Special Warfare Attrition p. 42 | Solving Safety p. 34 | Boeing's T-X Win p. 16

AIR FORCE MAGAZINE

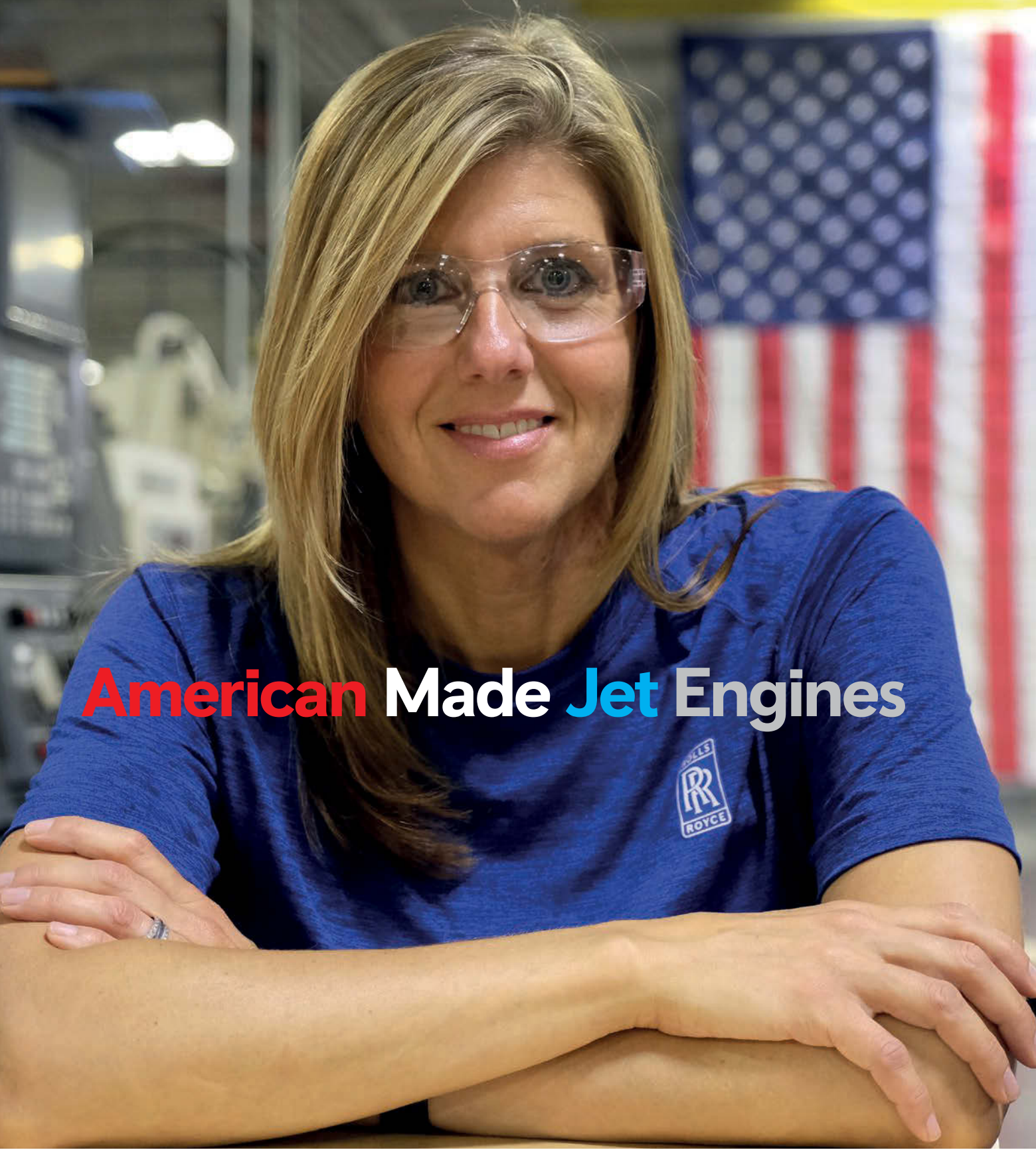
WHAT'S NEXT FOR TYNDALL

Six Keys To The Future Of A Wrecked Air Force Base

Published by the Air Force Association

December 2018 $8

0 74470 29757 4 1 2>



Forget cars – **we make advanced jet engines for the US military**. At our high-tech facilities in Indianapolis, Virginia and around the US, ***thousands of skilled Americans*** work every day to deliver the engines needed to power US military air crews to their missions – and back home safely. ***American-made jet engines, from Rolls-Royce North America.***

www.AmericanMadeJetEngines.com

ROLLS ROYCE

AIR FORCE MAGAZINE

December 2018. Vol. 102, No. 12

FEATURES

DEPARTMENTS

STAFF

ADVERTISING:

SUBSCRIBE & SAVE

FOLLOW US

GET THE DAILY REPORT

ON THE COVER

The control tower at Tyndall AFB, Fla., Oct. 10. See "What's Next for Tyndall," p. 20. Photo by SSgt. Alexander Henninger

Air Force Magazine (ISSN 0730-6784) December 2018 (Vol. 101, No.12) is published monthly, except for two double issues in April/May and October/November, by the Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198. Phone (703) 247-5800. Periodical postage paid at Arlington, Va., and additional mailing offices. **Membership Rate:** $50 per year; $35 e-Membership; $125 for three-year membership. **Subscription Rate:** $50 per year; $29 per year additional for postage to foreign addresses (except Canada and Mexico, which are $10 per year additional). Regular issues $8 each. USAF Almanac issue $18 each. **Change of address** requires four weeks' notice. Please include mailing label. **POSTMASTER:** Send changes of address to Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198. Publisher assumes no responsibility for unsolicited material.

By Tobias Naegele, Editor in Chief

The Air—and Space—Force We Need

Three themes are playing out across the Air Force as 2018 nears its end. Together they speak volumes about where the service is headed—or could end up—in the future.

The first is the vision for the future size of the force, what Air Force leaders are calling "the Force We Need." The second is the disaster that befell Tyndall Air Force Base in Florida and what that tells us about the true state of Air Force readiness today. The third is the battle over space, and the politics, costs, benefits, and risks of creating a brand-new, independent armed service for space.

Our Air Force is too small to match the demands of the National Security Strategy. Its 312 operational squadrons are overworked and under-resourced. Shortages of parts, pilots, and seasoned maintainers mean aircraft can't fly and pilots can't maintain peak readiness. Witness the rash of accidents last winter that led to a servicewide safety stand-down in spring. The conclusion: Op tempo and stress are undermining safety.

Air Force Secretary Heather Wilson and Chief of Staff Gen. David L. Goldfein make the case for 386 operational squadrons, a 24 percent increase, with added capability in almost every aspect of the force. So far, they offer this as a conclusion, not a detailed plan for how to get there. It's unclear how they arrived at this number, whether they anticipate changing squadron composition or how many new people, planes, and other gear they will need to acquire.

> "America does not need a Secretary of the Space Force."

Yet the arguments for growth are clear. The Air Force is fraying at its edges. It has been in constant combat since 1991—27 years. The average age of USAF planes is 28, double what it was in the first Gulf War. Many airframes are now irreplaceable. We can't buy more C-17s or F-22s. Our B-52 bombers and KC-135 tankers date from the Kennedy administration.

It's a struggle to keep many of the service's premier aircraft ready to fight: The F-22A had the service's lowest mission-capable rate in 2017 at 49 percent; the B-1, B-2, and F-35 were all under 55 percent. If a crisis strikes tomorrow, half our combat aircraft won't get off the ground.

This is not just a USAF problem. The Navy's F/A-18 mission-capable rate is also only 55 percent. This is what happens when missions grow and resources shrink, as happened during the dark days of sequestration. With the recently announced cuts to the 2020 budget, it is happening again.

What does it look like when the alarm sounds and planes can't get off the ground? Look at Tyndall. Hurricane Michael was an act of God, not of war, but its vengeance was no less menacing, its destruction no less complete, and the lessons no less severe. When Tropical Storm Michael cranked up its winds and upgraded its violence from Tropical Storm to 1 mph short of a Category 5 monster, there was just enough time to evacuate the base and get all the airworthy aircraft possible out of the storm's path. Left behind were 17 F-22s in various states of disrepair. Michael ripped the roof from one of those hangars, and for a week it seemed we might have lost a number of our most capable airframes.

As it turns out, all of those aircraft were able to fly again by early November, a testament to the hard work and ingenuity of Air Force and Lockheed maintainers who got them back in the air faster than initially thought possible. Yet the fact remains that, in an emergency, the Air Force could only surge 70 percent of those F-22s to get them out of harm's way.

What if that had been an attack instead?

On a more familiar battleground—Washington—sides are forming up for the battle over a proposed new "Space Force." Led by Deputy Secretary of Defense Patrick M. Shanahan, the Pentagon is drawing up plans to form a Department of the Space Force from parts drawn mostly from the Air Force, with smaller pieces from the Army and Navy. The logic is that space is a unique domain, that prior administrations under-invested there, and that a new bureaucracy is needed to guide development of space-based capabilities.

Wilson and Goldfein are in favor of the split, as long as it is done right. Some question their bona fides, however. The knives came out for Wilson because she had the audacity to put a price-tag on her own plan: An internal study pegged the five-year cost of forming a Space Force headquarters and secretariat at $13 billion.

Space Force zealots howled that the price tag was inflated and that its release was intended to undermine space independence. A better answer is that this was an honest act of transparency, a dose of reality about the true cost of bureaucracy. The only reason to fear and object to that reality is that it interferes with the logic and excitement of creating a new military branch.

America does not need a Secretary of the Space Force. Adding a Space Force Chief of Staff will not increase the lethality of the US military. The Joint Chiefs will not become wiser with the addition of an eighth four-star general.

The United States does need, however, to invest in space capabilities that enhance our ability to use space effectively for our national defense. First, we must ensure the Air Force's space mission is fully funded. Second, we must formally acknowledge space as a warfighting domain with the re-establishment of US Space Command, as the Pentagon already envisions. Modeled on US Special Operations Command, SPACECOM would also provide joint-service domain expertise and leadership without creating a separate service and all the costs that would entail. If necessary, we can ensure the nation understands where our primary military focus on space resides by renaming the Air Force as the US Aerospace Force.

Logic tells us that creating a Space Force unwittingly opens the door to other parochial debates: Submariners could argue that undersea warfare is really its own domain. Cyber warriors could call for a unified Cyber Force. Airpower advocates could return to old arguments over why the Army, Navy, and Marine Corps should cede their aviation assets to the Air Force. These are not good ideas—they are illustrations of parochialism run amok.

America already has the Space Force we need. It's called the US Air Force. Let's invest in making that Air Force—and all its space assets—great again. ✪

From the Editor in Chief ...

With this issue I join the long and storied history of *Air Force Magazine* and the Air Force Association, succeeding Adam Hebert as editor in chief. I am grateful for the loyal readers and talented staff he leaves behind and excited about the opportunities that lie ahead. Having spent 30-plus years in military and defense journalism, half that time as chief editor of the *Military Times* and *Defense News* media groups, this is familiar territory. Yet every product and readership is unique, and I'm excited to learn the nuances of this one as I embark on this adventure.

Magazines are like good friends. We look forward to their arrival, welcome them into our homes, enjoy their company. We notice when they change and worry if they seem to be growing away from us. I am confident that, like a good friend, you will tell me when you think we fall short and how we can do better. That's what friends are for.

Beginning with this issue, you will notice changes in substance, style, and design. The intent is to make this magazine more valuable to our readers: more current, more compelling, more insightful, and therefore more important. We want to be the friend you can't wait to hear from when something significant happens, the one who brings a unique perspective to every conversation, who helps explain what's complex, and shed light on what's hidden. Most of all, we want to be that friend who, when it's time to leave, surprises you as you realize how much time has passed in pleasurable discourse.

Everyone has ideas about what will make a publication better. I invite you to share yours and look forward to a long and rewarding friendship with each of you.

Tobias Naegele
Editor in Chief
tnaegele@afa.org

Winging It

Congratulations on the 100th anniversary issue, September 2018. The cover was outstanding and thanks for placing at the top the "Hap Arnold" wings and star symbol.

I never warmed to the "space age" version created under former SECAF [Sheila E.] Widnall. She said that the Air Force needed an official symbol, when in fact the Arnold symbol had been there for decades.

That symbol was worn on the shoulders of all AAC and AAF uniform jackets from the early 1940s and was embossed on the flight clothing of the crews that flew thousands of combat missions in all theaters in World War II, the Berlin Airlift, the Korean War, the Cold War, and Vietnam.

That original symbol had a long life.

Air Force Association

1501 Lee Highway • Arlington, VA 22209-1198

afa.org

Telephone: **703.247.5800**

Toll-free: **800.727.3337**

Fax: **703.247.5853**

AFA's Mission

Our mission is to promote a dominant United States Air Force and a strong national defense and to honor airmen and our Air Force heritage.

To accomplish this, we:

- **Educate** the public on the critical need for unmatched aerospace power and a technically superior workforce to ensure US national security.
- **Advocate** for aerospace power and STEM education.
- **Support** the Total Air Force family and promote aerospace education.

Contacts

CyberPatriot .... **info@uscyberpatriot.org**
Field Services ..... **field@afa.org**
Government Relations..... **grl@afa.org**
Insurance ..... **afa.service@mercer.com**
Membership..... **membership@afa.org**
News Media.... **communications@afa.org**

Magazine

Advertising.... **airforcemagsales@afa.org**
Editorial Offices ..... **afmag@afa.org**
Letters to Editor Column... **letters@afa.org**
Wingman ..... **wingman@afa.org**

Change of Address/Email

In an effort to stay connected with AFA and your local chapter, please update your mailing and email addresses. Change of address requires four weeks' notice.

To update your contact information:

- **Email:** membership@afa.org
- **Visit:** The Members Only area of our website, afa.org
- **Call:** Our Membership Department at 1-800-727-3337
- **Mail** your magazine label, including your first and last name, to our Membership Department at 1501 Lee Highway, Arlington, VA 22209-1198.

I have an Air Force document from the early 1980s that has the symbol at the top of the page. Thanks again for featuring the original symbol on your cover.

MSgt. Edward Curtis Jr., USAF (Ret.)
Grapevine, Texas

We're Not Them

A couple of the captions in the "Old Bombers, Making History" story in the August issue [p. 48] incorrectly identify weapons personnel as munitions personnel. Munitions personnel build, store, and deliver the munitions to the flight line. Weapons personnel load the munitions as well as maintain the weapons systems and components of the aircraft. There is a stark contrast between the two career fields and neither wants to be confused with the other.

CMSgt. W. Glen Pugh
Abilene, Texas

Skunk Rules For All

The article "Skunk Works at 75" is the most profound article I've ever read in *Air Force Magazine* [September, p. 34], because of the effect the 14 rules could have for our country. The list can be separated into two distinct groups: creating innovative culture and nurturing creative people.

In some cases, we are innovative by inviting and linking new ideas using small teams. Just ask the Defense Innovation Unit in Silicon Valley or some of the various national labs. We could be doing much better by allowing more rank-and-file organizations to create and keep the magic alive by dreaming and acting on those dreams. My sense is, this kind of widespread creativity is stifled by a risk-averse culture and a fear of failure.

The rules for nurturing creative people present a much larger challenge. Our personnel system, both military and civilian, is overburdened by too much oversight, too many reports, too many meetings, and tinkering from upper management. Recent initiatives by the SECAF and CSAF have addressed these deficiencies by eliminating unnecessary bureaucracy, but much remains to be done—specifically convincing the force to cut out non-value-added activity. Just do it!

The current personnel system is not designed to pay people based on contributions rather than supervisor responsibility, nor is it designed to hire people motivated to do the impossible. This must change if we are to remain competitive and able to win America's wars. The various "pay for performance" and direct-hiring initiatives are good first steps and must be accelerated.

The 14 rules should be proliferated throughout DOD, and indeed our entire government. This list could have just as well been titled, "How to Create Winning Organizations."

Col. W. Michael Guillot, USAF (Ret.)
Montgomery, Ala.

INDEX TO ADVERTISERS

Chapman and Child

I've managed to read the excellent article on MSgt. John Chapman's Medal of Honor several times and will retain it in my personal archives. Without taking anything away from the article itself, I am repeatedly drawn to the profound and moving photograph that makes up the cover of your October/November issue. This crusty old chief is moved to tears every time I look at it. In my mind, it gives new meaning to that old axiom, "a picture is worth a thousand words." Thank you so much for sharing it with us.

CMSgt. Robert D. Hudson, USAF (Ret.)
Bismarck, N.D.

Fake News, Indeed

Richard Reif seems to have taken President [Donald J.] Trump's frequent critiques of Jeff Bezos to the extreme ["Letters: Monetary Collusion," October/November, p. 4]. In voicing his concern over Amazon Web Services (AWS) providing "cloud computing services to the entire federal Intelligence Community," Reif makes a spurious charge that since Bezos owns Amazon and *The Washington Post* and since

the latter reports on the Intelligence Community that creates a conflict of interest for Bezos.

Huh?

In an article from the July 2014 issue of *The Atlantic,* Reif found this excerpt friendly to his premise, "This is a radical departure for the risk-averse Intelligence Community."

Reif's quote is close, but in the actual passage from that edition is this, "For the risk-averse Intelligence Community, the decision to go with a commercial cloud vendor is a radical departure from business as usual."

Not only is Reif's direct quotation inaccurate, he leaves the impression that somehow going with AWS is weakening security. But, later in that same piece is this: "CIA Chief Information Officer Douglas Wolfe called it [the contract with AWS] ... one of the most important technology procurements in recent history. I think it's going to make a big difference for national security."

Then Reif refers to a Nov. 20, 2017, *Washington Post* article that he says found "some serious security mistakes, ... which Amazon was seeking to remedy." This again leaves the impression that AWS has security problems and that it was "seeking to remedy," but nowhere in that story is there any such language.

There were three episodes where users of AWS failed to properly secure their own information and left it vulnerable, but those were not at all a result of weak or flawed AWS security.

Finally we get to the meat of Reif's letter. He is angry, really, really angry that President Trump—an avowed critic of Jeff Bezos and Amazon and *The Washington Post*—has not stepped in to "cancel the contract or ask tough questions about it?"

Tough questions, like the one Reif posed, "Why do our intel agencies need Amazon's cloud computer services?"

Had Reif read that *Atlantic* piece thoroughly and not cherry-picked text to suit his biases, he would have found his answer—"What we were really looking at was time to mission and innovation," the former intelligence official said. "The goal was, 'Can we act like a large enterprise in the corporate world and buy the thing that we don't have, can we catch up to the commercial cycle? Anybody can build a data center, but could we purchase something more? We decided we needed to buy innovation.'"

No, Mr. Reif, Amazon's success is no reason for you to spin webs of unfounded conspiracies. There are sufficient proclamations of "fake news" emanating from others in government without adding yours to the chorus.

Frank G. Scafidi
Carmichael, Calif.

Pick That Fruit

With reference to the C-5 entry in the June Almanac issue [p. 101]: Because the C-5A airframes in AMARC still have

WRITE TO US

Do you have a comment about a current article in the magazine? Write to "Letters," *Air Force Magazine*, 1501 Lee Highway, 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.

—The Editors

significant hours left on them, with only the problem of trouble-prone engines and other subsystems onboard, I would propose that private industry, under the rubric of the CRAF program, buy up some (20-40?) of the best A model airframes in the boneyard for next to nothing, and do the M mod-plus a rigorous review and replacement of the remaining high-maintenance items with commercially available equipment, in other words, picking the low-hanging fruit. Civil industry could operate the aircraft as a Western analog to the commercially operated An-124, selling hours, pounds, and miles to whomever needs it in the Western world. I imagine they could do it more efficiently than the military/government can and usefully augment our outsize cargo capabilities.

MSgt. Christopher Dierkes
Westhampton Beach, N.Y.

What a Good Fellow!

Imagine my sheer exhilaration upon seeing the article featuring 1st Lt. John Goodfellow ["Namesakes: Goodfellow," October/November, p. 88].

I enlisted with USAF in July 1962. I was security-cleared for USAFSS [USAF Security Service] at Goodfellow Air Force Base in San Angelo, Texas. My class, BN14112, graduated in May 1963. I still have our graduation photo. Capt. Donald Clark was our squadron commander. Captain Clark formed an Airman's Advisory Council. I was [one of] its first members.

My four years with USAF are among the best of my entire life. I was giving serious thought to a USAF career, becoming a commissioned officer. Regrettably, and I do mean regrettably, I returned to civilian life after being honorably discharged with three written commendations.

I was promoted to staff sergeant before I turned 21 as a result of being admitted into the "2T" (two-tour program).

I do not recall that we were told the history of naming Goodfellow. Your article makes my journey all the more meaningful. Thank you!

Vince Turner
Silver Spring, Md.

Aged Tankers Aging On

Seems to me that something is amiss with the KC-46 tanker ["Mobility Boom," August, p. 26]. In the 1950s, we built over 750 KC-135s on a relatively new airframe in a matter of five years or so. Boeing built the airplane and flying boom that was perfected on the KC-97. You would think that Boeing would have that whole air refueling thing down pat. The KC-46 is built on the B-767 airframe that has been flying since the early 1980s. Every time I read the Daily Report there has been another delay with the comm gear or are you ready for this ... the boom! Boeing has been in the refueling business for almost 70 years. This is one item that should not have any problems. The KC-10 was fielded quickly without too many problems. Somebody is not doing their job and, as usual, the taxpayer is on the hook. Good thing the KC-135 was built as good as it was because the way things are going with the KC-46, it will have to fly another 50 years.

George Keeler
Pine Plains, N.Y.

More Uniform Kerfluffle

My thanks to both Mr. Endsley and Mr. Haigh for their comments and lively opinions regarding current Air Force dress standards "Letters," August, p. 4 and October/November p. 4].

I agree with Mr. Endsley that today's "on-the-job" uniform is unattractive and looks like pajamas. When on base, other than clerical jobs, we wore fatigues with the shirt tucked into the pants along with a standard-issue blue belt. A practical utility uniform with a sharp, military appearance. When off base, Class A or Class B dress was expected to be worn.

Mr. Haigh's referral to the reduced number of airmen and unit manning shortages as a reason for sloppy appearance is not an excuse for excepting lower uniform dress standards.

It is not true that the majority of airman don't live on base in barracks or the BOQ [bachelor officer quarters]. That may be true of Air National Guard and Reserve personnel, but is not the case with Active Duty airmen.

Mr. Haigh's statement that in yesteryear "leaving the base depended on obeying higher-up demands" is total nonsense. Permission from supervisory ranks was never a requirement at any of the three bases that I served at.

The fact that the military brass spent their time and taxpayer money to approve a utility uniform that looks like camouflage pajamas is a disservice to the airmen who have to wear it. So I don't blame the troops for this uniform fiasco. They would like to ditch the "pajamas" and look professional and sharp on duty. Appearance is a vital part of being militarily competent. I blame the USAF uniform board for recommending it and the USAF senior officers for approving it.

To quote Rainer W. Josenhanss: "You never get a second chance to make a first impression."

David Ribbe
Nanuet, N.Y.

About the Air Force adopting the Army's operational camouflage pattern: What a waste of my taxes! I joined the Civil Air Patrol cadet program in 1966. Within two years, all the patches and collar insignia I purchased were deemed obsolete, and so began a cycle of constantly purchasing new items. There was the change from silver chevrons and name tags on the fatigue uniform in 1978. There were the "blueberry" airmen stripes in 1976 (who was the flaming genius who thought of that?). Then it was BDUs in 1987. Before I retired in 1992, there was the change to the master sergeant stripes ("top three", really?). For what? All because some colonel or some chief master sergeant with too much time on their hands decided to make a change—which confirms my opinion there are no improvements, only changes. None of this had anything to do with winning wars, which should be the main consideration when any "improvement" is contemplated. I enjoyed serving in the Air Force; the uniform changes are one thing I don't miss.

MSgt. Michael R. Betzer,
USAF (Ret)
Lancaster, Calif.

Pride's a Family Tradition

I've read with great interest about our past, current, and future Air Force in *Air Force Magazine* since being a brown bar and looked forward to each issue. One of my favorite sections of your magazine is "Letters." For instance, in the September issue, I read with great interest Carl Van Pelt's commentary ["A Different Breed," p. 4], and I largely agree with what he has to say. However, his closing comments took me somewhat aback. Before I retired in 1985, I swore in my son Charles as a second lieutenant, using the same brown bars I once proudly wore. He subsequently flew the A-10 for over 3,500 hours in all the wars and conflicts I could no longer be involved in. I met the young men and women who went off to RAF Bentwaters, England, feeling 10 feet tall, just having finished training at Davis-Monthan [AFB, Ariz.,] to man their country's defenses against the Soviet foe and subsequently participate in conflicts none of us had dreamed of at the time. Like Carl said in his letter, they, too, were changed forever and bonded.

My son later flew in the 52nd Fighter Wing at Spangdahlem [AB, Germany], a wing I flew with after I returned from Vietnam, and the ground and aircrew I met on a visit were all as inspired and professional as we once were. I do book signings at the National Air and Space Museum now and meet in the process many youngsters flying everything from the B-1, F-22, F-35, A-10, C-130, C-5, RC-135, etc., not just fighter pilots, but the others as well, who make it all work for us—and I see the gleam in their eyes and the pride they feel in what and who they are. America may have changed since our Vietnam days, but the few are still as capable and proud as ever to be part of the defense of our great nation. I am not saying that we don't have our issues—retention problems in a vibrant economy are nothing new. But those who man the cockpits I would fly with any day—and their standards are as high as ever. They will have their reunions, just as we do and our World War II flyers had before us, and look back with pride at the time when they did something unselfish, serving their country.

So, Carl, America may have changed in ways, as we always have and will continue to change in the future, but those who serve our country now and are charged with its protection, you wouldn't mind flying with. Later next month, my granddaughter Anna is off to Laughlin AFB, Texas, to enter pilot training and keep up a tradition of service to our nation, now in the third generation. Yes, she wants to fly the A-10, just like her dad once did.

Col. Wolfgang W. E. Samuel,
USAF (Ret.)
Fairfax Station, Va.

Better Late than Never

Peter Grier's article, "The Chappie James Way," published in the October/November issue [p. 70], contains much valuable information about a great American, but it also contains a major error. It falsely claims that Daniel "Chappie" James graduated from Tuskegee Institute in 1942. Actually, he received his Tuskegee Institute degree in 1969, twenty-seven years later. The reason James did not graduate in 1942 is that he was expelled from Tuskegee Institute for fighting during his senior year, not long before he expected to complete his college degree. Despite his expulsion, James entered military pilot training, also at Tuskegee, and graduated from advanced flight training at Tuskegee Army Air Field, not part of Tuskegee Institute. Tuskegee Institute awarded James his college degree in 1969 because he had taken additional courses during his military career. He received his degree, in physical education, just before his promotion from colonel to brigadier general. He went on to become the first African-American four-star general in any of the military services.

Daniel L. Haulman
Maxwell AFB, Ala.

A Good Man Gone

Your September 2018 issue brought sad news of the death of Gen. Lawrence A. Skantze [p. 14]. He was a man of many skills and talents, but he was especially good working with the news media. I know because I was his public affairs officer at Air Force Systems Command from mid-1985 until he retired in 1987. Skantze's defense of the B-1 on the "Today Show" was a classic that has been used by the Air Force in its media-relations training program. He will be missed.

Col. David J. Shea,
USAF (Ret.)
Springfield, Va.

SCREENSHOT

As American as baseball and apple pie, SSgt. Kori Myers waves the flag from the ramp of a C-17 Globemaster III before Game 3 of the 2018 National League Championship Series at Dodger Stadium. The Dodgers went on to win the National League Championship, only to lose the World Series to the Boston Red Sox. The Air Force performs about 1,000 flyovers each year to promote the service and its capabilities.

Photo: Kyle Larson/USAF

SCREENSHOT

An F-15D Eagle glides above the pristine Pacific waters near the Mariana Islands, one of just 23 D-models in the Air Force inventory. The jet was among 160 aircraft, 15,000 people, and 15 ships taking part in the joint Valiant Shield 2018 exercise in September. It was one of the largest joint exercises of the year.

Photo: SrA. Zachary Bumpus

SCREENSHOT

"You are not forgotten," read the words at the bottom of the familiar black and white POW/MIA flag. To drive that home, more than 70 airmen at Schriever AFB, Colo., ran through the night carrying the flag aloft for 30-minute intervals and logging 120 miles on Sept 19. More than 82,000 Americans remain missing from WWII, the Korean War, the Vietnam War, the Cold War, the Gulf Wars, and other conflicts.

Photo: Kathryn Calvert/USAF

By Jennifer Hlad

SrA. Christopher Leslie, 44th Aircraft Maintenance Unit, loads an AIM-9 heat-seeking missile during Kadena AB, Japan's annual weapons load competition.

Keystone of the Pacific

KADENA AFB, Japan—

Looking out of the 360-degree windows in the air traffic control tower here, there's a clear view of the Kadena Marina and the East China Sea to the west, a densely populated Kadena town just to the north, and the city of Naha to the southwest—close enough that Naha Airport's airspace overlaps with Kadena's. To the east, beyond the trees and towns, is the Philippine Sea.

Two F-15Cs are approaching quickly from the south side of the tower as a C-130 lifts off toward the east. A helicopter is slowly towed from its hangar.

Kadena, in the heart of Okinawa, Japan, is the largest US air base in the Pacific, and the sixth busiest in the Air Force worldwide. With a typhoon bearing down on the base, things could get busier still as leaders ponder whether to evacuate as many as 100 aircraft to avoid the storm.

"When they say we're the keystone of the Pacific, that's no lie," said Maj. Tim Bills, the airfield operations flight commander.

Kadena is home to the 18th Wing—the largest combat wing in the Air Force—and to detachments from three other services. The base is also a hub for Air Mobility Command cargo operations, and a key force projection platform for Indo-Pacific Command.

"The 18th Wing is a mission wing," Commander Brig. Gen. Case A. Cunningham said. "There's any number of missions that we're responsible for, [in regards to] Pacific Air Forces and Indo-PACOM. Air superiority, airborne warning and control, combat search and rescue, and then aerial refueling are the significant ones."

Two F-15 Eagle squadrons, a KC-135 Stratotanker refueling squadron, an E-3 AWACS airborne air control squadron, two rescue squadrons and an aeromedical evacuation squadron are among the 26 Air Force squadrons here. Also here: Navy P-8 reconnaissance and patrol aircraft; P-3 anti-submarine patrol aircraft, and fighter jets when aircraft carriers are nearby. The base also serves as a divert location for the civilian airport and the Japan Air Self-Defense Force.

"We have an enormous selection of aircraft," said TSgt. Chris Anderson, an air traffic control watch supervisor.

While local control talks to aircraft overhead, ground control is watching all the vehicles on the ground. Anderson can make on-the-spot air traffic decisions, making him "kind of the last step" before an incident can happen.

Kadena Air Base is a busy transit point for all the services. An 18th Wing F-15C Eagle (foreground) passes by a US Navy P-3 Orion. The Navy rotates P-3 squadrons to Kadena routinely.

"So if I'm listening to everybody, like if my ground (control) and local (control) are doing something and one does something that he shouldn't, I can stop it, so we don't have a plane hitting a car or a plane hitting a truck, or even two planes hitting together," Anderson explained.

This is Anderson's second tour in Okinawa, but he already had several years of experience before he arrived on the island the first time. A busy tower demands experienced air traffic controllers.

"We have everything from the Navy, [and] the Army flying through, we have all the sister services come here, we have the Japanese that come here, we have the Aussies that come here—anybody— NATO pretty much comes through here," he said. "That's a big difference, talking to different cultures, different nations."

SrA. Jessica Newman, an aircraft management shift lead, said she loves how busy the airfield is. "Kadena's a beast," Newman said. "Our airfield is just so big."

Roughly 600 miles south of Korea, 500 miles east of China, and 950 miles southwest of Tokyo, Okinawa is a critical central hub for Indo-PACOM and home not just to the 18th Wing, but also to III Marine Expeditionary Force and Marine Forces Japan, and four Army Patriot Missile batteries—a hedge against ballistic missile attack.

Just 70 miles long and averaging seven miles wide, the island is packed with a dozen interconnected US military bases.

"Okinawa is a joint island," Cunningham said. " So, all services are represented here in significant fashion, and we work together as a joint team."

The location makes it an ideal launching pad for operations all over the region.

"You take the Thailand cave rescue," Cunningham said. "A lot of those airmen came from Kadena. We have very special capabilities that enabled that, but it's also our location that enabled us to respond quickly."

Likewise, with responses to the 2011 earthquake and tsunami in Japan, the 2015 earthquake in Nepal, and a 2013 typhoon in the Philippines.

"All of those are opportunities for us to provide that humanitarian assistance and disaster relief from Kadena," Cunningham said, whether that means direct support from the 18th Wing or a base to support US-based operations.

The senior US military officer on Okinawa is Marine Corps Lt. Gen. Eric M. Smith, commander of III Marine Expeditionary Force and Marine Forces Japan. He is responsible for the sensitive political-military affairs here, which have long been a sore spot with a portion of the island's population.

Because of the tensions and the level of activity on the airfield, officials take pains to suppress noise and minimize the impact on the local community.

Quiet hours are strictly enforced, and only rarely are operators permitted to take off or land between 10 p.m. and 6 a.m.

Instead of taxiing, aircraft are towed to minimize noise; service aprons 5 and 6—the two closest to Kadena town—are kept empty.

Even routine takeoffs and landings are planned to reduce noise, with early morning departures oriented toward the water rather than populated areas.

Tensions have been high since before the US and Japan signed a bilateral agreement in 1996 to reduce the US military presence on Okinawa. The reduction has been slow.

A plan to close Marine Corps Air Station Futenma and move it from a heavily populated area south of Kadena to a more sparsely populated area in the northern part of the island continues to face stiff opposition, including from Okinawa's new governor, Denny Tamaki, who has been steadfast in his opposition to the US military presence.

Many bases on the island see regular protests, as Okinawans complain about aircraft noise, accidents, and violent crimes committed by US troops. Frequent radio commercials remind US troops that they are guests in a foreign country and that their actions have consequences.

Not so well-known, Cunningham says, is "how incredible the community here is on Okinawa."

"I can't overemphasize enough the importance and the strength of the alliance that we have here with the Japan Self-Defense Force and our responsibilities," he said.

"They're amazing friends, they're amazing allies ... and we work to continue what is already a strong relationship. We work to continue to strengthen that every single day," said Cunningham.

Jennifer Hlad is a freelance journalist based in Okinawa, Japan, and a former *Air Force Magazine* senior editor.

Photos: A1C Greg Erwin; SrA. Omari Bernard

By John A. Tirpak, Editorial Director

Boeing's T-X trainer won the competition for USAF's jet trainer with a $9.2 billion bid.

Winning T-X, Boeing Runs the Table

OCT. 5, 2018—

With a trio of recent big-ticket contract wins, Boeing is back in the small military-aircraft game—but with bids so far below cost estimates that competitors are scrambling to figure out if the company low-balled its offers—as it did with the KC-46 tanker—or really does have some new manufacturing magic up its sleeve. The big one was the T-X advanced trainer contract, which the Air Force estimated at about $16 billion, but which Boeing and its partner, Saab of Sweden, won with a $9.2 billion bid. That's nearly $10 billion below estimates of just a few years ago. In fact, the actual total could be considerably less.

The Air Force also tapped Boeing to build the UH-1N helicopter replacement to support missile fields and ferry around VIPs. Offering the Leonardo MH-139, Boeing got the contract for $2.38 billion—some $1.7 billion less than USAF was expecting to pay for up to 84 helicopters.

Boeing had already scored a Navy deal to build an unmanned carrier-based aerial tanker, the MQ-25 Stingray. Valued at around $13 billion, that deal is for 72 airplanes.

Collectively, Boeing won up to $25 billion worth of new military aircraft business in the last weeks of the fiscal year—beating out principal competitor Lockheed Martin.

As a result, Boeing's St. Louis facilities, where its F-15 and F/A-18 work is winding down, will remain open and the company will retain design and engineering talent specializing in small military aircraft. Boeing will thus remain a viable contender for future competitions, such as the Air Force and Navy's next-generation air dominance combat aircraft.

During the T-X competition, all the competitors acknowledged that the trainer competition would come down to a "low-price shootout." Margins were so low that Northrop Grumman CEO Wes Bush pulled his company out of the race to concentrate on projects where "best value," rather than price, was key.

But in selecting the Boeing-Saab offer for T-X, Air Force acquisition chief Will Roper insisted that "best value" was indeed the discriminator. He noted that the $9.2 billion total would cover as many as 475 aircraft, while the Air Force requirement remains just 351 airplanes. Because the Air Force wants to "go faster" in some years when its budget will allow it to buy more T-Xs, the contract was structured to allow some larger nonconsecutive lots.

Asked how the Air Force can be confident that Boeing will perform, given the fact that it has already eaten nearly $3.5 billion in losses on the fixed-price KC-46 tanker program, Roper said "every program is different" and is weighed "on the merits of the proposal."

Roper chalked up the exceptionally low bid to "early dialogue" between the Air Force and industry to make sure competitors were "exactly" clear on what the service wanted most, and what it would and wouldn't pay extra to get.

"What you're seeing is the benefit of fierce competition," Roper said.

Asked if Boeing's "Black Diamond" proprietary manufacturing technology—touted as eliminating vast amounts of touch labor and rework—clinched the deal, USAF top uniformed acquisition official Lt. Gen. W. Arnold Bunch Jr. said "we won't speculate on how industry did it."

Roper allowed that the Air Force is required to apply "historical" cost estimation techniques in developing its expected should-cost

on a program like the T-X, but said the competition was structured to allow for new techniques that could drive prices lower. Industry tends to "look ahead" to new technologies, he noted—but he didn't explain what convinced the Air Force that Boeing could deliver at that price.

Darryl W. Davis, former head of Boeing's Phantom Works advanced development shop—which designed the T-X—said at the aircraft's St. Louis rollout in 2016 that the jet had been "tailored" specifically to the Air Force's stated requirements. Davis said the jet was designed with minimal performance margins, and only in those parts of the envelope where the Air Force would give extra credit for them.

Lockheed Martin—considered the other leading T-X contender—offered an improvement on the T-50 trainer it designed and built with Korean Aerospace Industries. Boeing was the only major airframe house to offer a clean-sheet design.

Coincidentally, the T-X award was announced just a week before a major interagency, interdepartmental study of the defense industrial base was released by the White House. The report noted that the number of companies in several key industries is dwindling, hurting competition and restraining innovation. Boeing had made it known the St. Louis operation was in peril without a T-X win.

Roper and Bunch denied such considerations played a role in the T-X decision.

The Air Force said it was not yet sure what nomenclature would be applied to the new airplane. The first squadron of aircraft for evaluation is due by 2023, and initial operational capability should follow in 2024.

NUKES ARE NEXT

The awarding of T-X means most of the Air Force's major acquisition programs are now in place, with contractors selected and development underway. What's next? USAF must execute the programs under contract as efficiently as possible before gearing up for a new round of modernization in the mid-2020s.

Back in 2011, the Air Force identified its top three procurement programs—the B-21, F-35, and KC-46—saying it was willing to trade people, operations, maintenance, and other programs to keep them on track. All three were deemed "existential" to the service's future. Northrop Grumman, Lockheed Martin, and Boeing, respectively, are the prime contractors on those programs.

Later, USAF added a second tier of must-have programs: replacement for the E-8 Joint STARS, T-X, a new Combat Search and Rescue Helicopter, and the UH-1N replacement. The Presidential Aircraft Replacement program—a new Air Force One—rounded out the top eight.

The Air Force set apart replacements for the venerable Minuteman ICBM and AGM-86 Air-Launched Cruise Missile; programs now known as the Ground Based Strategic Deterrent and Long-Range Stand-Off missile, respectively. Under then-Secretary Deborah Lee James, the Air Force suggested that, given its heavy load of required conventional renewal, modernizing its two legs of the strategic nuclear Triad might be something Congress should consider separately, with a dedicated and segregated funding stream. The idea went nowhere, even though the Navy secured such an arrangement for its Trident nuclear submarine program. Those programs are now the Air Force's top acquisition priorities.

Lockheed Martin-Sikorsky got the CSAR helicopter contract and Boeing took home the Air Force One contract. The Air Force has now officially canceled the Joint STARS replacement in favor of a still-undefined "network"' approach with no central platform.

Focus will now shift to the nuclear projects. Boeing and Northrop Grumman are the designated finalists for the Minuteman replacement, and one will be chosen in 2020 to develop and build the missiles for deployment in the late 2020s. Lockheed Martin and Raytheon are duking it out to provide the LRSO. A winner will be chosen in 2022.

Under Pentagon pressure, the Air Force is also pushing hard on several hypersonic missile programs in the near-term. Roper has said flight tests of the Hypersonic Conventional Strike Weapon (HCSW) will take place next year and that his intent is to get some kind of first-version hypersonic capability fielded quickly, within the next two years or so.

Lockheed Martin has much of the hypersonics work under various research and development contracts, although Raytheon is also involved, and Northrop Grumman has hinted that it has hypersonic projects in the pipeline, as well. Boeing, which built the X-51 demonstrator that first sustained air-breathing hypersonic speeds, is at least pursuing the field with independently funded projects.

Into the mid-2020s, the Air Force's headline program will be the Next Generation Air Dominance system. Bunch and Roper told reporters at the AFA symposium in September that the NGAD is still in the experimental and investigative prototyping stage, as USAF examines a variety of solutions that will in all likelihood wind up not being a single aircraft like the F-22, but a "portfolio" approach, or "family of systems."

Citing his previous work at the Strategic Capabilities Office, Roper said quick solutions typically "start with what you have." Air Force leaders have said unequivocally that the threat from peer competitors in the 2030 time frame will mean the F-22 and F-35 must be supplemented with new capabilities. That could be a new airplane, new air-to-air missiles, cyber weapons, unmanned "wingmen," directed energy, something else or "all of the above," but to be operational in 2030, a program will have to get underway soon.

The Air Force has also begun to realize that its big-wing intelligence, surveillance, and reconnaissance aircraft—such as the E-3 AWACS and RC-135 Rivet Joint—are becoming too tempting and too vulnerable as targets in a battlespace where adversary missiles are increasingly smart and long-ranged. The Joint STARS cancellation is the first official acknowledgement of this reality, and the service will likely seek network-style successors for the other platforms as well. Decisions about whether to sustain such programs will come to a head in the mid-2020s, when USAF will have to decide whether to invest in major service life extensions for those aircraft or pursue something new.

Likewise, USAF knows that it has an Achilles' heel in its dependency on large aerial tankers. Its ability to project power depends on tankers to extend the range of its smaller combat aircraft, and the tankers, too, are a tempting target with limited capabilities in self-protection.

The service's strategy of recapitalizing its KC-135 and KC-10 tankers with KC-46s and a "still to be determined" platform seem now to be leaning toward a stealthy tanker that can actually accompany strike aircraft into enemy-defended airspace. That airplane, too, will be needed in the 2030-2035 time frame, so a contract would have to be awarded in the mid-2020s to have something ready in time.

Finally, the Air Force knows that its fleet of MQ-9 Reaper hunter-killer remotely piloted aircraft can't survive a battlespace defended by a peer adversary. Service leaders acknowledge a stealthy successor is needed but have been mum about plans, suggesting one may already be in the works. The RQ-170 Sentinel is such an aircraft, but industry officials have said only a handful were produced. They were intended to be special mission aircraft rather than comprising operational fleets. ✪

Photo: Office of the Secretary of the Air Force

verbatim@afa.org
By Robert S. Dudney

Scams and Non-Scams

"Since the 1990s, countries have reported 18 seizures of weapon-usable nuclear material in various quantities. This included several seizures of highly enriched uranium in Georgia and Moldova in the 2000s. On at least a couple of occasions, Chechen groups in Russia ... have also tried to employ 'dirty bombs,' though so far unsuccessfully. ... We cannot be sure how much R/N [radiological/nuclear] material is already out there on the black market. There are a great many nuclear material scams out there, but not everything is a scam, and there have been enough real cases to make clear that we must take this challenge very seriously indeed."**—Asst. Secretary of State Christopher A. Ford, International Security and Nonproliferation, speech to a nuclear security conference published on Oct. 1.**

Mephistopheles Speaketh

"According to the mullahs in Tehran, we are 'the Great Satan,' 'Lord of the Underworld,' 'Master of the Raging Inferno.' So, I might imagine they would take me seriously when I assure them today: If you cross us, our allies, or our partners; if you harm our citizens; if you continue to lie, cheat, and deceive. ... Yes, there will indeed be hell to pay."**—John Bolton, President Donald J. Trump's national security adviser, prepared remarks for delivery to the group United Against Nuclear Iran, Sept. 25.**

Time's Up

"Russia must return to compliance with the INF Treaty or the US will need to respond to its cavalier disregard of the treaty's specific limits. Make no mistake: The current situation, with Russia in blatant violation of this treaty, is untenable. ... We are trying to bring them back into compliance. Now is the time. It's gone on long enough."**—Secretary of Defense James Mattis, prepared remarks to reporters in Brussels, Oct. 4. He referred to Moscow's pursuit of a new cruise missile banned by the 1987 Intermediate-Range Nuclear Forces Treaty.**

First Things First?

"Hey, let's get the five services that we currently have back to readiness levels that the American people think we should have. ... Nobody thinks we're at the readiness levels that we should be. Then, once we get there, then we can talk about the Space Force."**—Sen. Dan Sullivan (R-Alaska), Senate Armed Services Committee member and critic of the concept of building a separate US space service, washingtonexaminer.com, Oct. 1.**

Last Things First?

"I think that, if there were a US Space Command like there used to be, it would obviate the need for [an independent] Space Force. When you have one command focused on that area, I think it brings a focus to it that's important. I think the investment to re-establish US Space Command makes a lot of sense."**—Retired USAF Gen. Richard B. Myers, former Commander of US Space Command (1998-2000) and later Chairman of the Joint Chiefs of Staff (2001-05), interview with Aerospace America, Sept. 25.**

Barriers Are Eroding

"When Iran fires a ballistic missile from its homeland against a target in a foreign country, this means that Iran is not afraid of the prospects of retaliation, and has probably calculated that it will be safe. So we are going to a point in the Middle East, very quickly, where the threshold for Iran's use of force is continuing to drop, as the accuracy of Iran's missiles is continuing to grow."**—Iran expert Behnam Ben Taleblu, commenting on Iran's Oct. 1 missile strike into Syria, voanews.com, Oct. 2.**

No Verdict

"It [women in infantry] is a very, very tough issue. ... We have Army, Navy, Marines, all looking at it as we speak. ... The close-quarters fight being what it is, ... is it a strength or a weakness to have women in that circumstance? ... So few women have signed up along these lines, we don't even have data at this time.—Clearly the jury is out on it."**—Secretary of Defense James Mattis, remarks at Virginia Military Institute, in response to a cadet's question about the wisdom of having women serve in infantry units, Sept. 25.**

No Kidding!

"Particularly concerning is the prospect of an authoritarian country, such as Russia or China, overtaking the United States in AI [artificial intelligence]. ... In general, authoritarian regimes like Russia and China have not been focused on the ethical implications of AI in warfare and will likely not have guidelines against more bellicose uses of AI, such as in autonomous weapons systems."**—From "Rise of the Machines," a study of AI by Rep. Will Hurd (R-Tex.) and Rep. Robin Kelly (D-Ill.), published Sept. 25.**

The Bear in the Water

"Russia has renewed its capabilities in the North Atlantic and the Arctic, in places not seen since the Cold War. For example, Russian forces have recently reoccupied seven for their former Soviet Union bases [north of] the Arctic Circle. The improved capability of Russia to be able to project power into this region—and these strategic routes from the Arctic into the North Atlantic and the GIUK [Greenland-Iceland-UK] Gap—is something that we need to pay particular attention to. We know that Russian submarines are in the Atlantic, testing our defenses, challenging our command of the seas, and preparing a very complex underwater battlespace to try to give them an edge in any future conflict. We need to deny them that edge. ... [R]ussia's actions and capabilities increased in alarming and sometimes confrontational ways."**—Adm. James G. Foggo III, head of US Naval Forces in Europe, quoted in usni.org, Oct. 3.**

The Fly in the Ointment

"We are in Syria [to fight ISIS]. ... What we want to do is make certain that ISIS does not come back. ... Getting rid of the caliphate doesn't mean you then blindly say, 'OK, we got rid of it,' march out. ... As part of this overarching problem, we have to address Iran. Everywhere you go in the Middle East, where there's instability, you will find Iran."**—Secretary of Defense James Mattis, remarks to reporters about when US forces might be able to leave Syria, Sept. 24**

Chilly War

"What [the Chinese] are waging against us is, fundamentally, a cold war—a cold war not like we saw during the Cold War, but a cold war by definition. [China is] a country that exploits all avenues of power—licit and illicit, public and private, economic and military—to undermine the standing of [its] rival, relative to its own standing, without resorting to conflict."**—Michael Collins, deputy assistant director of CIA East Asia and Pacific Mission Center, quoted in *Stars and Stripes,* Oct. 2.**

UNLIMITED REINVENTED

30+ LIVE TV CHANNELS

PLUS THE PREMIUM SERVICE OF YOUR CHOICE

WHEN YOU SELECT THE UNLIMITED &MORE℠ PREMIUM PLAN:

HBO® CINEMAX® SHOWTIME® STARZ® VRV amazon music UNLIMITED pandora PREMIUM

VISIT YOUR LOCAL AT&T STORE & BRING IN ONE OF THE FOLLOWING:

- Valid military ID, retired military ID or current AMVETS membership card
- A Dept. of Defense Form DD214 indicating an honorable discharge
- Military pay stub less than 60 days old
- A veteran-designated driver's license or Veteran Health Insurance card
- Qualified spouses of active duty or deceased Military service personnel providing a valid Dept. of Defense sponsorship card

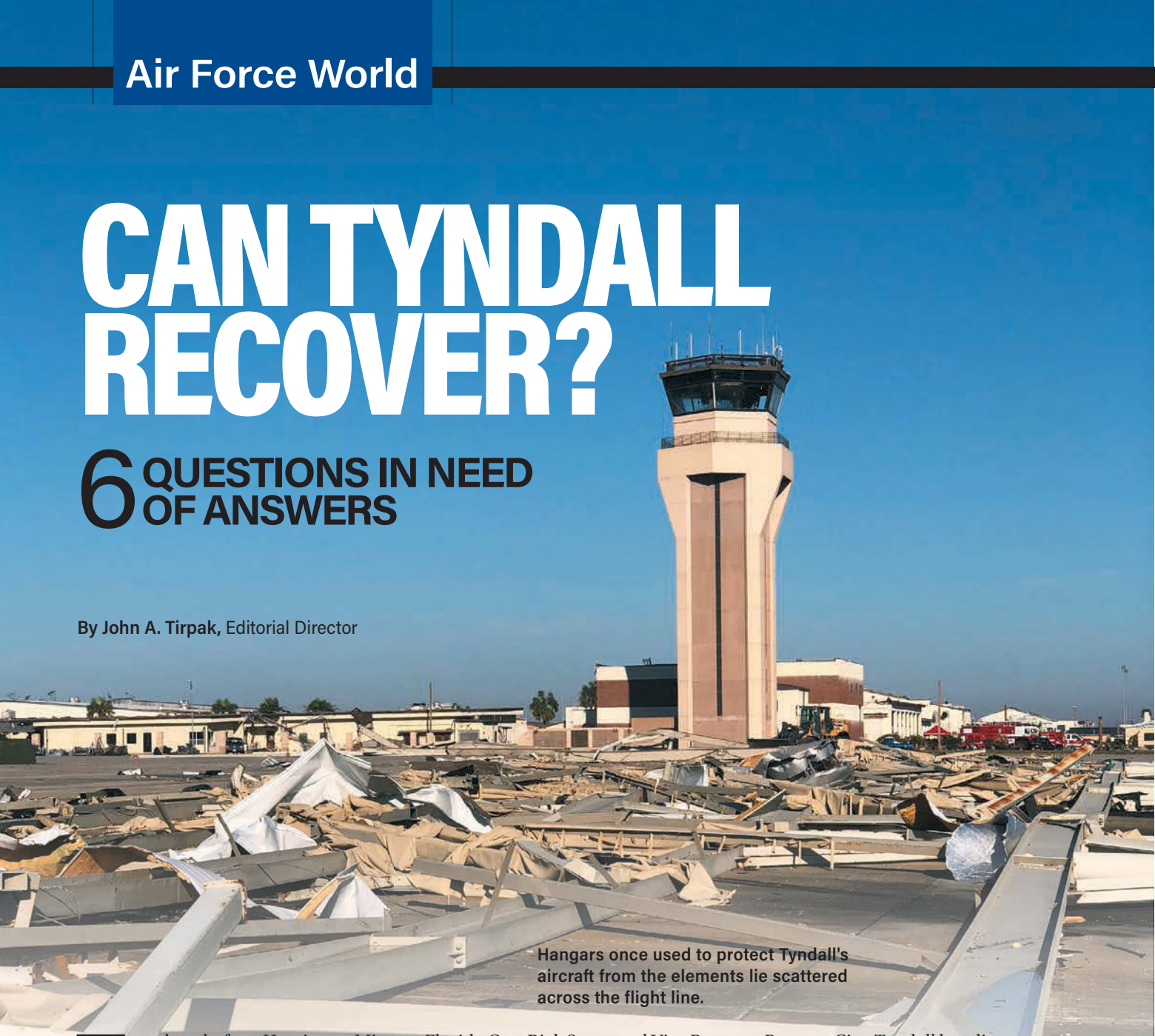
MILITARY DISCOUNT OFFER: Eligibility: Avail. to: (i) active U.S. military service personnel providing a valid military ID or current paystub; (ii) qualified U.S. military veterans providing either a Department of Defense Form DD214 indicating an honorable discharge, or a valid retired Military ID or current AMVETS membership card; and (iii) qualified spouses of active duty or deceased U.S. military service personnel providing a valid Department of Defense sponsorship card. Must provide proof of eligibility. Available only in select locations/channels. For internet or video credit, address on wireless bill must match address on video and/or internet bill & primary wireless acct. holder name must match that of elig. military member, qualified military veteran, or qualified spouse of active duty or deceased military service personnel. Customers accepting offer certify they are permitted to under applicable law. Eligibility is subject to annual recertifications for Military discount offers. **Exclusions**: Offer may not be combined by customers: (i) receiving any free internet offer, (ii) receiving a $20 off internet promotion or (iii) receiving $25/mo. video loyalty credit. Other restr's may apply. Not be combinable w/ other select offers or promotions. **Credits/Discounts:** Start w/in 3 bill cycles after svc. activation & eligibility confirmed. One-time catch-up credit applied for the time since customer met offer requirements to time video/internet credit begins, which does not change taxes. **25% off Wireless svc. discount**: Req's qualifying AT&T Unlimited &More plan. Discount applied after the application of any available Autopay, paperless bill or Multi-line discount. **On AT&T Unlimited &More plan, for all data usage, AT&T may temporarily slow data speeds during times of network congestion. On AT&T Unlimited &More Premium plan, after 22GB of data usage on a line in a bill cycle, for the remainder of the cycle, AT&T may temporarily slow data speeds on that line during times of network congestion.** For pricing & details of plans, see www.att.com/unlimited. **$15 off Video svc**: Req's elig. satellite residential DIRECTV or U-verse TV or DIRECTV NOW pkgs. (credit not applicable to DIRECTV NOW packages less than $40/mo.). Must have both qualified wireless plan (above) & elig. video svc. ordered on or before promo ends for $15/mo. credit. Customers w/ complimentary video service won't get $15 video credit until complimentary period expires. **$15 off Internet svc**: Req's elig. residential internet svc. Must have both qualified wireless plan (above) & elig. internet svc. ordered on or before promo ends for $15/mo. credit. **Limits**: 1 credit per each elig. svc. Not stackable w/other offers, credits or discounts. For Military personnel w/ two or more qualifying video svcs., AT&T may pick acct. credits apply towards. **If you become ineligible or move from qualified svcs, you lose applicable discounts.** AT&T reserves right to discontinue offer in select jurisdictions at any time in AT&T's sole discretion. Offer not made as a solicitation of business from governmental agencies.
Offers, programming, pricing, channels, terms & restr's subject to change & may be modified or terminated at any time without notice.

GEN. WIRELESS: Subj. to Wireless Customer Agmt at att.com/wca. Svc not for resale. **Deposit**: Service deposit may apply. **Limits**: Purchase & line limits apply. Credit approval, activation (up to $45/line) and other fees, advanced payments and other charges apply. **Other Monthly Charges/Line**: May include taxes, fed. & state universal svc charges, Reg. Cost Recovery Charge (up to $1.25), gross receipts surcharge, Admin. Fee, & other gov't assessments which are not gov't req'd charges. See your plan details and att.com/additionalcharges for details on fees & charges. Coverage & svc not avail. everywhere. You get an off-net (roaming) usage allowance for each svc. If you exceed the allowance, your svc(s) may be restricted or terminated. International and domestic off-net data may be at 2G speeds. Other restr's apply & may result in svc termination. AT&T svc is subject to AT&T network management policies, see att.com/broadbandinfo for details.

CAN TYNDALL RECOVER?

6 QUESTIONS IN NEED OF ANSWERS

By John A. Tirpak, Editorial Director



Hangars once used to protect Tyndall's aircraft from the elements lie scattered across the flight line.

Two days before Hurricane Michael pummeled the Florida panhandle with 150-mph winds, it was still just a tropical storm. The biggest threat then seemed to be the potential for a storm surge and flooding.

Then the forecast worsened. The 325th Fighter Wing commander, Col. Brian S. Laidlaw evacuated the base, dispatching most of its aircraft and all but 90 base personnel, who weathered the storm in the base's most hardened structures. When it was over, even those buildings were damaged, and 95 percent of Tyndall's 1,300 structures were severely damaged or destroyed.

Now comes the hard part: Deciding what to do next.

Almost instantly, local politicians, Florida Gov. Rick Scott, and Vice President Mike Pence all pledged Tyndall would be rebuilt. But whether Tyndall will ever be a fully functional military base again or some shadow of its former self—as was the case after Hurricane Andrew destroyed Homestead Air Force Base in southern Florida in 1992—is still unknown.

Before that future can be determined, six questions must be resolved.

1 WHAT'S AT STAKE?

Tyndall has "probably a $2.5 billion-a-year economic impact," according to Florida Gov. Rick Scott, and is responsible, in one way or another, "for 20,000 jobs."

Sitting on an 14.5-square-mile peninsula of coastal flatland due south of Panama City, Tyndall has direct access to valuable and expansive military training ranges, ample runway for its training F-22s, purpose-built F-22 simulators, and a separate runway for target drones.

Total damage could top $3.4 billion, based on the estimated replacement value in a 2018 Florida Economic Impact Study. Damage to aircraft was also severe: 17 F-22s were not ready to evacuate when the call came and had to be left behind. Many were damaged—but not so badly they couldn't be repaired and flown off under their own power, over the weeks that followed. By Oct. 30, all but two had flown to JB Langley-Eustis, Va. Other aircraft were also damaged. Their repair costs had not been estimated by early November, but

could easily run into tens of millions of dollars.

Tyndall is home to the schoolhouse for F-22 Raptor pilots; an operational Raptor squadron; Air Operations Center; and extensive USAF air-to-air weapons testing and training, hosting QF-16s and other types of target drones and T-38 trainers that serve as adversaries for F-22s.

2 SHOULD TYNDALL BE REBUILT?

Some argue the Air Force already has more base infrastructure than it can afford and that closing additional bases would benefit the service and the nation.

A 2016 Defense Department study that found the Air Force had 32 percent more basing capacity than it needs. Consolidating to fewer installations would save billions if Congress would permit another round of base closures. But lawmakers never warmed to the Base Realignment and Closure process, which is designed to minimize the influence of individual congressmen and also costs votes back home.

Congress rejected that report, countering that closures could preclude future expansion plans if the Air Force needed to grow. Indeed, just weeks before Tyndall was leveled, the Air Force rolled out an ambitious vision to grow the force by 24 percent by 2030, reaching 386 operational squadrons in order to meet the demands of the National Security Strategy.

Yet, will Hurricane Michael make a decision for the Air Force and Congress that was otherwise untenable? Should Tyndall be abandoned?

Hurricane Michael made landfall as a catastrophic Category 4 in the afternoon of Oct. 10. The storm virtually demolished the base, causing significant structural damage to the majority of the base and surrounding areas.

Retired Gen. Herbert J. "Hawk" Carlisle, who headed Air Combat Command from 2014 to 2017 and is now president of the National Defense Industrial Association, says no. The Air Force may have bases it doesn't need, but Tyndall isn't one of them.

"There are too many attributes to that base and that area," Carlisle said in an October interview. "It's one of the places we need. So I don't see this as nature doing us a favor."

Retired Gen. Gilmary "Mike" Hostage, another former ACC commander, said Tyndall is a unique asset that can't be duplicated elsewhere.

"Tyndall is in an excellent location for us, right on the edge of the Gulf" of Mexico, where the training range lets Raptor pilot trainees fly at supersonic speeds, Hostage said, and missile tests can target unpiloted drones, because there is "relatively little populace around." The open airspace, even though it is shared with Eglin and Hurlburt, gives new F-22 pilots maneuver room to make mistakes without major risks, Hostage said.

"It would be very hard to move the F-22 training location," Hostage said. "Plus, the simulator infrastructure that's already established there would be expensive to replicate somewhere else."

Tyndall has eight full-motion simulators—formidable physical structures anchored to their concrete floors with elaborate electronic and hydraulic support. Initial reports from the base suggest the simulator facility was one of the few that took only minor damage in the storm. No other F-22 base boasts as many simulators.

As for the target drone operation, "there's really nowhere else to put it," Hostage asserted. Targets hit with live missiles fall into the sea, minimizing the risk of debris falling on people or property.

One mission that could go elsewhere, however, is the AOC, which is responsible for the air defense of the United State homeland. In fact, that mission was quickly moved to an undisclosed location, US Northern Command chief Gen. Terrence J. O'Shaughnessy said during an Oct. 10 press conference. "We have other nodes in other places where we can actually do the same command and control mission set and, seamlessly, transition."

Air Force Secretary Heather Wilson promised the Tyndall AOC and its staff of 800 will be back in business by Jan. 1, 2019.

John Henderson (l), the Assistant Secretary of the Air Force for Installations, Environment, and Energy, and Secretary of the Air Force Heather Wilson survey the aftermath of Hurricane Michael from a CV-22.

3 WILL TYNDALL EVER BE THE SAME?

Near the end of his tenure at ACC, Carlisle said the Air Force studied bases and what they might look like

Photos: Staff Sgt. Alexander Henninger; SrA. Joseph Pick; SSgt. Ryan Conroy

An airman takes notes on the destruction at Tyndall Oct. 14. Special tactics airmen had a runway open for business shortly after 7 p.m. Oct. 11, the day after the devastating storm.

in the future, in terms of amenities and support.

A base can be self-contained, "like the old days and the way it is today," he said, "where the base includes all the work infrastructure—the runways, hangars, office space, the simulators," as well as a base exchange, commissary, bowling alley, golf course, restaurants and housing. Or it coud be minimized, where the Air Force provides a work facility but all those other things are "available right off base, so we don't have to pay for that."

An in-between approach called for "some housing and ... more sought-after facilities for family childcare, things like that," he said, while still not trying to replicate services available outside the gate.

While Tyndall is not geographically far from nearby Hurlburt or Eglin Air Force Base, the 90-minute travel time is not workable for routine commuting. "That's a pretty long drive," he said, though "people do it."

The full complement of airmen and families at Tyndall was about 11,000 people. For now, at least, F-22 training is temporarily reassigned to Eglin, and a tent city has sprung up amid Tyndall's rubble, housing 1,300 construction and recovery airmen on what is effectively an expeditionary site.

Vice President Pence said the objective of the administration is "that the families that serve here are able to return here as quickly as possible," and that with the support of local congressional representatives, "we'll have the resources to rebuild Tyndall."

Sen. Bill Nelson (D), who was running for a fourth term, insisted Oct. 16 that Tyndall would not suffer the fate of Homestead Air Force Base, which was destroyed by Hurricane Andrew in 1992. Once slated for closure, Homestead eventually was rebuilt as a Reserve base, regaining about 80 percent of its former capabilities, Nelson noted.

But Tyndall, he said, is even more valuable, "critically located next to one of our greatest assets,"—the Gulf test and training range. A member of the Senate Armed Services Committee, he said Tyndall must be "rebuilt as a modern Air Force facility."

Rep. Neal Dunn (R), whose district encompasses Tyndall, said in a statement that the storm's destruction represents "an opportunity for us to plan for the future and build a base that fulfills the future needs of our airmen, whether that be state-of-the-art drone-ready simulation buildings" or modern hangars with up-to-date technology. "We will rebuild and come back better than ever," he said.

Nelson, Dunn, and Sen. Marco Rubio (R) said in a joint letter to Wilson they are committed to funding the base's reconstruction, and they followed with a letter to President Donald J. Trump saying it is "imperative" the base be repaired "as quickly as possible ... to protect and promote US national security interests."

Tyndall could potentially be converted to an "expeditionary" base. But Hostage said slimming it down probably wouldn't save too much money in the long run. Reducing the mission or footprint at Tyndall might be perceived as weakening the base's chances in future BRAC processes, and Florida's delegation would fight against such a move.

Utimately, the only way to save large amounts of money is to close something down completely, he said. Facilities not rebuilt at Tyndall would have to be built at a neighboring base, "so, once I clean off the debris at Tyndall, why wouldn't I put it right back where it was?" Taking "a little bit away ... isn't going to save anybody anything."

Closing Tyndall and turning it over to the local community would also incur cleanup and remediation costs, Hostage said. "My guess is that there's things lurking that would cause us all kind of remediation issues before we could turn it over to civilians."

4 CAN BASES BE STORM PROOF?

Michael was the fourth major hurricane to make landfall in the US in less than two years and the second within a month. Coming on the heels of many other "once-in-100-years storms," hardening coastal bases is of significant concern.

Hostage said there are both physical risks and probabilities to consider. True, he said, a billion dollars' worth of Raptors—USAF's most capable and short-stocked fighter—might have been destroyed when they were left inside hangars that were never intended to withstand a Category 5 storm.

But investing in hardened facilities that can withstand 150 mph winds is a bet on the weather. "You're spending a lot of money on a very miniscule probability," Hostage said. "How frequently would I have to take a hit to justify spending the money to save a $300 million airplane?"

Few existing hangars were "meant to withstand the strength of the hurricane that hit [Tyndall], even though they had hurricanes like that back in the day," Hostage said. The engineering understanding, standards, and codes to build stronger structures didn't exist then, he said.

Today, that's different. The Air Force will not "replace flimsy buildings with flimsy buildings," Hostage insisted. "If all we did was rebuild ... to modern code," Hostage said, "that would represent a significant improvement" in the base's resiliency to storms.

"We wouldn't be allowed to put up sheet metal-sided buildings with wooden frames" today, he said. "It wouldn't meet any kind of code."

Modern code calls for burying power, telephone, and fiber-optic lines and steel straps to help hold roof trusses to structures—and structures to foundations.

Too much of the Air Force's infrastructure is aging, and replacement and upgrade plans aren't keeping up with the need. "Our buildings are on a 100-plus year refit and refurbish schedule," Hostage said. "Our vehicles are on a 100-year schedule. And that's really absurd."

Hostage said it might be worth building some aircraft revetments in

the US similar to those USAF has in Europe, the Middle East, or at Kadena AB, Japan—facilities really intended to protect aircraft from missile attack, but which would be equally useful in guarding against ravaging storms.

Rebuilding might not be limited to above ground structures. Modern commercial airports have eliminated fuel trucks, for example. "They bury all the fuel lines in the ramp so that all they do is move a small pump around to refuel the airliners. They don't drive fuel trucks around."

"The problem is, I have to have fuel trucks," Hostage said. The Air Force must remain expeditionary, able to pick up and operate anywhere, anytime, without those amenities. "I have to have people trained to maintain [those trucks] and use them and drive them around, so that when I go to an expeditionary location, I can move fuel around."

So while burying fuel lines "makes good sense from a local standpoint," it may not be a full-fledged solution. Still, "I think that's one of the things we should look at," Hostage added.

Either way, the Air Force will never be able to afford to eliminate all risk, Carlisle said. "You've got to be judicious and [use] due diligence for what potential things can happen to you." At Tyndall, he said, the Air Force will certainly "use all those lessons learned over time and try to minimize the risk and only accept what we absolutely have to."

That includes considering what nature may dish out in the future. "The most probable natural disasters, he said, must "be part of the calculus as you plan and put money into those facilities."

5 WHAT DID WE LEARN?

Tyndall already had a detailed plan to evacuate its thousands of airmen, family members, and aircraft in the event of a major hurricane—and it worked. Chief of Staff Gen. David L. Goldfein said the plan was not only well thought out, but had been "exercised" in the recent past.

The proof of that it worked: No lives were lost. "Things can be replaced," he said. "People can't."

The Air Force took heavy criticism for having left so many aircraft behind. Some armchair generals opined that F-22s could have been loaded into C-5 Galaxies or driven out on flatbed trailers. But dismantling aircraft is not an overnight job. The bigger issue: Ongoing maintenance problems and parts' shortages. With a mission-capable rate under 50 percent, it was arguably a triumph that so many F-22s did make it out—and so few had to be left behind.

"You're never going to get 100 percent of your airframes," Hostage said. "There's always some airplanes that are non-flyable. So we put them in the sturdiest of hangars, put them in the sections of the hangars that are least likely to fall down. But when the hurricane scores a bull's-eye, there's only so much protection you can do."

6 WILL CONGRESS PAY?

Saving Tyndall is not a question for the Air Force alone. Service leaders will get a vote, but the real battle will take place in Congress.

"Politics is politics," Carlisle said. While the Florida congressional delegation will lobby for the funds, rival priorities both inside and outside the Department of Defense are also vying for funds. Tyndall will not return to form without supplemental appropriation.

The biggest source of funds will "be some help from money outside the defense budget," Carlisle predicted. "Then I think there will be, as there is all the time, unexecutable programs that haven't been on track." The Pentagon can divert funding from those to more pressing needs like those at Tyndall.

It will have to be, Hostage said. "If you don't get money to fix Tyndall over and above the current budget ... maybe we find a different place to do business and close it."

The magnitude of the task can't be appreciated unless lawmakers make the trip and see the scope of the damage themselves.

It's not just a matter of rebuilding. It's also a matter of taking care of people, he said. "How do you reintegrate all those families that have been devastated, all those homes? All the base housing has been pretty much destroyed. ... How do you rebuild their lives, while trying to get that mission back up to 100 percent as soon as possible?"

The Air Force "can't be made to pull it out of hide," Hostage said. "I'm very worried that somebody is going to suggest that they do" and leave the Air Force to "limp along trying to Band-Aid things while hoping that someone will finally give the funding to do it right."

It will take at least a year to sort all that out and know what the future holds, Hostage said. Tyndall will hang in the balance at least that long. For now, the questions are clear. Answers will come only in time. ✪

Tyndall's Operational Units: Status Update

- **601st Air Force Operations Center:** Resume operations no later than Jan. 1, 2019
- **337th Air Control Squadron:** Resume air battle manager training by Jan. 1, 2019 (limited); full production by summer 2019
- **2nd and 43rd Fighter Squadrons:** F-22 and T-38 aircraft will relocate to Eglin AFB; pilots will use F-22 simulators at Tyndall
- **372rd Training Squadron, Det. 4:** Will relocate to Eglin AFB
- **53rd Air-to-Air Weapons Evaluation Group:** Staying at Tyndall
- **823rd RED HORSE Squadron, Det. 1:** Staying at Tyndall
- **Air Force Civil Engineer Center:** Staying at Tyndall
- **Air Force Medical Agency Support team:** Staying at Tyndall
- **Air Force Office of Special Investigations and the Air Force Legal Operations Agency:** Staying at Tyndall
- **95th Fighter Squadron:** 21 F-22 aircraft and associated personnel will be split temporarily divided up among JB Langley-Eustis, Va.; JB Elmendorf-Richardson, Alaska; and JB Pearl Harbor-Hickam, Hawaii
- **Noncommissioned Officer Academy:** Will temporarily disperse among McGhee-Tyson ANGB, Tenn.; Maxwell AFB—Gunter Annex, Ala.; Keesler AFB, Miss.; and Sheppard AFB, Texas
- **MQ-9 Reaper:** A planned MQ-9 Reaper wing at Tyndall may have to be reconsidered

Photos: TSgt. Sandra Welch

UNWINDING THE MAINTAINER MESS

A problem years in the making continues—especially in the Guard and Reserve.

By Brian W. Everstine, Pentagon Editor

The Air Force finally fixed its maintainer shortage this year, closing a gap that had grown to 4,000—6 percent of requirements—as recently as two years ago.

Now the service needs to deal with the maintainer knowledge gap.

Getting back to a full complement of 67,000 maintainers is only the first leg in a years-long trek to solve the problem. That's because the shortfall was made up almost entirely by recruiting new maintainers, rather than retaining experienced mechanics—and also because major deficits persist in the Guard and Reserve.

As Fiscal 2018 ended, the Air Force was still 3,000 short of requirements for 5-level journeyman maintainers and 650 short for 7-level craftsmen. There is also a surplus of 2,900 among

SrA. Eric Hansard climbs into an F-35 at Westover ARB, Mass., in July. The new fleet of F-35s and the need to retrain people contributed to the maintainer shortage.

Maintainers stow a power cable on a C-17. Funding to grow the maintainer force was finally approved in 2017.

A1C Nathan Manzella (l) and SrA. Shayne Cole read a tech order at Moody AFB, Ga. Some hope digital technology will speed the learning curve.

3-level apprentice maintainers.

The result is an "experience gap" that will take years to solve. It takes more than a year for an apprentice to mature to journeyman, and years more to gain enough experience to be rated as a craftsman.

Addressing airmen at AFA's Air, Space & Cyber Conference, Air Force Secretary Heather Wilson said, "As a result of the actions all of you have taken, the Air Force is more ready for major combat operations today than we were two years ago." The Air Force, she said, is "moving the whole force to higher levels of readiness with actions that will play out over several years, but there are also steps that are making differences right now. We see them when we visit you."

"Airmen are hitting the flight line," said Air Force Chief of Staff Gen. David L. Goldfein in an interview last summer. "The challenge we have is, they're young."

CONTRIBUTING FACTORS

The causes of the maintainer shortage include funding inadequacies, the need to retrain maintainers as the F-35 entered the fleet, and Air Force plans that didn't work out.

Congressional inaction in 2013 led to sequestration, or automatic budget cuts, that hit the service hard. From 2004 to 2015, the service's Active Duty maintenance force shrank by 17,000 airmen, or 21 percent, bringing USAF maintenance levels to their lowest point in more than 20 years.

Meanwhile, the war against ISIS ramped up and USAF began deploying more airmen to Afghanistan. An aging fleet and the introduction of a whole new aircraft made everything worse.

The Air Force hired Lockheed Martin to provide much of its initial F-35 maintenance capability because its original plan to retire the A-10 and retrain its maintainers to service F-35s didn't pass muster in Congress.

It wasn't until 2017 that lawmakers finally came through with additional funding to grow the maintainer force. And while USAF has now made up the shortfall by recruiting more candidates and ramping up throughput at its maintenance schools, the long process of maturing that force still lies ahead.

However, the new airmen are becoming "more experienced every day," said Air Mobility Command boss Gen. Maryanne Miller, shortly after taking command in September. One of the first things she did was visit new airmen on AMC flight lines. While inexperience is a short-term problem, she said, she is excited by the prospect of new airmen, raised on technology, bringing new ideas to

Photos: SSgt. Peter Thompson; MSgt. Mark Olsen; A1C Eugene Oliver

Maintainers service an F-15 Eagle at Kadena AFB, Japan. As end strength suffered under sequestration, ops tempo boomed, and the maintainance field was hit hard.

solving old problems.

Miller said she encouraged young maintainers to offer innovative ideas for the command in the hope that not only will they offer new thinking, but that having been given that chance, they will feel more vested in the mission and more willing to stay in uniform.

ANG AND AFRC CHALLENGES

The maintainer shortage in the Guard and Reserve won't be solved as quickly.

The Guard was short 3,823 maintainers as of mid-October—some 15 percent of its total maintainer force. One major reason: The Active Duty controls the accessioning of their recruits and doubled their number of recruits to address its shortfall. The ripple effect has impacted the Guard.

"The Guard is dependent on the Active Duty for those same seats in basic training and their career training," said Air National Guard spokesman Capt. Matthew Murphy. "The Active Duty has also offered retention bonuses and other incentives to have maintainers serve longer. This reduces the recruiting pool for the Guard and Reserve because they are staying [on Active Duty] longer."

A1C Lisha West removes a panel on an A-10. Active Duty retention bonuses reduce the Guard and Reserve recruiting pool.

To make up the shortfall, the Guard has increased funding to pay for almost 1,300 full-time civilian maintainers and added second-shift maintenance at seven of its F-16 units.

Meanwhile, Air Force Reserve Command was shy about 1,400 maintainers in 2017 and still had more than 1,000 openings at the close of Fiscal 2018, according to Air Force Reserve chief Lt. Gen. Richard W. Scobee.

"We struggled with the maintainer piece because, as the economy improves, there are a lot of job opportunities out there," he said.

"We have to season our young airmen and get them to be craftsmen at their work," Wilson told the Senate Armed Services Readiness Subcommittee recently. "But at least now, we have enough people there to do the maintenance that needs to be done." ✪

Photo: Naoto Anazawa/USAF; A1C Eugene Oliver

■ Helo Struck Cable, Causing Fatal March Crash in Iraq

The HH-60G Pave Hawk that crashed in March, killing all seven on board, struck a galvanized steel cable, bringing it down onto the Iraqi desert, the Air Force announced.

The HH-60G, assigned to the 332nd Air Expeditionary Wing, was flying alongside another Pave Hawk during the night of March 15. The helicopter crews were tasked with prepositioning at a base that would bring them closer to an upcoming operation.

During the flight, the Pave Hawk overflew its intended destination because the aircraft's pilot misinterpreted aircraft navigation displays, according to an Air Combat Command Accident Investigation Board report recently released. As a result, the helicopter descended into an unplanned location and turned to avoid a tower, but struck an unseen 3/8-inch diameter galvanized steel cable that was strung horizontally between two 341-foot high towers.

The cable entangled itself in the HH-60G's main rotor assembly, resulting in "catastrophic damage and an unflyable condition." The aircraft was traveling so fast, the impact was not survivable and debris scattered a large area of the desert, according to the report.

The other Pave Hawk saw the light of the crash and circled back, calling for a quick-reaction force of pararescuemen in another HH-60G to secure the site.

An HH-60 Pave Hawk crew trains to provide personnel recovery operations and support. A USAF Pave Hawk operating in Ukraine catastrophically crashed after the pilot misinterpreted navigation displays.

The crash killed four airmen from the New York Air National Guard's 106th Rescue Wing: Capt. Christopher Zanetis, 37, an HH-60G pilot from Long Island City, N.Y.; Capt. Andreas O'Keeffe, 37, a Pave Hawk pilot from Center Moriches, N.Y.; MSgt. Christopher Raguso, 39, a resident of Commack, N.Y., an HH-60G special missions aviation flight engineer; and SSgt. Dashan Briggs, 30, a resident of Port Jefferson Station, N.Y., also an HH-60G special missions aviation flight engineer. Two of the airmen killed were Air Force Reserve pararescuemen from the 308th Rescue Squadron at Patrick AFB, Fla. They are MSgt. William Posch, 36, and SSgt. Carl Enis, 31. Also killed was Capt. Mark Weber, a combat rescue officer with the 38th Rescue Squadron at Moody AFB, Ga.

The helicopter, tail No. 92-6466, was completely destroyed at a loss of $49 million.

■ No KC-46 Delivery in October

The Air Force did not receive its first KC-46 in October as originally expected, while the program office and Boeing are still working to address five "category one" deficiencies that still need to be remedied, Gen. Maryanne Miller, the head of Air Mobility Command, said Oct. 26. The original deadline of 0ctober has passed, but Boeing said it still plans to deliver the aircraft by the end of the year.

Whither Pegasus? Boeing still plans on delivering aircraft by the end of this year.

■ Shanahan: Space Force Details Coming Soon

The Defense Department must submit its plan to Congress in December detailing what it thinks the new Space Force should look like and how much it will cost to create the service, said Deputy Defense Secretary Patrick Shanahan. He acknowledged the Air Force's estimate that it will cost $13 billion to establish the new service over the next five years, but he urged reporters to "put that number aside" and wait until details of the Fiscal 2020 budget are released.

When asked what the new service will look like, how the personnel will be transitioned, and whether there will be a Space Guard, for example, Shanahan said, "I don't know."

Photos: SSgt. Keither James; Christopher Okula/USAF; SMSgt. Chris Drudge

■ AETC Fires Three Commanders at Laughlin

Three commanders at a main flying training wing were fired after investigations into chronic leadership failures, Air Education and Training Command announced on Oct. 30.

Col. Charles Velino, commander of the 47th Flying Training Wing at Laughlin AFB, Texas, along with the operations group commander and a flying training squadron commander at the base were relieved by Air Education and Training Commander Lt. Gen. Steven Kwast after a review and recommendation from the commander of 19th Air Force, according to an AETC press release.

Col. Lee Gentile, formerly the commander of the 71st Flying Training Wing at Vance AFB, Okla., has assumed command of the wing.

"The prior command team chronically failed to appropriately care for people and the mission," Kwast said in the release. "They failed to correct an evolving situation that led to an environment where some airmen did not feel safe or respected."

AETC did not detail the specific actions, but stated that the commanders did not take appropriate steps to respond to, correct, and report incidents of officer misconduct. Some reports allege the incidents include a female pilot being given a vulgar name during a drinking ritual and another case involving a threat.

The command change comes as the Air Force's flying training wings face repeated incidents of hypoxia-related events and crashes involving T-6 and T-38 aircraft, including a November crash of a Talon from Laughlin that killed one pilot and injured another.

■ USAF Airlift Plan Calls for Increase in C-17s, Reduction in C-130s

Air Mobility Command is still trying to figure out exactly how it will increase the number of its C-17 squadrons while simultaneously looking to reduce the size of its C-130 fleet. The Air Force at AFA's Air, Space & Cyber Conference in September outlined its plan to grow the number of total squadrons to 386, which included a large increase for Air Mobility Command airlift and aerial refueling squadrons.

The "Air Force We Need" calls for more airlift, but only with C-17s. Specifically, the Air Force wants an increase of three C-17 squadrons, with a corresponding drop of two C-130J squadrons. USAF studies have shown the strategic airlifter is in higher demand for potential future conflicts than the tactical C-130, AMC boss Gen. Maryanne Miller told reporters previously. The plan is largely based on classified information, so the Air Force's reasoning for why it would need the larger C-17 isn't public. However, Air Mobility Command is finalizing a mobility capabilities study for its future needs, which is in coordination with the Pentagon and Congress and will be released in the near future.

The Air Force cannot, right now, say how any potential jump in the C-17 fleet would be possible because the Boeing production line for C-17s has closed. Those details "we have not looked at," and would be the focus of future discussions with Congress. The "Air Force We Need" plan is an "initial stage" to get the concept out there, and more in-depth discussions are forthcoming, Miller said.

■ California Guardsman Killed in Su-27 Crash

Lt. Col. Seth "Jethro" Nehring, 44, of Fresno, Calif., died Oct. 16 in an Su-27 crash during the Clear Sky 2018 exercise in Ukraine.

Nehring, a California Air National Guardsman, was assigned to the 194th Fighter Squadron, 144th Fighter Wing. He was deployed to Ukraine in support of the Clear Sky 2018 exercise, and he was riding in a single-aircraft familiarization flight with a Ukrainian pilot when the aircraft crashed at about 5 p.m. local time in the Khmelnytski region of Ukraine, according to statements from US Air Forces in Europe and the California governor's office.

"This is a sad day for the United States and Ukraine," said Maj. Gen. Clay Garrison, California National Guard commander and Clear Sky 2018 exercise director, in a news release. "Our deepest condolences go out to the family, friends and fellow airmen of both the US airman and Ukrainian aviator who were killed in the incident."

The exercise is a large multinational exercise involving about 950 personnel from nine countries, according to USAFE. It also marks the 25th anniversary of the partnership between the California National Guard and Ukraine.

Both US and Ukrainian governments are investigating the crash.

■ Military Intelligence Gets Big Boost With Return to Great Power Competition

The Defense Department is spending billions more on classified intelligence programs, with the most recent numbers representing the biggest spike in years. In Fiscal 2018, Congress appropriated $22.1 billion for military intelligence—that's a $3.7 billion increase from Fiscal 2017 appropriated funds and $1.4 billion more than what was originally requested in Fiscal 2018. The ramp-up in classified funding comes amid a return to "great power competition," as outlined in the most recent National Security Strategy. Chief of Staff Gen. Joseph F. Dunford told military reporters last week that, "Our competitive advantage has eroded over time, and that needs to be dealt with."

■ The War on Terrorism

Casualties:

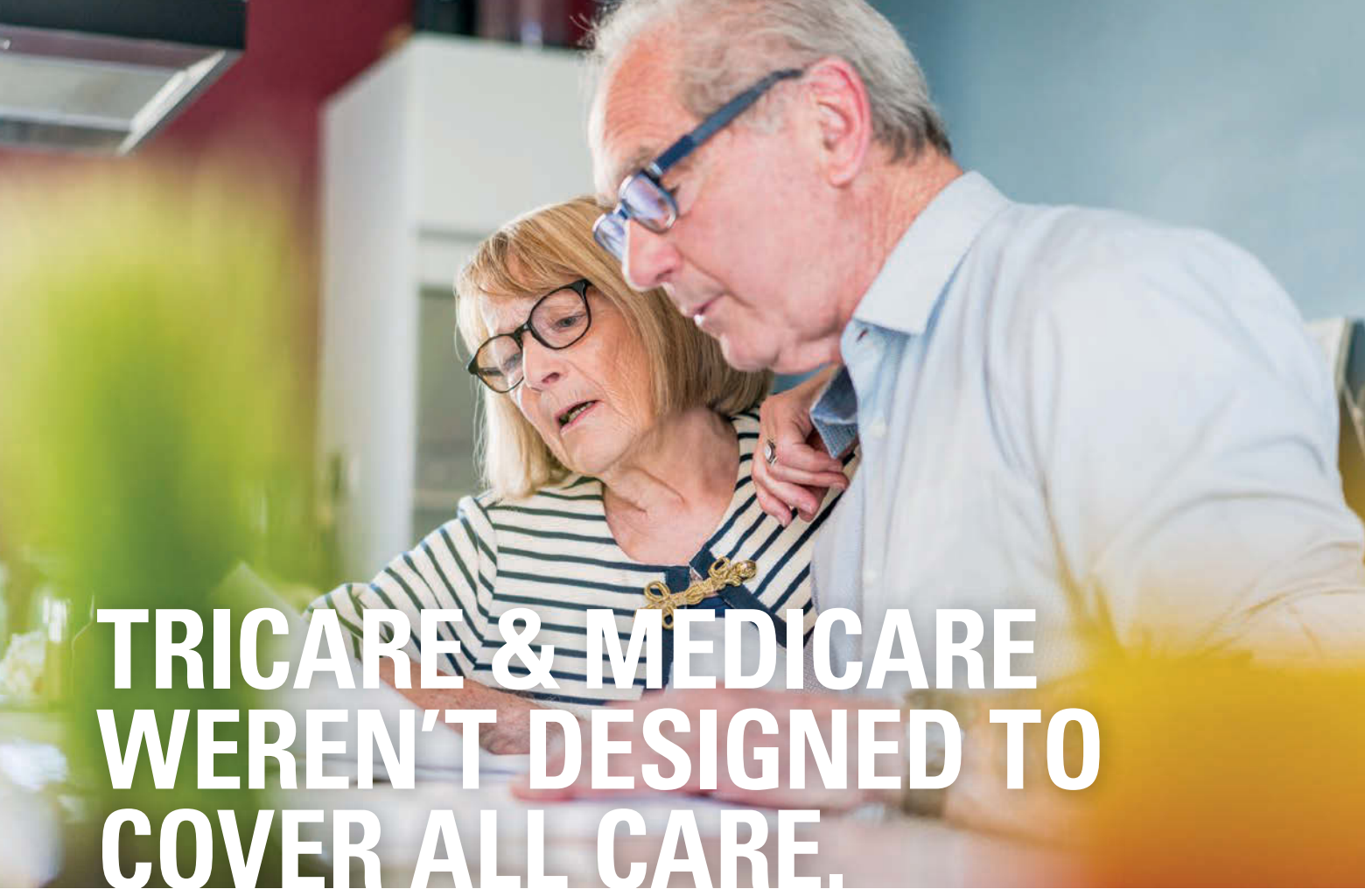
As of Oct. 29., a total of 56 Americans had died in Operation Freedom's Sentinel in Afghanistan, and 69 Americans had died in Operation Inherent Resolve in Iraq and Syria.

The total includes 121 troops and four Department of Defense civilians. Of these deaths, 53 were killed in action with the enemy while 72 died in noncombat incidents.

There have been 346 troops wounded in action during OFS and 75 troops in OIR.

Then-Capt. Seth Nehring in the cockpit of an F-16.

Photo: SMSgt. Chirs Drudge



TRICARE & MEDICARE WEREN'T DESIGNED TO COVER ALL CARE.

Are you prepared to cover the rest?

Sudden accidents and serious illnesses happen without warning. So do the extra expenses they bring.

Expenses not covered from a hospital stay can be costly, but at-home recovery needed after your stay can deplete your personal and retirement savings you've worked so hard for. And you still may not be able to afford the quality of care you deserve.

The **AFA Hospital Income and Short Term Recovery Insurance Plan** picks up where Medicare and TRICARE For Life leave off—providing you, or anyone you choose, with a cash benefit to help pay for things such as physical therapy, occupational therapy, speech therapy, nursing care, companion services, homemaker services and more. And, you decide how the money is spent without any restrictions—allowing you to be in control of your health care decisions while paying for the care you need and receiving the quality of care that your service has earned.

COVERAGE FOR AFA MEMBERS AND SPOUSES AGE 65 AND OLDER

AFA Hospital Income and Short Term Recovery Insurance Plan:

- Guaranteed acceptance—you cannot be turned down*.
- Affordable group rates negotiated for our AFA members.
- Cash benefits paid directly to you or anyone you choose, in addition to any other coverage you may have.
- Use the money any way you want—without restrictions.

Learn more about the AFA Hospital Income and Short Term Recovery Insurance Plan. Call **1-800-291-8480** or visit **www.afainsure.com**

THE HARTFORD

Hospital Indemnity Form Series includes SRP-1151, or state equivalent.

Underwritten by: Hartford Life and Accident Insurance Company Hartford, CT 06155

The Hartford® is The Hartford Financial Services Group, Inc., and its subsidiaries, including issuing company Hartford Life and Accident Insurance Company.

Coverage may not be issued in some states. All benefits are subject to the terms and conditions of the policy. Policies underwritten by Hartford Life and Accident Insurance Company detail exclusions, limitations and terms under which the policies may be continued in force or discontinued.

*This policy is guaranteed acceptance, but it does contain a Pre-Existing Conditions Limitation. Please refer to the Certificate of Insurance for more information on exclusions and limitations, such as Pre-Existing Conditions.

Program Administered by Mercer Health & Benefits Administration LLC

AR Insurance License #100102691
CA Insurance License #0G39709
In CA d/b/a Mercer Health & Benefits Insurance Services LLC

A KC-135 from the 100th Air Refueling Wing at RAF Mildenhall, UK, tops off an F-15 from nearby RAF Lakenheath, UK.

DETERRENCE IN EUROPE

USAF is pre-positioning base supplies and materiel throughout the European Theater.

By Amy McCullough, News Editor

America is ramping up defense investments in Europe, quadrupling spending on the European Deterrence Initiative from about $1 billion in 2014 to $4.8 billion in 2018. Another major boost is coming in 2019.

For the Air Force, the initiative means "a little more of a permanent posture in some of the forward locations," Melvin Harris, US Air Forces in Europe-Air Forces Africa European Deterrence Initiative (EDI) chief, told *Air Force Magazine* in July. Originally called the "European Reassurance Initiative" and intended to bolster allies on NATO's Eastern flank after Russia's annexation of Crimea, the effort has since expanded.

Theater Security Packages (TSPs) and training deployments are increasing. In 2018, the Air Force alone will invest about $1 billion—$800 million of it for prepositioning materiel throughout theater.

The European Contingency Air Operations Set (ECAOS) is essentially a "base in a box," and it includes everything necessary to rapidly generate sorties and establish air superiority in a crisis. It includes the heavy equipment needed to build ramps and runways. It also includes war reserve materiel, which was largely depleted after US forces drew down following the Cold War due to ongoing operations in US Central Command and in Africa.

The objective is to ensure USAF can quickly respond if a "near-peer adversary, like Russia, throws a lot of forces into theater," Harris said. "There is a capacity constraint to strategic airlift. You can only get so much on a C-17, and if we can preposition that equipment in theater, it postures us right for [a] contingency."

Airmen deploy a "base in a box" in Poland during an exercise in late July. The Deployable Air Base System is a new concept for USAF.

Of the $800 million set aside for ECAOS, roughly 40 percent will fund deployable air base systems (DABS) facilities, equipment, and vehicles. These are very large kits that include everything from riot-control gear for security forces to fuel trucks to mess tents. Alternatively, they have specialized hospital tents in which expeditionary medical personnel can conduct surgery, if necessary.

Harris said "multiple DABS sets" will be prepositioned at "regionalized locations" throughout the theater, noting that transporting a single kit would take about 100 C-17s.

Gen. Tod Wolters, head of USAFE.

Maj. Benjamin Murfin, USAFE-AFAFRICA's EDI international logistics planner, said the kits not only allow the Air Force to establish an airfield, but also provides all the supplies needed to generate sorties for the first 30 days of an operation. Beyond that, he said, the service would have to call for backup.

"When you look at EDI, the main purpose of it is to back our allies and strengthen our posture in response to enemy aggression," Murfin said. "We've come up with requirements to form each DABS kit based on what different functional areas we need to set up an airfield."

The kits do not include weapons, but do include munitions handling equipment. Most also include Joint Light Tactical Vehicles, fire trucks, crash and rescue vehicles, forklifts, fuel support equipment, fuel trucks, and fuel pumps, as well as runway repair gear and medical equipment.

"We want to save as many lives as we can," said Maj. Matthew Kesti, USAFE chief of medical plans and operations for Europe. "It becomes very difficult for commanders to prioritize medical ahead of bombs, beans, and bullets. You have to fight the war before you figure out how to deal with the consequences." The kits should help mitigate those risks.

Sites for the equipment were selected based on how accessible they were by rail, road, or air.

"We've learned there could be overloading issues in the system," said Murfin. "If a single semitrailer turned over on a highway, the whole Baltic region" could be affected for days. So "multimodal" access is critical.

The Air Force started planning for the prepositioning in 2014 and has already started procuring the kits, Murfin said. "By 2024, the goal is to have all the kits in place."

The service declined to detail the exact number or location of kits, citing operational security concerns, but EDI funds are being used to expand the Air Force's War Readiness Materiel storage facility in Luxembourg. Lt. Col. Gregory Orbino, USAFE-AFAFRICA deputy branch chief for Europe, said the facility will serve as the "collection point" for DABS kits as they move through theater and as the "first test case" for prepositioned assets.

Orbino, who oversees the construction portfolio for Europe, said design work is slated to begin this year on the site, to be followed shortly by construction.

EXPANDING THE SCOPE

USAFE also is using EDI funds to strengthen its presence in other locations. "EDI funding has allowed us to complete projects such as munition storage facilities in Lithuania; a hangar and extended parking aprons in Romania; and airfield upgrades in Hungary, Iceland, and Slovakia," said Gen. Tod D. Wolters, commander of USAFE-AFAFRICA. "These projects help us enhance the infrastructure in forward operating locations that we utilize with our partner nations. Ultimately, they let us achieve our goal of developing more resiliency, and thus, enhancing our readiness."

One example: the runway upgrade at Lask AB, Poland. The base is home to the 52nd Operation Group's Det. 1—a group of just 10 USAF airmen with a wide range of specialties who are tasked with hosting four aviation detachments per year—two F-16 and two C-130 rotations.

"They are reconstructing the runway so it's more compatible" with USAF F-16s, said Lt. Col. Beau Diers, 555th Fighter Squadron commander, in an interview at his unit at Aviano AB, Italy. USAF F-16s had difficulty stopping when the old runway was wet, so sorties often were cancelled under such conditions. Polish F-16s, by contrast, are outfitted with parachutes to help them stop, added Diers, whose squadron last conducted an aviation rotation to Poland in June 2017. At the time, "about a quarter of the sorties had to be scrapped for wet weather," he said.

EDI foots the bill for "about 20 percent of the rotations we see," said Det. 1 commander Lt. Col. James Busch. Sequestration had been a "huge limiting factor for getting people and stuff" to Poland for "training and interoperability," but EDI was a big "boost to the baseline budget," and that translates into increased presence.

The 52nd Fighter Wing at Spangdahlem AB, Germany, was able to deploy 300 airmen and 18 F-16s to Poland in June—significantly more than the 110 personnel and six Fighting Falcons the wing deployed to the country in September 2017.

While there, the F-16s flew with their Polish counterparts and supported both the Navy-led BALTOPS and the US European Command-led Saber Strike exercises.

The two exercises included "40-plus ships, 18,000 troops, and a host of airmen of varying nationalities. It was really a demonstration of what NATO can do in the largest concentration of forces since the Cold War. It was a pretty impressive display," Col. Jason E. Bailey, commander of the 52nd FW,

Photos: Amy McCullough/staff; Andy Morataya/USAF

A-10s on the line weathering a deluge at Lask AB, Poland, before a Theater Security Package deployment.

told *Air Force Magazine* during a visit to Spangdahlem.

But, the increased presence does more than just send a strategic message to potential adversaries.

Bailey said he recently took his wife and kids on vacation in Poland, where they stopped to visit with the USAF detachments there. "Communities are an integral part of what we do. When you think of it from a NATO perspective, that's part of that presence that allows us to really connect and be an important partner. It's really tough to put into words when you get a good bear hug from the mayor of the base," he said, noting the same mayor also "came over to our house for Thanksgiving last year."

That trust, he said, and the understanding of how the two countries' militaries operate, already exists thanks to the regular rotations through Poland, so if a contingency erupted the two forces could work together seamlessly on Day 1.

THEATER SECURITY

Perhaps the most high-profile EDI activity, however, are the Theater Security Packages that rotate through the theater for varying lengths of time several times a year.

"We're looking for activities to be conducted within USAFE that meet US [European Command] objectives from ... deterring any regional actors to assuring our allies that our presence here is supportive of their security and stability within various treaties and other agreements we have with partners," said Lt. Col. Robert Risko, the A3 EDI program manager for USAFE.

Although the Air Force has been conducting TSPs in the Pacific since 2004, it wasn't until the then-European Reassurance Initiative funds became available that the service began rotating similar forces to the European continent.

Twelve A-10 Thunderbolt IIs and about 300 airmen from the 355th Fighter Wing at Davis-Monthan AFB, Ariz., marked the first European TSP when they deployed to Spangdahlem in February 2015. Since then, the 52nd Fighter Wing at Spangdahlem has regularly hosted TSPs of both fourth and fifth generation aircraft, including F-15C Eagles from the Florida Air National Guard's 159th Fighter Wing, which arrived at Campia Turzii, Romania, in late June.

"This gives us the opportunity to train together so in the future we will be better prepared to handle any security ... or humanitarian challenges that may come up, particularly with the relationship that we establish over our time here," said Lt. Col. George Downs, 159th Expeditionary Fighter Squadron commander, in a USAF release. "It also gives us an opportunity to exercise going to a location we might not be familiar with."

Shortly after *Air Force Magazine's* visit, and around the same time the Guard Eagles were deployed to Romania, a squadron of F-22 Raptors from the 95th Fighter Squadron at Tyndall AFB, Fla., deployed to Spangdahlem for a multiweek flying training deployment, which was funded in part by the EDI.

While in theater, the Raptors deployed to Orland AB, Norway, where they flew alongside Royal Norwegian air force F-35As, and to Albacete, Spain, where they flew with Spanish Eurofighter Typhoons.

Bailey, the 52nd FW commander, said part of the wing's ability to provide full-spectrum airpower to the European and African theaters comes from its ability to "receive, support, operate, and integrate forward deployed forces."

Spangdahlem—once home to three fighter squadrons—now has just one, the 480th, which flies F-16 Fighting Falcons. That means, "we now have the real estate" to support Theater Security Packages and other forward deployed forces, Bailey said. "We've done that in the past from F-22s to A-10s to F-15Cs, and we're actually putting in specific infrastructure here that enables us to be postured for fifth generation integration."

USAFE has allocated several million dollars of EDI funds to upgrade existing structures at Spangdahlem and to build some new ones specifically designed to accommodate the F-22 as it rotates through theater. That includes $18 million to build a new low-observables composite repair facility; a 25,000-square-foot hangar that will allow maintainers to fix the stealth surfaces and structures of F-22s. The facility will include one bay with room for a 14-person administrative staff, paint tools, and other specialized gear. Another $2.7 million of EDI funds will go toward the upgrade of seven existing third-generation shelters to accommodate the F-22

"The ability to reassure our allies requires us to have a presence in Europe, and this will increase our ability to have a modern aircraft presence that can be supported in the theater," said Lt. Col. Gregory Mayer, commander of the 52nd Civil Engineer Squadron at Spangdahlem, when asked why USAFE was dedicating funds to highly specialized facilities for rotational forces.

Also over the summer, more than a dozen F-15C/D Eagles and some 280 airmen from the 48th Fighter Wing at RAF Lakenheath, UK, deployed to Keflavik AB, Iceland. Four of the aircraft, which are assigned to the 493rd Fighter Squadron, supported the Icelandic air policing mission while the remaining Eagles conducted training in the region.

During the nearly month-long deployment to Iceland, the F-15s "flew 238 sorties accumulating more than 400 flying hours," 70 of which simulated

USAFE Holds First-Ever Combat Ammunition Production Exercise

RAF LAKENHEATH, UK—

One clear sign the Air Force is ramping up readiness in Europe: its first-ever in-theater Combat Ammunition Production Exercise.

July's CAPEX saw dozens of Total Force airmen from Lakenheath; Aviano AB, Italy; Spangdahlem AB, Germany; Ramstein AB, Germany; RAF Alconbury, UK; Beale AFB, Calif.; and Little Rock AFB, Ark., show up here to build, transport, and tear down as many as 1,000 live munitions. Supported by European Deterrence Initiative funds, the exercise gave airmen direct experience with live joint air-to-surface standoff missiles, air-to-air missiles, joint direct attack munitions, laser-guided bombs, and small diameter bombs.

The exercise was a significant departure from day-to-day operations, in which mostly inert munitions are used. Although not intentionally planned this way, it also coincided with F-15 surge operations at the base, more closely simulating real-world combat operations. As teams built the weapons and loaded them onto vehicles to transport to quality check, F-15E Strike Eagles consistently roared overhead.

Airmen load live munitions during the first-ever in-theater Combat Ammunition Production Exercise at RAF Lakenheath, UK.

"Most people train like they fight," said Maj. Dan Connors, commander of the 48th Munitions Squadron. ... If you're on the flight line, you launch and recover jets, whether it's training or war. In munitions, it's way different muscle movements and muscle memory you need from routine support to full combat operations."

Without CAPEX, the only chance Lakenheath airmen had to work with live munitions was during training at the Air Force Combat Ammunitions Center at Beale or when they deployed (or prepared to deploy).

"At the strategic level in USAFE, they saw a need for us to show our capabilities in this part of the world," said SMSgt. Dan Cain, production flight chief with the 48th Munitions Squadron and lead planner of the exercise. The exercise not only tested airmen's technical ability to build bombs, but also helped identify where the squadron needs more support and/or resources from higher headquarters.

USAFE hopes to rotate future CAPEX events through other bases in Europe, Cain said, much the way Pacific Air Forces does.

"We have a youth movement in the Air Force—as we're growing," said Connors. "There is no better way to get a massive amount of training than the baptism they get through CAPEX here. They get full immersion."

an alert situation, according to an Air Force release.

None of these initiatives would have been possible without EDI funds.

Faced with the stiff budget cuts demanded by sequestration in 2013, the Air Force had decided to withdraw its RAF Lakenheath, UK-based Eagles; the only F-15C squadron in Europe. At the time, it was believed the eventual beddown of F-35As at Lakenheath would offset the risk of losing the air-to-air capability the Eagles brought to theater. Then, Russia invaded Ukraine and USAF decided to keep the F-15Cs at Lakenheath.

The Eagles are deployed frequently and regularly participate in air policing missions—both in Iceland and in the Baltic States of Estonia, Latvia, and Lithuania—where they remain on call 24 hours a day, seven days a week during the deployment.

In the Baltics, Eagles on alert must be airborne within 15 minutes if the claxon sounds. They mostly intercept Russian fighters that cross Baltic airspace, but they have also intercepted a helicopter and some cargo aircraft, said Lt. Col. Cody Blake, commander of the 493rd Fighter Squadron. There is always that initial adrenaline rush when the horn sounds because the pilots never know exactly what they might face, Blake said. Most encounters are professional, though, and pilots quickly settle into their routine of identifying the type of aircraft and sending any other pertinent information—such as tail numbers, number of aircraft, and weapons load—to NATO controllers.

"We get close enough [that] we can see the pilots," said Blake, who noted that "some guys are super friendly, waving back and taking selfies, while other guys were ... just going to do their mission and wouldn't look at you."

Despite its demanding operational tempo, the squadron's funding ran out in Fiscal 2017, so the Air Force decided to use EDI money to fully fund it and keep it operating at Lakenheath through Fiscal 2022, one year after the first F-35As are slated to arrive. What happens to the F-15Cs after that isn't clear.

"Sure, guys here talk about the uncertainty of the squadron. 'Are we staying at RAF Lakenheath, or will they move us?' " said Blake. "If this [squadron] goes away, then you just have two Active Duty F-15C squadrons [in the Air Force] and that drastically reduces the options."

What EDI all boils down to, said General Wolters, is improving the readiness of USAFE forces.

"It's matured the operating environment, so when crews conduct missions, exercises, and training events on the European continent, they leave those exercises with a higher state of readiness than when they started," he told *Air Force Magazine* during an interview at the 2018 Royal International Air Tattoo in England, the world's largest military air show. "Those EDI funds also have matured the infrastructure to a point where crews can operate in challenging environments effectively and efficiently." ✪

Photos: SSgt. Christopher Ruano; Amy McCullough/staff

SAFETY FIRST

After the stand-down, more focus on readiness.

With the recent trend of deadly aircraft crashes, safety must become a No. 1 priority. This WC-130H from the Puerto Rico ANG crashed near Savannah, Ga., last May, killing nine.

By Brian W. Everstine, Pentagon Editor

Conflicting priorities and its own can-do ethos are challenging Air Force leaders to improve mission readiness without compromising safety.

A rash of accidents last winter and spring drove Chief of Staff Gen. David L. Goldfein to order a fleetwide stand-down. Commands used that time to dig into safety and operational concerns, concluding that ops tempo, stress, and a cultural aversion to ever say "no" had helped to increase stress and undermine the safety culture.

Yet no sooner had commands started talking of adding "white space" to pilots' schedules, than a new challenge rattled the service: Defense Secretary Jim Mattis sounded the alarm over fighter aircraft readiness. Disturbed by mission-capable rates of just 49 percent for F-22s in 2017—and only slightly better at 55 percent for F-35s—Mattis ordered the Air Force and Navy to solve the problem. He wants rates to hit 80 percent as soon as possible.

So, once again, the pressure to execute and the need for more downtime are in a head-to-head competition.

Based on data collected from individual flying wings during the force-wide, day-long safety stand-downs, the September report found maintainers and aircrew believed their units suffered from:

- Stress resulting from a high operations tempo;
- Not enough time to train on basic flying;
- Pressure to accept risk due to a cultural insistence to always execute the mission;
- Decreased aircraft availability; and
- Complacency while performing routine tasks.

Now the situation is getting worse. More than a dozen F-22s were damaged when Hurricane Michael tore through Tyndall AFB, Fla., in October; while the Air Force was able to fly at least 30 F-22s out of Tyndall to safety, the remaining jets could not be made flightworthy in time—a real-world illustration of the airplanes' troubled availability. Meanwhile, the Air Force also continues to struggle with a pilot shortage, along with a parallel shortage

of experienced maintainers. While overall maintainer numbers have improved, it will take years to build back lost experience.

In an October report, the Government Accountability Office cited the way the Air Force organizes its F-22s and trains Raptor pilots as contributing to the jets' low mission-capable rates. The report also found problems with Air Force F-35s, which it said suffer from sustainment challenges, repair backlogs, and shortages. The lack of spares meant the aircraft were unable to fly 22 percent of the time due to parts shortages throughout most of 2017.

The fleets of these two aircraft are already small, meaning a push for improved mission-capable rates will come on the backs of stressed aircraft.

CSAF Gen. David Goldfein directed a one-day operational safety review in May. Airmen at Seymour Johnson AFB, N.C., got instructions on how to safely arm a weapons system on an F-15E Strike Eagle during the review.

"The Air Force will have to keep much of its existing force structure for decades to come," said John H. Pendleton, director of defense capabilities and management at the GAO, in an Oct. 10 Senate Armed Services Readiness and Management Support Subcommittee hearing. "The priority needs to be rebuilding the readiness of the existing fleets certainly in the near-term."

Pendleton said the Air Force has a steep climb ahead, but is making progress. "They have taken several steps in the right direction," he said. "Now it's a matter of achieving results. Recovery won't be easy or fast. It took a quarter-century for the Air Force to get here, so it may take a while to recover."

PACE OF OPERATIONS

Goldfein ordered flying wings to take a one-day flying "stand-down" in the spring to discuss, review, and emphasize safety after a deadly series of accidents in 2017 and 2018 killed dozens of airmen and raised concerns that military aviation was in crisis.

The stand-down helped bring a renewed focus on the culture of safety, Goldfein said in September. "I want commanders to push themselves and their airmen to achieve high levels of readiness," he said in an official release. But, "sometimes the right answer is to knock it off."

Beginning May 21, wings stopped flying as air and ground crews gathered for all-calls and in operations offices. Maintainers and pilots sat side by side to discuss issues they thought contributed to mishaps, with most of the discussions focusing on similar themes.

"The review proved tremendously helpful as we continue to see both high levels of safety with intense and realistic training," Goldfein said. "As air superiority is not an American birthright, our training must continue to be challenging and meaningful. But I also want commanders to have the decision authority to determine how far to push."

The stand-down included specific topics for discussion and deadlines for conducting the safety review, but did not include an action plan for follow-up. Wings and major commands weren't required to report specific findings or explain planned changes, and no formal compilation of results was released.

For Air Mobility Command, the discussion was "invaluable" because airmen appreciated commanders "sitting down and having the conversation" on safety and the operations tempo they live with every day, AMC boss Gen. Maryanne Miller said. The command is looking to build more "white space" into airmen's lives to reduce operations tempo, and airmen appreciated being heard, Miller said.

The discussion showed a "safety-minded consciousness" among airmen, Pacific Air Forces Deputy Commander Maj. Gen. Russell L. Mack

Photos: Int'l Assoc. of Fire Fighters 574 (Savannah); A1C Shawna Keyes

Col. Jennifer Short, 23rd Wing commander, addresses airmen at Moody AFB, Ga., during the one-day operational safety review on May 14.

told *Air Force Magazine*. While airmen face a high operations tempo, they are "all about making sure things are done effectively and safely. They know that, they drive to that," he said.

After the review, however, the service has not as yet identified an all-force action plan (as of November) to address the situation, even as it comes under greater pressure to increase its readiness rates, which are keyed to flying hours.

For Air Combat Command, the review was an "opportunity to identify issues" that could affect the overall mission. ACC initiated no commandwide changes, said command spokesman Capt. Luke Nimmo.

Other changes across the Air Force meant to reduce stress on aircrew, such as reducing additional duties, revitalizing squadrons, and enhancing mission planning, had already been in the works before the stand-down.

From Fiscal 2008 to Fiscal 2018, the Air Force lost 84 airmen to crashes. Eighteen of those fatalities occurred in 2018, including nine when a Puerto Rico Air National Guard WC-130U crashed on a Savannah, Ga., highway on May 2. Crashes have continued since:

- Two T-38s crashed, one Aug. 17 near Vance AFB, Okla., with the pilots ejecting, and another Sept. 11 at Sheppard AFB, Texas.
- A T-6 crashed Sept. 18 near JBSA-Randolph, Texas, with the pilots able to eject.
- An F-22 skidded off the runway when landing gear failed during an emergency landing Oct. 10 at JB Elmendorf-Richardson, Alaska.

OVERSEAS CHALLENGES

While most of the wings affected by the stand-down were Stateside and able to fully stop their operations, others had to find workarounds. The 199th Fighter Squadron from JB Pearl Harbor-Hickam, Hawaii, was deployed to South Korea as a Theater Security Package and worked its stand-down into a break during an exercise. The unit's "safety guys" walked the unit through recent F-22 accidents and led discussions on contributing factors, a 199th FS pilot said in a recent interview.

At the 432nd Wing at Creech AFB, Nev., the Air Force's principal remotely piloted aircraft wing could not stand down the entire wing at once, Wing Commander Col. Julian C. Cheater said in a recent interview. Instead, the stand-down had to be held in phases.

One takeaway for his wing, Cheater said: RPA pilots and sensor operators are encouraged to raise their hands if they become too tired during a mission and hand off to someone else to continue. The decision to stop or continue is between the crew and the operational command in theater, instead of with higher command locally at Creech.

At the 374th Airlift Wing's stand down at Yokota AB, Japan, maintainers and operators came together for an "open conversation about what everyone is seeing," then-wing commander Col. Kenneth E. Moss said in a recent interview. He wanted help "identifying things leadership isn't seeing or [is] not aware of because of the distance from the flight line."

Moss said he learned so much that he ordered regular stand-downs, quarterly.

The 535th Airlift Squadron also at JB Pearl Harbor-Hickam, Hawaii, a C-17 unit responsible for long-distance airlift across the Pacific, identified problems driven by the vast expanses flights span in the region. Squadron commander Lt. Col. Chad Cisewski said in an interview long flights can end up meaning 24-hour workdays for aircrew. To mitigate risk, the squadron is giving crews more warning before missions to ensure they're well rested and adding a fourth pilot to the current three-pilot minimum needed for a 24-hour mission.

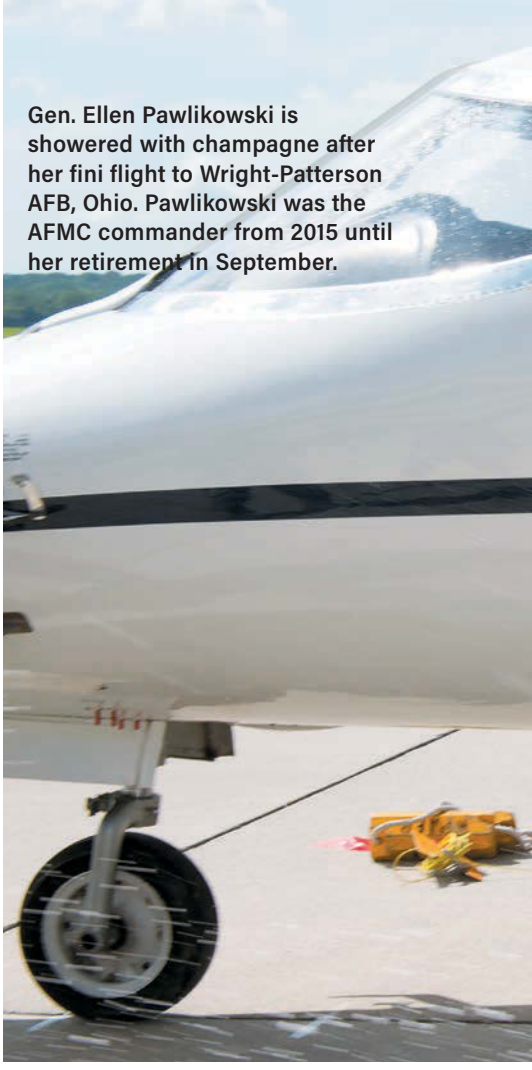
"It's kind of a tax on the squadron, a step above and beyond, but when we can do it, it's absolutely worth it," Cisewski said.

Goldfein said the stand-down accomplished its objective: to increase the awareness of safety issues.

Maj. Gen. John T. Rauch Jr., commander of the Air Force Safety Center, said the stand-down helped commanders identify concerns and flag those to higher-level commands. "This review gave commanders the opportunity and time to focus on ensuring operations were safe by identifying hazards that could lead to mishaps," Rauch said in a release. Safety, he said, is ultimately about airmen taking care of airmen. ✪

Photo: SrA. Daniel Snider

RETAINING FUTURE AIR FORCE WOMEN GENERALS



Gen. Ellen Pawlikowski is showered with champagne after her fini flight to Wright-Patterson AFB, Ohio. Pawlikowski was the AFMC commander from 2015 until her retirement in September.

Women are underrepresented in USAF's senior ranks. There are ways to change that.

By John A. Tirpak, Editorial Director

For a month in mid-2015 the Air Force boasted three four-star women among its leaders—momentarily coming close to matching the share of women in the officer corps as a whole, about 21 percent.

It's unlikely that will happen again anytime soon. The percentage of women among the Air Force's general officers today is just 7.7 percent compared to 26.5 percent of all officers.

After Gen. Maryanne Miller took command of Air Mobility Command on Sept. 1, and before Gen. Ellen M. Pawlikowski retired as chief of Air Force Materiel Command, the Air Force had two four-star women among its senior leaders. But by the end of September, the number was back to one.

The fact that women are now routinely rising to the top ranks is a mark of success. Indeed, one sign of progress is that when Miller took over AMC, much of the press coverage focused on her being the first Reserve general to take charge of an Active Duty Major Command, rather than noting she was also the first woman to take that job—and the first woman pilot to make four stars.

Women have proven they can succeed at any level in the Air Force and the number of women succeeding in the officer ranks is significant.

The Air Force has no affirmative action program in place to promote women to the general officer ranks. But it has in recent years begun concentrating more on retaining women at critical career inflection points. Women make up more than 23 percent of the officer corps through captain, then fall off rapidly at the field-grade ranks of major to colonel, when those choosing to have children find themselves squeezed between family and career demands.

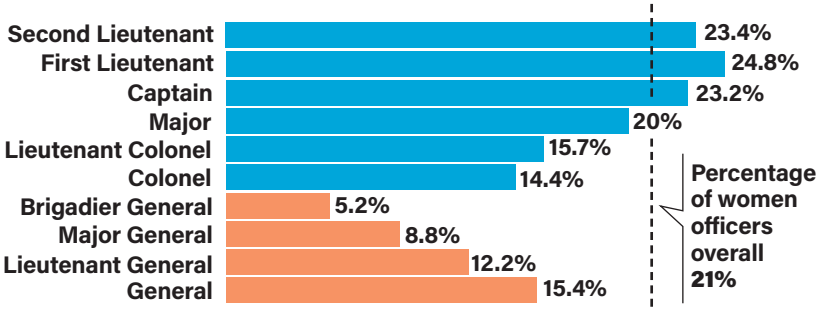
Then-Air Force Secretary Deborah Lee James sought to ease those pressures when she doubled maternity leave to 12 weeks in 2016, and new mothers may now defer deployments and physical fitness tests. Women may also apply for a "career intermission," switching to the Reserve for up to three years. And they now have up to a year after giving birth to decide if they wish to separate from the Air Force; in the past, they were forced to make that decision more rapidly, and some found they later regretted choosing to leave.

An Aircrew Crisis Task Force report on the pilot shortage argued earlier this year that USAF should recruit and train more women and minorities as pilots. Women pilots say, however, that rules regarding pregnancy and flight status have not kept up with the times or medical knowledge. They complain that their prime childbearing years overlap with the time in their careers when they need to maximize flying hours; choosing to have children cuts into flying time, as well as the ability to take on career-essential jobs and schools. One solution: Let women fly longer into a pregnancy and, perhaps, join a later officer-year cohort when they lose flying time after childbirth. That would help them better compete for promotion.

Lt. Gen. Jaqueline D. Van Ovost, a command pilot with more than 4,200 hours who served as director of the Air Staff, said rolling into a later year group

Women officers decline in higher ranks

The Air Force has no difficulty recruiting or retaining women officers up through captain. But from then on, retention decliens rapidly, with women making up a smaller and smaller portion of the force as they rise up the ranks.and begin to choose between their Air Force careers and bearing and raising children.



would enable women who choose to have children to still "go on and get command slots." Women could maintain flying proficiency by having regular sessions in simulators. That beats the alternative: losing the millions of dollars invested to train those pilots in the first place.

WISE COUNSEL

If the Air Force is to attract and retain the workforce it needs in the future it must continue to evolve the accommodations provided to women, Pawlikowski told *Air Force Magazine* in a wide-ranging interview about her 40 years of commissioned service.

Today's Air Force has more and more "dual-career families, in which both the man and the woman are pretty successful," she said. Traditionally, couples have had to make a choice about whose career would take precedence, Pawlikowski said, driving "one or the other to make the decision to get out, for the sake of the family or the work-life balance."

But young officers today are less willing to make that choice, she said—and shouldn't have to.

The first Air Force women four-stars all faced such a choice. "Each of the three of us"—Gen. Janet C. Wolfenbarger, Gen. Lori J. Robinson, and herself—"by the time we were approaching that three-star, four-star level, our husbands were no longer serving on Active Duty," Pawlikowski said. "I was extremely fortunate that my husband decided that he really wanted to be a high school math teacher. ... Which enabled me to have someone with the flexibility to find a job wherever the Air Force took me. Because high school math teachers were always in high demand ... and he was able to be with the children when they were home."

Wolfenbarger's husband retired as a colonel; Robinson's husband retired as a two-star Reserve officer.

A lot of married women officers in the Air Force are married to other military members, "so you end up with this constant challenge of, 'how do I keep my family together and progress my career?' And it's more acute in the military," she said.

She added, "We lose a lot of people because of a spouse career." It's therefore critical that the Air Force "seriously look at what we can do to enable our military members, especially as we're an all-volunteer force, to be able to establish that work-life balance." She acknowledged that USAF has "done a number of things in the last three to five years that has helped us to move toward" that goal. "And it benefits everybody."

"The Air Force of today is very, very different from the Air Force that I started with," she said. "We've gone through many significant transitions in terms of the introduction of women into the leadership." The "things that the Air Force has done to help women progress through the ranks—and I don't mean preferential treatment—have been, I think ... positive for the force across the board."

Pawlikowski asserted that the Air Force has been uniquely progressive in addressing the needs of women and families, and its progress continues to evolve.

"Keep in mind that, until about 1972, women who got pregnant were separated," she noted. The idea of

Photo: R. J. Oriez/USAF

Lt. Gen. Jaqueline Van Ovost, staff director at Headquarters Air Force, speaks with Col. Jocelyn Schermerhorn, 11th Wing and JB Andrews, Md., vice commander. Van Ovost, a command pilot, participated in a seminar about retention solutions hosted by AFA in March.

First Lt. Hillary Keltner follows a dress right dress command during inspection at Schriever AFB, Colo. Women make up more than 20 percent of the officer corps at major and below, but above that rank, the number of women officers drops dramatically.

child-care centers on Air Force bases was a remote and laughable notion when she was commissioned in 1978. "If you were a woman on Active Duty and you were worried about childcare, that was your problem," she recalled. In a recent meeting, however, she said the top USAF leadership had a lengthy discussion about the need for 24-hour childcare at Creech AFB, Nev., because remotely piloted aircraft operators are often "flying" on a clock many time zones away.

"It would have been unheard of, 20 years ago, that we would have had a bunch of four-stars talking about that," she observed.

When Pawlikowski joined ROTC in 1974, women had only recently been allowed to become line officers, with the same rights and opportunities as men (a 1972 legal case ended the practice of denying females spousal, housing, and other benefits, and it had only been since 1967 that women were allowed to become general officers). There were "no scholarships" available to women when Pawlikowski joined, she added.

She acknowledged that she, Wolfenbarger, and Robinson were among the first female four-stars because they happened to excel in non-pilot specialties. Women entered flying later, and that means that female pilots in transport and other flying specialties only later became eligible to be generals. Women in combat flying roles—fighters and bombers—will be along soon, she said, as they only got started in that field in the early 1990s.

It takes approximately 25 years of service for airmen to first pin on as general officers, and then "It's about at the 33-year point when you make four stars," she noted.

Pawlikowski said she favors "this opportunity to take a break" for women seeking to start a family, "because I think that the women of today want to have a family."

She recalled when Brig. Gen. Wilma L. Vaught (Ret.) gave a speech in 1983, when Pawlikowski was at McClellan AFB, Calif., Vaught agreed to meet with the three women officers on the base. "'You're not going to be able to have a family,'" Vaught told the three women at the time. "'In order for you to progress to where I am, you're going to have to be 100 percent dedicated to your career.'"

That, Pawlikowski recalled, "really irritated me—why is it that the [male] lieutenant sitting next to me can have a family but I can't?"

When Pawlikowski pinned on her first star years later, Vaught was invited. The new one-star made a point of introducing Vaught to her daughters. "'I've been waiting 20 years to tell you [that] you were wrong,'" Pawlikowski said. "But the fact of the matter was, she was right—in 1983. Many women in my year group chose to ... leave to have a family" and became "highly successful doing other things."

Women of today "want to have the flexibility to take three years off, maybe,

Then-Lt. Gen. Maryanne Miller, Chief of AFRC, during a tour of Hill AFB, Utah. Miller pinned on her fourth star in September and became head of Air Mobility Command. She is USAF's fourth woman to be promoted to full general officer.

Gen. Wolfenbarger speaks on an Air Force Association panel of four-stars. Gen. Hawk Carlisle is to her left.

until their children are older, and not have it be an insurmountable" hurdle for a successful career. Not only that, "these are things that, frankly, my male counterparts would like to do, too. And so I really think the Air Force needs to continue on this journey ... of really looking at the quality of life aspects of our military."

As to whether the "time off" idea will fly with the rank and file, Pawlikowski said, "The jury is still out. We've had that program now for maybe three years." She added, "I'm hopeful."

The promotion of Gen. Maryanne Miller and others is a positive sign, Pawlikowski said, that the Air Force has "an appetite" to step outside of its traditions and try new things. As the first Reservist to command an Active Duty major command, Miller is setting a precedent that will reduce objections to similar arrangements in the future.

"But it will be interesting because there will be cultural challenges," Pawlikowski said. And those will chiefly reside with more senior officers and retirees. Younger people typically don't have a problem with new approaches, she said.

Just over the course of her own career, Pawlikowski said, the Air Force has gone from spouses being almost entirely women—"where the wing commander's wife was equivalent to the wing commander"—to today, when spouses are male and female, and "spouse clubs ... are struggling."

Millenials, market research shows, "just don't join things," Pawlikowski noted, and the Air Force must do a good job articulating "what's in it for me?" She believes USAF should emphasize that serving is not just a job, but "you're part of a family, and a family that takes care of each other, and it goes beyond just the member." The service must accept that "you don't get 'two-for-one' when you hire a squadron commander. And that's particularly challenging when the spouse may also be a squadron commander."

Once upon a time, much of that support was provided by other members, she said. Recalling how, when her husband sat alert, husbands not on alert were ready to help "if my toilet backed up and I needed help cleaning up the mess."

Now, "just like industry, we're probably going to have to offer more of that institutionally, instead of it being a volunteer spouse network." The old system of members helping each other still happens and is laudable, but physical realities get in the way, she noted. When she commanded USAF's Space and Missile Systems Center in Los Angeles, family housing was "35 miles south of the base," and it was impractical to invite members to "a social function after work."

So, "that type of environment is very difficult to replicate. ... Culturally, we have to figure out how we're going to adapt to that with this generation of airmen."

Pawlikowski said 1980 marked a true watershed for the Air Force, because that was the year that women first graduated from the Air Force Academy. She noted that she and Gen. Robin Rand of Global Strike Command, who retired this summer, were "the last of the '70s. ... All the other four-stars, now, are post-1980," and with the exception of combat pilots, women were able to serve in almost any capacity from that date forward.

THERE'S NO GOING BACK

Today, "people don't bat an eyelash" at women serving in previously male-only specialties. "People still ask me, what's it like to be a four-star and a woman? I don't know why I would feel any different from any other four-star," she said.

While Pawlikowski agrees there may be a "lull" in the number of four-star women generals, "what I think you're going to see ... I'm hoping," she said, "over the next three or four years you'll see that group of women that have been able to compete in the combat arms on an equal footing with men, [and] we'll start to populate the more senior ranks." ✪

Photos: Amn. Michael Murphy; Dennis Rogers/USAF; Paul Holcomb/USAF; Amn. Aaron Stout

MSgt. Maria Teresa Pineda, a special operations recruiter, hefts a sandbag during a Battlefield Airman Prep Course at JBSA-Lackland, Texas. Recruiters are put through the course to learn the challenges BA recruits face.

SPECIAL TREATMENT FOR SPECIAL WARRIORS

How the Air Force is building the next generation of special warfare airmen.

By Steve Hirsch, Senior Editor

JBSA-LACKLAND, TEXAS—

It can take two years and up to 10 recruits to produce a single special warfare airman today. Finding a way to make that process more efficient—yet no less effective—is the focus of a critical new Air Force initiative.

A new recruiting command is taking shape to help identify the kinds of candidates who can best succeed in USAF's six special warfare specialties—combat controller; pararescueman; special operations weather technician; tactical air control party specialist; explosive ordnance disposal technician; and survival, evasion, resistance, and escape specialist—and a new up-front conditioning program aims to better prepare candidates for the rigors they'll face in training.

Attrition rates for the six specialties range from 50 to 85 percent. That high washout rate contributes to the elite persona of special warfare jobs, but burning through candidates at such high rates is ultimately inefficient.

The Air Force reactivated the 330th Recruiting Squadron here as one of the first steps in a multipart strategy to reduce attrition and boost the numbers of special warfare airmen. The service had previously tried to foster mentor relationships between hopeful recruits and prior-service special operators across

Trainees endure a rigorous eight-week physical regimen of running, rucking, and swimming to prepare for the special warfare training pipeline.

the country with the hopes they would increase graduation rates.

As USAF's only unit solely dedicated to recruiting for special operations and combat support, the 330th stood up June 29 with 96 airmen dedicated to the task.

Maj. Heath Kerns, who has more than a decade as a special tactics officer and now commands the 330th RCS, said the Air Force cannot afford to expend "exorbitant amounts of effort" only to lose most of "these rare personnel" before they ever complete the one- to three-year training pipeline.

Kerns said the pararescue indoctrination course—the initial course of the pararescue pipeline—has historically high attrition rates because it is very intense physically and demands quite a bit from candidates very early on in the pipeline. In contrasst, in the combat controller specialty and special operations weather technician pipelines, the culminating apprentice courses are difficult because they assess much of previously learned skills over two years of training and this course takes place after several less-intense joint schools which do not require as much mental/physical stamina. Initial results are promising for pipeline courses with historically high attrition rates, but it is too early to tell how these changes have affected the combat controllers and special operations weather technicians, according to Kerns.

"We have changed many variables in the system, so it's hard to isolate all the facts," he said.

"In recruiting we know that many factors come into play over a two- to three-year training pipeline. While recruiting has less to do with training, how our recruits are doing long-term is something we always must keep in mind. The solutions that we build must lead to long-term success. We are not exclusively focused on only getting them through the first gate. Ultimately, all of this, from recruiters to the training pipeline, must work together to deliver the most lethal fighting force to our operational squadrons," he said

At least twice, Kerns said the Air Force suffered 100 percent attrition. "They literally had no one left, and no one graduated the course," he said. "Obviously [that] is just a total failure across the entire spectrum of that process."

RECRUITING FOR SUCCESS

Recruiting for special warfare specialists in the Air Force starts with understanding that the core target group of potential candidates probably doesn't even know the Air Force does this kind of work.

"Brand awareness," Kerns said, is a major challenge. "No one knows who we are and what we do."

The kinds of potential recruits the Air Force wants may know all about the Army's Green Berets and Rangers, the Navy SEALs, and even the Marine Corps' Force Recon units, but Air Force special operators don't get that kind of attention.

"That's one of the major problems that we're addressing," Kerns said. "It comes largely from priding ourselves on being quiet professionals, just the humility to want to focus on doing your job and not worrying about the press."

Recruiting fits in with other steps the service is taking along these lines. In October, the service activated a Special Warfare Training Wing, which has aligned training components similarly to other services.

Recruiting the right kinds of individuals—people who are most likely to succeed—is also critical. Special warfare demands "very tough" recruits with high intellectual aptitude, as measured by the Armed Services Vocational Aptitude Battery (ASVAB), as well as the fortitude to not give up when the going gets rough.

The Air Force wants former high school and college athletes who are not just fit, but physically and mentally tough. Football, wrestling, lacrosse, and rugby—considered the "more arduous, more contact-related sports"—produce strong candidates, but so do high-endurance sports like long-distance running and "adrenaline-charged" recruits attracted to high-risk extreme sports, such as rock climbing or skydiving.

It's all about finding that "X-factor,"

Photos: EJ Hersom/DOD; Ismael Ortega/USAF

Battlefield airmen recruits train for amphibious operations in—and out of—water. Amphibious training includes mask and snorkel recovery, as well as sharing a snorkel underwater.

Kerns said: "That drive, that dedication, that duty—sacrificing yourself for the benefit of your brothers and sisters, putting others first for a greater cause."

It's a quality that "gets tested very painfully and thoroughly" throughout special warfare training.

"When you're tired, when you're exhausted, when you're hungry, when your body's cramping, can you still push through and take care of the guys alongside you to accomplish your mission?" he asked.

"We can train people physically," he said, but getting fit is only part of the battle. "We can get them physically fit in the short term, but "their bodies break down over a long and arduous training pipeline."

To stave off attrition and increase success, the Air Force hired former special operators, dubbed "developers," who work with recruiters and recruits to help prepare them for the training that lies ahead. The developers help with nutrition, share reading lists and motivational speeches, and interact with recruits on a social media platform.

"It's a whole process," Kerns said. "It's helping them build that mental resiliency." The idea is to help recruits succeed through training and preparation.

"You still have to have that toughness," Kerns said. "We're trying to give ... every opportunity for success [to] that kid that didn't have the opportunity to swim or didn't have the role models that were encouraging him in those ways."

Better preparation means fewer surprises, he said. "They know exactly what to expect."

More focus on what kinds of people will succeed has also produced more viable candidates. While in years past, training slots went unused for lack of candidates, now the pipelines are growing more crowded. This year, the tactical air control pipeline produced more candidates than class slots, according to Kerns, as well as the battlefield airmen development course, "where we're able to push more than they're initially able to handle."

Historically, "that was always the reverse," Kerns said. "There had always been more class slots than they had personnel to fill them, and then the people that showed up weren't the right quality. Now we're flooding them with higher quality."

BUILDING STRONGER AIRMEN

Just getting people to training, however, is only part of the challenge. Getting them through up to two years of challenging training is not easy.

The new eight-week Special Warfare Prep Course covers the four specialties of combat controller, special operations weather technician, tactical air party control specialist, and pararescueman. It is modeled on a Navy SEAL training course designed for the same purpose—to better prepare future special warriors for the brutal training they'll experience on the way to earning their special warfare credentials.

Physical training, close monitoring of performance, and focused remediation to fix problems all aim to increase the likelihood that candidates can pass the course. Standards, however, remain constant.

"This is not a selection course, it is a development course," said Innovation Cell Program Manager Patrick Wilson, who oversees a program that uses advanced sensors to monitor candidates' conditions as they progress through the course.

Trainees drill in swimming, running, strength, conditioning, and mobility in a program that treats the recruits like professional athletes, which allows access to physical therapists and trainers.

"That's our job, to get them through, to make them into better battlefield airmen," said MSgt. Stephen Thomas, an instructor.

Athletic trainer Rachel Matson monitors a recruit. Trainees are treated like professional athletes, with access to physical therapists, trainers, and a system of sensors that track a candidate's physical condition as they progress through the course.

Mike Fisher, a prep course swim coach, was a NCAA Division 1 qualifier and competed in the 2012 and 2016 Olympic Trials. He helps students gain confidence in the water through two-hour swim classes, five times a week.

Water confidence training, he said, includes some pool skills, such as mask and snorkel recovery and buddy breathing—sharing a snorkel—under pressure.

Injury prevention is a critical focus of the prep course. "We've traditionally had a lot of students get injured, and their risk of getting reinjured was too high," he said. That contributed to the high attrition rates. "We work really hard on injury prevention in this course because often, injuries are career-postponing or worse."

Students are screened to try to spot potential injury risks early.

If a candidate squats poorly, athletic trainer Rachel Matson might have them do single or double squats, mobility exercises for each joint, or stability exercises, all of which could improve movement and reduce the risk of injury.

Candidates are monitored constantly. With at least one sensor attached to candidates at all times, instructors monitor about 300 data points for every student and consolidate the data into a central database to help spot trends.

Monitoring takes place both inside and outside the gym. One sensor, shaped like a hockey puck, tracks candidates' core temperature, heart rate, and breathing rate; another conducts an electrocardiogram "with a whole bunch of bells and whistles" at the start and end of the day, Wilson said. A third is a wristband that measures the quantity and quality of candidates' sleep and correlates the effects of sleep problems on performance with the impact alcohol consumption can have on performance, to help candidates understand the implications of lost sleep on their individual effectiveness. Tracking sleep helps identify those who are suffering from stress and those who might benefit from float tanks or meditation to help them unwind.

To enhance performance, candidates sleep in Tempur-Pedic beds and are held on lockdown for the first five weeks, which also helps build camaraderie and teamwork.

Psychological testing administered several times throughout the course also provides insights.

"This is the first time we have treated humans like weapons systems," Wilson said.

It is not clear yet just how much all this special attention will affect attrition.

Hughes stated in an email that it is still too early to draw definitive conclusions, but answers should be available soon. "We expect to have sufficient data for a more conclusive assessment next year," he said. "Ultimately, the purpose of the prep course is to create fitter, faster, stronger, more mentally resilient airmen for entry into the pipeline training."

While the jury is still out on attrition, Hughes said course leaders are seeing higher physical fitness scores. "We are now focused on building out the mental-resilience component of the course to complement the great work on the physical component," he said.

Overall, he added, Air Force efforts to look at the entire special warfare talent pipeline do seem to be having an impact. "It has allowed us to develop a more consistent and predictable program for onboarding candidates, sequencing them into Basic Military Training, working with them during BMT, transitioning them to the prep course, and then aligning initial AFSC training courses with prep course completion," he said. That means less time wasted between classes waiting for training and a more efficient, effective path through the process. ✪

Photos: Ismael Ortega/USAF; Johnny Saldivar/USAF

OUTSTANDING AIRMEN of the Year

SMSGT. MELISSA A. BEAM

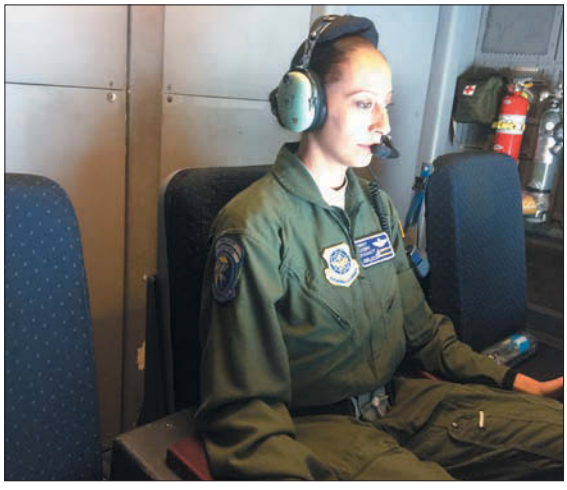
1N0 Air Force Specialty Code Manager
497th Operations Support Squadron (Air Combat Command)
JB Langley-Eustis, Va.
Home of Record: Catskill, N.Y.

SMSgt. Melissa A. Beam was the distributed ground system-1 analysis and reporting team flight chief at JB Langley-Eustis, Va., where she led a team of 134 officers, enlisted members, civilians, and contractors responsible for delivering 24-hour, time-dominant intelligence fusion and target-discovery capabilities to five combatant commanders in direct support of Operation Inherent Resolve. Her team of airmen was instrumental in the freeing of 4.5 million Iraqi citizens and six cities from Islamic State of Iraq and Syria (ISIS) control. They tasked intelligence, surveillance, and reconnaissance assets to erase more than 100 remotely piloted aircraft and 19 improvised explosive device networks and eliminated more than 225 ISIS oil fields, ultimately saving 138,000 coalition forces lives.

SMSGT. RUTH C. GRIFFIN

Superintendent, Operations and Compliance Management
2nd Logistics Readiness Squadron (Air Force Global Strike Command)
Barksdale AFB, La.
Home of Record: Brinkley, Ariz.

SMSgt. Ruth C. Griffin led 391 military and civilian personnel to success in optimizing fuels capabilities by eliminating biodiesel fuel for 284 vehicles. These actions saved two organizations 724 man-hours and earned her unit the 1 percent Government Green Fleet Award. Additionally, she championed the wing's Hurricane Evacuation Receptions, ensuring the beddown of 550 personnel across 10 wings, and powered an 85,000-gallon refueling operation in support of 176 aircraft. The team's actions afforded protection of $6 billion in United States Air Force assets. Her team also garnered 11 higher headquarter and wing awards and earned five Below the Zone stripes. Finally, the major command functional manager chose Griffin to provide expertise and shape future career field requirements. She led nine subject-matter experts and modified 52 manpower-process orientation descriptions.



SMSGT. LUCERO STOCKETT

KC-10 Boom Operator Superintendent
6th Air Refueling Squadron (Air Mobility Command)
Travis AFB, Calif.
Home of Record: El Paso, Texas

SMSgt. Lucero Stockett has been instrumental as the KC-10 boom operator superintendent. During this period, she oversaw the supervision of 32 boom operators, managing 17,500 days of personnel on temporary duty on over 2,100 mission and 26 Central Command deployment taskings that supported over 3,000 receivers and 1,000 strikes. She won two national-level awards for her leadership and community involvement: the National LATINA Style Distinguished Military Service Award and the National Image Meritorious Service Award. Additionally, she was awarded the Robert "Dutch" Huyser Award for her leadership and professional acumen as a career enlisted aviator. She also garnered the John L. Levitow and Distinguished Graduate Awards at the Senior Noncommissioned Officer Academy.

THE AIR FORCE OUTSTANDING AIRMAN PROGRAM annually recognizes 12 enlisted members for superior leadership, job performance, community involvement, and personal achievements.

THE PROGRAM DEBUTED at the Air Force Association's 10th annual National Convention in 1956. The Chief Master Sergeant of the Air Force and the command chief master sergeants from each USAF major command comprise the selection board, with the Air Force Chief of Staff reviewing their selections.

MSGT. KIT C. LUI

NCOIC, Engineering Flight
433rd Civil Engineer Squadron (Air Force Reserve Command)
JBSA-Lackland, Texas
Home of Record: Schertz, Texas

MSgt. Kit C. Lui, noncommissioned officer in charge and engineer craftsman, directed and performed civil engineering design, drafting, surveying, and contract surveillance to support Air Force facility construction and maintenance programs. Lui utilized surveying technology to include global positioning systems to evaluate potential construction sites and airfields. He supported various military campaigns: Operations Inherent Resolve, Combined Joint Task Force–Horn of Africa, Freedom's Sentinel, and Resolute Support. He forward deployed to numerous countries such as Afghanistan, Iraq, Kuwait, Qatar, and Syria and undisclosed locations in support of joint operations and contingencies. Prior to assuming his current position, he served as the NCOIC, airfield pavement evaluation and expeditionary geoBase manager, Southwest Asia.

MSGT. JOSHUA A. MATIAS

Control Tower Chief Controller
14th Operations Support Squadron (Air Education and Training Command)
Columbus AFB, Miss.
Home of Record: Milwaukee

MSgt. Joshua A. Matias led 28 airmen and civilians in support of AETC's No. 1 flying hour program, generating 65,000 sorties and producing 453 Air Force pilots. His efforts enabled 394 position certifications and 22 skill-level upgrades in 54 percent of the allotted time. As squadron superintendent while deployed to Southwest Asia, he led 135 warfighters from 13 Air Force specialty codes and 17 bases worldwide in the execution of eight major combat operations. His team generated 56,000 operations and 7,000 intelligence and weather products supporting the Combined Joint Task Force with the liberation of 500,000 civilians in the city of Mosul, leading to the elimination of 5,000 ISIS enemy combatants. As deployed tower chief controller, Matias' team partnered with 100 host nation air traffic controllers. Their partnership supported eight weapons systems, 23,000 combat missions, 40,000 flight hours, and the delivery of 194 million pounds of fuel.

TSGT. BRETT M. LASWELL

AC-130U Evaluator Special Missions Aviator/Flight NCOIC
4th Special Operations Squadron (Air Force Special Operations Command)
Hurlburt Field, Fla.
Home of Record: McLeansboro, Ill.

TSgt. Brett M. Laswell was awarded a Distinguished Flying Cross for his efforts in Afghanistan, after 10 hours of CAS, expending two combat loads of ammunition, killing 32 enemies, and destroying 23 buildings. He led a five-person gun crew during Southern Command's largest CAS exercise, flying 21 hours, readying 400 Special Operations Forces personnel for AC-130U employment and was selected for evaluator upgrade. As special missions aviator instructor, he executed 23 sorties and 105 flight hours, instructing lead gun, instructor, and evaluator training, directing 22 special missions aviators for next-level certification and qualifications. He completed five college classes, 40-hour senior enlisted Joint Professional Military Education, and JSOU CEP-1 PME with a stellar 4.0 GPA, earning two CCAF degrees in aviation operations and maintenance technology. Additionally, he was selected for a Smithsonian Channel film, where he provided aircrew reenactments, stamping AFSOC's AC-130U aircraft into the history books.

Photos: USAF

OUTSTANDING AIRMEN of the Year

TSGT. DAVID E. MILLER

Noncommissioned Officer in Charge of Personnel and Readiness
48th Contracting Squadron (USAFE-AFAFRICA)
RAF Lakenheath, England
Home of Record: Columbus, Ohio

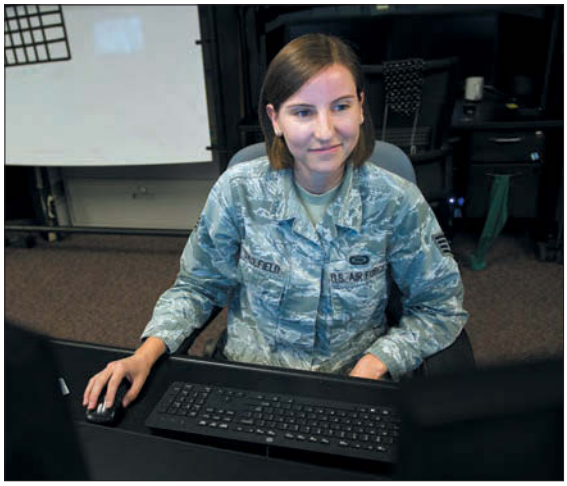
TSgt. David E. Miller was instrumental in leading the 48th Contracting Contingency Support cell by providing expert oversight onto 18 of the wing's deployment and exercise operations, increasing combat mission readiness for eight nations across three combatant commands, while supporting $3 million worth of life-saving requirements. Miller served as project officer for three multinational operations, coordinating emergency logistics for 275 members in less than three days. He also served as the subject-matter expert for emergency operations, which led to the elimination of 14 response vulnerabilities connected to eight real-world disasters, thereby increasing emergency capabilities by 35 percent over three wings. He further led contracting operations for multiple deployments in Spain and France, thereby staging over $2 million of base support services while bolstering operations for more than 700 AFRICOM sorties.

Photos: USAF

TSGT. APRIL A. SPILDE

Flight Chief/Security Forces Craftsman
30th Security Forces Squadron (Air Force Space Command)
Vandenberg AFB, Calif.
Home of Record: Minneapolis

TSgt. April A. Spilde was instrumental to the Total Force success of the 58th Presidential Inauguration, dedicating 80 hours training 90 Air National Guard and Air Force Reserve airmen as ceremonial Guardsmen with the USAF Honor Guard. Spilde led a three-person mobile training team to the 156th Airlift Wing at Muñiz ANGB, Puerto Rico, and established a fully funded base Honor Guard program, including a budget increase of $10,000. As a security forces flight chief, she led 135 airmen, securing $10.2 billion in space-launch assets, and managed the flight schedule, logistics, and daily police operations, defending 999 family houses, 2,100 facilities, and 15,000 personnel across a 99,000-acre installation. Spilde masterfully completed nine college classes and graduated cum laude, earning her bachelor's degree in english. She graduated from the NCO Academy and was the recipient of the John L. Levitow Leadership Award.



SSGT. ELIZABETH G. CAULFIELD

Advanced Scientific and Technical Intelligence (S&TI) Analyst
National Air and Space Intelligence Center (Air Force Materiel Command)
Wright-Patterson AFB, Ohio
Home of Record: Traverse City, Mich.

SSgt. Elizabeth G. Caulfield led a four-member deployment team for a total of 60 days supporting Combat Sent operations across two separate geographic areas of responsibility, while successfully processing 23 missions encompassing 235 signals. She conducted 22 deployed aircrew debriefs and provided feedback which fixed shortfalls and refined identification by 35 percent. She authored seven engineer-level reports, highlighting key enemy weapons systems vulnerabilities which revised US operations plans with emerging threat data. She aced four college courses achieving a 3.8 GPA, earning her bachelor's degree in organizational psychology. Additionally she discovered an upgrade to an advanced weapons system enhancing a Department of Defense high-priority intelligence effort, fusing vital data with fighter/bomber development.

THE 12 SELECTEES ARE AWARDED the Outstanding Airman of the Year ribbon with the bronze service star device and wear the Outstanding Airman badge for one year.

SSGT. WILSON B. GARDNER

Airfield Systems Journeyman
202d Engineering Installation Squadron (Air National Guard)
Robins Air Force Base, Ga.
Home of Record: Douglasville, Ga.

SSgt. Wilson B. Gardner enhanced data processing and network security at 20 sensitive compartmented information facility sites and fabricated 30,000 feet of fiber-optic cable, which resulted in installation cost savings of $25,000. He created an in-house, high-reliability soldering course, training 25 members on a critical high-tech skill. Gardner was voluntarily activated three times for more than 400 days in support of a C4IT construction project with United States Strategic Command, Offutt AFB, Neb. He installed 216 communication racks and 18 telephone closets, fitted 5,000 J-hooks, and 37 multi-user telecommunications outlet assemblies, directly resulting in savings of over $200 million and increasing C4ISR capabilities by more than 200 percent. Additionally, he provided support to three sites in Puerto Rico after Hurricane Maria, enhancing network reliability and reducing maintenance requirements by 25 percent.

SRA. PATRICK O. P. SCHILLING

Explosive Ordnance Disposal Technician Journeyman
775th Civil Engineer Squadron (Air Force Materiel Command)
Hill Air Force Base, Utah
Home of Record: Sarasota, Fla.

SrA. Patrick O. P. Schilling filled a crucial capabilities gap for the 775th EOD Flight when he stepped up to fill the role of munitions account manager for the Air Force's largest custodial account during his supervisor's absence; coordinating 40,000 items worth $554,000. During operations, he destroyed seven intercontinental ballistic missile motors, saving the US Navy $6 million in storage and maintenance costs, fulfilled international relations agreements between the US and Russia, in turn earning him AFMC's nomination for Enlisted Military Assistant to the Secretary of Defense. Additionally, while Schilling was administering a physical training test, he saved another airman's life by being the first to respond to a medical emergency. He partnered with the US Secret Service during the Presidential Inauguration, where he cleared 112 acres, five vans, and four packages of explosive hazards, ensuring the safety of the president and 800,000 personnel.

SRA. JON R. TAITANO

Client Systems Technician
644th Combat Communications Squadron (Pacific Air Forces)
Andersen AFB, Guam
Agana Heights, Guam

SrA. Jon R. Taitano was a combat communicator and client systems technician assigned to the 644th CCS, 36th Contingency Response Group, 36th Wing, Andersen AFB, Guam. He maintained and troubleshot classified and unclassified communication systems in direct support of 3,000 deployed users, as well as theater deployed systems for a broad range of military missions, such as President of the United States support, contingency operations, agile combat employment, and humanitarian assistance operations for Pacific Air Force's only combat-rated communications squadron. In addition, he assisted with maintaining operational readiness within the 36th CRG by certifying personnel in cardiopulmonary resuscitation and self-aid buddy care.

Photos: USAF

THE FALL OF FRANCE

The French armed forces had more of almost everything, but they suffered a defeat in less than six weeks.

By John T. Correll

As war clouds gathered over Europe in the summer of 1939, the French were boldly confident of their capability to defend themselves should Germany be rash enough to attack.

"The French Army is stronger than ever before in its history," declared Gen. Maxime Weygand, the retired chief of staff. "Its equipment is the best, its fortifications are first rate, its morale is excellent, and it has an outstanding high command. Nobody wants war but if we are forced to win a new victory then we will win it."

The military editor of *The New York Times,* Hanson W. Baldwin, was of a similar opinion. "The French army has long been called by experts the 'best in the world,' and its finest divisions undoubtedly are unmatched," he said.

The French were ahead of the Germans, or nearly so, in almost every category of military power. They had more tanks, more artillery, more men under arms, and about the same number of combat airplanes.

The entire French-German border, from Basel in Switzerland to the

British soldiers wade from the beaches at Dunkirk to a waiting destroyer during a mass evacuation effort just before the fall of France.

A German Dornier light bomber drops bombs over France in June 1940. The French had more combat aircraft than Germany, but only a fourth of the fleet was operational on the Western Front.

Longwy on the Luxembourg frontier, was protected by the Maginot Line, a continuous string of linked concrete fortifications, mine fields, barriers, ditches, and prepared fields of fire.

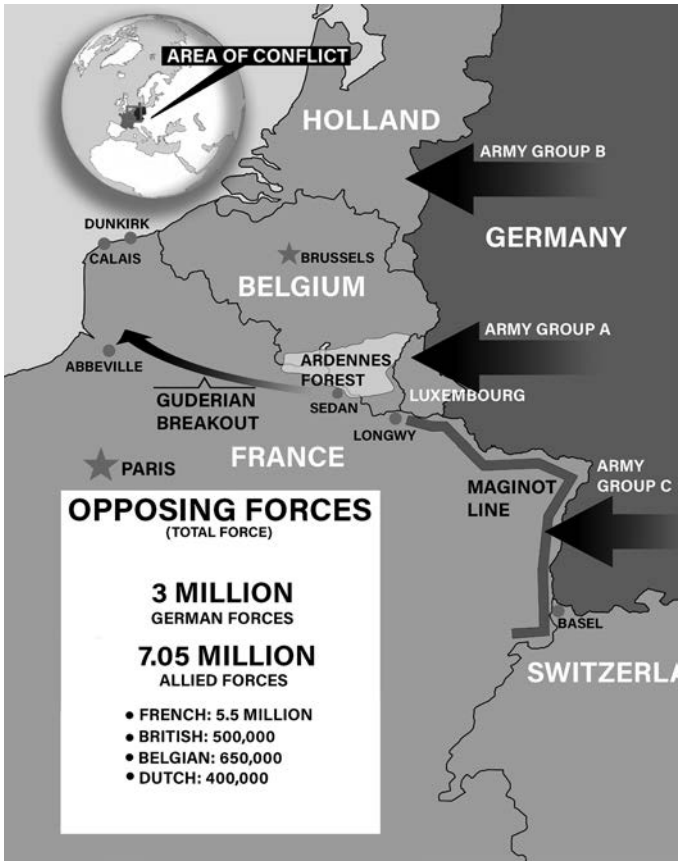
With reduced requirement for mobile forces on that front, the French could allocate more of their manpower to the Belgian border on the north, where a German attack, if there was one, was expected to come. The lowest priority for defense were the approaches from the Ardennes Forest—regarded as "impenetrable"—between the Maginot Line and Belgium.

The Germans invaded Poland Sept. 1, 1939, and two days later, Britain and France declared war. The French did not redeploy their forces based in North Africa and other colonial territories, but the numbers added by the Belgians and Dutch—previously declared neutral—and the British Expeditionary Force, ensured a favorable ratio. On the Western Front, 151 Allied divisions faced 135 German divisions in the spring of 1940.

French confidence gave way to cockiness. Gen. Maurice Gustave Gamelin, 68, the current army chief and commander of the armed forces, said in February 1940 that he would be happy to make the Germans a gift of one billion francs if they would do him the favor of taking the initiative in an attack.

What followed ranks as one of the most stunning upsets in the history of warfare. The Germans invaded western Europe May 10, 1940, and with a success that surprised even themselves, completely routed the French and their allies in less than six weeks. On June 22, the French signed a humiliating armistice that marked the end of their independence as a nation.

How could it have happened?



SHIFT TO THE DEFENSIVE

After World War I, the French military abandoned its traditional offensive doctrine for a defensive strategy called bataille conduit, or "methodical battle."

"The 'methodical battle' started from the premise that in modern warfare the strength of firepower bestowed an immense advantage upon the defender," said historian Julian Jackson. "Massing the amount of material necessary to carry out a successful offensive was a complex logistics operation that required meticulous preparation.

"What the army wanted to avoid above all were improvised 'encounter' battles where moving armies came upon each other without having prepared their positions. Instead, the emphasis of French doctrine was on a tightly controlled battle where decision-making was centralized at

Photos: Imperial War Museum; German Federal Archives; staff map by Mike Tsukamoto

A column of German Panzer IVs move through a French town in May 1940.

the highest levels. This was in stark contrast to German doctrine, which encouraged initiatives by lower-level commanders."

The Maginot Line, built between 1930 and 1937, was a key aspect of the strategy, blocking an advance from the east and establishing a stable front on the French-German border.

The expectation was that, if the Germans did attack, they would come charging through Belgium, as they had done in the "Schlieffen Plan" that opened World War I in 1914.

The bedrock assumption was that France would meet the German attack in Belgium. A basic problem with that was the weakness of the Benelux countries. Luxembourg had only a few hundred soldiers and a 12-horse cavalry troop. The armies of Belgium and the Netherlands, with respective strengths of 650,000 and 400,000, were substantial, and the Belgians had 270 tanks.

In 1936, however, King Leopold of Belgium repudiated the military treaty with France and declared neutrality. The Dutch followed his example, and French forces were denied entry. Unknown to Leopold, the French planned to go into Belgium anyway if they needed to, although prepositioning was not possible.

Leopold did not change his mind until the invasion. A few hours after the Germans crossed his border, he asked the French for help.

SICKLE CUT

The French had not been altogether wrong about German strategy. "Indeed, in the first three drafts of the German campaign plan, drafted between October 1939 and January 1940, the primary attack was against Belgium by the right wing of the German army," said Karl-Heinz Frieser, a German historian.

Germany had assembled three army groups on the Western Front: Group B in the north opposite Holland and Belgium, Group A in the center facing the Ardennes, and Group C in a holding action against the Maginot Line in the south.

Lt. Gen. Heinz Guderian, Germany's best tank officer, convinced Gen. Erich von Manstein, chief of staff of Army Group A, that he could move his panzers efficiently through the Ardennes and Manstein convinced Hitler. The primary attack would be delivered by Group A under Gen. Gerd von Rundstedt.

"The new plan was a mirror image of the Schlieffen Plan, which had been like a revolving door through which the German armies advancing through Belgium swung southeast behind the French armies marching eastward into Lorraine," said historian Jackson. "This time the rotation operated clockwise, with the Germans swinging northwest behind the French moving into Belgium."

The operation, known as Sichelsnitt or "Sickle Cut," aimed to split the French army in two and sever the support lines for the forces in Belgium. Traditionalists, notably Gen. Franz Halder, chief of the army general staff, ridiculed the revised strategy but later attempted to take credit for it when it worked.

The declarations of war in September were followed by a lull that lasted through the winter and was called "the Phony War" by the newspapers. There were a few skirmishes between patrols and an occasional dogfight by the fighter planes, but both sides seemed reluctant to begin the real fighting.

Gamelin had time to bring additional forces back to France from distant locations but did not choose to do so. His headquarters was in Paris, and his contact with troops in the field was limited. He concentrated on dealing with the politicians, with whom he was more comfortable.

PANZERS

Tanks were first introduced by the British and French in World War I, and by the end of that conflict, they were operating thousands of them. Germany never had more than 20. Despite the German military buildup in the 1930s, the French were still ahead in 1940.

French army Gen. Maurice Gustave Gamelin in 1936. Gamelin sarcastically offered the Germans one billion francs if they would do him the "favor" of taking the initiative in an attack. That was a mistake.

On the northeast front in Western Europe, the French had 3,254 tanks compared to 2,439 for the Germans. The French tanks, notably the medium Somua S35 and the heavy Char B1, were rated as superior to the German workhorses, the Panzer III and Panzer IV.

France was also first, in 1933, to organize tanks into armored divisions. By 1940, though, only a third of the tanks were assigned to these divisions. The others were distributed around the army to support the infantry. Innovative tank officers, such as Col. Charles de Gaulle, were distrusted and promoted slowly.

The Germans consolidated their tanks into 10 Panzer divisions. The thrust through the Ardennes would be led by Panzer Group Kleist—commanded by Gen. Ewald von Kleist—with five divisions divided into two corps. Guderian was more qualified than Kleist for the assignment, but the old guard was suspicious of his ideas. Instead, he was given command of the XIX Panzer Corps with three divisions on Kleist's left flank.

Guderian was pointed directly toward the center of the front, where the French had posted their weakest tank forces, around Sedan on the bank of the Meuse river.

THROUGH THE ARDENNES

"Operations in the Netherlands and northern Belgium were now envisioned as a 'matador's cloak' to draw French forces into that area, while von Rundstedt struck the lethal sword blow in the south," said historian Jackson.

Even though the northern offensive that began May 10 was secondary, it was full strength. Luxembourg gave up without a fight. The Netherlands surrendered May 14. The Belgians held out for a short time near the border and then fell back to form a new line with the 22 French and British divisions that had moved forward to the Dyle river. The Allies had not yet discerned the German strategy.

It is not clear how the French convinced themselves that the Ardennes was "impenetrable" and impassible for large military forces, but they believed it absolutely. The Ardennes was densely forested, with rugged hills, steep ravines, deep valleys, and winding roads. Nevertheless, military formations could and did get through.

British strategist B. H. Liddell Hart visited the region in 1928 and described it as "well-roaded and most of it rolling rather than mountainous country." He reported that the "impassibility of the Ardennes has been much exaggerated."

A German map exercise concluded that the Ardennes could be crossed in nine days. Guderian estimated that he could do it in four. In fact, Guderian's panzers burst out of the Ardennes at Sedan, six miles inside the French border, on the afternoon of May 12, well ahead of expectation. The French retreated across the Meuse, and Guderian occupied Sedan without opposition. The German infantry was close behind.

On May 13, panzers from Kleist's right flank crossed the Meuse. First to reach the other side was the division commanded by another up-and-coming tank officer, Maj. Gen. Erwin Rommel.

AIRPOWER

French airpower was competitive with the Luftwaffe, or so it seemed before the war started. In May 1940, the French had 4,360 combat aircraft vs. 3,270 for the Germans. However, the French had only a fourth of these aircraft in operational formations on the Western Front.

Airplanes, like tanks, were considered to be support for the infantry. "There is no such thing as a battle of the air," Gamelin said in 1939. "There is only a battle of the land."

Most authorities rated the French fighters as at least as good as their German counterparts. The Dewoitine 520 and even the American-made Curtiss 75A—a variant of the obsolescent P-36 Hawk—often held their own with the Messerschmitt Bf 109, the best fighter in the world at the time.

The French Hawk 75As were eventually captured, outfitted with German instrumentation, and sold to Finland, which operated them alongside the Luftwaffe against the Soviet Union in 1941.

The French airmen were not organized for quick response. Airpower was not centrally controlled, and requests for air support were delayed by the sluggish chain of command. French fighter units flew an average of 0.9 sorties a day, compared to 4.0 for the Germans. French bomber units were even worse, at 0.25 sorties a day.

Aerial reconnaissance discovered "considerable motorized and armored forces on the move" through the Ardennes on May 11 and reported them to be carrying bridging equipment. "The air forces of the allies were presented with a unique opportunity on a silver platter to smash a major portion of the German panzer force in the Ardennes," said German historian Frieser. "But as if by a miracle, the German panzers were not bothered."

The commander of the Northeast Front ordered the priority for bombing to be switched from Belgium to the central region around Sedan. However, his headquarters was back in France. The local French commander ignored the order and directed that two-thirds of the air support go to the forces in Belgium.

The remaining French and British air forces assailed the Germans crossing

Photos: National Library of France; Erhardt Eckert/German Federal Archives

Lt. Gen. Heinz Guderian in a tank car in France, along with radio operators with Enigma encryption devices. Guderian was controversial among German military leaders, but proved to be a brilliant tactician.

the Meuse, but it was not enough to prevent Guderian from establishing a bridgehead. Guderian, meanwhile, was supported superbly by the Luftwaffe, and especially by the Stuka dive bombers.

FROM SEDAN TO THE SEA

Guderian was no sooner across the Meuse than he left one of his divisions to consolidate the position and struck out to the northwest with the other two. Kleist was wary of the risk of the advance but he did not prohibit it.

Two days later, the panzers were 40 miles into France. On May 17, Kleist, worried that the operation was going too fast, ordered Guderian to stop the attack and relieved him of command—which was promptly restored by von Rundstedt. Guderian then continued toward the coast, cutting a swath through northern France that was filled in by German forces coming behind.

Breakout from Sedan, crucial to the German victory, was achieved at Guderian's initiative. "I never received any further order as to what I was to do once the bridgehead over the Meuse was captured," he said in his memoirs. "All my decisions, until I reached the Atlantic seaboard at Abbeville, were taken by me and me alone."

Prime Minister Paul Reynaud was among the first to recognize the calamity, although he was somewhat early in conceding the loss. "We have been defeated," he told British Prime Minister Winston Churchill May 15. "We are beaten. We have lost the battle."

Directed to counterattack, Gamelin asked, "With what? I have no more reserves. Between Laon and Paris, I do not have a single corps of soldiers at my disposal."

Gamelin was not as bereft of resources as he claimed but the available reserves were scattered loosely along the front. Gamelin persisted in his detachment from operations, leaving conduct of the battle to the ineffectual commander of the Northeast Front.

Former army chief Weygand was recalled to active duty May 19 to replace Gamelin. At 73, Weygand was even older than Gamelin and no more able to figure out what to do.

That left most of two French armies, including the mobile tank divisions, and all but one of the divisions of the British Expeditionary Force stranded in Flanders and Belgium and cut off from France. Belgium surrendered May 28.

A vast British evacuation, calling on more than 700 ships and boats of all sizes, plucked 338,226 Allied soldiers—mostly British but also 110,000 French—from the beaches at Dunkirk between May 26 and June 4.

The French were curiously slow in getting their forces to the pickup points at Dunkirk, and some vessels departed half empty. About 40,000 French troops were left to be captured.

The Germans might have wreaked more devastation except for a Hitler order May 24 for the army to stop its advance. This has been explained variously as a gesture offering peace to the British, as a measure to allow the Luftwaffe to finish off the enemy at Dunkirk, or simply a judgment to slow the attenuated German force and reduce vulnerability to its flanks.

COLLAPSE

The invasion force could now turn its full attention south into France. The Stukas roamed freely ahead of the panzers and infantry, clearing anything that lay in their path. The Maginot Line held, with some skirmishing, but it was irrelevant.

The French government abandoned Paris on June 11 and declared it an open city. The Germans marched in on June 14. The Armistice—a poorly disguised surrender—was signed June 22, bringing the Third French Republic to an end.

The victory was hardly free. The Germans took 156,492 casualties, including 27,074 killed, and heavy losses in tanks and aircraft.

The toll was much higher on the Allies, who sustained 2,291,340 casualties, the great majority of them by the French. The French troops on the fighting line fought doggedly and well, as reflected by the casualty count: 90,000 killed, 200,000 wounded, and 1,900,000 missing or taken prisoner.

That commitment and the initial advantage in numbers and equipment could not overcome the failure in strategy and leadership. The French could not break free of their outmoded concept of war, nor could they adapt to concentrate their available forces to any real effect.

Only so much of the blame for the defeat can be assigned to the French. The excellent military performance of the Germans was also a critical factor in the battle. However, they were greatly aided in that respect by the disengagement and incompetence of the French high command. ✪

John T. Correll was the editor-in-chief of *Air Force Magazine* for 18 years and is now a contributor. His most recent article, "Into Son Tay," appeared in the October/November issue.

Photo: German Federal Archives

2 Hoodies in 1!

Air Force™ Reversible Hoodie

Black Reverse Side

Black Front

Available in 5 men's sizes M-XXXL

Gray Front

Gray Reverse Side

A Custom Designed Apparel Exclusive from The Bradford Exchange

Honor the brave patriots who will forever put Service Before Self! Our *"Air Force™" Reversible Hoodie* offers 2 striking and stylish looks that will show off your U.S. Air Force™ pride wherever you go! Practical and comfortable, this 2-in-1 hoodie is crafted in an easy care cotton blend knit that reverses from black to gray. Custom-designed artwork on the back of the black side showcases a banner that reads "HOME of the FREE BECAUSE of the BRAVE". The patriotic eagle and flag design is enhanced with an embroidered Air Force™ logo and the words, "UNITED STATES AIR FORCE™" which are also embroidered. An appliqué patch of the official Air Force™ emblem decorates the front of the black side. The back of the gray side is printed with "The United States AIR FORCE™ SERVICE BEFORE SELF Established 1947" and is accented with an embroidered American flag patch. The front of the gray side features an appliqué patch of the Air Force™ insignia. A full front zipper with reversible puller, kangaroo pockets, lined hood, and black knit cuffs and hem complete the look. Imported.

TM Department of the Air Force. Officially Licensed Product of the Air Force (www.airforce.com).

An Outstanding Value...Not Available in Stores

Available in five men's sizes M-XXXL, this reversible hoodie is a remarkable value at just $129.95*, payable in four installments of $32.49 and backed by our 30-day money-back guarantee. This is a limited-time offer, so don't delay. To acquire yours, send no money now; just return the Priority Reservation today!

bradfordexchange.com/28914

*For information on sales tax you may owe to your state, go to bradfordexchange.com/use-tax.

PRIORITY RESERVATION SEND NO MONEY NOW

THE BRADFORD EXCHANGE
APPAREL & ACCESSORIES

9345 Milwaukee Avenue · Niles, IL 60714-1393

YES. Please reserve the *U.S. Air Force™ Reversible Hoodie* for me as described in this announcement. I've indicated my size preference below.

- ❑ **Medium (38-40)** 01-28914-011
- ❑ **Large (42-44)** 01-28914-012
- ❑ **XL (46-48)** 01-28914-013
- ❑ **XXL (50-52)** 01-28914-014
- ❑ **XXXL (54-56)** 01-28914-015

Signature

Mrs. Mr. Ms.

Name (Please Print Clearly)

Address

City State Zip

Email

*Plus a total of $14.99 shipping and service, plus sales tax (see bradfordexchange.com). Please allow 2-4 weeks after initial payment for shipment. Sales subject to product availability and order acceptance.

E61011

THE BEST BARGAIN IN MILITARY HISTORY

The B-52 has proven itself stunningly effective and adaptable to whatever the world throws its way.

A B-52G with Strategic Air Command readies for takeoff from a base in Saudi Arabia during Operation Desert Storm in 1991. B-52s delivered more than 27,000 tons of bombs during the conflict.

By Walter J. Boyne and Philip Handleman

The B-52 is a mainstay of the US bomber fleet. Though officially named the Stratofortress, the subsonic bomber is more often called the BUFF for Big Ugly Fat Fellow (while in less pristine jargon the last word is replaced by an alliterative expletive). A total of 102 H-models were built as the concluding segment of a production run that aggregated 744 aircraft.

The last B-52 rolled off the assembly line in October 1962. Virtually all crew members who currently fly aboard the bomber were born after it was built. The aircraft has undergone extensive structural modifications and avionics upgrades during its extended service life, keeping it an effective platform well into the twenty-first century. The miracle of its adaptability goes back to its development.

By the end of World War II, the jet engine was a reality that the Air Force sought to exploit in its emergent bombers. The problem was that the early jet engines failed to provide the blend of high thrust and efficient fuel consumption necessary to carry a heavily laden bomber great distances, as the air force requirement mandated. Not surprisingly, the first post–World War II heavy bomber was the mixed propulsion B-36 Peacemaker, which had a combination of propeller-driven and pure jet engines that were variously "turning and burning."

Boeing had conceived a scaled-up version of its B-29/B-50 with six turboprops. Meanwhile, though, Boeing was developing the XB-47, a futuristic medium bomber with swept wings and four jet engines mounted in cluster pods. Because of the thrust limitation, fifth and sixth jet engines were added in individual pods on either side near the wingtips. The promising possibilities of this jet-powered medium bomber led some on the Boeing design team to suggest that the heavy bomber should be similarly configured with pure jets rather than turboprops.

The imperative for a long-range strategic bomber was heightened in June 1948 when the Soviet Union blockaded the Western sectors of Berlin. It became clear that the United States would need a modern heavy-bomber force to counter the threat posed by the rising tensions of the Cold War. Against this backdrop of increased urgency, work on the B-52 continued with a heightened sense of purpose.

The Air Force procurement officer on the project, Col. Pete Warden, was open to the idea of a pure jet design, but he wanted the turboprop configuration to remain a consideration. There are varying accounts of what happened next, but in general the story goes that on a Friday in mid-October 1948, Boeing's top designers and aerodynamicists—Ed Wells, George Schairer, Bob Withington, Vaughan Blumenthal, Art Carlsen, and Maynard Pennell—met with Warden at Wright-Patterson Air Force Base in Ohio.

Reportedly Warden told the men at that point that a pure jet design was the way to go after all, but that the configu-

Airmen perform a postflight inspection on a B-52 at Andersen AFB, Guam. Since 2004, B-1s, B-2s, and B-52s have been rotating in and out of the base as part of a continuous bomber presence in the region.

ration they had presented was deficient for it would hold back the bomber's speed. They needed a greater angle of sweep, closer to that of the B-47, and more engines than the six adopted for the B-47. The Boeing team regrouped in a room at Dayton's Van Cleve Hotel and worked nonstop through the weekend, sparing no effort to create the definitive design. They even obtained balsa wood from a local hobby shop to sculpt a model of their proposed heavy bomber.

First thing Monday morning the team showed up in Warden's office with the model fittingly decorated in Air Force colors. Also, they submitted a thirty-three-page report revealing performance, engineering, production, and cost details that represented the culmination of their extraordinary exertions over the weekend. The wing was swept thirty-five degrees and the aircraft was to be powered by eight engines mounted in four under-wing pods of two engines each.

AN ENGINEERING MARVEL

Though it defied the odds, the design thrashed out that weekend by the team from Seattle proved to be an engineering marvel. The design that derived from such improbable circumstances led to the B-52, which profoundly affected the balance of power for the generation to come and remains a bulwark of American might.

Maiden flight occurred less than four years later, on April 15, 1952. Lead test pilot was the flamboyant Tex Johnston, Boeing's choice to take the helm on this important foray. The flight lasted nearly three hours as Tex and his copilot, Air Force Lt. Col. Guy Townsend, got the feel of the new plane.

It was soon determined that the bubble-type canopy under which the pilot and copilot were seated in tandem should be changed to a more conventional bomber flight deck layout with side-by-side seating. Landing gear consisted of bicycle-type twin-row trucks of two wheels each spaced along the length of the lower fuselage. Innovatively, the wheels could pivot to remain in line with the runway as the aircraft crabbed at an angle in a crosswind. Lithe outrigger gear at the wingtips kept the fuel-laden wings from drooping to the ground and scraping against the taxiway/runway pavement.

A wing with a high angle of incidence permitted rotation while the aircraft was still positioned horizontally. Auxiliary power for the many power requirements in the massive airframe came from a bleed-air system driving small turbines. The original Pratt & Whitney J57 turbojets, which produced eighty-seven hundred pounds of thrust, were accompanied by deafening howls and black smoke trails. Reflecting the myriad improvements to the aircraft over its amazingly long time in service is the fact that today's Pratt & Whitney TF-33 turbofan engines are rated at nearly double the thrust level of the bomber's earliest engines.

The first combat-capable version was the B-52B, which achieved readiness in June 1955.

The final model was the B-52H, built exclusively at the Wichita plant. Notably, it received an engine upgrade that not only boosted thrust, but improved consumption to where a 30-percent increase in unrefueled range was possible. The machine guns in the tail were replaced by the Vulcan gun system with six barrel 20-mm cannon.

The B-52 was a key asset of Strategic Air Command. The bomber frequently flew long-range high-altitude missions in preparation for a nuclear counterstrike against the Soviet Union. However, with the rise of a sophisticated surface-to-air missile threat, doctrine shifted and the bombers started to fly low-level missions as a means to avoid radar detection. The increased flying in thicker and more turbulent air near the ground necessitated structural upgrades to the B-52 fleet.

Under the hard-charging SAC commander, Curtis LeMay, B-52 flight and maintenance crews were forged into an exceptionally professional fighting force. SAC operated with great regimentation. It was an organization that exemplified the virtues of discipline and teamwork.

Largely because of the finely honed skills of SAC's personnel and the unparalleled efficacy of its bombers, Soviet leaders did not dare to tap the tripwire. The certainty of catastrophic consequences prevented the Cold War from erupting into a shooting war. SAC's motto of "Peace through strength" provided an epigrammatic description of the winning strategy. Without a single bomb being dropped in anger, the generational contest ended in a euphoric moment at the wall in Berlin where it had symbolically begun.

BAPTISM OF FIRE IN VIETNAM

It was in the unlikely airspace over the jungles of Vietnam that the B-52 got its baptism of fire. Raids started on June 18, 1965. B-52Fs flying from Andersen Air Force Base in Guam ranged over preselected sites in South Vietnam where the Viet Cong were thought to be operating. The bombing campaign, characterized by long flights and questionable effects, ensued for years under the code name Arc Light. As the war dragged on, some missions were flown out of the much closer U Tapao Air Base in Thailand.

Frustration reached the boiling point in late 1972 when North Vietnam would

Photos: TSgt. Rose Reynolds via National Archives; A1C Alexa Ann Henderson

A new B-52 rolls out at the Boeing facility in Seattle during a night production-line move during the 1950s. The first BUFF flew in 1952.

not negotiate in earnest at the Paris Peace Talks. Massive raids were ordered to jump-start the stalled diplomacy. For eleven days in December, the skies over North Vietnam reverberated with the roar of waves of B-52s. Hanoi and Haiphong, the North's two major cities, were targeted like never before.

Because the airspace was more heavily defended than any other in the history of air warfare up to that time, B-52 losses were considerable. The array of top-line Soviet surface-to-air missile batteries caused an attrition rate of 7 percent after the first three nights of bombing. Tactics employed in the bombing campaign, known as Linebacker II, were flawed and contributed to the toll. Changes were implemented and SAM positions were targeted with renewed vigor, which improved the situation.

The relentless pounding, in coordination with other Air Force and Navy attack aircraft, had a substantial impact. Not only did the North Vietnamese take up negotiations again in Paris, but the North's military leaders along with a large portion of the North's population were deeply shaken. It was revealed years afterwards that officials in the North had doubted their ability to continue resisting because of Linebacker II's devastation.

Interestingly, SAM defenses had been depleted, which meant that the skies would have been virtually open to US bombers had raids continued. When the constraining rules of engagement had been lifted by US policymakers, measurable results were evidenced. All of this has caused some analysts to wonder what outcome might have been achieved if such ferocious air strikes had been unleashed early in the war.

For nearly the next two decades, the B-52 force refocused on the Cold War. Crews remained on alert in scramble huts near their bombers, ready to launch retaliatory strikes on a moment's notice. The nuclear-armed B-52s were a main component of the nuclear triad, which still includes them as part of the bomber component along with land-based ICBMs and submarine-launched ballistic missiles.

FROM COLD WAR TO HOT WARS

When the Iron Curtain finally came crumbling down on Nov. 9, 1989, there was but a brief sigh of relief for US airmen. In 1990, Kuwait, a small and vulnerable country rich in oil reserves, had been overrun by its belligerent neighbor to the north. In conjunction with a large coalition of international partners, US air strikes were ordered against Iraq in early 1991.

In the opening phase of Operation Desert Storm, seven B-52s from Barksdale Air Force Base in Louisiana embarked on a mission to Saudi airspace where they employed Conventional Air Launched Cruise Missiles (CALCMs) against designated targets in Iraq. The bombers then returned to their home base in what was the most distant bomb run in history up to that time. The nonstop mission involved multiple air refuelings and lasted a grueling thirty-five hours.

Isolated carpet bombing was successful in compelling Iraqi troops to abandon their positions and surrender. B-52s delivered more than twenty-seven thousand tons of bombs. In little more than a month of aerial bombardment and a matter of only a few days of land warfare, Kuwaiti sovereignty was restored.

The following year, with the Cold War lapsing into faded memories, the Air Force was restructured to better contend with new global challenges. Strategic Air Command was inactivated; its B-52s were transferred to the newly established Air Combat Command. In the post-Soviet era, with no strong-fisted global power imposing its will in forgotten corners of the world, long-simmering ethnic divisions broke out in the Balkans.

In the spring of 1999, Operation Allied Force commenced against Serbian forces to stop so-called ethnic cleansing against Albanian and Muslim majorities in Yugoslavia's Kosovo province. B-52s staged for sorties at RAF Fairford in England. These operations initially involved use of CALCMs and soon entailed gravity bombs. The ethnic cleansing at first accelerated, but as the bombing ramped up, the Serbian forces stood down and a peace agreement was signed on June 9.

Any thought of mothballing the fleet of aging bombers ended on Sept. 11, 2001. Jihadi terrorists hijacked four domestic US airliners. Two were rammed into the twin towers of the World Trade Center and one was flown into the side of the Pentagon. Passengers were aroused on the fourth airliner, and after a fight for control it slammed into a field near Shanksville, Pennsylvania.

Nearly three thousand people were killed. Most of the victims were civilians. The horrifying acts prompted a military response less than a month later. As Operation Enduring Freedom unfolded, B-52s and other bombers aided the takedown of Afghanistan's Taliban government and the scattering of the al Qaeda terrorist organization's key leaders. In addition to bombs, B-52s dropped propaganda leaflets.

With radicalized elements in the Middle East seemingly intent on obtaining weapons of mass destruction, fears grew in Western capitals that Iraqi dictator Saddam Hussein may have developed such weapons. Though the suspicions were later determined to be unfounded, the United States decided once and for all to remove Saddam from power.

B-52s played a role in Operation Iraqi Freedom, which got underway the night of March 20, 2003. Flying from Fairford and the island of Diego Garcia, the B-52s pummeled Iraqi forces with a variety of ordnance. The air campaign persisted for eighteen days until Saddam's regime was toppled.

The bomber has proven to be a versatile delivery platform. It can be configured for the full range of bomber-attack missions, including nuclear strikes, conventional saturation bombing, and surgical blows. Before the Air Force had

SrA. John Myer pushes a tow bar under a B-52H during a Red Flag exercise at Nellis AFB, Nev., in 2013.

deployed a large number of Predator/Reaper unmanned aerial vehicles to the conflict in Southwest Asia, the B-52H served as a kind of close air support aircraft, loitering high above the battlefield for long durations and launching precision-guided weapons as directed by ground troops.

RENEWED FOCUS

Concerns over the integrity of the US nuclear arsenal arose when a succession of troubling incidents demonstrated that oversight and proper handling were deficient. A new organization was established to renew the high levels of safety, security, and effectiveness that nuclear weapons warrant and that were manifest during the time of the vaunted Strategic Air Command.

Air Force Global Strike Command was activated on Aug. 7, 2009, to assume this important responsibility. The B-52 fleet, the sole B-2 wing, and the three remaining ICBM wings came under its purview at that time.

A current focus is on the Pacific Rim, as China flexes its new-found muscle and the irascible North Korean regime continues to make mischief. B-52Hs are currently rotated on a virtual permanent basis at Andersen Air Force Base in Guam. With air tanker support, this outpost in the Pacific gives the bombers a springboard to reach points in Asia.

There are sixty-five combat-coded B-52s left in active duty (split between Barksdale Air Force Base in Louisiana and Minot Air Force Base in North Dakota). Eleven are in the reserves at Barksdale. Because these bombers have precision strike capability, substantially fewer airframes are required to hit a given target set. Yet the fact that so few comprise the force means that there is hardly any margin for attrition.

Despite its age, the B-52 has continued to demonstrate its worth. Both the Air Force and prime contractor Boeing see the old bomber soldiering on for years to come. Indeed, an Air Force study has projected that the B-52H can remain a viable military platform through 2044, and Boeing has indicated that the aircraft can keep flying through 2060, based on a structural service life of eighty thousand hours. If the latter comes true, B-52s—the actual airframes of the models currently flying—will achieve an operational span of ninety-nine years.

One modernization idea was to swap out the B-52's eight aging engines with four engines of the type used on either the Lockheed C-5 cargo plane or the Boeing 757 airliner. This would have led to significantly reduced maintenance and higher fuel efficiency, but was rejected because of the estimated time and cost to integrate the aerodynamics-changing retrofit. Instead, attention focused on the possibility of doing an engine-for-engine swap so that the aircraft's configuration would remain essentially unchanged.

Under this proposal, the replacements would be off-the-shelf engines used on regional airliners or high-end business jets, offering better maintainability, sustainability, and performance. From an environmental standpoint these engines would be drastically less polluting and much quieter. Also, additional thrust would permit the carriage of a heavier payload. Pratt & Whitney, manufacturer of the bomber's decades-old TF33 engines, advocates upgrading them through targeted design changes, which it claims would be the lowest-cost solution.

Beyond modifications to keep the B-52 viable as a flying machine, extensive avionics and weapons upgrades continue to be implemented to enhance the aircraft as a combat platform. One of the more important programs is the coming replacement of the B-52's outdated APQ-166 radar. Meanwhile, phased installation of the Combat Network Communications Technology (CONECT) is occurring to integrate the bomber into network-centric operations. With the addition of the Link 16 data link, the B-52 will have an unmatched ability for secure communication with other mission aircraft.

Whereas in the past, human-to-human communication via voice was necessary, it will be possible for vital data to be transmitted machine to machine. This technology will simplify and speed up the transfer of target coordinates to the B-52 from ground-based tactical air controllers. By eliminating tasks in the data transfer process, the so-called kill chain will be compressed and there will be less probability of flawed data entry.

Separately, installations of an upgraded rotary launcher have begun. Along with an electrical power system enhancement, this will give the B-52 the ability to carry large numbers of the precision Joint Air-to-Surface Standoff Missile (JASSM) internally. Also in the works is the follow-on cruise missile, known as the Long-Range Standoff (LRSO) weapon, which will eventually equip the B-52.

With further modifications and upgrades in the years to come, some current crew members speculate that the B-52 will be around long enough for their children and maybe even their grandchildren to fly it. Little could Boeing's design team have known during the drawn-out weekend at the Van Cleve Hotel, sketching configurations, running numbers, and fashioning a balsa wood model that their labors would yield such a long-lived warplane. The Air Force has already stated that it expects the B-52 Stratofortress to complement the next bomber, the B-21 Raider, when it enters service, scheduled for the mid-2020s. ✪

Walter J. Boyne and **Philip Handleman** are the authors of "*The 25 Most Influential Aircraft of All Time*," from which this article is excerpted.

Photos: AFA; SSgt. Vernon Young Jr.

AFA's Spencer Honored

Paul Severance (left) and John Sperling (right) of the Eisenhower School present Gen. Larry Spencer with the Dwight D. Eisenhower Award at the Air Force Association's 2018 Air, Space & Cyber Conference in National Harbor, Md.

Gen. Larry O. Spencer, President of the Air Force Association and Publisher of *Air Force Magazine,* on Sept. 19 was given the *Dwight D. Eisenhower Award* from the Eisenhower School (formerly the Industrial College of the Armed Services). The prestigious award, presented to former students or instructors at the school, is sponsored by the ICAF-ES Alumni Association and was presented at the Air Force Anniversary Dinner Gala on the closing night of the Air Force Association's 2018 Air, Space & Cyber Conference in National Harbor, Md.

Criteria considered when choosing an award recipient include support of US armed services and security-related agencies with strategic impact; exceptional contributions to a strong US national security and industrial base; active support of the US defense industrial base; and leadership in defining and addressing US industrial base and national security issues, among other criteria. Former award recipients include Secretary of Defense Dick Cheney, Secretary of Defense William Perry, Joint Chiefs of Staff Chairman Gen. John Vessey, and House Armed Services Committee Chairman Rep. Ike Skelton of Missouri.

Spencer said he was surprised and overwhelmed by the award. "Understanding the level and contributions of others that have received this award, I don't know how I got into that company," he said. "I am very honored."

Spencer, who retired as a four-star Air Force general serving as USAF's Vice Chief of Staff in 2015, began his military career as an enlisted airman in 1971. He attended Officer Training School and was commissioned as a second lieutenant in 1980. In 1993, he was selected to attend ICAF, where he was a distinguished graduate and received a master of science degree in resource strategy.

USAF has also honored Spencer. In June 2015, the Air Force created a new award to recognize innovation and efficiency within the service and named it for Spencer, who created, as Vice Chief of Staff, the "Make Every Dollar Count" and "Airmen Powered by Innovation" programs to encourage airmen—particularly the enlisted corps—to bring new ideas into Air Force operations. The *General Larry O. Spencer Innovation Award* recognizes airmen who bring innovation into the service.

"There's a 'frozen middle' in large organizations that—deliberately or not—tends to stifle innovation," Spencer said. "Young airmen are full of good ideas, but sometimes can't find a way to get them heard by the people at the top who can apply the ideas and make them happen. The 'frozen middle' is hard to break through, and we should reward those with the perseverance and determination to fight through those layers ... to get their innovative ideas heard."

Scheduled to leave his post as President of AFA in a few months, Spencer has no intention of retiring. He is certain, he said, that he will continue the charity work he already performs—and perhaps expand it—and doesn't rule out working in the private sector or even for another nonprofit organization. His focus has long been nurturing and encouraging innovation and thinking "outside the box," particularly among young people and those just beginning their careers, and he'd like to continue his efforts in that direction.

"People don't like change," he said. "They say they do, but really, they don't. But it takes a diverse group of thinkers—diversity in gender, race, education, social experience—to come up with different ideas ... ways of doing things. Not every 'different' idea is better, but we all need to challenge the status quo to ensure we don't get trapped inside our own sphere of knowledge." ✪

Photo: Mike Tsukamoto/staff

By Rachel Cox

Nathan Wages

Home State: Georgia
Chapter: David C. Jones Chapter (N.D.)
Joined AFA: 2014
AFA Office: North Dakota State President, former Chapter President, and Vice President
Military Service: 1999-present, Active Duty
Occupation: Aircraft Specialist Section Superintendent
Education: A.A.S., Aviation Maintenance Technology, and A.A.S., Operations Management, Community College of the Air Force; B.S., Criminal Justice, Southwestern College

Elinor Otto, one of the original Rosie the Riveters, and Nathan Wages at AFA's Air, Space & Cyber Conference in 2017.

How did you first hear of AFA?
Honestly, I've heard people talk about AFA most of my career, however, in my early airman years I really didn't know what it was all about.

What prompted you to join?
My wife became a lifetime member when she was in high school, so needless to say, once we got married she convinced me to join and help the local chapter with her

What do you enjoy most about your AFA membership?
I enjoy all the opportunities I've had to meet people throughout the community, such as senators and all the Air Force leaders that I would have never had the chance to meet otherwise. My favorite was meeting an original "Rosie the Riveter!"

How do we build awareness about AFA?
Some people think AFSA (Air Force Sergeant's Association) and AFA are the same organization. I've even had lieutenants tell me that their rater doesn't push private organizations, so they're not interested. I've had SNCOs including chiefs ask me what the difference is between AFA and AFSA. Because AFA and AFSA sound so similar, I try to avoid using the term AFA and actually say Air Force Association now when I talk to people.

How has AFA helped you?
Through my constant interactions with people, AFA has helped to improve my communication skills.

Mario Rios

Home State: Texas
Chapter: Salt Lake City Chapter (Utah)
Joined AFA: 2012
AFA Office: Utah State Treasurer
Military Service: 2002-2005, Active Duty, 2013-present Air Force Reserve
Occupation: SBIR Technology Transition Agent
Education: B.S. Industrial Engineering, Instituto Tecnológico y de Estudios Superiores de Monterrey

How did you first hear of AFA?
When I moved to Utah in 2011 to start working for the Small Business Innovation Research (SBIR) program, one of my coworkers recommended I attend a meeting with the Industrial Associates (IA) of Utah AFA. This was my introduction to AFA and the IA.

What prompted you to join?
Once I talked to the folks there, it seemed like a great opportunity to network and make some good SBIR connections. During that first meeting, the IA were looking for volunteers to replace the current treasurer, and I raised my hand just to be nice. I got the treasurer position since no one else volunteered. I became an AFA member at that point and have been involved ever since.

What do you enjoy most about your AFA membership?
I like being part of the state committee (Utah AFA). There are a lot of activities for committee members to get more involved within AFA, as well as community events that give me the opportunity to interact and network with other great leaders who are making a difference.

What should AFA do to draw in more members?
We need to identify ways to involve members in AFA activities. Members will renew when they feel valued and believe they are contributing to the organization.

How do we build awareness about AFA?
We can drive awareness by word of mouth, print literature, event sponsorship, and community involvement, among other activities AFA has and will continue to be involved with.

How has AFA helped you?
AFA has helped me in my current job by providing the opportunity to make connections and build a network. It has helped me personally by providing opportunities to lead efforts and have a committee position.

AFA began an Emerging Leaders Program in 2013 as an avenue to secure AFA's future. The purpose of the program is to identify, motivate, develop, and encourage emerging leaders to serve actively in AFA by providing hands-on experience and unique insights into how AFA operates and is governed. Emerging Leaders volunteer for a year. With guidance from a mentor, they participate on a national-level council, attend national leader orientations, and serve as National Convention delegates.

US Postal Service Statement of Ownership, Management, and Circulation

1. Publication Title: Air Force Magazine
2. Publication Number: 0730-6784
3. Filing Date: Oct. 16, 2018
4. Issue Frequency: Monthly, except for two double issues, Jan./Feb. and July/Aug.
5. No. of Issues Published Annually: 10
6. Annual Subscription Price: $50.00
7. Complete Mailing Address of Known Office of Publication (not printer): 1501 Lee Highway, Arlington, VA 22209-1198. Contact Person: Eric Chang Lee. Telephone: 703-247-5849
8. Complete Mailing Address of Headquarters or General Business Office of Publisher (not printer): 1501 Lee Highway, Arlington, VA 22209-1198
9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor:

Publisher: Larry O. Spencer, 1501 Lee Highway, Arlington, VA 22209-1198; Editor: Tobias Naegele, 1501 Lee Highway, Arlington, VA 22209-1198; Managing Editor: Juliette Kelsey, 1501 Lee Highway, Arlington, VA 22209-1198

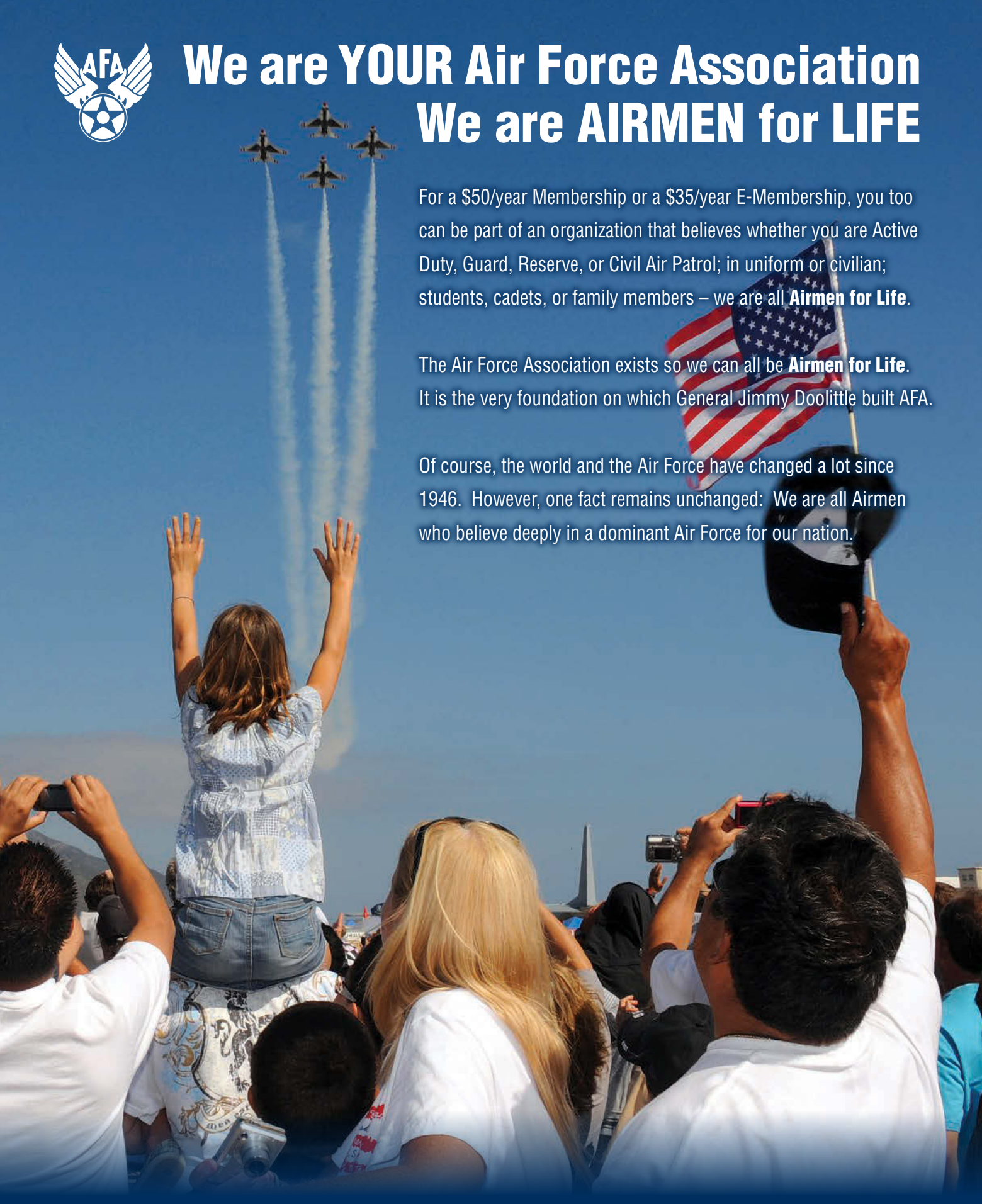
10. Owner: Air Force Association, 1501 Lee Highway, Arlington, VA 22209-1198
11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities: None
12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates): Has not changed during preceding 12 months
13. Publication Title: Air Force Magazine
14. Issue Date for Circulation Data Below: Sept. 1, 2018

15. **Extent and Nature of Circulation** Monthly Journal of the Air Force Association	**Average No. Copies Each Issue During Preceding 12 Months**	**No. Copies of Single Issue Published Nearest to Filing Date**
a. Total Number of Copies (net press run)	83,956	80,583
b. Paid Circulation (by mail and outside the mail)		
(1) Mailed outside-county paid subscriptions stated on PS Form 3541 (include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	74,076	71,394
(2) Mailed in-county paid subscriptions stated on PS Form 3541 (include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	0	0
(3) Paid distribution outside the mails including sales through dealers and carriers, street vendors, counter sales, and other paid distribution outside USPS	1,295	1,848
(4) Paid distribution by other classes of mail through the USPS (e.g., first-class mail)	0	0
c. Total Paid Distribution [sum of 15b (1), (2), (3), (4)]	75,371	73,242
d. Free or Nominal Rate Distribution (by mail and outside the mail)		
(1) Free or nominal rate outside-county copies included on PS Form 3541	0	0
(2) Free or nominal rate in-county copies included on PS Form 3541	0	0
(3) Free or nominal rate copies mailed at other classes through the USPS (e.g., first-class mail)	0	0
(4) Free or nominal rate distribution outside the mail (carriers or other means)	577	577
e. Total Free or Nominal Rate Distribution [sum of 15d (1), (2), (3), (4)]	577	577
f. Total Distribution [sum of 15c and 15e]	75,948	73,819
g. Copies Not Distributed	8,008	6,764
h. Total [sum of 15f and g]	83,956	80,583
i. Percent Paid [15c / 15f x 100]	99.24%	99.22%
16. Electronic Copy Circulation		
a. Paid electronic copies	0	0
b. Total paid print copies (15c) + paid electronic copies (16a)	75,371	73,242
c. Total print distribution (15f) + paid electronic copies (16a)	75,948	73,819
d. Percent paid (both print & electronic copies)(16b / 16c x 100)	99.24%	99.22%

17. Publication of Statement of Ownership
If the publication is a general publication, publication of this statement is required. Will be printed in the December 2018 issue of this publication.
18. Signature and Title of Editor, Publisher, Business Manager, or Owner: Eric Chang Lee (signed), Production Manager. Date: Oct. 16, 2018

I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

Courtesy photos: Nathan Wages; Mario Rios



We are YOUR Air Force Association
We are AIRMEN for LIFE

For a $50/year Membership or a $35/year E-Membership, you too can be part of an organization that believes whether you are Active Duty, Guard, Reserve, or Civil Air Patrol; in uniform or civilian; students, cadets, or family members – we are all **Airmen for Life**.

The Air Force Association exists so we can all be **Airmen for Life**. It is the very foundation on which General Jimmy Doolittle built AFA.

Of course, the world and the Air Force have changed a lot since 1946. However, one fact remains unchanged: We are all Airmen who believe deeply in a dominant Air Force for our nation.

Join today at www.AFA.org

1/ Charles Loring as a major in the Air Force. 2/ Loring AFB, Maine, in 1968. 3/ Lieutenant Loring beside a P-47 in World War II.

LORING

Blaze Of Glory

Loring Air Force Base, in remote northern Maine, was shuttered long ago, but many remember the warrior for whom it was named.

Charles J. Loring Jr. was a superb fighter pilot. He fought in Europe and then in Korea, where he died in a blaze of glory.

Born in Portland, Maine, Loring graduated from a Catholic school there and began a promising career as a professional boxer.

However, his life changed utterly when the US entered World War II. In March 1942, Charley Loring enlisted in the Army and soon moved on to the Air Corps. He was awarded wings in December 1942.

In early 1944, he and his 36th Fighter Group, a P-47 unit, were sent to England. They struck German forces before, during, and after the Normandy invasion. Loring once destroyed 10 German armored vehicles in a single mission, an act for which he received the Distinguished Flying Cross.

Loring flew 54 missions and ran out of luck. On Christmas Eve 1944, during his 55th mission, he was shot down and captured, after which he was a POW for six months. The experience left a scar.

"Charley was a stubborn man," Loring's father later noted. "He said he would never be a prisoner again." It was a fateful remark.

After the war, Loring was stuck for years in nonflying posts. He avidly sought combat duty when the Korean War erupted in 1950. In May 1952, Loring went to Korea and soon linked up with the 36th Fighter-Bomber Squadron, an F-80 unit concerned with flying close air support and interdiction of Communist ground targets. It took him only a few months to bag 50 combat missions.

On Nov. 22, 1952, US-led allied forces were operating near Sniper Ridge, 20 miles north of the 38th Parallel. China had massed 133 large-caliber guns, 24 rocket-launchers, and 47 anti-aircraft guns, posing a major threat. A call went out for airpower.

Loring, recently promoted to major, led a flight of F-80s to dive-bomb the Chinese guns. Shortly after he began his dive, his F-80 was struck multiple times by AAA fire, yet he did not try to pull out and attempt a risky escape and return to home base.

The other pilots looked on, stunned, as Loring, rather than abort the mission, continued to dive. At 4,000 feet, he accelerated his aircraft at a 40-degree angle in a controlled maneuver. The F-80 crashed directly into the gun position, obliterating it but killing Loring in the process.

Why did Loring do it? Some thought that it was to avoid becoming a Chinese POW. Others believed he was impelled by a sense of duty to Allied ground forces. In any event, he silenced the Chinese artillery and saved many lives. Loring was awarded a Medal of Honor posthumously. His remains have never been recovered.

CHARLES JOSEPH LORING JR.

Born: Oct. 2, 1918, Portland, Maine
Died: Nov. 22, 1952 (KIA) Kunwha, North Korea
Education: Cheverus High School, Maine
Occupation: US military officer
Services: US Army Air Forces, US Air Force
Main Eras: World War II, Korean War
Years Active: 1942-52
Combat: Northern Europe, Korea
Final Grade: Major
Honors: Medal of Honor, Distinguished Flying Cross, Purple Heart (2), Air Medal (12), Prisoner of War Medal, American Campaign Medal, European-African-Middle Eastern Campaign Medal, World War II Victory Medal, National Defense Service Medal, Korean Service Medal, Air Force Longevity Service Award, Belgian Croix de Guerre with Palm, Korean War Service Medal.
Buried: Arlington National Cemetery (cenotaph only, body not recovered)

LORING AIR FORCE BASE

State: Maine
Nearest City: Limestone
Area: 22.3 sq mi / 14,300 acres
Status: Closed
Opened as Limestone AAF: April 15, 1947
Renamed Limestone AFB: June 6, 1950
Renamed Loring AFB: Oct. 1, 1954
Closed by USAF: Oct. 1, 1994
Current owner: Loring Development Authority
Former owners: Strategic Air Command 1947-92; Air Combat Command (1992-94)

In 1947, the Army built Limestone Army Airfield in far northern Maine—the first US site specifically constructed for the storage and assembly of atomic weapons. USAF in 1954 renamed it in honor of Loring. For most of existence, the base was home to the bombers, tankers, and interceptors of Strategic Air Command. ✪

Photos: National Museum of the US Air Force; Library of Congress; World War II Flight Training Museum

I SERVED FOR *loved ones*

With the Air Force Association USAA Rewards™ Visa Signature® credit card, you have the freedom to provide your loved ones with the things they deserve while benefiting from great rewards, competitive rates, and USAA's legendary customer service.

JOIN USAA AND APPLY TODAY!

CALL 877-618-2473 **OR VISIT** USAA.COM/AFAVISA

USAA is proud to be the **Preferred Provider** of Financial Services for the Air Force Association

The United States Air Force E-11A Global aircraft fleet is the backbone of the extremely critical Battlefield Airborne Communication Node mission.

Quickly approaching 100,000 flight hours since entry-into-service with the United States Air Force, the Global aircraft fleet has repeatedly shown it is up to the task in the most demanding of environments.

bombardier.com