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SKY WARRIOR

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Space-Based Missile Tracking 47

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October 2022 Vol. 105, No. 10

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AT-802U/Air Tractor via Facebook

An illustration of the AT-802U Sky Warden, which has been selected by the United States Special Operations Command for its Armed Overwatch program. The aircraft is built by L3harris and Air Tractor.

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Let's Do It Again

Air Force Gen. Charles Q. Brown Jr.'s keynote address at the Air & Space Forces Association's biggest-ever Air, Space & Cyber Conference last month looked to the past—and to the future.

"As I looked across the security horizon, three things crystallized for me," Brown said. "Uncontested Air Force dominance is not assured. Good enough today will fail tomorrow. And we must collaborate within and throughout to succeed."

Brown led his audience on a sweep through 75 years of history. The Wright Brothers, bicycle makers with a dream, proved human flight was within their grasp. He cited Billy Mitchell, Hap Arnold, Jimmy Doolittle, Amelia Earhart, and Benjamin O. Davis Jr. as visionaries who risked their lives and careers to unlock possibilities and redefine warfare, commerce, and our very human existence ever after.

"We proved that we could rise above any challenge," Brown said. "We proved that we were willing to take risk. And we proved that we could solve any problem."

America has also proven fickle. Our nation had repeatedly neglected its military, and in particular its air forces, in peacetime, only to have to reinvent them when conflict arose. The U.S. was not ready for war in 1941, despite warning signals that, in the light of history, seem obvious. Germany had been at war in Europe for more than two years by then. Japan was increasingly belligerent and isolated.

Today, as then, we can see a thuggish foe in Europe, where Russia's war on Ukraine, though not going according to Vladimir Putin's plan, could still expand to other formats. In Asia, China has replaced Japan as a dominant regional power eager to assert its dominance and influence on its neighbors.

Building the capabilities to face down China or Russia and others who might threaten the U.S. or its allies is our new and familiar challenge. "We have done this before," Brown said. "And we will do it again."

The Air Force's equipment is still as good or better than any on Earth—but there is not enough of it to meet defense strategy demands. Airmen's tactical skills are good, but could be better—practice makes perfect, but most Airmen aren't getting the flight time they need to maximize proficiency. America's edge—unparalleled for a generation—is no longer what it was. Without that strategic overmatch, which made it possible to face off larger enemies with smaller, more capable forces, our less-is-more formula no longer works. Instead, less is really less. America cannot fight a war of attrition with the likes of China, a nation five times more populous than ours.

Yet America has advantages. First and foremost, we have friends. Our forces, as Brown says, are "integrated by design." The United States does not intend to fight alone, but as an integrated team with allies and partners. Russia's attack on Ukraine sought to splinter the NATO alliance, but instead reinvigorated it, drawing in new members and renewing every member's commitment to the collective. There is no such organization in the Indo-Pacific, but our allies and partners are many. We share a common commitment to democracy, free speech, human rights, the rule of law, and weapons like the F-35 Lightning II fighter jet, which we operate in common.

Such integration leverages our great national capacity for collaboration, innovation, and invention.

Within the Air Force itself, Brown seeks a cultural shift, away from centralization toward distributed decision making that empowers individual Airmen to make decisions on their own. Leaders must convey clear and

unambiguous intent, Brown said, and "then get out of their way." Trust must extend down the chain. Expeditionary forces cannot be effective if they must be directed at every moment. There is no clearer lesson from Russia's failures in Ukraine than this.

This is also at the root of Agile Combat Employment (ACE), the Air Force's flexible operational concept. ACE will complicate the fight for the enemy, but it requires Airmen to be more flexible and capable themselves. It means less specialization and more jacks-of-all-trades. It will be more demanding of everyone.

The Air Force's new force generation model is also part of this culture change. Here, the issue is as much external as internal. Better planning is better for Airmen. But better communication to the rest of the Defense Department leadership and to the combatant commands is crucial. The Air Force is not a perpetual fountain of capability.

Forces have a life cycle, must be built up and prepared before they become ready, and that readiness cannot be perpetually sustained for every unit. Capabilities can be worn out, broken, and lost. USAF's B-1 bombers flew so hard, so often, and for so long over the course of 20 years of war in the Middle East that many are beyond repair. That capability and capacity, now lost, must be replaced.

Flexible thinking is paramount in this new construct. Not only must Airmen be ready and able to do whatever is asked—even if it's not one's trained specialty—but aircraft must be flexible, as well. Experiments with palletized weapons from C-130s or C-17s, developing new electronic warfare and directed-energy capabilities, and adding those to unconventional platforms makes our Air Force less predictable. That makes

defense harder for our potential adversaries.

Brown also outlined plans to change the organizational construct of Air Force units down to the wing level, making them more consistent with the way the other forces are

organized, thus making it easier for Airmen to "plug in" to joint commands.


Our nation must also do its part. Congress must get out of its own way. We are once again ending a fiscal year without a budget, a wasteful habit that costs taxpayers billions and undermines our investments in national defense.

In the coming years, America must also restore balance to our nation's defense and ensure we are investing at least as much in our Air and Space Forces as we are in our Army and Navy. That has not been the case for 30 years in a row. Meanwhile, 20 percent of Air Force spending is siphoned off as a "pass-through" to fund other DOD agencies.

Investing in our Air and Space Forces will ensure Airmen and Guardians not only have the advanced capability to defeat rivals, but also the capacity to present an overwhelming threat. It's not enough to have the greatest airplanes in the world, one has to have enough of them to fight. To deter war, we must demonstrate both superior capability and sufficient capacity to endure a fight.

Finally, we must invest in readiness. Capability is the combination of technology and skill. Having the world's greatest combat jets is only helpful if our pilots are sufficiently skilled to employ them effectively. That takes practice. Pilots today are getting less than half the flying hours they need. Training must be regular and consistent to be effective.

The credible capacity to fight is the No. 1 deterrent to war. What rival begins an action without first considering the odds? Our job as citizens is to ensure those odds are always in our nation's favor.

America has been here and done that before. And, yes, we can do it again—so long as the Air Force is resourced to do so. 

To deter war, we must demonstrate both superior capability and sufficient capacity to endure a fight.



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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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Chiefs

It was very refreshing to read the words from Gen. Merrill A. McPeak and Gen. Ronald R. Fogleman in the August 2022 "Four Chiefs" article [p. 52].

McPeak stated, "What is the Air Force all about?... It's about excellence." That vision is too often lost, he said, in other pursuits. Again McPeak, "I hear way too much today about diversity.

"It is not the mission of the Air Force to solve society's diversity problems. I'm not against diversity, but I am for winning in aerial combat. That comes first." I couldn't agree more!

Then Fogleman, "... So I began to try and send the message of what it was we did deter, and if deterrence fails, we fight and win America's wars. That's why we're here. We're not a social organization. We're not an employment agency. We're here to fight and win America's wars."

I was grateful to serve under those mindsets and that way of life. As I read about all the nonsense the Air Force is pursuing and prioritizing today, it's obvious the Air Force has lost its sense of purpose. A perfect example, [recently] Secretary of the Air Force Frank Kendall announced, "The Department of the Air Force offered up new "aspirational" goals for diversity in its officer applicant pool in August." So, now we're reinstating racism and gender discrimination by making decisions based on the color of skin and sex of the officer candidate. What happened to merit and ability?

Secretary Kendall, Gen. [Charles Q.] Brown and CMSAF [JoAnne S.] Bass would do well to read and heed the words of Gens. McPeak and Fogleman. Until they do, the Air Force will continue down the path of focusing on diversity and inclusion, to the detriment of winning America's wars.

CMSgt. Jerald Akers,
USAF (Ret.)
Forest, Va.

The electric copy of this article is eye-opening!

No doubt who the author likes; but the amount of money wasted on a series of useless "new" uniforms and other fashions would have funded a lot of warrior equipment.

In addition his reorganizations made no sense, except to shake up and waste funds on new stationary, flags, signs, patches while adding nothing to function. One wonders if Dugan might not of served the country's needs better.

If all Chiefs could fly as well as [John P.] Jumper or focus on the troops like Fogleman; the Air Force would be in a superior condition.

The admission that the AFE/EAF was not a stable idea is the first truth about that fantasy I have seen published. The concepts were based upon purely imaginary numbers and never looked at personnel as anything but a series of AFSCs.

The treatment of the USAF in the 90's was a disgrace, particularly when the Army couldn't even get assets to [President Bill] Clinton's military diversion, from his scandal, to fight.

Since then the requirements for Chief seem to have morphed into lemmings as we have had a series of political appointees.

Interesting question, why skip Chief Ryan?

Lastly, the quality of Air Force Secretary starting sinking around this time and continues to raises serious questions about the support for the warriors vs the ever-changing social engineering experience.

Charlie McCormack,
Danville, Conn.

Editor's note: Chief Michael Ryan's perspective appears in this issue.

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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Thanks for a revealing USAF 75th Anniversary edition. I admit to skeptical reading of General McPeak's interview, but appreciate that he admitted to some mistakes. As a member of the USAF helicopter community during his tenure, I recall changing command patches a couple of times, and some of my fellow rotary team as many as four times in a couple-year period. To say that it led to chaos and confusion is an understatement as each new owning command seemed to learn from scratch how to deal with us castoffs. General Fogleman's stability (or attempt at it) truly helped thousands of Airmen in this community (both crew and maintenance)!

Speaking of helicopters, I'm sure I'm not the only reader that spotted a swap of captions on pg. 81, identifying the HH-53: Super Jolly Green ("Giant" was omitted from the title) as a CH/HH-3 Jolly Green Giant, and vice versa. An easy mistake for those not familiar with the two similar, but very different, Sikorsky aircraft.

Thanks for an interesting read and updated information on current topics.

Maj. Alan D. Resnicke,
USAF (Ret.)
Silver City, N.M.

The August 2022 edition and especially Part I of "Four Chiefs," provided very intense reading. I arrived for duty in the Pentagon when General McPeak was CSAF and witnessed General Fogleman's arrival. What a breath of fresh air the latter was! I was at Nellis, AFB, Nev., before the Pentagon, when McPeak came out to fly one of my F-15s. And so we were prepared to get a D model ready when word from the Pentagon asserted he would only fly a C model. That was just the beginning of his demonstrated arrogance.

And when he did strap on our beautiful F-15C, he never spoke with the crew chief and berated the rest of us (I was a squadron commander) as not being "real workers." After he landed, not one kind word to the crew chief, nor thanks for a great airplane. He simply signed the forms and left the flight line.

I watched him belittle the weather staffers at one of his commander's calls in the Pentagon, telling them not to expect promotions, since he saw little need for colonels in the weather business. He was horrible with his people.

Then along came a real leader and gentleman, General Fogleman. He got rid of that ridiculous McPeak uniform and stood up for his people. He is the only CSAF to actually demonstrate integrity. Politics and optics got in the way of the Air Force, and he stood tall and tried to do the right thing (think,

Khobar Towers, Kelly Flinn, etc). His, and the Air Force's values were being trampled on by Secretary of the Air Force and Secretary of Defense and he decided to retire early. God bless men like Fogleman.

General Jumper was my boss twice, once as my wing commander at Nellis, and again as my dual-hatted boss in NATO AIRCENT and USAF/CC. I have deep respect for the man, him having inherited the world after 9/11. He is so correct in "how do we re-instill confidence,"—by starting internally. Our No. 1 job in the Air Force is deterrence and that begins with the basic ability to put warheads on foreheads.

If we cannot show that we can do that reliably, we have no deterrence. Many of us felt like Gen. [T. Michael] Moseley (and Secretary of the Air Force Michael Wynne) were unfairly cast aside by someone who let his emotions, rather than common sense, do his bidding. I was a contractor in the F-22 SPO when Secretary of Defense [Robert] Gates canceled the program at just 187 airframes, when we needed at least 350. We felt he made a rash decision at the expense of our deterrence ability. His "Next-war-itis" is exactly counter to what we were taught at the war colleges.

One does not plan the next war based on the current one, and there was no comparison between the SWA wars and preparing for battle with what I often referred to, the re-emerging Soviet Union, or China. When I retired a second time, from the F-22 SPO, I actually bought Gates' book to see if I might have missed something. I missed nothing. His decision to cancel the F-22 was a huge mistake.

Col. Frank Alfter,
USAF (Ret.)
Beavercreek, Ohio

75th Anniversary

Thank you for continuing to pursue excellence in reporting and publication. I always look forward to receiving my Air Force Magazine and enjoyed the August 2022 issue ["75 Years of Innovation in Flight," p. 62].

I'm sure you anticipated many comments about your section on the operations aircraft the Air Force has fielded over the last 75 years. I certainly appreciate the limitations and you did caveat that these pages reflected 'most' of the nearly 200 aircraft; and that you have 'not attempted to portray every variant.' Yet, I believe you missed the mark when deciding not to show the **FB-111**.

There are many dedicated crew, ground operations, and base support personnel and systems that will be surprised not to have the FB-111 listed in the bombers pages. The fact this system was a medium-range, high- and low- flying supersonic nuclear bomber

should distinguish it enough from the other F-111 variants to give it its own small place in your commemoration.

Having served in the Strategic Air Command for many years, I was quick to see this omission. I'm sure there will be many others who will let you know they missed seeing the FB-111.

Col. Daniel D. Badger Jr.,
USAF (Ret.)
Universal City, Texas

The August 2022 Edition is great and I have a suggestion that I hope AFA will consider: Your collection of aircraft photos and historic captions is the best I have ever seen.

(And I'm a retired USAF Public Affairs Officer and retired corporate PR/Advertising guy.) Please consider producing a pamphlet that includes all these great reports and make it available to all of us and the public.

Lt. Col. C.J. Hoppin,
USAFR (Ret.)
Peaks Island, Maine

I know when you list significant aircraft we've had in the Air Force since 1947, you risk missing a few, but you really blew it when you failed to include the great **T-29** series aircraft. Built by Convair, the T-29 was a mainstay in the Air Force from the early '50s and for nearly 40 years. The T-29 was everywhere and had a fully operational mission.

T-29s had many configurations and missions. It was used to train thousands to be navigators (the "Flying Classroom"), and was a solid, reliable aircraft to fly to maintain "pilot proficiency" while serving in nonflying jobs. The "Convair" flew as a medical air evacuation "air ambulance" (the C-131 version, "Samaritan"), and was a reliable personnel transport as a standard "base flight" aircraft.

I logged thousands of hours as an instructor pilot and flew her to bases throughout the U.S. and to Alaska and Panama. She was a grand aircraft that deserves its place in the pantheon of operational aircraft you list.

Lt. Col. John Taylor,
USAF (Ret.)
Puyallup, Wash.

I was disappointed to notice your omission of the **Titan III** Space Booster on page 84. I was part of the development team from 1964-1969, and we launched several important satellites including Vela, DSP, GPS and several communications satellites until 1982. We also launched NASA's Helios, Viking and Voyager space probes. From Vandenberg Air Force Base, Calif., we launched the Keyhole intelligence satellites on Titan IIIB,D and 34D until 1989.

What About These Favorites?

Editor's Note: Readers both praised and challenged our 20-page "75 Years of Innovation in Flight" feature (August 2022). Here below are some of the planes and systems that didn't make our compilation—but that readers argue deserved to be included.



Master Sgt. Buster Kellum via National Archives

The 76 FB-111s had longer wings and bigger fuel tanks, versus the conventional "Aardvarks," to perform the strategic attack mission with the SRAM missile. They were retired in the early 1990s.



USAF via AFA Library

The T-29B Samaritan was a converted Convair CV-240 used for navigator training until the early 1970s.



A transitional, test ICBM, the Titan IIIA was used four times; three times successfully, to launch experimental satellites and test upper rocket stages.



Master Sgt. Fernando Serna

The T-43A—informally the "Gator"—was a Boeing 737-200 used for navigator training from the early 1970s through the late 2000s.



National Museum of the U.S. Air Force

The SM-75A/PG-17A Thor was USAF's first nuclear ballistic missile, an intermediate-range system deployed in the U.K. between 1959 and 1963.



Tech Sgt. John McDowell via National Archives

A psychological operations aircraft, the EC-130E Volant Solo broadcast to citizens of Grenada and Panama in Operations Urgent Fury and Just Cause, respectively, and were later renamed Commando Solo.

How could you overlook a program which contributed so much to our military and civilian space efforts during the Cold War?

Lt. Col. James M. Thompson,
USAF (Ret.)
Carmel, Ind.

The August 2022 issue offers a wonderful retrospective, "Seventy-Five Years of Innovation in Flight." Unfortunately, it appears to have been allocated a bit too little space. The two-page spread on trainers details all the planes that contributed to undergraduate pilot training. It even shows the T-1 Jayhawk used for training tanker/transport pilots, "as well as navigators."

Without getting into the debates as to whether combat systems officers are navigators, thousands of navs, RNs, WSOs, and EWOs started their careers in T-29s and T-43s. A few of us even got to come back to fly these airplanes as pilots a few years later. Having spent nearly four of the last 75 years logging T-43 time, it seems some passing reference to these airplanes is appropriate.

Lt. Col. John Valliere,
USAF (Ret.)
Lake Frederick, Va.

As usual, your coverage in the August anniversary issue covered aircraft pretty well, but you shortchanged us Missileers once again. A few years ago, the Association of Air Force Missileers concluded, based on a lot research done by member Greg Ogletree and me (I was executive director at the time) that almost 80,000 Air Force members have served or still serve as Air Force Missileers.

We are a small part of the Air Force, but have made giant contributions to nuclear deterrence, for almost 70 of our 75 year Air Force history. We were and are part of other missions, too, like air defense and air-to-air and air-to-ground combat.

You briefly mentioned Atlas, but only the A and D. How about two key operational Atlas ICBMs, the E and F (12 squadrons), Titan I (6 squadrons), Matador and Mace (deployed in Europe and the Pacific), Jupiter and Thor (IRBMs in Europe) and GLCM (one reason the Soviet union is gone). For a long time, we had BOMARC defending our northern border, and there were a whole lot of air-to-air and air-to-ground systems, nuclear and conventional, that Missileers have worked with. (Hound Dog, ALCM, SRAM, Sidewinder, Falcon, Maverick and many more).

We Missileers are still around, still being trained at Vandenberg, not only on ICBMs, but other Air Force missiles. And Sentinel is on the way.

Col. Charlie Simpson,
USAF (Ret.)
Breckenridge, Colo.

In the section on ISR/C3, my old unit born in Vietnam is not pictured. I'm referring to 7ACCS, ABCCC, **EC-130E**. It provided command, control and communications, as well as intelligence threat warnings. I believe it first flew out of DaNang, then to Saigon and finally during the war to Thailand, all due to airfield safety concerns. When I was a crew member in the 1980's the squadron was commanded by a special ops full colonel and based at Keesler Air Force Base, Miss.

One of the planes, tail number 1809 as shown in another aviation magazine, was used as a fuel bladder plane during the failed Iran hostage rescue. This plane was selected due to being one of the few C-130s capable of being airborne refueled. The other publication shortly after the operation published a photo of the burned plane

in the Iranian desert. The origin of the plane was not published, however we knew because of the tail number and the very distinctive and numerous antennas. [I was an] AIO Instructor (Airborne Intelligence Officer), one of only 12 in the Air Force at the time.

Capt. Robert Kinzel,
USAF (Ret.)
Jacksonville, Fla.

Words of Wisdom

I am a 10 year veteran of the Air Force (F-111's, Avionics, 82-92). I wanted to thank you for the great editorial in the August 2022 edition. Incredible piece of writing. I especially want to point out the reference to a little bit of Biblical fact/history "... to quote St. Paul to Timothy ... I have fought the good fight, I have finished the race, I have kept the faith!" Awesome seeing in print, this great showing of faith of one the most influential contributors to The Greatest Book Ever Written, hands down. Do not be afraid to add in more from our greatest book in future issues! Just may impact someone (or many someone's) in a very good way!

Also wanted to comment on the letter from MSgt. Mark Bernhardt [See Letters, August, p. 5]. I concur!!! Specifically the comment "what is the point of focusing on notional, 'feel good' stuff like diversity, inclusion, and equality and hyper-vigilance to root out military extremists, when the No. 1 priority should be preparation for a war that promises to be radically different from the "sandboxes" of Iraq and Afghanistan."

I am not saying these items are not important, they are. Had an old boss who used to preach "do not let perfect get in the way of good!" Great for an engineering organization whose main focus was "margins." However, the USAF (The total U.S. military for that matter) should strive for "perfect," because in this business (especially today) ... "coming in second place, is a showstopper!"

Chris Cintron
Parkville, Mo.

Space-Based ISR

In regards to "The Evolution of Space-Based ISR," by Maj. Gen. Thomas Taverney, USAF (Ret.) [August, p. 94.], the author did an excellent job in writing the article. I wish to add a few comments based on my experience as a cartographic officer, which is currently called geospatial intelligence officer, on Active duty from September 1967 to October 1987.

My first assignment was at the Aeronautical Chart and Information Center

(ACIC) in downtown St. Louis. ACIC was a function under the HQ USAF DCS for Intelligence. Its mission was to produce aeronautical charts and flight information products mainly for DOD military operations. At the onset of space-based ISR, the first responsibility of ACIC was to develop a digital database from which all ISR, air and missile missions could be planned on a single worldwide geographic/geodetic system (WGS). The final product was a reference system based on the exact shape of the Earth (a geoid) versus the previous methods of using mathematical systems based on various geographical shapes like the spheroid.

The second function of ACIC was to produce flight information products that were necessary to facilitate mission planning and ensure flying safety. By having a standardized digital world geographic reference system, the possibility of flight error by aircraft and missiles was reduced considerably, from errors of many miles to errors of less than a tenth of a foot. ISR collection, reporting, and targeting also increased in accuracy.

Needless to say, ACIC was a leading advocate and instrumental in the development of the Global Positioning System (GPS), which was originally used only for U.S. military air and missile operations. President [Ronald] Reagan directed the civilian use of the GPS which has a reduced accuracy level for limited operations.

ACIC became the Defense Mapping Agency Aerospace Center (DMAAC) when it was consolidated with Navy and Army mapping, charting, and geodetic (MC&G) agencies into the Defense Mapping Agency (DMA) in 1972. In 1996, service and DOD imagery agencies were absorbed into DMA and the name was changed to National Imagery and Mapping Agency (NIMA). In 2003, the name was changed to National Geospatial Agency (NGA) and all of its products and services became known as geospatial intelligence (GEOINT) and its specialists became known as geospatial intelligence personnel.

Lt. Col. Russel A. Noguchi,
USAF (Ret.)
Pearl City, Hawaii

Based on Actual Events

Reading the article titled "Rebuilding America's Air Power" [September 2022] brought to mind a few hard truths. In the golf game, when you cheat, you're only cheating yourself, and the same is true for military funding. The pass-through scheme is a means of cheating, and remains pointless as we're only cheating

those who already know better. Also, while the movie "Top Gun: Maverick" was hugely entertaining, the basic plot was a group of pilots having to train to use extraordinary skills because the aircraft they were forced to fly against the target were horribly obsolete for the task.

Entertainment is one thing, but the movie hit too close to home. It's not merely the Air Force who's flying assets are dangerously thin, old, and increasingly obsolete. The Navy had abandoned stealth until the F-35C's finally came online just a few years ago. Overall, the nation's citizens think we have the finest class military in the world by an overwhelming margin. Civilians where I worked asked me, if that Maverick movie was realistic, then how is it that we pay more for our defense than anyone else, but would be forced to send pilots to fight using outdated aircraft? It was a tough question, but the answers were even tougher.

Every budget battle over the last 30 years has seen every Air Force aircraft program attacked roundly, few receiving any widespread support, and ultimately the numbers purchased being well short of the initially submitted planned requirements. We've played that game three decades and that's long past the peace dividend period. The only remaining question is when will the federal government remember what its first duty is, to provide for the common defense, and get busy fixing the budget issues? One doesn't see much activism for solution.

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

Old Friend

I was a kid growing up at Loring AFB, Maine, '68-'83. A B52 flying/landing was so ordinary then. I was in tears as I watched the videos coming from the Loring Museum this summer. The fact that this highly dedicated, enthusiastic group pulled this event together was a miracle. [See "Airframes," September, pp. 16-17]. It's an isolated area at the top of Maine.

The area and people from far away still came out in the thousands to see their beloved planes fly over head after leaving in 1994. Thank you for the beautiful picture and recognition. To those who were there, this scene will be in their hearts forever. [My] dad retired as a senior master sergeant. He was a licensed AP mechanic and would go on to work on WWII Warbirds at the Valiant Air Command in Titusville, Fla.

Colleen Iacuzzo
Jacksonville Beach, Fla.

At the Speed of Yesterday



Mike Tsukamoto/Air & Space Forces Magazine

"My aviators need JATM in high quantity numbers yesterday. And so I'll advocate for the testing to go forward ... as fast as the testing enterprise and risk will allow, and I need to get it bolted on their airplanes yesterday. ... (I) shot AMRAAMs 25 years ago. I need to get them something different."

—**Gen. Mark D. Kelly**, head of Air Combat Command, speaking with reporters Sept. 21 about the classified AIM-260 Joint Advanced Tactical Missile, which expands on the range and capability of the AIM-120 AMRAAM.



Jud McCrehin/Air & Space Forces Magazine

Money Matters

"The DAF leadership knows we can't expect Airmen and Guardians to give their all to the mission when they are worried about paying for gas to get to work, finding child care, and providing their family a safe place to live. That starts with compensation."

—Air Force **Secretary Frank Kendall**, ASC22, Sept. 19.

CHANGING TIMES

"Western nations want to preserve the Old World Order, which benefits only them, to make everyone follow the 'rules' they invented themselves and which they regularly break or change to their benefit. ... The policies adopted by the leaders of the U.S. and its allies run counter to the public's interests, which they are supposed to protect—this shows the Western elites are 'detached from their own people.'"

—**Russian President Vladimir Putin** at the Eastern Economic Forum in Vladivostok, Russia [RT.com, Sept. 7].



Mike Tsukamoto/Air & Space Forces Magazine

Don't Get Me Started

"Social media has a huge impact on information warfare, and the need for digital and social media literacy has never been greater. And that is whether it's in grade school, and most certainly throughout the military. A generation of American sons and daughters who would enter our Air Force spend nearly, on average, four hours a day on Facebook, Instagram, Twitter, Snapchat, YouTube, and don't get me started on TikTok. The adversaries know this and they are taking full advantage. Information Warfare threatens to disrupt our way of life, and to some degree, our will to fight as a unified nation, and every one of us has a responsibility to ensure that we are ready, alert, and aware of the tactics of the adversaries. They don't care if you're at home or at work, the information domain is ever present. The Airmen today and into the future have got to be critical thinkers who are collectively focused so that our Air Force can be what it needs to be when our nation calls on us."

—Chief Master Sergeant of the Air Force **JoAnne S. Bass**, at AFA's 2022 Air, Space & Cyber Conference (ASC22), Sept. 21.

MADNESS

"There will never be any declaration of giving up our nukes or denuclearization, nor any kind of negotiations or bargaining to meet the other side's conditions."

—North Korean leader **Kim Jong Un** speech on nuclear weapons as the Parliament passed a new law allowing preemptive nuclear strikes [Wall Street Journal, Sept. 9].

Get Ready



Mike Tsukamoto/Air & Space Forces Magazine

"We have combat air patrols in the air, with live weapons, as a deterrent to Russia. But we don't want to just do that. Because if you just do that, you're just doing circles in the sky, and you get very inproficient. ... As we move forward, the new normal is going to be a lot of practicing with other nations ... on missions that we're going to have to do should Russia decide to attack a neighbor"

—**Gen. James B. Hecker**, commander of U.S. Air Forces in Europe–Air Forces Africa, speaking to reporters at ASC22, Sept. 19.



Mike Tsukamoto/Air & Space Forces Magazine

THE FUTURE IS NOW

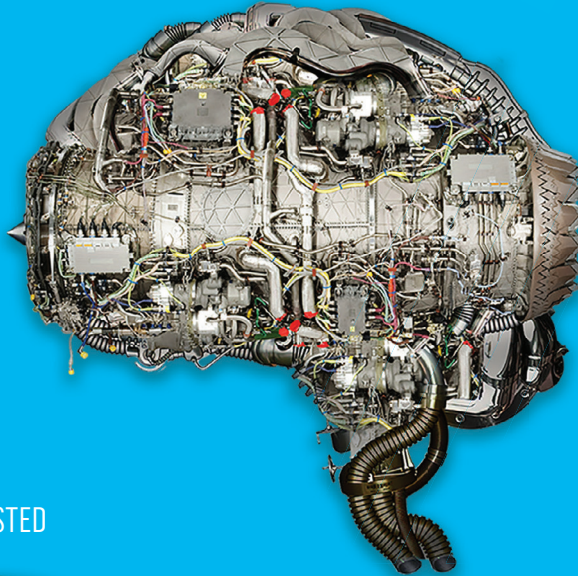
"Nobody is going to care what our plans are for five to 10 years if we lose tomorrow!"

—**Gen. Mike Minihan**, commander of Air Mobility Command, speaking at ASC22.



GO BEYOND

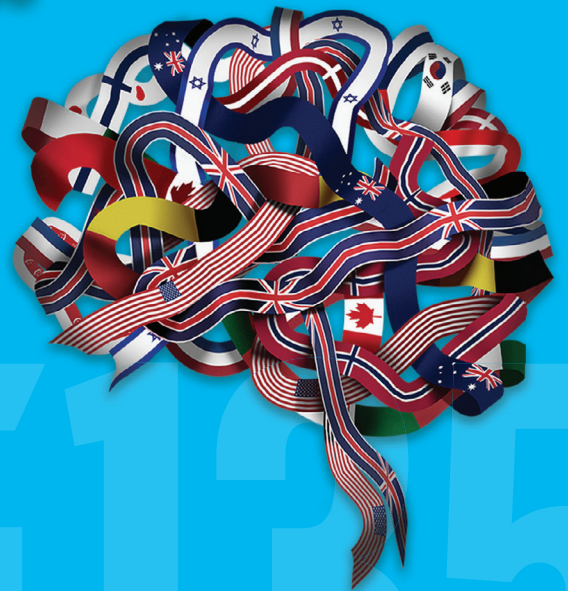
VARIANT-COMMON



COMBAT-TESTED



COALITION-ASSURED



THE SMART DECISION FOR THE F-35

The F135 Enhanced Engine Package (EEP) upgrade delivers adaptive technologies wrapped in a variant-common, combat-tested, coalition-assured and cost-effective combination. For full Block 4 capability and \$40B savings over the lifecycle of the program to keep our military on the leading edge.

GET SMART AT PRATTWHITNEY.COM/F135EEP



Members of the Air Force's Air Demonstration Squadron, the Thunderbirds, perform a Calypso Pass during the Joint Base Andrews 2022 Air & Space Expo in Maryland, in September.



U.S. Air Force crew chiefs from the Hawaiian Raptor Expeditionary Squadron, a Total Force Integrated unit based out of Joint Base Pearl Harbor-Hickam, conduct a basic postflight inspection at Royal Australian Air Force Base Tindal, Northern Territory, Australia. Opportunities to train alongside our allies and partners enhance interoperability and bolster our collective ability to support a free and open Indo-Pacific.

Master Sgt. Mysti Bicoy-ANG



Members of the 216th Space Control Squadron (SPCS) set up antennas as part of a Honey Badger System during Black Skies 22 at Vandenberg Space Force Base, Calif., in September. The first exercise of its kind, Black Skies 22 used live and virtual simulations to layer electromagnetic effects against 29 simulated targets. Participants also planned and executed integrated operations and rehearsed command and control relationships.

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- Mobile nuclear power



INNOVATING FOR FREEDOM

AFSOC Shifts Focus

Lt. Gen. James C. Slife was set to transition from his role commanding Air Force Special Operations Command at Hurlburt Field, Fla., at the beginning of October, with a likely assignment to the Pentagon next. He visited the Air & Space Forces Association in September for an Air & Space Warfighters in Action event. This conversation with AFA President Lt. Gen. Bruce Wright has been edited for space.

Q: How is AFSOC preparing to make the shift from counterinsurgency to peer competition with the likes of Russia and China?

A: The question is, how do you go about this change, particularly in an era [where] we expect fairly flat or perhaps declining budgets for the special operations forces? ... The answer is, you take stock of what you have, and you think about how you can use it a little differently.

The analogy that I use is ... [sometimes for dinner] we go to the grocery store, we get a buggy and we fill up the buggy with rib-eye steak and a baked potato and key lime pie and a bottle of wine. But more often than not, we go and open the refrigerator and we open the cabinet next to the refrigerator and we look at the ingredients that we have and we figure out how to make different recipes with the ingredients we've got.

We've got some great ingredients in the Air Force Special Operations Command. Obviously, the most powerful ingredient we have is the Airmen that make up the command. We've really got a fantastic force. Clearly our Airmen are our competitive advantage, so how do we empower those Airmen?

The second great ingredient we've got is some really fantastic platforms. Not without our challenges in some of them of course, but AFSOC has the youngest fleet of aircraft inside the entire Air Force. ... They're multi-role platforms. We can use them a little differently.

Q: AFSOC recently demonstrated you can launch a Joint Air-to-Surface Standoff Missile (JASSM) from an MC-130. What is this capability for?

A: One of the things that we tend to do [in the Air Force] is we get affixed to our prefixes. ... What do we do with airplanes that start with B? We drop bombs.

... We label our airplanes, and we allow that to constrain our thinking to what we can do with that airplane. But, in fact, they're all just airplanes, right? ...

If you can take a C-130 and enable that to be a delivery platform for a dozen long-range standoff precision munitions, this is the same payload that a B-52 [can carry]. Out of a 3,000-foot dirt strip, you can have a long-range fires platform that carries the same payload as a B-52. ...

And so this capability allows us to use what we already have in non-traditional ways to create volume-of-fire challenges for our adversaries. It also creates targeting problems too. I mean, it's not hard to figure out where all the 10,000 feet concrete runways in the Pacific are. But when you're trying to figure out where the 3,000-foot straight stretches of road and grass strips are ... that's a different targeting problem for your adversaries. ...



Mike Tsukamoto/staff

Lt. Gen. James Slife, commander, Air Force Special Operations Command, discusses AFSOC operations at the Air & Space Forces Association in Arlington, Va., in September.

Q: How is AFSOC combining Agile Combat Employment with your already proven joint warfighting experience?

A: Since the end of the Cold War, the Air Force has been on a bit of a centralization drive. We typically centralize things because we tell ourselves it will be more efficient or there are economies of scale or we don't have enough to go around. ... And when you centralize, you tend to create functional organizations. We gather together all of our comptrollers, and we put them together into a single squadron, and we call it the comptroller squadron. ...

While that has worked reasonably well in a static environment where we're largely not pressured by an adversary, ... the challenge is that's not actually how a mission manifests itself. I spent several years at CENTCOM, and in the time that I spent at CENTCOM, we never once submitted a request for forces asking for the on-call comptroller squadron because we had a financial management emergency that we needed to solve in CENTCOM.

And so the question is, how do you build teams organized around a mission and not around a function? That's kind of at the heart of how we're approaching what the Air Force broadly calls agile combat employment. We're building what inside of AFSOC we call mission sustainment teams. This is 58 Airmen—19 different specialties—that come together into an organization, and they spend an entire force generation cycle together. ...

And those 58 Airmen all learn one another's skills. They all learn to interoperate. And critically, they learn to trust their teammates because they've been training with them for the whole cycle. ... And the sense of purpose that those Airmen possess is really remarkable. Every time our Command Chief and I go visit these Airmen, the first question they ask is, 'Do I have to go back to my squadron?' They really, really like what they're doing because they're directly connected to a mission,

and they're challenging themselves. ...

Q: You mentioned the Air Force's new force generation model. What are you seeing there?

A: From a commander's perspective, the value of a disciplined force generation model is it allows you to articulate capacity and risk to the joint force in a way that has eluded us up to this point.

For example, when I was an ops group commander, we were kind of in the ... 'more ISR, more ISR, more ISR' business. ... And the question was always, 'Hey, can you fly one more combat line for us?'

How do you answer that question? I actually have a crew here that's available. And I actually have an airplane that's available, and I have a ground control station. And so, I mean, the answer is, 'Yes, I can.' But what I'm unable to communicate is the pressure on the force. ...

We've been unable to talk about our capacity in a way that resonates with the joint force. It becomes too technical and complicated. And so when we migrated to a four-cycle force generation model, it allows us to have these conversations very unemotionally and very fact-based and allows us to articulate risk and capacity in a way that has really eluded us [before].

Q: How does the demand signal from combatant commanders contrast with the resources you really need?

A: We frequently talk about mission and resources: 'We have more missions than we have Airmen' [to do them], or 'we're being asked to do more with less.' It always comes down to mission and resources. But the point that we make inside of AFSOC is there's actually a third variable, and that third variable is risk. And so there's always a tension between mission, risk, and resources.

If you tell me, 'Hey, Jim, I need you to do more mission with no more resources,' I can do that. It just comes with increased risk. Or if you tell me, 'You're taking too much risk. I need you to reduce the level of risk you're taking,' I can do that. It either means I do less mission or I need more resources. So there's a three-way relationship here, and what we have to be better at is articulating risk in ways that are understandable to people outside the bubble of the Air and Space Forces.

Q: You discussed earlier the use of a C-130 to deliver a JASSM. What challenges will that capability create for adversaries?

A: The thing about that capability, it's not actually about the JASSM. It's about the unconventional use of the platforms that we have available to us. We're actually looking at other types of munitions and capabilities, whether it's an electronic attack capability that we might want to deploy, whether it's long-range precision fires. I mean, you could use your imagination to figure out the many things that you might do with a large volume carrier like a C-130 or C-17.

The challenges that presents [are], No. 1, from a targeting perspective, I think an adversary has to take a different look at the region [in regards] to where we project power from? No. 2, we have a lot of partners around the globe that don't have heavy bomber platforms that would be traditional carriers of those types of munitions. But they've got plenty of C-130s proliferated around the globe, and A-400s and C-17s. And the beauty is, this capability doesn't require any aircraft modifications, and it doesn't require any special crew training beyond what any airdrop crew already possesses. It's really easily exportable to our partners and allies around the

globe. ...

We've had a number of requests from partners to actually demonstrate this capability and to help them integrate that onto their aircraft.

Q: In competition with China, how important are advanced AI sensors for the future of AFSOC?

A: If you think back ... as an Air Force, when we got into the remotely piloted aircraft business in the 1990s, we did it the way that you might expect the Air Force to do it. ... One pilot, one cockpit, one data link to one airplane—that model has persisted now for the better part of 30 years.

... That's a very manpower-intensive methodology for operating aircraft. And so one of the things we're looking at is moving to an open architecture control layer that has the ability to control multiple platforms, multiple types. It's really platform agnostic. ...

All of that is here and now stuff. It's a matter of bringing it together into a logical architecture. And we're actually moving pretty quickly down that path inside of AFSOC.

Q: What is the testing plan for developing an amphibious capability for AC- or MC-130s ?


A: We don't have any plans to land a gunship on the water. The weight and the center of gravity is a little bit different on that. [This is] really for our MC-130s. But we're already going through the tank testing right now.

We've got a 100 percent digital design. We started out with a number of digital designs. We ran through a series of testing to figure out, do we want to do a catamaran, a pontoon, a hull applique on the bottom of the aircraft? I mean, we kind of went through all the iterations of that. And we settled on a design that provides the best trade-off of drag, weight, sea state performance—all those types of things.

And so we've got a 100 percent design done. Everything has so far tested out pretty much the way the digital design was predicted to perform. And so I think we're going have our first construction of this, an amphibious modification—it's not a float plane. It will have the ability to land on both land or water. And it'll be a field-installable modification kit. And so it won't be every airplane; it won't be all the time. It'll be a capability that's available to the fleet, and I think we're going to start aircraft integration in 2023.

Q: What synergies exist between SOF, cyber, and space, and what AFSOC is doing in that realm?

A: A common theme for the last five years inside of SOCOM has been the magic that occurs at this intersection of SOF, space, and cyber capabilities. ... Much of the defining security. ... tend to be trans-regional in nature. So these three combatant commands [CYBERCOM, SOCOM, and SPACECOM] have global responsibilities, and so there is an opportunity to kind of bring those three together to address some of these trans-regional challenges.

The question then becomes, how do you do it at the tactical level? Inside of AFSOC, our answer to that [is] we're building in each of our wings units that have a heavy intelligence, analytic, multi-source intelligence capability, and have some of our more high-end SOF capabilities embedded inside those units, along with teammates from both the Space Force and CYBERCOM embedded in those units. And so that synergy can take place, not at an ethereal level but down at a tactical level, solving problems that are much more locally focused. 



Air & Space Forces Magazine

Chief of Staff of the Air Force Gen. Charles Brown Jr. told the AFA audience at the Air, Space & Cyber Conference that flexibility of the force, particularly through the Agile Combat Employment construct, will keep adversaries guessing and preserve USAF's edge.

Air Force Looks to Adapt With ACE

By James Kitfield

The Air Force is confronting one of the most consequential inflection points in its 75-year history, Chief of Staff Gen. C.Q. Brown Jr. told his assembled top commanders at AFA's 2022 Air, Space & Cyber Conference. The Agile Combat Employment construct—of dispersing and frequently re-deploying forces to a myriad of bases to complicate an enemy's targeting problem—is a centerpiece of how USAF is responding, he and other service leaders said.

Repeating his off-stated imperative to “accelerate change or lose,” Brown described the existential stakes at play in the nation's confrontations with aggressive, authoritarian regimes in Beijing and Moscow.

“If we don't get this right together—if we fail to adapt—we risk our national security, our ideals, and the current rules-based international order,” Brown warned.

“But if we do get this right, together; if we do adapt, we'll preserve the freedoms we hold most dear,” support alliances, democracy, common values “and strengthen societies all around the world.”

Brown spoke against the backdrop of Russia's ongoing war against Ukraine, with Moscow threatening nuclear attack against anyone that dares intervene, and China's moves, a few weeks earlier, of launching ballistic missiles and military maneuvers around Taiwan, after unilaterally declaring that the roughly 100-mile Taiwan Strait was no longer “international waters.” In recent years, China has built and militarized a string of small islands to back its discredited claims over virtually the entire South China Sea.

During his first two years as Chief, “I've watched with pride and seen the vision of ‘accelerate change or lose’ take hold in every corner of our Air Force,” said Brown, noting that many of those changes are driven by the service's new warfighting doctrine of “agile combat employment,” or ACE. The traditional way USAF has deployed to established bases over the past several decades “will not work against the advancing threat,” he said.

Airmen are driving the cultural transformation that ACE represents, he said. But “we must continue to develop and refine capabilities that are important to ACE: command and control, logistics under attack, resilient basing, air and missile defense—just to name a few,” he stated. Embracing ACE will also demand that “we ... all be multi-capable Airmen. That's

... a mindset and technical competency, that when things hit the fan, our Airmen are ready.”

INDO-PACIFIC CHALLENGE

Air Force leaders said ACE has come to dominate internal counsels and the service’s strategic plans.

“When we talk about ‘global competition,’ we’re talking about China, China, China,” said Gina Ortiz Jones, undersecretary of the Air Force. “If you don’t wake up thinking about the pacing challenge, you’re doing it wrong.”

China has long strategized around a potential attack on Taiwan, saying in a recent white paper that Beijing will resolve “the Taiwan question” and reunify China “by force if necessary.”

“We’ve also heard [Chinese President Xi Jinping] tell his military commanders to be ready to take Taiwan by force by 2027,” said Gen. Kenneth S. Wilsbach, PACAF commander and the air component commander to U.S. Indo-Pacific Command. While the U.S. military was distracted by the “global war on terror” and counterterrorism operations in Iraq and Afghanistan for two decades, China pursued an “anti-access/area denial” (A2/AD) military strategy, chiefly by holding a handful of major U.S. air and naval bases in the Indo-Pacific at risk with its massive arsenal of precision-guided, theater ballistic missiles, according to Wilsbach.

“Traditionally, we had only a handful of very large bases in a theater, [so] our adversaries developed the capability to lob missiles into those bases and shut them down, depriving us of our air power,” said Wilsbach, adding, “we essentially had all of our eggs in one basket.”

The countermove is ACE. Shifting Air Force combat operations from major air bases to dispersed, bare-bones airfields, however, requires rethinking every level of operations, from command and control and logistics to air base defense and repair.

The ACE concept requires “expanding the number of [air-base] hubs and spokes we use, which creates extremely complex command-and-control challenges, especially in the midst of [a] dynamic...contested environment” featuring jamming and chemical/biological/radiological threats, said Wilsbach.

REIMAGINING C2 & LOGISTICS

Brown recently reissued Air Force Doctrine Publication 1 to emphasize mission command and the clear articulation of “commander’s intent” to the lowest levels of command. “Leaders need to give our Airmen intent, empower them, and get the hell out of the way,” he intoned.

Air Combat Command’s Command Chief Master Sergeant John G. Storms said the Air Force must be mindful that ACE “raises the possibility that units will be operating in an environment of degraded command and control, with incomplete or inaccurate information, and oftentimes without the specialists or subject-matter experts we are accustomed to having at our big air bases.”

Junior leaders will be asked to “make the best decisions possible” under less-than-ideal conditions with the information at hand, “executing according to their commander’s intent.” On the upside, “if you’re a young leader, it’s a perfect opportunity to express your leadership abilities,” he said.

Because adversaries will surely target logistics and resupply nodes, PACAF has also been funded to sharply increase levels of prepositioned equipment, fuel, ammo, and supplies in the theater. To facilitate a much wider dispersal of air operations, PACAF is negotiating new basing and overflight rights in the region and expanding airfields and related facilities.

“In the next three to five years we’ll see the extension of runways in small islands in the Pacific, including around the Guam cluster,” said Wilsbach. Rapid airfield damage assessment and repair is also being emphasized, “so that if an airfield takes a hit, we can fill those holes and get things running again very quickly.”

The ACE concept was declared initially operational in 2021, and PACAF is now working to reach full operational capability. Its focus on dispersal and “multi-capable Airmen” is becoming second nature in the theater.

Last year, “ACE was new and sort of episodic,” Wilsbach said, but PACAF is conducting “some kind of ACE event almost every day, now.” He envisions pilots landing on remote islands in the Pacific, swiftly refueling, and getting aloft again even before being assigned their next mission.

Recently, he said, “we had an F-35 pilot land at Elmendorf in Alaska and get out of the cockpit and refuel his own jet. ... I never had to do that!”

AIR MOBILITY ADAPTATION

Gen. Mike Minihan, head of Air Mobility Command, unveiled his “Mobility Manifesto” at the conference, setting the ambitious goal of being ready to operate and fight inside the “first island chain” outside Chinese waters by August 2023. AMC will have a critical role in the region, given the “tyranny of distance,” he commented.

“AMC is the joint force maneuver. There is too much water and too much distance [in the Pacific] for anyone else to do it relevantly, at pace, at speed, at scale,” Minihan asserted. While “everybody’s role is critical, if we don’t have our act together, nobody wins.”

AMC leaders have set a think-outside-the-box team of functional experts called “The Fight Club.” Composed of officers and NCOs, it’s imagining what a winning, agile “scheme of maneuver” looks like against an adversary such as China.

“There are still major gaps in the concept, beginning with command and control, because this is a really huge area of operations,” said Brian P. Kruzelnick, command CMSgt. for AMC. “Contested logistics and maneuver are also very hard problems to solve,” he said, likening it to “running an obstacle course while someone is shooting at you.”

AMC runs an air expeditionary center that cross-trains Airmen on the multiple skill sets needed to arrive at an austere air base, establish security and command-and-control, and get operations underway. The center marks an advanced course in training multi-capable Airmen.

“I know [that term] freaks some people out, but if you’ve deployed in the last 30 years and you were asked to do something outside of your sole specialty, you are already a multi-capable Airman,” said Kruzelnick. “We just gave it a new name and put some structure behind it.”

Other recent ACE experiments include:

■ AMC is looking at slashing crew size on aircraft like the KC-46 tanker from three to two, by eliminating the co-pilot. The command is also looking for a KC-46 crew break to current records by flying 30-hour plus sorties.

■ Air Force Special Operations Command is developing an amphibious modification system to allow its MC-130J aircraft to take off and land on water.

■ The Hawaii Air National Guard’s 199th Fighter Squadron has experimented with deploying its F-22 Raptors supported by just one pallet of parts and equipment, which can be moved by a C-130 transport or even a CH-47 helicopter.

■ Last June, two Air National Guard C-130s flew to Guam,

picked up a Marine Corps High-Mobility Artillery Rocket System [HIMARS] rocket launcher, and took it to another base for a simulated firing exercise before reloading it and returning to Guam.

■ Senior Master Sgt. Brent Kenny of the 52nd Fighter Wing created a system using solar fabric and an environmental water harvester to produce drinking water, negating the need for pallets of prepackaged water and saving precious cargo space.

TRAINING & EXERCISING AGILITY

Such ACE concepts and others will be tested at “Mobility Guardian 23,” AMC’s premier annual exercise, which will shift from the continental U.S. to the Pacific next year. The need for rigorous training and regular exercises to identify capability gaps and flaws in new concepts is another lesson standing out from early ACE doctrine development. Whenever possible, training events and exercises will be joint service and include international allies to better reflect how the Air Force will fight in a real-world scenario.

Training and exercise regimes “that are really tough” must be created, to teach enlisted leaders “to take prudent risks and not be afraid of making mistakes,” said Storms. “Debriefs also need to be timely and accurate in order to ensure we learn from the mistakes we do make,” he said.

Partners and allies need to be included in exercises, both to

acquaint them with the considerable operational demands of ACE. Joint exercises will also underscore to potential adversaries that allies remain an asymmetrical advantage for the U.S.

Gen. Jacqueline D. Van Ovost, commander of U.S. Transportation Command, sees lessons from the Afghanistan experience, “because we were faulted for our ability to ‘scale quickly’ and eventually had to abandon some of our processes,” which slowed down operations.

“We also could not have accomplished that mission without allies granting us overflight rights, which we will need in spades in the Indo-Pacific,” she said.

Lt. Gen. Michael A. Loh, director of the Air Guard, pointed to lessons learned from the Afghanistan noncombatant evacuation, the largest in U.S. history. During the operation, one of the Guard’s C-17 crews landed at Kabul airport, taking fire. While the need to complete the mission and relaunch was urgent, the aircrew had no time to ask permission to abandon standard operating procedure.

“The loadmaster took ... calculated risks, and in just 55 minutes, he unloaded cargo that would normally take four hours to offload,” said Loh. When asked how he did it, the loadmaster told Loh, “you don’t want to know,” but Loh insisted, to ensure that no one in the chain of command will “stifle that kind of ingenuity.” While the Afghan evacuation was kind of “the ‘Wild West’ ... that is the culture we need to harness in the future.” ☛

An Emphasis on People

By Greg Hadley

“People” issues that generate headlines—inflation, recruiting challenges and sexual assault, to name a few—were a main topic among Department of the Air Force leaders speaking at AFA’s Air, Space & Cyber Conference.

Air Force Secretary Frank Kendall set the tone with his opening keynote speech, devoting roughly two-thirds of his 30-minute address to personnel issues like compensation, diversity programs, sexual assault prevention, child care, and housing.

Such a focus is needed, Kendall argued, to ensure the Department of the Air Force (DAF) is ready to compete with near-peers China and Russia.

Though he is known as “a technocrat,” Kendall said, he must put people first, because “it all comes back to mission and our readiness to perform it.”

“If you think that calling our Airmen and Guardians our decisive national advantage is just a tagline, take a look at what’s happening in Ukraine,” he said. “We’re seeing the price Russia is paying for failing to invest in its people. We’re seeing failure at scale in action, and it is very visible on the battlefield.” All DAF leaders took time to lay out a raft of policy changes and shifting focus.

COMPENSATION

Kendall identified three main areas where personnel have expressed concerns: compensation, housing costs or conditions, and child care.

“The DAF leadership knows we can’t expect Airmen and



Mike Tsukamoto/Air & Space Forces Magazine

USAF will try to soften the inflation blow—restoring special duty pay to some—and work on allowances and child care availability, Air Force Secretary Frank Kendall promised.

Guardians to give their all to the mission when they are worried about paying for gas to get to work, finding child care, and providing their family a safe place to live,” Kendall said. “That starts with compensation.”

Compensation has been affected by record-high inflation, though. Service members are slated in 2023 for one of their biggest pay raises in decades, but it could be swallowed up by rising costs if current inflation rates persist.

Meanwhile, the Air Force has had to make ends meet to rising expenses like the cost of fuel.

With costly modernization programs to pay for, DAF made a controversial cut in its 2023 budget to reduce special duty pay for many communities of Airmen. This pay, which ranges from \$75 to \$450 per month, incentivizes Airmen and Guardians to

stick with difficult duties that may involve an unusual degree of responsibility or a military skill in short supply.

But Kendall announced he was reversing that cut, saying the system had been “out of sync with the rapid changes to our economy.”

Leaders also acknowledged they have to address rapid economic changes affecting things like Basic Allowance for Housing (BAH) and Basic Allowance for Subsistence. Those allowances are set to get bumps in fiscal 2023, but again, inflation may erode them.

The Pentagon’s ability to respond to inflationary pressures is somewhat limited—typically, allowances are adjusted on a year-by-year basis. In September 2021, the Defense Department announced a temporary increase in BAH to help troops in certain markets, followed by another temporary increase for a smaller group of markets in September 2022.

Chief Master Sgt. of the Air Force JoAnne S. Bass has called for the Pentagon to craft a faster, more responsive method for adjusting BAH, and in a panel on community relations, Chief of Staff Gen. Charles Q. Brown Jr. indicated he also wanted a change.

He’s looking for ways “to be a bit more responsive on some of our allowances to match up with what the economy is doing,” he said. He also doesn’t want Airmen to endure “a roller coaster ride” of wide swings, when inflation bears down or eases up, driving unpredictable changes in compensation, “So as a family, you can actually ... build a budget.” Airmen should have a firm idea of “what your paycheck is going to look” every month.

In addition to allowances, Kendall and others all stressed the importance of providing better child care options for Airmen and Guardians.

Brown and Chief Master Sgt. of the Space Force Roger A. Towberman both noted issues that can leave families scrambling for childcare options because the DAF’s system is too slow or complicated; a fact Towberman highlighted with a slide showing that there are fewer steps a service member must follow to get childcare than those needed to quit the service.

“We live in the one-click world, and we must be retention-focused,” he said.

“The technical expertise, the depth of experience, the phenomenal craftsmen that we need to stay ahead of China and to win cannot be built in six months or a year, or in four years.” That requires that DAF give no one a reason to quit. “It can’t be easier to leave than it is to get help.”

ASSIGNMENTS

Leaders also laid out new policies aimed at giving Airmen and Guardians more options and flexibility in their careers.

Bass announced a slate of changes on how the Air Force handles assignments, based on recommendations from the Enlisted Assignment Working Group. Among them were switches to assignment priority posts for military training instructors, military training leaders, and recruiters; no more time-on-station requirements for expedited transfers, and no ‘report no-later-than dates’ for four months for Airmen returning from deployments.



Mike Tsukamoto/Air & Space Forces Magazine

Chief of Space Operations Gen. John Raymond gave the State of the Space Force keynote address with focus on recruiting and competing for strategic talent.

Perhaps the biggest change Bass previewed is a new assignment swap policy, which could allow Airmen to switch jobs and locations if they can find someone with a similar specialty and skill level.

“There’s a whole lot more coming,” she said.

Chief of Space Operations Gen. John W. “Jay” Raymond touted the service’s focus on specialized skillsets for Guardians, allowing assignments to be more tailored.

“It’s no longer good enough to say, ‘Hey, I need a lieutenant colonel space operator, or a master sergeant space operator,’” he explained. Now, it’s “we wanted a lieutenant colonel or master sergeant with orbital warfare...[and] technical skills...for example, data management skills.” By doing this for every billet, “we could be more purposeful in our assignment process.”

Towberman went further, saying “the entire environment is tailorable,” so that while the Space Force has focused on specialized assignments, it has opened up its leadership opportunities.

“On the enlisted side, we don’t have ... key leadership positions anymore. We don’t have stratifications anymore,” he said. “We’re doing all we can to eliminate anything that could be used as a proxy for truth ... [things] we should be able to learn and know about a human being if we look hard enough.”

RECRUITING

While Towberman preached the importance of retention, the services still need to recruit new talent as well. And while the USSF continues to have more than enough applicants, the Air Force is hitting an historically tough recruiting environment and only barely reached its Active-duty goals for fiscal 2022.

Both long-term and short-term issues affect the Air Force Recruiting Service, commander Maj. Gen. Edward W. Thomas Jr. told reporters. Among them are continued declines in both eligibility and propensity to serve among America’s youth, along with the cumulative effects of the COVID-19 pandemic and a competitive labor market.

Some of those short-term problems will resolve themselves over time, Thomas said. But for the bigger picture issues, the Air Force’s recruiting enterprise is taking a proactive approach.

That includes expanding the pool of eligible recruits: Pentagon surveys have shown that just 23 percent of the target popu-

lation is eligible due to issues such as medical conditions, prior drug use, out-of-regulation tattoos, and trouble with the law.

He insisted that he has no intention of compromising on standards, but Thomas outlined several ways that eligibility can be expanded.

“A year or two ago, frankly, we could afford to lose people around the margins because of finger tattoos, [or] because of certain medical conditions that we weren’t willing to take risk on,” Thomas said. “We are in an environment today that we have to be exceptionally smart in how we assess the risk and how we set our accession criteria.”

Recently, Thomas was granted the authority to approve waivers for smaller hand tattoos, a process he’s done hundreds of times using photos on his iPhone.

It’s a process he’d like to shed. He’s advocating for a change in policy to reflect changing societal attitudes toward tattoos.

Another issue that has seen a shift in public opinion is marijuana use. As more and more states legalize cannabis, either for recreational or medicinal use, the Air Force is also taking steps to ensure it isn’t automatically disqualifying for a recruit, while at the same time emphasizing that “drug use ... has no place” in the Air Force.

A new policy allows recruiters the latitude to let recruits retake their drug test if they come up positive at the Military Entrance Processing Station (MEPS), and it’s determined to be due to unintentional exposure or residual effects, Thomas said.

“This is not about ... those folks who were not honest with their recruiter, and they smoked marijuana...and the next day or ... week, they went to MEPS and they tested positive. That’s not who this is for,” he noted.

Recruiters are also looking to leverage more data when it comes to approving recruits with medical conditions that previously would have been automatically disqualifying.

“For instance, ... if you look at issues like mental health conditions, anxiety, eczema, asthma ... we’ve been able to turn up the dial” on who will be granted a waiver, decreasing the disqualifying rate “by 30 percent or more in some of those categories, simply by having the data” to better assess potential impacts, Thomas explained.

In addition to expanding the overall recruiting pool, Air Force and Space Force leaders also emphasized continued efforts to attract a more diverse cohort of Airmen and Guardians, an effort Thomas said will not affect standards but is necessary to solve the “mathematical” problem of an increasingly diverse general population.

More immediately, Undersecretary Gina Ortiz Jones said, a more “deliberate” approach to recruiting diverse candidates will increase mission readiness.

She said, “We recently had a meeting at the department, where we were talking about our competition for strategic talent. And the last time we had looked at our talent pool and our goals...with regard to some critical languages was in 2004. That was a long time ago. ... That was Baghdad times. We’re in Beijing times.”

The critical talent pool with respect to these language skills “did not reflect essentially what we needed,” she said, driving a rethink of requirements—as well as being “deliberate about bringing in that talent.”

It takes about six to eight years to develop a Chinese linguist at the “three-three level,” she noted.

“That’s a long time. That’s time we don’t have. You know who can probably get to three-three, if they’re not already at a three-three, much quicker? Chinese Americans; first-generation kids” who may see that one or two hitches in the Department of the Air Force “might be something that is attractive for them and something that they may consider, had they not previously.”

Flexibility for the Air Force Future

By Chris Gordon

New capabilities like hypersonic missiles, B-21 bombers, and other cutting-edge weapon systems are key to the Department of the Air Force’s future. But it must also have the flexibility to make the most of what it already has, top leaders said at AFA’s Air, Space & Cyber Conference on Sept. 19-21.

Among the marquee initiatives in making old USAF systems capable of new tricks include turning cargo planes into weapons launchers, training “multi-capable” Airmen to double up on their skills, dispersing aircraft to expeditionary bases, and working more effectively with allies.

“The Air Force was founded on a different way of looking at things,” said Gen. Mike Minihan, the head of Air Mobility Command and the former deputy commander of the United States Indo-Pacific Command (USINDOPACOM). The service must “make sure we’re doing everything possible to use what we have in the most efficient



Mike Tsukamoto Air & Space Forces Magazine

AMC Commander Gen. Mike Minihan laid out his “Mobility Manifesto,” to include smaller aircrews and cargo planes shooting missiles.

and effective manner.”

The initiatives are diverse. Under the Rapid Dragon program, the Air Force is experimenting with dropping palletized munitions out the back of cargo planes such as the C-130

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and C-17. Crated onto wooden pallets, AGM-158B Joint Air-to-Surface Standoff Missile-Extended Range (JASSM-ER) missiles fall out of the aircraft, are extracted from the pallet by parachute or gravity, ignite their engines, and head off to their targets. The idea is to add mass and unpredictability to the force. A live-fire test has been successfully conducted.

There is a strategic rationale for the innovation: While the service is waiting for future stealthy aircraft such as the Next-Generation Air Dominance program and the B-21 bomber, it will have fewer aircraft that can operate in harm's way. Many of America's air bases are within missile range of its main adversaries. As a result, the Air Force must be able to function from "austere environments," or nontraditional air bases. While logistical challenges remain, they are made easier when rugged, lower-cost aircraft like the C-130 can be used as a strike platform.

"A C-130 only needs about 3,000 feet of dirt or straight stretch of road or whatever to generate sorties, which provides a complicated problem for our adversaries that might want to target our infrastructure," Lt. Gen. James C. "Jim" Slife, head of Air Force Special Operations Command (AFSOC) said. The C-17 also has short runway capability. Current tests are working toward six weapon configurations for the C-130 and nine weapon configurations for the C-17, with the possibility to expand that in the future.

"Why would I drop a pallet of JASSMs out of C-130?" Minihan asked rhetorically. "Frankly, I don't want to take the time to land, download it, have it find the army maneuvering unit, upload it. And that tempo is going to be the tempo required to win."

Slife said the service is learning to get past its "prefixes." Airplanes with a "C" prefixes "carry cargo. What do we do with 'B' airplanes? We drop bombs," he said. But, "the reality is, they're all just airplanes" and can be used in many ways. The KC-46 tanker, for example, will be pressed into service as a communications node in the sky; there's room on board, and it will already be in the area where "combat" aircraft will be working.

AFSOC also wants to test an amphibious modification on its MC-130s, fitting the aircraft with massive pontoons and thus expanding potential landing sites when a flat runway-like field isn't handy. This capability would be especially useful in the Pacific, Slife noted.

With an amphibious MC-130J program, the Air Force is testing the ability to bypass the need to land at all—at least on a runway. However, that would be a niche capability set aside for AFSOC.

Air Force Chief of Staff Charles Q. Brown Jr. said the service is still exploring how much adapting existing aircraft to new roles would be "a complete part of the Air Force."

Still, complicating enemy targeting—and imposing cost on the adversary—is an attractive option. "It's the multi-capability of a platform to provide us the opportunity, budget resourcing or not," Brown said. "They've got to account for these things."

While putting cruise missiles on cargo planes may expand the number of targets an enemy must go after, the Air Force would still need to buy the weapons. In the case of the JASSM and JASSM-ER, the cost is upward of \$1 million per missile.

"If ... we start buying significant numbers of standoff weapons, I think it can really make an important contribution to denying the enemy invasion," said David A. Ochmanek, a senior researcher at the Rand Corp., former senior Defense Department official, and U.S. Air Force

Academy graduate.

Another innovation, which the Air Force has already put into effect, is ending the practice of continuously basing bombers in Guam and instead flying Bomber Task Forces to critical regions from bases in the United States. The endeavor is intended to make U.S. bomber deployments less predictable, and to provide military leaders with more flexibility in deploying nuclear-capable B-52s, stealthy B-2s, and B-1s. For example, as tensions soared during Russia's invasion of Ukraine, the iconic B-52 flew missions over Europe, along with allied F-35 stealth fighters, pairing one of the oldest deterrents with one of the newest.

Other moves to provide the Air Force with more flexibility are still evolving, including the Agile Combat Employment (ACE) concept that is intended to enable the Air Force to disperse its aircraft to a wider array of bases, some of them expeditionary, and the plan to train multi-capable Airmen to reduce the U.S. military's footprint.

Yet another way to ease the burden on the existing U.S. forces is to rely even more on America's allies and partners. In Europe, Sweden and Finland are set to join NATO, bringing with them capable air forces. Finland has 64 F-35s on order. Sweden has a homegrown aircraft industry, which the U.S. Air Force has already turned to for a significant portion of its new T-7 trainers. The Swedish government also dedicated money to a project towards advancing its fighter designs after committing to join NATO. In the meantime, Sweden is procuring 60 of the latest E variants of its Gripen fighter.

The U.S. Air Force has stepped up exercises with its allies in Europe as other countries share more of the air power burden, reported Gen. James B. Hecker, commander of both United States Air Forces in Europe—Air Forces Africa and NATO's Allied Air Command.

America's allies plan to bolster their air forces, NATO Secretary General Jens Stoltenberg said.

"I think that willingness to invest, to spend money in difficult times shows that the political leadership realizes what you do really makes a difference and is more important than it has been for many, many years," Stoltenberg told staff at Allied Air Command in September.

America's allies in the Indo-Pacific are also increasing their defense spending in response to a changing world.

Taiwan, directly threatened by China, is set to massively boost its defense spending by nearly 14 percent in 2023. Australia signed a defense partnership with the United Kingdom and the U.S., abbreviated to AUKUS, that will enable it to field its own nuclear-powered submarines for the first time. It also includes partnerships in other areas, including artificial intelligence, autonomous systems, hypersonic missiles, and undersea technologies, among other areas. Japan, whose public has long resisted non-domestic defense activities since World War II, aims to double its defense spending to 2 percent of gross domestic product within five years. In addition, Japan is working on developing its first-ever indigenously produced stealth fighter for the Japan Air Self-Defense Force.

"When you're operating in a tough neighborhood, travel with friends who know how to fight," said Gen. Mark D. Kelly, head of Air Combat Command.

To make the most of the U.S. alliances, the Air Force needs to bring its allies into planning and development at every stage. "They're more likely to buy into something if they felt like a part of the process," Brown said. Even the idea of deploying palletized munitions has been proposed as a way for partners to boost their firepower.

Some experts caution that flexibility initiatives like ACE, while worthy, do not eliminate the need to pursue more far-reaching efforts to develop new weapons systems, command and control, and operational concepts to deal with the growing threat from China and Russia.

"We're faced with an enemy that's confronting us with challenges that, at least for the Air Force, are almost existential in nature," said Ochmanek. "What I'm hearing about flexibility is we're kind of tinkering at the margins to try and mitigate those

challenges. But we're not solving them with this approach."

The Air Force says that preparing for Chinese and Russian challenges will require adaptation after two decades of flying in uncontested skies from secure bases to fight against ill-equipped extremists in the Middle East and Southwest Asia. The service wants to create a culture of innovation. If so, the best time for test runs is before the shooting starts.

"I'd rather explore some of these opportunities when we're not in conflict versus trying to do it all in conflict," Brown said. 🚀

Advancing Toward the New Collaborative Combat Aircraft



Lockheed Martin illustration

Uncrewed "Collaborative Combat Aircraft" (as depicted in this illustration) will soon be a major part of the Air Force fleet, but there's a debate over how to introduce them.

By John A. Tirpak

The Air Force wants to develop and build a large number of uncrewed airplanes to build capacity, augment the existing fighter fleet, and impose costs on a potential enemy. But how it will go about developing and introducing what are now known as Collaborative Combat Aircraft (CCA), and the form they'll take, is still very much a matter of discussion and debate.

Air Force leaders at the 2022 AFA Air, Space & Cyber Conference saw a wide diversity of proposed CCAs at contractor booths in the exhibit hall. Ever since Air Force Secretary Frank Kendall named CCAs one of his seven "operational imperatives" the service must field to deter China, the Gold Rush has been on to meet the Air Force's need.

But service leaders have so far not bounded what a CCA will be; only that the Air Force must start testing them in the next couple of years, and have them in the force in meaningful numbers by the end of the decade.

Industry has put forward ideas ranging from inexpensive, controllable aircraft that are only slightly more sophisticated than expendable missiles, all the way up to highly sophisticated, stealthy platforms that could fly well ahead of the main fleet, collecting information, suppressing defenses and acting as pathfinders.

Kendall told reporters in a press conference that in the Operational Imperatives, "I defined the problems that we're trying to solve, and that gave industry some information that they can

use to make their own investments. And I think they've reacted to that ... not just parroting back" he said, but "bringing forward some innovative ideas that we certainly want to consider. I'm encouraged by that."

He's also admonished industry "repeatedly...[that] I don't want you waiting for the RFP to come out. ... If we adopt your solution to our problems, that probably gives you a head start. It's in your interest to be thinking ahead of us and giving us creative ideas."

As the concept now stands, he explained, a crewed fighter, "whether it's NGAD [the Next-Generation Air Dominance system] or possibly the F-35 or even the F-15EX—is going to be accompanied by, let's say one to five uncrewed aircraft ... that the manned aircraft will control." The crewed fighters will be "the quarterback, or play-caller for that formation." The uncrewed airplanes will have "a variety of mission systems and sensors, including weapons. And you can employ them in very creative ways."

This sets "a very difficult problem for the adversary," Kendall said. "He has to regard every single one of those platforms as equally a threat. And so, he can't neglect any of them." The CCAs also offer a clean slate to write new air combat tactics, Kendall noted.

"So, we have a lot to work our way through to develop this and field it. And there are a lot of unknown questions about how far we can go."

He said he's got the Air Force Scientific Advisor Board

“working on the task of what we should shoot for, in our first substantiation of the kind of concept I just described. And I think we can go pretty far.”

What Kendall doesn't want to do is “over-reach with the first ones,” but rather to try to field something quickly, with more sophistication possibly coming later. But “we want it to be very cost-effective,” he said.

“You can get big operational exchange advantages ... and cost-effectiveness advantages out of this concept. Our analysis shows that's definitely true. And the technology is there to support it.”

He has previously said that most of the Operational Imperatives were based on rapidly maturing technologies in development with the Air Force Research Laboratory. The CCA idea is possible because AFRL has nurtured its Skyborg airplane-flying, artificial intelligence system to an advanced point.

Gina Ortiz-Jones, undersecretary of the Air Force, emphasized to reporters that “we're not talking about less pilots” in the service. “We're talking about a different way that we employ CCAs that augment the capabilities that we currently have.”

Andrew Hunter, an Air Force acquisition executive, told reporters that “given the timelines that we're working on ... the first thing is to field something meaningful in the next several years, due to the threat. So that's absolutely going to be the early focus.”

Hunter said the Air Force isn't necessarily looking at multiple types of CCA platforms.

“It's more about accomplishing the mission,” he said. The CCA might be a single platform with modular elements, or “it may be the case that there may be multiple platforms. And that's something we'll figure out over time. We'll work with industry to identify what is the most effective mix of vehicles and mission systems.” Mission systems, he said, are “a big part of the puzzle.”

There are likely to be “iterations” of the system, Hunter said. “But the highest priority is to field a capable CCA that can team with our manned platforms in the earliest time frame” possible.

Funding for basic work will come in the fiscal 2024 budget, Hunter said, moving toward fielding “in the '24 POM,” or program objective memoranda, a five-year plan.

The idea for CCAs came out of the NGAD program which will need to function as a family of systems, he said, and that in turn requires “operating in denied airspace and making sure we have the ability to establish freedom of action, freedom of maneuver for U.S. forces.” Inherent to that is survivability and ability to communicate back to friendly forces, but Hunter would not comment on “how exactly CCA will do that.”

“Also, there's the issue of scale,” he said. “A lot of the things that are out there aren't necessarily ... production (ready).”

But “I want to foot-stomp: this is an acquisition program,” Hunter said. The Air Force may not use “other transactional authorities” of the kinds that have been used in recent years to accelerate programs. Such “OTAs” are typically “about prototypes [and] experimentation,” Hunter said.

“We will choose our [acquisition] tool sets to be aligned” with the objective of developing and fielding “on a near-term timeline.”

Hunter said the Air Force is “open” to collaborating with allies and partners on such systems, but if they are to be fielded in numbers, the system will have to comply with laws requiring certain levels of U.S. content, and be built in the U.S.

“There is an implicit competition” already underway, Hunter said. “All the main players are aware of that, and I am confident we will be able to field something in a very relevant

time frame,” he said.

Given that CCAs come out of Kendall's operational imperative, and that requirements usually come from a user command, Hunter was asked if Air Combat Command is being handed a requirement, top-down.

“The requirements community was an integral part” of creating the operational imperatives, Hunter answered. “So, I would say that, as far as I can tell, we have very strong buy-in from the requirements community, [and] from ACC, as to the need for a CCA, the utility of a CCA, and continuous input on exactly what kinds of missions CCAs can perform.” He added that “we remain engaged continuously” with the user on requirements.

He acknowledged, though, that there is “cultural resistance” to CCAs.

“There has been cultural resistance to uncrewed aircraft as long as there have been uncrewed aircraft,” Hunter asserted. “Some of this is human nature. Change is hard. It is in every aspect of our business.”

That requires strong top-down, “strong leadership support to overcome the cultural barriers that are sometimes there when it comes to uncrewed aircraft.”

He said there's such support from Kendall, from Chief of Staff Gen. Charles Q. Brown Jr. and from ACC's Commander, Gen. Mark D. Kelly. “And we need that.”

Gen. Duke Z. Richardson, head of Air Force Materiel Command, told reporters that “we know through modeling and simulation that there's value in teaming crewed and uncrewed aircraft. So the question becomes, what do the numbers look like, and what does the mission package look like? That work is not yet completed.”

In his opinion, “I think it's multiple mission packages. I don't think it's going to be just one thing,” but it's possible CCAs may be a single airframe with modular mission packages.

A certainty is that the CCA will be built with “digital engineering, agile software development, [and] open systems architecture. CCA will be founded on that.”

There's no question that CCAs are coming, and will be a big part of the future Air Force, Kelly said.

“Everyone is in agreement” about that, he told reporters at the conference.

What he's concerned about is that USAF may rush to field such systems and may in the process get the concept wrong and have to go back start again. He's advocating a building block, iterative approach to fielding the aircraft, with each step defined by aircrews actually working with prototypes and lending their ideas and experience to the process.

“The captains will lead us in this,” Kelly said, referring to the Weapons School experts and veterans of Red Flag exercises. He wants to “get the tools to the Airman and get out of their way. Let them iterate and innovate.”

Each iteration should be inserted “into the mix,”—and the lessons learned—he said, adding that he's certain “if we try to foist this” on combat pilots “and tell them how to do it, we'll mess this up.” Rather than “swing for the fence” and quickly develop what he called an “exquisite” capability, the Air Force should “get some singles and folks on base and try to iterate our way there.” He doesn't want “an exquisite miss,” partly because “exquisite means exquisite pricing.”

He also said the CCA has to be developed in lockstep with the all-domain command and control system and communications that can work in denied airspace through heavy jamming.

“I could have a CCA that could punch into really, really highly defended ... airspace, but if I don't have resilient comms, and that thing doesn't know how to phone home ... I don't get it

home.”

He also noted that uncrewed, armed aircraft can only operate from a few Air Force bases nationwide that are immediately adjacent to restricted airspace; they are not yet FAA-cleared to operate in regular airspace, and that’s a hindrance to developing a useful capability.

“You can race down the track of autonomy,” Kelly said, but if the authority to operate unrestricted doesn’t come with the hardware, the concept will fail.

“I’ve got to have autonomy, authority, and resilient comms” if CCAs are to be a success, Kelly said.

Companies looking toward a “clean sheet” CCA should emphasize iteration and modularity, he said, with interchangeable sensors, jammers, and other mission items. Operators should be able to “unlock a nose, bolt on another nose ... quickly take

off the radars, put on the jammers.”

He urged contractors not to “lock it in” to a particular mission.

“If we lock ourselves into” a particular mission or capability, the CCA could be a “race to failure,” he warned.

If the Air Force guesses wrong, “we have to go back to the start,” costing money and time the Air Force can’t afford to waste.

Nevertheless, he agrees with Kendall that it’s time to “get past the PowerPoint slides” and start producing something.

“He’s right, there’s enough out there that we can start iterating now.”

Kendall said, “I’m convinced that we should move in this direction, and we’re going to do it, under any budgetary future that I can imagine.” ✪

The Story Behind the Space Force's New Official Song

By Amanda Miller

James Teachenor was living in Nashville in 2015 and browsing Craigslist for vintage guitars when he spotted the unlikely ad that led to his occupying a unique place in military history.

The Air Force Academy’s country band Wild Blue Country needed a lead vocalist. Teachenor later found out the ad was only up for a matter of hours.

“It wasn’t supposed to be advertised that way,” he recalled while headed back home to Nashville from AFA’s Air, Space & Cyber Conference with his wife and two teenage kids. “For whatever reason, I saw it in that small amount of time, and I called Colorado Springs and asked if it was legitimate.”

After a few more questions, “I put Colorado Springs’ weather on my phone, because I knew we were going to Colorado Springs,” he recalled. Without having yet auditioned, “I knew that was part of my path.”

He became a senior Airman with the band, which performed at events for both the Air Force Academy and what was then Peterson Air Force Base, Colo., home to the Space Force’s predecessor, Air Force Space Command.

Given that this frequently put him in contact with military space personnel, it’s hard to imagine anyone better positioned to supply the words and melody to the Space Force’s new official song, “Semper Supra,” which debuted at the conference.

Together with a Coast Guard trombonist who doubles as musical arranger, Teachenor composed ‘Semper Supra’ to join the likes of the Air Force’s “U.S. Air Force”—aka “Wild Blue Yonder.”

“What was very interesting about my time of service was I knew what the space capabilities were for space operators before they were Guardians,” Teachenor said. He also met today’s Chief of Space Operations Gen. John W. “Jay” Ray-



James Teachenor, composer of “Semper Supra”—the new Space Force song—leads the audience in singing it at the AFA conference.

Mike Tsukamoto Air & Space Forces Magazine

mond and Chief Master Sergeant of the Space Force Roger A. Towberman at that time. As Teachenor’s enlistment wound down in 2019, he even went along on a trip with the two leaders to Thule Air Base in Greenland, which performs missions in space surveillance and missile defense.

“I got to see so much of what our now-Guardians—but at the time they were Airmen—do and just was blown away by their mission,” Teachenor said. He felt like the trip “had a lot to do with how the song was written because I saw firsthand just the precision and the ... amazing assets that we have in our folks who wear the uniform. And our civilians, too.”

Teachenor and his family went back to Nashville following the conclusion of his enlistment, and in December 2019, the Space Force came to be.

“Several folks reached out and said, ‘Hey, you know, the Space Force is actually going to be a branch—are you thinking about writing a song?’”

He didn’t laugh off the idea but “eventually General Ray-

mond and Chief Towberman reached out to me and said, 'Hey, would you consider writing something and just, you know, give us an option?'"

Feeling simply "honored and thankful just to even throw something in there," Teachenor estimated that by about February 2020, the song was largely complete.

"I knew they wanted something that was singable and that fit with the other anthems—the other service songs—and that would be something that could last. ... They made it very clear they wanted it to be timeless."

Months passed as the service narrowed down the submissions until choosing Teachenor's.

Throughout the process, Space Force leaders made only one request, he said—to include the words "standing guard both night and day," and to emphasize the service's continuous mission of "making sure that we're safe and protected all the time."

"And so I looked at that line and changed it. I believe it's a better line for that," said the recently elected county commissioner for Sumner County, Tenn.

THE SCORE

Trombonist and arranger Coast Guard Chief Musician Sean Nelson responded to a callout to military band arrangers early in the Space Force's search for a song. Now an 11-year member of the U.S. Coast Guard Band based at the Coast Guard Academy in New London, Conn., he'd been "a little green," he said, when he originally auditioned for the Air Force Band in the competitive national auditions that draw high-caliber musicians who ultimately "come in fully trained for the job."

He'd composed the score to an organization's military-style service song once before, updating the march of the Commissioned Officer Corps of the National Oceanic and Atmospheric Administration.

By 2020, he'd made a submission to the Space Force based on a preliminary set of lyrics, and "the group listening really liked my version." In the spring of 2022, "they contacted me again and said, 'We've come up with this melody and lyrics'—and it was Jamie's lyrics and Jamie's melody—'and we're looking for somebody to complete the song, to harmonize it, to orchestrate it.'"

Nelson liked the lack of any other musical contribution such as a chord structure "because it allowed me to be creative with it."

"What I would do is I would play the melody on the piano, and I would sing it, and I would keep trying different

harmonies underneath it. And sometimes there's harmony that is obvious, and sometimes there's harmony that makes sense but is unexpected," said Nelson.

He would ultimately compose 30 parts for a full military band, from the four-part vocal harmony performed at the Sept. 20 premiere by the Air Force's Singing Sergeants to counter-melodies—"there's the main melody that you sing, and there are multiple melodies going on at the same time above and below that melody that makes it sound full and thick and [gives it] a traditional march sound."

Having performed the "Armed Forces Medley" of service songs at many military events, he well knew the need for the Space Force's to fit in with the other traditional military marches. At the same time, he wanted to write something "that was maybe a little unexpected and maybe not as obvious and that had its own sounds as opposed to copying other military songs."

To strike the balance, "you have to know the tradition"—specifically that of American march composer John Philip Sousa—"while knowing where you can break from it."

Without such a well-trained ear, "not everyone might notice it," Nelson said, "but I think if you listen to it a few times, you start to notice, 'Hey, that sounds a little fresh.'"

He sang the first two lines to demonstrate:

"We're the mighty watchful eye; Guardians above the blue. ...

"When you get to the word 'blue,' that chord is outside of the key—so it's just a little bit surprising, I think. ... Maybe you get a little extra sparkle out of it."

Nelson suspects—based on his experience performing in the Coast Guard Band, usually without singers—that "the form that you're going to hear the song in the most is actually going to be without singing."

Next he expects the military bands—along with school bands and choruses across the U.S.—to start adding "Semper Supra" to their medleys.

"Semper Supra"

We're the mighty watchful eye

Guardians beyond the blue

The invisible front line

Warfighters brave and true

Boldly reaching into space

There's no limit to our sky

Standing guard both night day

We're the Space Force from on high

Beyond the blue

The U.S. Space Force



THE PACIFIC

Tensions in Europe, Pacific

By James C. Kitfield

When asked about the real-world demands driving the Air Force's new agile combat employment doctrine, Lt. Gen. Michael A. Loh, director of the Air National Guard, recalled the Guard C-17 aircrew involved in 2021's noncombat evacuation from Afghanistan, the largest such airlift in U.S. history. Once on the ground at a chaotic Kabul airport that was taking incoming fire, the C-17 initially taxied to the wrong side of the

airfield. The need to complete the mission and relaunch was urgent, and the aircrew had no time to ask for permission from higher command.

"So the loadmaster took risks, calculated risks, and in just 55 minutes, he unloaded cargo that would normally take four hours to offload," said Loh, speaking to reporters at AFA's Air, Space & Cyber Conference. "When I asked him how he did it, the loadmaster told me, 'Sir, you don't want to know what I had to do to get that job done.' But I wanted to hear—because I can't afford to have someone in the chain of command above him





(L-r) Lt. Gen. John Healy, Chief, Air Force Reserve; Lt. Gen. Michael Loh, Director, ANG; and Maj. Gen. Daryl L. Bohac, Adjutant General, Nebraska National Guard, discuss the Total Force adapting to the Agile Combat Employment model.

Jud McCrehin/Air & Space Forces Magazine

who would stifle that kind of ingenuity. The Afghan evacuation was kind of the ‘Wild West,’ but that is the culture we need to harness in the future.”

With the Russian army pummeling Ukraine in Europe, and China increasingly threatening its neighbor Taiwan militarily in the Indo-Pacific, the Air National Guard has embraced the culture of can-do innovation at the core of ACE.

“Air Force Chief of Staff General Charles Q. Brown Jr. has said we have to ‘accelerate change or lose,’ and that has led to a whole new mindset in the Air Guard,” Loh said. “We are getting after new ways of doing things that will make us more survivable in a contested environment.”

Earlier this year, Vermont’s 158th Fighter Wing completed the National Guard’s first overseas deployment of the F-35A Lightning II, for instance. Just a week after arriving in Germany, it had fighters in the skies over the Baltics to reassure NATO allies nervous about Russia’s aggression next door in Ukraine.

In the Indo-Pacific, the Hawaii Air National Guard’s 199th Fighter Squadron has experimented with deploying its F-22A Raptors supported by just one pallet of parts and equipment that can be moved by a C-130 transport or even a Chinook helicopter. In June, two Air National Guard C-130s flew to

Guam, picked up a Marine Corps High-Mobility Artillery Rocket System [HIMARS] rocket launcher, and transported it to another base for a simulated firing exercise before loading it back up and returning to Guam.

“We have multiple units doing really good work taking small teams of multi-capable Airmen and moving them forward quickly,” said Loh. “I spoke with an aircraft maintainer, for instance, who had qualified herself on four specialties involved in maintaining the F-35 aircraft. So when you consider the high experience level of Air Guard personnel to begin with, and then add in the experience from their civilian jobs, we have a unique ability to put together teams of really multi-capable Airmen for mission success.”

Increasingly the Air Guard has embraced the ACE operational doctrine, he noted, that focuses on small teams and a mindset that mission accomplishment takes priority over all else. “Because with small teams, if someone gets sick or even killed, you still have to work together to solve problems and accomplish the mission,” said Loh. “What we can’t do is let this model turn into an exercise of just asking our Airmen to do more with less. Some of them are concerned about that, and we need to make clear that is not the model.”

SPACE

AFGSC Launches Second Minuteman III Test in Three Weeks

By Greg Hadley

Air Force Global Strike Command launched an unarmed Minuteman III intercontinental ballistic missile from Vandenberg Space Force Base, Calif., on Sept. 7—its second test launch in three weeks.

The ICBM launched at 1:13 a.m. Pacific time with three test re-entry vehicles, according to an AFGSC release. The vehicles traveled some 4,200 miles before landing in the Kwajalein Atoll in the Marshall Islands.

That’s the same location where the previous test launch, which took place Aug. 16, landed.

This latest launch was overseen by the 576th Flight Test Squadron, stationed at Vandenberg, with support from Airmen from the 341st Missile Wing at Malmstrom Air Force Base, Mont., 90th Missile Wing at F.E. Warren Air Force Base, Wyo., and 91st Missile Wing at Minot Air Force Base, N.D. Space Force Col. Bryan Titus, vice commander of Space Launch Delta 30, was the launch decision authority.

“We have had a busy test schedule just in the past few months

and I am in awe of the way our team has performed during each mission,” Col. Christopher Cruise, 576th Flight Test Squadron commander, said in a statement. “Today’s launch sends a visible message of assurance to our allies, and I couldn’t be more proud of the mission of continued deterrence this launch represents.”

The two tests come more than a year after the last publicly announced test launch in August 2021. Previously scheduled tests were either canceled or postponed by President Joe Biden’s administration in an effort to avoid potential miscommunication and escalation with Russia and China.


The first instance, in March, came in the early days of Russia’s invasion of Ukraine, as Russian President Vladimir Putin raised tensions by putting his nuclear forces on high alert. The second, in early August, came as China launched military exercises around Taiwan in retaliation for Speaker of the House of Representatives, Rep. Nancy Pelosi (D-Calif.), leading a congressional delegation on a visit to the island.

AFGSC has repeatedly emphasized that any test launch



Airman 1st Class Ryan Quijas

An Air Force Global Strike Command unarmed Minuteman III Intercontinental Ballistic Missile launches during an operational test at 1:13 A.M. on Sept. 7 at Vandenberg Space Force Base, Calif.

“is not the result of current world events.” The command has conducted tests in quick succession before. In May 2019, AFGSC launched two Minuteman IIIs in the span of less than two weeks. 

‘We’re Not Ready’ to Fight China in Space and Cyber

By Chris Gordon

The United States is unprepared for a wartime fight with a peer adversary in the space and cyber domains, top U.S. generals said Sept. 20 at AFA’s Air, Space & Cyber Conference.

“The answer is no, we’re not ready,” Lt. Gen. Leah G. Lauderback, Air Force deputy chief of staff for intelligence, surveillance, reconnaissance, and cyber effects, said when posed the question by Lauren Barrett Knausenberger, the Department of the Air Force’s chief information officer.

At the end of 2015, the Chinese stood up the People’s Liberation Army Strategic Support Force (SSF). This newest part of China’s armed forces focuses on the “strategic frontiers” of space and cyber, including electromagnetic and information warfare.

Partially in response to these increased capabilities, the U.S. Space Force was created in 2019.

“As we pivot to China, what gives me concern is how fast they’re moving,” said Space Force Brig. Gen. Gregory J. Gagnon, the service’s director of intelligence, surveillance, and reconnaissance. “We have to tell that story. Because that’s the story that I think people who make resource decisions need to hear.”

According to Gagnon, the Chinese have over 260 satellites surveilling the Pacific.

“Why? To provide warning and to provide strike capability if directed by leadership,” he said.

The threat is a current one, not a distant prospect.

“We’re talking about the PRC, and Russia, and think about the spectrum of conflict. We clearly are in competition with both,” Lt. Gen. Kevin B. Kennedy Jr., commander of Air Forces Cyber, told a room of service members. “We’re being targeted. You, personally, are being targeted right now by our adversaries




Jud McCrehin/Air & Space Forces Magazine

USAF must move faster toward an interconnected military to keep pace with China and Russia said Lt. Gen. Leah Lauderback, Deputy Chief of Staff for ISR and Cyber Effects Operations.

whether it’s via social networks, devices, or the information that you’re using to accomplish your mission.”

But the most concerning element of the Chinese SSF’s role has not been tested. The Department of Defense has a plan to connect all its data in a concept known as joint all-domain command and control (JADC2). The SSF’s brief is to be able to disrupt such a network.

The U.S. still has much work to do to protect and advance its electromagnetic spectrum operations, a key pillar for an interconnected military.

“We are nowhere near where we need to be with that,” Lauderback said. “We are just starting the sprint with the acquisition community and with the operational community. ... It is something that we do not have a deep bench on at all. And we’ve got to do it.” 

Van Ovost: Time to Invest in Next Generation of Tankers, Airlifters

By Greg Hadley

The Air Force needs to start investing in its “next generation of strategic mobility and refueling assets,” U.S. Transportation Command boss Gen. Jacqueline D. Van Ovost said Sept. 20—and that means replacing the two pillars of those respective fleets.

“The C-17 has demonstrated its merits countless times, but the last one was delivered to the Air Force in 2013,” Van Ovost told reporters at AFA’s Air, Space & Cyber Conference. “When we receive the last KC-46 at the end of this decade, we will still have hundreds of Eisenhower-era KC-135s in our fleet that must be recapitalized.”

AERIAL REFUELING

In June, the Air Force sent a request for information to the aviation industry launching the Advanced Aerial Refueling Family of Systems (AAR FoS) program. The program, intended to develop new and existing technologies to go on both current tankers and future ones, detailed some of the attributes it needs, including connectivity, survivability, and increased situational awareness.

Van Ovost called those required attributes “heartening” and detailed how TRANSCOM helped shape them with its own studies.

“We’ve been working with [U.S. Indo-Pacific Command], PACAF in particular, on how we would employ those airplanes ... and what environment they will be in and what we’re refueling,” Van Ovost said. “It really sort of calculates what kind of airplanes we need, and in what positions.” The simulations also show whether “you can modulate how much more fuel they take; or if they take less fuel, would they have this or that, [and] what value would that be to the battlefield.”

Air Mobility Command, the Air Staff, and the Office of the Secretary of Defense receive the results of those studies, Van Ovost said, and will help inform the requirements for the service’s KC-Y “bridge tanker” and KC-Z programs. Requirements for KC-Y are set to be unveiled this fall, while work on the KC-Z future tanker begins in 2023, officials have said.

Van Ovost also detailed some of the capabilities she believes future tankers will need.

“I can tell you, spoiler alert, it’s got to be connected like the KC-46,” Van Ovost said. “Gone are the days where you can just go out there and go to an anchor orbit and just wait for someone to come. It has to be connected and have some sort of battlespace awareness, even if it’s MacGyvered on ... because that is key to survivability.”

On top of that, maneuverability will matter so that the aircraft can be “in the fight, literally linked to everybody so that it can be of more value,” according to Van Ovost.

And if tankers are in the fight, they’ll need some form of defense.

“I’m not saying you have to have an onboard defense, but have a defense,” Van Ovost said. “What is it? What’s the spectrum defense? What’s the kinetic defense? But that could look



Mike Tsukamoto/Air & Space Forces Magazine

Gen. Jacqueline Van Ovost, commander U.S. Transportation Command, said the Air Force needs look for successors to the current fleet of airlifters, while also remaining fit to fight.

like multiple things. It could look like a loyal wingman. It could look like you’re on the network and someone else on that network sees it and takes care of it, and they aren’t anywhere close to you.”

All of those requirements, however, aren’t locked in, and Van Ovost said TRANSCOM will likely conduct wargames to test them in “more of a final stage.”

MOBILITY

While the push to replace the 60-year-old KC-135 has been going on for years now, the C-17 Globemaster III is relatively new in comparison, and the Air Force hasn’t sought to cut its fleet.

But while the average C-17 is decades younger than the KC-135, the airlifter has been used hard—with no obvious immediate successor.

“It’s been critical to the fight. But I’m aware that we’re using them a lot, and there are no [active production lines] for a capability like that—a roll-on, roll-off kind of capability” versus lifting, Van Ovost said of the C-17. “It makes a huge difference for throughput if you can roll-on, roll-off an airplane.”

Van Ovost also noted that the C-5 Galaxy, the Air Force’s largest airlifter, isn’t “getting any younger, either,” heightening the importance of keeping the C-17 fleet airworthy.

The Air Force has articulated plans to keep the C-17 in service through the 2050s—but Van Ovost suggested that TRANSCOM is already looking ahead to its successor.

“We need to be able to ... consider in the concepts looking forward, how much stuff are we moving forward, what kinds of stuff, and what kinds of capabilities that airplane will need?” said Van Ovost. “So as we do these studies, we keep the airlift in the fight, and we keep pushing to the Air Force and refreshing what we think the next airlifter should look like.”

What exactly that will be, Van Ovost didn’t say. But she did point to the Air Force’s operational concept of agile combat employment—emphasizing smaller teams of multi-capable Airmen who can operate in remote or austere locations—along with similar ideas from the other services, as what will “really define” the aircraft’s requirement. ✪

Acquisition Inflation Being Managed on a Case-by-Case Basis, Hunter Says

By John A. Tirpak

Despite inflation at levels not seen in decades, Air Force primes have yet to demand major adjustments to existing contracts, but there are concerns about lower-tier vendors, Air Force service acquisition executive Andrew P. Hunter said.

Speaking with reporters at AFA's Air, Space & Cyber Conference, Hunter said the structure of contracts usually means the company "has to make a request" for inflation adjustments.

"The contractor has to come forward and say, 'These are the costs that we are seeing—we need some kind of adjustment,'" he explained. But "we haven't had much of that ... yet."

The Air Force is also not planning a large "across-the-board, everyone-gets-an-adjustment" action, because each contract is unique, and inflation is affecting various programs and companies differently.

"Not everyone has been impacted in the same way. ... The impacts are pretty broad, but they're not the same magnitude for everyone," he said.

"The issue is fixed-price contracts," Hunter continued. While such agreements usually compel the vendor to absorb inflation losses, there may be ways to mitigate them, depending on the needs of the service and other factors, he said.

The Federal Acquisition Regulations were "developed in the 1960s and '70s, when there was a lot of inflation, so mechanisms exist to deal with this," he said.

Pentagon acquisition and sustainment chief William A. LaPlante will issue guidance for all the military services to



Andrew Hunter, Air Force acquisition chief, says USAF may help contractors with inflation: if they ask, and can document why it's deserved.

Staff Sgt. Chad Trujillo

"try to understand how" to reply "should those requests come about and what are the natural channels that exist" to deal with them. LaPlante's guidance will tell contractors, "this is how you ask us."

Hunter acknowledged that for those "high dollar value" contracts still in negotiation, "we do see that there are higher dollar values than we anticipated."

In all cases, the Air Force will have to work to ensure that "the costs that are being cited to us are supported by the data."

Hunter said the Air Force does not have direct visibility into the health of subcontractors, especially at the lowest level of supply, and so is paying close attention to what is being said at industry days, through trade associations "that focus on the supply chain" and through small business advocates.

"We are listening carefully," he said. "We" and Air Force Materiel Command "have our ear to the ground."

But primes are also being reminded that they are "responsible for their subs; that's a big part of what they get paid to do," Hunter noted.

"We are ... instructing the primes that they need to assure that their supply chain is going to be able to deliver," he said. "If there are companies at risk because of inflation, you need to identify that and look at ways to mitigate that."

Hunter said the Air Force has noticed that for some products and components, "we ... are starting to see substantial lead times to get things; much longer than is typical." Consequently, "we may have to identify alternatives to meet program schedules." ✪

CULTURE

Brown's 5 Big Steps to Transform the Air Force

By John A. Tirpak

Aggressive competitors, limited resources, and accelerating technological advances compel the Air Force to rapidly transform, as it has during other inflection points in its 75-year history, Chief of Staff Gen. Charles Q. Brown Jr. said.

"We've done this before ... we can do it again," Brown said in his keynote address to AFA's Air, Space & Cyber Conference.

Two years into his term, Brown said the Air Force can no longer assume it has dominant capabilities and must be willing to constantly rethink its technology and processes and

to "collaborate within and throughout" to achieve its goals.

"We must change ... if we want to preserve our way of life," Brown said, invoking his "accelerate change or lose" mantra.

"We already know how to accelerate," he said.

The nation finds itself "in a pivotal period ... one that is fundamentally reshaping the international security landscape," he noted. While the U.S. focused on "violent extremists" for two decades, "our competitors focused on matching" the Air Force's dominant capabilities.

The challenges are "not new ... but the complexity and combination" are greater, he said. While "Our tactical skills are sharp ... we need to reframe our thinking to meet the



Jud McCrehin/Air & Space Forces Magazine

USAF Chief of Staff Gen. Charles Brown Jr. says the Air Force culture has to change and laid out five ways to push decisions to lower levels and be quicker on the move.

challenges we will face in the future.”

Brown said, “If we don’t get this right, together—if we fail to adapt—we risk our national security, our ideals, and the current rules-based international order.”

The Air Force’s cultural change will be in five areas, Brown said:

■ **Mission Command.** “We rewrote Air Force Doctrine Publication One,” Brown said, which requires “mutual trust, shared understanding, and clear commander’s intent.” It directs leaders to spell out their objectives for their Airmen and “then get out of their way,” he added. “We might think this is intuitive; I assure you, it is not.”

■ **Force Generation.** “We are transforming the way we deploy,” Brown said. The Air Force new Force Generation Concept, or AFFORGEN, will be operational Oct. 1, defining four stages of operational readiness: “Prepare, Ready, Available to Commit, and Reset.” Each stage runs six months in an overall two-year cycle for every unit. The goal of this system is to establish “discipline” in parsing air power in sustainable ways, so commanders better understand the implications for downstream readiness when selecting units to deploy.

■ **Agile Combat Employment.** The old model of operating from large forward bases “will not work” because adversaries can focus their attacks on those few operational locations. ACE will increase survivability by distributing forces over a wide and shifting area. It “requires us to be lighter, leaner, and more agile,” Brown said, and he’s seen “great progress being made” in this area. Enabling capabilities and concepts will include “command and control, logistics under attack, and missile defense, to name a few.” Helping Airman to become more flexible and less narrow in their scope is a key to ACE. Multi-capable Airmen are a key to making ACE work, Brown said. The shift to multi-capable Airmen is “not a checklist,” he said, but a mindset.

■ **Multi-capable Airmen.** Brown said he wants to “crush bureaucratic hurdles” that hold Airmen back from accomplishing tasks outside their core specialties, creating a “more agile and lethal force.”

■ **Applying the A-staff Construct at the Wing Level.** In this model, A-1 is personnel, A-2 is intelligence, A-3 is operations, and so on. Using the model, Airmen and USAF units will more intuitively “plug into” the joint force when they deploy. This allows USAF to “train like we fight,” providing wings with “more rapid decision-making” and better responsiveness and aligning them in a way that mirrors that of USAF Headquarters and the other joint forces.

In the lead-up to USAF’s founding in 1947, service pioneers “pushed the limits, challenged the status quo,” and proved the value of air power and the credibility of a separate air-oriented military branch, he said. “Giants” in air power history such as Hap Arnold and Billy Mitchell “risked their reputations and their careers because they knew what was at stake.”

In the decades that followed, the Air Force continued to innovate, he said. From the Berlin Airlift to the creation of supersonic aircraft and rapid development of intercontinental ballistic missiles, the Air Force met the nation’s security challenges, Brown said, and will do so again now. The Air Force, industry, and academia pooled their talents to develop ICBMs in just two years, he noted.

To overcome greater numbers of Soviet forces, the Air Force invested in and rapidly fielded stealth aircraft and precision weapons, leading to its dominant performance in the 1991 Gulf War and across the ensuing 20 years, Brown said. In the Balkans, the Air Force used the B-2 stealth bomber for the first time and fielded an armed version of the Predator remotely piloted aircraft “in just 39 days,” he continued.

Today, the Air Force is again confronted with challenges to its ability to control the skies, defend the homeland, and penetrate to any target it must hold at risk. It must not be daunted.

“We’ve done this before,” he said. “We can do it again. ... We must not rest on our laurels.”

While still “the most respected Air Force and Space Force” in the world, Brown said that status must be earned. The path to do that is through ever-greater collaboration among the services and with industry—and by empowering Airmen at every level to figure out solutions that achieve their commanders’ intent.

Brown said he will forgive mistakes made in pursuit of true innovations, “pushing through failure until finding success.”

“This has always been in our DNA,” he added. “With every new trial, no matter how difficult, we proved we could rise above any challenge ... if we were willing to take risk.” Airmen must feel free to “challenge the status quo.”

Calling for experimentation, risk-taking, and “creating disruption at all levels,” he directed Airmen to pursue faster and better ways to accomplish the mission.

“We have done this no matter how seemingly impossible” the challenges, he said.

Brown cited several examples of Airmen who have risen to this challenge, including Senior Master Sgt. Brent Kenney of the 52nd Fighter Wing, who came up with a way to create potable water at a remote location using solar fabric and “an environmental water harvester,” saving USAF from having to dedicate “precious” cargo missions to delivering bottled water and saving on diesel generators.

Adaptation today requires “collective effort” and collaboration—both within the Air Force and with its partners and allies worldwide—to “understand the environment,” define the threat, share information, and “employ air power.”

Toward that end, Brown is working toward a future force he calls “Integrated by Design,” which will “start with allies and partners in mind, versus ... adapting to include partners and allies later.”

The Air Force “can’t do this alone,” he said. “We must accelerate. Our window of opportunity is closing. ... We have to ... get beyond talking about what we want to do ... and go do.”



Armed and Dangerous

In Sky Warden, AFSOC gains a flexible new hunter-killer.

Air Tractor

Air Force Special Operations Command's Sky Warden, built on the Air Tractor AT-802U single engine crop duster platform, has multiple hardpoints to support sensors and weapons, so it can be tailored to a range of Special Forces missions. L3Harris beat out several other competitors to win a 75-plane order.

By Hope Hodge Seck

An eight-vehicle convoy of U.S. Special Operations troops and Nigerien soldiers departed the village of Tongo Tongo in October 2017, following a short resupply stop a day after a failed raid on a target. Almost immediately, the troops' armorless pickup trucks and Toyota Land Cruisers were surrounded by heavily armed militants from ISIS in the Greater Sahara (ISIS-GS). On motorcycles and in pickups, the militants overwhelmed and fragmented the convoy, killing four U.S. Soldiers and five Nigeriens.

Investigators would later conclude the team had been left totally unprotected from the air; a U.S. drone that tracked the convoy earlier in the mission had been sent north to the Mali border and when the team had called for help, it took almost an hour for a French Mirage aircraft to reach the areas.

The ambush highlighted a gap in U.S. military capability—the lack of a small, nimble, and flexible Armed Overwatch platform able to provide surveillance, close air support, and precision strike in the

“Instead of running a bill of up to \$150,000 per hour for a complex stack of air assets, the Sky Warden can fulfill much of the same for ... pennies on the dollar!”

—Retired Maj. Gen. Michael Kingsley, former USAFRICOM chief of staff

austere and permissive environments that U.S. special operations forces operate in routinely. In August 2022, nearly five years after the Tongo Tongo incident—and two years after U.S. Special Operations Command launched a search for such a capability—SOCOM selected a modified crop-duster from L3Harris for the mission.

SOCOM will invest about \$170 million to build 75 Sky Warden aircraft based on the Air Tractor single-engine turboprop AT-802U. To start, Sky Warden will replace Air Force Special Operations Command's aging fleet of U-28A Draco ISR aircraft and in turn augment the Air Force's remotely piloted MQ-9 Reaper drones. But AFSOC and other experts anticipate an expanding role for this simple platform, which requires a very small footprint to operate in the wild.

Sky Warden is designed to “collapse the stack” of up to 20 ISR and armed defense aircraft that are sometimes called in to support missions like the failed 2017 operation in Tongo Tongo. Retired Air Force Maj. Gen. Michael Kingsley, who led U.S. Africa Command prior to his 2016 retirement, said that stack can include ISR assets like the Draco, unmanned

platforms like the Reaper, and manned fighters like the F-16 to validate and act on intelligence.

“We’re entering into a world now, where a majority of the fighters and other airplanes, to include remotely piloted airplanes, are going to be focused elsewhere,” Kingsley said. Russia’s war on Ukraine and China’s increased assertiveness in the Pacific is changing U.S. defense priorities, and counter-insurgency and counter-terrorism missions may not always be able to garner the attention and commitment of forces needed.

“Instead of running a bill of up to \$150,000 per hour for a complex stack of air assets, Kingsley said, the Sky Warden can fulfill much of the same requirement for an hourly operating cost in the low thousands—‘Pennies on the dollar.’”

Kingsley has a history with the Air Tractor aircraft, having been a vice president at IOMax USA, which created an earlier armed version of the Air Tractor flown by the United Arab Emirates Air Force.

PLANS FOR SKY WARDEN

Sky Warden won out over five competing options using an Other Transaction Authority (OTA) competition intended to accelerate acquisition. The first batch of seven aircraft are due in fiscal 2023, and Air Force Special Operations Command anticipates 75 planes by the end of fiscal 2029. The 18th Special Operations Test and Evaluation Squadron at Eglin Air Force Base, Fla., will start putting the aircraft through its paces by the end of calendar 2023. Ahead of that, contractor and government verification testing is already underway at L3Harris facilities in Waco, Texas.

“We’re basically buying this complete production aircraft off the shelf, like a fully mature aircraft,” said Maj. Alex Flori, branch chief for Armed Overwatch requirements at headquarters, AFSOC.

AFSOC officials told Air and Space Forces Magazine to see the platform as perfectly in tune with the Air Force’s Agile Combat Employment concept for rapid, small-footprint deployments. Because the plane is a relatively simple, low-maintenance aircraft and can land and take off easily from unimproved roads, it

doesn’t require the kinds of maintenance support and facilities required of jet aircraft like the A-10 Thunderbolt. As a bonus, its load capability and low operating costs make it a potential fuel supply platform; in a pinch, it could deliver enough fuel to fill the tanks of a UH-60 Black Hawk.

“There’s definitely room for expansion of mission capability,” Flori said, citing the palletized munition initiative that has turned C-130s into makeshift bombers, capable of launching missiles and munitions from their cargo bays. “I think SOCOM and AFSOC have a long, long history of doing this on our aircraft.”

AFSOC and the Air National Guard Bureau will stand up in the second quarter of fiscal 2024 at Will Rogers Air National Guard Base, Okla., with an initial cadre of 24 U-28 and MC-12W Liberty pilots. The unarmed MC-12 turboprops are Guard ISR planes. By 2029, the Air Force anticipates retiring the U-28s, with pilots transferring to other aircraft.

“I think the experience you would gain on a U-28 as a senior pilot or a command pilot would translate well to an Armed Overwatch squadron,” Flori noted. “Slightly different mission, but those experiences as an Airman still translate.”

THE AIRCRAFT

Sky Warden isn’t really like anything else in the aircraft stack it’s supposed to replace. It has a crew of two compared to the Draco’s four, and its 18-meter wingspan dwarfs that of an F-16. With chunky tires built for primitive airfields and a NASCAR-style roll cage to protect the crew, “it’s structurally just a tank,” said John Totty, a former Army and Air Force pilot who has helped with developmental test and demonstration flights. “It’s a phenomenal airplane that will take a tremendous amount of punishment.”

Similar in size to the A-10, the beloved close air support platform that is sometimes criticized for flying too slow, Sky Warden is even slower: Its top speed of 213 knots is about half that of the A-10. But its tailwheel design is well suited to austere environments, keeping the aircraft’s nose up during landings to ensure the prop stays clear of grass or other obstacles.

“When I saw the aircraft, being a tail-dragger pilot, I loved



Senior Airman Vernon Walter III

The Air Force is replacing its aging U-28A Draco aircraft, like this one at Dugway Proving Ground, Utah, with the new Sky Warden planes, which are smaller, simpler, and less costly to operate.

L3Harris is expanding production capacity and hiring to modify 75 Sky Warden aircraft for Air Force Special Operations Command.



L3Harris

it,” said Totty, who previously flew Russian Antonov An-2 Colt biplanes, another tailwheel aircraft that was adapted for military service. “And the fact that they could take this very utility-oriented crop-duster, and turn it into a military machine, you know, was really intriguing.”

Totty said the Air Tractor proved its low-maintenance bonafides in testing. At the joint exercise Bold Quest 21 in southern Indiana last November, he said, it supported Airmen, Marines, and other troops from 11 partner nations over nine days and 50 hours of flight time without any “squawks,” or mechanical issues. Advertised as able to spend eight hours airborne on station, Totty said testers found they could reliably get more than nine under the right conditions. They gave Sky Warden high marks for reliable performance and ease of maintainability, noting it needed little more than oil and tire changes between flight days, he said.

L3Harris gave Sky Warden two FMV ISR sensors; four secure mission radios, in addition to its two standard air traffic control radios; Ku band and UHF satellite communications; Link 16 networking capability; and a Mobile Ad hoc Networking (MANET) digital radio that allows teams on the ground to control and aim the mounted sensors and view the data the aircraft is collecting via a video feed on a tablet.

Multiple hardpoints support a significant weapons load. The aircraft can haul combat loads up to 6,000 pounds and can launch GBU-12 Paveway II 500-pound bombs; AGM-114 Hellfire Missiles; stand-off precision-guided munitions fired from 8x common launch tubes; and 70 mm rockets, such as the Hydra 70 or AGR-20 Advanced Precision Kill Weapons System, reportedly the Sky Warden’s primary armament.

SKY WARDEN VS. MQ-9

Loaded up with sensors and weapons stations, tough to destroy and easy to maintain, the Sky Warden checks the boxes for its designated mission to protect exposed ground troops and surveil targets in austere regions. Critics see its slow speed and limited maneuverability as a vulnerability, making it a fat target in a world where sophisticated and powerful counter-air weapons are increasingly available.

But Kingsley, the former AFRICOM chief of staff, said in the parts of Africa where Armed Overwatch is needed, Sky Warden

can operate safely at 10,000 feet now and for a long time to come.

“The surface-to-air threat there is minimal—probably just small arms,” he said. “There might be a [rocket-propelled grenade] or two. But just saying they’re going to get and be able to operate advanced shoulder-fired missiles against our aircraft, I’m a skeptic with that.”

Kingsley said AFSOC’s purchase of Sky Warden is likely to fuel interest in foreign military sales to allies such as Nigeria, and that their purchases will allow those countries to better control militants operating inside their borders.

Armed Overwatch was needed largely because the Air Force’s fleet of 300 MQ-9 Reapers is already overtasked and costly to operate, which led to coverage gaps like the one in the case of the Tongo Tongo ambush. But Sky Warden advocates see other advantages, too.

“In my world and the platforms I make, I’ll never make an airplane that only has one [electro-optical/infrared] sensor on it again,” said Luke Savoie, president of L3Harris Technologies and a former Air Force evaluator pilot. “It is very hard to maintain chain of custody of targets, to increase your situational awareness ... especially after someone has come into an area and left an area—and to make a decision—especially when you’re making a decision to shoot a weapon. It’s very hard to do that with only one sensor.”

The Sky Warden’s two EO/IR sensors compared to the MQ-9’s one mean it can track multiple objects with high fidelity simultaneously, accelerating pilots reaction time, Savoie stated.

“Our time is measured in milliseconds, not seconds, for our operators to observe and react to things that they see,” he said. “So you’re not waiting on the latencies and the delays of getting to someone looking at it on the other side of the planet.”

Totty said there are also advantages in some cases to having a crew on scene versus operating an aircraft remotely.

“There are some risks involved anytime you deploy an unmanned system, because you don’t have the aircrew on station, and you have to control that machine via a link,” he added. “In the Sky Warden, [there are] crew onboard who are able to see and monitor ops within and outside the sensor fields of view, with their hands on the flight controls so no one else can interfere with what the aircraft’s going to do, and the targets that it services.”

SUCCEEDING WHERE OTHERS FAILED

Despite its estimation that Armed Overwatch was an urgent need, SOCOM had to convince Congress and others. The fiscal 2020 National Defense Authorization Act barred the Defense Department from investing in Armed Overwatch until an independent study validated the requirement and the Air Force's inability to meet the need with existing aircraft. RAND completed the study in March of this year, but although the study has not been publicly released, its impact is evident.

Both the House and Senate versions of the fiscal 2023 defense bill fund Armed Overwatch with the full \$246 million requested by DOD. That makes Sky Warden a rare success among at least half a dozen DOD efforts to purchase modified commercial aircraft for surveillance and attack mission. The most recent bust was the Air Force's Light Attack Experiment, which stalled out after a decade of effort and hundreds of millions spent. The Light Attack program culminated in a four-aircraft evaluation event in 2017, but a combination of confusion over how the aircraft would be used and where it fell in the priority list ultimately meant it did not move forward. Air Tractor's armed AT-802U was an unsuccessful competitor in that competition.

Savoie said Armed Overwatch benefited from a clear and coherent mission description and powerful advocacy from senior leaders such as AFSOC commander Lt. Gen. James C. Slife and SOCOM Commander Army Gen. Richard D. Clarke, who each made passionate pleas to Congress in testimony last year.

"I think you could look at the quotes from General Clarke at the time, you can look at the quotes from Lieutenant General Slife, and you can clearly see the articulated need, and how it fits into their scheme of maneuver to the overall national defense strategy," Savoie said. "The continued war to counter violent extremists is a continuing mission step, but it has to be done with less assets than the conventional force needs to focus solely on the near-peer or peer threat in [U.S. European Command] or [U.S. Indo-Pacific Command]. Then, it makes perfect sense."

Communication with Congress and responsiveness to lawmakers' concerns was also key, Air Force Capt. Cory Moore,

acquisitions officer for the Armed Overwatch branch, said in an interview.

"Some of the homework they provided us was to weigh risk/reward and was also to balance against what is the mission that Armed Overwatch entails," Moore said. "Once we were clear on those definitions, we provided a good roadmap to pursue."

BEYOND ARMED OVERWATCH

Sky Warden may be a candidate to replace Javaman, a little-mentioned MC-12W mission.

"Everything that Javaman did, Sky Warden certainly can do with additional capability, because it brings the agile strike capability," Totty said.

Savoie also expects the Defense Department's commitment to Sky Warden to affect international sales, instilling confidence in customers leery of investment in an off-the-shelf tactical aircraft after the foundering of the Light Attack program. It's also a proof of concept, he added, for defining a problem and developing a tailored solution, rather than settling for a more accessible proximate fit.

It's part of that entire paradigm shift that we're doing of how to fight a little bit differently, so the same type of things with the same effects, but approach those problems differently," he said. "And I love that the platform is kind of a forcing function for that."

Totty also expects Air Force and SOCOM operators to develop uses that haven't even been imagined yet as they get acquainted with the platform.

"We've met all the requirements that they were looking for in an airplane that will take the punishment over the long haul. They can rapidly deploy it; you can pull the wings off, you can ship the airplane somewhere. We've proven that they can do that with a very low footprint," he said. "But honestly, it's engineered to go well beyond [requirements] knowing that when we put that airplane in the hands of these AFSOC aircrews and their ingenuity, and they start writing the tactics, techniques and procedures for their mission set, that's when we're really going to see the value." ❄️



Air Tractor AT-802U/Twitter

The AT-802U Sky Warden aircraft can be easily broken down and reassembled for transport.



Gen. Michael E. Ryan

Tom Reynolds/USAF

Chiefs Connected



Gen. David L. Goldfein

Scott Ash/USAF

BY TOBIAS NAEGELE

The Air Force is a massive institution in a state of perpetual change, its many pieces operating in unison and yet moving to their own unique rhythms. A continuous flow of new Airmen cycle into service—bright, eager, hopeful. Last year's models, now seasoned, move up a notch, the assembly line continuing as members are routed up, and out, over the course of 15 or 20 or 30 years.

But though the Air Force churns out Airmen with precision, it is not simply a machine. It is in its own way a family, and the connections that span the generations, both by blood and the unique relationships that grow out of shared service, add a human dimension that informs and softens the perpetual motion machine.

PART 3 OF A 4-PART SERIES

Gen. Michael E. Ryan, Chief of Staff of the Air Force from 1997-2001, is the only Air Chief to succeed

his father in that job. "They'll never make that mistake again," he says now, but not because of any rule. The odds of an Airmen following his or her father into service remain higher than for the civilian population at large, but surviving to four stars is itself a rarity and to be in the right place at the right time to become Chief is as much luck as it is talent.

More common are the connections Chiefs have with other leaders who came before them, whether they served together in combat or on staffs. Assignment as a general's aide is not a guarantee of future stars, but such exposure to the inner workings of the service can be foundational for future success. Was it a coincidence that Gen. David L. Goldfein served under Ryan as an aide a couple of decades before he became Chief himself? Hardly. Though Ryan and Goldfein hailed from different family lines, their intertwined bonds of service are just as unbreakable.

Gen. Michael E. Ryan, CSAF No. 16 (1997-2001)

Like Father, Like Son

As America rolled toward the end of the second millennium and the year 2000—Y2K, as it was dubbed—President Bill Clinton was in his second four-year term as President, Rep. Newt Gingrich was in his second two-year term as Speaker of the House, and the Defense Department was in trouble. Eight years after the fall of the Berlin Wall, Americans were more interested in the new "dot-com" boom than national defense. The post-Cold War drawdown that began in 1991 had twisted military personnel policy such that it seemed the armed forces were more focused on getting people out of uniform than in recruiting members to join or stay in.

The Air Force suffered a 20 percent cut in the six years from 1991 to 1997, a loss of \$18.3 billion a year.

The fighter force shed 1,800 jets in that time, a 40 percent reduction since 1987. The missions, however, continued: Somalia in 1992, Haiti in 1994, Bosnia in 1995, not to mention Operations Northern and Southern Watch, no-fly-zone enforcement over northern and southern Iraq, which demanded continuous U.S. Air Force presence.

Air Force Chief of Staff Gen. Ronald R. Fogleman, nearly three years into his own four-year tour, was in a bind. He believed the cuts to the Air Force were dangerous to U.S.



Air Force Chief of Staff Gen. Michael Ryan is briefed by Lt. Col. Steve Rainey before take off in an F-16 Fighting Falcon at Edwards Air Force Base, Calif., in January 2000. The two flew chase during an F-22 Raptor test mission. Building enough Raptors was a vexing challenge for Ryan and the Chiefs who followed him.

Tom Reynolds/USAF

national security, but couldn't seem to convince the people who mattered—in particular, Defense Secretary William S. Cohen—that he was not some Chicken Little warning that the sky was falling. Worse, he was also butting heads with Cohen over personnel matters in the aftermath of the terrorist attack on Khobar Towers, a military housing complex in Dhahran, Saudi Arabia, where a truck bombing in 1996 had killed 19 U.S. Airmen and wounded 400 American and allied military and civilian personnel.

Congress and the public wanted accountability, and Cohen, a former Republican senator from Maine who had crossed party lines to join the Clinton administration, was willing to pin the blame on the one-star commander on the scene, Brig. Gen. Terryl Schwalier. Fogleman was not. In July 1997, Fogleman elected to retire early. "My stock in trade after 34 years of service is my military judgment and advice," Fogleman wrote to Airmen that July 30. Now, he wrote, "I may be out of step with the times and some of the thinking of the establishment."

Enter Gen. Michael E. Ryan. While not a stranger to Washington—Ryan had been a military assistant to Air Force Chief of Staff Gen. Larry Welch (CSAF No. 12) and for two Chairmen of the Joint Chiefs of Staff, Generals Colin Powell and John Shalikashvili—but he was returning after three and a half years in Europe, during which he had led the U.S. air campaign that forced an end to the Bosnian civil war and led to the Dayton Peace Accords.

In Bosnia, Ryan had been left largely to his own devices. "No one told me what to do. No one told me to put a work plan together called [Operation] Deliberate Force," he said. "I just did that on my own. No one tasked me to do that. And I picked every ... aimpoint that we used in that war to avoid civilian casualties because we couldn't be seen as being as bloodthirsty and as committing atrocities, as the participants in that war had been [doing] to each other. In Srebrenica, they killed maybe 6,000 Muslims. There was a horrible war. And how do you stop a war? How do you end a war? We were able to do it by taking away the Bosnian Serbs' capability to fight."

Bosnia, Ryan said, was his greatest legacy. But he himself had descended from a unique Air Force legacy, having spent his entire life within the bubble of the Air Force as the son of a decorated bomber pilot, Gen. John D. Ryan (CSAF No. 7). The elder Ryan became Chief in 1969 when Mike was a young captain flying F-4s at Holloman Air Force Base, N.M.

Now for the first and only time in the history of the U.S. armed forces, the son of a former service chief had advanced to reach the same position. What he inherited, though, was an Air Force in crisis.

"I found my Air Force in free fall," Ryan said in a recent interview. "There was no safety net. We didn't have a stopgap. There was nothing that was going to keep it from continuing to fall. We had become victims of our own success, in a way: We had gone and done the Gulf War, we had done Bosnia, touted as the war that was won by air alone."

In the wake of those conflicts, American air power was so overwhelmingly powerful and effective, its technology so obviously superior, the nation was taking that capability for granted.

"We were faced with, 'where's the peace dividend here?' And 'where's the threat

for the future?'"

That future looked busy to Ryan. Southern Europe, where the former Yugoslavian states were still jockeying for control of border lands and where ethnic tensions that had been held in check for decades under decades of communist rule, continued to unravel in violence. The Middle East, where Operations Northern and Southern Watch continued unabated, with no end in sight, and where Iran continued to pose a meddlesome threat requiring continuous U.S. military presence in the region.

Many also saw another potential threat rising on the far side of the world. While Britain had turned Hong Kong into an elite island city-state, an international economic powerhouse, time was running out on a 99-year agreement that allowed British rule. On July 1, 1997, weeks before Fogleman retired and just months before Ryan took over as CSAF, the United Kingdom completed the ceremonial transfer of power in Hong Kong, returning sovereignty to China after a century and a half of British rule. Now, just eight years removed from the Tiananmen

"Being an Airman is being part of a team.

"So in my mind, it's about being a trusted, trusted member of a team. That's what being an Airman is about. And it always has to be that way because you're never going to do it alone. You're always going to have to do it with others, and you're going to have to trust them and they need to trust you. You're always going to have a wingman no matter what your job is. That's what it means to me."

Square massacre where China's People's Liberation Army had brutally crushed a civilian protest, China was taking possession of a vital connection to world financial markets. Hong Kong's ticket to modernize its economy, and it pledged to uphold a "One Country, Two Systems" policy that would protect Hong Kong's independence.

But China was not Ryan's worry. His eyes were set firmly closer to home.

"I was terribly worried about how to protect the Air Force," Ryan recalls now. "How do we stabilize this thing so it can't just keep being eaten away?"

Every element of the Air Force was under attack. "Pieces grabbed. Every piece of your force structure questioned," Ryan recalled. Questions flew: "Why do you need that?" The entire service was on the defensive, Ryan described. "It was—it was awful."

From the outside, the Air Force seemed not to have any difficulty. There were plenty of planes—even if those planes weren't all interchangeable. The Air Force lacked a simple force structure that could be explained in building block form, like the Army, Navy, and Marine Corps. The Army had divisions, which were not all equivalent, but at least sounded as if they could be somewhat interchangeable. The Navy had carrier battle groups and a rotational model that resulted in predictable deployment and maintenance cycles. The Marine Corps had Marine Expeditionary Forces, which worked similarly to the Navy model.

But the Air Force had been built around its bases, its forces tailorable to mission needs. So as demand rose and the service shrank, cracks were beginning to show. Readiness and morale began to slide, right along with the declining budget.

Ryan noted how the Air Force built stand-in forces for those times when the Navy could not provide aircraft carrier presence in the Persian Gulf. This was the Air Force being expeditionary in its own right, as it had been in World War I, in south Asia in World War II, and in the Middle East since Operations Desert Shield and Desert Storm.

"I said, 'What if we took our Air Force and cut it up in a way that we could form these AEFs—Air Expeditionary Forces?'" Ryan said. If that concept were applied not just for gap-fillers, but for all operations, he thought, it would benefit the Air Force in myriad ways. "We could put some stability into our operations, we could say this is what the Air Force is made of—10 AEFs—and that's something we can build a force structure against."

Brig. Gen. Charles F. Wald was Ryan's special assistant for the upcoming quarterly defense review, and he asked Wald to work out how to make the concept work. The model Wald's team built meant the AEF could be used to size the force, Ryan said. "We used it as a force structuring tool, too, not just a tool to put stability into the rotations, but as a tool to say, 'This is how many F-22 squadrons we need.'"

When then Air Force was ordered to cut the original F-22 planned purchase from 750, Ryan said, the Air Force used its 10 AEF model to rationalize a new figure: Every AEF needed at least one squadron of F-22s, and every squadron needed 24 planes; add in 25 percent more for training, a percentage for attrition, testing, and so on, and the requirement came out to 381.

The AEFs did not exist in a vacuum. The National Defense Strategy required a force able to fight two major regional contingencies at approximately the same time. The Navy drew the line at 11 carrier battle groups "and anyone who ever questioned that, they'd say, 'No, we have to have 11 carrier battle groups,

and no one would take that on.'"

Ryan believed the AEF construct "would have legs" and survive because "it was designed to be able to handle an op tempo that was constant, because you could put two AEFs online at any one time, and that was plenty for what was going on. And if you had the big one, we'd go back to mobilize, just like for every other war we'd ever had."

Defining an AEF for outsiders was never as simple as defining a carrier battle group, however. A carrier battle group could be seen in a photograph, and that image could be held in the mind's eye. When the Air Force laid out its AEFs, however, it lacked that visual element. Instead, it was a complicated list: combat, mobility, and "low-density/high-demand" forces, delineated as wings, air groups, and squadrons, drawn from the Active, Reserve, and Guard components, and organized by date ranges. A separate list included support forces, organized by duty location. To show all the pieces of all 10 AEFs required two-and-a-half printed magazine pages in Air Force Magazine's Almanac; even then, one needed to view all three pages to understand the contents of a single AEF.

Ryan's AEF settled on deployment rotations of 90 to 120 days, another element that outsiders found difficult to fathom. The Navy and Marine Corps used six-month rotations. But the Air Force had set out to ensure units maintained proficiency in the full range of missions each one might face. That drove the decision for short rotations. "We thought we could keep proficiencies up if we had shorter deployments," Ryan insisted. "You have readiness requirements you lose when you're deployed. You don't do certain things because of the kind of missions you're force into when deployed, so you can lose your proficiency after 120 days if you haven't shot a missile, or refueled, or any number of kinds of things you're required to [be able] to do."

But short cycles became unsustainable after 9/11, with the wars in Afghanistan and Iraq, especially when the Army found itself forced to extend some deployments to 15 months, and to impose stop-loss orders that kept deployed Soldiers on Active duty beyond their enlistment dates. Would Ryan do things differently if he could go back and get a do-over? He's not sure. He sees the argument for six-month deployments, as well as the benefits of 120. "What kinds of deployments are you going on? What kind of a beast are we feeding?"

The AEF construct survived the transition to Ryan's successor as CSAF, Gen. John P. Jumper, but began to come apart under his successor, Gen. Norton A. Schwartz. Today, the Air Force is trying to establish a new means of presenting forces. The "force generation" model introduced late last year by CSAF No. 22 Gen. Charles Q. Brown Jr. establishes four six-month stages—commit, reset, prepare, and ready—for every unit, underscoring that the requirement Ryan identified for stabilizing the force in the late 1990s endures, even if the solution has remained elusive over the quarter century since he became Chief.

The undoing of the AEF may have been its flexibility, Ryan suggests. "Flexibility is the enemy of stability," he said. "And unfortunately, air power is very flexible."

PROTECTING THE PEOPLE

Ryan had more on his plate than combat rotations and deployments. The situation in the former Yugoslavia was still troubling, and the Air Force was on continuous duty there, as well as in the Middle East. Meanwhile, the military was facing other problems.

The Clinton administration had capped military pay growth below wage inflation in 1993. By 1997, the caps had opened

up a 9 percent gap between military and civilian pay, according to RAND Corp. estimates at the time. This came on top of an estimated 12 percent gap that had grown since the 1980s. RAND and others questioned whether that gap really applied to the full force, or only to certain service members, but there was no escaping that military pay had fallen behind—and that recruiting and retention were beginning to demonstrate that fact. Another change Congress made in the 1980s was also coming into focus. Lawmakers had changed the formula for military retirement in 1987, but many in the military did not begin to recognize the difference until the late 1990s.

“Recruitment and retention were a big issue when I came on board,” Ryan said. “We had never advertised before that.”

Pilot retention was also a problem. “During the drawdown we had made a huge mistake: We had tried to throttle up and down the number of pilots that we would put out in a year. ... But we had no way of predicting the run on our force that came from the airlines. Or how much our young force would decide after X amount of time they wanted out. Or what kind of payback we’d get from any of our” incentive programs. “But never pull it back,” Ryan said. “Because when you pull it back, you lose the instructor pilots, you lose range capability, you lose airplanes.”

But then, Ryan added a wrinkle. Those who agreed to let the Air Force train them to be pilots also agreed to stay in the service for 10 years. “My personnel guys said, ‘No—we can’t do that!’ But I said, ‘Yes, 10 years, you go to pilot training, you give us 10 years back.’”

The increased commitment had no impact on the take rate, Ryan said. But 15 years later, the Air Force is still struggling to retain enough mid-career pilots. Why? “That goes back to that stability issue,” Ryan said. “If the family is unhappy because they don’t have that stability, then it’s very hard to keep the member.”

Having tried advertising for new recruits, Ryan was now interested in leveraging that kind of marketing power for retention. “I looked around and I said, ‘We don’t have a rallying symbol in the Air Force, we don’t have a symbol.’ I mean, the Marines have their eagle, globe, and anchor, and the Army has their star, and the Navy’s got a lot of anchors. Well, we don’t have anything.”

Ryan hired some “Fifth Avenue guys” from New York and took their renderings to a Corona meeting of the Air Force’s four-star leadership. “There was one that stood out above the others,” Ryan said. “And that’s the one we have today.” But it wasn’t really that simple. He launched the symbol in a guerilla marketing campaign, using it as an unofficial logo in Air Force ads and waiting to see if it caught on organically. “I said go put it on a couple of water towers, put in on the front gate in a couple of places, but don’t force it. ... And it caught on big time.”

Ryan said on issues of style, rather than substance, it’s better

to let people buy in than to force change. In the end, it was Ryan’s successor, Jumper, who made it the Air Force’s official logo. But by then it was already widely recognized and accepted.

Not taking credit and letting things percolate is also reflected in Ryan’s approach to Corona meetings. All Chiefs have experience in Coronas before they are running them. When they finally are in charge, they have a very good idea of what they think is going to work. “First thing is: You’re not the smartest person in the room, and if you think you are, you’re not going to learn anything.”

“Make sure you include everybody’s opinion, and listen to them because someone in there has got a better idea than you do—or can take your idea and make it even better,” Ryan said. “When you go into executive session at Corona, that’s an important meeting. People can say what they need to say and give their honest opinions without fear of being chastised. I had some wonderful, cooperative four-stars that were my guys. They helped me a lot. ... I didn’t have a maverick in the group in the sense of a guy who was fighting where we wanted to go. And we had some that had a lot of opinions and a few that had a bit of an ego, but everyone of them in the end were on the team. Everyone of them was an Airman. A team player.”

Ryan had a lot to live up to as the second Ryan to become Air Force Chief. His father had been a highly decorated bomber pilot in World War II, with two Silver Stars and a Purple Heart for being wounded on an anti-aircraft fire on a bomber mission. “He was a hero in my eyes, not just because he was my dad, but because of his background. He took me up in a B-26 when I was about 10 years old, and he was a commander at Carswell Air Force Base, Texas. And from then on, I wanted to fly airplanes.”

The elder Ryan impressed his son with his “ethical quality that was unquestionable ... and I vowed that I would try and live up to that too. Integrity ought to be your watchword, because if you don’t have integrity, you have nothing. You’ve got to admit when you’re wrong, and you’ve got to stand up and say so when something is your fault.”

When Air Force Capt. Scott O’Grady was shot down in Bosnia, Ryan said, it was his fault. “I put them in a position where they were vulnerable,” he said. “So Scott got shot down because of me.”

A few years later, another Airman was shot down, this time in Serbia. The pilot, then-Lt. Col. David L. Goldfein, had been an aide to Ryan earlier in his career, and Goldfein’s brother Col. Stephen Goldfein was Ryan’s aide at the time. Ryan said the day “Fingers” Goldfein was shot down was his worst day as Chief. When he finally got word that Goldfein had been rescued, he called Stephen. “I’ve got some good news and some bad news,” Ryan told his executive aide. “The good news is we got your brother back. The bad news is the Goldfein family owes the Air Force one F-16.”

Gen. David L. Goldfein, CSAF No. 21 (2016-2020)

The ‘Joint’ Chief

By September 2015, everyone knew that year’s “AFA”—the Air Force Association’s annual Air, Space & Cyber Conference in National Harbor, Md.—would be Gen. Mark A. Welsh III’s last as Air Force Chief of Staff. He’d been in the job since 2012, and his four-year tour would be up the following summer.

On the eve of the conference, news outlets speculated

about two ground-breaking options for his relief: Gen. Lori J. Robinson, then commander of Pacific Air Forces, and Gen. Darren W. McDew, who had only recently taken charge of U.S. Transportation Command. Absent from that conjecture: Vice Chief of Staff Gen. David L. Goldfein.

Junior to both Robinson and McDew, Goldfein had survived a missile strike that downed his F-16 over Serbia, leaving

him stranded in hostile territory until he could be rescued. “Intercepting an enemy missile with my airplane was not my best mission,” he said. Surviving and then thriving as his career advanced belied the notion that the Air Force suffered from a zero-defect mentality. In the wake of losing his airplane, Goldfein had not only survived, but thrived.

“Beginning as a young captain in Desert Storm, I had not missed a single fight in my career,” Goldfein said. That included two years as the Air and Space Component Commander for Central Command from 2011 to 2013. Even so, Goldfein didn’t see himself as a serious candidate for Chief until Welsh let him know he was a serious contender, a wake-up call that forced him to start thinking seriously about how he would approach the role if he was indeed the choice.

“That was really when I started thinking seriously about, OK, what are my gifts?” he said. “I think every leader brings certain gifts and strengths to the table and certainly an equal number of weaknesses. So what are my strengths? And as I thought about it, it became clear to me that what I knew, perhaps as well as anybody else in the Air Force, was the business of joint warfighting.”

Goldfein had flown in every Air Force combat operation since Desert Storm and in the prior seven years had stepped through a series of preparatory jobs: Deputy Director of Programs on the Air Staff, Director of Operations at Air Combat Command, Commander of U.S. Air Forces Central Command, and Director of the Joint Staff at the Pentagon. Now he awoke to a possibility he hadn’t really seen coming.

Once selected, Goldfein went to Welsh with a plea: “I need some time with a small transition team to really put some serious thought into where I want to focus so I can hit the ground running on Day One,” Goldfein said. “You know, that’s tough conversation. What I was really asking him was, ‘Hey, Chief, I want you to work like a dog until the end without a Vice.’”

Welsh agreed, cutting Goldfein loose with a small team to develop his plan. That team included then-Brig. Gen. Alexis G. “Grinch” Grynkewich (now the three-star commander of 9th Air Force and the Combined Forces Air Component Commander at U.S. Central Command). He wanted focus—“big, audacious, and achievable” ideas to shape the coming four years.

“Where I focused was joint warfighting excellence: How do I take the service from where it is to a point where I can hand it off as a more capable joint teammate?” he said. For the next four years, everything he could control—and there were, of course, plenty of issues he could not control—had to “make us better joint warfighters.”

Three areas would get his particular focus: First, reinvigorating the fighting formation of the Air Force, in particular empowering squadron leaders; second, joint development; and third, digitizing and connecting joint warfighters, a concept that became multi-domain command and control, and then, as he was reaching the end of his tour, joint all-domain command and control (JADC2).

Of the three, it is the third one—helping to convince the



Senior Airman Jeff Parkinson

Air Force Chief of Staff Gen. David Goldfein interacted with Air Force Special Operations Command personnel at Hurlburt Field, Fla., in October 2016. Goldfein was the keynote speaker at a Special Tactics Memorial dedication ceremony.

other services that his concept joint command and control concepts not only made sense but were critical—that will likely be his long-term legacy. “When we started the conversation, it was a question of whether we really needed to do this,” Goldfein said. “What took four years was building trust amongst the services that this wasn’t the money grab.”

The challenge was that all the services were already operating in multiple domains. “Think about it: If you’re the Chief of Naval Operations, you’ve invested billions in command and control to connect what you believe is an all-domain force that operates from subsurface submarines to the surface and to the air. So you’re already a multi-domain force, and you build C2 to connect your forces at sea. If you’re the Chief of Staff of the Army, you’ve invested billions of dollars to connect your Soldiers, and you’re transitioning your Army into the digital world. And along comes this Air Force guy that says, ‘Hey, I’ve got an idea: Scrap all those investments you’ve made and let me come in and solve this for the world.’ That is a nonstarter.”

Goldfein knew the Air Force had expertise the other services could leverage. Going back to 1947, Congress had identified command and control as an initial Air Force mission. “But if we were to approach it so that it could be interpreted as a money grab, it would be dead on arrival,” Goldfein said. He spent the next four years “squinting with his ears,” he said, listening and learning about the challenges each service chief saw in his particular domain. The Army chiefs saw the issue as one of scale and speed. While the Air Force sought to connect a few thousand airplanes, the Army needed to connect a million Soldiers; and as USAF tried to operate at the speed of sound, the Army needed to keep up only with the speed of traffic.

“We had to educate ourselves,” Goldfein said. “If we’re going to offer solutions to the Army, we better understand ground maneuver. If we’re going to offer solutions to the world’s greatest Navy, we better understand submarine operations.”

Slowly the multi-domain phrase caught on. The Army and Navy began to adopt the language. The question had changed. Instead of ‘Why do we do this?’ Goldfein said, it was, “How do we get after this as a team?”

Not everything went so well. Goldfein inherited a force in decline, one too small to meet its many requirements. The nuclear force was decrepit, he had a new tanker that wasn't performing, his fighter force was aging out faster than he could acquire replacements. When Congress asked for an objective assessment to define the Air Force the nation needed, Goldfein and then-Secretary of the Air Force Heather Wilson responded with a clear flight plan: 386 operational squadrons, a 20 percent increase over the existing force.

The plan was laid out at AFA's Air, Space, & Cyber Conference in 2018, halfway through Goldfein's tenure, and the Air Force celebrated by giving the press and others coffee mugs emblazoned with the number 386. "There was classified assessment and intelligence analysis that went into this," Goldfein said. "This was 386 squadrons that directly aligned with the national security and national defense strategy and combatant commander demand, given classified operational war plans."

Some greeted the disclosure of this plan as the beginning of a new campaign to grow the Air Force. Goldfein did not. "We did all the analysis, and you could back it up with data to say you could meet the need at moderate risk with 386. Anything below that, you just increased risk. So now, do we keep banging the drum and say 386, when we're actually at 320? That didn't make much sense."

Goldfein saw the analysis as a worthwhile, but academic exercise, because he couldn't imagine that Congress would fund 66 more squadrons and all the people, weapons, and support that would require.

A generation before, at the end of the Cold War, then-Chairman of the Joint Chiefs of Staff Gen. Colin Powell presented his Base Force, the blueprint for a scaled down, peacetime U.S. military in a unipolar world. All of the services would be cut deeply, and all of the services accepted their fate. Whatever pushback occurred, only the Marine Corps managed to take their fight public, resisting the call to shrink the Corps to just 159,000 Marines. Then-Commandant Gen. Carl Mundy, a buzz-cut, square-jawed Marine straight from central casting, launched a sort of insurgency, telling every audience possible

that yes, he could cut the Corps to 159,000—but then pivoting to say that to meet the nation's security requirements, 174,000 Marines was the number needed. Mundy repeated his case at every opportunity for a year and ultimately won the argument.

Could Goldfein not have followed that model to achieve his needed 386 squadrons?

"The big difference between us and the Marine Corps [in 1992] was that the Commandant already had 174,000 Marines," Goldfein said. The two services were approaching a similar value statement, but from opposing directions.

The Marines were drawing down from a force greater than 200,000 and hoped to be spared the deep cut to 159,000; by contrast, Goldfein's force was already undersized. Rather than seeking to foreshorten a drawdown, he would have been asking for a budget increase measured in the tens of billions. That was beyond imagination.

Still, "386 was a helpful metric for me because I could then articulate where I thought we were risk-wise, in various scenarios, whether in the tank or at the White House," Goldfein said. With that, he said, he could "now articulate what I thought was the amount of risk was, and I could do it with a lot greater granularity, based on where we were versus where the moderate risk level was. It was a very helpful benchmark in some of those discussions."

Goldfein saw risk every place he turned. But he also saw opportunities, seizing them—at some cost.

When the Air Force took a cut to help fund fourth-generation Navy F/A-18 purchases, he later got a chance to claw some of that back. But Defense Department leadership were offering a choice. He could have the money to fund new-build F-15s, built in the same Boeing Co. plant in St. Louis where the F/A-18s were made, but not for additional Lockheed F-35s.

"My first response was, 'I'm not going to spend a penny of fifth-generation money against a fourth-generation asset. That's a red line,'" Goldfein recalled. "And then I said, second, that 'there can be no trading of aircraft, because where we are headed is fifth- and sixth-generation. But I do have a capacity challenge, and I can't allow the Air Force to lose \$7 billion in assets.'"

Goldfein took the deal, accepting a future that would in-



Gen. David Goldfein focused on revitalizing squadrons during his tenure as Chief, visiting the 16th Electronic Warfare Squadron in June 2018 at Eglin Air Force Base, Fla. Four months later, the base was almost destroyed by a hurricane.

Samuel King Jr./USAF

clude dozens—and possibly up to 200—new-build F-15EX fighters. If it was the will of the Department of Defense and the Congress that the Air Force purchase F-15s, Goldfein said, “then we’re going to look at these airplanes and we’re going to take a look at the fleet, and then determine the best option.”

What the Air Force found, he said, was that the Pacific’s long ranges made the new-build F-15EXs attractive because—as good as the F-35 is—it can’t match the F-15 for range and payload. “In a Pacific scenario, when we played various force elements together, the combination” proved attractive, he said.

New advances promised by the F-15EX also helped change his perception. “Stealth is not the only spectrum,” he said. “Radar is not the only spectrum where you have to hide. And so the more we looked at the options, the better the F-15EX looked from a joint warfighting perspective.”

Now Goldfein’s focus on jointness came into play. “I was confident I was making the Air Force a better joint warfighter and joint warfighting service by entering the F-15EX,” he said.

He also had a problem. The first was that he was breaking a line held by every Chief before him for nearly two decades, that the Air Force should not “buy new old airplanes.” Second, the real skinny on why this made sense couldn’t be shared in the open. The real advantages could only be shared in classified settings, Goldfein said, meaning Goldfein struggled to tell that story publicly, while generally holding his own in private.

Goldfein’s tenure included four wildcards. The first, was his nomination to be Chairman of the Joint Chiefs of Staff. As Marine Gen. Joseph F. Dunford’s term as Chairman neared its end, Goldfein seemed the hands-on favorite to succeed him. Having positioned himself as a joint warfighting advocate, focused on projects and programs that made the joint team stronger, he was a natural. No Airman had been Chairman since Gen. Richard B. Myers from 2001 to 2005, and in the 15 years since, the position had been held by two Soldiers, two Marines, and one Navy Admiral.

Goldfein had the endorsement of Defense Secretary James Mattis, himself a retired Marine general. But by then, [President Donald J.] Trump was feuding openly with Mattis, questioning his loyalty and challenging his independence. Army Chief of Staff Gen. Mark A. Milley, a burly New Englander, was less joint in focus but held some special appeal to the President. Whether it was his Princeton pedigree, his New England roots, his substantial presence, or merely the fact that he wasn’t Mattis’ choice is unclear. But Trump nixed Goldfein for Milley, regardless. Goldfein has no regrets.

“I’ve never looked back for a second on the decision to make Mark Milley the Chairman,” he said. “Hey, he’s a friend. He’s a great officer, we served together as Chiefs, we served together in Afghanistan when he was there, and I was the CFACC.” The President interviewed both—chose one. “He chose the individual he had really good chemistry with. ... It’s not personal. It’s professional.”

SPACE WARS

This was 2019, debate about forming a stand-alone mili-

tary branch focused on space was underway. Goldfein was opposed at the start. He saw a seamlessness in the integration of air and space within his force, and “I was worried that in the business of separating the services, we would separate that jointness,” he said. “I was worried about us, you know, losing some of our edge and the integration of air and space.”

He imagined turf wars ahead, because he’d been around the Pentagon to know well enough that when something is new, “First thing you build is a castle, then you dig a moat, and then you fill it with dragons. Because you’ve got to protect your resources,” he acknowledged. But then Goldfein went to Maxwell Air Force Base and Air University. He met with a group of Schriever Fellows, “our smartest space officers.”

Goldfein was trying to sell them on his operational integration concept. “I was watching their body language, and could see: They ain’t buying it,” he admitted. “So I finally just stopped, and did what Chiefs really ought to do, which is to listen.”

By the time the conversation was over, Goldfein said, “I was convinced. I said, ‘Show of hands: How many of you think we need a separate service for space?’ Every hand went up. You know, when you’re the Chief and your Airmen are telling you something, you better


listen.” Goldfein set out to learn more. I visited every space base, I went and I read, I listened, I watched, I spoke to industry leaders, I went to NASA.

“I had two fundamental questions I was asking myself: Can we as a service culturally embrace space superiority with the same passion that we historically have embraced air superiority? And, who can move space for the nation faster in the business of joint warfighting?—Me, as a service Chief that does leaflets to nukes and everything in between, and operates in all the domains? Or a service Chief that is singularly focused on advancing space for the nation?”—In the end, he said, “I came to my own personal conclusion that the President got this one right.”

There were still risk, he thought. If the Air Force and Space Force got this right, the two would co-exist as close and effective partners, independent masters of their individual domains, yet at the same time interdependent on each other and tightly integrated to maximize their joint effect.

He took to sharing a photograph of himself holding his two granddaughters, each two years old at the time. “I said, ‘Hey, meet my granddaughters, Eva and Rae. They don’t know this, but they are members of the Class of 2040 at the Air Force Academy. And one of them—I’ll let them choose—will join the Air Force and one will join the Space Force. And when they walk across that stage in 2040, the class of 2020 will be graded.’”

The test, would be what the two services had forged over the prior 20 years. “Did we build two services that were focused and built on a foundation of trust and confidence in each other, able to work as a joint team for air and space operations, as both supported and supporting commanders?” he asked “Or did we build castles, moats, and dragons?”

Goldfein bet his tenure on tearing down castles, slaying dragons, and breaching moats. He sees just one good option for the future. Slay the dragons—or fail. 

“The Air Force Chief [is] the only Chief of a service that’s a garage startup. ... you know, Orville and Wilbur, bicycle mechanics, tinkering in a garage? And, of course, the rest is history. I was the Chief of a service that has a very technical edge to it. And today, we’re a hardware company, but the future is in software. And we, as a service, need to be the thought leaders for the Department of Defense, on how we apply the military instrument of power in a digital age. ... This goes to the essence of what it is to be an Airman: An Airman is an innovator. The nation has always looked to its Air Force, pushing the edges of technology. ... We don’t think outside the box, we try to throw away the box, we try to look for completely new ways of using existing technology and applying new technology. That, to me, is the essence of an Airman. It’s what we do for the nation.”



Lockheed Martin illustration

An artist illustration depicts a Next-Generation Overhead Persistent Infrared (Next-Gen OPIR) system in GEO orbit. Next-Gen OPIR is intended to replace the Space Based Infrared System (SBIRS), beginning with its first launch in 2025.

Enhanced Space-Based Missile Tracking

America needs a more resilient missile warning system.

By Christopher Stone

America's Space Based Infrared System (SBIRS) is the most advanced ballistic missile warning capability in the world. Looking forward, however, SBIRS alone will not provide adequate warning of missile attacks by peer adversaries on the United States and its forward deployed military forces. Both China and Russia are fielding a new generation of hypersonic, low-flying missiles that U.S. ground-based radars are unable to track in the time needed to provide warning and cue defenses. They are also fielding anti-satellite (ASAT) weapons to degrade or destroy existing U.S. space-based missile warning sensors. Current U.S. systems lack sufficient defenses against these threats and are locked into predictable orbital regimes that leave them vulnerable. These capabilities, and America's relative vulnerabilities, give China and Russia a decisive advantage in a major conflict with the United States.

In order to defeat large-scale missile attacks, you have to "see" them first, then provide warning in time



Christopher Stone is senior Fellow for Space Studies at the Mitchell Institute Spacepower Advantage Center of Excellence. Download the entire report at [http:// MitchellAerospacePower.org](http://MitchellAerospacePower.org).

to cue countermeasures. For that reason, detecting and tracking nuclear strikes on the United States has been a primary requirement for DOD's space-based missile warning systems since the Soviet Union first developed nuclear-tipped intercontinental ballistic missiles (ICBMs) in the 1950s. At that time, the United States developed a network of space-based infrared (IR) and terrestrial long-range sensors to provide early warning. The first architecture, called the Missile Defense Alarm System (MIDAS), was a 12-satellite constellation designed to provide U.S. leaders with enough advanced notice of a Soviet ICBM attack to direct a response before DOD's nuclear forces could be destroyed.

A more advanced follow-on system called the Defense Support Program (DSP) operated in various configurations from the 1970s until the early 2000s when it was subsumed into the larger SBIRS program. DSP systems were deployed into GEO orbits with supplementary sensors operating in Highly Elliptical Orbit (HEO) to provide uninterrupted global early warning coverage of ballistic missile strikes. An enemy-launched ballistic missile's rocket would emit IR

energy that entered the opening in the satellite's IR sunshade, passed through a corrector lens, traveled past the photoelectric cell detector array, reflected off a mirror, and then focused onto the detector array. Fourth generation DSP satellites increased the number of infrared cells each satellite carried from 2,000 to 6,000, which further enhanced their ability to discriminate between separate launch events.

As ballistic missile technologies began to proliferate globally during the latter part of the Cold War, DOD adapted its missile warning systems to detect and track shorter-range "theater" ballistic missiles, as well. This development followed DSP successfully detecting several Iraqi short-range SCUD theater ballistic missile launches during the 1991 Gulf War. DOD developed SBIRS to detect shorter-range, non-maneuvering ballistic missile launches and increase the accuracy of the missiles' predicted impact points. By the mid-1990s, the U.S. space-based missile warning architecture had expanded from nuclear deterrence and defense to also providing warning of theater ballistic missile attacks.

SBIRS, consists of five dedicated satellites operating in geosynchronous Earth orbit and sensors carried by two host satellites in highly elliptical orbit. A SBIRS GEO spacecraft consists of a bus with a radiation-hardened shell and five separate mission downlinks that enhance their survivability and endurance. SBIRS remains an important capability, as the theater ballistic missile threat has only grown. In fact, even with SBIRS, the massive January 2020 Iranian strike into northern Iraq still sent U.S. troops in the area "rushing for shelter."

SBIRS satellites in GEO and HEO can scan the entire surface of the Earth to detect the IR signatures of missiles in their boost phase of flight after launch—except over the Antarctic region. Unlike previous architectures, SBIRS can continuously scan and provide early warning while simultaneously dwelling over theater areas of interest. However, SBIRS was never designed to continuously track ballistic, non-ballistic, maneuvering, and very-low-altitude hypersonic warheads after separation from their launch boosters. While GEO and HEO are great for achieving global sensor coverage, they are not ideal for systems that must also provide continuous, hi-fidelity tracking of low-flying, maneuverable warheads, which do not produce as intense of an IR signature as their launching booster.

MISSILE TRACKING CHALLENGES

The current U.S. space-based missile warning architecture was optimized to detect traditional ballistic missile launches that followed relatively predictable flight paths and could be detected and tracked early enough to cue defensive systems. Both China and Russia recognized the limitations of these warning systems and deliberately developed long-range missiles to evade detection by SBIRS and other warning sensors.

These new weapons range from low-flying supersonic cruise missiles to Mach 5-plus hypersonic missiles that fly depressed trajectories in the atmosphere and maneuver.

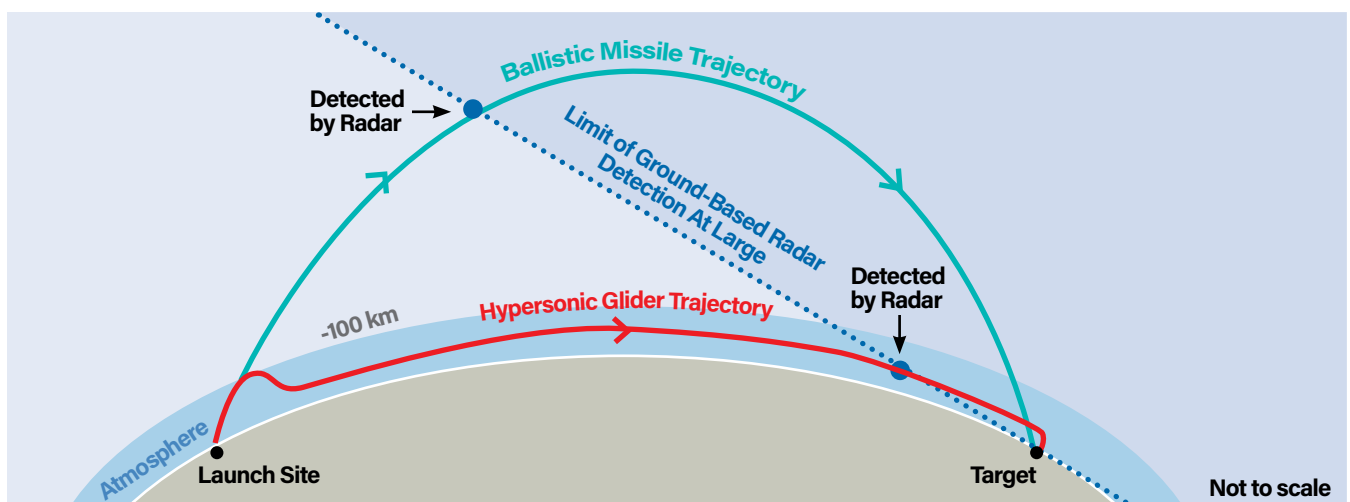
Hypersonic weapons can be launched from airborne aircraft, ships at sea, and land-based mobile launchers. Long-range air-launched hypersonic missiles with scramjet engines could also be launched by an enemy's bombers from under the cover of air defenses in their own airspace. Such weapons could be deployed as part of a fractional orbital bombardment system. The variety of launch options means hypersonic weapons might not create an IR signature intense enough to be detected by current U.S. sensors.

Long-range ballistic missiles typically have flight trajectories that take them over 300 km into space before they reenter the atmosphere. The highly predictable flight paths and high altitudes of non-maneuvering ballistic missiles make them much easier to detect and track. In contrast, hypersonic missiles can fly as little as 30 to 50 km above the Earth's surface or even lower, which means that, because of the curvature of the earth, they may be below areas that are effectively covered by today's radar warning architecture.

Cruise missiles also have low IR signatures that cannot be detected by current overhead systems. Moreover, both cruise missiles and hypersonic weapons can maneuver to create unpredictable flight paths. Very-low-flying weapons can also "hide" in the curvature of the Earth to avoid detection by surface radars. A combination of low-altitude flight and high speeds limits the time available to detect incoming missile threats, predict their impact points, cue defensive systems, and launch countermeasures. Today, most of China's and Russia's deployed long-range missiles can carry one or more weapons that can maneuver in space, in the atmosphere, or both.

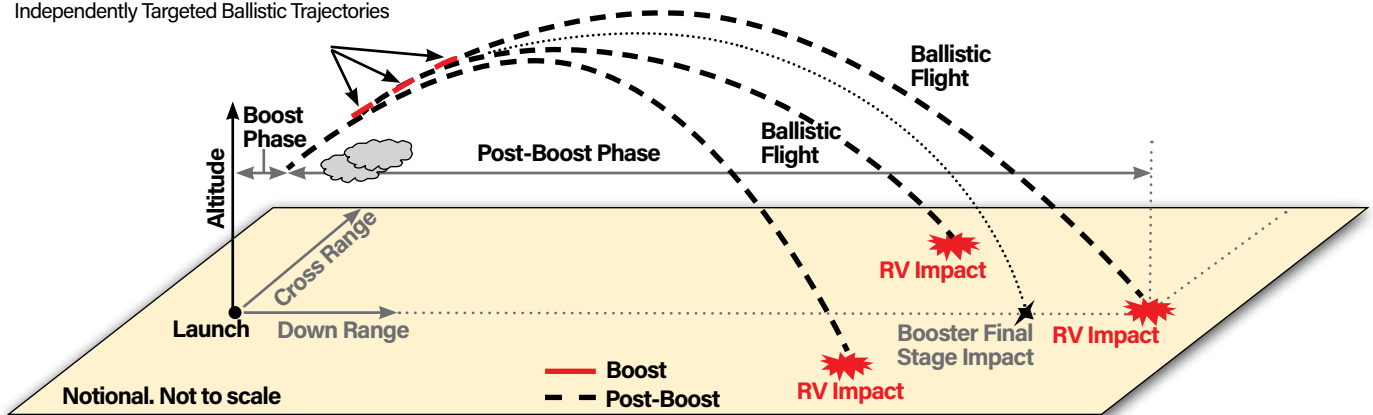
Ground-Based Radar Detection of Ballistic vs Hypersonic Glide Weapons

Current missile warning radars are designed to monitor for ballistic flight paths. China and Russia's new hypersonic weapons are designed to defeat such radars by flying low and undetected until its too late.



Ballistic Missile with Multiple Independently Targetable Re-Entry Vehicles

Payload Post-Boost Propulsive Burns Place Each Re-entry Vehicle (RV) On Different Independently Targeted Ballistic Trajectories



There are now five basic categories of threats a future U.S. missile warning architecture must be capable of tracking:

1. Traditional long-range ballistic missiles with no post-boost payload maneuverability.
2. Missiles on ballistic trajectories with the ability to perform very small, exo-atmospheric trajectory corrections via multiple large propulsive burns that deploy multiple independently targetable (MIRV) warheads on independent trajectories with impact points several kilometers apart.
3. Missile systems with post-boost weapons, flying ballistic trajectories capable of very small maneuvers during the terminal portions of the trajectory inside the atmosphere, known as maneuvering re-entry vehicles (MaRVs).
4. Boost-glide missiles that fly non-ballistic, depressed trajectories at hypersonic speeds in the upper atmosphere that can maneuver enroute to their target and in the terminal phase.
5. Missiles that can sustain long-range flight in the atmosphere and maneuver after launch, such as cruise missiles.

■ **Ballistic missiles with limited exo-atmospheric post-boost weapons maneuverability.** One type of maneuvering weapon has payload-carrying vehicles equipped with post-boost propulsion system engines that can deploy multiple warheads on independent trajectories while above the atmosphere. ICBMs with Multiple Independently Targetable Re-Entry Vehicles (MIRVs) are one example of this type of weapon. A MIRV ballistic missile carries multiple reentry vehicles on top of its main rocket booster. Some of these reentry vehicles could be configured as unarmed decoys to complicate an opponent's missile defense operations. Discriminating between "live" weaponized reentry vehicles and decoys can be a major challenge.

■ **Missiles with warheads capable of minor post-boost, aerodynamic maneuvers in the atmosphere.** These weapons are another type of maneuvering threat with external control surfaces that can be moved to direct a warhead to its target with greater accuracy than weapons that can only fly gravity assisted, spin stabilized ballistic flight paths. Maneuverable Reentry Vehicles (MaRVs) are aerodynamically capable weapons that can alter their flight paths within the atmosphere to establish glide profiles that can extend their range. Hypersonic Boost-Glide Vehicles (HGVs) can also aerodynamically maneuver, but they have the capability to glide at hypersonic speeds for most of their flight in the atmosphere after booster separation.

■ **Missile systems that combine both post-boost propulsion and aerodynamic surfaces.** These attributes further extend the range and maneuverability of a warhead's flight to its target.

Examples include the medium-range DF-21D "carrier killer" anti-ship missile, which China has operationally deployed since 2010. The DF-21D has a ballistic missile booster with a payload that separates and maneuvers to a designated target. The missile system has a dual anti-ship and land-attack role; its design includes a post-boost propulsion system and flight surfaces that give its warhead the ability to change targets or modify its flight path to correct for moving targets—like ships at sea.

■ **Cruise missiles.** Finally, cruise missiles are weapons that combine aerodynamic control surfaces and jet propulsion engines to extend their ranges or atmospheric flight times. Cruise missiles can be highly maneuverable, which can increase the number of directions from which a cruise missile can attack a target.

ANTI-SATELLITE THREATS

Both China and Russia now consider U.S. space-based assets as high-value targets that can be threatened to coerce the United States in a crisis or attacked to achieve space superiority in a conflict. They have developed kinetic ASATs and other space weapons to hold these "difficult to defend, easy to attack" targets at risk. These capabilities could give China and Russia the means to negate much of DOD's current ability to detect large-scale missile attacks, track them, and relay fire control information to U.S. air and missile defenses. This could give China or Russia a decisive advantage in a major conflict with the United States. These realities point to the need to ensure that DOD's future missile warning architecture and other space systems are designed and deployed in modes that will help them survive and operate in this contested environment.

China has developed and deployed what it refers to as a "multi-layered attack architecture" with weapons systems that span the counterspace threat continuum. Used in combination, these weapons can degrade, deny, or destroy U.S. space systems in all orbital regimes.

On the non-kinetic side of this threat continuum, China has operational ground-based jamming systems that are capable of disrupting satellite communications, GPS navigation signals, synthetic aperture radars, missile warning, and other satellite systems. Jamming can prevent users from using satellite communication networks, degrade or prevent transmissions of vital missile warning data from space-based sensors to warfighters, and disrupt uplinks and downlinks needed to command and control spacecraft.

On the kinetic side of the threat continuum, Chinese forces

have deployed ground-launched ASAT missiles that can attack assets in LEO. China has also demonstrated capabilities to reach targets in MEO and GEO, as well as its ability to maneuver co-orbital anti-satellite spacecraft close to high-value U.S. space systems.

Like China, Russia views space as a warfighting domain, and they base their warfighting doctrine around the idea that achieving space supremacy is a precondition for winning a conflict with the United States. Consistent with these beliefs, Russia has committed to developing space capabilities to deter the United States and its allies and to attack their space assets in the event of war.

Russia has fielded a suite of non-kinetic options to create reversible effects on satellite systems in space, including ground-based systems to counter GPS navigation signals, tactical communications, satellite communications, and radars. Reportedly, Russia is also developing an airborne laser platform to use against space-based missile warning sensors. Perhaps most importantly, Russia has demonstrated several ASAT missiles that could become operational within the next few years that can destroy targets in LEO. In late 2021, Russia demonstrated this capability in a live-fire, hit-to-kill demonstration. The Russian government also appeared unfazed by orbital debris created by this demonstration, emphasizing instead that it had gained another means of threatening adversaries' space systems in a crisis.

DIVERSIFIED SPACE-BASED TRACKING

There is an answer to these challenges. DOD now has the technology to create a multi-orbit system of systems that can detect non-ballistic missiles from launch to their designated target areas. The most effective approach would be to develop a multi-layered, space-based architecture of sensors across all orbital regimes—low Earth orbits (LEO), medium Earth orbits (MEO), geosynchronous Earth orbits (GEO), and Polar orbits. This multi-orbit architecture must be capable of detecting missile launches, tracking maneuvering missiles at all altitudes, and then providing fire control information directly to air and missile defenses in near-real-time. DOD should enhance resilience by fielding satellites capable of enhanced maneuver to avoid or otherwise negate ASATs; Deploying decoys at LEO, MEO, and GEO to complicate an adversary's attack; and developing its own kinetic and non-kinetic counterspace capabilities to directly defeat enemy ASAT and other counterspace threats. In fact, this is the direction the Space Force is already moving in, as General Jay Raymond has explained: "We are diversifying the architecture to reduce the threat in space to an attack that may occur. We pivot from handfuls of very exquisite, very expensive satellites, to an architecture that's more diversified

to get after both the emerging class of missiles and the threat that currently exists in space."

PROLIFERATED-LEO TRACKING LAYER

The Space Development Agency's (SDA) National Defense Space Architecture Tracking Layer now in development is intended to increase DOD's ability to receive timely warning of attacks by hypersonic weapons and other emerging missile threats. SDA's design evolves over time. Tranche 1 will initially consist of 28 tracking vehicles with IR sensors to detect and track missiles; over 100 transport layer vehicles to "provide assured, resilient, low-latency military data and connectivity worldwide to the full range of warfighter platforms"; and other orbiting satellites. These Tranche 1 vehicles will orbit at an altitude of approximately 1,000 km above the Earth—in Low Earth Orbit—with an inclination between 80 and 100 degrees. One advantage of a proliferated LEO constellation force design is the added operational resilience that its hundreds of satellites create. Over time, SDA will "expand its global coverage and chain of custody of various missile threats."

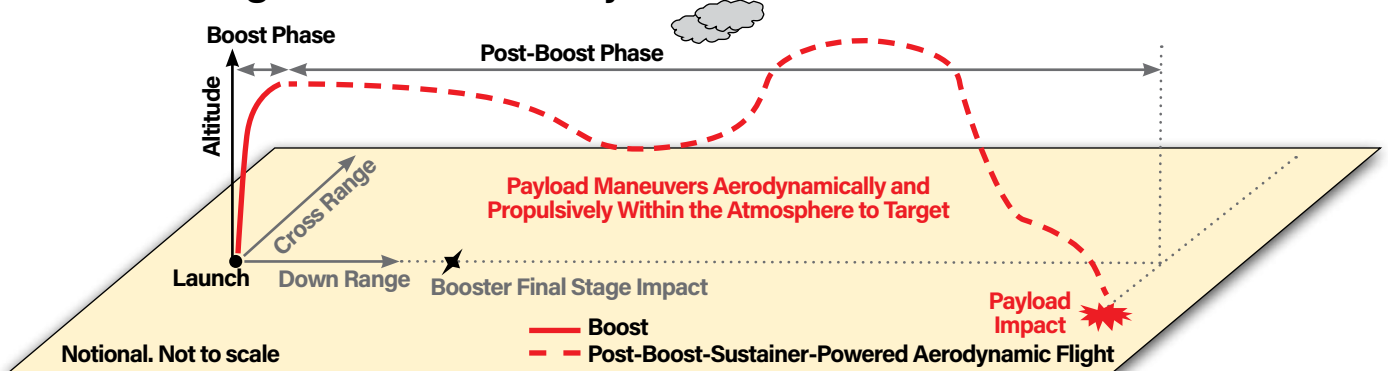
An important SDA goal is to fully integrate information from its Tracking Layer with other space-based missile warning capabilities to provide highly accurate fire control solutions for both current and future missile defense operations. This will be the mission of battle management, command, control, and communications (BMC3) modules in each Tracking Layer satellite. These modules will be designed to support key mission functions such as processing data from sensors, fusing data from multiple satellites in the constellation into three-dimensional missile tracks, and managing operational tasks.

Proliferated LEO constellations will increase the resiliency of DOD's future missile warning operations, but will not be enough on their own to offset growing counterspace threats. They remain vulnerable to non-kinetic threats including radio frequency (RF) jamming and high power microwave (HPM) weapons that could affect multiple systems in LEO in very short periods of time.

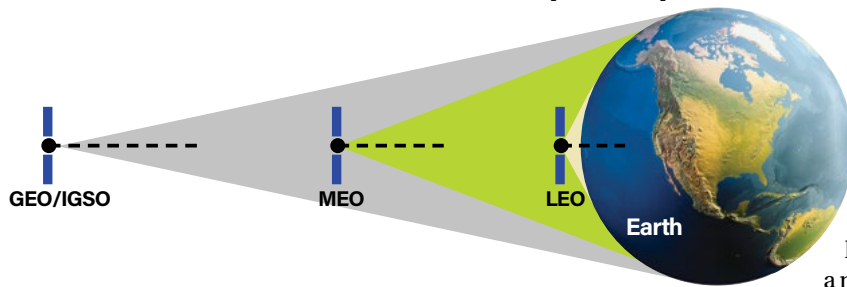
RF jamming includes ground-based systems capable of using RF frequencies to block or damage communications links between satellites in LEO and their user ground stations. Downlink jamming can enhance the "noise" of a satellite signal to the extent that the signals are not useful or cannot be received by ground users. Uplink jamming can likewise block or otherwise interfere with signals going up to the satellite from major operational commands or ground sites that provide command and control over the vehicle. Targets of these jamming systems are typically high-value GEO satellites or SATCOM systems.

HPM weapons are another emerging threat to assets operating in LEO. Emitters that could be ground-based or mounted on

Maneuvering Cruise Missile Trajectories



Field of View: Satellites in LEO, MEO, and GEO



ships, aircraft, or even other satellites could generate pulses of HPM energy that can “disrupt a satellite’s electronics or cause permanent damage to electrical circuits and processors in a satellite.” The “kill” mechanism of counter-electronics HPM weapons is to create a buildup of energy in a vulnerable circuit or electronic component in a satellite past its tolerance levels, causing them to stop working or even burn out.

Given growth in these counterspace threats, global missile warning coverage should include systems based in MEO and GEO.

MEDIUM EARTH ORBIT BASING CONCEPT

MEO orbits—in the space between 2,000 km and 35,766 km (the edge of GEO) above the Earth—have been called the “sweet spot” for satellite systems.

Satellites in MEO are closer to the Earth than GEO-based DSP and SBIRS satellites, which reduces the time needed to transmit missile warning information signals to air and missile defenses. MEO sensors provide faster and higher fidelity missile warning information transmission compared to sensors operating in more distant GEO.

Conversely, compared to LEO, sensors orbiting in MEO have longer pass times over target areas and wider fields of view, so they can maintain custody of missile tracks for longer. It would require between 9 and 36 missile warning satellites in MEO to achieve continuous global coverage, compared to the hundreds of satellites needed to achieve the same coverage for a LEO constellation.

MEO-based systems are vulnerable, however, to numerous counterspace threats. Adversaries have demonstrated MEO-capable ASAT systems since 2014. Chinese and Russian co-orbital ASATs and counterspace systems capable of operating across multiple orbits to attack targets are clear threats to satellites in MEO. A resilient, survivable space-based missile warning and tracking force design with onboard defensive capabilities such as maneuver, decoys, or active defense weapons should be based across all orbital regimes and hardened against the threats that will exist in the “rapid and destructive” dynamic space warfighting environment China and Russia seek to create.

GEOSYNCHRONOUS EARTH ORBIT BASING

GEO-based satellites have the advantage of providing “persistent stare” coverage for boost-phase ballistic missile warnings while monitoring specific theaters for shorter-range theater ballistic missile events simultaneously.

DOD’s objective is to create multiple fields of view over designated regions or specific target areas without the need to deploy massive constellations into GEO. Next Generation OPIR sensors will be three times as sensitive and two times more accurate than SBIRS sensors to better detect and track the weaker IR signatures of non-ballistic missiles such as hypersonic weapons. Next Generation OPIR will also have a downlink data

rate four times greater than SBIRS.

Data collected by Next Generation OPIR during the initial phase of a missile attack could cue sensors in other layers. Satellites deployed at MEO could use these cues to begin tracking threats as they transition to their post-boost and mid-course phases of flight. The lower altitudes of IR sensors in MEO will help increase the fidelity of missile tracks in preparation for handing off threats to LEO layer sensors. Finally, a mature future proliferated LEO constellation with

its hundreds of satellites will provide even higher fidelity tracks that give air and missile defenses on the ground, in the air, and at sea the information they need to achieve precise fire control solutions.

CONCLUSION AND RECOMMENDATIONS

DOD has the technology to develop a new space-based missile warning and tracking architecture that is capable against emerging threats. Countermeasures are also needed. DOD and the U.S. Space Force should consider active and passive capabilities that would help deter attacks on the force design and counter them should deterrence fail.

■ DOD should adopt a multi-layered satellite architecture that combines legacy ballistic missile warning capabilities with enhanced sensors in LEO, MEO, GEO, and Polar orbits to detect and track hypersonic weapons and other novel missile threats over their entire flight profiles. Multiple, complimentary layers of sensors should be a threshold requirement for any future missile warning and tracking architecture that is designed to operate and survive in future contested space environments.

■ DOD should develop the capability to deploy decoy satellites in LEO and MEO orbital regimes to complicate Chinese and Russian counterspace targeting operations. This defensive measure would enhance deterrence as well as increase the resiliency of DOD’s space-based missile warning architecture in a conflict. Like late Cold War ICBMs that carried decoy reentry vehicles to complicate an enemy’s missile defense operations, mixing decoys with active missile warning and tracking satellites across all orbital regimes, but especially MEO and GEO, will pose a targeting dilemma for China and Russia. It could possibly even cause them to waste high-value ASAT assets on non-operational, low-cost decoys.

■ DOD should take advantage of mature technologies that will increase the maneuverability of satellites in MEO and GEO. Given the limited numbers of satellites deployed to MEO and GEO, increasing their survivability by giving them the ability to rapidly maneuver to avoid threats and fill gaps in a post-attack environment will be vital. Missile warning and tracking satellites in MEO and GEO basing layers should transition from using limited lifespan, chemically based propellants to other more advanced propulsion capabilities to enhance their ability to maneuver to avoid attacks and change orbits post attack.

■ Both Chinese and Russian strategic space writings indicate their militaries believe an effective deterrent in space must include capabilities that can attack an adversary’s space infrastructure in a “rapid and destructive” manner. DOD should likewise rapidly and overtly field kinetic and non-kinetic ASAT systems in sufficient numbers to hold adversary space systems at risk to enhance deterrence and, in the event deterrence fails, achieve victory. These capabilities would not only deter peer adversary attacks on U.S. space-based missile warning and tracking assets, but they would also increase options to respond to attacks in space. ❖



Freedom Ride

Inside the Biggest Noncombatant Evacuation in U.S. Air Force History.

Airmen assisted refugees boarding a U.S. Air Force C-17 as they departed Kabul's Hamid Karzai International Airport on Aug. 19, 2021.

By James C. Kitfield

Aug. 30 marks the one-year anniversary of the end of Operation Allies Refuge (OAR), the final act in the longest war in U.S. history. Historians will long study the United States' post-9/11 Global War on Terrorism and, in particular, the failed, two-decade effort to plant sustainable seeds of democracy in Afghanistan. Certainly as a coda to the conflict, OAR reflected the chaos, tragedy, and good-intentions-gone-awry that characterized so much of the Afghan War.

What was accomplished a year ago under the most challenging of conditions and pressures was largely overshadowed by a horrific suicide bombing that killed more than 170 people at Hamid Karzai International Airport, including 13 U.S. service members; an errant U.S. drone strike that killed 10 Afghan civilians, including seven children; and by the dispiriting spectacle of flag-waving Taliban extremists sweeping to victory in Afghanistan—20 years after the Sept. 11,

"The hair on the back of your necks should be standing up: This is not the Afghanistan we knew."

—71st Rescue Squadron wing commander

2001, terrorist attacks.

On this one-year anniversary, however, the fog of war that enshrouded so much of Operation Allies Refuge has largely lifted. Revealed beneath the chaos and tragedy is the largest non-combatant evacuation operation (NEO) airlift in U.S. history, one that involved round-the-clock operations of nearly 800 military and civilian aircraft from more than 30 nations. In just 17 days, more than 500 U.S. Air Force Active, Reserve, and National Guard aircrews and hundreds of Air Force ground personnel helped evacuate a staggering 124,334 people, the vast majority of them Afghan nationals.

Heroism and great compassion were behind those unprecedented numbers. Airmen helped deliver three babies aboard C-17s during the operation, and dozens more were born shortly after their mothers landed safely at staging bases and temporary safe havens around the world. Air Force Aeromedical Evacuation teams and medics stood up "Operation Stork," gathering the specialized personnel and equipment

required to safely transport the roughly 20 percent of adult female evacuees who were pregnant. U.S. Air Forces in Europe and the 521st Air Mobility Operations Wing created passenger medical augmentation teams to attend to the needs of evacuees who were in many cases wounded and traumatized, and crammed shoulder-to-shoulder in flights of more than 450 passengers per sortie. Their efforts included multiple lifesaving resuscitations in flight.

After the suicide bombing at HKIA, three Aeromedical Evacuation missions whisked 35 patients to care, saving the lives of the critically wounded. In all, 28 Aeromedical Evacuation missions conducted during OAR flew 177 patients to badly needed care. One of the C-17s from the 21st Airlift Squadron also carried the 13 fallen U.S. service members killed in the bombing home to Dover Air Force Base, Del.

For the one-year anniversary of Operation Allies Refuge, Air & Space Forces magazine interviewed a number of the many Air Force participants, the better to remember their largely untold stories of bravery and compassion in the face of deadly chaos.

'NOT THE AFGHANISTAN WE KNEW'

Just days after the United States military had officially furled the flag on Operation Resolute Support in Afghanistan, Secre-

tary of Defense Lloyd J. Austin III issued a vocal order on July 16, 2021, instructing the U.S. Air Force to deploy a personnel recovery task force (PRTF) to Hamid Karzai International Airport. The PRTF's mission was to provide combat search and rescue in support of a U.S. noncombatant evacuation operation for tens of thousands of Afghans who had served as interpreters, drivers, and assistants to U.S. forces and diplomats.

The Pentagon avoided such a move for many months, concerned that a mass exodus would demoralize Afghan allies. The plan at the time was still to leave behind a large U.S. diplomatic presence in Kabul to support the Afghan government and security forces. In July, however, Taliban insurgents intensified an offensive that had already seen them capture more than a third of provincial capitals around the country. A new U.S. intelligence assessment that took note of those negative trends warned that the Afghan government could fall within the next six to 12 months, as opposed to the two- or three-year window that the Intelligence Community assessed only months earlier. That Afghan institutions might collapse in just weeks had not yet occurred to U.S. intelligence analysts.

The day after Austin's deployment order, the State Department announced Operation Allies Refuge, and the Air Force was directed to organize relocation flights for Afghan nationals and their families eligible for U.S. Special Immigrant Visas. In the classified briefing at the operations center for the 71st Rescue Squadron at Moody Air Force Base, Ga., the wing commander explained to the deploying Airmen that "the hair on the back of your necks should be standing up: This is not the Afghanistan we knew."

Lt. Col. Brian Desautels was chosen to command the personnel recovery task force, which included combat search and rescue (CSAR) units and helicopters from Moody as well as Nellis and Davis-Monthan Air Force Bases in Arizona. Along with many senior officers, Desautels had spent much of his career fighting America's longest war, but in 20 years of operations in Afghanistan, U.S. Air Force units had become accustomed to operating out of large, secure military bases with abundant ground support such as Bagram and Kandahar airfields. At HKIA in Kabul, the task force would operate out of a facility wedged into the middle of a sprawling capital of nearly 5 million people, with no hardened base support or dedicated security force. The task force would thus need to carry all the food, water, equipment, and expertise it would require in the coming weeks.

The deployment amounted to an unprecedented stress test of the Air Force's agile combat employment (ACE) concept, with pressures few could imagine at the time.

"I had served in Afghanistan, so I knew what my commander was talking about in terms of the hair standing up on the back of our necks, but we are used to operating out of austere airfields and making the best of it," Desautels said in an interview. He noted that the roughly 170 multimission-capable Airmen of the task force were wheels up in three C-17 "chalks" in less than 72 hours, arriving at HKIA within 96 hours of receiving the deployment order. By mid-August the PRTF had settled into a good battle rhythm, helping to evacuate on average 7,500 civilians each day. "We hit the ground running with a lot of focused energy, committed to giving 100 percent until our mission was complete."

Then one morning in mid-August, Desautels entered the operations center at HKIA to find that Rear Adm. Peter Vasely, a Navy SEAL and the top U.S. commander in Kabul, was wearing his full "battle rattle" and carrying his M-4 rifle. There was also a new sense of urgency in the orders he barked. Taliban

Staff Sgt. Brandon Cribelar

Airman 1st Class Stephen Conklin removes stitches from an Afghani refugee following Operation Allies Refuge in September 2021.



Staff Sgt. Andrew Schumann

forces were sweeping into Kabul, and the U.S. Embassy had yet to be fully evacuated. As Desautels entered the operations center, an Army captain saluted and requested permission to abandon his post because they were taking so much sniper fire from nearby rooftops. He was given reinforcements from the PRTF team instead.

Desautels worked 27 hours straight and was grabbing a couple of hours sleep when he awoke to the sound of explosions and heavy machine-gun and automatic weapons fire. Jumping out of his rack, he grabbed two bug-eyed majors and headed for the operations center. There was screaming and multiple conversations talking over each other on the radio net. With the Taliban entering the capital virtually unopposed, Afghan President Ashraf Ghani fled the country and Afghan Security Forces had melted away.

“Then the Taliban opened fire on the airport, and suddenly word came that the whole airfield was being overrun by thousands of desperate Afghan civilians,” recalled Desautels. “The whole perimeter was collapsing around us.”

‘I COULDN’T HELP BUT THINK OF MY DAUGHTER’

After U.S. forces abandoned Bagram Airfield in July, the chief medical officer, Air Force Col. Bruce Lynch, and roughly 50 members of his staff relocated to the U.S. Embassy in Kabul. As the top medical adviser for Vasely, he felt acutely the tension between a U.S. military command anxious to evacuate the embassy and a U.S. ambassador and embassy staff determined to keep the faith with their allies in the Afghan government.

“At the embassy, it was in the back of everyone’s mind that things weren’t going well for the Afghan government, and by early August when two or three major provincial capitals fell to the Taliban, you could read the tea leaves, but we didn’t want to abandon our Afghan partners and exacerbate their problems by making a hasty exit,” Lynch said in an interview. Working alongside an Afghan doctor he had met at Bagram, Lynch helped treat Afghan soldiers who were wounded defending Kabul, and the two physicians became close.

When Kabul fell to the Taliban on Aug. 15, the embassy staff were finally hustled into helicopters and transported to HKIA. Given the incredible stress of the moment, Lynch was relieved to be greeted at the airport not by surly Turkish soldiers who

were previously in charge, but rather by young U.S. Marines in full battle gear.

“On such a hectic day, it was quite a relief to get off the helicopter and be greeted by a bunch of U.S. Marines on the runway. That was calming to me,” said Lynch, who along with his team was ushered to the medical facility at HKIA that would serve both as their workplace and home for the next two weeks. Luckily the medical center was fairly new, with a well-equipped and modern emergency room, two operating rooms and an intensive care unit. Most important, the HKIA medical center was a hardened facility of brick and concrete with no exterior windows. Given the proximity of high-rise buildings surrounding the airport, it was a relief for the medical team not to feel they had a constant target on their backs.

In one of the conversations with the Afghan physician he had worked with at Bagram and the embassy, Lynch learned that the man had a 12-year-old daughter who was nearly the same age as Lynch’s own children.

“We were exchanging stories about our kids, and he told me that his daughter wanted to be a doctor like her father when she grew up,” recalled Lynch, who knew that a whole generation of young Afghan women and girls who had grown up with unprecedented freedoms in a fledgling democracy would soon be subjected to the medieval patriarchy of the Taliban. “In the back of my mind, I remember thinking that the options for his daughter’s future would be pretty grim under Taliban rule, and as a father, I couldn’t help but think of my own daughter in such a situation. It was a horrible thought.”

Later Lynch learned that neither the Afghan doctor nor his daughter were able to escape during the evacuation.

‘RIGHTLY CONCERNED’

When the emergency call came in mid-August, Col. Colin McClaskey was on a mission in the Horn of Africa. As deputy commander of the Air Force’s 821st Contingency Response Group out of Travis Air Force Base, Calif., he led a unit that specialized in opening, operating, and, if necessary, closing airfields. His team included air traffic controllers, aircraft maintenance personnel, military police, fuel specialists, and logisticians. And the word came that the situation in Kabul was essentially going to hell, and they were needed there yesterday.

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With the rest of his team already underway from the United States, McClaskey took a C-130 transport from Djibouti, Africa, to Ramstein Air Force Base, Germany. There he hitched a ride on a C-17 transport that was ferrying U.S. Army troops to Kabul, part of an emergency deployment of some 6,000 U.S. Soldiers and Marines being rushed to HKIA to try to secure the airport. After refueling in Kuwait, the C-17 approached the Kabul airport Aug. 15. Sitting in the cockpit in the right observer seat as the aircraft circled low over HKIA, McClaskey could hardly process what he was seeing. The airport looked like a crowded soccer stadium during a riot, with thousands upon thousands of people outside trying to cram through the various gates and thousands more running onto the tarmac and taxiways like they were a football pitch.

“I was talking to the aircrew and over the radio with members of my team already on the ground at HKIA as we flew low over the airfield,” said McClaskey. “I don’t know that there was anybody in that airspace that wanted to be on the ground with their team more than me at that moment. But as we talked through the situation very frankly, we all agreed that putting the aircraft down would risk both it and those people on the ground. In the end, we had to divert back to Al Udeid, and I can tell you [as we left], my folks on the ground were rightly very concerned about their physical security.”

‘WE’RE STAYING’

“Everyone just calm the ___ down! We’re launching the iron, but we’re not flushing the whole team! We’re staying,” Desautels shouted into the radio in the operations center, referring to the two HC-130 aircraft that were designated to fly his team to safety in the event of an emergency exfiltration. With the perimeter breached and thousands of Afghan civilians swarming the tarmac, the situation at HKIA was deteriorating by the second, and many people in the operation center and around the world via television footage were unnerved by what they were witnessing.

A C-17 Globemaster that had just landed at the airport to deliver a load of equipment and security forces were swarmed by hundreds of Afghan civilians before it could even offload its cargo. Faced with possibility of losing control of their aircraft and jeopardizing all those onboard, the pilots quickly taxied

and took off, with Afghan civilians clinging desperately to the fuselage and wheel wells. The sight of Afghans falling as the C-17 gained altitude would become an iconic image of OAR, recalling photos of U.S. helicopters pulling desperate Americans and South Vietnamese off the roof of the U.S. Embassy in Saigon in 1975.

Just minutes later, Desautels had to make a life-or-death decision. In the event that HKIA was completely overrun by not only by Afghan civilians but potentially Taliban fighters, he had promised his team he would get them out or “flush” them on the two HC-130 aircraft designated “Fever 11” and “Fever 12.” Now that the moment had apparently arrived, Desautels also understood that pulling his 170-person team, many providing airport security, would leave a critical gap in the airport’s already crumbling defenses.

“We had intelligence that the Taliban had liberated a nearby prison full of al Qaeda and ISIS fighters, so my team understood how critical we were to the base defense plan. So instead of flushing the team, I got permission from the CFACC [Combined Forces Air Component Commander] to launch the HC-130s from the taxiways, which is risky. Word came back that ‘the airport is not clear, take off at your own risk,’ and within seconds Fever 11 and 12 were airborne flying just 30 feet or so above the heads of the crowd on the runway.”

With the aid of air refueling tankers, the increasingly exhausted pilots of the HC-130s circled overhead for more than 13 hours, waiting to see if the U.S. military could regain control of the airfield. The alternative was to attempt an emergency extraction of the personnel recovery task force from a contested airfield.

‘A GUT PUNCH TO EVERYONE’

Late in the afternoon Aug. 26, Lynch stepped out of the medical facility at HKIA for a breath of fresh air. The scene that greeted him outside was almost post-Apocalyptic. The shells of abandoned cars were scattered about, and piles of discarded suitcases, bags, mattresses, and the other detritus of lives torn asunder littered the area. A stench escaped from a nearby line of latrines that had not been emptied in days.

Due to intelligence indicating a possible suicide-bombing



Image from Al Jazeera video

Desperate to flee the Taliban, thousands of Afghans stormed the airport, breaching security and forcing this C-17 to return to the air without unloading its cargo or taking on passengers. Some tried to cling to the aircraft as it lifted off, with predictably tragic results.

Casualties evacuated from Afghanistan arrived at Landstuhl Regional Medical Center in Germany on Aug. 26. The evacuation of Kabul flooded hospitals with sick and wounded civilians.



Marcy Sanchez / Landstuhl Regional Medical Center

attack on the airport, leadership had put the small hospital on lockdown for much of the day. Most of the doctors and nurses were sleeping at the facility after their shifts anyway, so they really had no place else to go. Then around 6 p.m., word came that there had been a suicide bombing across the airport at Abbey Gate, which U.S. Marines guarded against a swirling mass of as many as 10,000 Afghan civilians desperately hoping to be rescued. The mass of humanity provided an inviting target for the Islamic State-Khorasan terrorist who had packed his suicide vest with ball bearings for maximum lethality.

Lynch immediately activated the mass casualty plan his team had rehearsed many times. Yet no amount of planning could prepare them for the arrival of the first trucks carrying the wounded.

“When the first truck pulled up and we saw all of the Marines injured in the back, that was a game-changer. That was a big shock to me personally and a gut punch to everyone. I don’t think any of us had seen so many American casualties from a single incident, and it was clear that four or five of the Marines had passed away already,” said Lynch. “But after stepping back for a moment, we had to jump-start ourselves out of the shock because so many wounded were coming in, and we had to be on our ‘A’ game to take care of all the patients.”

Enlisting the help of a group of Air Force pararescuemen, Lynch quickly established a triage point outside the facility. He walked up and down the lines of wounded, deciding who needed to be rushed into the emergency room, which patients had less severe wounds that could be treated elsewhere in the hospital, and who lacked a pulse and was beyond help.

During one of the longest nights of his life, Lynch realized that the small hospital was in danger of being overwhelmed, doubling up in the emergency room and treating 63 U.S. and Afghan wounded in the small facility. The staff had already confirmed 10 American fatalities, some having died on the operating table. In their mass casualty plan, they had anticipated having to treat patients without dog tags or easy identification, so they created packets for them and gave each one the name of a Hollywood celebrity. They quickly ran out of celebrity names and had to think of others.

By early morning, the last of the Aeromedical Evacuation flights transporting the wounded to Landstuhl Regional Medical Center in Germany lifted off. An exhausted Lynch looked around a hospital very much the worse for wear. He knew the team would have to find the energy to clean up and reset the facility in case the airfield was attacked again. After all, they were still in the middle of Kabul; the base was still surrounded by the Taliban; and other Islamic State-Khorasan terrorists were undoubtedly still out there plotting massacres.

Soon, medical corpsmen started showing up with blood donations, and Marines arrived to help clean the hospital, mopping floors, taking out the trash, and disposing of bloody bandages and sheets. That allowed Lynch and his team to get a little rest, but not much. Lynch knew that every day until their scheduled departure Aug. 31 would be more dangerous than the previous one.

‘AN OPPORTUNITY TO ACTUALLY DELIVER HOPE’

After flying four evacuation missions out of HKIA in a matter of days, C-17 pilot Lt. Col. Austin Street was on his first extended crew rest at Al Udeid Air Base in Qatar. The ramp of the air base had been expanded to accommodate more than twice the number of C-17s as normal, one of many signs that the Globemaster had become the workhorse of Operation Allies Refuge. Roughly half of the Air Force’s entire fleet of 222 C-17s had been committed to the operation, and they would evacuate more than 79,000 of the more than 124,000 total evacuees, including roughly 6,000 Americans.

Street, commander of the 21st Airlift Squadron out of Travis Air Base, Calif., was asleep when the phone call came from the operations desk at Al Udeid. There had been a mass casualty suicide bombing at HKIA, and he was designated to command an Aeromedical Evacuation mission to transport the wounded to Germany. But when Street arrived at the aircraft for the high priority mission, only one maintenance person was on site prepping the aircraft. He also learned that because the heat in Qatar had the effect of expanding jet fuel, he would have to launch without a sufficient fuel load to complete the mission. To make matters worse, some of the generators at HKIA had

been targeted by saboteurs, meaning he would have to land at night without runway lights.

The Aeromedical Evacuation flight was so rushed that the two aeromedical transport teams and critical care air transport team onboard had to reconfigure the aircraft to accept wounded patients while underway to Kabul. No midair refueling tankers were in range. Once on the ground at HKIA, Street had to wait two hours on the tarmac with the aircraft engines running because some of the critically wounded passengers were just out of surgery and needed to be stabilized before transport.

Once again, Street took off without enough fuel to complete the mission and reach Ramstein Air Base in Germany. Initially air command and control could identify no tankers in range, but they finally located a KC-135 tanker on “strip alert” in the region. Street conducted a tricky midair refueling at night over the Black Sea, while in his cargo bay a critical care team performed emergency surgery on a wounded patient.

“I’ve flown the C-17 for 15 years, and that was not only the most important and significant mission I ever flew, it was also the most challenging,” Street said in an interview. At Air Mobility Command, he noted, their mission mantra is to ‘project power and deliver hope.’ “Well, I’ve had lots of opportunities to project combat power into war zones, but I’ve rarely had the opportunity to deliver hope. That’s why I’m so proud of my crew for pushing through and overcoming the most challenging conditions I ever witnessed. This entire operation was an opportunity to actually deliver hope, not only to our own wounded, but also to all the Afghans trying to get out of Kabul. That allowed the American military to keep faith with many of those Afghans that we’ve built trust with over the past 20 years.”

‘AN EERIE FEELING’

On the final day of Operation Allies Refuge, McClaskey led a skeleton crew from the 821st Contingency Response Group

as they launched the final evacuation flights from HKIA. The suicide bombing days earlier had given his team a renewed sense of purpose, and they had worked around the clock to get as many Afghans out of the country as possible in what little time remained. Even in the last 24 hours of operations, they had managed to rescue 1,250 additional evacuees

McClaskey and his team finally policed up the last remnants of equipment at HKIA, determined to leave nothing of combat usefulness for the Taliban fighters they could see all around the airport’s perimeter, their signature black-and-white flags unfurled. Everything that couldn’t fit into the rear of a C-17 was destroyed.

That evening under the cover of darkness, five C-17s would help the 82nd Airborne Division execute a joint tactical exfiltration, flying the remaining 800 U.S. personnel at HKIA, including the acting U.S. ambassador to Afghanistan, to safety. The C-17s were supported by more than 20 orbiting aircraft stacked overhead, to include command-and-control, strike, and intelligence, surveillance, and reconnaissance platforms.

When the ramp closed on his C-17 on Aug. 30, 2021, McClaskey knew his long Afghan War was over.

“At that point, I thought about the first time I flew into Afghanistan right after the 9/11 terrorist attacks and how many subsequent birthdays I had spent flying to this country. I also thought about the thousands and thousands of Americans injured and killed there, some of whom I had flown out of there, and the countless lives and families changed as a result of this war,” said McClaskey. “It was an eerie feeling, and a lot to unpack. I’d spent my entire career fighting in these conflicts, and now it was all over. At that moment, I couldn’t wait to call my wife and tell her we were on our way home.”

James C. Kitfield is a contributing national security correspondent and author, and a three-time recipient of the Gerald R. Ford Award for Distinguished Reporting on National Defense.



Master Sgt. Alexander Burnett, 82nd Airborne Public Affairs

U.S. Army paratroopers prepare to board a U.S. Air Force C-17 on Aug. 30, 2021, at the Hamid Karzai International Airport in Afghanistan. The final flight of U.S. personnel left the country just before midnight, bringing an end to the 20-year conflict.

The Air Force's Legends of Yesterday Meet the Legends of Tomorrow



The Legends: Gen. John Hyten, Gen. John Jumper, Gen. Richard Myers, Gen. Lloyd Newton, Gen. Lori Robinson, Gen. Larry Spencer, Maj. Gen. Suzanne Vautrinot, CMSAF Frederick Finck, CMSAF Gerald Murray, CMSgt. Harold Hutchinson, and CMSgt. Gerardo Tapia.

To celebrate the Air Force's 75th anniversary, the Air & Space Forces Association set out to connect 11 "living legends" from Air Force history with Airmen and Guardians in the force today.

The Legends—six retired four-star generals, one retired two-star general, two former Chief Master Sergeants of the Air Force, and two retired chief master sergeants—visited eight Air Force and Space Force bases between July and August, crisscrossing the country to share their stories and experiences with some 3,500 Airmen and Guardians. Their visits opened an intergenerational dialogue between the legends of yesterday and tomorrow.

The genesis of the 75th Anniversary Legends Tour was a conversation between two retired generals: Gen. John P. Jumper (the Air Force's 17th Chief of Staff) and AFA President Lt. Gen. Bruce "Orville" Wright. They wanted to create a way to connect Active-duty Airmen and Guardians with the wisdom and knowledge of retired senior leaders.

The Legends Tour was organized by the Gen. Jimmy Doolittle Leadership Center (DLC) and its director, Patrick Donley, a retired Air Force colonel and former National War College instructor.

"Just as every superhero has an origin story, the Legends on this stage and those visiting the units are a part of your origin story," Donley told the audience at Seymour Johnson Air Force Base, N.C., in August. "They are part of your family tree, and they are some of the giants on whose shoulders you stand."

Seymour Johnson, the fourth stop on the Legends Tour, hosted Jumper; former Chairman of the Joint Chiefs of Staff Gen. Richard B. Myers; former Air Force Vice Chief of Staff Gen. Larry Spencer; Chief Master Sergeant of the Air Force #14 Gerald Murray; and retired Chief Master Sgt. Gerardo Tapia.

The group participated in panel discussions and unit visits, with stops at the 4th Medical Group, the 336th Rocket MX Hangar, and

the 916th Air Refueling Wing, where the Legends toured the new KC-46 Pegasus tanker.

"I could not be more proud to be here standing in front of Airmen again," Jumper said. "They're the same quality, motivated the same way, and took the same oath that I did many, many decades ago."

The panels came to life as Airmen took the microphone to pose questions. No subject was off limits, and the Legends shared stories of their greatest personal failures; coping with policy changes; being "voluntold" to take on undesired duties; dealing with political divisiveness; encouraging service; and everything in between.

The questions and responses were unscripted and uncoached. Attending Airmen were encouraged to ask tough questions.

When one Airman asked how the Legends overcame the darkest periods in their lives, Spencer spoke out about military suicide rates and the necessity for anyone to seek help when one needs it.

"There is no stigma," he said. "You need to get the help that you need. So please, find whatever that is for you."

Other conversations got personal: Murray opened up to a group of junior Airmen about the personal demons he fought to save his marriage early in his career. Tapia acknowledged he would have been discharged for bad behavior had it not been for the trust of one particular boss who saw something in him worth cultivating. Spencer told his origin story about how, as an E-3, a chief master sergeant demonstrated to him the importance of holding yourself to worthwhile standards.

"When I was 18 years old, I had an afro like you could not believe," Spencer said. Despite being in the Air Force, he refused to get it cut. Every day when he went to work at Whiteman Air Force Base, Mo., he would hide his hair under his cap in an act of defiance—until the day a chief master sergeant caught him, drove him to a barbershop in his pickup truck, and got him a military cut.



Senior Airman Kylie Barrow

Members of the Air & Space Forces Association, the 4th Fighter Wing, and the 916th Air Refueling Wing pose for a group photo during the AFA Legends Tour at Seymour Johnson Air Force Base, N.C. The AFA mission is to promote dominant U.S. Air and Space Forces as the foundation of a strong National Defense as well as honoring and supporting Airmen, Guardians, and their families.

It wasn't punishment, Spencer said, but an act of leadership. That chief told Spencer it was time to take himself (and his service) seriously, then encouraged him to enroll in the college classes he'd been avoiding. A few years later, that Chief was on hand when Spencer graduated.

"That chief master sergeant talked to me in a way that no one ever talked to me before," he said. "He wasn't chewing me out. He cared about me—turned my life around."

The common thread woven through Spencer's story and the other Legends' stories was leadership, and that leaders don't have to be those at the highest ranks or with the most gray hairs. Leadership involves action and communication.

Indeed, the Legends found the discussions with Airmen were not a one-way street in which wisdom flowed from them to others. On the contrary, they found inspiration in the Active-duty Airmen of today, who they said are shaping their own legacy.

"You are smarter, and you are better prepared to do that than any

generation that ever existed," Jumper said. "And it's going to be your legacy, your pride that you're able to accept that ... develop that ... deploy that and use that. That's going to be your legacy."

The Legends repeatedly emphasized how responsibility for making positive change rests on the shoulders of every Airman. That's true whether they're sharing a new or better way to do something or changing culture and policy.

"Learn how to go stand on somebody's desk," said Spencer. "If you have a good idea, it's going to break through. So don't give up—please."

The 75th Anniversary Legends Tour weaves past and present together, with the aim of reinforcing the future. But reinforcement worked in the other direction, as well. Speaking for all of the Legends, Spencer told Airmen at Seymour Johnson, "Now I get to go home knowing my Air Force is in good hands."

The value of the tour was not lost on the Airmen, who were overheard to make remarks like, "This was exactly what we needed to

Members of the Air & Space Forces Association speak to Airmen assigned to the 4th Fighter Wing during the AFA Legends Tour. AFA works to advocate and promote aerospace power that will favorably shape policy and resourcing decisions.



Senior Airman Kevin Holloway

hear," according to Donley.

Donley said AFA and the Doolittle Leadership Center hope to lead additional Legends Tours in the future and are seeking sponsors to help underwrite the cost and continue providing tomorrow's Legends with the encouragement and support they need today.

"In every session there were powerful moments," Donley said. "[The Legends] spoke to the Airmen with surprising candor and transparency. Having listened to all of their engagements and been a repeat beneficiary of the wisdom that they're sharing, I'm confident that this tour has been immeasurably valuable. And from this start, I'm sincerely hoping there will be more opportunities for similar engagements in the future." ❖



Senior Airman Kylie Barrow

An Airman assigned to the 916th Air Refueling Wing shows the different functions of the KC-46A Pegasus during the Air & Space Forces Association's Legends Tour at Seymour Johnson Air Force Base, N.C., in August.

Legends of Air & Space

Eleven Air Force Legends joined one or more legs of the Air & Space Forces Association's inaugural Legends Tour to visit some 3,500 Airmen and Guardians at eight bases in a series of visits over four weeks. The Legends, all General Officers and Chiefs, varied by location.

Nellis Air Force Base, Nev.

Gen. John Jumper, 17th Air Force Chief of Staff (active 1966-2005)

Gen. Lori Robinson, Commander of USNORTHCOM and NORAD (active 1981-2018)

Gen. Lloyd Newton, Commander of Air Education and Training Command (active 1966-2000)

CMSAF #14 Gerald Murray (active 1977-2006)

Chief Master Sgt. Harold Hutchison, Command Senior Enlisted Leader of NORAD/NORTHCOM (active 1985-2018)

Creech Air Force Base, Nev.

Gen. John Jumper, 17th Air Force Chief of Staff (active 1966-2005)

Gen. Lori Robinson, Commander of USNORTHCOM and NORAD (active 1981-2018)

Gen. Lloyd Newton, Commander of Air Education and Training Command (active 1966-2000)

Chief Master Sgt. Harold Hutchison, Command Senior Enlisted Leader of NORAD/NORTHCOM (active 1985-2018)

Joint Base Lewis-McChord, Wash.

Gen. Richard Myers, 15th Chairman of the Joint Chiefs of Staff (active 1965-2005)

Gen. John Jumper, 17th Air Force Chief of Staff (active 1966-2005)

Gen. Lloyd Newton, Commander of Air Education and Training Command (active 1966-2000)

CMSAF #13 Jim Finch (active 1972-2002)

CMSAF #14 Gerald Murray (active 1977-2006)

Seymour Johnson Air Force Base, N.C.

Gen. Richard Myers, 15th Chairman of the Joint Chiefs of Staff (active 1965-2005)

Gen. John Jumper, 17th Air Force Chief of Staff (active 1966-2005)

Gen. Larry Spencer, Vice Chief of Staff of the Air Force (active 1971-2015)

CMSAF #14 Gerald Murray (active 1977-2006)

Chief Master Sgt. Gerardo Tapia, Command Chief Master Sgt. Air Education and Training Command (active 1985-2016)

Buckley Space Force Base, Colo.

Gen. Richard Myers, 15th Chairman of the Joint Chief of Staff (active 1965-2005)

Gen. John Hyten, 11th Vice Chairman of the Joint Chiefs of Staff (active 1981-2021)

Gen. John Jumper, 17th Air Force Chief of Staff (active 1966-2005)

Maj. General Suzanne Vautrinot, Commander, 24th Air Force (active 1982-2013)

CMSAF #14 Gerald Murray (active 1977-2006)

Chief Master Sgt. Gerardo Tapia, Command Chief Master Sgt. Air Education and Training Command (active 1985-2016)

U.S. Air Force Academy, Colo.

Gen. Richard Myers, 15th Chairman of the Joint Chiefs of Staff (active 1965-2005)

Gen. John Hyten, 11th Vice Chairman of the Joint Chiefs of Staff (active 1981-2021)

Gen. John Jumper, 17th Air Force Chief of Staff (active 1966-2005)

Maj. General Suzanne Vautrinot, Commander, 24th Air Force (active 1982-2013)

CMSAF #14 Gerald Murray (active 1977-2006)

Chief Master Sgt. Gerardo Tapia, Command Chief Master Sgt. Air Education and Training Command (active 1985-2016)

Peterson Space Force Base, Colo.

Gen. Richard Myers, 15th Chairman of the Joint Chiefs of Staff (active 1965-2005)

Gen. John Hyten, 11th Vice Chairman of the Joint Chiefs of Staff (active 1981-2021)

Gen. John Jumper, 17th Air Force Chief of Staff (active 1966-2005)

Maj. General Suzanne Vautrinot, Commander, 24th Air Force (active 1982-2013)

CMSAF #14 Gerald Murray (active 1977-2006)

Chief Master Sgt. Gerardo Tapia, Command Chief Master Sgt. Air Education and Training Command (active 1985-2016)

Schriever Space Force Base, Colo.

Gen. Richard Myers, 15th Chairman of the Joint Chiefs of Staff (active 1965-2005)

Gen. John Hyten, 11th Vice Chairman of the Joint Chiefs of Staff (active 1981-2021)

Gen. John Jumper, 17th Air Force Chief of Staff (active 1966-2005)

Maj. General Suzanne Vautrinot, Commander, 24th Air Force (active 1982-2013)

CMSAF #14 Gerald Murray (active 1977-2006)

Chief Master Sgt. Gerardo Tapia, Command Chief Master Sgt. Air Education and Training Command (active 1985-2016)

Interns at the Pentagon



Courtesy of Arnold Air Society/Silver Wings

Air Force Chief of Staff Gen. Charles Brown Jr. posed with a dozen of the 16 Arnold Air Society/Silver Wings cadets who held internships in the Pentagon this summer.

Sixteen Arnold Air Society/Silver Wings members earned coveted Pentagon summer internships in 2022. A few shared their stories in their own words with AFA field leader Gabbe Kearney.

2nd Lt. Hannah Olver was a member of the Andrew Dougherty Silver Wings Chapter at Rochester Institute of Technology, she was the National Development Officer for her senior year, leading the growth of the Silver Wings membership nationwide. Olver earned her commission from the Rochester Institute of Technology, Air Force Reserve Officer Training Corps (AFROTC) program. She graduated with a nursing degree from Roberts Wesleyan College, N.Y. She received the Silver Valor Award for swift actions to save the life of a fellow cadet who was choking during the annual AFROTC Field Training that took place in May 21 at Camp Shelby in Mississippi. Olver helped a cadet who accidentally swallowed a valve-cap from a water bottle. The Silver Valor Award is given to a cadet for a voluntary act of heroism.



AAS/SW

Olver

"I am very thankful for Silver Wings and the connections and opportunity to work at the Pentagon under senior leadership.

This truly was an experience unlike any other. At the Pentagon I worked under Space Force S2A Analysis and Production from May to August. I worked Under Brig. Gen. Gregory J. Gagnon, Director of Intelligence, Surveillance and Reconnaissance, and Brad Edmonson.

The primary focus of the work being produced was compiling current intel and threats in regard to Space for senior leadership. During this time I was able to largely observe how products are produced, attend different briefings, and begin to write on various topics.

I found this experience to be extremely rewarding. The people that I worked with on a daily basis created an experience where I was welcomed. There was always an open invitation to learn more, ask questions, and receive feedback to better myself. I felt surrounded by some of the most intelligent and hardworking people I have met to date.

As I prepare to go to Intel School in the fall as an officer in the Space Force, I am excited to bring this experience, knowledge, and abundance of advice with me."

Cadet Antonio (Tony) Capelo is a rising fifth-year cadet in the AFROTC program at North Carolina State University. He is majoring in Mechanical Engineering and minoring in Aerospace Studies. Capelo was the Mission Support Commander and had many achievements in his previous position in the detachment and currently serves as the Training Squadron Commander. In addition, he is also this year's National Development Officer for the Silver Wings Nation as a member of the Martha Metz Chapter.



AAS/SW

Capelo

"I can confidently start off by saying this internship was the most beneficial and rewarding opportunity I have had as a

cadet. The chance to work in the Pentagon is amazing enough already, but having opportunities like meeting the CSAF and CSO is the cherry on top.

During my time at the Pentagon, I primarily worked for Legislative Liaison Correspondence, Office of the Secretary of the Air Force (SAF/LLC), but would occasionally work at Legislative Liaison Strategy.

My main responsibilities were to receive, coordinate, and respond to congressional correspondence, execution of the Legislative Fellowship and Action Officer Orientation, facilitate communication with Air University regarding the Air Force Immersion and Professional Military Education Program for congressional staff, and finalizing any existing congressional inquiries.

My goal coming into the internship was to expand my breadth about how the Air Force operated at the departmental level and to learn more about politics since my background was mainly mechanical engineering.

I easily accomplished these goals within the first few weeks because my assignment gave me additional opportunities outside of the ones provided to all the interns.

I had the opportunity to sit in on the House Armed Services Committee (HASC) Readiness Hearing with all the vices from the service branches and saw them field a variety of questions from the representatives. I got to sit in on a crash course of how Congress works from one of the most reputable, independent defense lobbyist, Jeff Green.

I was "kidnapped" by Chief Schneider, and she introduced me to Vice Chief of Space Operations Gen. David D. Thompson and Chief Master Sergeant of the Air Force JoAnne Bass. My sponsor, Doug Altrichter, brought me to District Director Fly-Ins so I got to understand how important it was to develop good relations with the representatives' team back in their home states. On top of that, he and the Division Chief, Colonel Sundstrom, always took me to the weekly division meetings so I experienced the intricacies of Secretary of the Air Force/Legislative Liaison (SAF/LL).

The most memorable lesson about how the Department of the Air Force operates with Congress was from Maj. Gen. Christopher E. Finerty, Director, Legislative Liaison. I remember him saying in a weekly meeting that 'Congress can make the NDAA without the input of the DOD and make whatever budget they think is appropriate because they aren't mandated to include the DOD's opinion. However, they want the DOD's opinion because they want to make sure we get what we need. That is exactly why it is necessary for us to have an open line of communication with them and make sure we are giving them exactly what they need in a quick manner.'

Being able to sit in at the HASC-Readiness hearing and sitting down with Gen. Charles Q. Brown and Gen. John "Jay" Raymond were the coolest opportunities while I was there.

The day I will probably reminisce about the most was my last day where I raced against Lt. Col. Petrash in the morning (I won) and Maj. Gen. Finerty coining me at a farewell party.

I want to specifically call out Col. Julia Sundstrom, Division Chief of LLC, Mr. Doug Altrichter, Deputy Division Chief of LLC, Lt. Col. Eric Hendrickson, Lt. Col. Donald Petrash, and Dominique Wellons. Everyone I worked with made my internship amazing but these five specific individuals made a massive impact on my time there.

Needless to say, I had a plethora of opportunities and experiences from SAF/LL and am extremely grateful to them. They trusted me to do actual work. They gave me a treasure-trove of knowledge and went out of their way to show me the cool aspects of the job."

Cadet Sidney Walters is a member of the Andrew Turner Arnold Air Society Squadron and is also the Cadet Wing Mission Support Squadron Commander for Air Force Reserve Officer Training Corps (AFROTC) Detachment 130, Howard University, Washington, D.C.

"SAF/IA, also known as Secretary of the Air Force International Affairs, is a department known for its partnership in aiding international trade on behalf of the United States Air Force and Space Force. Housed at the Pentagon, this large department works to continue partnerships around the world. SAF/IA's aids senior leaders in completing "successful engagements with allies and partners; work with the interagency, foreign governments, and nongovernmental officials ... to advance mission priorities." Their mission is: Advance U.S. national security by cultivating deep, enduring relationships through security cooperation with our Allies and Partners in support of U.S. Air Force and U.S. Space Force global operations. Under SAF/IA there are two directorates, Policy and Programs (SAF/IAP) and Regional Affairs (SAF/IAR).

Policy and Programs focuses on the tools used to make security cooperation and other programing possible, they are the logistical side of business.

Regional Affairs focuses on the emotional side of business. This directorate has FAOs or Foreign Area Officers, Desk Officers, and Country Directors.

SAF/IA is an "integrator of the Department of the Air Force security cooperation enterprise and the front door for international allies and partners." This department tries to incorporate most if not all their security collaboration under one single organization, making them very different from other services. This collaboration leads to a lot of the success one sees between the U.S. Air Force and U.S. Space Force and their allies.

This summer I worked in the SAF/IARA division in Regional Affairs. I wanted the opportunity to see business conducted between the USAF and their international partners in the Americas and Africa. SAF/IARA is the biggest division with the most countries to cover. SAF/IARA's mission is: Integrate Security cooperation, Security Assistance, Pol-Mil Strategy, and Strategic Communication actions with Partner Nations for the United States Air Force.

I learned how SAF/IA builds programs that benefit the USAF, USSF, and U.S. allies. Meeting air chiefs/generals of other militaries is how negotiations flourish and become many of the programs you see today. A lot of their time is spent traveling to conferences, other countries, and air bases to conduct business with allies. Their key functions include facilitating Foreign Military Sales from beginning to end.

I got to experience and witness a lot of things that the average cadet would not. I was able to meet the Air Chief of Chile and converse with him over lunch in Spanish. I spoke with his trusted officials about the future of the Air Force and more importantly the strong partnership that exists between the United States and Chile. I attended classified meetings and was able to meet the Chief of Staff of the Air Force and the Chief of Space Operations. Learning from them and gaining mentorship was monumental. Overall, I accumulated an immense amount of valuable information as well as [gaining] several mentors from different career fields and branches. I would not trade this experience for the world!"



Walters

AAS/ISW

FACES OF THE FORCE



Staff Sgt. Candim Muniz

Seven years ago, **Master Sgt. Bridget Carroll** of the 727th Special Operations Aircraft Maintenance Squadron was part of team tasked with reducing cargo taken on an MQ-1 Predator alert package. Her proposed solution, the Digital Aircraft Link Emulator, or DALE, was recently deployed and employed for the first time. Before DALE, it would take more than 10 Airmen to accompany the package, set it up, and tow the RPA around the airfield to ensure link connections were made. Today, the DALE can be unloaded and ready for use with two Airmen in less than an hour.



Rodney Speed/USAF

Master Sgt. Mathue Snow, 78th Security Forces Squadron flight chief, received a Bronze Star Medal at Robins Air Force Base, Ga., on Sept. 9, in support of Operation Octave Shield at Manda Bay Airfield, Kenya, in 2019 and 2020. In particular, he helped to fend off an attack on the base by 30 al-Shabab terrorists armed with rocket-propelled grenades, mortars, and small arms. During the initial moments of the attack, Snow rushed to the Joint Defense Operations Center, sounded the giant voice system, and quickly dispatched Defenders to their defense towers.



Staff Sgt. Victoria Nelson/ANG

In July in Pelham, N.H., **Senior Airman Amy Granfield**, a public health technician with the 157th Medical Group, was wakesurfing on Long Pond when a fast-traveling Jet Ski crashed into the side of Granfield's boat, knocking her, her brother, and a friend overboard. The operator and her passenger ended up in the water severely injured, and Granfield swam to get them into the boat and made a tourniquet out of a ski rope to stop major blood loss. Granfield and her party took the Jet Ski operator and passenger to shore, where they were transferred to paramedics.



Airman 1st Class Alvaro Villagomez

The Air Force could save up to 40,000 man-hours and approximately \$1 million per year, thanks to an invention from **Airman 1st Class Jacob Helzer** at RAF Mildenhall, U.K.—a 3D-printed “Boom Cover Tool” that makes the task of removing and installing the boom cover on a KC-135, normally a 30-minute operation, a simple one-minute task. Helzer's tool costs roughly \$200 to manufacture, and he is currently working to produce prototypes for every KC-135 at Mildenhall. After that, he hopes to contract the fabrication of a final, more durable prototype and share the Boom Cover Tool throughout the entire fleet and modify the design to be adopted for other variations of refueling aircraft.



Airman 1st Class Nicholas Paczkowski

Maj. Benjamin Saunders, of the 49th Wing at Holloman Air Force Base, N.M., was named the 2021 Air Force Fighter Instructor Pilot of the Year this August, in recognition of his work developing combat-ready F-16 pilots. An instructor since 2018, Saunders teaches Airmen fresh out of Undergraduate Pilot Training how to employ fighter tactics in the F-16. He also teaches the instructors that then go on to teach other pilots.



Kendra Williams/USAF

At just 13 years old, **Jaiya Patillo** has already competed and won against athletes in high school and college. The 400-meter sprinter recently made history as the first middle schooler to compete against collegiate-level athletes and win the South Dakota State University's Last Chance track meet in February 2022—and she often trains with Airmen at Offutt Air Force Base, Neb., where her mother. Lt. Col. Sheree Patillo serves in the Air Force at U.S. Strategic Command. Now a 14-time Junior Olympian, Patillo won the USA Track and Field Junior Olympic Nationals in Sacramento, Calif., at the end of July.



Master Sgt. Ryan Campbell/ANG

On Sept. 7, **1st Lt. Kelsey Flannery** made history, becoming the first female F-35 pilot in the Air National Guard. The process started in 2019, when the Vermont Air National Guard became the first guard unit to be assigned the F-35. The 134th Fighter Squadron selected Flannery and a small group out of hundreds to become the squadron's newest pilots. She then attended Officer Training School, Undergraduate Pilot Training, Fighter Fundamentals, and SERE school, before finally flying the F-35 in the Air Force's “B-course.”



Courtesy

With a philosophy of “unbiased genuine care, empathy, and respect to all,” **Master Sgt. Crystal Bateman** of the 402nd Aircraft Maintenance Group was named the 2021 Air Force First Sergeant of the Year. CMSAF JoAnne Bass presented Bateman with the award in San Antonio on Aug. 27. Selected to attend the U.S. Navy Senior Enlisted Academy, Bateman said she overcame difficulties and depression thanks to her “family, friends, command team, various mentors, and first sergeants all over the Air Force.”

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



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