of America, military service is something done by people they'll never know and never meet.

This is dangerous to a Democracy and risky to our nation. As AFA Chairman Bernie Skoch noted at the Warfare Symposium, America was essentially run and led by veterans 50 years ago. Veterans dominated Congress in those days. They held state and local office, led media institutions, and worked in every corner of our economy.

"That's not true today," Skoch said. "In 1974 when I was commissioned into the Air Force, 82 percent of Congress members were veterans—82 percent! Today, in our new Congress, just 18 percent of lawmakers are veterans. We've gone from four of every five members as veterans to less than one in every five."

Across the population, the percentage of veterans in the population has plunged by two-thirds since 1980, according to the Census Bureau.

The Vietnam War was disastrous to our nation in many ways, but it ended relatively quickly. Fighting really didn't ramp up until the early 1960s, and it was over in 1973. By contrast, the wars in Iraq and Afghanistan ground on for two decades. Protests ended the Vietnam War, in which American draftees made up the bulk of the force. Regular kids from all over the country. The Forever Wars in the Middle East would not have lasted so long if they hadn't been fought by such a small subset of the population.

America needs a reckoning with itself over whose responsibility it is to defend and protect our nation from all enemies, foreign and domestic. It isn't someone else's responsibility. It belongs to all of us, collectively.



It is tempting to view this as another blip in the boom-and-bust cycle of recruiting. It is not.

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“**M**embership has its privileges.” Those of a certain age may recall this popular slogan from an old American Express advertising campaign. The point of the campaign was that an American Express card was more than just a credit card; it provided other tangible benefits.

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Plus, the AFA Member Insurance Program recently launched a new, easier-to-use website. Members can apply for coverage online for many of the plans and the site will eventually enable you to apply online for all plans. That will mean no more filling out PDFs or paper applications.

Here is an overview of the insurance policies offered through your Member Insurance Program's website, www.AFAinsure.com:

Term Life Insurance. AFA members can choose between two term life insurance plans exclusive to the organization. Unlike many Life Insurance policies, there are no exclusions for war or terrorism, and flying personnel are covered 100%.

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U.S. Air Force photo by Chustine Minoda)

The AFA Member Insurance Program was designed for military families like U.S. Air Force Maj. Sara Salmeri, 60th Medical Group TRICARE Operations flight commander, and Tech. Sgt. Peter Salmeri, 60th Communication Squadron cyber systems supervisor, shown with their children for the Military Spouse Appreciation Day campaign at Travis Air Force Base, California, April 7, 2022.

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tions that are competitive, efficient and easy to access.

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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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I Can See Clearly

Your title, "Eyes on the Boom ..." [January/February, p. 48] about the continuing problem with the KC-46 actually stated the solution to the problem, but the "high-tech" gurus of today insist on replacing the human eye with television. Let me relate a true story that will seem unrelated but proves my point.

At Nellis Air Force Base, Nev., in 1952, prior to my going to Korea, I was taught a dive-bombing technique in the F-80 Shooting Star. It was the technique in use at the time, but unfortunately it didn't work. It required that dive angle, airspeed, altitude and cross-hairs on the target all came together at the time of bomb release. Unfortunately, all of those are variables and unknowns. Direct hits were rare.

Later, in Korea with several missions under my belt, I met four F-84 pilots who had diverted to my base for the night. I asked them about an automatic bomb-release system that I heard they had and asked if it worked. They said they had it, and it had problems. It involved diving at a 45 to 60 degree angle with some depression in your sight. You signed up so that your crosshairs were below the target. As you dove, the crosshairs moved up to the target. At that point you pushed forward on the control stick until you reached one-half of one positive "G."

At that point you were flying the arc/trajectory the bomb would take from there to the target and the automatic system released the bomb when you reached that 1/2-G condition. It sounded great, but if you hit jetwash or turbulence while rolling in or overshot the target and pushed forward on the stick to bring the crosshairs back to it, the system released the bomb. The pilots told me that, as a result, they threw bombs all over the place.

I thought about that and said, "What if

we take the computer out of the system?"

The next day I was able to get a practice mission with four 250 pound bombs. I went to the Suwan bombing angle and tried their system. It was simple and by the end of the fourth bomb run I had dropped three shack. I simply followed their procedure and cross-checked my G meter. When it read 1/2 G and my crosshairs were on the target, I hit the release button and "bull's-eye!!" All I did was remove the technology and replace it with the human factor.

The same thing applies to the problem with the KC-46. Boom operators with thousands of hours experience have told you, time and time again, that television just doesn't work. Television gives only a two-dimensional picture whereas the human eyes, two of them, give a three-dimensional picture with depth perception. That is vitally important if the boomer is going to do his job without punching a hole in the skin or windshield of the receiver.

In short, if God wanted the boomer to use television, he wouldn't have invented eyeballs.

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

I was heartened to read the four pages in the January/February edition of Air and Space Forces Magazine reporting that progress continues to be made on KC-46 deficiencies. After all, it's only been 12 years since the KC-46 was selected as the winner in the KC-X tanker competition (February 2011) and a mere 5.5 years after Boeing was required to deliver the first 18 "fully capable" aircraft to the USAF (by August 2017).

Yea team, such progress!

WRITE TO US

Do you have a comment about a current article in the magazine? Write to "Letters," *Air & Space Forces Magazine*, 1501 Langston Blvd, Arlington, VA 22209-1198 or email us at letters@afa.org. Letters should be concise and timely. We cannot acknowledge receipt of letters. We reserve the right to condense letters. Letters without name and city/base and state are not acceptable. Photographs cannot be used or returned.

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Although it has been a few years, I flew KC-10s and KC-135s for most of my flying career, and I believe I recall that even back in the “olden days” we had refueling booms that refueled all receptacle-equipped receivers in the inventory, pallet locks that stayed locked, fuel system seals that sealed, and boom operator visual systems that enabled safe refueling day, night, and in the weather. Maybe I misremember?

So what happened? How did we get on this embarrassing (and apparently never-ending) journey that eschews proven concepts in favor of technical gimmickry? And maybe more importantly, why are we still on it?

Not only is it a world-recognized embarrassment to Boeing, the USAF, and the citizens of the U.S., this fiasco has wasted years and untold piles of cash and has caused immense harm to our military capabilities over time. We are collectively poorer in so many ways because of it.

I won't hold my breath while I continue to scan the news for the punishment of those responsible.

Brig. Gen. Thomas E. Stickford,
USAF (Ret.)
Burke, Va.

Your January/February issue still touts the KC-46. But since its first flight in 2014 and delivery four years later, it has been plagued with problems. Time and money, years and billions, have been lost and are not recoverable and still we have problems. One “fix,” the RSV-2.0, is over three years away.

Tell Boeing to go back to the drawing board and to put a Boomer's pod under the empannage and to leave the video games to the arcades.

And ... if the receptacles were emplaced on the nose of our receiving aircraft as on the F-105 and the other Republic stalwart, the A-10, instead of above and behind our pilots our refueling would be a lot easier—easy to hook up and without the disturbing bow wave; ask any old Thud Driver. Because we liked the Boomers we would not denigrate them ever. But, with our receptacle right in front of our wind-screens, we could have easily plugged in ourselves.

While I'm at it, two more notes. Where was the B-36 in your pictorial of our long-range strike bombers? Wingspan of 230 feet, 10 engines, and 10,000 mile range! Finally, adding division to the tape measure may not reduce overweight, but it will surely improve posture as members suck in their guts and try to stand taller.

Lt. Col. John F. Piowaty
USAF (Ret.)
Cape Canaveral, Fla.

Finally! A senior officer that is willing to stick his neck out and do something other than talking about the possible threat from China. Gen. Mike A. Minihan's written directive to his command and commanders reminds me of the notice Halsey sent to his fleet regarding encounters with the IJN (Imperial Japanese Navy) prior to Dec. 7, 1941. General Minihan established a rock-solid deadline of Feb. 28, 2023, for reporting back to him. I wonder how that went. Results of the weapons qualification are probably interesting as well.

I see once again, the Air Force is taking a bath on the KC-46 again. To wit:

Complex, unorganized cargo loading procedures. How is this possible? Remind me again just how long the Air Force has been loading aircraft. How is loading this aircraft more complex to load than a C-135? After all, it was designed as a commercial aircraft first.

The other five issues bear similar serious review. All of these issues results from poor planning and a lack of leadership. Why has no one been fired? All of this reflects poorly on the current Air Force leadership. Fire management in Boeing and the Air Force officials—both military and civilian now.

Issues with the boom are still not projected to be fixed anytime soon. No excuse for that. Any excuse offered is ... well ... just BS. Issues with the Remote Vision System are years away from being resolved? Again. No excuse.

Why, with this many issues, are the meetings of the deficiency board infrequent? Not poor leadership ... just plain no leadership. I hope that the individuals charged with the B-52 upgrades are reading the magazine and are planning steps and procedures to avoid similar situations with their program. There is that concept again—leadership, or a lack thereof.

Maj. Howard T. Whitehurst,
USAF (Ret.)
Prescott Valley, Ariz.

Advancement

In “Honorary Promotions,” [March 2023, p. 54] stopping the inflation of honorary promotions is easy without raising interest rates or risking a recession! Just stop the practice of awarding general officer promotions outside the normal promotion process using various real and imagined

loop holes in the regulations as was outlined in the article.

Replace the questionable practices with a straightforward way of recognizing exceptional contributions such as giving each Chief of Staff the authority to give special recognition to deserving individuals. A limit on the number designated per year or per term as Chief would be necessary.

Col. Michael R. Gallagher,
USAF (Ret.)
Hillsboro, Ore.

F-16s in Ukraine

What is the end state for the war in Ukraine? [“Will Ukraine Get F-16s?” March p. 44] It isn't going to be another agreement like the Budapest Memorandum of 1994 in which the U.S., U.K., and Russia guaranteed the independence of Ukraine. That didn't work. Ukraine is probably not getting in NATO. The likely alternative is arming Ukraine to the point where it will deter any future Russia attacks. Where is that point? We don't know, but it will certainly involve arming Ukraine with western aircraft such as the F-16.

The USAF is probably retiring 50 F-16s this year, and it would be wise to give them to Ukraine. What difference could this make? Currently, the press has noted the wide disparity between the number of artillery rounds fired by the Russians (about 20,000 daily) vs. the Ukrainians (4,000-7,000 daily.) Each artillery round weighs about 100 lbs, so the Ukrainians are hitting the Russians with 4,000 rounds x 100 lbs or 400,000 lbs per day. This same weight of explosives could be delivered by 50 F-16s making two sorties per day with a load of 4 x 1000 lb bombs.

Specifically, this would be 50 F-16 x 2 sorties x 4 x 1,000 lb = 400,000 lbs. While the press has noted the difficulty in getting another 4,000 rounds to Ukraine because of artillery production limitations, the problem could be solved by using F-16s. Operationally the F-16s could fly in low, zoom to 15,000 ft in 20 seconds, release the 1,000 lb bombs on the Ukrainian side of the front line and dive down to treetop level again in 10 seconds which would be too fast for Russian anti-aircraft to react. The glide range of the 1,000 lb bombs (especially if they were JDAM-ER) would be beyond the Ukrainian artillery range. This is just one example of what the F-16s could do to help even the odds and there are many other missions as well.

William Thayer
San Diego

Legacy of Valor: The Tuskegee Airmen

In reading the article “The Tuskegee Airmen, Heroes of War and Peace” by Daniel L. Haulman [January/February, p. 41], I was surprised and disappointed to see such a lack of credit for the accomplishments of Gen. Benjamin O. Davis Jr. in it. Our First Flight Society inducted General Davis Jr. as the 2022 Honoree of our Paul E. Garber Shrine at the Wright Brothers National Memorial at Kitty Hawk, N.C., on Dec. 17, 2022.

An important part of our decision to recognize him as the Honoree was the part he played not only as a combat leader, but for being an outstanding leader in the integration of the U. S. Air Force beginning in 1948 when he played a key role. Then-Colonel Davis served as an adviser to both the Air Force DCS/Personnel on their study on USAF racial policies and practices, and the Fahy Committee to establish the formal Air Force integration policy. Thereby playing a key role in the Air Force becoming the first branch of the Armed Forces to integrate.

In “Makers of the United States Air Force” by John L. Frisbee which focuses on the 12 Leaders “whose careers spanned the life of the Air Force and who filled with distinction a variety of roles in its evolution,” he is one of those 12. One of the things it points out is that it was not a “War Department study” that allowed the Tuskegee Airmen to stay in combat but the testimony of General (then Colonel) Davis Jr. before a committee that did.

“Davis’ articulate defense helped convince the committee, and through it the highest U.S. Army leadership that the Tuskegee Airmen deserved more time to prove themselves. General Marshall agreed that the 99th should not be removed from combat on the little evidence presented by the Army Air Forces.” This author concludes that on the integration of the Air Force, “Gen. Benjamin O. Davis Jr. can claim a larger measure of credit for inaugurating this critical reform than any other person. For that pioneering accomplishment, America stands in his debt.”

As to Haulman’s, “It is very possible that one reason the 332nd Fighter Group lost fewer bombers to enemy airplanes than the other escort groups is that its pilots were ordered not to leave the bombers to go chasing after enemy fighters;” I had the honor of spending quite a bit of time with Brig. General Charles McGee, who was unequivocal on the discipline laid down by General Davis Jr. to stay with the bombers and getting back to them after driving off attacking German fighters until they were clear of further potential attacks. There was clearly a reason that General Davis’ P-51 carried the name “By Request.”

Haulman nears the end of his article transitioning to, “Many of the Tuskegee Airmen elected to remain in the Air Force after 1949, some of them flying combat missions in Korea and Vietnam” and failing to cite any of the postwar accomplishments by Gen. Benjamin O. Davis Jr. at all, let alone his key role in integrating the Air Force as previously cited.

We were proud to have a video message from Chief of Staff of the Air Force Gen. Charles Q. Brown, Jr. for our event in which he paid honor to the leadership of General Davis Jr. both as an inspiration to him and for his part in leading the integration effort within the Department of Defense. Our keynote speaker for the event, Gen. Mark D. Kelly, Air Combat Command Commander, commented that “No Airman embodies the idea of thriving in the warrior spirit of our Air Force with a past or present more so than our honoree today, Gen. Benjamin O. Davis Jr. I think General Davis is the epitome of what we call today ‘empowered Airman,’ and in turn, he empowered other Airmen to give us the competitive edge we still enjoy over our adversaries.” I think that these current Air Force leaders get what both the Tuskegee Airmen and Gen. Benjamin O. Davis Jr. meant to today’s Air Force.

For myself, and only myself, I finally take issue with Haulman’s supposition at the close of his article that, “We should remember the Tuskegee Airmen story as a Black and White story, a story

of American military personnel who served their country and furthered the great principle that all men are created equal.” Returning to “Makers of the United States Air Force” on the postwar integration of the Air Force, the author cites, “Even after integration took place, Benjamin O. Davis Jr.’s career was still shaped by race, for no one would expect that all prejudice stopped when the Air Force formally ended segregation.

“The official sanctions and discriminations ended, but the Air Force was composed of thousands of people whose attitudes had been conditioned by prejudice, and although institutional bigotry ended, personal prejudice was much harder to uproot. Unquestionably race played a role in General Davis’ post-integration career. Both he and Mrs. Davis enjoyed overseas assignments where they met less racial discrimination than in the States. But it was overseas, most importantly, that the Air Force was willing to use Davis as a commander.

All of his commands after Air Force integration were overseas, despite his outstanding record as a commander. The Air Force apparently believed that the time was right for senior Black commanders, but not in the United States.” My reading of his autobiography, “Benjamin O. Davis, Jr.: American,” is that clearly his early, voluntary Air Force retirement was a result of asking for a more demanding job of the Chief of Staff of the Air Force and being offered nothing—so it was time to move on.

For the Tuskegee Airmen that continued in the Air Force, it continued to be a “Black and White story” of their determination to excel and is probably best reflected in both Benjamin O. Davis Jr. and Charles E. McGee receiving promotions deserved only after their retirement.

Lt. Col. R. William Douglas,
USAF (Ret.)
Holly Springs, N.C.

I enjoyed reading Daniel Haulman’s short history of The Tuskegee Airmen and the 332nd Fighter Group in the January/February issue. I was disappointed, however, in Haulman’s choice of words describing what really was Lt. Gen. James H. Doolittle’s 8th Air Force alternative strategy for protecting the

bombers by ranging out and away to engage the attackers directly.

To say that the 332nd pilots were ordered to remain glued to the bombers and not “to go chasing after enemy fighters” conjures up the image of maverick fighter pilots going off in search of glory. On the contrary, most post-war

assessments, including that of the chief of the German fighters himself, Gen. Adolph Galland, concluded that it was Doolittle’s very strategy that established air superiority for the Allies and hastened the destruction of the Luftwaffe.

Recognizing the correctness of this approach, that is, to clear the skies

ahead of the bombers, takes nothing away from the bravery and excellence demonstrated by the Tuskegee Airmen, who rightly deserve an honored page of Air Force history.

Col. Ron Schloemer,
USAF (Ret.)
Oxford, Ohio

I just finished reading the article on the Tuskegee Airmen in the January/February issue. I'd like to thank the members of the 99th Fighter Squadron's Tuskegee Airmen for protecting my dad, Sgt. George Mathys, 45th Infantry Division, 160th Field Artillery Battalion, over Anzio, Italy in 1944. As a Patriot Guard Rider, I've met and stood honors for quite a few Tuskegee Airman.

Thank you ALL.

Maj. Dan Mathys,
USAF (Ret.)
Fort Worth Air Power Council
Arlington, Texas

I wish to commend Daniel Haulman for his thorough article on the Tuskegee Airmen and their revered exploits in both the 332nd/477th Fighter Groups and associate units during the Second World War. This piece has to be the most informative one I've read detailing their role and mission, along with their path to realizing an integrated USAF (the first DOD branch to do so).

I, among many other Airmen, had the privilege of serving in the 332nd AEW (AFCENT) during the Iraq War, in multiple phases. As we too generated and sustained vital airpower for ground troops, we also came to learn more about those we were commemorating.

Also, some of my fellow Airmen deployed to Balad Air Base, Iraq, had the pleasure of meeting three charter Tuskegee Airmen: Col. Charles McGee, Lt. Col.'s Lee Archer and Herbert Carter, along with four other fellow Red Tails, during the operational midpoint to share their own stories (talk about rugged warriors, gearing up, and visiting an active war zone on a morale tour in their (then) 80's!

I will always admire these men and what they from this Greatest Generation were able to accomplish as aerial warfighters as well as brothers in arms, Black and White, against a common enemy, to use Haulman's words. Yes, we should all learn from the injustices committed, but I believe we should also remember them best for their role in accelerating positive social change through their demonstration of skilled and disciplined

Airmanship. That in my opinion is the highest honor we could ever bestow as a nation.

MSgt. Thomas M. Ruffing,
USAF (Ret.)
Bountiful, Utah

Alarmed

I was interested to read Col. Budura's letter to the editor ["False Alarms," March 2023] about his experience in the False Missile Warning of Nov 9, 1979. I have never read anything about this event, but on that day I was a first lieutenant pulling five-minute air-defense alert in the F-106 at McChord Air Force Base, Wash. As we were having breakfast (Air Defense Command squadrons had dining halls), completely out of the blue came an announcement "ALL AIRCRAFT FLUSH" over the intercom. "FLUSH" was a wartime survivability measure whereby we would disperse our F-106's in pairs to different civilian airfields around the northwest.

Being new to ADC, I was vaguely familiar with the concept, but it was not something we ever practiced. The pilots all looked stunned for a moment, then jumped up, raced to life support to grab a parachute and helmet, and headed out to the ramp to find an aircraft. Because I happened to be on alert, I went post-haste out to the alert hangar and jumped in my jet—all the while thinking that this must be an exercise. This was reinforced by the fact that the visibility was nearly zero-zero in a dense Tacoma fog, and so I was convinced we could not possibly really be going to launch since there was no way we could land back at McChord once the exercise was over.

As I pulled into the arming area, I found several other aircraft lined up, with one already on the runway, when, just before he released brakes, the FLUSH order was canceled.

Upon my return to the squadron, I discovered that "no," the FLUSH had been real-world! The other pilots all said that they had thought that WW III had somehow started and it was the end of the world! There were plenty of stories that followed—one of the pilots, seeing all the aircraft on the ramp spoken for, went to the maintenance hangar, where an F-106 was up on jacks under heavy maintenance.

About six to eight maintenance guys came out, physically pushed the aircraft off the jacks, and starting putting every third screw back into the panels that had been removed. He was about to start the engine when the FLUSH was canceled,

and it was a good thing because he said the hangar floor was covered with screws and pieces of the airplane.

I took some deserved grief for not being the first airplane to the runway, since my jet was already cocked and loaded, and it turned out that a couple of Canadian F-101's on alert at Comox Air Force Base, Canada, actually did get airborne, but beyond that we never heard anything more about the event, except that it had been a "false alarm."

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

Two of A Kind

With regard to "Letters" [January/February, p. 5], I concur with Lt. Col. Dale Hanner, USAF (Ret.). One magazine for each the Air Force and the Space Force. If I'm interested in either, I will buy that magazine.

SMSgt. Leonard N. Schaefer,
USAF (Ret.)
Azle, Texas

B-36 Peacemaker

In the January/February issue I read the article "B-21 Shape of the Future," [p. 34]. On p. 36, there was a graphic presenting "Long-Range Strike Through the Years," which showed the USAF bombers with the greatest range of their era, from the B-17 to the B-2. My question is: Why wasn't the Convair B-36 Peacemaker shown as well?

The omission of the B-36 I hope was an error. To not show this aircraft is a slight to all of the aircrew and maintainers that operated this aircraft in SAC from 1949 to 1959.

The B-36 held the Line and kept the Peace while deterring aggression until the newer jet aircraft could come into service with the USAF.

The B-36 deserves better than what You've just done to it.

Gary A. McIntosh,
GS-7 (Ret.)
Niagara Falls, N.Y.

Reunion Notice:

14th Air Force (Space Numbered Air Force), for the 30th anniversary of the stand-up (July 1, 1993). We are targeting getting people together at Vandenberg Space Force Base, Calif., on **June 22-25, 2023**, with particular focus on the "**Plankholders**" who were the initial cadre during the years of 1993-1997.

Unit members from any year are welcome, but we are looking to bring the original members back together. **Contact: Rod or Melinda Reed (isurocket@gmail.com) (805-588-9616).**

Revitalizing Air Force Materiel Command

Gen. Duke Z. Richardson leads Air Force Materiel Command, and recently released a new strategic plan for AFMC. He spoke with Air & Space Forces Magazine's News Editor, Greg Hadley, about his vision for the command. The conversation has been edited for length and clarity.

Q: The first line of effort in your strategic plan is to “pursue enterprise solutions.” What does that mean?

A: Within the command sometimes even within certain centers, you might have business done slightly differently, in different ways in different offices. And I think a lot of that is just fine. We wouldn't want to over-prescribe.

But what we're trying to do is where it makes sense to have the best way of doing it that we then propagate that either across a single center, or if it's AFMC-wide, across all six centers. There's value in that, just as we move our folks around, they're not learning new processes every time they move jobs. And it also extends into just being able to pick the best of breed and making sure that propagates.

One of the first enterprise solutions that we're going to come out with is this idea called digital materiel management. ... We've got a number of programs that are doing programs digitally, but let's see if we can figure out a standard way of doing it—not just a standard way, but standard tools, trying to figure out a common tool set that we could use, and then making sure that the workforce is training.

Another one is we have a tool called Air Force Product Life Cycle Management. And it's basically an IT tool that we're going to use to house a lot of our data in a very standardized way across all six centers. And I think that might be the only tool we mandate because we also have to realize that we're going to be working very closely with the defense industrial base, so I'm trying to be very cautious and not mandate too many tools. But that one is a tool that we will mandate in terms of how to house all the data.

We're going to build enterprise solutions that the whole Air Force can use, and we're going to use enterprise tools to build those enterprise solutions.

Q: Another idea in the Strategic Plan is surge requirements. That issue has been highlighted by the war in Ukraine. How do you envision that working for AFMC?

A: Like every other MAJCOM needs the capability to surge, AFMC does the same exact thing. So we will actually do a lot of exercising. We will come up with exercise scenarios in the materiel domain like, 'Hey ... here's a problem statement. Here's a requirement from, pick a combatant commander, how do you go about getting X munitions to this COCOM within nine months or something like that?'

And so we'll pull together a team from across Air Force Materiel Command to put together a very, very quick strategy on how to do that. ... We haven't exercised that muscle as much as we should have. The purpose of that objective is to dust off that plan



Gen. Duke Richardson, head of AFMC, talks about building enterprise solutions at AFA's Warfare Symposium in Colorado.

Mike Tsukamoto/staff

and start exercising that muscle a lot more than we have in the past.

We have certain organizations that do exercise that muscle, but we're going to try to get more folks involved in it.

Q: So how exactly do you exercise those muscles?

A: So you basically write out a scenario: 'Hey, what if you had to put this special radio on a KC-135, how would you go about doing that?' So we'll have a team that's not from the program office, from the Staff, they'll write up a scenario and hand that over and then three days later, the team has got to come in and brief the strategy for it.

What's really neat is they take them seriously and a lot of times the solutions they come up with are pretty good—like, wow,

we should just go ahead and do that. And so they're very, very realistic. Just like when you play a board game at home, people get into it.

Q: As you advance the strategic plan, what comes next?

A: What you're not seeing in the strategic plan is the initiatives—so you're seeing the [lines of effort] and you're seeing the objectives. What you're not seeing are the initiatives.

We are right now drafting initiatives to fall under each of the objectives. Those are in the very early stages. One of them is digital materiel management, we're going to come up with a training program. We have pockets of it going on going on, but we want to really expand it. So we've got teams that know how to do it, and so we're going to actually try to formalize the training behind all that and also the tools. There's an example of an initiative that's going fall under there.

If you look under LOE 1.2, "Deliver the Future Force," that's very closely tied to Secretary Kendall's operational imperatives. And so my job is to organize, train, and equip. So I'm not selecting the programs that follow the OIs. I'm also not selecting the strategies for executing the programs. What I have to do is make sure that I've got people ready to execute those programs. And so one of the initiatives is to take those programs that Secretary Kendall is about to approve and then start figuring out how to execute them from a staffing perspective, from a facilities perspective to make sure that we have the right classified facility space, and then from the tools perspective.

Q: When will those initiatives be released?

A: I don't intend to publish them, per se. The idea would be that you'd hear about them. The initiatives will come and go.

Another one is common support equipment. You hear the Chief and the Secretary talk about Agile Combat Employment, about distributing our forces more. So if we're going to distribute our forces, that requires more support equipment, and so if you're going to have support equipment distributed, it really makes a lot of sense to make sure that if you have multiple weapon systems at the same location, that they can share the same equipment, so

that you're not buying a lot of very specialized equipment. So an enterprise solution for me is common support equipment.

And you'll see something in the strategic plan about unique solutions only when necessary ... we will enforce that. It's not going to be 100 percent, but you're going to have to have a really good reason before you feel the need to build a piece of support equipment that only works on your airplane.

Q: Much has been made of the potential of the digital design process. What areas are most ripe for digital transformation?

A: All of them. I mean, seriously all of them.

Digital design is in manufacturing. So once you've designed it, you can imagine when you manufacture something, if you have digital design tools, it allows you to push a lot of the subassembly manufacturing off station, to the point where when the parts come together, they just fit. And so it takes a lot of the large tooling that you'd see in a normal ... aircraft factory [where] you'll see a lot of fixtures to hold the aircraft parts align just right so that you can then drill holes. We don't need to do that anymore.

What's really cool about these digital tools is because they're all cloud-based, you can distribute them. So your suppliers can actually build the parts as they come in. That tool that I talked about, the product life cycle management tool, it's going to house a lot of our data. And so it's also going to allow us to make sure that the intellectual property that the government owns is actually being enforced, but at the same time, the intellectual property that the vendor owns is also being enforced.

Part of this is having models that very accurately match the system.

We will never not fly to verify performance. But if we have models that correlate, we won't have to fly as much. We'll be able to fly at the corners of the envelope and do a lot more interpolation between the points. So yeah, it's very pervasive. It is not digitizing paper. It is not at all about that. It's enabled by three things—the cloud, number one. Number two, the computing power that we have today is just enormous. And the third thing is the companies have actually made all these digital design tools.

Q: Are there guidelines you need to put on digital design and digital testing? The T-7A was the vanguard of all of that, and the timeline put on that was extremely ambitious, but it has experienced delays. Clearly there are still things that need to be ironed out.

A: I think that is actually a very powerful use of digital design tools, which allowed Boeing to basically design, build, and fly an airplane in about three years—pretty remarkable.

I think the lesson that I take away from that is that it goes back to the models: When we do future solicitations, we have to make sure there's an ability to share the model. If we can't share the model and understand the model, both the government and industry, we won't be able to speed up the test part. That is one area that I do worry a little bit about. I think the test area is really ripe for digital materiel management, but that's only going to work out if we have certified models.

The joint simulation environment, that's being used pretty heavily right now on the F-35 program. We want to propagate it and start using it as a way of testing out more systems than just F-35.

But that really is going to require a certified model in it. So that'd be my one area that I'm watching closely is just making sure that the modeling part of it is really reflective and it's truly a digital twin of the physical world. If it's not a digital twin of the physical world, it will limit the usefulness of it. It will still be useful for things like product support and manufacturing, but it will

be less useful for design verification.

Q: In the Strategic Plan, I was struck particularly by the idea of wanting to amplify the warfighter culture. Why do you think that's important for AFMC?

A: Air Force Materiel Command is 70 percent civilian. It is easy to get disconnected from what all this equipment does that we're developing.

You can imagine yourself being a configuration manager—you may not see the linkage between that and actual aircraft dropping a weapon.

It really involves a lot of things. [First] is making sure they see how their job connects, because it definitely does connect. [Second] is getting them access to some of the intelligence products that they may not see, which you don't see.

These things come in many flavors, many different classification levels, but allowing more of the workforce that has the proper clearances to see why it is they're building and designing and supporting the systems that they're doing.

We're also going to try to do better about giving them opportunities to actually walk on their equipment and touch it. There'll be an effort where we're working very closely with the other major commands that actually operate the systems to allow more access to their systems, which they're very open to doing. What the workforce here does is very important. I can say that, but until they really feel it, they just think that I'm saying it.

Q: A lot of contractors have been stung by losses in fixed-price contracts. What are your thoughts on what this means for the Air Force and your relationship with those contractors?

A: If you look across time, we go through these phases of ... about 15 years where different contract types are in vogue—cost plus, fixed price and then we have bad experiences with fixed price and the push goes back to cost plus.

Maybe I'm a simple acquirer on this. But what I do is I really have a very simple process—what is the requirement that we're trying to procure or acquire? What's the risk? What are the technical risks inherent in that requirement, in fulfilling it? And then that then drives the strategy. When I say strategy, part of that strategy is a contract type. And so, if all that stuff's aligning, I think there are cases where fixed price development is appropriate.

Secretary Kendall, in his book, he kind of offers a five-step recipe in there. ...


One is setting firm requirements, which means that you've already done the cost versus performance trade-offs. So those are all complete and you know the requirements are firm.

The second one is low technical risk. Now once you set those requirements, the technical risk is low. And basically you're integrating mature technologies. So you're not trying to invent something.

And the third one is having a qualified supplier base. So if you know that you've got qualified vendors that can actually bid, that would be a requirement.

The fourth one was financial capacity to absorb overruns. So, if for some reason, you did get into trouble, the company wouldn't go under. And the fifth one is motivation to continue. I think the fifth one is important, because there's got to be a business case, right?

I think if we get the first three right, we don't ever have to worry about four and five. Firm requirements, we're not trying to invent something, and we have qualified suppliers—if those three things are met, we don't have to worry about number four and five.

Fixed price is definitely an option. We just have to be careful that we don't try to apply it when it doesn't match. 



Staff Sgt. David Petrie and Staff Sgt. Timothy Petterson, crew chiefs assigned to the 23rd Expeditionary Bomb Squadron, inspect the Pratt & Whitney TF33-P-3 turbofans engines in a B-52H Stratofortress after landing at Morón Air Base, Spain, in March. Those original engines will all be replaced by more efficient Rolls-Royce F130 engines, mounted in the same twin-pylon, eight-engine arrangement, by 2038. Testing of the new engines and enclosures is underway now.



At the upper reaches of the atmosphere, the pilot of a U.S. Air Force U-2 Dragon Lady looks down on a Chinese surveillance balloon maneuvering over the central United States in February. Two days later, an Air Force F-22 shot down the balloon with an AIM-9X Sidewinder missile. The U.S. built 104 U-2s from 1955 to 1989. Some 27 remain in the active inventory, averaging 40 years of age.



Two Russian Su-27 Flankers repeatedly intercepted an unarmed U.S. Air Force MQ-9 in international airspace over the Black Sea, initially attempting to douse it with fuel and disrupt it with jet wash, but ultimately causing a collision that forced operators to ditch the aircraft in the sea. This freeze-frame from video released by the Pentagon shows a Russian jet dumping fuel. "They would start an intercept ... and start dumping fuel all over the skies and then fly right in front of the MQ-9," said Gen. James Hecker, head of U.S. Air Forces in Europe, calling the Russian pilots unprofessional—and worse. "We saw true incompetence when, on the last attempt to do that same maneuver, the pilot basically had too much energy coming in, couldn't get out of it, and clipped the propeller of the MQ-9."

FACES OF THE FORCE



Jason Trefry/USAF

Space Force **Lt. Col. Nathan Zahn**, Air Force Honor Guard commander, became the first Guardian to lead a platoon and represent the service in a joint ceremonial detail at the Tomb of the Unknown Soldier on Feb. 9. He was joined by counterparts from the Army, Navy, Marines, and Coast Guard at a wreath-laying ceremony for Georgia's visiting Defense Minister Juansher Burtchuladze. "Our country has a hard-fought legacy of freedom, secured by the warriors resting at Arlington National Cemetery, as well as all veterans, those currently serving our nation and their families," Zahn said.



Airman 1st Class Michael Killian

After wanting to leave his comfort zone in 2018, Air Force **Senior Airman David Larsen**, 6th Communications Squadron radio frequency transmission technician, reevaluated his life and left his job for America. Dual U.S.-Germany citizenship led Larsen to enlist in the U.S. Air Force. "I decided to sign a four-year contract with the Air Force for a challenge," he said. "I soon discovered how much [the Air Force] seemed to care about my well-being." His initial dream was to become a pilot, but he was too old. However, the rule changed while he was at tech school, and Larsen will soon take his USAF pilot test.



Senior Airman Makensie Cooper

Capt. Jarod Washington, 15th Operations Support Squadron aircrew flight equipment commander, began his career at the Air Force Academy as only one of two African Americans in his pilot training class. He knew he had chosen the right career field after his first solo flight. "As soon as I landed, that was one of the best feelings I've ever had," Washington said. "I think it is really cool to think back to my six- or seven-year-old self, and reflect on how proud he would be to know that this is where he would be in 20 years."



Airman 1st Class Marrisona Rodriguez/ANG

Airman 1st Class Alvin Auffant, a cyber surety specialist with the 156th Combat Communications Squadron, and also an artist, has developed designs representing his previous military organizations. Last June, he was selected to design the new 156th CBCS morale emblem, a mural of the legendary phoenix. "We wanted something special and unique," Auffant said. Lt. Col. Troy Johnson, the 156th CBCS commander, who tasked Auffant for the work, added, "The phoenix mentality is that there may be failures, but we will grow and be bigger and stronger out of those failures to become successful!"



Airman 1st Class Elizabeth Davis

Space Force Guardian **1st Lt. Katie Scheibner**, 333rd Training Squadron cyber warfare course student, led conversations focused on the importance of the space domain at the annual Association of Marshall Scholars U.S.-UK. in London in January. "I wish we could have had endless amounts of time to have those conversations," Scheibner said. "I can't see a future where we don't work together to help defend the space domain." Holding a computer science degree, Scheibner volunteered to be one of four cyberspace operations officers to commission directly into the Space Force.



USAF

Brig. Gen. Jeffrey R. Alexander, director of Air Force Global Strike Command A5/A8 Strategic Plans, Programs, and Requirements, is the 2023 U.S. Air Force Black Engineer of the Year Stars and Stripes Honoree. Alexander, also chief of staff of the Michigan Air National Guard, was chosen for his outstanding contributions as a leader and for being a positive role model for those aspiring to have careers in STEM in public and private sectors. "I am humbled by this selection," Alexander said, "and I think I won because I have tried to do the best I can, always."



Airman 1st Class Michael Killian

Air Mobility Command named Air Force **Tech. Sgt. Evon Pennington**, a 6th Medical Group public health technician, as female Athlete of the Year. A recent Ms. Olympia competitor, Pennington has been an athlete most of her life, starting with track and field and then transitioning to bodybuilding in 2014 when she cross-trained in her current public health job. "At the age of 10, I remember watching the Olympics for track and field," Pennington said. "From then on, I knew internally that I was meant to be an Olympian. I wasn't sure how I was going to get there, but I truly believed that this was more than just an aspiration or a dream."

Tech. Sgt. Raymond Zgoda and **Master Sgt. Sarah Hubert** (originator of the winning idea) of Yokota Air Base, Japan, won the 2023 Spark Tank competition before thousands of Airmen, Guardians, and a judging panel that included the Air Force Secretary, the Air Force Chief of Staff, the Chief of Space Operations, and the top enlisted members of the Air and Space Force. Spark Tank is an annual department-wide competition modeled after the "Shark Tank" TV program, in which DAF "intrapreneurs" pitch their innovative ideas before top leaders in search of funding to solve real-world problems. From this year's field of 235 "sparks," six finalists earned the chance to pitch their projects on the main stage at the 2023 AFA Warfare Symposium. Zgoda and Hubert won for their proposal to use ground-penetrating radar to map the underground pipes and wires beneath the surface of military installations, and then use augmented reality to avoid accidental damage to underground infrastructure. They estimate the new tech could save up to \$750,000 in wasted labor on every single base. Winning over SECAF Kendall, CSO Saltzman, CMSAF Bass, and CMSSF Towberman, they took home the prize.



Mike Tsukamoto/staff

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Mike Tsukamoto/staff

No More Questions

“When addressing the pacing, acute, unforeseen challenges of today or tomorrow, Airpower is the Answer.”

—Air Force Chief of Staff Gen. Charles Q. Brown Jr. at the AFA Warfare Symposium March 7.

Ever-Ready



Staff Sgt. Danielle Sukhiall

“My goal is to be ready today, tomorrow, next week, next year, next decade. And set ourselves as an Air Force to have capability and capacity to be able to provide options for the President.”

—Air Force Chief of Staff Gen. Charles Q. Brown Jr. during a recent event at the Brookings Institution stating that we must be ready for all looming threats. [DefenseOne, March 3].

Not Today ... Or Tomorrow



R. Nial Bradshaw/USAF

“This budget is a procurement budget. It puts its thumb on the scale in favor of game-changing capabilities that will deliver not just in the out-years, but in the near term, too. Our greatest measure of success and the one we use around here most often is to make sure the PRC leadership wakes up every day, considers the risks of aggression and concludes today is not the day, and for them to think that today and every day between now and 2027, now and 2035, now and 2049, and beyond.”

—Deputy Secretary of Defense Kath Hicks, unveiling the Biden Administration's 2024 defense budget request, March 13 [from transcript].

Anchored Away

“I woke up this morning, checked what's the readiness rate. It's 32 [percent]. We can't live with that. We can't live with a 32 percent readiness rate. And over the last decade it's below 50.”

—Gen. David Berger, Commandant of the Marine Corps, to the Amphibious Warship Industrial Base Coalition [DefenseOne, March 9].



Mike Tsukamoto/staff; Robinraj Premchand/Pixabay

Digital Whack-A-Mole

“Today, the threat that everyone is talking about is TikTok, and how it could enable surveillance by the Chinese Communist Party, or facilitate the spread of malign influence campaigns in the U.S. Before TikTok, however, it was Huawei and ZTE, which threatened our nation's telecommunications networks. And before that, it was Russia's Kaspersky Lab, which threatened the security of government and corporate devices. ... We need a comprehensive, risk-based approach that proactively tackles sources of potentially dangerous technology before they gain a foothold in America, so we aren't playing Whack-A-Mole and scrambling to catch up once they're already ubiquitous.”

—Sen. Mark R. Warner (D-Va.) Chairman of the Senate Select Committee on Intelligence, and Sen. John Thune (R-S.D.) along with 10 other senators, proposing a new bipartisan bill (RESTRICT) to address foreign national security threats on March 7.

Do the Math



Julita/Pixabay

“The budget will hit a trillion dollars. Even if it only grew 3 percent a year, when the numbers are what they are, it's inevitable. And I think maybe that's going to be a psychological, big watershed moment for most of us. ... It just reflects the growth of the economy, among other things. When I was born, [defense spending was] at 9 percent of GDP; [during] Ronald Reagan's [term, it] was considered high at 6 percent. Now we're at three. So it's a big number, but in other contexts, you could look at it another way.”

—DOD Comptroller Michael J. McCord, March 13, on the growth of the defense budget. At 3 percent annual growth, it will reach \$1 trillion by 2030.

FASTER

“Everything needs to go faster. Everyone needs a sense of urgency, because that's what it's going to take to prevent a conflict.”

—Adm. John C. Aquilino, commander, U.S. Indo-Pacific Command, on Chinese military expansion and the need for America to move rapidly to improve its force deployment in the Pacific [The Washington Post, Feb. 20].

A Record Budget: President Seeks '21st Century' Air Force

By Chris Gordon, Greg Hadley, David Roza, and John A. Tirpak

President Joe Biden's \$842 billion defense budget is the biggest in history, with a 5.2 percent pay increase, funding for 72 new fighter aircraft, heavy investment in 20 major Air Force and Space Force systems, including a dozen new starts, and accelerated procurement and research spending.

Yet even so, topline defense spending would increase only 3.2 percent, or well under the U.S. inflation rate for the past year which was 7.9 percent, according to the U.S. Bureau of Labor Statistics. Also notable: The Air Force—perhaps the most critical element of the joint force in deterring and ultimately fighting a war in the Pacific—continues to lag behind the Army and Navy in overall spending.

The Biden administration is requesting \$259.3 billion for the Department of the Air Force in its fiscal 2024 budget, an increase of more than \$9 billion or about 4 percent over this year.

The proposed budget includes a 5.2 percent pay raise for troops, a 4.2 percent increase in the Basic Allowance for Housing, and a 3.4 percent boost to the subsistence allowance. With inflation still running higher than budget growth, lawmakers in Congress are likely to press for further increases over the coming months.

Not all that money would go to the Air Force and Space Force, however; \$44.2 billion would pass through the department budget to other agencies. Funding for the Air Force and Space Force would be \$215.1 billion, \$9.3 billion over the prior year.

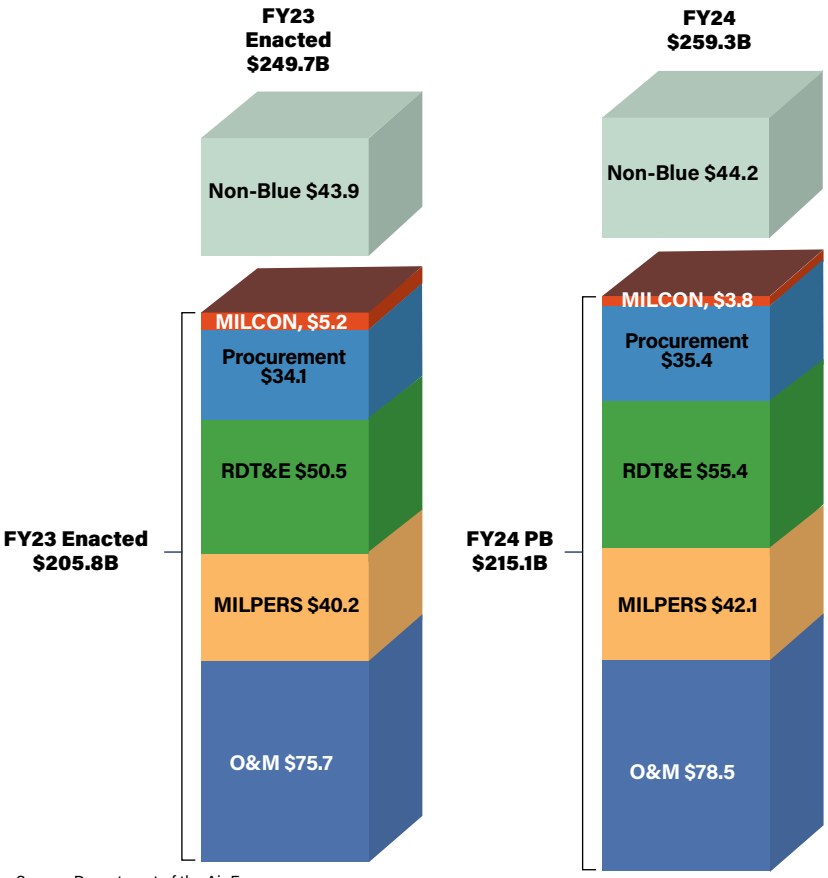
The proposal would:

- Retire 310 existing aircraft and invest billions to develop and acquire replacements
- Buy 48 F-35As and 24 F-15EXs
- Start the acquisition process for the B-21 Raider
- Invest heavily in the Next-Generation Air Dominance (NGAD) fighter and in a coming generation of uncrewed Collaborative Combat Aircraft (CCA)
- Increase the Space Force budget by nearly 15 percent, to \$30 billion.

The Department of the Air Force budget would grow

How the DAF Budget Stacks Up

The President's proposed Department of the Air Force fiscal 2024 Budget is \$9.6 billion more than was enacted for 2023. After deducting the "non-Blue" funds that pass through the DAF to go to other agencies, that increase declines to \$9.3 billion. How that spending breaks out by category:



Source: Department of the Air Force

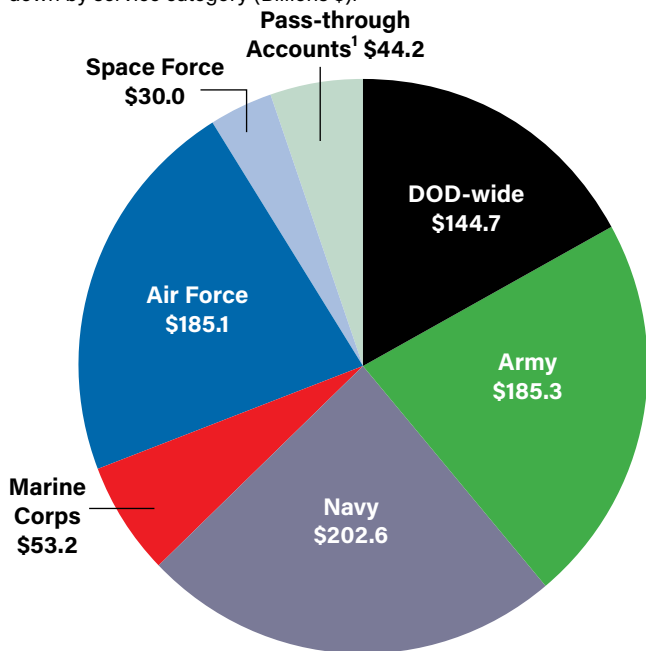
slightly more than the overall defense budget. The President is seeking \$842 billion for the Defense Department in fiscal 2024—a 3.2 percent increase—plus an additional \$44 billion that mostly funds nuclear programs in the Department of Energy. That makes for total defense spending of \$886 billion in the Presidential Budget Request.

HOW THE SERVICES STACK UP

The administration's proposal does not treat all the services equally. The Air Force, Space Force, and Navy would all gain investment, while Army and Marine Corps spending would remain essentially flat if the Pentagon gets its way.

How DOD Would Slice its '24 Budget Pie

How the Biden Administration's proposed 2024 budget breaks down by service category (Billions \$):



¹Pass-through funding is contained in the Department of the Air Force budget, but is spent by other defense agencies.

Source: DOD, A&SF Magazine Research

After two decades of wars in the Middle East, the Department of Defense has shifted its focus largely toward the Pacific and China, and instead of large armor purchases, is increasing investments in long-range precision weapons.

"The focus here is making our military more capable, not making it larger," DOD comptroller Michael J. McCord said.

The Department of the Air Force budget continues to be inflated by \$44.2 billion in pass-through spending neither destined for the Air Force nor Space Force but rather for other agencies. In reality, the Air Force and Space Force share just \$215.1 billion of the \$259.3 billion DAF budget. And for the 30th year in a row, Air Force spending is less than the Army and the Navy.

MAJOR EFFORTS

Secretary of the Air Force Frank Kendall said the budget plan reflects a shift to new capabilities over sustaining USAF's ever-aging platforms. It funds 20 "major efforts" and a dozen new programs, he said. The Space Force budget rises \$3.9 billion, or nearly 15 percent, to \$30 billion under the President's plan, while the USAF budget, totaling \$185.1 billion, would grow by \$5.4 billion, or just 2.9 percent.

Much of the new spending is to gain future capability, some of which may not arrive until the end of this decade.

"We're in a situation strategically where we have to make a transformation to next-generation capabilities," said Kendall. "If we stay where we are and emphasize keeping the current force strong ... we're going to be falling behind. And we're going to be falling behind pretty rapidly."

NGAD is already maturing in development, Kendall said, but the program remains shrouded in secrecy. The development of CCAs is also rapidly maturing, spurred by a combination of Air Force and industry investment.

The budget also pays for 15 new KC-46 tankers to continue replacing aging KC-135 and KC-10s, and invests in a new

stealthy tanker, dubbed the Next-Generation Aerial Refueling System (NGAS).

In a major decision regarding the F-35 fleet, the Air Force plan does not fund the Adaptive Engine Transition Program (AETP), which would have provided a new more powerful and potentially more reliable engine for the Air Force F-35A; the performance improvements were attractive, Kendall noted, but the Air Force would have had to fund the change on its own and the service opted instead for a less costly and complex core upgrade to the existing Pratt & Whitney engines.

"I think we've got a good balance and we were able to get the resources through processes internally to allow us to move forward," according to Kendall.

"The President's proposed budget for the Department of the Air Force rightly prioritizes modernization of our Air & Space Forces," said AFA President & CEO Lt. Gen. Bruce Wright, USAF (Ret.) "We are pleased to see a substantial pay raise—the biggest in 22 years—and a 15 percent increase in Space Force funding to improve intelligence, communications, and resilience in that critical domain. We also applaud robust investment for 72 new fighter aircraft, the B-21 bomber, the E-7 Wedgetail AWACS replacement, a new generation of Collaborative Combat Aircraft, and Sentinel ICBM modernization program.

"Yet at a time of grave threats and significant inflation, the rate of growth in the Air Force investment accounts is still not what it should be. Investments in airpower today will deter war tomorrow. Congress must work across party lines to ensure unfunded priorities are addressed and that budget legislation is completed in a timely manner this fall."

BUDGET FIGHTS


The \$842 billion topline for the Pentagon would be \$26 billion more than the \$817 billion appropriated for fiscal 2023—a 3.2 percent increase. Congress is likely to up the ante, as it did in each of the past two years. House and Senate Republicans will lead that charge.

Sen. Roger Wicker (R-Miss.), ranking member on the Senate Armed Services Committee, and Rep. Mike Rogers (R-Ala.), chairman of the House Armed Services Committee, each released statements criticizing defense investment as insufficient.

"The President's defense budget is woefully inadequate and disappointing," Wicker said. "It does not even resource his own National Defense Strategy to protect our country from growing threats around the world."

Rogers called the threats facing the United States "the most complex and challenging ... in decades." The President's budget request "fails to take these threats seriously," he added. "A budget that proposes to increase non-defense spending at more than twice the rate of defense is absurd. The President's incredibly misplaced priorities send all the wrong messages to our adversaries."

But Sen. Jack Reed (D-R.I.), chair of the Senate Armed Services Committee, praised Biden for crafting a "strong budget," even as he left room to tinker with the details.

"Some will inevitably say the topline is too much, while others will claim it is not enough," Reed said. "I say America's defense budget should be guided by our values, needs, and national security strategy. This topline request serves as a useful starting point. I look forward to receiving the detailed budget request so we can get to work crafting a responsible, balanced National Defense Authorization Act." 

Space Force Budget Would Soar by 15 Percent in 2024

The Space Force would gain the largest percentage increase under President Biden's 2024 budget request, a total of \$30 billion for the nation's smallest military branch, or 15 percent—\$3.9 billion—more than the enacted 2023 budget.

Investments in overhead persistent infrared missile warning systems, the global positioning system enterprise, and launch vehicles for both the National Security Space Launch and Rocket System Launch Program lead the increases.

"The FY24 request continues aggressively integrating the Space Force into the fabric of national and international security by collaborating across the Department of Defense, interagency, commercial industry, and our allies and partners," the budget documents say. "Space is a warfighting domain critical to the nation's security, economic prosperity, and scientific knowledge, therefore, the FY24 request reflects a substantial increase in funding over previous budget requests."

The Space Force would expand from 8,600 Guardians to 9,400. Like all military personnel, Guardians would receive a 5.2 percent pay raise, along with a 4.2 percent boost for the basic housing allowance, and a 3.4 percent increase in the basic subsistence allowance.

Much of the increase in the Space Force budget would fund new Research, Development, Test & Evaluation. The service is budgeted to spend \$16.6 billion for RDT&E in 2023, and the 2024 budget would add \$2.6 billion for a total \$19.2 billion. Development of new resilient missile warning and tracking satellites, space technology development and prototyping, and Next-Generation Overhead Persistent Infrared missile warning are the primary targets of that new investment.

The Space Force would also invest \$4.7 billion to buy new space vehicles and terminals, ground control systems, launch services and related communications security and training products.

The main focus of all that investment is modernization to respond to growing threats to space technology. "The fast-growing array of threats that can attack American interests in, through, and from space pose a challenge that cannot be addressed through enhancements to decreasingly relevant legacy space systems designed for an uncontested domain," the service wrote in its budget highlights.

The 2024 budget would support procuring 10 National Security Space Launch Services, which are used to send medium and heavy lift systems into orbit. Five launches under the NSSL program would deliver Tranche 1 and Tranche 2 transport capabilities, which are responsible for communications and data transmission in orbit. The 2024 budget request asks for about \$980 million more than last year for buying new launch vehicles and launch range upgrades.

The fiscal 2024 budget would also start up the production of Family of Advanced Beyond Line-of-Sight Terminals Force Element terminals for the Air Force's B-52 bomber. The FAB-T program allows commanders to communicate with B-52 crews even in contested environments.

The 2024 request also seeks:

- About \$5 billion for space-based missile warning. The

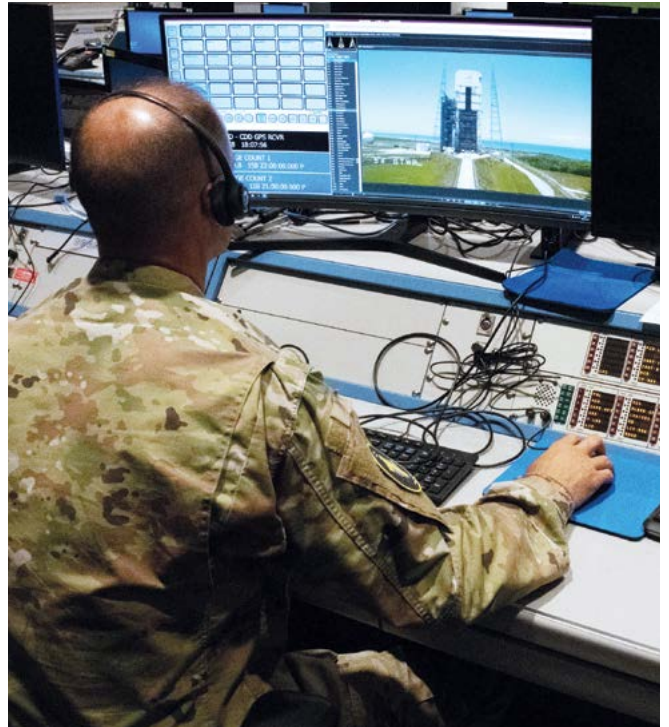


Photo: James Hodgman/USAF

The 2024 budget plan would fund 10 National Security Space Launches, including launching the Space Development Agency's first communications and data transmission satellites.

Next-Generation Overhead Persistent Infrared Program (OPIR) and Resilient Missile Warning and Missile Tracking (MW/MT) systems are critical programs for identifying China's most advanced missile threats even in the event of attacks on those space-based sensors. Next-Gen OPIR will "rapidly deliver strategically survivable missile warning capabilities" to detect advanced missiles, while Resilient MW/MT is meant to ensure that the missile warning system can survive attacks by counter-space systems developed by adversaries.

■ About \$4.7 billion for satellite communications projects. The Space Force has three categories of satellite communications: strategic, for nuclear command, control and communications; protected tactical, for tactical-level communications in contested environments; and wideband and narrowband, which provide "large throughput in less contested areas," according to the Department of Defense. The 2024 budget request would support continued SATCOM development and initiate engineering and manufacturing for a new "purpose-built high-throughput anti-jam satellite system" for protected tactical networks, according to budget documents.

■ About \$1.3 billion for the GPS enterprise, including development of 10 GPS III follow-on satellites and support the satellite constellation's transition from a legacy operational control system to its next-generation edition. Military GPS User Equipment, meant to help service members keep using GPS-provided positioning, navigation and timing information even "in the most contested environments," is also included. ★

In 2024 Budget, USAF Pushes Major New Aircraft Starts

Among the new aircraft programs the Air Force included in its fiscal 2024 budget request are uncrewed, autonomous wingmen for its fighters, a next-generation tanker program, a fast-as-possible replacement for its aged E-3 AWACS air battle management jets, and a new airborne command post.

The service is also continuing development of the Next-Generation Air Dominance (NGAD) fighter and adding 72 new in-production F-35s and F-15EXs. To pay for it all, USAF is looking to divest some 310 airplanes.

Air Force Secretary Frank Kendall told reporters the Collaborative Combat Aircraft program is a “major new start in this budget,” with \$522 million in research, development, test and evaluation funding; a tenfold increase over the previous amount. At AFA’s Warfare Symposium in Aurora, Colo., Kendall revealed that the service is notionally pursuing 1,000 CCAs, to augment some 200 NGADs and 300 F-35s.

In a March 10 budget brief, Kendall said manned/unmanned teaming demonstrations thus far “convince us that this makes sense and [is] something we could achieve.” The CCA is intended as an autonomous flying wingman to crewed fighters, providing extra sensors, weapons, and “affordable mass” without demanding more pilots.

Production of CCAs is planned before the end of the decade, Kendall said, with initial operational capability projected to be roughly comparable to the NGAD fighter despite entering development later. The \$522 million in the budget is “a pretty significant investment in the first year,” he added. The Pentagon did not provide outyear funding profiles with its March 13 budget announcement.

Kendall said he’s encouraged by self-funded work done by industry on CCAs.

“There’s been a lot of IRAD (Independent Research and Development) money spent since we started talking about this much more seriously,” he said, and the planning figure of 1,000 CCAs “I think, reinforces that,” and will encourage more industry investment, he added.

The CCA program will begin with a competition, Kendall explained, but there is no set timeline for when a winner will be determined. The CCA will also be “nominally one, but it could be more” than one type of uncrewed aircraft, Kendall said—he previously has said each manned fighter could have up to five CCAs, but at AWS said initial planning would be for two per fighter. In a separate budget briefing, acting Department of the Air Force Undersecretary Kristyn E. Jones said two CCAs would be “a floor,” with more expected.

“How long we will carry multiples” of contractor designs “will depend on the affordability of that as we go forward,” Kendall said.

“This is a serious program,” Kendall added. “If you look out over our five-year [plan], it’s a multibillion-dollar program. And this is headed toward production and fielding; it’s structured to do that.” He said the “intent” is that CCAs will cost “a fraction of the cost of an F-35,” which have a unit cost of about \$80 million. “We’ve got enough work behind us that we think that’s a very reasonable goal,” he said.

Andrew Hunter, Air Force acquisition executive, announced at the AWS conference that the Air Force is pursuing a Next-Gener-

PROPOSED NEW AIRCRAFT BUYS IN FISCAL '24

The proposed budget funds at least 94 new aircraft, with the exact count classified due to undisclosed details on the B-21 Raider bomber program.

Aircraft Type	Airframes
B-21	Classified
E-11	1
F-15EX	24
F-35	48
KC-46	15
MH-139	7
TOTAL	>95

Source: USAF

PROPOSED AIRCRAFT DIVESTMENTS IN FISCAL '24

The budget proposal continues previously planned divestments of aging aircraft. Congress must approve these decisions, some of which could be contentious.

Aircraft Type	Airframes
A-10	42
A-29	3
B-1	1
C-130H	2
E-3	2
E-8	3
EC-130H	2
EC-130J	4
F-15C/D	57
F-22	32
HH-60G	37
KC-10	24
MQ-9 (Block1)	48
RQ-4	1
T-1	52
TOTAL	310

Source: USAF

ation Air refueling System (NGAS), which will get underway this year with an analysis of alternatives, which the Air Force funded with about \$8 million in fiscal 2024.

The NGAS, still undefined, is expected to be a stealthy tanker able to operate and survive in contested airspace. Hunter and Kendall also said that the interim tanker buy after 179 KC-46s are delivered are also likely to be KC-46s, but only 75 of these next-increment of tankers are planned, versus the 150 originally expected. After the 179, Boeing could start delivering a somewhat upgraded KC-46 circa 2032.

Although the Air Force only requested 43 F-35s in fiscal '23, it is back to asking for 48 in FY24. Together with its request for 24 F-15EXs, it reaches the goal of 72 new fighters in FY24; a number USAF officials say is the minimum needed to keep the age of its fighter fleet from increasing to unsustainable levels. At 72 per

ANTICIPATED AIRCRAFT DELIVERIES IN '24

Aircraft Type	Airframes
C-130J	2
E-11	1
F-15EX	10
F-35A	45
HH-60W	19
KC-46	20
MC-130J	12
MQ-9 (Block 5)	10
TOTAL	119

Source: USAF

year, the Air Force can hold its fighter fleet to an average age of about 29 years old.

The Air Force now plans an F-15EX fleet of 104. Kendall indicated some of the F-15EXs would replace aging F-15C/D Eagles in the Air National Guard fleet.

“The reason we do that in part is because of the cruise missile defense mission,” Kendall said.

But the planned F-15EX buy would not fully replace F-15C/Ds and some Air National Guard F-15C/Ds are being replaced with F-35s. The Air Force has around 200 F-15C/Ds that it will eventually retire, and the service wants to divest 57 in fiscal 2024. The Air Force made the decision to pull its 48 F-15C/Ds from Kadena Air Base, Japan, in late 2022, with some of those aircraft destined for the Air National Guard.

“We’re going to continue to draw that fleet down until there’s none left,” director of the Air National Guard Lt. Gen. Michael A. Loh told reporters March 8 at the AFA Warfare Symposium. “So the recapitalization is occurring. ... The two things on the production line right now are F-35 and F-15EX.”

The service would also buy 15 KC-46 tankers in fiscal '24, seven MH-139 VIP/missile field support helicopters and one E-11 Battlefield Airborne Communications Node (BACN) aircraft.

One aircraft that did not get any procurement funding in the budget is the T-7 trainer, which has been delayed due to escape system issues. The Air Force has said deliveries, initially slated for 2024, will slip to 2026.

With E-3 AWACS aircraft availability rapidly declining due to parts shortages, the Air Force is moving to replace it as quickly as possible with the E-7A Wedgetail, also built by Boeing. The service asked \$681 million for the E-7 in FY24, up from \$421 million a year ago. At the AWS conference, Kendall said the service looked at “accelerating” the E-7 but determined it is moving as fast as it can, with the first aircraft due to arrive for service circa 2027.

To replace its rapidly obsolescing E-4B National Airborne Operations Center, the Air Force is asking for \$889 million to develop a Survivable Airborne Operations Center, a significant bump from the \$98 million it received for the effort in 2023.

The NGAD program is requested for \$1.933 billion in RDT&E, up from \$1.658 billion enacted for '23. For F-35 RDT&E, the Air Force asks \$1.372 billion in the new budget, in pursuit of Block 4 capabilities, up from \$1.098 billion a year ago.

RDT&E for the new B-21 bomber declines somewhat, from \$3.144 billion in 2023 to \$2.984 billion in 2024, as that program begins its transition from development to production. Production funds for the Raider, from accompanying budget documents, were pegged at \$1.617 billion, but quantities were not discussed, although Jones repeated previous comments that six aircraft are in various stages of production.

Elsewhere in the bomber fleet, the Air Force wants to boost B-52 modernization, with new engines and a radar upgrade. R&D increases for those efforts to \$857 million requested for '24, up some \$134 million over last year.

The Air Force is looking to divest 310 aircraft in fiscal 2024, according to Maj. Gen. Michael A. Greiner, deputy assistant secretary for budget and comptroller of the Air Force.

“Most of these are continuations from existing authorities” for divestiture granted to the Air Force by Congress last year, he said.

The 310 include 32 F-22 Block 20s, which Kendall noted “we asked for last year, and didn’t get.” Yet despite those planned divestments, the service is also asking for \$726 million to develop capability upgrades for the fighter, versus the enacted 2023 figure of \$560 million. Those upgrades are known to include an infrared search and track system, upgraded radar, the AIM-260 Joint Advanced Tactical Missile and other improvements to keep it relevant and credible in the air superiority role before the NGAD comes online, circa 2030.

In addition to the F-22s, the Air Force also wants to retire its remaining 24 aerial refueling KC-10s; 57 F-15C/Ds fighters; 37 HH-60G Pave Hawk rescue helicopters; 48 MQ-9 Reaper Block 1s, and 52 T-1 trainers. Greiner said the Air Force wants to reduce the E-3 Sentry AWACS inventory to 18 aircraft, which means two more will leave the inventory this year.

If all the Air Force’s divestiture requests are honored by Congress, the '24 budget will zero out the KC-10 tanker, E-8 Joint STARS, EC-130J Commando Solo, and A-29 light attack aircraft inventories. ★

Chinese Spy Balloon Prompts \$90 Million in New Air Defense Spending

The high-altitude surveillance balloon that traversed the U.S. in late January and early February prompted last-minute additions to the Pentagon’s budget—according to DOD officials, there was a late plus-up of around \$90 million for measures to protect against similar intrusions in the future.

“We did add some funding late in the process,” DOD comptroller Michael J. McCord told reporters March 13. NORAD has said it suffered a “domain awareness gap” that enabled the balloon to travel over U.S. territory, leading to changes to the settings, or “gates,” set radar sensitivities. McCord described the new funds as earmarked for “sensing and analysis in that particular set of altitudes and phenomenology” for balloons and other low-signature, low-speed objects.

“Cruise missiles are the things we care about probably the most in that space of looking at our airspace,” McCord said. “On this particular niche, if you will, we did add some funding to try and refine some capabilities on the back end.”

Adm. Sara A. Joyner, the director of force structure, resources, and assessment (J8) on the Joint Staff, characterized the \$90 million as “significant investments” that will improve U.S. sensing in all aspects of U.S. airspace.

“I would tell you that the sensors that we have today are capable of seeing the high-altitude balloons,” Joyner said. “They’re capable of tracking them. It’s a matter of tuning and optimizing those systems to try to get after all forms of intrusions into our airspace.”

The new investments would try to bridge the gap between detecting fast-moving threats and balloons. When the U.S. stopped filtering out some slow-moving objects, radars started picking up—and the Air Force began shooting down—objects the American government now believes were benign. ★

Budget Q&A: Lt. Gen. Richard Moore Jr.

As Deputy Chief of Staff for Plans and Programs, Lt. Gen. Richard G. Moore Jr. is responsible for developing the Air Force's program objective memorandum, which includes its critical five-year spending plans. Few have a better handle on the overall Air Force budget. Editor in Chief Tobias Naegele interviewed Moore about the Air Force's proposed 2024 budget plan.

Q: Can you share some of the strategy going into this budget cycle, and how you went about this year's budget build?

A: The pacing challenge is China, and they're becoming more and more aggressive. So the kind of organizational construct that we used was the secretary's seven Operational Imperatives [OIs]. They give us the ability to see—and close—key capability gaps in our ability to confront Chinese aggression. That was the guiding principle. Anything we were able to do, any ability that we had to pivot or repurpose, it all went toward the Operational Imperatives.

Q: Secretary Frank Kendall has defined short-, medium-, and long-term needs. How does the budget get at that?

A: The Secretary used short, medium, and long. The deputy secretary of defense says China is “a now and forever problem.” What we tried to do was only accept manageable risk in the near term—and there has to be some risk in the near term in order to pivot—and then, in the end of the near term and into the medium term—we tried to put meaningful operational capability in the hands of our warfighters. Then, in the long term, if we can deter through the near and into the medium term—we can get to a meaningful pivot in terms of capability.

But in the near [and medium] term, we have to pay attention to capacity. ... It can't just be about the long term because China is that now and forever problem.

Q: You need to build more airplanes?

A: Starting now. We have been saying for several budget cycles, that we needed to procure 72 new fighters a year in order to gain the capability we need, but also bring down the average fleet age of our fighter fleet. In '24, we will budget for—for the first time [in years]—72 new fighters.

Q: How does that break down?

A: It is 48 F-35s and 24 F-15EXs. The same in 2025. Now we're into the FYDP [future years defense plan]. That will get us to an F-15EX fleet of 102. We have an ATR [above threshold reprogramming] on the Hill right now for two more, which will get us 104, if it works.

Q: And that's the goal, to finish at 104 F-15EXs?

A: Right now that's all we've programmed. The original Program of Record was 144, but right now we've only programmed 102, and that finishes at the end of FY25. We will then continue across the FYDP buying 48 F-35s a year.

Q: So what comes in after the EX is done?

A: Good question. We'll have to see. But based on the information we had during the budget build, we were limited on the purchase amount of F-35s. We're buying every production slot that they have available for U.S. F-35As across the FYDP.

Q: And that's all they can make?

A: We are buying every available U.S. F-35A that we can across



Staff Sgt. Chad Trujillo

“We are buying every available F-35A that we can across” the next five years, says Lt. Gen. Richard Moore Jr. “That’s 48 a year”

the FYDP, and that’s 48 a year.

Q: So last year you wanted to retire 32 Block 20 F-22s, and Congress made you wait. Does that change the equation on what to do with those?

A: It doesn't. The F-22 Block 20s are not funded in '24. We stayed consistent with our FY'23 position, which is that those are not combat representative. They don't have the highest-end comms, they don't shoot the most advanced missiles, they don't have the highest-end [electronic warfare capabilities]. And they never will. So the money from that went directly to NGAD [Next Generation Air Dominance]. We seldom tie a particular offset to a particular purchase, but in this case, that money went directly from F-22 Block 20s to NGAD, and we feel like that was absolutely the trade to be made.

Q: That means people, operations dollars, the whole chunk of money, right?

A: Yes. We don't see that NGAD fits ... alongside F-22. NGAD is the replacement for F-22.

Q: So will you go from buying 72 down to 48 fighters a year? Or are you going to buy 24 of something else?

A: We will continue to assess available purchase capacity in FY25 and FY26 before we can make a definitive proposal. What we know is what we've programmed right now, which is an F-15EX fleet of 102, could be 104.

Q: Inflation is a major issue for everyone right now. How did you factor inflation into your budget this time around?

A: Inflation is a challenge and inflation has an impact on all parts of the portfolio. The pay raise was 5.2 percent, that's one of the larger pay raises we've seen in quite some time. We know that

[inflation] will impact the O&M [operations and maintenance] portfolio as well as the investment portfolio, but forecasting what that impact will actually be? We'll have to continue to work with the Hill as we go through the legislative season. It is tough to forecast inflation to the end of the next fiscal year.

Q: So it's always hard, but one of the things you do know is that some of your categories are more sensitive to inflation than others?

A: Yes, so I'll give you an example: the flying hour program. The largest components of the flying hour program are fuel and spare parts. The flying hour program, from the time we submitted our POM [Program Objective Memorandum] to OSD to the time we submitted the PB [President's Budget], went up by approximately 10 percent in the budget year. Much of that was driven by inflation, and spares were a much larger contributor to that than fuel. The Secretary himself... decided that we were not going to reduce the number of flying hours in the portfolio, and so we plussed-up flying hours to account for that increase. We did not do that across the rest of the FYDP because inflation remains just very difficult to predict. ... It's a wild card.

Q: We've top talked about balancing near term and long term. Clearly, there's a lot of medium- and long-term investment coming?

A: That's accurate. There's a lot of near-term investment, as well.

Q: Are you also swallowing the elephant trying to fund nuclear modernization?

A: Yes. Although we have predicted for several budget cycles now that the peak of the nuclear bow wave would be in FY27. So far, it looks like it may hold, at least in this budget cycle. What we know now, it still appears that FY27 is the peak. ... Assuming that peak stays in '27, that would be the middle of the FYDP. So we're starting to get to the backside of the nuclear recap bow wave, and we are really excited about that.

Q: Can you hold the costs on the B- 21? Does that program and the Sentinel ICBM stay on track?

A: And on schedule—because if the schedule slips, then that could change your FY27 peak. Right now in the budget that we have—this is a FYDP number—Sentinel goes into procurement in FY26. And so once you hit procurement, then RDT&E starts coming down. However, the critical piece is to keep IOC on schedule, there may be more than one way to get there.

Q: But, what if you don't go into procurement for some reason?

A: Well, we try and pull other content forward and keep the program running as best we can, but we continue to strive for IOC in FY29.

Q: What we hear from the Chief and the Secretary is that the greatest risk to the FY24 cycle is not getting this budget done—not getting a budget on time?

A: The greatest risk to the 24 budget is a year-long CR [continuing resolution]. The second greatest risk is not getting a budget on time. What [Secretary Kendall] said was the worst thing that can happen is we get no budget at all, and we wind up in a year-long CR. And then the thing that could have the greatest impact after that, is a late budget.

Q: You also continue to struggle with Congress over retiring assets?

A: So we talked about the F-22. Congress has actually been very helpful, and the bulk of what we've asked for we've gotten. ... The KC-10s finish their divestiture in the budget year in '24. JSTARS finishes in '24. The first A-10s are going this year, in FY23. We've completed divestiture of Global Hawk Block 20s and Block 30s. There are some more [divestitures] across the FYDP that are less relevant than those, but Congress has been helpful. They understand that we need to pivot and we're working with them to make sure that we can present them a plan that they can that they can work with. That's the difference in the last couple of years. What we see in this budget is an increase in procurement of fighter aircraft specifically, rather than a bunch of new divestitures. ... The money for those new fighters came as an add to the Air Force top line, not as a result of divestitures. There's not enough money in divestitures to pay for modernization anyway.

Q: What they do is buy you people and places to put things.

A: It buys you out of people that are doing legacy missions. The A-10 maintainers at DM [Davis- Monthan Air Force Base, Ariz.,] specifically, we intend to transfer to Tyndall [Air Force Base, Fla.,] to stand up the second F-35 op squadron. That is a big impact. We should repurpose the resources, as well. There's a lot of money in legacy platforms, but it's not enough to modernize.

You have to divest an entire squadron of F-16s to buy a single F-35. You have to divest an entire squadron of KC-135s to buy a single KC-46. There's never been enough money in divestitures to modernize. And the modernization that's in this year's budget—the increase in modernization in fighters specifically—is additive resources to the Air Force's top line.

Q: Ukraine has burned up a lot of your weapons. You need to backfill those, but you also have to anticipate how to sustain sourcing in the future. How will you do that?

A: We're working with the defense industrial base on this, and we have been successful at utilizing the presidential drawdown authority to replace much—some amount—of what has gone to Ukraine. But what we've found is that the ability for the defense industrial base to surge is fairly limited. So you will see some investments in our budget this year, to increase the capacity of the defense industrial base.

Q: So you're going to help build factories?

A: We are working to increase the capacity of the defense industrial base for what the Air Force needs to confront Chinese aggression. ... What we're doing is increasing procurement of munitions and also increasing capacity in the defense industrial base to produce them.

Q: By how much? Is it 10 percent, 20 percent?

A: We are increasing our munitions request by \$2.2 billion in FY24. Our FY24 request includes a \$1.0B multiyear procurement strategy to ensure we have the necessary capabilities in upcoming years. The thing is, the defense industrial base can only react so quickly. ... When you try to surge, you find that you can surge, but not this year and not next year. [It's going to take time], and it's going to cost you a lot of money.

Q: Wedgetail is moving forward. Is that being accelerated?

A: Let's be careful about "accelerating" with Wedgetail. The first aircraft is not going to arrive any earlier. We can't make that happen. By the time you make the green jet and Northrop makes the radar and you get it all integrated, it's going to be on time. ... In the '24 cycle, the profile for Wedgetail is the same as it was in '23. There was a congressional add [for fiscal 2023] that we're grateful

for that will help us buy down risk. And what could happen is that, as airplanes start to come, we could increase the rate at which they come. But that's not what happened in '24. ... No amount of money makes the first airplane arrive before FY27.

Q: So what are people talking about when they say it's accelerated?

A: You're not mistaken about what you heard, but I'm telling you what's in the budget is the same as in FY23. We will continue to look critically at our programs to identify investment opportunities that give us needed capabilities.

Q: And in the FYDP?

A: That profile stays largely the same. If we paid a Wedgetail bill it was a reprice, it wasn't an acceleration. We are keenly interested in Wedgetail, and we're committed to it, but that profile is not substantially altered from what it was last year.

Q: ABMS—what is the story there?

A: The biggest change in ABMS [Advanced Battle Management Systems] is a non-programmatic change, it's the establishment of the PEO for C3BM [command, control, communications, and battle management] and what we are finding is it really, no kidding, takes PEO-level oversight of the various programs that are all a part of ABM. ... We had this glorious vision, but it is a large effort to actually bring that together. There are lots of things in the OIs, lots of [classified] things ... that ABMS will connect. ... On the U.S. Air Force side ... the largest single investment in our budget for the OIs, is CCAs [collaborative combat aircraft].

Q: At this stage, you're investing to take CCAs to the next level, not saying, 'We're going to buy X number of CCAs.' What's the scale of that investment?

A: You will see north of \$6 billion in our FYDP for CCAs.

Q: And in 2024?

A: The FY24 budget includes a request of \$533.4M for the CCA program.


Q: And for NGAD? What kind of numbers are we talking about investing there?

A: [There is a] pretty substantial add to NGAD across the FYDP: It is about \$1.8 billion added to NGAD, plus another \$1.7 billion added to the NGAP program, which is the next-generation engine program. ... AETP [the Advanced Engine Technology Program to replace the F135 engines in the F-35] is not funded in the budget. What is funded in the budget is the Engine Core Upgrade (ECU) for the F-35, as well as some power and cooling money. ... By the time we got to [AETP], we didn't have the resources to do a U.S. Air Force-only, very expensive developmental program for AETP.

Q: Anything else?

A: One last thing that you didn't ask about that you could have is ACE [agile combat employment]. The second largest investment in the OI portfolio is ACE, the ability to complicate the Chinese targeting solution in the Pacific.

Q: And that is for communications, pre-positioned equipment, etc?

A: It's a lot of pre-po, but it's also a lot of expeditionary comms and some airfield work. There are additional airfields to use, there's some camouflage concealment and deception in there. ... What it is, is the ability to complicate the Chinese targeting solution. There's over \$5 billion for that across the FYDP. Those are big pivots. 

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Courtesy photo

The XQ-58A Valkyrie was a critical proof-of-concept for the future Collaborative Combat Aircraft the Air Force now envisions as making up as much as a third of its combat aviation platforms. The Valkyrie drop-launched an ALTIUS-600 small unmanned aerial system in a 2021 test over the Yuma Proving Ground in Arizona.

CCAs Could Make Up 1/3 of Combat Air Forces

By John A. Tirpak

The Air Force could field 1,000 or more autonomous Collaborative Combat Aircraft (CCA) in the next decade or so, uncrewed, semi-autonomous aircraft that would accompany F-35s and future Next Generation Air Dominance aircraft into battle, Secretary Frank Kendall announced at the 2023 AFA Warfare Symposium in Denver.

The 1,000 CCAs are a planning figure, not a program of record. Kendall said the figure is based on the idea that two CCAs would partner with each of 300 F-35s and 200 NGAD aircraft.

The plan answers the Air Force's need to build up its combat fleet at a lower cost than the \$80-million-per-copy cost of an F-35A, while at the same time not exacerbating the service's chronic shortage of pilots. Kendall asserts that CCAs should also enhance the effectiveness of crewed airplanes, particularly in lethal contested airspace.

Kendall's mention of 200 NGADs, though "notional," marked the first time a USAF leader offered any number for how large that fleet could be. Significantly, it is greater than the number of F-22s the Air Force acquired, even though service officials have previously said they do not plan to replace the F-22 on a one-for-one basis.

At a cost of \$80 million to \$100 million or more, the high cost of new fighter aircraft are among the drivers for developing CCAs, Kendall said. NGAD will cost

"We've got a lot to learn, and that is going to take some experimentation ... some testing and some careful thought."

—Air Force Secretary Frank Kendall

"multiples" of what the F-35 cost today, he said.

Relying only on manned fighters alone would yield "an unaffordable Air Force," Kendall asserted. He said he is now satisfied that the technology is at hand to allow CCAs to do what the Air Force needs them to do, "on a timetable" that meshes with strategic demands. He did not specify an in-service date for the first examples but has previously suggested that 2030 is a likely target.

When the Pentagon unveiled the 2024 defense budget request days later, it expanded on his comments, stating: "Investing in this mix of aircraft provides an opportunity to increase the resiliency and flexibility of the fleet to meet future threats, while reducing operating costs." One reason CCAs should cost less: They don't have to carry a pilot's weight or any of the extensive life-support systems, from oxygen to ejector seats, needed in crewed aircraft.

Kendall said the Air Force is requesting "the resources needed to move these programs forward along with associated risk-reduction activities that will allow us to explore operational, organizational and support concepts, as well as reduce technical risk."

In a press conference, Kendall said his estimate of 300 F-35s that might operate with CCAs is "somewhat arbitrary, [but] a reasonable starting point" for analysis. Not all F-35As will necessarily operate with CCAs. The Air Force already has well in excess of 300 F-35As, and has never officially deviated from its 20-year-old requirement for 1,763 Lightning IIs.

Kendall's objective is for CCAs to cost less than half the price of an F-35. At that rate, a fleet of 1,000 CCAs would cost upward of \$40 billion.

Still, the 1,000 figure "isn't an inventory objective, but a planning assumption to use for analysis of things such as basing, organizational structures, training, range requirements, and sustainment concepts," Kendall said.

Asked the ultimate inventory goal for CCAs, Kendall answered, "I don't know," and allowed that "it could be more" than the 1,000. The planning figure gives Chief of Staff Gen. Charles Q. Brown Jr. "a reasonable assumption," he said, "a basis to begin some planning."

Kendall added that the number of CCAs should not affect the numbers "of the crewed fighter inventory." But in time, as the technology is proven, that is unlikely to remain the case.

Initially, CCAs can be thought of as "remotely controlled versions of the targeting pods, electronic warfare pods, or weapons now carried under the wings of our crewed aircraft," Kendall said. These new systems "will dramatically improve the performance of our crewed aircraft and significantly reduce the risk to our pilots," he added.

Air Force planners have said that as many as five CCAs could collaborate with each crewed fighter, filling roles in electronic warfare, suppression of enemy air defenses, sensing, communications, and even as weapons carriers. In Denver, Kendall did not narrow down what roles the notional two CCAs per fighter would undertake.

"We've got a lot to learn, and that's going to take some experimentation ... some testing and some careful thought," Kendall noted. His 1,000 CCA planning figure "is a reasonable first tranche," he added, and deploying them at the rate of two CCAs per crewed fighter is "a reasonable ratio—we'll learn as we go."

Ultimately, Kendall and others are seeking the "sweet spot" in the crewed-uncrewed ratio. "We don't want to undershoot [or] ... overshoot," Kendall said. Overshooting would create "a problem program that gets caught in schedule and cost overruns," while undershooting could leave the Air Force short of needed capabilities. "I want to push the technology without

pushing it too far."

Maj. Gen. R. Scott Jobe, Air Combat Command's director of plans, programs and requirements, said in a panel discussion that the notion that these new CCAs would be "attributable" is a "common misconception." He said the CCAs will be valuable weapons, expected to deploy for missions and return to base for future flights like any other aircraft.

The idea of expendable CCAs is a holdover from the last administration, when former USAF acquisition executive William Roper argued for a generation of aircraft that would be used for 5 to 8 years, then retired or sent on one-way missions in battle. The savings from designing the aircraft for long-term sustainment would be funneled into subsequent iterations of CCAs.

Under Kendall's vision, the Air Force is focusing on CCAs that will operate alongside crewed fighters for somewhat longer. Using them as kamikazes would be up to the battle commander, he said, but they won't be built with that purpose in mind.

"We're going to reuse these air vehicles," Jobe said. They must be "affordable assets. ... We've got to make sure that everyone keeps an eye on that."

Jobe said the Air Force is "still working out" the desired service life for CCAs. While squadrons will operate with CCAs daily, he suggested savings could be found in not flying all CCAs "until we unpack them" for combat missions.

Gen. Mark D. Kelly, who will retire this year as head of Air Combat Command, was cautious in his view of what today's pilots can manage when it comes to flying their jets as well as CCAs. Two CCAs per fighter might be too much to aim for right away—saying he would prefer starting with one and "see where it takes us."

Kelly said fighter pilots will need time to get used to working with CCAs in order to trust them to do what they're supposed to do without getting in their way.

"A lot of discovery" needs to happen still, Kelly told reporters during the conference. Once it's proven that CCA can perform missions like "sensing or jamming, or something like that," then a second aircraft could be added to perform a different mission,



Maj. Gen. R. Scott Jobe, director of plans, programs, and requirements for Air Combat Command, dismissed as "a common misperception" the idea that future Collaborative Combat Aircraft might be cheap enough to be seen as "attributable" assets. The expected cost and service life for the aircraft is still to be determined.

1st Lt. Aaron Chen

he suggested. Kelly said he “could see” as many as three CCAs per crewed fighter, as long as they don’t impose undue burden on the pilots who must control and direct them.

All this will take years, Kelly said. Meanwhile, the FAA and other government agencies will have to approve their use to transit commercial airspace. The Air Force risks getting ahead of itself and investing in technology it can’t employ if it isn’t careful, he warned. Another unproven capability, Kelly added: “Well before you get to weapons employment, you’ve got to get to the ability for [CCAs] to do auto-target recognition,” he said.

Advocating an iterative approach to CCAs, Kelly said the Air Force must ensure it brings RQ-4 operators, MQ-9 Reaper pilots, and RC-135 Rivet Joint electronic warfare operators into “the room” as details, processes, and requirements are worked out. Those operators “know how to handle lost links” and other potential problems that CCAs will inevitably face. The Rivet Joint operators are skilled in the “high-end jamming and SIGINT,” or Signals Intelligence, missions he thinks CCAs will take on.

Kendall said the Air Force will ask Congress to fund CCA stand-ins that are “not the ultimate” version of what’s needed, but “which we can use for a variety of things: to develop operational concepts, to develop technology, reduce the risk of the program ... and start to think through some things, like how we train.”

The Air Force has been experimenting with autonomous, uncrewed aircraft like the Kratos XQ-58 Valkyrie and General Atomics’ Avenger for several years, developing autonomous flight programs like the Skyborg, and trying out crewed/uncrewed teaming concepts.

There are many useful CCA concepts already circulating in industry, Kendall said, and given that there are “a lot of candidates,” the program will be highly competitive, which in turn

should drive costs lower.

Jobe said the concept of CCAs is to achieve “overmatch” of an adversary, not only in technology, but potentially in numbers.

Brig. Gen. Dale White, Program Executive Officer for fighters and advanced aircraft, said cost will be a key parameter of the new autonomous aircraft, but hardly the only factor. “We need ... affordability and capability,” he said. “No matter how cheap it is,” if the CCA isn’t capable enough to send into the fight, it won’t be worthwhile.

Mike Benitez, director of product at Sheild AI, which has an agreement to develop CCA technology with Boeing, said the Air Force must constrain the manpower demands for supporting CCAs. Today’s uncrewed aircraft have a manpower requirement “four to five times” that of crewed aircraft, which is not sustainable in an Air Force where people are the most expensive asset and recruiting remains an ongoing challenge.

Benitez said the Air Force must also establish a CCA industrial base capable of producing new aircraft fast enough to replace CCAs lost to combat attrition. It must aim for “capable mass at scale,” he advised.

Kendall said he’s confident in the CCA technology, but concerned that delays and fights in Congress risk setting back the Air Force. He pleaded for timely authorization and appropriation bills, before the end of the fiscal year.

Continuing resolutions (CRs) have become routine, occurring in 12 of the past 13 years. New programs can’t launch under CRs, however, and the risk of a year-long CR could be enormous. It would waste time the Air Force doesn’t have to spare, Kendall said.

“My greatest fear” is that Congress won’t quickly enact the next defense budget, he said. Such delay would be “a gift to China ... that we cannot afford.”



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Actional domain awareness, first-mover advantage, and responsible counterspace capabilities that can deny space to adversaries undergird Chief of Space Operations Gen. B. Chance Saltzman's strategy to compete, survive, and win in space. He unveiled that vision in March at the AFA Warfare Symposium in Aurora, Colo.

Saltzman's 'Theory of Competitive Endurance'

By Greg Hadley

AURORA, COLO.

The Space Force is doubling down on its warfighting focus under new Chief of Space Operations Gen. B. Chance Saltzman. At the AFA Warfare Symposium in March, Saltzman pressed to sharpen the Space Force's doctrine, strategic direction, and operational concepts. He laid out a new "working theory of success" centered on long-term competition with space powers such as China and Russia, which he dubbed "Competitive Endurance."

"I intend Competitive Endurance to be a starting point for a dialogue I believe is critical—absolutely critical—to the success of our young service," Saltzman said. "The goal of this theory of success is to ... deter a crisis or conflict from extending into space and, if necessary, allow the joint force to achieve space su-

"The Space Force must shift this balance by making an attack on satellites impractical and self-defeating."

—Chief of Space Operations Gen. B. Chance Saltzman

periority, while also maintaining the safety, security, and long-term sustainability of the space domain."

Competitive Endurance is undergirded by three core tenets, Saltzman said:

- "Comprehensive and actionable" domain awareness to ensure the Space Force is never operationally surprised;

- Overall "first-mover advantage" to ensure no adversary can overcome the resilience of U.S. Space Force satellite architectures; and

- Counterspace capabilities to deter adversaries from risking conflict in space, while always acting responsibly in orbit.

Saltzman never mentioned China by name, but there was little doubt the adversary he had in mind when he warned that "our competitors watched, plotted, and invested in capabilities to blunt our advantages in space."

"The rise of these threats against on-orbit systems and increasing threats to the joint force from adver-

sary satellites drove us to the realization that we must be able to contest and, when necessary, control the space domain,” Saltzman said.

Brig. Gen. Anthony J. Mastalir, commander of the new U.S. Space Forces Indo-Pacific component, defined that threat even more explicitly:

“The [Peoples Republic of China] has put out a lot of satellites just within the last five to six years,” Mastalir said. “There’s a lot of capability on most of those—many of those are intelligence, surveillance, and reconnaissance satellites designed to find, fix, track, and target U.S. forces and allied forces. They’re designed to help kill Sailors, Airmen, Soldiers, and Marines.”

Saltzman also warned about the rapid number of “dramatic offensive capabilities” the Chinese have deployed recently.

“The thing that concerns me the most is the pace with which they made their shift to a very operational aggressive counter-space capability,” Saltzman stated. “And I’ve been doing this a long time. In 2007, when they launched the [anti-satellite] missile ... we knew this was different. Like, OK, this is not normal anymore. Things are going to be different. ...

“Now it’s going on 16 years later, and they’ve put some remarkable capabilities on orbit and on the ground to really affect the advantages we have,” Saltzman continued. “It’s a pretty remarkable shift, if you think about how fast they put all that together.”

Air Force Secretary Frank Kendall’s oft-repeated focus on China has frequently been viewed by some as all about Air Force capabilities, but it’s clear he believes the Space Force also has significant work to do to ensure it is ready for competition and, if necessary, conflict.

Maj. Gen. Gregory J. Gagnon, deputy Chief of Space Operations for intelligence, added: “Space superiority will have to be gained in a conflict in the Pacific against the PLA. Their on-orbit armada of satellites can track us, can sense us, can see us, can connect that data ... and can now hold U.S. forces at risk in a way we have never understood or had to face to date. And that is what has been the fundamental change in force design.”

RESILIENCE IN MANY WAYS

As things currently stand in the space domain, Saltzman said, the U.S. is so dependent on its space capabilities to fight and operate on the ground, at sea, and in the air, that China or another adversary is actually incentivized to try to take that advantage away, to go on the offensive first.

“This is an unstable condition that works against deterring attacks on space assets,” Saltzman said. “We can’t have that.”

Lt. Gen. DeAnna M. Burt, deputy Chief of Space Operations for operations, cyber, and nuclear, said that China is just as much a focus for the space operators. “We’ve talked about China, China, China, and why we need that resilient architecture in order to continue to fight through that,” she said. “We’ve focused on how the U.S. and allies ... [can] continue to provide that capability through all stages of conflict.”

Current space capabilities were built for a different era, when space was viewed as benign, and the greatest threats were meteors or space debris. Now, those threats have multiplied.

“The Space Force must shift this balance by making an attack on satellites impractical and self-defeating,” Saltzman said. This, he argues, would discourage adversaries “from taking such actions in the first place.”

No wonder, then, that the first of Kendall’s seven Operational Imperatives is an “operationally resilient space order of battle.”

One way the Space Force is looking at building resilience is through proliferation—launching greater numbers of less exquisite and expensive satellites. Saltzman pointed out the benefits

in taking advantage of lower-cost satellites and less costly launch services to constantly refresh constellations.

“When I learned about satellites, launch was so expensive, the missions were so exquisite, we had to build satellites to last a long time in orbit,” Saltzman recalled. On a recent trip to Buckley Space Force Base, Colo., he said, he watched new operators fly old satellites. “They’re flying satellites from my early days in the military,” he pointed out. The technology associated with a satellite that was launched 25 years ago is 25 years old. ... So the idea of smaller satellites also gives us an opportunity to change our refresh rate on how fast we can put new technology on orbit.”

Other ways to achieve resilience include increased maneuverability—launching satellites with enough fuel to move in orbit as needed to avoid threats—and leveraging commercial capabilities as more and more private companies launch satellites into low-Earth orbit for things like communications and imaging. That gives the Space Force more options if its native capability is compromised.

Ukraine has made great use of commercial satellite services to resist Russia’s invasion, and while that has led to some concerns about civil and private satellites being targeted in a conflict, Saltzman affirmed the Space Force is working to more formally define how commercial capabilities can be called upon, as the Air Force does with its Civil Reserve Air Fleet (CRAF) of commercial aircraft to expand airlift capacity in emergencies.

“It’s almost like a CRAF fleet, if you will, with arrangements that we can have with commercial providers,” according to Saltzman. “So do we have ready access in crisis to extra capacity? We’re in the very early stages of kind of sorting out what they want. There’s a lot of contract work to be done, a lot of legal work to be done to make sure that that’s all in place.”

The details are complicated for an industry that doesn’t want to see its unique business assets targeted.

“The question is: When we actually go to war, what happens to those systems and how do we think about our commercial partners?” asked Kay Spears, vice president and general manager of space, intelligence, and weapon systems at Boeing Defense Space & Security. “If they lose a system, what is the liability? Is the Space Force willing to cover that liability?” Further, what constitutes liability—current revenue losses or future losses or both? “Are they willing to take that risk?” Spears asked. “It just raises, in my opinion, a lot of new questions about how we leverage commercial. But it’s not an ‘If’—it’s a ‘How.’”

COUNTERSPACE CAMPAIGNING


Saltzman also advocated for what might be called responsible counterspace campaigning—a dramatic change from years past when talk of fighting in space was taboo.

Saltzman said the Space Force is “investing in capabilities that protect our joint force from space-enabled targeting while understanding that we cannot have a pyrrhic victory in this domain.”

What exactly those capabilities are remains a mystery—most of the service’s offensive and defensive capabilities are classified.

But there’s no questioning the Space Force’s intent to keep developing its ability to deter and fight if necessary. One of three lines of effort Saltzman has defined is fielding “combat-ready forces.”

Vice Chief of Space Operations Gen. David D. Thompson said the importance of preparedness for the Space Force cannot be overstated.

“Especially in the early days of a conflict ... we are going to struggle greatly to have access to the air, to the sea, to land spaces around that matter,” Thompson said. “The only way we will do that is if in those early days we succeed through space.” 



Airman 1st Class Moses Taylor

For Agile Combat Employment to work throughout the Air Force, Airmen must familiarize themselves with tasks such as hot-pit refueling and new equipment like VIPER (the Versatile Integrating Partner Equipment Refueling kit), designed to help refuel any airframe. Kadena Air Base Airmen tested out VIPER for the first time in June 2022.

USAF Goes All In on ACE

By Chris Gordon

AURORA, COLO.

When the Pentagon and think tanks run wargames on a potential war with China, they envision U.S. air bases and ports attacked from the outset by Chinese ballistic and cruise missiles. The Air Force solution: Build more bases, create more targets, and move aircraft around.

"It's to make the targeting problem for the adversary more difficult," said Gen. Kenneth S. Wilsbach, commander of Pacific Air Forces, at the AFA Warfare Symposium in March. "It makes them use more munitions. And it gives us the chance to keep airpower in the air to create effects."

The Air Force calls this Agile Combat Employment.

Each of the military services is seeking to adapt to the challenges of a potential Pacific war. The Air Force has ACE; the Space Force wants more proliferated, resilient satellites; the Marine Corps is reorganizing to create a lighter, more flexible force, the Navy wants more submarines, and the Army hopes to field a new hypersonic missile in the fall—though at this point, it still faces the problem of finding a place to base it.

Air Force operators do their work at 500 miles per hour, but their bases do not move. To keep the enemy guessing, ACE seeks to rapidly move aircraft and operations around the theater, and building more airfields is one key to making that work.

The Air Force plans to spend about \$1.3 billion to make ACE a reality in fiscal 2024.

"We're generally trying to expand the target set potential adversaries are going to have to worry about,"

"We're generally trying to expand the target sets potential adversaries are going to have to worry about."

—Secretary of the Air Force Frank Kendall at the AFA Warfare Symposium

said Secretary of the Air Force Frank Kendall during the AFA Warfare Symposium in Aurora, Colo. "We're trying to make the idea of Agile Combat Employment meaningful."

ACE responds to China's emergence as a near-peer adversary with advanced, long-range missiles, significant intelligence, surveillance, and reconnaissance (ISR) capability, and a strategy intended to deny major overseas bases to U.S. operators in a conflict. China has also rapidly increased the number of satellites it has in orbit to 260, many of which the U.S. military believes are specifically intended to track U.S. and allied forces.

"Let's be honest, that's all about find, fix, track, target—against Airmen, against Sailors, against Soldiers, and Marines that are there to fight in that theater," said Brig. Gen. Anthony J. Mastalir, the commander of the Space Force's Indo-Pacific component. That unit was established in November to give INDOPACOM its own native Space operations liaison.

Such threats mean the Air Force must assume it may not be able to operate aircraft from its permanent air bases overseas. Instead, leaders must anticipate having to disperse forces to austere nontraditional air bases.

"Air bases are no longer considered a sanctuary from attack, regardless of their location," according to Air Force Doctrine Note 1-21, which defines the elements of ACE.

Lt. Gen. Tony D. Bauernfeind, the head of Air Force Special Operations Command, said the change is a natural response to U.S. success over the past 30 years.

"If we look at the last three decades, our adversaries have been looking at the American way of war," Bauernfeind said. "What do we do? We power project, we established super bases. We establish our forces and

once we've collected ourselves, then we proceed forward with our offensive operations. Our adversaries have taken full note of that and they are going to attack our bases in a quite aggressive manner. It's a critical vulnerability that we have. [Now,] we have to have these forces that can power project at [other] locations and be able to shoot and scoot."

EXPANDING ACE

ACE may take somewhat different forms in different theaters. In Europe, the Air Force faces the "tyranny of proximity." Massive installations, such as Ramstein Air Base in Germany, a major hub for refueling, staging, and medical support, could be subject to a Russian missile attack.

In Asia, the Air Force faces the "tyranny of distance." Many U.S. bases are thousands of miles from one another. For example, Guam, the westernmost U.S. territory in the Pacific, is home to Andersen Air Force Base, which provides U.S. planes free access to land and stage without foreign government approval. Roughly one-third of the entire island is home to some form of U.S. military installation. To disperse its forces, ACE aims to shift away from such centralized infrastructure in favor of a "hub-and-spoke" system of smaller operating locations. Large bases, however, will not go away.

"To be successful we need to have the right amount of prepositioned materiel, at the right scalability, so that it is available or arrives in time to meet the need, but not overdoing it to the point that it rots in the tough climate and environment that we face in the Indo-Pacific," said Brig. Gen. Paul R. Birch, then commander of the 36th Wing out of Andersen Air Force Base in Guam. "Base protection is also imperative, and it can take many forms. At the same time, being a target isn't our main focus. Rather, the focus is getting our airpower off the ground in a way that is lethal."

In March, F-22 Raptors deployed to the spartan island of Tinian, the next island up from Guam in the Northern Mariana Islands. Tinian hosted U.S. warplanes in World War II, but this was the first time the Air Force's premier air-superiority fighters had ever operated there. And it immediately followed the staging of F-35 Lightning IIs there in February.

Ensuring remote bases can support U.S. forces with prepositioned equipment, fuel, and adequate runways is hardly automatic. The Air Force is investing billions to bring locations like Tinian up to basic standards.

"There's not much there," Wilsbach said. "There's a runway, a taxiway, a very small ramp, and a very small terminal that acts as the commercial terminal and the other half is our ops center."

The Department of Defense is committing to expanding basing on Tinian, with the goal that the base can eventually serve as a "divert" airfield for Andersen. In blunt terms, that means if Andersen is attacked, USAF can move operations to Tinian. The Air Force will begin to invest in ACE infrastructure at an array of locations in the 2024 budget.

For PACAF, Tinian is a natural starting point for ACE operations, with a preexisting airfield on U.S. land. But the more austere the location, the more the Air Force needs to make sure it can actually operate from there. ACE hubs, such as Guam, already exist. Now it's time to ensure the spokes are ready to support operations, as well.

"We have places where we can go that are ready for us," Kendall said. "We have prepositioned equipment in some cases, as well as the other infrastructure we're going to need to operate successfully."

ACE will require Airmen to be more flexible, to take on duties outside their specific job descriptions. Air Force leaders say Airmen already possess the quick-thinking and inventive nature

to take on roles they haven't done before, but training them to be "multi-capable" is still a work in progress.

"We're emphasizing multiple-capable Airmen for a variety of reasons," Kendall said in explaining the investment necessary to make ACE work. "We want our people to have skill sets to do more than one job, because, quite frankly, our forward air bases are going to be attacked. We're going to want to be able to move people out and have them do things in smaller numbers available at a given location, but also have the resilience to absorb casualties. We have to. The reality for the Air Force in particular, even for some Space Force humans, is that they're going to be at risk. They're going to have to fight against stressing threats in a way in which they're going to be operating under fire."

The exact breakdown of what multi-capable Airmen will officially mean and what skills will be required from whom is still being determined. But the Air Force says it will begin to spend money in the 2024 budget to begin a formal training process.

As for ACE bases, Guam and Tinian are over 1,700 miles away from Taiwan, the likely flashpoint in a conflict between the U.S. and China.

The U.S. is moving to secure more basing and overflight fights in the Pacific, such as an agreement with the Philippines to eventually base some American military assets and forces there and a plan to provide nuclear-powered submarines to Australia and forward deploy American submarines there. Other allies such as Japan are strengthening their alliances with the U.S. Staging American troops on the Japanese home islands is a sensitive political issue, but the two countries are growing increasingly aligned. In the future, the U.S. might spread out from Japan's large air bases at Kadena, Misawa, and Yokota.

"There are over 600 airfields within 2,500 miles" according to AFA's Mitchell Institute for Aerospace Studies. "So, while stealth bombers will be key, so will stealth fighters creatively based across the area of operations."

In many ways, ACE is a throwback to earlier times. The Army Air Forces used a similar model in the Pacific campaign during World War II, throughout the U.S. island campaign.

"We're returning to our roots," Bauernfeind said. "Nobody complained and said, hey, 'I'm just a maintainer. I'm going to do maintenance, it was all hands on deck as they established that airfield and brought in combat airpower and made it happen.'"

WHO'S IN CHARGE

Another throwback aspect of ACE is the independence necessary for detached operations.

"The definition of command and control and how we thought of it was just with an air operation center," Lt. Gen. Alexis G. Grynckewich, the commander of Air Forces Central said. That's not going to be the case in the future.

In the Middle East, the air force has a number of small air bases, many in undisclosed locations. AFCENT has a cluster of bases under an Air Expeditionary Wing commander, and when they get an air-tasking order, Grynckewich doesn't want, or need, to control every aspect of what they do next.

"I'm not going to tell them what base to generate from," Grynckewich said. "I'm not going to tell them what base to land an aircraft at. I'm just going to tell them what mission it is that they need to fill and they need to get that line where it needs to go. But if I try to manage their cluster base, I won't have the situational awareness as to how much gas or the location of the right munitions there or not."

Grynckewich quoted an old mentor explaining this phenomenon: "I'm always in command, but I'm not always in control."

That will be the key to ACE.





Airman Mason Hargrove

U.S. Air Force Brig. Gen. Jason Rueschhoff, 56th Fighter Wing commander, swears in new Air Force and Space Force recruits in September 2022, at Gila River Arena, Glendale, Ariz.

How to Solve the Recruiting Crisis

Incremental fixes and sharing your own story can turn the tide on today's shortfalls, leaders say.

By David Roza

From 2007 to 2017 the British cycling team made a series of “1 percent improvements” in every aspect of their operation; combined, the changes helped the team win a streak of international medals.

Faced with a projected 10 percent shortfall in recruiting, Maj. Gen. Edward W. Thomas, head of the Air Force Recruiting Service, aims to apply the same strategy.

“There wasn’t going to be a new bike, a new way to race—it was improvements by 1, 2, 3 percent in a hundred different areas,” Thomas said at the AFA Warfare Symposium. “That’s where we are in recruiting today. Much to our disappointment, there is not one silver bullet. But there are many things that we can do better.”

Changes in the works are eliminating policies that exclude highly qualified candidates, such as restrictive

“America is changing, and those applicants coming to us are changing. We’ve got to be able to adapt.”

—AFRS Commander Maj. Gen. Edward Thomas

tattoo policies, offering better incentives for recruits, such as college loan repayments, and more strategically placing recruiters to areas where they will be more likely to find successful candidates.

The biggest problem today, Thomas said, is simply finding people interested in joining the military.

“This has been a slow-moving train that’s been coming at us for decades, frankly,” Thomas said. “There are less veterans, less service members, less bases, less opportunity to be exposed to what it means to serve in uniform today ... the longer-term challenge of lack of familiarity is one that we’re going to have to come to grips with as a nation.”

This theme came up throughout the AFA Warfare Symposium, where top Air Force and Space Force officials urged Airmen and Guardians to help overcome negative perceptions or unfamiliarity with military service by sharing widely their own stories of service.

“Retention numbers look very good,” Air Force Secretary Frank Kendall said in his keynote address

March 7. “We’re keeping the people that we get. But we need to get more people.”

STRONG HEADWINDS

The Air Force Recruiting Service is flying into turbulent times. Having barely reached its fiscal 2022 goal for the Active-duty Air Force—and missed its goals for the Guard and Reserve by 1,500 to 2,000 recruits each—recruiters went into fiscal 2023 in the hole, projecting to come up 5,000 recruits short for the Active-duty alone.

Coming out of the pandemic when recruiting went almost entirely virtual, the Air Force now faces low unemployment and rampant negative misperceptions about military service, some even fueled by veterans complaining about today’s force.

Today, unemployment stands at 3.4 percent, the lowest since 1969, according to the Department of Commerce. Worse, only 23 percent of American youth are eligible to serve in the military, Thomas said, and only 9 percent say they are interested in serving.

With margins that small, the recruiting service needs to eliminate as many barriers to entry for qualified candidates as possible.

The service changed its tattoo policy March 1 to allow a single tattoo on each hand, not exceeding one inch in size, as well as one tattoo on the neck not exceeding one inch—as long as the tattoo is behind an imaginary vertical line dropping down from the ear. Previously, the service permitted only ring tattoos on the hand and none on the neck.

“America is changing and those applicants coming to us are changing,” Thomas said. “We’ve got to be able to adapt. We were literally turning away highly qualified applicants because of a small tattoo that was between their fingers, saying, ‘We wish we could make you an American Airman but why don’t you walk next door to the United States Navy?’”

On March 10, the Air Force unveiled another change, reinstating the Enlisted College Loan Repayment program that promises repayment plans of up to \$65,000 to help recruits settle their student loans and still take advantage of the GI Bill.

Thomas said the Air Force is also working with the U.S. Citi-

zenship and Immigration Services to expedite the naturalization process for U.S. permanent residents who join the branch.

“I find as we travel—whether it’s in Brooklyn or Miami or different parts of the United States—that we’ve got a lot of U.S. legal residents who are high-performing,” Thomas said. “They’re high quality, they’re hungry, they’re patriotic, and they want to serve. And we want to be able to get to them.”

If each small change such as these can get a few more hundred recruits in the door, Thomas hopes the Air Force can make up its shortfall.

“We are making smart changes where we were unnecessarily preventing otherwise highly qualified people from coming into the service,” he said.

‘REINTRODUCE OURSELVES TO AMERICA’

Eliminating barriers is only going to solve some of the problem, however. The more central issue is that military service is fading from view to most high school graduates today.

The Air Force was more open to visitors when Thomas first commissioned in 1990. Back then, busloads of schoolchildren visited for tours around bases, the services sent speakers out to talk about Air Force life with the local community, and open houses for people to visit were the norm. But multiple rounds of base closures, increased security measures after 9/11, reductions in force, and two decades of high-tempo counterterrorism operations have made the service less visible to the public.

Air Force Chief of Staff Gen. Charles Q. Brown Jr. has directed commanders “to get back out and reintroduce ourselves to America,” and by that he means more than just the local community. Instead, the Air Force must reach into all “those areas where the connection is a very thin thread at best,” Thomas stated. “Those are the areas that we need to be able to reconnect with America.”

Fifty years after eliminating the draft and establishing the all-volunteer force, the military is coming face-to-face with the fact that the number of Americans who served or know someone who served continues to decline.

Today, the Air Force can no longer depend on a population “of propensed or interested individuals, those that are already



High school students tried out Air Force technology during an open-hangar recruiting event held by the 155th Air Refueling Wing in Lincoln, Neb. Military service is less visible to many kids today, who are less likely to know service members or veterans.

Senior Airman Alexander Schriener/ANG

leaning toward the military,” Thomas explained.

“We have to be able to connect and reintroduce ourselves to America in a way that we interest the eligible, that we expand that pool.”

Pay and benefits go only so far. The military may not always be able to compete on straight compensation, so instead it must emphasize the sense of purpose, camaraderie, and personal growth that define the service experience.

“We are shifting our advertising strategy to focus more on that transformational message ... serving your community, doing things that matter, doing things that will help the nation, help your family, help grow you as a person,” Thomas added. “We are looking to be able to connect at that level, to reach people’s passion and their desire for a purpose-driven life.”

Chief of Space Operations Gen. B. Chance Saltzman, Vice Chief of Staff of the Air Force Gen. David W. Allvin, Chief Master Sergeant of the Space Force Roger A. Towberman, and Chief Master Sergeant of the Air Force JoAnne S. Bass are all singing from the same songbook. The four implored Airmen and Guardians at the symposium to go home and tell their stories.

So did Air Force Chief of Staff Brown, who asked everyone in attendance to take out their phones, take a selfie, and send it to everyone they knew saying, “Because of me, airpower is the answer.”

Brown took out his own cell phone, turned around, so that the standing-room-only crowd of 4,000 was behind him, and said “I’m going to send it to my mom. ... Because of our Airmen, airpower is the answer.”

Saltzman recalled that he joined the military to pay for college, then stayed on “because all of a sudden there’s relationships and people you like and respect, and it’s a fun group to hang out with,” he said. “So you take the next job, and you take the next job. And before you realize it, you have this sense of purpose.”

When Saltzman went home for visits, it seemed many of his civilian friends did not have that same sense of duty or purpose.

Suddenly, service was a special point of pride.

Towberman’s journey was different. For him, the Air Force became a refuge, a place to get his life back in order.

“I messed up my life in every way imaginable between 17 and 22,” said Towberman, the second Guardian in the Space Force’s history. “I’ve stolen food to feed myself. It doesn’t matter what I do—I don’t think my debt to the United States Air Force, and now Space Force, will ever be paid.”

Towberman called on his fellow service members “to play offense” to help build up the Air and Space Forces, to share their own stories of joining and staying in the military as an inspiration for others who might follow in their footsteps. Bass echoed the sentiment.

“The best recruiters are every single one of our Airmen, every single one of our Guardians,” she said.

The 2021 document, the “Guardian Ideal” was designed with that in mind.

“Our commitment to Guardians is to not give them a reason to quit this team,” Towberman said. “That’s where the focus has to be. ... We’re really focused on providing Guardians an experience that matters to them, that they feel empowered, that they feel cared about, that they’re connected to each other and to the mission.”

In recent years, the military has been increasingly portrayed as a place where young people become damaged, either through physical or emotional trauma, chemical exposure, or even poor leadership. That is not the military most Airmen or Guardians experience, the leaders said.

“Get out there, be proud, puff up your chest, tell people your stories and tell them your whole story—that’s what they need to hear from us,” Towberman said. “This is an opportunity like no other, where, especially on the enlisted side, on Day One of service, you can literally hit the reset button on your entire life and do anything you want to do.”

Opportunities like that, he said, “just don’t come along every day.”

Chief of Staff Gen. Charles Q. Brown Jr. stopped to take a selfie in the middle of his “Airpower is the Answer” speech at the AFA Warfare Symposium. He asked everyone present to do the same, and to share it with friends and families, saying “Because of me, airpower is the answer.”



Mike Tsukamoto/staff

Lack of Airpower in Ukraine Proves Value of Air Superiority



Staff of the Armed Forces of Ukraine/Facebook

As both Ukraine and Russia experience heavy casualties, the one who gains air superiority will finally have the upper hand. A flow of international support and aid to Ukraine has helped it stay in the fight as the wreckage of this downed Russian helicopter shows.

By Chris Gordon

Russia's failure to assert air superiority in its invasion of Ukraine demonstrates exactly how vital that capability is to success in conflict, said Gen. James B. Hecker, the top U.S. Air Force commander in Europe, March 22.

"One of the things that we see is the lack of either side—whether it be the Russian or Ukrainians—[achieving] the ability to get air superiority," Hecker said during an Aerospace Nation event with AFA's Mitchell Institute for Aerospace Studies. "That has really changed this into a different fight that we haven't seen in quite a while."

If Russia had gained air superiority early in the conflict, Hecker suggested, Ukraine would have been finished off militarily long ago.

Instead, however, Ukraine's air defenses and poor Russian tactics bought Ukraine time to generate international support and open up a flow of aid, including arms, access to technology, and humanitarian supplies. Since 2022, the U.S. alone has pledged over \$40 billion in arms support for Ukraine, an amount approaching what the entire U.S. Space Force spent in that same time frame.

Air Force Gen. Jacqueline D. Van Ovost, head of U.S. Transportation Command, recently said her command had made 1,000 airlift sorties and delivered an additional 65 shiploads of aid for land-locked Ukraine, with deliveries going through neighboring countries and then reaching Ukraine mostly by rail and truck.

Hecker said the West could not have managed that had Russia won control of the skies.

"Let's say the Russians had air superiority," he said. "If they were able to, all that equipment ... wouldn't have gotten there because there would have been Russian close air support sitting over those lines of communication coming in from the other countries. And as soon as it got into Ukraine, it would have been demolished."

Conversely, Ukraine's lack of airpower resources has kept it from overcoming Russian air defenses; had it been able to do so, Ukraine could have blunted Russia's invasion in its initial phases.

Now, a brutal war of attrition has set in, with both sides suffering tens of thousands of casualties, as U.S.-made 155 mm howitzers and precision HIMARS rockets pound away for Ukraine and Russia's Iranian-made one-way attack drones and stand-off cruise missiles pummel Ukraine from the air.

"From the Russian side, they don't care if you hit hospitals, they don't care if you hit schools, they don't care if you hit malls," Hecker said. The result is "massive destruction, massive casualties—just something that we're not used to."

As commander of U.S. Air Forces in Europe (USAFE) and NATO Allied Air Command, Hecker is the airpower point person for 30 nations aligned in opposition to Russia's invasion, but united in trying to stay out of the conflict. Gradually, however, NATO activity has expanded, from Air Policing missions at the start, to exercises that approximate what NATO would do if Russia expanded its war to the West, to routine intelligence

missions, such as the one in which an unarmed MQ-9 Reaper drone was felled after a Russian Su-27 Flanker clipped its propeller after first trying to dump fuel on it.

“What we’re looking at and concentrating on at USAFE is what can we do to ensure that we get air superiority should we have to invoke Article V [NATO’s mutual self-defense clause], and then what can we do to make sure that our enemy doesn’t get air superiority,” Hecker said.

“The number one priority to make sure that we’re able to get air superiority is to make sure that we can do the counter-IADS mission,” Hecker said, referring to Russia’s integrated air defense systems. “What we’ve seen on both sides—both Russia and Ukraine—is their integrated air and missile defenses are working pretty well, to the point where they’re shooting down the other’s aircraft. And the aircraft aren’t as visible as they should be if they’d concentrated more on air superiority.”

Ukraine has lost around 60 aircraft and Russia has lost over 70 aircraft, Hecker revealed at the AFA Warfare Symposium in early March.

NATO, in turn, must bolster its own air defenses, Hecker said. The Air Force must also increase information sharing among allies and focus on Agile Combat Employment (ACE) to disperse its targets, he added.

In Hecker’s role as commander of USAFE, he is helping the U.S. provide Ukraine with information to assist its targeting. The U.S. has also been providing hardware, including AGM-88 HARM anti-radiation missiles to attack Russian surface-to-air missile sites, and 500-pound JDAM extended-range guided bombs.

The Biden administration has so far declined to provide long-range ATACMS missiles for HIMARS, has prohibited U.S.-origin weapons from being used against Russian territory, and has held fast against delivering fighter aircraft, such as F-16s. Ukraine’s air force will be aided, however, by the donation of 17 Soviet-era MiG-29s from eastern European NATO allies. But with Russian air defenses across the border in Russia and in neighboring Belarus, seemingly out of range of Ukraine’s ability to attack, that will pose additional challenges for the MiGs.

Still, Hecker said, capacity is important. “Any more quantity is going to help [Ukraine],” he stated. “This will allow them to come at different axes, which will complicate the problem Russia has.”

Doing that is critical to blocking Russia from gaining the upper hand in the ongoing slugfest. “In the short term,” Hecker said, “we just need to make sure that Russia does not get air superiority.”

Minihan: Mobility Guardian 23 Will Test Airmen in New Ways

By David Roza

AURORA, COLO.

Air Mobility Command aims to find out how Airmen manage the combined challenges of distance, open ocean, and joint-force integration at a major Pacific exercise this summer.

Operation Mobility Guardian is usually a domestic event, but this year AMC is amping up the challenges, said Gen. Mike A. Minihan, AMC commander, during the AFA Warfare Symposium. “We moved that into the theater that matters,” he said. “We are going to understand intimately what the tyranny of distance is and what the tyranny of water is.”

Mobility Guardian is USAF’s largest full-spectrum annual mobility readiness exercise, and typically tests the command’s ability to refuel aircraft, transport equipment, and practice aeromedical evacuations and the like. Plans for Mobility Guardian 2023 took shape over five days of planning sessions in February, where some 180 leaders representing the Air Force, Army, Navy, Marine Corps, the U.S. Department of State, and seven allied nations came together. The event itself will take place under the authority of U.S. Indo-Pacific Command this summer.

For Minihan, the exercise is a chance to find out whether the changes he’s pushed since taking over the command in October 2021 have borne fruit. He sees four crucial areas in which mobility troops must come out ahead to be ready to fight and win against China—command and control, navigation, tempo, and “maneuver under fire,” which Minihan defines as being able to execute maintenance, logistics, and fueling to keep the joint force operational.

“Can we operate at the tempo required to win? Can we operate at the tempo greater than our potential adversaries?” Minihan asked March 7. “You cannot have integrated opera-



Mike Tsukamoto/staff

Gen. Mike Minihan, Commander, Air Mobility Command, says Mobility Guardian 23 will test our Airmen’s readiness in the Indo-Pacific theater.

tions if you do not have integrated planning in advance.”

Mobility Guardian 2023 will put that integration to the test.

“As the joint force maneuvers, we have to service everybody,” Minihan said. “We are going to have a chance to do that in the theater: We are going to have a chance to work with all these entities, and we’re going to test the planning integration to see if that really turns into operational integration in the theater.”

It will not go perfectly, he pointed out, but it will expose the gaps in capability and knowledge that must be bridged in the future.

“We’ll learn something,” Minihan said. “Some things won’t go perfectly, and we’ll go back... and close gaps as quick as we can.”

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Boeing

The Air Force has contracted to buy Boeing E-7 Wedgetail Airborne Early Warning and Control aircraft, shown here accompanied by uncrewed MQ-28 Ghost Bats; both developed with Australia. The MQ-28 is a candidate for USAF's Collaborative Combat Aircraft.

The Future Force

13 programs that offer a glimpse at what the Air Force's drive to modernize could yield.

By John A. Tirpak

After a prolonged period of anemic aircraft recapitalization, the Air Force is launching a robust and fast-paced program of modernization. At least 20 new airplane programs—including a handful that are variants—are in some stage of planning or development. If sustained, this airplane-building campaign will lower the average age of the fleet, increase its size, and enhance its ability to be upgraded rapidly. But with so many new efforts underway, and the never-ending competition from funding “fight tonight” readiness and force structure demands, trade-offs and choices will have to be made.

For this summary, we have listed only programs that have been announced by Air Force leaders, or which have appeared in budget documents, been announced through industry solicitations, or otherwise disclosed through open sources. Programs already in series production—such as the F-35 and T-7A trainer—are not included. This list is not comprehensive, as many programs have changed names or concept, may have been submerged in a new level of classification, or may not have been revealed publicly. Not all of these programs are likely to make it into production.

MOBILITY AIRCRAFT

Program: Advanced Aerial Refueling Family of Systems/ “Bridge Tanker”
Target Service Date: 2032
User: Air Mobility Command



Lockheed Martin

The Air Force has dropped its decade-long, three-phase plan to recapitalize its KC-135 and KC-10 tanker fleets: known as the KC-X, Y, and Z. The KC-X, meant to recapitalize much of the KC-135 fleet, became the KC-46, and is delivering 179 aircraft through 2029. Its follow-on, the KC-Y, was to have been a 150-airplane program to complete replacement of the KC-135 and the KC-10. However, the Air Force has trimmed that phase to 75 “traditional” tankers—modified commercial airliners or cargo jets—and moved on to a stealthy, survivable future tanker known as the Next-Generation Air refueling

System (or NGAS, see below) in the third phase. Although no longer called the “bridge tanker,” the Advanced Aerial Refueling Family of Systems is essentially that. The service will decide mid-2024 whether to hold a competition for the interim tanker or simply award Boeing a sole-source contract for more KC-46s with some additional communications and possibly command and control capability. Some members of Congress, unhappy with Boeing’s KC-46 performance, will push for a new competition. Lockheed Martin has put forward its larger LMXT tanker based on the Airbus A330 Multi-Role Tanker Transport (MRTT) for the bridge tanker.

Program:
Next-Generation
Air-Refueling
System (NGAS,
formerly KC-Z)
Target Service
Date: 2040
User: Air Mobility
Command



Lockheed Martin

Air Mobility Command needs a stealthy tanker able to survive in contested airspace, in order to expand the fleet’s range and allow other aircraft to operate closer to well-defended targets. Air Force Secretary Frank Kendall has said USAF can no longer simply convert civilian airliners or freighters for tanking duty, but must have purpose-built aircraft that put a “high premium on survivability.” The Air Force asked industry for NGAS information in a Jan. 31, 2023, announcement, saying it’s open to a wide variety of operational concepts and aircraft designs, but the Air Force and the Defense Innovation Unit are already studying blended wing body (BWB) concepts, able to achieve at least a 30 percent efficiency improvement over the existing KC-135/KC-10 fleet. An NGAS Analysis of Alternatives will get underway in October. Formerly the “KC-Z” phase of a three-stage tanker recapitalization effort, the program is now known as “increment three.” USAF will entertain any ideas that can reach a Technology Readiness Level of 6—ready for a prototype—by 2032.

Program: C-X Strategic Transport
Target Service Date: 2045+
User: Air Mobility Command

The C-5 Galaxy received a major upgrade in the 2010s, which should extend its life into the 2040s, but the C-17 has not yet had a service life extension program (SLEP). Even if it does, the Air Force believes that more survivable aircraft, able to operate from areas without a large runway—perhaps without any runway—are its future. The “C-X” is a placeholder for a future strategic transport to succeed the C-5 and the C-17, likely having stealth and globe-girdling ranges, but the requirements are still being hashed out and will depend on many other choices made in the interim. With new tankers the focus in the near-term, and a reasonably healthy fleet of strategic lifters in hand—the C-17 fleet averages just 14.1 years old—the Air Force has time to decide what it really needs in a follow-on heavy lifter. Kendall has established a “cross-cutting capability task force” for airlift and tanking charged with developing a comprehensive mobility roadmap that meshes with his “operational imperatives.”

TACTICAL COMBAT AVIATION

Program:
Next-Generation
Air Dominance
(NGAD)
Target Service
Date: 2030
User: Air Combat
Command



Northrop Grumman

The Air Force describes the highly classified NGAD as not a single, crewed fighter but a family of platforms intended to collectively gain air superiority at a time and place “of our choosing.” The NGAD is needed because adversary aircraft, particularly those of China, are gaining in stealth and have long-range air-to-air missiles, driving USAF to seek a new fighter-like capability an order of magnitude stealthier than the F-22. Meant to succeed the F-22 circa 2030, the NGAD will comprise one crewed airplane and up to five Collaborative Combat Aircraft that will act as its wingmen and protect it from air, electronic/cyber, and surface threats. The Air Force will have invested more than \$9 billion in NGAD by 2025. Former USAF acquisition executive Will Roper in 2020 revealed that an NGAD “full-scale demonstrator” prototype had already flown and “broken a lot of records,” although he did not say whether those had to do with physical performance or speed of prototyping. Further, Roper’s vision was for a fresh NGAD design to become operational every five years, to keep up with rapidly advancing technology. Roper’s vision called for 50 to 100 NGADs that would be flown up to 15 years, then either moderately updated, retired or used in one-way missions, eliminating long-term sustainment costs. The NGAD is not meant to replace the F-22 on a one-for-one basis. At least one variant of NGAD will have sufficient range to operate in the Pacific with far less tanker support than today’s fighters. While the Air Force and Navy are comparing notes on NGAD technologies and seeking some commonalities, they are not pursuing a joint program. Kendall has mentioned a “notional” inventory of 200 NGADs, but has not offered a definitive fleet size.

Program:
Collaborative
Combat Aircraft
Target Service
Date: 2030
User: Air Combat
Command



General Atomics

The Air Force envisions Collaborative Combat Aircraft (CCA) as uncrewed, autonomous escorts for crewed airplanes, with an ultimate ratio as high as five CCAs to each fighter or bomber. They will perform missions such as Suppression/Destruction of Enemy Air Defenses (SEAD); intelligence, surveillance, reconnaissance (ISR); Electronic Attack/Electronic Warfare (EA/EW), secure communications, and potentially as battle management nodes, and provide “affordable mass” for the combat air forces. Air Combat Command requirements chief Maj. Gen. R. Scott Jobe said in March 2023 that it’s a “misconception” that CCAs will be “attritable,” saying they are meant to be capable platforms that will have years of service,

though some will not be “unpacked” until they’re needed for combat. Kendall said in March he has tasked staff to examine how a 1,000-CCA force—with two each to accompany 200 NGADs and 300 F-35s—would be equipped, and how ACC would be organized to operate them. Kendall described the CCAs as analogous to flying, independent versions of the pods fighters carry for sensing and targeting, and wants them at a “fraction” to “half” of the price of the F-35, which costs about \$80 million each. Early versions are likely to be used as stealthy threat simulators in live-fly wargames. The service expects that a majority of CCAs will be of modular design, with payloads or even whole sections of the aircraft able to be changed out to fit required missions.

Program: Penetrating Electronic Attack (PEA) aircraft
Target Service Date: 2030-2032
User: Air Combat Command

In the mid-2010s, the Air Force was working on two aircraft meant to carry the air-superiority fight inside contested enemy air defense zones: the Penetrating Combat Aircraft (PCA) and Penetrating Electronic Attack (PEA) aircraft. The PEA was described as a “stand-in jammer,” replacing and expanding on capabilities lost when the Navy/Marine Corps retired the EA-6B Prowler and curtailed their EA-18 Growler program, on which the Air Force relied. Former Air Combat Command chief retired Gen. Herbert J. Carlisle said in 2017 that he thought the PEA would beat the PCA into service, as the need for it is greater, given China’s heavy investment in spectrum warfare. He also said the PEA was likely to be “autonomous” or “semi-autonomous.” While the PCA is likely to have evolved into the crewed centerpiece of the NGAD program, the PEA may now be one of the CCA platforms in the NGAD family. ACC Commander Gen. Mark Kelly said in March that electronic warfare is the No. 1 function needed of CCAs.

Program: MR-F or MR-X
Target Service Date: Mid-2030s
User: Air Combat Command

When the Air Force’s F-16s reach the end of their already-extended service lives, circa 2035, the service will need a successor: a relatively low-cost aircraft able to act as a force-builder, as well as an aircraft the U.S. can use to partner with countries lacking the funds or sophistication to operate a high-end combat aircraft fleet. Chief of Staff Gen. Charles Q. Brown Jr. has described this aircraft, known in USAF planning documents as “MR-F” or “MR-X,” as a “fifth-gen-minus” aircraft, meaning it has more survivability than a fourth-generation F-16 but somewhat less complexity and cost than a fifth-generation F-35. First revealed in 2021 in tactical aviation planning documents, the MR-F/MR-X is not yet a program of record, and Air Combat Command has not signed out a requirement for it. Air Force Program Executive Officer for fighters and advanced aircraft, Brig. Gen. Dale White, said in August 2022 that “the MR-F piece is going to continue to be looked at, because at some point we’ll have to have a replacement” for the F-16. One potential option for MR-F/MR-X is a weaponized T-7A RedHawk trainer, built by Boeing, which could be fitted with hardpoints and sensors to provide a low-cost, easily maintained light strike and air defense capability.

INTELLIGENCE, SURVEILLANCE, RECONNAISSANCE

Program: E-7 Wedgetail
Target Service Date: 2027
User: Air Combat Command



With USAF’s E-3 AWACS fleet mission capable only half the time—mainly due to obsolescing systems and a nearly-extinct 707 parts pipeline—the service moved in late winter to acquire the E-7A Wedgetail, an AWACS built by Boeing (originally for Australia) that has now been adopted by a number of U.S. allies. The E-7 is already in production, and the investments made in it by allies can be leveraged by the Air Force. After preliminary studies last fall, in March USAF awarded Boeing a \$1.2 billion contract to get underway and build two prototypes starting in 2025, which should be available for operational use in 2027. A total of 26 E-7s is planned, with the last one delivered circa 2032. Beyond that, the Air Force expects to conduct the future Air Moving Target Indicator mission with space-based assets. The E-7 will also have a Battle Management, Command and Control mission. It will be inherently interoperable with the air forces of allies who have already bought it, but USAF will be adding its own unique capabilities. The E-3 will be retained and upgraded until the E-7 can take the mission over.

Program: RQ-180
Target Service Date: Imminent or Already Operational
User: Air Combat Command

The Air Force’s gradual phase-out of the RQ-4 Global Hawk and U-2 Dragon Lady with no apparent successor suggests a classified program is well in hand. While satellites have tremendous ISR capability, they lack the flexibility for quick repositioning to observe fast-developing events. The existence of the RQ-180—said to be a high-altitude, stealthy flying wing for penetrating intelligence, surveillance and reconnaissance work—is something of an open secret, but the Air Force has not officially revealed the aircraft. Budget documents, comments from senior USAF leaders and unexplained classified work with Northrop Grumman points to the RQ-180 as a possible technological pathfinder for the B-21 Raider, both programmatically and as part of “family of systems” that helps the bomber prosecute its targets. Northrop had a seven-year relationship with the Air Force’s Rapid Capabilities Office before the B-21 contract was awarded, and this work likely focused on the RQ-180.

LONG-RANGE STRIKE

Program: Uncrewed B-21 “Raider” Bomber
Target Service Date: Mid-2020s to 2035
User: Global Strike Command

The B-21 program is expected to produce “usable assets” in the mid-2020s, and become the backbone of USAF’s bomber force in the early 2030s, as the B-1B and B-2 retire. While the Air Force still quotes a figure of “at least 100” B-21s as its buy objective, service leaders have quoted requirements of up to 150

of the aircraft, and outside experts say the service needs more than 200. Extremely stealthy, the B-21 has been designed with an open architecture to allow its many systems to



USAF

be upgraded continuously in response to an evolving threat. The B-21 contract calls for the bomber to be “optionally manned,” and service leaders have been coy in discussing whether and when that capability will be demonstrated, but there have been no statements suggesting the requirement has been dropped. Air Force acquisition executive Andrew Hunter said at the aircraft’s rollout only that the crewed version is “clearly the focus” of the program right now. Not widely discussed by the Air Force, the B-2 will also have advanced sensors and ways to stealthily share the information it collects from deep inside enemy airspace. Its uncrewed capability may have been required in order to keep B-21s in heavily defended airspace for long periods of time for that purpose. Described as a “family of systems,” the B-21 also likely will rely on satellites for real-time targeting information and other “enabling” capabilities the Air Force has not discussed. The first B-21 rolled out in December 2022, and USAF leaders say five more are in work at Northrop Grumman’s Palmdale, Calif., factory. It is expected to make its first flight in the next few months, delayed about a year from initial predictions. The B-21 has been managed by the Air Force’s Rapid Capabilities Office. [See “The Case for the B-21 Raider,” on p. 44 for more information]

Program: Long-Range Bomber Collaborative Aircraft
Target Service Date: No Earlier than 2040
User: Global Strike Command

Among Kendall’s “operational imperatives”—seven hardware capabilities demanded by the evolving threat—is “defining the B-21 family of long-range strike systems,” and among those initially described were autonomous aircraft that could fly along with the B-21. These robotic wingmen could potentially provide fighter cover or electronic support for the bomber, or perhaps carry their own nuclear weapons. However, at the 2022 Royal International Air Tattoo in the U.K., Kendall admitted to reporters that such an idea is not proving “cost-effective,” and the idea had been tabled for now. Service officials have since said that the idea is not dead, but will depend on progress in CCAs developed for the NGAD program. If the technology takes off, bomber escorts could return, especially if adversary air defenses demand it. Air Force leaders say they are not contemplating CCA-like aircraft equipped with nuclear weapons, but that may change, as the status of strategic arms agreements with Russia are in flux, and no such agreements are in place with China.

SPECIAL OPERATIONS AND COMBAT RESCUE

Program: Advanced Tactical Transport
Target Service Date: ~2030
User: Special Operations Command

Under many names, and for at least 30 years, the Air Force has explored the idea of a stealthy special operations aircraft that could infiltrate and exfiltrate special operators in well-defended enemy territory, applying short takeoff/vertical landing

concepts without the need to use prepared airfields. Early concepts explored rocket-assisted takeoffs and landings in special operations C-130 aircraft for STOVL capability, but the need for a dedicated low-observable craft in this role has only increased.



Lockheed Martin

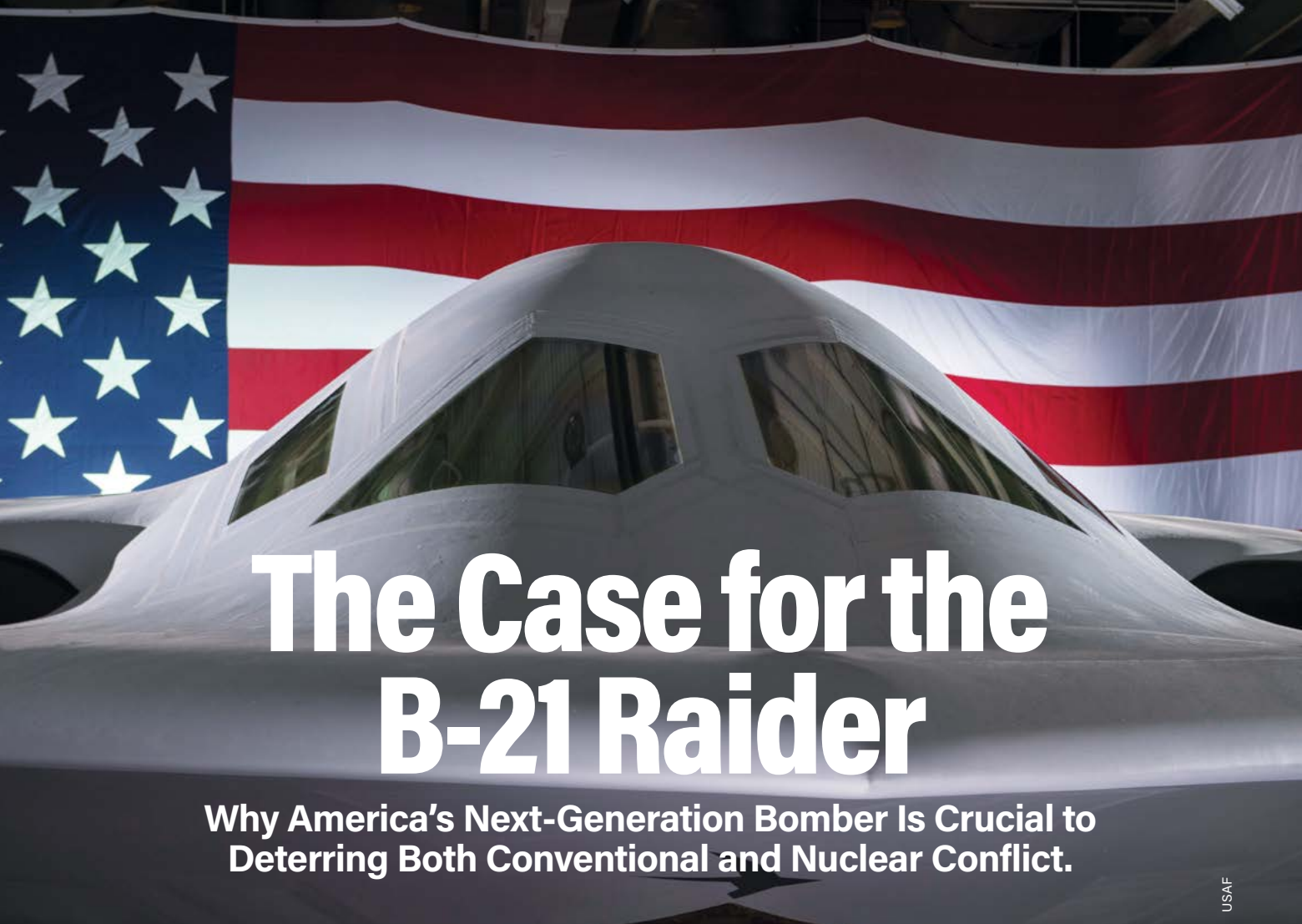
In recent years, the Air Force has focused on improving its C-130-based special operations fleet, but an advanced tactical transport for SOF has recently been mentioned in the same breath with an advanced, small, stealth tanker with possible overlap between the two designs. In the 2000s, Lockheed Martin pushed a concept called VARIOUS, which featured a fan-in-wing concept, and could be scaled from small unmanned aircraft up to medium-size transports. VARIOUS or something like it could at first supplement and later succeed the CV-22 tilt-rotor used for infil/exfil of SOF, being inherently more survivable, and with a reduced crew. The program appears to be an outgrowth of a 2020s program called Project IX, and may be in the prototype stage.

Program: Future Combat Rescue Aircraft / Agility Prime Variant
Target Service Date: 2028 or Later
User: Air Combat Command



Staff Sgt. Taylor Crui

The Air Force announced in 2022 that it would stop buying HH-60 Jolly Green II Combat Rescue Helicopters after acquiring the 75th aircraft, well short of the program objective of 113. The service said that in the Pacific theater and elsewhere, downed Airmen are likely to be beyond the practical range of the HH-60 or other protective force elements, and Air Combat Command is studying how it will reimagine and conduct the combat search and rescue mission. While the CV-22 has been suggested as an alternative—given its greater speed and range versus the HH-60—it lacks the stealth and survivability ACC will likely require in the future. For the last few years, USAF has been working on “Agility Prime,” meant to explore “flying car” concepts that could rapidly find a commercial market while potentially fill military needs as well. In a report to Congress last summer, Kendall said Agility Prime could be an “advanced air mobility” craft incorporating electric or hybrid propulsion, and perform “optionally crewed missions with onboard pilot, remote pilot or autonomous control.” ACC is said to be looking at options wherein a small Agility Prime-like craft could retrieve a downed Airmen while placing no other aircrew at risk. Undetermined at this point is how first aid could be rendered without a rescue operator onboard. As a nearer-term measure, the Air Force is evaluating the concept of C-130s equipped with floats for water landings and takeoffs, to reach Airmen at longer ranges in the Pacific.



The Case for the B-21 Raider

Why America's Next-Generation Bomber Is Crucial to Deterring Both Conventional and Nuclear Conflict.

USAF

The B-21 will play a critical role in ensuring America's enduring airpower capability by providing survivable, long-range, penetrating strike capabilities to deter aggression and strategic attacks against the United States, allies, and partners.

By Col. Mark Gunzinger, USAF (Ret.)

The ability to conduct long-range strikes at scale in all threat environments has been a decisive U.S. military advantage for more than 70 years. Long-range bombers enable theater commanders to strike enemy targets inaccessible to other U.S. and allied forces. Yet this advantage is severely diminished today by a smaller bomber force that cannot meet growing demand for global precision strikes, in particular the contested environments we can anticipate in potential peer conflicts.

The Air Force's B-21 Raider will be the world's most advanced stealthy bomber when it is fielded later in this decade. For Air Force leaders, the challenge will be to fund the B-21 program to rapidly acquire the inventory it needs to meet operational demands. The Air Force cannot afford to repeat the cuts, delays, and outright cancellations that struck the B-2, F-22, and F-35A over the past three decades.

To achieve the capacity to simultaneously defeat Chinese aggression in the Indo-Pacific, credibly deter an opportunistic aggressor in a second theater, and still deter nuclear attacks on the United States—all requirements of the 2022 National Defense Strategy (NDS)—the U.S. will need a significantly larger bomber

The U.S. will need a significantly larger bomber force than it has today. Without the Raider, the U.S. has no viable "Plan B."

force than it has today. Even a delay in achieving this objective could result in a hollow U.S. military incapable of prevailing against China. Other combat aircraft lack the B-21's attributes, and they cannot match the options B-21s offer theater commanders.

Without the Raider, the U.S. has no viable "Plan B."

TODAY'S BOMBER FORCE

In 1989, the Air Force had 411 B-52, F-111, and B-1 bombers in a force sized to deter nuclear threats and fight conventional conflicts against Cold War adversaries including the Soviet Union. This force enabled the decisive response that defeated Iraqi forces and sent them fleeing back home from occupied Kuwait in 1991. B-52s alone flew 1,741 combat sorties and dropped 27,000 tons of weapons on Iraqi targets in Operation Desert Storm—30 percent of all weapons, by tonnage, delivered by American airpower. Seven of these sorties flew directly from Barksdale Air Force Base, La., to strike Iraqi power and communications nodes on the first night of the air campaign. These sorties, called Operation Senior Surprise by the Air Force—or "Operation Secret Squirrel!" by the crews that flew them—unambiguously demonstrated the ability of long-range bombers to strike any target on the face of the Earth.

Three Decades of Cutting the Bomber Force

Over six quadrennial reviews, the Pentagon cut its bomber force in half. Plans now call for expanding the bomber force to meet new challenges.

DOD Strategic Review	Bomber Force Sizing Decisions
1993 Bottom-Up Review	184 total bombers (100 bombers needed for one major theater war)
1997 Quadrennial Defense Review	142 operational bombers
2001 Quadrennial Defense Review	112 combat-coded bombers
2006 Quadrennial Defense Review	Cut the B-52 force to 56 total aircraft (intent was to use resulting savings to modernize remaining bombers) Directed the Air Force to field a new stealthy bomber by 2018
2010 Quadrennial Defense Review	96 primary mission aircraft New stealthy bomber canceled by the Secretary of Defense in 2009
2014 Quadrennial Defense Review	96 primary mission aircraft (44 B-52H, 36 B-1B, 16 B-2)

Despite their proven effectiveness, 30 years of cuts have reduced America’s bomber force to just 141 aircraft, most of which are the exact same airframes—B-52Hs and B-1Bs—that were on the ramp in 1990. Throughout the post-Cold War period, multiple Department of Defense reviews repeatedly downsized the combat air forces; labeled as “strategic” reviews, most of these assessments were, in fact, budget drills, driven by the objective to realize cost savings for other needs. The U.S. repeatedly traded current force capacity in order to sustain and upgrade remaining forces.

Today’s bomber force is also the Air Force’s oldest ever. The last new B-52 was delivered when President John F. Kennedy was in office; the Air Force took delivery of its B-1Bs in 1989. The Air Force plans to operate its B-52s until 2050, by which time they will have reached an unprecedented average age of 82 years.

DOD’s only long-range strike aircraft capable of penetrating contested areas protected by advanced integrated air defense systems (IADS) are its 20 B-2 bombers. Yet even that number is an overstatement: Only 16 of the 20 B-2s are assigned to combat squadrons; the other four are unavailable due to maintenance or testing requirements. Further, it is likely in any conflict that some nuclear-capable B-2s would be withheld from deployment to deter nuclear attacks on the U.S. homeland, especially during conflicts with a near-peer nuclear power. And because most flights would be long-duration missions across the vast expanses of the Indo-Pacific, B-2s would most likely average just 0.8 sorties per day or less.

In short, DOD’s long-range, penetrating strike capacity for a conflict with China currently totals just six to eight B-2 sorties per day, depending on basing, sortie durations, and the time needed to turn aircraft between sorties. Losing a single B-2, whether in combat or some other reason, would reduce sortie potential by at least 10 percent.

This is the definition of a fragile force. The Air Force’s bomber inventory and other combat air forces are now too small, too old, and lack enough lethality and survivability for a peer conflict.

WHY WE NEED PENETRATING BOMBERS

Threats facing the United States and its allies and partners are now far different than the more benign security environment DOD used to justify hollowing out its bomber force in the decade after the Cold War. The dissolution of DOD’s long-range strike capabilities and capacity accelerated in the post-9/11 era, as resources were surged to fund low-intensity counterterrorism and counterinsurgency operations.

While the U.S. cut, China invested. The People’s Liberation Army Air Forces’ most advanced weapons systems now ap-

proach—and in some instances surpass—the U.S. military’s capabilities. Further, China has fielded offensive and defensive capabilities “expressly designed to keep U.S. and allied forces at arm’s length and to suppress U.S. and allied operations for a period of time that is sufficient to allow the success of a *fait accompli*.”

China has developed an anti-access/area-denial (A2/AD) complex that includes multiple variants of low-observable military aircraft, such as the J-20; the PL-15 long-range air-to-air missile, which has an active radar seeker and is carried internally by stealthy fighters; and other advanced weapons designed to intercept U.S. surveillance aircraft and air-refueling tankers, such as the 400-kilometer-class PL-XX. The Royal United Services Institute has suggested PL-15s can outrange U.S. AIM-120C/D air-to-air missiles, a standard munition used by Air Force, Navy, and Marine Corps fighters for air-superiority missions.

China also has substantial inventories of the DF-21D anti-ship ballistic missile (ASBM), anti-ship and land-attack cruise missiles, and hypersonic weapons designed to strike U.S. bases and forces well beyond the first island chain in the Pacific.

China continues to modernize its nuclear forces and now has an operational triad of nuclear-capable intercontinental ballistic missiles (ICBM), bombers, and submarine-launched ballistic missiles (SLBM). China’s growing nuclear warhead inventory suggests a shift from maintaining a minimum force designed to retaliate in the event of a nuclear attack on China to a force that equals or exceeds the U.S. triad.

In a conflict over Taiwan, China would be the “home team,” compared to the U.S. which would have to mount operations from a great distance away. That proximity means the PLA’s power-projection forces would be closer to mainland bases, with simpler resupply lines and greater protective cover from existing sensors and air-defense systems deployed along China’s coast.

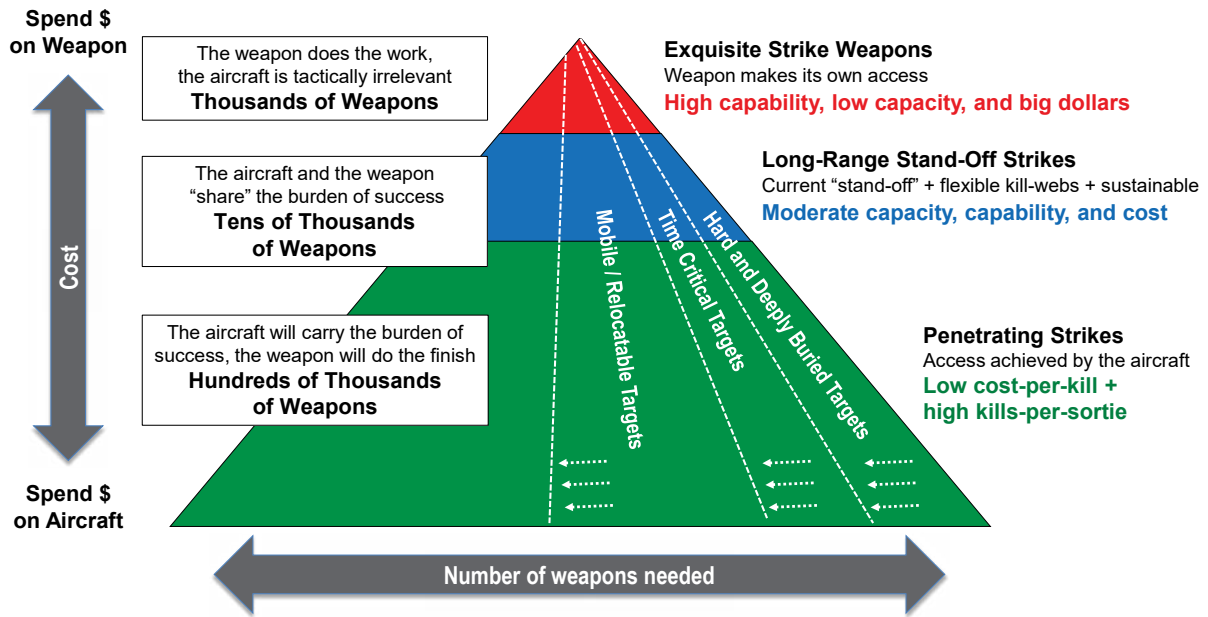
China’s military modernization is on pace to enable it to potentially seize Taiwan by 2027 and become a “world class force” by 2049.

To counter China and defeat a Chinese *fait accompli* in Taiwan, the Air Force needs penetrating bombers that can deliver weapons at range, enabling theater commanders to achieve a wide spectrum of effects against the most difficult target sets. More Air Force long-range, penetrating strike capacity is now required to defeat Chinese aggression in the Indo-Pacific and meet other NDS force-sizing requirements. To a significant extent, the need for more long-range penetrating strike capacity is driven by theater commander requirements to counter China’s operational advantages in a conflict that occurs along its periphery.

The long ranges required to project power against the PLA in

The Weapons Portfolio DOD Needs

Different targets require different weapons. “Exquisite strike” weapons at the apex of this pyramid include stand-off hypersonic boost-glide weapons that, while capable of penetrating enemy defenses, cost more than \$10 million each. Such weapons can only be used against certain very high-value targets. Precision-guided bombs cost less per strike and enable more strikes per sortie.



Source: U.S. Air Force Armament Directorate

the Indo-Pacific stresses the U.S. military’s current force design, which was optimized after the Cold War for lesser regional conflicts in far more confined and less-contested battlespaces. U.S. forces have grown accustomed to freely accessing bases near operating areas, surrounding those bases with forces, and then executing sustained, short-range operations with manageable risk, safe from enemy defenses.

Not so in the Pacific, where U.S. aircraft operating from Guam, northern Australia, and Japan must fly hundreds of miles to reach the battlespace around the Taiwan Strait and adjacent to China’s mainland. DOD’s current fixed-wing combat aircraft fleets overwhelmingly consist of fighters with a mission radius of 650 to 700 nautical miles (nm) or less, depending on their payloads and mission profiles.

To put this in context, 700 nm is like flying from Washington, D.C., to Tampa and back. The distance from Australia to the Taiwan Strait are more like flying from Washington, D.C., to Juneau, Alaska, and back—more than four times as far—and all in a single mission. Fighters operating from bases along the first and second island chains in the Pacific or from distant aircraft carriers would require aerial refueling to reach targets in the Taiwan Strait, and again to return to their bases. Critically, the PRC’s missile threats put carriers at risk, making them of little use in a defense of Taiwan scenario.

Long-range stand-off strikes are helpful, but not an alternative to penetrating bombers. Many of the forces that China would use for its initial assault operations, like SAGs and surface-to-surface missile launchers, will be moving or can quickly relocate. Highly mobile targets can significantly degrade the effectiveness of stand-off strikes. If all an adversary needs to do to be survivable is move targets a few hundred feet left or right, stand-off weapons won’t be enough to defeat them.

Only penetrating bombers have mission persistence to locate, track, and strike large numbers of mobile/relocatable targets in a single sortie. Compared to bombers, fighter aircraft carry fewer weapons and lack the range and loiter time to remain effective for long. Indeed, even in best-case scenarios, fighters operating

from first island chain bases can reach parts of China’s coastline, but not much further.

WHAT PENETRATING BOMBERS DO

Penetrating bombers provide flexibility unmatched by other strike systems. The combination of long ranges, large payloads, on-board sensors, and other capabilities make penetrating bombers ideal for conventional strikes as well as suppression of enemy air defenses (SEAD), close air support (CAS), and other missions in all threat environments. With appropriate munitions, penetrating bombers can conduct maritime attacks and air-deliver sea mines deep into contested areas where surface ships could not operate. Maritime strike is already a key mission for the B-1 bomber, which can carry up to 24 Long-Range Anti-Ship Missiles (LRASM) per sortie.

Like other Air Force bombers, B-21s will be able to operate directly from the United States and overseas bases with less need for replenishment and aerial refueling compared to shorter-range aircraft and carrier air wings. This is crucial at the start of a conflict when Air Force tankers will be in extremely high demand to support deploying forces.

The B-21’s large weapons bays will also allow them to strike more targets per sortie than fighters, and their ability to penetrate highly contested areas will allow them to fire smaller, shorter-range weapons that are more effective against a range of targets. This increases the number and type of aimpoints that B-21s can strike per sortie compared to nonstealthy aircraft that must employ much larger stand-off weapons to strike the same targets.

Like the B-52 and B-2, the B-21 is designed to deliver nuclear as well as conventional weapons, making them “dual capable.” Bombers are the only leg of the U.S. nuclear triad that are able to be used for conventional or nuclear attacks. In a crisis, bombers can be postured to reduce their response times and dispersed to multiple bases to reduce vulnerability to counterattacks. As the most visible leg of the U.S. nuclear triad, bombers can launch, remain on airborne alert, and then recover or proceed

on their nuclear strike missions, providing unmatched signaling options in a crisis.

Penetrating bombers are also the most effective means to strike mobile/relocatable targets. DOD has had a persistent shortfall in its capacity to strike large numbers of missile transporter-erector-launchers (TELS), surface-to-air missile (SAM) launchers, vehicle-based command and control (C2) centers, and other mobile and relocatable targets in contested areas. Mobilizing high-value targets has been widely embraced by the world's militaries as a tactic to counter precision strikes. Today's modern missile launchers can fire their weapons, stow their sensors, and relocate within minutes. For a cruise missile flying 400 nm to its target, even at high subsonic speeds, it can take more than 40 minutes from launch to impact. That gives mobile targets ample time to move.

Weapon flight times could be even greater for surface-to-surface missiles launched from more distant locations along the Pacific's first island chain or Navy ships standing off 1,000 nm or more from China's coastline defenses.

Another proposed approach is to design individual weapons with sophisticated sensors and the ability to loiter in target areas to find, identify, and then attack mobile targets. While valuable, such features drive up weapons costs to the point where they may be unaffordable at the scale needed for peer conflict. Weapons with a powerplant, capacity to carry enough fuel to fly long distances and then loiter, control surfaces to maneuver, guidance systems, and target seekers can cost millions of dollars each. Such costs are difficult to justify for all but the highest-value targets.

By contrast, penetrating bombers are reusable sensor-shooter nodes that can organically close kill chains against mobile/relocatable targets in contested airspace. This is a huge advantage over stand-off strike systems that depend on off-board sensors for target cues, especially in contested areas where space-based sensors and long-range data links may be degraded or denied. Smart munitions are no longer smart when they lose necessary data inputs.

The compressed kill chains of penetrating strike aircraft can also reduce the time available to an adversary to counter attacks.

Compressed kill chains that improve the probability that PGMs will reach their designated aimpoints could also reduce the total number of weapons and sorties needed to strike large target sets. This is critical at the onset of a campaign when time and resources can make the difference between success or failure.

Penetrating bombers are the best means to strike very hard/deeply buried targets over long ranges. Killing hardened targets like aircraft shelters, C2 centers, and weapons storage facilities, typically requires large, hardened warheads specifically designed to penetrate through layers of concrete and steel. Destroying the most hardened and deeply buried targets requires extremely large penetrating weapons, like 5,000-pound "bunker buster" bombs or 30,000-pound GBU-57A/B Massive Ordnance Penetrators (MOP).

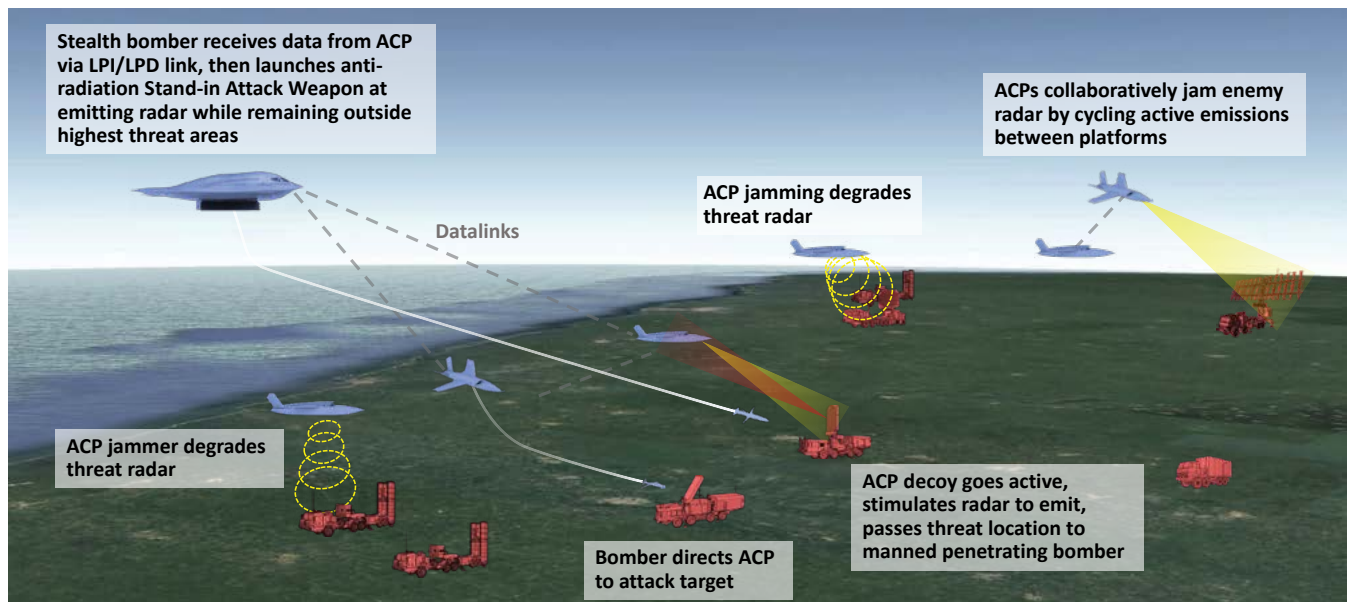
Cost-effectiveness is even more apparent when bombers are compared to long-range surface-to-surface launchers. As a rule of thumb, a PGM's cost correlates with its range, technical sophistication, and launch mode. So a short-range, air-delivered JDAM with a simple GPS guidance unit costs tens of thousands of dollars; a more sophisticated mid-range Small Diameter Bomb II glide weapon costs about \$200,000; and a powered JASSM-ER with a range exceeding 500 nm costs about \$1.2 million. By comparison, surface-to-surface weapons require much larger rocket boosters to accelerate them from zero altitude and speed into ballistic trajectories, increasing the size and cost of such weapons. The Army's surface-to-surface Long-Range Hypersonic Weapon (LRHW) apparently has the range to launch from Guam and reach targets along China's coastline, but at a cost of \$50 million or more each, that's an awfully expensive way to destroy a single target.

CREWED-UNCREWED TEAMING

With advanced computing and sensors, B-21s will help usher in an era of crewed-uncrewed teaming, operating with collaborative combat aircraft at scale. B-21's family-of-systems force design creates opportunities for the Air Force to use next-generation UAVs in new ways, increasing the B-21's survivability and lethality. Penetrating bombers could be ac-

All In the B-21 Family

The B-21 Raider will employ a family-of-systems approach to increase survivability and lethality of long-range penetrating strikes.



Source: Mitchell Institute

accompanied by or even carry AI-enhanced autonomous collaborative platforms (ACPs) that could locate targets—including moving targets—and pass cues to B-21s without the need for the stealthy bombers to use their own onboard radars or emit other detectable energy. Other ACPs could act as jammers or otherwise emit to stimulate enemy defenses to react in ways that can be detected. A bomber crew could then suppress or maneuver to avoid these threats

B-21s could also act as long-endurance information gateways, ISR nodes, and even “quarterbacks” for ACPs that are distributed across large areas. Unlike single-seat fighters, multi-crew bombers would have greater human cognitive capacity to perform as airborne ACP battle managers in combat environments. In combination, these attributes will make crewed bombers—not just ACPs—force multipliers in future teaming operations.

Notably, in order to maximize the capability that its future fleet of penetrating bombers and fighters could offer, DOD must also develop a new family of precision-guided munitions. These new PGMs should be designed to overcome advanced IADS that are increasingly capable against individual munitions like nonstealthy cruise missiles and even fourth-generation aircraft. Ensuring weapons are survivable maintains efficiency; otherwise, it takes more PGMs—and aircraft sorties—to attack and destroy each target set.

SIZING THE FUTURE BOMBER FORCE

Today’s bomber force of 141 total aircraft can theoretically generate up to 59 sorties per day at the start of a conflict. The reality, however, is significantly less, since nuclear-capable B-2s and B-52Hs would almost surely be withheld to deter nuclear attacks on the U.S. homeland.

A deployed bomber might only be able to generate an average of 0.7 to 0.8 sorties per day or less depending on its air base location, mission duration, and the time needed to regenerate for its next sortie. Realistically, that suggests the entire bomber force might generate only 30 to 40 sorties per day. This will not provide the penetrating strike capacity to rapidly blunt and then

defeat a Chinese invasion of Taiwan. Nor does it address the potential need to replace bombers lost in combat.

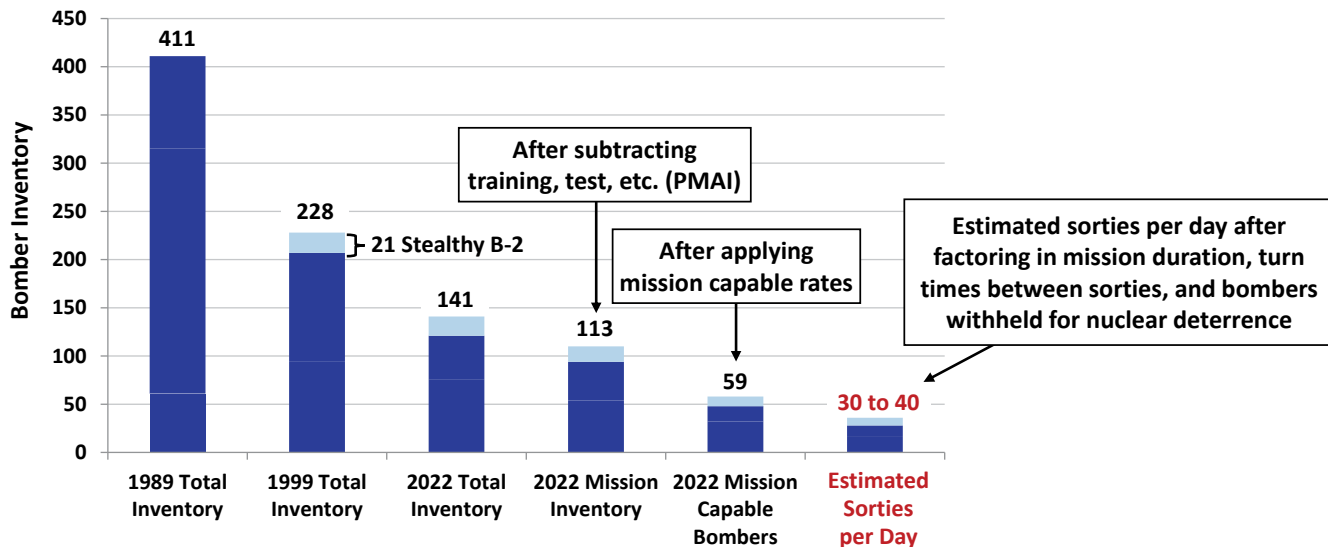
Sizing the Air Force’s bomber inventory and other combat air forces today for a single peer conflict, as the NDS requires, increases the risk that other opportunistic adversaries could open a second front, draining resources from the primary fight. Given China’s hegemonic ambitions in the Indo-Pacific, Russia’s initiation of the largest conflict in Europe since World War II, Iran’s nuclear and regional ambitions, and North Korea’s growing inventory of long-range missiles, the risk of an opportunistic second war is significant. DOD cannot expect the defense industry to rapidly rebuild force capacity as a hedge against a second conflict during a crisis. Because of the time it takes to train and supply ready forces, the Air Force must instead size those forces to reduce this risk. To be credible as a deterrent, the U.S. bomber force needs the capacity to simultaneously fight in the Pacific and respond to aggression in Europe or another theater.

Nuclear deterrence layers additional requirements on the number of bombers needed. The NDS requires the Air Force to size its bomber force to deter or respond to nuclear attacks even while engaged in a conflict. But here, too, there are new twists: In the past, the U.S. sized its nuclear forces to deter a single nuclear peer adversary. Today, however, China is emerging as a nuclear peer, joining Russia, and North Korea and Iran are also threats. Russia never stopped modernizing its nuclear forces and has now withdrawn its participation from all nuclear treaties. China is in the midst of a rapid nuclear build-up that could create a force of at least 1,000 warheads by 2030, according to Commander of U. S. Strategic Command General Anthony J. Cotton.

Dual-capable B-21s would be the most cost-effective means of quickly increasing the size of the U.S. triad compared to expanding the Air Force’s ICBM fields or acquiring additional *Columbia*-class submarines. Expected to make first flight in the coming months, B-21s will be flexible assets, able to support global operational requirements or go on nuclear alert in the event of a crisis. The alternatives are single-use systems. Moreover, each nuclear-capable B-21 would count as a single

Less Combat Power Than You Think

Today’s bomber inventory is about a third the size of the 1989 force, and a quarter-century older. With just 113 bombers assigned to combat units, only 59 bombers may be available for day-to-day operations. Even in all-out conflict, USAF’s bomber force could probably a mere 30 to 40 sorties per day.



Source: Mitchell Institute



Image from USAF video

An image from a U.S. Air Force video shows ground crew working around the B-21 Raider as it was unveiled to the public at a ceremony on Dec. 2, 2022, in Palmdale, Calif. The Air Force must rapidly size its bomber force to deter or respond to more than one peer conflict at a time after 30 years of cuts.

warhead if New START warhead counting rules were applied to future arms control agreements. No other alternative offers this “two-for-one” advantage or has the same potential to hedge against the uncertainty that spans the spectrum of conflict.

Another sizing consideration is that top Air Force leaders have already indicated a need for growth beyond 100 B-21s. Gen. Timothy M. Ray, former commander of the Air Force Global Strike Command, concluded that the Air Force must have 225 total bombers including B-52s to support the NDS and its single war force planning construct, and then Chief of Staff of the Air Force Gen. David L. Goldfein testified to Congress that “a moderate risk force is 220 bombers of which 145 would be B-21s.”

Other studies have proposed an even larger bomber force. An independent study required by the 2018 NDAA recommended the Air Force field up to 24 bomber squadrons (383 total bombers) based on its assessment of forces needed to defeat Chinese and Russian aggression nearly simultaneously. Recent studies led by the Mitchell Institute have recommended the bomber inventory include at least 300 aircraft, including 225 or more B-21s.

RECOMMENDATIONS

1. DOD should increase the range and payload capacity of its strike forces for peer conflicts. DOD’s past decisions to retire two-thirds of its bombers created a combat aircraft inventory barely large enough for conflicts against lesser regional adversaries. DOD now requires much greater long-range strike capacity to defeat Chinese aggression in the Indo-Pacific and deter other threats as directed by the NDS.

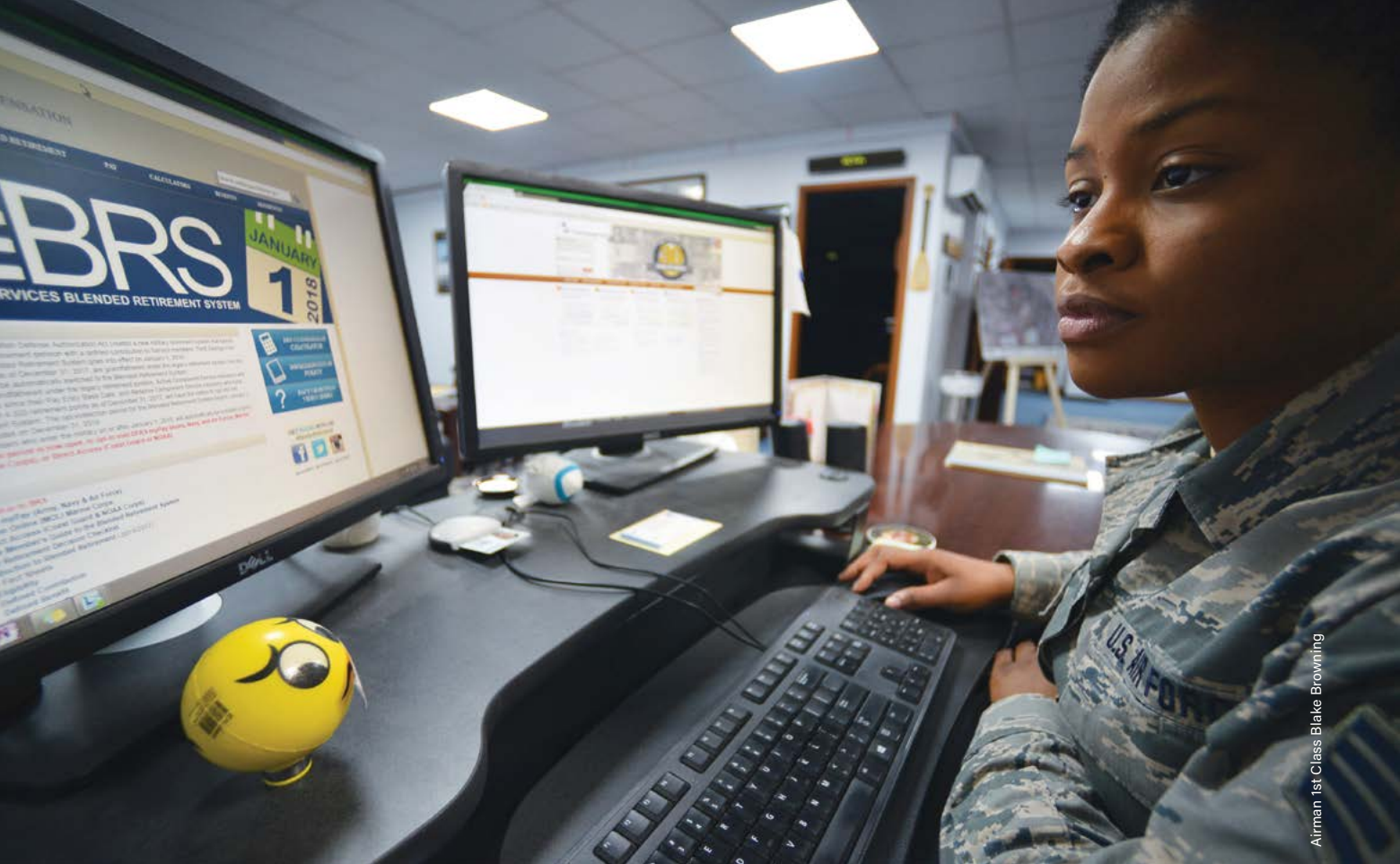
2. A Total Force of more than 300 bombers including 225 stealthy aircraft is needed to provide the penetrating strike capacity needed to defeat peer aggression. Overwhelming strikes to rapidly attrit warships, armored vehicles, missile TELs, and other PLA offensive weapons will be critical to defeating a Chinese invasion of Taiwan and aggression elsewhere around the world. Only bombers can deliver warheads large enough to defeat very hard or deeply buried shelters, C2 centers, and weapons storage bunkers deep in China’s interior.

3. Developing a force capable of conducting long-range strikes at scale will require DOD to prioritize cost-effective capabilities. Defeating a Chinese invasion of Taiwan or another area it seeks to dominate may require U.S. forces to strike 100,000 or more aimpoints—too many to rely primarily on high-priced one-time-use missiles launched from stand-off ranges. Stand-off strike platforms require target cues from off-board sensors, secure data links, fire-control systems, and other capabilities that increase the complexity and expense of their kill chains. DOD analyses that have considered these and other factors repeatedly conclude that penetrating bombers capable of organically finding, tracking, and attacking multiple aimpoints per sortie are the more cost-effective means of striking large target sets over long ranges in contested areas.

4. A larger bomber force would be the most cost-effective means to deter two peer nuclear adversaries. Today, Russia’s nuclear forces are more modern than the U.S. triad, and China is increasing the size and capabilities of its nuclear triad to reach or exceed parity with the U.S. Only the expansion of the dual-capable B-21 force offers a “two-for-one” cost benefit with the potential to offset the growing threat from two near-peer nuclear adversaries.

5. A robust, faster B-21 acquisition rate is critical to deterring Chinese aggression. The PLA may be prepared to forcibly reunify Taiwan with the Chinese mainland before the end of this decade. This timeline coincides with the Air Force combat air forces reaching a new low in size and scale. Maximizing the B-21’s acquisition rate is necessary to manage costs and achieve objectives quickly. The Air Force must remain wary of a “buy-to-budget” approach, rather than advocating for additional funds to buy what is needed. Throttling B-21 acquisition to achieve short-term budget savings will increase program costs in the long run. ✪

Col. Mark Gunzinger, USAF (Ret.) is the director of Future Concepts and Capability Assessments at The Mitchell Institute for Aerospace Studies.



Airman 1st Class Blake Browning

U.S. Air Force Staff Sgt. Dalia Theodule, 380th Air Expeditionary Wing command chief executive assistant, researches the Blended Retirement System (BRS) on Al Dhafra Air Base, United Arab Emirates. Nearly 1.6 million service members will have the option to opt into BRS or remain in the current "High-3" retirement system.

Is Blended Retirement Making a Difference?

Five years after the most recent military retirement overhaul, we still don't know if it will help or hurt retention.

By Hope Hodge Seck

The Defense Department introduced the most momentous change in its retirement system in January 2018. The new Blended Retirement System (BRS) is now five years old, and its consequences remain hard to decipher.

The first Airmen to opt into Blended Retirement are still at least three years from being eligible to retire themselves, so it's still too early to grasp the results of their choices, and the wisdom of those choices given hindsight. At its root, those choices boiled down to whether it was better to select a rapidly vesting payout in the Thrift Savings Plan (TSP) and reduced monthly retirement pay in the future, or a lump-sum payout at 20 years.

"It will take several years for the retention impacts of the BRS to be fully understood."

—Lisa Lawrence, DOD spokeswoman

For most Airmen, particularly enlisted members, BRS was a boon: Because only about 17 percent of those who join the service ever stayed long enough to retire, the vast majority of members left service with nothing but their personal savings. Now, instead of walking away empty-handed after four, six, or 12 years or more, every departing veteran will have accumulated thousands in retirement savings in the Thrift Savings Plan—what amounts to a military version of popular civilian self-directed retirement systems known by their tax code chapter as 401(k) plans.

With military recruiting and retention flagging in the aftermath of the pandemic and the end of the long wars in Iraq and Afghanistan, the question of whether the new system will help or hurt retention looms over the entire enterprise. Pentagon officials maintain the

new retirement system has a neutral impact on retention, but that is yet to be proven. Meanwhile, some see missed opportunities in how the services can leverage the system to their favor amid a military-wide recruiting crisis.

The Air Force Academy's Office of Labor and Economic Analysis has studied the issue, tasked by the Pentagon to analyze its impact on retention, said DOD spokeswoman Lisa Lawrence.

"Our expectation is that it will take several years for the retention impacts of the BRS to be fully understood," she wrote in response to questions. "Their preliminary analysis shows that the BRS is having little or no effect on retention to date."

The military's World War I retirement formula—50 percent of final basic pay after 20 years—endured through two World Wars, Korea, and Vietnam. It underwent two overhauls in the 1980s. In September 1980, with the passage of the 1981 National Defense Authorization Act (NDAA), the formula was shifted to "High-3," a slightly reduced formula that awarded retirees 2.5 percent of average basic pay over their highest 36 months of service—provided they served at least 20 years. Those serving 20 received 50 percent of their High-3 average, and those staying 30 received 75 percent of that average. This formula eliminated a common practice of waiting to retire until Jan. 1 or shortly after, once the next year's pay raises kicked in.

Six years later, Congress returned to the issue, introducing "REDUX," in August 1986. Under REDUX, the formula was reduced to 2 percent per year for the first 20 years—or 40 percent of High-3—then 3.5 percent for each additional year up to 30. This preserved the 75 percent threshold for members who stayed 30 years. Effectively, this reduced the value of most retirees' pensions, while preserving the value for the highest-ranking and longest-serving officers and enlisted members.

Little thought was paid to the matter for the next decade. But as members who joined after 1986 approached 10 to 12 years of service and began to consider the implications of staying versus leaving for civilian careers, it became clear to many that their retirement was not worth what they believed. Military retention sunk and the Pentagon and Congress pressed to fix the problem. The 2000 NDAA repealed REDUX, providing service members a choice at the 15-year point in their career: They could stick with REDUX and accept a \$30,000 retention

bonus, or they could switch to High-3.

The retention bonus was derided by some as "the Corvette bonus," a bad deal for most given normal life expectancies and the greater value of High-3. But for some members looking to buy a home, finance a business, or send kids or spouses to college, it proved a boon. Retention improved. Concerns faded, but not for long.

In 2011, the Defense Business Board, an advisory panel reporting to the Secretary of Defense, noted how few military members actually save anything for retirement, noting in particular that while 43 percent of officers ultimately reached retirement eligibility, only 13 percent of enlisted members did the same. Effectively, the retirement system was weighted toward officers. Worse, the board argued, the system as constructed "appears increasingly unaffordable."

Beth Asch, a senior economist at the RAND Corp. and a leading scholar on military retirement, said offering the lure of 20-year retirement to young recruits was inefficient, because they tend to "discount the future very highly." A second issue was the "cliff-vesting" problem: After reaching the 20-year mark, the financial incentive to remain in service dried up for many, and retention dropped steeply. The increased joint service assignment requirements generated by the Goldwater-Nichols Act of 1986 had effectively shortened officer assignment lengths, Asch said, meaning they had to "cram" more assignments into the same period. It made for an unforgiving timeline.

The legacy retirement system did not distinguish between highly physical jobs that make serving 20 years harder and administrative positions that inflict no such problems on troops' bodies, and thus career lengths tended to vary by military specialty and career fields.

"It was like winning the lottery, practically," Asch said of securing military retirement. "In general, it was considered unfair, because only a fraction of the force would get the benefit."

A Government Accountability Office report had concluded the same thing in 1978 and called for "some form of vesting for members who do not complete full careers."

But not until the 2016 NDAA did Congress act, creating the Blended Retirement System. BRS would become standard for all troops entering service after Jan. 1, 2018, providing a hybrid ben-



South Dakota Air National Guard Staff Sgt. Morgan Haugen, a Financial Management Specialist for the 114 Fighter Wing, teaches Financial Literacy at Joe Foss Field, S.D. The Blended Retirement System is among the topics she explains.

Senior Airman Taylor Solberg

efit: All troops are automatically enrolled in the Thrift Savings Plan after just 60 days of service. From that day, the government contributes an amount equal to 1 percent of members' basic pay to each member's account. In addition, service members can contribute as much as they want to their TSP accounts; the default is 5 percent, but can be changed at any time. After two years of service, the government will match, dollar for dollar, service members' contributions up to 5 percent. When members leave, they take that retirement savings with them.

Between eight and 12 years of service, when many might be choosing between making the military a career or transitioning out, BRS dangles a new incentive to stay: In exchange for committing to serve at least three more years, the military will pay a cash bonus. For Airmen and Guardians, that amount today is equal to at least 2.5 times monthly base pay for those on Active duty, and half of monthly basic pay for Guard and Reserve members.

At 20 years, members become eligible for a traditional retirement, but valued at the REDUX rate of 2 percent per year, or 40 percent of basic pay after 20 years. The theory is that this pension, coupled with TSP savings, is a better deal for everyone. When BRS was introduced, service members who'd served fewer than 12 years as of Dec. 31, 2017, were given until the end of 2017 to make a choice: They could opt into the new retirement plan or remain with the High-3 system.

For Spencer Reese, taking the BRS deal required little thought. An Air Force C-17 Globemaster instructor pilot at the time, he wrote a book called "The Military Money Manual" and today maintains a website of the same name. He felt so strongly about the decision to switch that he shared his thinking in a column for Military.com's Paycheck Chronicles blog to encourage others to do the same. For troops with at least 10 years of service, even those headed toward retirement, he wrote, banking on the 20-year payout was too great a risk.

"In the current system, you or I could serve for 16 years, not promote to major or lieutenant colonel, get passed over for continuation, and get forced out," he wrote. "Under the new system you would at least have your TSP account with all the matching that had gone into it, plus the continuation pay bonus paid at the 12-year mark."

Reese was a captain with eight years of service at the time; he left Active duty in 2022 as a major with just shy of 12 years. He told Air and Space Forces Magazine he's happy with his choice.

"Especially in my cohort, which was Air Force pilots, a lot of them are getting out before 20 years, because the airlines are having a huge hiring boom," he said. "And so, at least with my peers and the group that I have the most interactions with, those who opted in are glad they opted in, because they're now off Active duty."

While Reese said he never planned to stay 20 years, he knew that he'd get a 40 percent pension, plus the funds accrued in his TSP had his plans changed.

"In my final full year of Active-duty service, which was 2021, I had \$3,688 of matching put into my TSP account," he said.

Safely nested in a tax-deferred account today, he expects that to be worth well over \$20,000 in 30 years.

MISSED OPPORTUNITIES

How people respond to new concepts like BRS is always a question. RAND predicted take rates of 70 percent to 100 percent for enlisted Airmen with fewer than eight years of service, and upwards of 50 percent for officers. But when the Pentagon finally released opt-in data in early 2019, it showed take rates well below half for every military service except the Marine

Corps. (The Corps typically retains just 10 percent of first-term Marines, an intentional force design consideration driven by its structure. But tellingly, the Marines also were the only service to require Marines to make a selection; the others required an affirmative choice to select BRS, and otherwise defaulted their choice to the legacy plan.)

In the Air Force, the opt-in rate was 29.1 percent, only slightly more than the Army (25.5 percent) and the Coast Guard (21 percent). The Marines opted in at a 59.4 percent rate.

"What I always felt was the big shame of it, aside from the fact that we got it wrong, which was embarrassing, was that it was a shame that there were people for whom it would have been a better decision," Asch said. "Then they would have left the military with at least something in a Thrift Savings Plan."

Air Force spokeswoman Tech. Sgt. Deana Heitzman said individual decisions are complicated and personal. "Numerous factors impact an individual service member's decision related to the BRS," she said in an email. "The [Department of the Air Force's] primary focus during the opt-in period was ensuring every member was fully informed, educated, and had the resources and information necessary to make a decision that best fit their personal situation."

Interestingly, however, allowing a default decision enabled members to ignore that education and let inertia be their guide.

Those who find themselves, by choice or inaction, excluded from BRS, do not qualify for the continuation pay incentive, which could become more potent than it appears today. While Congress set the minimum at 2.5 times monthly base pay, the military services have the authority to increase that to up to 13 times monthly basic pay, and to target that bonus to specific specialties as needed. In the Air Force, where pilots, cyber specialists, and others are in short supply, that could prove a powerful additional incentive.

Driving this rate flexibility is a revealing detail from RAND's analysis: BRS was projected to have a negative impact on officer retention. For officers, cliff vesting was so attractive that many stayed longer than they would have preferred rather than leave with no retirement nest egg.

In fact, for BRS to achieve retention parity with the previous system, estimates indicated the services might need to pay continuation pay bonuses of 10 to 12 times monthly basic pay—near the maximum set by Congress.

"In other words, you had to give an officer a year's worth of basic pay, not two-and-a-half months," Asch said. "And the services opted not to have a higher multiplier for officers. Maybe they felt like they weren't having retention problems with officers."

That may change. The Space Force is still too new to have any real retention data to show for itself, and the Air Force is in the midst of significant changes to officer advancement. The Air Force ended accelerated "below-the-zone" promotions for officers in 2019, and the consequences of that decision on retention won't be fully understood for several years. Other changes to the career development system are still underway.

Meanwhile, the Air Force has made no progress in reducing a chronic shortage of about 2,000 pilots across the Active, Guard, and Reserve components. A return to robust airline hiring has not helped, and efforts to accelerate pilot training are still too new to have an impact.

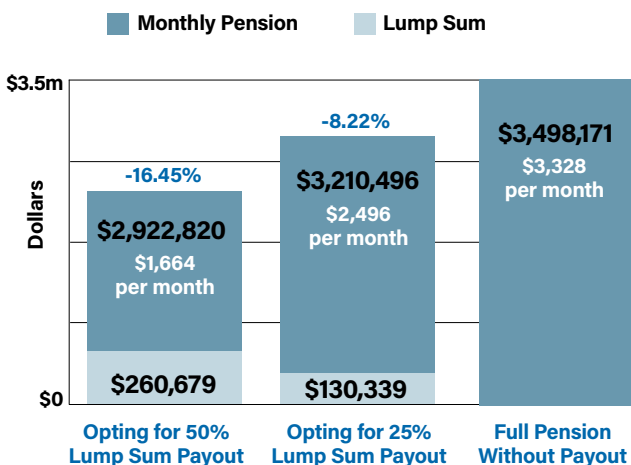
RECRUITING SHORTFALLS

These days, recruiting problems are of primary concern for the services, but when recruiting struggles, retention is another lever that can be adjusted. The Marine Corps has begun to

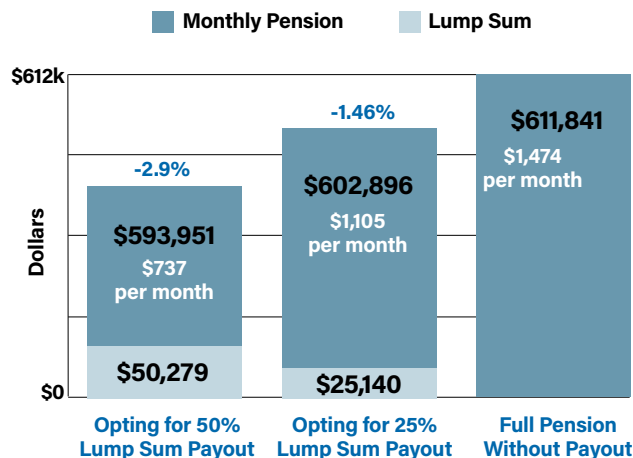
Blended Retirement: Three Options for All

Under the Blended Retirement System, members can choose between more cash now and smaller monthly stipends later, or less cash and more in a monthly check. How that could look for two sample Master Sergeants born in May 2003 and retiring from Active duty or the Guard/Reserve after 20 years of service.

Active-duty Cash Received: Retirement Through Life Expectancy



Guard/Reserve Cash Received: Retirement Through Life Expectancy



Active Duty Assumptions: Inflation of retirement pay: 2.75 percent, Discount rate: 6.75 percent, Thrift Savings Plan (TSP) withdrawal age: 67, TSP contribution rate: 5 percent, TSP rate of return 6 percent, TSP rate of return after being withdrawn: 3 percent, Life expectancy 85 years old, 2.5 times basic pay continuation pay at the completion of 12 years of service for 4 years paying in 1 installment and deposited 0 percent into TSP account.

Guard/Reserve Assumptions: Inflation of retirement pay: 2.75 percent, Discount rate: 6.75 percent, TSP withdrawal age: 67, TSP contribution rate: 5 percent, TSP rate of return 6 percent, TSP rate of return after being withdrawn: 3 percent, Points per year: 77, Life Expectancy: 85 years old, 0.5 times basic pay continuation pay at the completion of 12 years of service for 4 years paying in 1 installment and deposited 0 percent into TSP account.

USAA.com

retain more of its Marines, for example. Interestingly, Marine Commandant Gen. David H. Berger cited BRS in 2021 as hurting retention efforts, according to USNI News. The Army missed all its targets in 2022. The Air Force made its Active-duty recruiting goal for 2022 only by drawing down its delayed entry pool; it fell short of Guard and Reserve targets.

The Air Force has seen "no notable trends" linking BRS to retention, Heitzman said.

For the Air Force, while the pilot community continues to contend with longtime shortages, overall retention is robust, and in fact trending higher than typical amid pandemic recovery and continued job market uncertainty. The Air Force disclosed in December 2022 that 93.1 percent of officers and 89.4 percent of enlisted Airmen were retained in 2022, a slight decline from 2020, but still above pre-pandemic levels.

Tobias Switzer, an adjunct senior fellow at the Center for a New American Security's Military, Veterans, and Society Program (and also an Air Force officer), said he worries that the Air Force will not be able to respond fast enough if retention suddenly changes.

"One of the problems is waiting until retention hits rock bottom, when there's a mass exodus of service members. Then it's kind of too late to attempt to turn the dial back on," he said. "It's not like an on/off switch. ... And waiting until people start exiting, it kind of can be too late to then start trying to dial up continuation pay rates and offer them earlier. So I see that as potentially a tool that the services have not fully exploited to use for retention purposes."

Indeed, given USAF's history of asking Congress to increase the aviation bonus cap for pilots, it's curious that the service has thus far chosen not to use the continuation pay tool to its full effect.

A final what-if has to do with the underutilized BRS opt-in window. The disparity between the Marine Corps response rate and that of the other services indicates better education and a more deliberate approach might have resulted in more troops choosing the new system.

Asch compared the rollout of BRS with a similar program for government workers, the Federal Employees Retirement System, or FERS, which was introduced in 1987. As with BRS, there was a limited opt-in period for some employees who would otherwise be grandfathered into the old system. When the stock market began to boom a few years later, spurred by the 1990s dot-com era, many of those who missed the window regretted their choices. Congress ended up reopening the opt-in window for FERS in 1998.

"Maybe there's an opportunity for rethinking opt-in," Asch said.

In fact, the idea has already been proposed. In 2020, Sen. Patty Murray (D-Wash.) called for reopening BRS enrollment, describing the initial response as "lackluster" and citing a Government Accountability Office study showing that only about one-third of troops passed a required opt-in education course on the first attempt.

That bill didn't get far, but it's not too late for someone to introduce it once again. The most junior troops remaining in the legacy system are now in their second enlistment or service contract.

Reese, who emphasized the need for better and more consistent financial education for troops across the span of their careers, said he doesn't see a downside to giving troops a second chance.

"Why not?" he said. "I think giving troops more flexibility with their finances is always, always a good move." ★



In "Air Force Saves the Day," artist C. Winston Taylor portrays an OV-10 Bronco flying close air support to rescue U.S. Army troops pinned down by the enemy in Vietnam.

C. Winston Taylor via National Archives

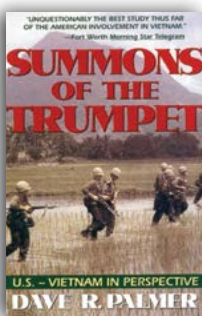
Readings on Vietnam

The Books Every Airman Should Read to Understand America's Lost War in Southeast Asia.

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

Fifty years after its conclusion, the Vietnam War continues to haunt the U.S. military, veterans, policymakers, and families. It was the first war America ever lost and, domestically, it nearly tore the country apart.

By 1963, the U.S. was entangled in the war in South Vietnam. Presidents John Kennedy and Lyndon Johnson were determined to "bear any burden" to protect freedom abroad, and their attempts to do so inexorably deepened America's commitment there. In *Summons of the Trumpet—U.S.-Vietnam in Perspective* (Presidio, 1978), Dave Richard Palmer offers an excellent perspective. Palmer was an Army officer who served in Vietnam, was superintendent of West Point retired as a lieutenant general. Though dated, his insights into how the Army fought are telling. Beginning with the Army's unique rotation policy in this war: Instead of units rotating in and out, individual Soldiers did. Thus, the U.S. did not have an army in



Google Books

"Young men were drafted and sent overseas. Few knew why they were there!"

Vietnam for 12 years, but rather 12 armies there for one year each. The President refused to call up the National Guard, fearing it would upset the public. Instead, young men were drafted and sent overseas. Few knew why they were there.

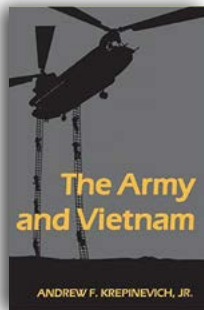
When the Viet Cong—the guerrillas, backed by Hanoi, who fought in the south—escalated the conflict by attacking several U.S. base camps, the U.S. responded by sending in more troops. The force grew from 23,000 in 1964 to over 385,000 by the end of 1966. The war was ferocious, the enemy courageous and creative. U.S. Army doctrine posited a conventional war against a European-style opponent that emphasized mobility and firepower. This, says Palmer, was a mistake. The infantry stopped marching. Instead, it traveled by air, was dropped into landing zones, and then spread out to find the enemy. Once discovered, airstrikes or artillery were called in to eradicate the enemy, after which Soldiers got back into their helicopters and returned to base camp. There was no pursuit of the enemy, no seizing and holding of terrain. Palmer refers to this as

“firebase psychosis,” which to him symbolized the disconnect between the tactics used versus those needed.

As the war intensified, so did U.S. casualties. In January 1968, the Viet Cong launched major attacks against urban centers throughout South Vietnam. The U.S. Embassy wall in Saigon was breached. The city of Hue was overrun. U.S. and South Vietnamese casualties were high. Even though the Viet Cong suffered even greater losses, the Tet Offensive, as it became known, was the turning point in the war. While the U.S. claimed Tet was a victory, strategically it proved a disaster. The American public, having been assured the enemy was nearing defeat and there “was light at the end of the tunnel,” felt betrayed; the American will was broken. Riots, demonstrations, and violence erupted in the United States, and President Johnson announced he would not run for reelection. A contentious campaign followed, resulting in a new President and a new ground commander, who instituted a policy of Vietnamization—a gradual withdrawal of American forces while turning the war over to the South Vietnamese.

Within the military, the war was no less controversial. The war’s conduct was dominated by the Army, and to a lesser extent the Navy. Pacific Command (PACOM) led the war effort from its headquarters in Hawaii under the leadership of an Admiral. The fighting in South Vietnam was directed by Military Assistance Command Vietnam (MACV), located in Saigon, and headed by a series of Army generals. Though subordinate to PACOM, MACV largely determined the pace, strategy, and tactics of the war in the south. Of the three Chairman of the Joint Chiefs of Staff who served during the war, two were Army generals and the third was an Admiral. The ambassador to South Vietnam was retired Army Gen. Maxwell Taylor. Airmen were conspicuously absent at that level.

Based on their experiences in World War II, MACV commanders took it as axiomatic that this war would be won on the ground. It was a war of occupation, a war of destruction. The Viet Cong



Ninety-five percent of Army operations engaged in search-and-destroy missions, not counterinsurgency,

Amazon

and the North Vietnamese had to be met in decisive battle and annihilated. Army leaders viewed aircraft as an auxiliary to the land forces, and decided how, where, and when airpower would be used.

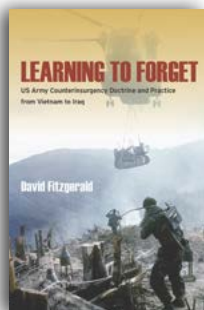
Vietnam was contentious, even within the Army itself. Although Gen. William C. Westmoreland and others were dedicated to the large, conventional strategy of search-and-destroy missions utilizing massed firepower, there were dissenters.

Andrew F. Krepinevich Jr., an Army officer, wrote *The Army and Vietnam* (Johns Hopkins, 1986), which criticizes his army and the way it had fought the war. He argues that the Army traditionally fought conventional battles using firepower to substitute for manpower. This was the American way of war. Vietnam and its guerrilla warfare did not fit this model.

The Viet Cong determined the pace and location of operations. They attacked when they wished, inflicted damage and death, and then faded away. By the time U.S. firepower was called in, the enemy was usually gone. To Krepinevich, the solution was a counterinsurgency strategy based on highly trained “special forces” who were mobile, smart, and familiar with the countryside and its people. The Army balked at such views, and Gen. Earle Wheeler, the Army Chief of Staff, stated bluntly that “any good Soldier can handle guerrillas.”

Before his death, President Kennedy had favored the Green Berets and pushed for their growth. The Army, Krepinevich says, responded half-heartedly, and kept conventional war advocates in charge, conducting a war of attrition, as Westmoreland ruefully claimed there was no other alternative. Ideas such as the Civil Action Program, an attempt to win over individual villages, protect them, and expand the area of government control, were never pursued with vigor, Krepinevich writes. Instead, 95 percent of Army operations were engaged in search-and-destroy missions, not counterinsurgency. He concludes by stating that the Army “learned little of value” from its Vietnam experience.

In *Learning to Forget: U.S. Army Counterinsurgency Doctrine and Practice from Vietnam to Iraq* (Stanford Security



Stanford University Press



Aerial reconnaissance was vital to ground forces. The RF-4C pictured here flew unarmed into harm’s way to capture film of activities on the ground. The Air Force was almost entirely a support element of the ground campaign, severely limited in its targets, missions, and strategy.

William Robles/U.S. Air Force Art Collection via National Archives

Services, 2013), David Fitzgerald concurs with this assessment, arguing that, “Defeat in Vietnam led the Army to consciously turn away from its experience there and discard what it had learned about counterinsurgency.” He further argues that this deliberate effort to expunge its unconventional warfare experiences resulted in disaster in Iraq and Afghanistan 40 years later.

But Col. Harry G. Summers Jr. argues precisely the opposite in his ***On Strategy: A Critical Analysis of the Vietnam War*** (Presidio, 1982). To Summers, Vietnam was a conventional war, but the American public and leaders in Washington were distracted by the guerrillas, and it became “fashionable” to view the war as an insurgency. Quoting freely from Clausewitz, he says the U.S. should have taken the war to North Vietnam—the real aggressor—via invasion. At the least, the Army should have occupied Laos and Cambodia to drive out the communists and secure the South Vietnamese flank, he wrote. Fears that China might enter the war, as it had in Korea a decade earlier, were based on bluffs, Summers says.

THE AIR WAR

Initially, the air components sent to Southeast Asia were of limited quantity and quality. The intent was to assist, not dominate, our South Vietnamese allies, and we trained them in the vintage aircraft provided. Often, American pilots flew along as “observers.” By early 1964, that model began to fade as the Viet Cong became increasingly aggressive. After they attacked several U.S. base camps, killing or wounding dozens of Americans and destroying several aircraft, President Johnson acted. His determination was steeled further when it appeared North Vietnamese patrol boats attacked two U.S. destroyers in the Tonkin Gulf in August 1964.

Westmoreland requested and received a large influx of heavy ground forces to launch offensives in the south. At the same time, the subject of punitive airstrikes arose. Air Force Chief of Staff Gen. Curtis E. LeMay—another World War II veteran famed as a bomb commander—argued strongly in favor, pushing to destroy the warmaking capability of North Vietnam with airpower. The Army was opposed, however, reiterating that the war was a ground war, and would be won in the south. Attacks on North Vietnam would be of little use, and indeed, would merely escalate the war, the Army argued. Johnson’s advisers agreed, and Defense Secretary Robert McNamara stated in June 1965 that he did not want even one plane dropping bombs on North Vietnam if that plane could be used advantageously in South Vietnam. This policy and strategic focus would remain fixed until U.S. ground forces were withdrawn from South Vietnam in 1972.

From 1965 to 1968, Operation Rolling Thunder played out, rigidly controlled by Washington. At lunch meetings, the President and his key civilian advisers met in the White House on Tuesdays to decide the targets for the following week. No Airman ever attended those meetings, although after two years, JCS Chairman Gen. Earle Wheeler, an infantryman, was finally allowed entrance.

The decisions made at these meetings were based heavily on political factors: How would the U.S. public react; how would the news media? What were the opinions of our allies? Over-shadowing all was fear of China and the Soviet Union. Johnson never forgot that China had intervened in force in Korea in 1950. Although those in uniform downplayed the chances of

intervention, Johnson was not convinced; he did not want to widen the war.

This story is told in Jacob Van Staaveren’s ***Gradual Failure: The Air War over North Vietnam, 1965-1966*** (AF History and Museums Program, 2002). Because of the political sensitivity regarding airstrikes both in the U.S. and abroad, Johnson was determined to maintain control. As a result, the number of sorties to be flown, consisting of what types of aircraft, carrying what weapons and against which targets were decisions made in Washington. Prohibited areas were established around the two major cities of Hanoi and Haiphong, and a no-fly buffer zone fronted the Vietnamese/Chinese border. Naturally, most of the lucrative targets in North Vietnam were located inside the prohibited zones.

Because decisions were made in Washington, there were inevitable delays in execution. Thus, if a strike was approved for a certain day but canceled by weather, weeks might pass before Washington would allow the mission to be rescheduled—by which time the target might have disappeared or moved elsewhere.

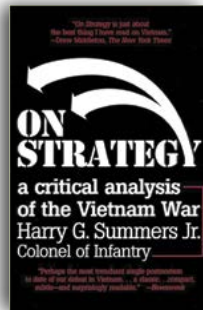
Rolling Thunder was all about signals. The U.S. was signaling Hanoi that we wanted them to negotiate, so we offered them carrots and sticks. If they agreed to talks and ceased their support of the war in the south, there would be economic aid in their future. If they refused, we would strike them harder. This policy was termed “Gradual Escalation.” We would strike; wait for a Vietnamese response; strike again, only perhaps a bit harder this time; wait some more; and then repeat the cycle, hoping that the North Vietnamese would succumb to our gradually increasing pressure.

Strict rules of engagement (ROE) meant the Air Force would not strike North Vietnamese airfields—Washington saw this as a provocative escalation—so the deadly MiGs could not be attacked while on the ground and vulnerable. When surface-to-air missile (SAM) sites were established in the north in April 1965, they too were declared off-limits—one of Johnson’s advisers opined the missiles were there simply to boost the morale of the North Vietnamese and would not be used. The first U.S. aircraft was downed by a SAM three months later—and 109 more SAM shootdowns would follow by the end of the war. Hampered by restrictions, USAF could not establish air superiority over North Vietnam, driving up the costs of each strike mission. Also off-limits: Ships in the port of Haiphong delivering deadly weapons—along with tons of additional military equipment and precious fuel—many were crewed by Russians, Chinese, or neutrals. Fuel sites and storage facilities were seldom targeted. Targets such as bridges, rail

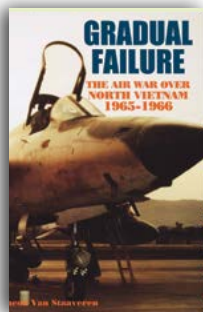
lines, marshaling yards, power plants and steel mills were also off-limits most of the time. When they were struck, it was a decision often made by the President himself. Johnson once commented that Airmen couldn’t hit an outhouse in North Vietnam without his approval.

ROE restrictions rankled the Airmen. They understood that war had to be guided by political leaders, but there seemed little rationale for the constraints placed on them. This must be understood in context: Our military today has spent their careers guided by strict and detailed ROE. They are accustomed to it. That was not the case in Vietnam where such restrictions were viewed as new, nonsensical, and dangerous.

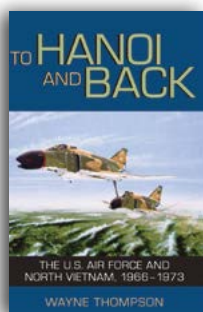
The story is continued in Wayne Thompson’s, ***To Hanoi and***



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Back: The USAF and North Vietnam, 1966-1973 (AF History and Museums Program, 1998). He describes the arguments between American military and civilian leaders regarding the goals of Rolling Thunder. Was it to defeat the north, or merely to get them to negotiate? Was it to destroy their warmaking capability, or just to stop the flow of supplies to the south? Unfortunately, different objectives demanded different types of air campaigns, and these would require different aircraft using different weapons against different targets.

Thompson's account illustrates the adage that excellent tactics cannot overcome a flawed strategy. No matter how ingenious, professional, and courageous were our Airmen, the odds were stacked against them. New weapons, new tactics, new aircraft, and new ideas were tried endlessly. The life of the aircrews depended on their adaptability, but of course, the enemy was evolving as well, introducing new weapons and technology from China and the Soviet Union. The result was a stalemate. Just as the ground war in the south was a war of attrition, so too was the air war over North Vietnam.

Little by little, in dribs and drabs, key targets were approved, yet still not attacked as hard as they could have been, nor in a timely manner. Thompson notes that "President Johnson repeatedly assured the communist rulers of North Vietnam that his forces would not hurt them, and he clearly meant it. Government buildings in downtown Hanoi were never targeted." Similarly, the President announced periodic bombing halts intended to bring enemy leaders to their senses and negotiate seriously. Instead, that time was used to move men and supplies and build more formidable defenses for when the airstrikes resumed.

Rolling Thunder shuddered on inconclusively until November 1968, when President Johnson announced another bombing halt, his 16th. This one would last for four years. During Rolling Thunder, the USAF flew nearly 154,000 strike sorties over the north, as well as 129,000 support sorties. It had dropped around 500,000 tons of bombs. But the price had been high: The Air Force lost 638 aircraft, including half of the F-105 fleet. Some 413 Airmen were killed, and 333 more became prisoners of war.

LOST IN WASHINGTON, D.C.

Two memoirs by leading air commanders during the war are must-reads. The first is Adm. U.S. Grant Sharp's *Strategy for Defeat: Vietnam in Retrospect* (Presidio, 1978). Sharp, who commanded PACOM during Rolling Thunder, states his conclusion early on: "We were never allowed to move decisively with our tremendous air and naval power."

To Sharp, the blame was clear: "The real tragedy of Vietnam is that this war was not won by the other side, by Hanoi or Moscow or Peiping. It was lost in Washington, D.C." Like LeMay, Sharp believed a robust air campaign against the north, carried out in 1965, would have been decisive in ending the war. Instead, politics shaped an ineffective air campaign: "We could have flown 10 times as many sorties as were permitted," he laments. Throughout his memoir, Sharp argues that civilian leaders in Washington made crucial decisions—down to the tactical level—that cost American lives. What he does not acknowledge, however, is that those orders were relayed to him from the JCS, and he in turn passed them on to his forces. There was plenty of blame to go around in this war, from both the civilian and military sides.

Another memoir is Gen. William W. Momyer's *Air Power in*

Three Wars (GPO, 1978). As a full general commanding 7th Air Force during the war, Momyer's in-depth look at air operations and how they were conducted is insightful. Like Sharp, he was bitter over the constraints and restrictions placed on him. More importantly, he looked closely at the command and control (C2) arrangements, which were a mess.

North Vietnam was divided into seven geographic "route packages." Some were assigned to the Navy and the others to the Air Force. Navy strikes were planned and conducted through naval channels, while Air Force missions were run through Pacific Air Forces (PACAF) in Hawaii. No one was in overall operational control of the air war; it seemed that competition between the services often took precedence over a joint effort.

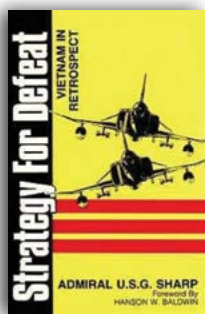
The Air Force had two tactical air forces fighting in Vietnam, 7th Air Force headquartered in Saigon and 13th Air Force in the Philippines. Aircraft based in South Vietnam were controlled by 7th Air Force and were usually not allowed to strike targets in Laos. Aircraft stationed in Thailand were controlled by 13th Air Force, but were generally not permitted to hit targets in South Vietnam. When either air force went to North Vietnam, they received their targets from PACAF in Hawaii. When targets were struck in South Vietnam, they were chosen by the MACV staff in Saigon. There were two different air command posts in Saigon—one termed "in-country" for strikes in South Vietnam, and the other called "out-country" for attacks against the North or in Laos. Thus, from one day to the next aircraft could fly against targets in three different countries, be controlled by two different agencies, and receive targets from two other agencies. It was confusing.

Procedurally, targets in the north were decided in Washington and passed on to Hawaii to be doled out to Air Force and Navy units. In the south, MACV would pass targets to the air components—the Air Force, Navy, Army, and Marines. (The South Vietnamese Air Force did not take orders from MACV). There was little or no coordination among these five air arms. The MACV staff was dominated by Soldiers, and as a result, Airmen had little input into which targets were struck nor were they told why these targets were selected or what their destruction was meant to achieve.

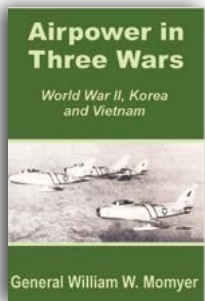
There were attempts to bridge these organizational gaps: Momyer was dual-hatted as commander of 7th Air Force plus MACV's deputy for air, and because 13th Air Force also controlled aircraft in the theater, a single individual was named the vice commander of both air forces to help smooth cooperation. These steps were inadequate. Note too that the 8th Air Force was also involved, bringing B-52s, KC-135s, U-2s, and SR-71s belonging to Strategic Air Command (SAC). Because these assets needed to be available for the nuclear deterrence mission, SAC refused to relinquish control, so they were commanded from Offutt Air Force Base in Nebraska, through an 8th Air Force forward headquarters based on Guam. In addition, strategic airlifters like C-141s and C-5s belonged to Military Airlift Command, headquartered at Scott AFB in Illinois. Seen as global assets, they were not controlled by the theater commanders either.

These C2 issues were never resolved. The position of a Joint Force Air Component Commander, now enshrined in U.S. joint doctrine, would not exist until the mid-1980s.

The result is a depressing tale of mismanagement, disorganization, and both interservice and intraservice rivalry. Momyer's conclusion is accurate though depressing: "Airpower can win battles, or it can win wars. All commanders since Pyrrhus have



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been tempted at one time or another to confuse the two, but few distinctions are more important.” Momyer was relegated to being a high-ranking tactician—strategic decisions were made elsewhere.

AIR WAR IN THE SOUTH

The air war in the south was more intensive than Rolling Thunder, even if the latter received most of the glamour and press. Two good books on the subject are John Schlight, *The Years of the Offensive, 1965-1968* and Bernard C. Nalty, *Air War Over South Vietnam, 1968-1975* (published by the AF History Program, 1988 and 2000, respectively).

From a slow beginning in 1962, U.S. forces began to build, and by the end of 1968 there were over 56,000 Airmen and nearly 1,100 aircraft stationed in South Vietnam, Guam, Okinawa, and Thailand. Unlike in the north, the U.S. enjoyed air superiority in the south; Hanoi’s aircraft never crossed the demilitarized zone (DMZ). Ground fire was another matter. As in most wars, ground fire accounted for most of the aircraft downed. The Air Force lost more than 1,500 aircraft in the South, at the cost of 2,100 men’s lives.

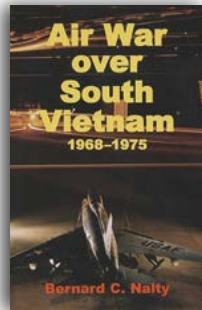
U.S. missions were flown by F-100s, A-1s, F-4s, B-57s, gunships of several types, A-7s, F-111s, and others. All told, the Air Force flew 3.9 million combat sorties in support of the Army and Marines in South Vietnam, of which over 630,000 were attack sorties. These strike missions included more than 67,000 flown by B-52s based in Guam and Thailand. They dropped an incredible 8 million tons of bombs—three times more than had been dropped in all of World War II. The Soldiers who directed these airstrikes saw firepower as the decisive and unique feature of U.S. military capability. Casualties were always paramount, so firepower was to be the great equalizer that saved American lives.

An example of this notion was the Marine base at Khe Sanh that was surrounded by the North Vietnamese during the Tet Offensive. U.S. leaders feared for its survival—many remembered the siege of the French base at Dien Bien Phu, which the North Vietnamese had surrounded in 1954. Its fall ended French military operations in its former colony. President Johnson and other leaders were loath to allow that to happen at Khe Sanh. Gen. Westmoreland demanded and received increased airpower, especially B-52s, to save the base camp. Over the next two months, the heavy bombers flew more than 2,500 sorties and dropped nearly 60,000 tons of bombs—more than all other U.S. aircraft combined. It is believed that 15,000 enemy died at Khe Sanh, and Westmoreland attributed the base’s survival to the B-52s.

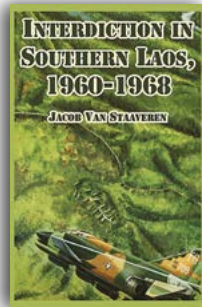
The war also bled over into Laos and Cambodia. Rather than infiltrating men and supplies across the DMZ, the North Vietnamese established a road system through its neighbors that terminated in various locations in South Vietnam. This huge and complex system, termed the Ho Chi Minh Trail, became a constant target of American airpower. These operations are covered in Jacob Van Staaveren’s *Interdiction in Southern Laos, 1960-1968*, and Bernard C. Nalty’s *The War Against Trucks: Aerial Interdiction in Southern Laos, 1968-1972* (published by the AF History and Museums



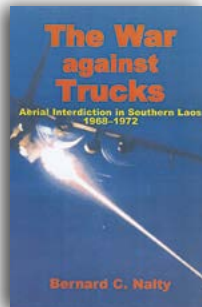
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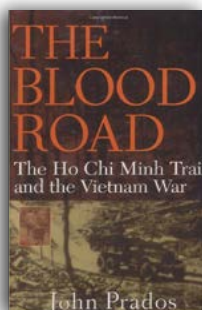
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Program, 1993 and 2005, respectively).

Reconnaissance missions over Laos began in 1963, and over the next decade thousands of U.S. aircraft would patrol the Trail looking for targets. This interdiction effort was termed Barrell Roll for missions over northern Laos and Steel Tiger—later named Commando Hunt—for operations over southern Laos. These missions were sensitive—the Laotian government sought to maintain the semblance of neutrality. Nonetheless, an early lesson learned was that to stop the flow of supplies, aircraft needed to be over the Trail both day and night and in all weather. This was difficult to achieve. By the end of 1967 the Air Force had flown over 183,000 sorties in Laos and allegedly destroyed over 8,000 targets, mostly structures and vehicles. This was achieved at the cost of 122 aircraft. By the end of the war, it was claimed that over 50,000 North Vietnamese trucks had been destroyed during the decade of interdiction efforts along the Trail, but few believed these figures.

To understand the war from the other side, John Prados offers *The Blood Road: The Ho Chi Minh Trail and the Vietnam War* (NY: John Wiley, 1999). The Vietnamese were every bit as determined, clever, and innovative as the Americans—maybe more so. Hanoi estimated a mere 20 to 30 tons of supplies per day would sustain the insurgency in the South. This was easily maintained, and soon 10 times that much was on the move. Indeed, by the end, the Trail—which consisted of 12,000 miles of roads—supplied nearly 500 tons per day, enough to supply nearly 12 regular divisions plus the Viet Cong. Although our aircraft came every day, 100,000 Vietnamese and Chinese workers were there every night to make repairs—rebuilding bridges or trails, clearing damaged vehicles out of the way or repairing them, and ensuring the supplies kept moving. It came at a price. Prados does not give an overall figure of the number of Vietnamese who died but notes tellingly that there are 72 military cemeteries along the Trail, holding the remains of those who labored there.

It was one of the many tragedies of the war in Southeast Asia that the clandestine wars being carried on in Laos and Cambodia were officially denied but were an open secret. The lies, when they eventually became known, only further undermined the credibility of the government in the eyes of the American people.

END GAME

In spring 1972 the North Vietnamese launched a conventional invasion across the DMZ. Termed the “Easter Offensive,” it occurred after the withdrawal of American ground forces. Sending them back in was not an option for President Richard Nixon; instead, he sent airpower.

The story of this air response, termed Linebacker I and Linebacker II, is told in Wayne Thompson’s *To Hanoi and Back* and by John T. Smith in *The Linebacker Raids: The Bombing of North Vietnam, 1972* (Arms and Armour, 1998). The Vietnamese assault began on March 30 with 100,000 regular troops supported by 400 tanks. Eventually, 14 North Vietnamese divisions were involved. Nixon reacted quickly, even mining Haiphong harbor, an idea that had been suggested for years but never implemented. Aircraft not only blunted the invasion, but

also went far north again for the first time since Rolling Thunder. This time, a remarkable new weapon was available: the laser-guided bomb. Precision-guided munitions had been tested in World War II, but it was in Vietnam that they were first used extensively. An example of their effect was Hanoi's Than Hoa bridge. During Rolling Thunder, hundreds of sorties had been flown against the bridge resulting in 11 aircraft shot down but no real damage inflicted. During Linebacker, a flight of F-4s carrying laser bombs dropped the bridge while suffering no losses. Precision-guided munitions would revolutionize war.

Secretary of State Henry Kissinger was meeting with North Vietnamese representatives in Paris during Linebacker, and it appeared progress was finally being made in peace negotiations. After weeks of bitter haggling, an agreement was reached: the North Vietnamese would stop their attacks, the Americans would withdraw, and the hundreds of POWs in Hanoi's prisons would be released. However, President Thieu of South Vietnam objected to these terms and demanded changes. Hanoi used this intransigence as a chance to renege on its own agreements.

The pact was not signed. Nixon was furious. He then launched Linebacker II—intensive strikes against North Vietnamese targets that had hitherto been off-limits and employed for the first time B-52s. Sensitive to endless complaints regarding restrictions placed on the military, he lifted most such constraints, noting: “The bastards have never been bombed the way they’re going to be bombed this time.”

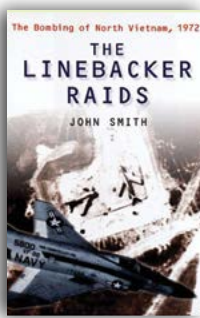
Sometimes referred to as “The Christmas Bombing,” because the heaviest raids took place in late December, the B-52s plus dozens of other strike aircraft went north to pummel targets in Hanoi and Haiphong. The North Vietnamese returned to Paris on Dec. 26. The heavy bombing did not change the terms of the original agreement, but this time the North Vietnamese signed.

The B-52s flew 729 missions north dropping 15,000 tons of bombs on 34 separate targets. They lost 15 aircraft carrying 92 crew members. Of these, 26 were rescued, 34 became prisoners of war POWs, and 28 are still listed as missing.

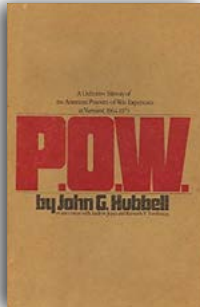
PRISONERS OF WAR

One of the most tragic stories of the Vietnam War was, paradoxically, also one of the most uplifting. It involved the plight of our POWs held in North Vietnam. The first Airman shot down was Navy Lt. Everett Alvarez, whose A-4 went down on August 5, 1964. At first, his captors were not sure what to do with him, and he was largely left alone in a rat-infested cell. That would soon change as dozens of Air Force and Navy crew members would join him in prison.

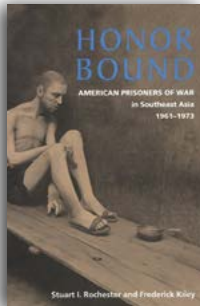
Beginning in October 1965, the first Airman, Rodney Knutson, was brutally tortured. Others soon suffered the same fate, repeatedly. The captives claimed they were POWs, protected by the Geneva Conventions, which the North Vietnamese had signed. The jailers, however, called them war criminals and denied they had any rights. Initially, the prisoners gave only the required name, rank, and serial number, but torture followed and more was beaten out of them. John G. Hubbell in *P.O.W.* (NY: Thomas Crowell, 1976) relates all of this in shattering detail. A similarly informative, if depressing account, is by Stuart I. Rochester and Frederick Kiley, *Honor Bound* (Office of the Secretary of Defense, 1998). The description of the torture these



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men suffered is stomach-turning, and many would die while others endured lifelong injuries. At first the captors wanted personal information—where they were from, families, etc. Then it was details on their planes, base/aircraft carrier, commanders, tactics. Finally, the torture led to propaganda. The POWs were to read statements before a camera or sign statements admitting they were war criminals who deserved their punishment. For over seven years the POWs fought their captors in the only way they could: they delayed, told lies, and spread disinformation. Ultimately, all were broken.

There was an upside related by Hubbell that is moving. The POWs maintained unity as much as was possible. They developed sophisticated methods of communicating by tap code, hand signals, and notes on scraps of paper left in toilets or buckets. They constantly tried to keep up the spirits of their comrades, urging them to “forgive themselves” after they had been broken. The goal was survival. Hubbell tells the story of one man, Lt. Cmdr. Richard Stratton, but his experiences were replicated by scores of his fellow prisoners. “Stratton was choked, kicked, and beaten until his face and head were bloody and his eardrums were ruptured. Twice he was tortured in ropes and hell cuffs and burned cigarettes, and there was a painful although incomplete effort to pull out his thumbnails. He was left with no choice but to admit that he had bombed Hanoi.”

There were efforts to trick the Vietnamese, by listing squadron mates as Ben Casey or Clark Kent; for radio broadcasts they would deliberately mispronounce Ho Chi Minh as Horseshit Men; or when on video they would use their hands or eye blinks to send Morse code

messages. It does not sound like much, but it did wonders for the POWs—it made them feel they were still fighting the enemy.

Over the years the treatment of the POWs waxed and waned depending on the mood of the prison guards or the political situation. When the Americans raided the POW camp at Son Tay on Nov. 21, 1970, only to find it empty, the Vietnamese hurriedly moved all prisoners into one camp, the Hanoi Hilton, to avoid the risk of another prison raid.

The Paris Peace Accords were signed on Jan. 27, 1973. One of its key provisions was the release of the POWs. Food immediately improved and became plentiful: the Vietnamese did not want gaunt skeletons returning to the U.S.

Eight Americans who had collaborated with the enemy faced no punishment from the military upon their return. Although some of their fellow ex-POWs filed charges against them, the cases were dismissed or the accused acquitted in every instance. It was time to heal. The Department of Defense states that 684 POWs returned from Southeast Asia—most from North Vietnam (470) and South Vietnam (167), but also from Cambodia (26), Laos (19), and even China (2). Another 1,587 remain listed today as Missing in Action; the search for remains continues.

There are few happy endings to any histories or memoirs from the Vietnam War. Those who served in Southeast Asia often returned home bitter over their experiences and yet also rejected by their fellow Americans. It has taken decades for the rancor and anger to subside. That story is still being written. ★

Phillip Meilinger is a retired Air Force colonel and historian. The author of 10 books on Airmen and Airpower, and has written more than 100 articles for this magazine and others.

AFA's Doolittle Leadership Center Launches Leadership Training Workshops



Photos by Mike Tsukamoto/staff

At AFA's Doolittle Leadership Center's first Leader Development Workshop, 27 cadets and two cadre members from AFROTC Detachment 890, joined DLC Director Patrick Donley, for two days of intense training and leadership exercises.

In February, AFA's Doolittle Leadership Center (DLC) held its first Leader Development Workshop hosting 27 cadets and two cadre members from Air Force Reserve Officers' Training Corps (AFROTC) Detachment 890 at Graves Mountain Lodge in Syria, Va. A joint effort between AFA, University of Virginia, Liberty University, and James Madison University, the training was led by DLC director, Patrick Donley, and Terry Cook, author of the book, "Lead, Develop, Care: Shaping a Different Kind of Leader."

The workshop equipped officer candidates with a practical leadership model they could apply immediately and carry with them throughout their careers. "Effective leadership is a force multiplier," said Donley a retired Air Force colonel. "Because of the complicated strategic environment in which we find ourselves, we need leaders to demonstrate capabilities that we haven't trained them to possess. Concepts such as Mission Command, Mission-Type Orders, and Multi-Capable Airmen demand skills most leaders haven't been taught or seen modeled. Accelerating change is critical, so we must invest more heavily in our leaders' abilities—especially our tactical level leaders."

Unlike many training efforts that focus on providing various tools or explaining theoretical underpinnings of leadership, the Lead, Develop, Care model is a simple, pragmatic framework for effective, proactive leadership. According to its creator, Terry Cook, "The leadership model is especially helpful to the leader in three key ways. First, it takes the mystery out of leading by providing a simple, overall framework that focuses on the three primary responsibilities of leadership. Second, it enables leaders to be intentionally proactive in their leadership rather than merely reactive. Third, it provides a



Jeb Nutt works on a leadership problem at the Lead, Develop, Care leadership event.

practical algorithm that enables leaders to process effectively leadership opportunities and challenges rather than merely reaching into a grab bag hoping for the right solution."

Donley, a 31-year Air Force Security Forces officer and former Mission Support Group Commander, agreed. "When I first learned the model in 2019 as a colonel, I was both excited and disappointed ... excited because I felt this approach could transform my leadership effectiveness, and disappointed that I hadn't been taught it before. I'm a firm believer that this approach will dramatically improve leaders' capabilities in the Air Force and Space Force, as well as in

families, businesses, and volunteer organizations."

To integrate instruction, scenario analyses, personal leadership application, along with various team-building activities, the Doolittle Leadership Center hosted the workshop at a rural mountain lodge. "We wanted to get the students outside of their normal routines so they could have the space to focus on the content and its application to their current leadership challenges," said Jared Harrison, operations manager of the DLC.

In post-workshop survey, cadets praised the value of their training. Col. Jason Bell, Commander of AFROTC Detachment 890 who attended with his cadets, said the focused training opportunity reinforced his mission. "The cadets were really pleased and felt the leadership workshop was worth voluntarily giving up their weekend to attend," he said. "The only two pieces of negative feedback I heard was, 'Why didn't they learn this earlier' and 'why weren't all cadets [instead of just 3rd- and 4th- year cadets] invited to attend?'"

"Lead, Develop, Care" can apply to anyone. Harper Alford, AFA Richmond Chapter president, who attended the training, called it a "terrific learning experience. While my USAF time was long ago, I can use this leadership format in projects that I manage for AFA and other organizations."

The DLC has already scheduled additional workshops for company grade officers and noncommissioned officers at several Air Force and Space Force bases and is working to expand the training to senior enlisted members and commanders. "My hope is that those who receive the training will take this model with them as they promote to higher positions within the services, so that this approach eventually permeates throughout the military," Donley explained. "I have no doubt this model will make a positive difference."

If your organization is ready to take its leaders to the next level by hosting a *Lead, Develop, Care* workshop, contact Patrick Donley or Jared Harrison or find us at www.afa.org/doolittle-leadership-center.



A study group working through the leadership exercises during their weekend of training and learning. Teaming was a big part of the workshop.



DLC Director Patrick Donley stressed the importance of the LDC model and how it will improve leadership in all aspects of our everyday lives.



Terry Cook, author of the book, "Lead, Develop, Care: Shaping a Different Kind of Leader," joined in the training at Graves Mountain Lodge.

By Patrick Reardon

CyberPatriot XV Crowns New National Champions



Mike Tsukamoto/staff

Rachel Zimmerman, CyberPatriot's Director of Business Operations, joins AFA's Chairman of the Board Bernie Skoch, with National Champion (Open Division) "CyberAegis Tempest," from Del Norte High School in San Diego, at the National Finals event in March. At far right is Stuart Pettis, AFA's Director of STEM Education Programs.

CyberPatriot XV launched last fall with 5,266 teams from all 50 states, the District of Columbia, Canada, U.S. overseas territories, and military dependent schools in Europe and the Pacific. Just 28 earned a ticket to the National Finals in Bethesda, Md., and just one team from each of three divisions earned the coveted title "champion."

CyberPatriot crowned its National Champions March 20:

■ "CyberAegis Tempest" from Del Norte High School in San Diego took the honors in the Open Division;

■ "Runtime Terror" representing Troy High School's Navy JROTC in Fullerton, Calif., won the All Service Division; and

■ "CyberAegis Vitalis" from Design 39 Campus in San Diego won the Middle School Division.

CyberPatriot is the nation's largest youth cyber education program and the Air & Space Forces Association's flagship STEM program for advancing youth cyber skills. The annual National Youth Cyber Defense Competition involves more than 5,000 teams from middle and high schools annually.

The finals competition included a variety of challenges over three days. Teams competed to maintain servers and repair system vulnerabilities while defending against simulated cyberattacks.

"You are truly America's future and what you are doing in cyber is not only remarkable, but needed," said AFA President & CEO Lt. Gen. Bruce Wright, USAF (Ret.), as the teams gathered to begin the competition. "I want to emphasize that point. We need you. We need your creativity, your ideas, your willingness to share, and your

boldness. You are already CyberPatriots, and the name says it all: a dedication to not only cyber, but to something bigger than yourselves."

John-Michael Linares, coach of "Runtime Terror" commended all the competitors, including his own championship team. "The students worked really hard for this win," he said. "They spent countless hours researching and applying cybersecurity trends, attack vectors, and mitigations. Each year, I'm awestruck by the level of technical expertise the students are able to achieve. This year is no exception."

Winners take home more than bragging rights. They also won \$51,000 in scholarships from Diamond Sponsor Cisco, the network technology giant. It was the fourth year that Cisco awarded scholarships to the Cisco NetAcad Challenge, bringing its total scholarships awarded to CyberPatriot winners to over \$200,000.

The top three winners in the Open and All Service Divisions were also awarded four-year undergraduate scholarships to Silver Sponsor Gannon University: first-place team members received full scholarships, while second-place team members received \$4,000 each, and third-place team members received \$3,000 each.

Maj. Gen. Gregory J. Gagnon, deputy chief of space operations for intelligence, U.S. Space Force, commended both the teams and the sponsors at the National Finals banquet.

"America talks a lot about staying strong and staying safe," he said. "In order to do that, it takes corporate citizens like this that, regardless of the bottom line, say that we need to give back. Because, when we need to build skills in the young generation ... we need to reward what we want to see. That's how we motivate, and

that's how we incentivize."

Other notable Space Force, Air Force, and industry figures joining in on the ceremonies included Lauren Barrett Knausenberger, Chief Information Officer for the Department of the Air Force; Aaron Copeland, Vice President of Engineering for Northrop Grumman's Mission Systems sector; Cindy DeCarlo, Director of Global Government and National Security for Cisco; and the Honorable Veronica Daigle, Director of Acquisition and Innovation Policy at Boeing.

CyberPatriot announced six new Cyber All-American Awards, given to senior-class CyberPatriot competitors who qualified for the National Finals in four consecutive seasons:

- Chan Chung from Troy High School
- Akhil Guntur from Del Norte High School

- Johnathan Lin from Del Norte High School
- Brian Ni from Troy High School
- Akshay Rohatgi from Del Norte High School
- Alvin Zheng from Del Norte High School

"The end of each season is bittersweet," said Paul Johnson, coach of CyberAegis, which has fielded 11 Championship teams in eight years. "I've been with most of the seniors for 6 or 7 years. I try to convince [them] to repeat their senior year so they can stay with the team, but for some reason they all insist on going off to college and taking on challenging careers."

Applications to compete in CyberPatriot's 16th season open April 1. To learn more about CyberPatriot and register your team, please visit www.uscyberpatriot.org



CYBERPATRIOT XV NATIONAL FINALS AWARDS

OPEN DIVISION

National Champion: *CyberAegis Tempest* from Del Norte High School (San Diego)

Runner-Up: *Half Dome* from Franklin High School (Elk Grove, Calif.)

Third Place: *CyberAegis Drift* from Del Norte High School (San Diego)

ALL SERVICE DIVISION

National Champion: *Runtime Terror* from Troy High School Navy JROTC (Fullerton, Calif.)

Runner-Up: *Terabyte Falcons* from Scripps Ranch High School Air Force JROTC (San Diego)

Third Place: *TXPatriot | baits 64==* from Roosevelt High School Army JROTC (San Antonio)

MIDDLE SCHOOL DIVISION

National Champion: *CyberAegis Vitalis* from Design 39 Campus (San Diego)

Runner-Up: *CyberAegis Aeris* from Oak Valley Middle School (San Diego)

Third Place: *The Other Half* from Toby Johnson Middle School (Elk Grove, Calif.)

INDIVIDUAL CHALLENGE AWARD WINNERS

Boeing Cyber-Physical Systems Challenge:

cYb3rhOu#d5 from Carmel High School (Carmel, Ind.)

Open Division Cisco Networking Challenge:

1st Place: *CyberAegis Drift* from Del Norte High School (San Diego)

2nd Place: *Half Dome* from Franklin High School (Elk Grove, CA)

3rd Place: *CyberAegis Tempest* from Del Norte High School (San Diego)

All Service Division Cisco Networking Challenge:

1st Place: *TXPatriot | baits 64==* from Roosevelt High School Army JROTC (San Antonio)

2nd Place: *Entropy* from Fullerton Composite Squadron - CAP (Fullerton, Calif.)

3rd Place: *Terabyte Falcons* from Scripps Ranch High School Air Force JROTC (San Diego)

Middle School Division Cisco Networking Challenge Winner:

CyberAegis Aeris from Oak Valley Middle School (San Diego)



Mike Tsukamoto/staff

First place winners in the All Service Division, Cisco Networking Challenge, *TXPatriot | baits 64==* from Roosevelt High School Army JROTC in San Antonio, compete at the CyberPatriot National Finals on March 19, 2023, in Bethesda, Md.

By Phillip S. Meilinger

The Man Who Built SAC

Curtis LeMay was blunt, determined, and always controversial.

Curtis E. LeMay is one of the icons of American airpower history, ultimately becoming the Air Force's fifth Chief of Staff and the first who did not attend West Point. LeMay earned his commission through ROTC at Ohio State in 1928 and over the next decade became one of the best navigators and pilots in the Air Corps.

In 1937, despite being given the wrong coordinates, he located the battleship *Utah* in exercises off California and "bombed" it with water bombs. The following year, he navigated B-17s nearly 800 miles over the Atlantic Ocean to intercept the Italian liner *Rex*, illustrating airpower's ability to defend the American coasts. In 1938 he led flights of B-17s to South America to display airpower's range and role in hemisphere defense.

War brought rapid promotion and increased responsibility. LeMay began as a group commander in the 8th AF in England, but within 18 months he leapt from lieutenant colonel to major general commanding an air division—he led many missions himself.

LeMay earned a reputation as an innovative tactician and problem-solver, so when Gen. Henry H. "Hap" Arnold had difficulty bringing the new B-29 into service, he chose LeMay to take over B-29 operations, first in China and later in the Mariana Islands. Always a tactical innovator, LeMay abandoned the long-held American doctrine of high altitude, daylight precision bombing. Stripping his B-29s of guns, he loaded them instead with incendiaries and sent them against Japanese cities at night and at low level. His decision to reverse two decades of American airpower doctrine was courageous, controversial—and successful. Japan was devastated, but still refused to sue for peace. The dropping of the atomic bombs over Hiroshima and Nagasaki in August 1945 provided the convincing final blows, bringing the Pacific war to an end without requiring an invasion of the Japanese home islands and the hundreds of thousands of casualties that would have entailed.

Returning to the States, LeMay served briefly as the Army Air Force's head of research and development in an attempt to learn more about the highly secret atomic bomb program. The AAF was still frozen out at that point, though they had been charged with using the weapons. He then went to Germany to command U.S. Air Forces in Europe. When the Soviet Union blockaded Berlin in 1948, LeMay was responsible for launching the Berlin Airlift. The Berlin crisis precipitated a major reshuffling in Washington. A war with the Soviets now appeared increasingly possible, and Strategic Air Command (SAC), which would bear the brunt of such a war, was seen as deficient following a series of internal inspections that illuminated serious problems within the command. Chief of Staff Gen. Hoyt S. Vandenberg relieved Gen. George C. Kenney and named LeMay as his successor in command of SAC.

Building SAC into an effective and efficient warfighting arm was LeMay's greatest accomplishment. LeMay built new bases, facilities, and training programs, began a "spot promotion" system to reward

his best aircrews, and through his legendary iron discipline soon transformed his command into one of the most effective military units in the world. The culture LeMay instilled was crucial: He wanted everyone to be ready for war at any time. A nuclear Pearl Harbor was unthinkable. His drive for readiness would translate into the command's motto: Peace is our Profession.

In 1957, LeMay was named Vice Chief of Staff, and when Thomas White retired in 1961, he became Chief. LeMay was one of the coldest of America's cold warriors, and partly for this reason his tenure as Chief was not a happy one. Under the new management policies of Defense Secretary Robert S. McNamara and the "flexible response" military strategy of Gen. Maxwell D. Taylor, then the Chairman of the Joint Chiefs of Staff, LeMay found himself at constant odds with his superiors. In his years as Chief, LeMay argued strenuously for new air weapons like the Skybolt missile and B-70 bomber, and against the swing-wing "fighter" plane from General Dynamics that would become the F-111. He lost those battles.

In the Cuban Missile Crisis of October 1962, LeMay took a hard line. The crisis resulted from the Soviets placing nuclear-tipped ballistic missiles in Cuba, putting much of the U.S. in the crosshairs. LeMay wanted to launch preemptive airstrikes against Cuba to take out those sites, but President John F. Kennedy opted instead for a blockade. The Soviets eventually removed the missiles and no shots were fired.

LeMay also had strong feelings regarding American involvement in Vietnam, arguing against the gradual response advocated by the administration and pushing instead for a major bombing campaign against the North. He foresaw that the administration's policy would result in a long, bloody, and inconclusive war. He was ignored.

LeMay's personality was often described as tactless to the point of rudeness. Although highly intelligent, he was unsophisticated, taciturn, possessing of unquestioned physical courage, and driven to work hard. Yet LeMay was sincerely concerned about the welfare of his troops, insisting on the best possible housing and facilities on the SAC bases he established all over the country.

LeMay is often characterized as the epitome of strategic bombing theory and practice and is lauded for the vigor and determination with which he rejuvenated Strategic Air Command. But his focus on bombing had a downside, as tactical airpower atrophied during his tenure as Chief and the Air Force as a whole became unbalanced. One could argue that this overemphasis on SAC left the Air Force unprepared for the Vietnam War.

Largely as a result of his run-ins with Defense Secretary McNamara, LeMay was pushed into retirement in February 1965, five months short of a typical four-year tenure. In 1968, he ran unsuccessfully for Vice President as George Wallace's running mate on a third-party ticket. He died in 1990.



United States Air Force Chief of Staff Gen. Curtis LeMay with his famous trademark cigar. A heavy cigar smoker, LeMay was also known by his nickname, "The Big Cigar."

LeMay's memoirs, written with MacKinlay Kantor and titled *"Mission With LeMay,"* were published by Doubleday in 1965. The best biography is Thomas M. Coffey's *"Iron Eagle"* (Crown, 1986). The general died in 1990.

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