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September 2017 $8

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USAF celebrates 70 years of achievement. See "United States Air Force: 70 Years in Pictures," **p. 32.** Photo collage by Eric Chang Lee.

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September 2017, Vol. 100, No. 9

Air Force Magazine (ISSN 0730-6784) September 2017 (Vol. 100, No. 9) 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:** $45 per year; $30 e-Membership; $110 for three-year membership. **Life Membership (nonrefundable):** $600 single payment, $630 extended payments. **Subscription Rate:** $45 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. Trademark registered by Air Force Association.

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Flying together for 70 years

Photo: U.S. Air Force

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By Adam J. Hebert, Editor in Chief

Stronger Together

KRZESINY AB, POLAND

Thousands of US military personnel are regularly deploying to Central and Eastern Europe to train with allies and deter Russia, as there are very few US forces based here. In Poland, for example, the entire permanent US operational military presence consists of 11 USAF airmen assigned to Łask AB, Poland.

The 52nd Operations Group's Det. 1, the "AvDet" as it is colloquially known, works with the Polish air force on a daily basis at three central Poland air bases—Krzesiny, Łask, and Powidz—laying the groundwork for cooperation and ensuring USAF has a "warm base" ready, come exercise season or war.

The detachment turns five in November, and few would have predicted in 2012 how important it would become. Then, in 2014, Russia invaded Ukraine and illegally seized the Crimean Peninsula.

Russian aggression understandably worries NATO's Eastern members, most of whom spent half a century under Nazi and/or Soviet domination—or were completely absorbed by the Soviet Union and ceased to exist as independent nations. Needless to say, Russia invading neighboring nations and seizing territory does not sit well on NATO's eastern frontiers.

Today there is an alphabet soup of US and NATO initiatives to promote stability: Enhanced Forward Presence (EFP), the European Reassurance Initiative (ERI), Operation Atlantic Resolve (OAR), and theater security packages (TSPs), not to mention air policing and the National Guard State Partnership Program. All serve overlapping purposes.

"The United States has demonstrated not merely with words, but with its actions, that we stand firmly behind Article 5," said President Donald J. Trump in a July visit to Warsaw, Poland. "Words are easy, but actions are what matters." This was an overdue but essential endorsement of NATO's all-for-one philosophy, and the President was spot-on about the importance of actions.

USAF F-16s fly a mission for BALTOPS and Saber Strike, multinational exercises in the Baltic region. Such exercises bolster Eastern Europe's confidence in the US.

Photo: SSgt. Jonathan Snyder

The US has indeed taken significant action to support its Eastern European allies. US funding for ERI initiatives has grown at breakneck pace. What was a $789 million training, deployment, and exercise program in 2016 is expected to grow to a $4.8 billion investment in 2018. Regular air policing missions defend the airspace of vulnerable allies, and theater security packages send combat-ready USAF units forward to work with and defend allies.

A recent visit to Lielvarde Air Base in Latvia during Saber Strike showed USAF C-130s practicing wartime delivery skills. The 435th Contingency Response Group was there as well, operating out of tents, exercising its ability to set up a bare base in combat conditions.

One high-profile move has a mechanized infantry battalion with armored fighting vehicles and towed artillery—1,000 US Army soldiers in all—populating a combat-ready NATO battle group in northeast Poland. Similar battle groups, manned by other nations, rotate through the Baltic states of Estonia, Latvia, and Lithuania, shoring up the defense of these nations in Russia's shadow.

A little US commitment goes a long way in Central and Eastern Europe.

In June, Saber Strike and Baltic Operations (BALTOPS) exercises were in full swing south and east of the Baltic Sea. Łask Air Base was closed to flight operations, as Poland and the United States make major improvements to the runway, ramps, and weapons storage areas, so Det. 1 was hosting four KC-135 tankers and eight F-16s at Powidz and Krzesiny instead. Airmen from each of the deploying units lauded the ease with which they were able to deploy to Poland and begin flying without missing a beat.

Lt. Col. Kristofer Padilla, Det. 1 commander, told *Air Force Magazine* the unit has a US European Command mandate to host four quarterly aviation detachment rotations per year, bringing F-16s and C-130s. Det. 1 is "absolutely dependent upon the Total Force ... to make those deployments happen," Padilla said. In other words, while USAF relies on the AvDet for successful deployments, the arriving forces also ensure Det. 1 can continue to keep the door open at the Polish bases.

In an all-out war, a handful of USAF fighters over Latvia or 1,000 soldiers in Poland will not defeat a Russian invasion. They will, however, serve as a tripwire—a symbol of US commitment that should prevent Russia from attacking in the first place.

As one BALTOPS participant noted, many civilians in Eastern Europe still "have an underlying fear we won't come" if their nation is attacked by Russia. This makes the US presence in northeast Europe mutually beneficial. High profile, public partnerships like those on display this summer in Poland and Latvia build up US skills, reassure vulnerable allies, and keep Russia in check. That's a win all the way around.

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Letters

Long Time Coming

The editorial "Silent Leadership—At a Cost" (July, p. 4) highlights a problem peculiar to the United States Air Force. It might be useful to spend some time thinking about the roots of that problem—and then even more time thinking through the most costly consequences.

The roots of the problem lie in the failure to clearly define the roles and missions of the services, beginning with the compromise of Key West and carried through every revisit of the issue since. Since no clear boundaries have been established, the services appear to be in competition with one another like different department stores, as opposed to being recognized as specialists in various means of modern warfare. Then, the existing problem was only exacerbated by that aspect of the 1986 Goldwater-Nichols legislation that exalted "jointness" as the pinnacle of military excellence. Over time, the symphony began to be more important than the excellence of any of the players—and solos are strictly discouraged!

Why is this not such a problem for the other services? When have you heard the Chief of Staff of the Army or the Commandant of the Marine Corps asked, "What does your service bring to the joint fight?" We have learned to assume that the "joint fight" is the "boots on the ground fight," deserving and requiring support from air and naval forces. Routinely, the Air Force is being defined (and defining itself) in terms of "what it brings to the joint fight." The Navy, relying on centuries of mankind's reliance on naval forces and the Air Force's unwillingness to exploit the vulnerabilities of surface and subsurface combatants, simply ignores the "jointness" dictum and presses on.

This is not the Air Force's problem. It is the nation's problem. It is past time to recognize and exploit the primacy of airpower. It is not doctrine; it is physics. If the Army and the Navy were to war against each other, the likely outcome would be a stalemate over one beach or another—unless one of them had the support of the United States Air Force. In the end, none of the services actually fights the war—they envision, develop, nurture, cultivate, and provide specialized capabilities to joint force commanders. The mission of the United States Air Force is not to "Fly, Fight, and Win." The mission of the United States Air Force should be to: "Ensure the fullest exploitation of air, space, and cyberspace in pursuit of national security interests." Were that in the forefront of every airman's mind—as opposed to "bringing airpower to the joint fight"—we would be finding better ways to bring airpower directly to bear on national security problems. We might have been able, for example, to prevent ISIS from graduating from junior varsity to major adversary status.

Finally, I take issue with one line in [Adam] Hebert's otherwise excellent editorial. In the second to the last paragraph he states, "No service should fight alone." Acknowledging that services do not actually fight, I would argue that anytime we can bring airpower to bear directly on national security problems without placing our sons and daughters in harm's way, we should be anxious to do so.

Maj. Gen. Charles D. Link,
USAF (Ret.)
Fairfax Station, Va.

Thank you for firing a public salvo on what I hope is no longer an institutionally taboo topic: the inability of the Air Force to effectively tell its story as it seems to have trouble standing up for itself. Bringing this deficiency out into the open is long overdue. Your list of reasons why it is frequently difficult to learn about Air Force wartime contributions is a good synopsis of the causes of the problem, but it is important to note this deficiency extends further back in Air Force history, and the steps needed to overcome it involved more than just publicizing efforts in today's wars. Here are three actions that could help:

Reinvigorate the declassification process. A good place to start is a mass declassification review and release of the annual histories of the operational commands, something which is long overdue. Command histories are the institutional memory of the Air Force and a good place to start telling the Air Force story. Of course, some facts must still remain classified, but those are fewer and fewer as time goes by. Keeping 25- to 70-year-old Cold War-era secrets locked in the archives doesn't help tell the story and reinforces the impression of an organization that is senile, and one symptom of senility is the inability to retrieve data from memory. Now is the time to air out some of the vaults before institutional rigor mortis and dementia set in.

Provide more personnel and resources to the Air Force Historical Research Agency. AFHRA should be the premier institution where anyone can learn what his great service has contributed—in both war and peace. It is a true national treasure, a rich resource of documents and collections that should be widely available for historians and researchers, especially airpower advocates. But AFHRA is undermanned, and it is difficult to access its holdings, very few of which are online and many of which still need declassification review despite their age. Allocation of a modest amount of additional personnel and resources would generate benefits far out of proportion to cost.

Be more forthcoming with both Congress and the American people. Lack of

WRITE TO US

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—The Editors

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candor doesn't do anyone any favors, especially in an era where trying to control information often fails. The ongoing A-10 saga is a good example where being secretive does not reflect favorably because, rightly or wrongly, the Air Force comes across as having a "we know everything and you're not smart enough to" attitude. An uninformed observer can be forgiven for believing the Air Force either doesn't know what it is doing or is trying to pull a fast one. Hoarding information is no longer a path to power. It is a path to irrelevance and does not garner public support. A shift from a top-down industrial age mindset to an information age approach would help a great deal. (This point deserves further elaboration, but suffice it to say, a change in orientation is essential to reconstruct and solidify an understanding of the Air Force that has faded from the public memory as the World War II and Desert Storm experience are now largely in the history hooks. The good news is leadership with the right outlook can make this happen without having to spend any money.

The Air Force must be able to tell its story to get more resources and smarter decisions from Congress. In this day and age, that means the American people must know the Air Force story so they can offer more support for the Air Force to which political leaders, in turn, should respond. The Air Force has a great story to tell, so let's tell it.

Lt. Col. Allan G. Johnson,
USAF (Ret.)
Fairfield, Calif.

Hooray for Mr. Hebert and his editorial. I have for most of my career and retirement cringed at the lack of good PR in the Air Force. For one, I am sick of hearing about SEAL Team 6 and the vaunted Tomahawks. The average American Joe is probably thinking, and who can blame him, that we really don't need an Air Force; the Navy can do it all. The Air Force (and the nation) is paying a high price for our non-PR "culture"—few joint commands, serious shortage of funds and manpower, aging inventory. I'm all for joint operations, but it doesn't take a military genius to realize that in our modern technological world, where speed and reach are the principal ingredients for successful combat, the Air Force should be the service of choice—first to be called and in command. We are an open and democratic society. The people matter, and they are going to be swayed by what they hear (or don't hear). It is past time for us to start doing some public bragging and doing it loud, clear, and often.

Col. Mike Sexton,
USAF (Ret.)
Albuquerque, N.M.

SENIOR STAFF CHANGES

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NOMINATION: To be Brigadier General: Deanna M. **Burt.**

CHANGES: Brig. Gen. Vincent K. **Becklund,** from Dep. Chief, Office of Security Cooperation-Iraq, CENTCOM, Baghad, Iraq, to Spec. Asst. to the Cmdr., AFSOC, Hurlburt Field, Fla. ... Brig. Gen. (sel.) Deanna M. **Burt,** from Cmdr., 50th SW, AFSPC, Schriever AFB, Colo., to Vice Cmdr., Air Warfare Center, ACC, Nellis AFB, Nev. ... Lt. Gen. John B. **Cooper,** from DCS, Log., Engineering, & Force Protection, USAF, Pentagon, to Cmdr., AF Sustainment Center, AFMC, Tinker AFB, Okla. ... Maj. Gen. Thomas W. **Geary,** from Asst. DCS, ISR, USAF, Pentagon, to Mil. Dep. to the Dir., DIA, Washington, D.C. ... Brig. Gen. (sel.) Anthony W. **Genatempo,** from Sr. Materiel Leader, AFLCMC, AFMC, Wright-Patterson AFB, Ohio, to AF PEO, Weapons, AFLCMC, AFMC, Eglin AFB, Fla. ... Brig. Gen. Christopher J. **Ireland,** from Dep. Dir., SOCOM, MacDill AFB, Fla., to Dep. Cmdr., Canadian NORAD, Winnipeg, Canada ... Brig. Gen. (sel.) David R. **Iverson,** from Sr. Mil. Asst. to the Under SECAF, Office of the Under SECAF, Pentagon, to Sr. Mil. Asst. to the SECAF, OSAF, Pentagon ... Maj. Gen. Scott A. **Kindsvater,** from Dep. Cmdr., Ops & Intel., Combined Jt. Task Force-OIR, CENTCOM, Southwest Asia, to DCS, Ops., SHAPE, NATO, Mons, Belgium ... Lt. Gen. Lee K. **Levy II,** from Cmdr., AF Sustainment Center, AFMC, Tinker AFB, Okla., to DCS, Log., Engineering, &

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Murder, Not Combat

In regard to the article "Airpower at the Bay of Pigs" (July, p. 62), although it provides an excellent overview of this historical event and the role that airpower played in it, I would like to address the matter of the circumstances surrounding the death of Thomas "Pete" Ray.

The simplistic statement that Ray "survived the crash but [was] killed in a shootout on the ground" suggests that this was the end of that part of the story. However, over a period of many years, additional information was obtained that would reveal that this was just the beginning of a quest for final justice.

In 1979, Ray's remains were returned from Cuba. An autopsy revealed that he had sustained multiple gunshot wounds, the majority of which were believed to have been survivable if he had received appropriate medical treatment. Also present was a fatal gunshot wound of the head. At the time of this examination, the circumstances surrounding Ray's death were unknown.

Information later obtained from eyewitnesses indicated that following the initial engagement with Cuban militiamen, Ray was taken to the field dispensary near Castro's headquarters. The wounded Ray was then confronted by the physician in charge of the medical facility and summarily executed by him, thereby providing an explanation for the contact gunshot wound to the head.

In 2004, the Cuban government was successfully prosecuted under a federal anti-terrorism statute, which was the culmination of a 30-year quest by Ray's daughter, Janet Ray Weininger, to have her father's remains returned and the true story of his death finally told.

Interestingly, one of the postmortem findings can be related to the statement by a CIA representative—"Cannot attach sufficient importance to fact that American crews must not fall into enemy hands"—was obviously in Ray's mind as he engaged Castro's soldiers in the gun battle, during which a projectile entered his outstretched right arm as he returned their fire.

CMSgt. Jay M. Glass,
USAF (Ret.)
Birmingham, Ala.

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By Jennifer Hlad

U-2: ALOFT EVERY DAY

Intelligence, surveillance, and reconnaissance (ISR) is always in demand. For the U-2 pilots of the 99th Expeditionary Reconnaissance Squadron (ERS), that means a lot of long missions flying 70,000 feet above the scorching heat of the desert, collecting communications and photos for Operation Inherent Resolve and Operation Freedom's Sentinel.

What they gather depends, said Maj. J. J., a U-2 pilot with the 99th ERS. (The Air Force does not release the full name of U-2 pilots operating downrange.)

For example, the day after an interview with *Air Force Magazine,* he was planning to fly a mission to collect images of "enemy positions, their movements, maybe what their facilities might be manufacturing, ... to kind of give the bigger pictures to keep people safe or help people make decisions," he said.

He also flies signals intelligence packages, compiling different communications.

"Everything has a frequency, whether it's somebody making a call on a radio or a signal sending out information, so we can kind of see what's out there based on the signals we're collecting, and we can do both simultaneously: We can collect images and signals at the same time," J. J. said.

The average mission for U-2 pilots in the US Air Forces Central Command region is between nine and 10 hours, said the major, and pilots spend the whole time in a full pressure suit, breathing 100 percent oxygen, at very high altitudes.

"It does take a toll on our bodies," he said. "We try to get a few days of rest before we go back out again."

The schedules for individual pilots are based on the stresses they are under when they do fly, but the planes go up every day.

"We're pretty busy," he said. "We've been pretty busy for about a decade now."

The major previously flew the C-130 and has deployed to his current undisclosed location several times in that aircraft. Even though this is his first deployment in the U-2, he's familiar with the airfields and airways, "so it's not all completely foreign," he said.

The environment is dynamic, J. J. said, but the pilots are trained well.

"We just kind of take it as it comes, and it might surprise us, but it's something that we're going to be ready for," he said.

According to him, the biggest challenge in the region is the heat.

"It's hot. Super hot. And the U-2 does great flying at altitude. It handles great, it cools down the cockpit great, but once you start getting down to the ground, it's not happy," he explained. "It doesn't like the heat. It doesn't like to taxi; it doesn't like to land over thermals that get produced around here."

The pilots know they have to be careful when they taxi in the extreme heat, "because the tail wheel likes to melt all the time," he said. But the maintainers "do a great job of keeping the planes flying, keeping the jets good to go, and they're out here working in sweltering conditions."

There are some misconceptions about the U-2, he said: namely, that it's "an old Cold War plane that's still barely hanging on, barely flying," when in reality the spyplane he's flying was built in the 1980s and "still has a lot of years left."

The pilots spend a lot of time in the air on each mission, but there's too much to do to get bored.

"I could be scanning five different radios and talking on two other ones, ... maybe trying to get pictures of the airspace and what's going on, to see if I can help out in any way." He could be talking to people on the ground to let them know he is in their airspace, talking to airmen back in the United States to see how the ISR collection is going, and of course, flying the aircraft, he said.

"You can't just put it on autopilot and forget about it," J. J. said. "It's a pretty unforgiving plane."

Despite the challenges, the major said he has volunteered for his last few deployments and will continue to deploy.

One thing he loves about deployments is that it's "not just Air Force doing Air Force stuff, not just the U-2 collecting for the Air Force boys, and the Navy out there doing their own Navy thing."

Troops may have jokes and interservice rivalries, "but realistically, when it comes down to it, especially in a deployed environment, everybody's out there doing the best they can and doing great work."

On any given day, he said, "I guarantee there's going to be a few people I'm talking to on the radio who have an accent. And you know, ... it doesn't matter what country they're from, because I know they're great at what they do and I can trust them 100 percent." ✪

A U-2 Dragon Lady launches in Southwest Asia in February. U-2s flying missions for Operation Inherent Resolve and Operation Freedom's Sentinel gather many different types of intelligence for the US military.

Photo: SrA. Tyler Woodward

Jennifer Hlad is a freelance journalist based in the Middle East and a former *Air Force Magazine* senior editor.

By Megan Scully

Toward a Space Corps?

When the House Armed Services Committee goes through its annual rite of approving the defense authorization bill, the work the panel's seven subcommittees do is quick and largely free of major news as they kick the big decisions to the marathon, day-long debate of the must-pass policy measure.

This year, however, the strategic forces subcommittee decided to shake things up. Their portion of the bill doesn't just prescribe funding levels and set new policy, it will create a whole new military service, a fighting force focused on warfare in space.

The so-called Space Corps would function quite a bit like the Marine Corps. The nascent service, if it makes it into the final defense bill, would be a part of the Department of the Air Force, but its four-star chief would be a member of the Joint Chiefs of Staff.

Service leaders have been united in their opposition to Space Corps.

The leaders of the subcommittee—Republican Mike Rogers of Alabama and Democrat Jim Cooper of Tennessee—were united in the proposal, saying it is a bipartisan acknowledgement that the US strategic advantage in space is eroding. The problems, they said, are not only developments by adversaries, but "crippling organizational and management structure and an acquisition system that has led to delays and cost overruns."

The only solution, they contend, is a separate military service responsible for National Security Space programs for which the Air Force has responsibility today.

Their proposal generated only mild criticism during the panel's markup of the authorization measure, and the committee easily fended off an effort from Ohio Republican Michael Turner, who chairs the tactical air and land forces subcommittee, to water down the language.

Indeed, Space Corps has the backing of the Republican and Democrat leaders of the powerful Armed Services panel. During the debate on the bill, Chairman Mac Thornberry of Texas acknowledged the historic nature of the proposal, but also stressed that the subcommittee had thoroughly worked on the issue.

"It was Congress that created the Air Force in 1947, when it became time; it was Congress that created the Department of Defense and forced the Army and the Navy together; it was Congress that did Goldwater-Nichols," Thornberry said. "There are times when an issue becomes developed and ripe and it is our responsibility to act."

Air Force Secretary Heather A. Wilson has stressed the need to focus time, energy, and investments on space. She and other service leaders have been united in their opposition to Space Corps, which they claim creates unnecessary new bureaucracy and could ultimately hurt the United States' ability to respond to threats in space.

The Air Force has proposed a 20 percent increase in space funding in the Fiscal 2018 budget, noted Wilson, while also announcing a reorganization aimed at improving the Air Force's ability to make advances and counter threats in space.

Rogers said he is disappointed by the Air Force's claims that Space Corps won't help meet the objectives of advancing in space.

"Let me be clear, that is not the case," he told the panel during its 14-hour debate on the bill. "Our plan empowers the Secretary of the Air Force with the ability to shape the composition of the Space Corps, streamline the acquisition authorities, and prioritize space as the important warfighting domain that it is."

While Space Corps has the near-unanimous support of the House Armed Services Committee, the Senate's version of the measure does not contain anything similar. And it seems unlikely that the Senate Armed Services Committee, which is typically more circumspect about making sweeping changes to military organization, would go along with the language this year.

It's also likely that it will continue to face strong pushback from the Pentagon, which has been loath to add to the elite and exclusive Joint Chiefs of Staff.

Indeed, it took the National Guard, which has tremendous sway on Capitol Hill, years to elevate its chief to a four-star and give him a seat with the other Joint Chiefs, thanks largely to strong and mostly united opposition from other military brass. The Marine Corps faced similar hurdles decades ago.

If history is any guide, it seems unlikely that Space Corps will happen in the coming months, as the two chambers work out their differences on the massive policy bill. But the fact that it has the endorsement of House Armed Services leaders also means it's a proposal with some legs and could one day become law.

Megan Scully is a reporter for *CQ Roll Call.*

Secretary of the Air Force Heather Wilson speaks about the proposed deputy chief of staff for space and her role as the Secretary of Defense's principal advisor on space.

Photo: Wayne A. Clark/USAF

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SCREENSHOT

07.06.2017

An A-10 pulls away after refueling from a KC-135 tanker during a flight supporting Operation Inherent Resolve. The air war against ISIS in Syria and Iraq heated up this summer.

Photo: SSgt. Trevor McBride

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Air Force World

By Wilson Brissett, Senior Editor

A B-2 Spirit at RAF Fairford, UK, in June.

■ All Bomber Types Deploy to Europe

In June, all three of the Air Force's bomber types deployed to Europe for "theater assurance and deterrence" in the region, marking "the first time in history that all three of Air Force Global Strike Command's strategic bomber aircraft [were] simultaneously in the European Theater," according to the service.

Two B-2s touched down at RAF Fairford, UK, on June 9, joining three B-52Hs and three B-1Bs already deployed to the area. The B-52s, from Barksdale AFB, La., and the B-1s, from Ellsworth AFB, S.D., were participating in exercises Saber Strike and Baltops across Europe.

The B-2s were not flying in the exercises, but were "in support of recurring bomber assurance and deterrence operations," according to US Air Forces in Europe.

■ B-1 Availability Rates on the Rebound

Five years ago, B-1 aircraft availability rates reached a historical low point. But thanks to the maturation of the bomber's upgrade program, the timely assistance of stopgap civilian maintainers, and a recent increase in military manpower, B-1 availability is rebounding.

By the time the Air Force completes the Block 16, or Integrated Battle Station upgrades in 2020, the service expects availability rates for its fastest, heaviest-lifting bomber to improve even more, Col. Robert Lepper, chief of the combat aircraft division at Air Force Global Strike Command, told *Air Force Magazine.*

USAF is now approaching the halfway point of the largest-ever modification of the B-1, which began in 2012. Twenty-nine of the service's fleet of 62 aircraft have put in their time at Tinker AFB, Okla., where the upgrade work is being done. AFGSC expects to upgrade the remaining 33 B-1s by May 2020, Lepper said.

Other issues had lowered B-1 availability rates as well, but in the last five years the service has "been making consistent improvements to get better in the B-1," he said. First, AFGSC "hired some civilian technicians to help us in the B-1 arena while we were going through low manning," and more permanent help is also on the way. "We have fortunately just added almost 250 maintenance positions to the B-1," Lepper said. "Those people are coming on board right now."

As more rejuvenated B-1s come online, the upgrades are helping the aircraft availability picture because they offer "improvements in aircraft reliability and sustainment," he explained. The hope is that with increased availability and an extended lifespan, the B-1 will remain "a significant deterrent to our adversaries across the globe" for years to come, he said.

A B-1B Lancer from Dyess AFB, Texas.

■ Half the E-4B Fleet Damaged in Tornado

On June 16, a tornado hit Offutt AFB, Neb., and damaged 10 aircraft and caused up to $10 million in damage.

Two E-4B National Airborne Operations Center aircraft were damaged, along with eight RC-135 Rivet Joints, in the storm. Six of the RC-135s had returned to mission-capable status by late June, according to Offutt, which said the base did not lose its combat capability.

An E-4B is towed out of a hangar at Offutt AFB, Neb.

The primary E-4B aircraft was off station during the tornado, and there was no impact to the mission, the Air Force said.

The service always keeps one E-4 on 24-hour alert, seven days a week, "with a global watch team at one of many selected bases throughout the world," according to an Air Force fact sheet. The aircraft serves as a key component of the national military command system for the President, Defense Secretary, and Joint Chiefs of Staff by serving as an airborne command, control, and communications center in the event of a national emergency or destruction of ground command centers.

In addition, 18 buildings were damaged, including the Offutt field house, the Aero Club, and other buildings near the parade grounds, Offutt said in a press release. The base's 55th Civil Engineer Squadron responded, with 25 personnel providing about 1,200 man hours.

Photos: TSgt. Miguel Lara III; Mike Kaplan; Josh Plueger/USAF

■ Air Force "Strongly Opposes" EELV Restrictions

The Air Force said in June it "strongly objects" to language in the House Armed Services Committee's chairman's markup of the Fiscal 2018 National Defense Authorization Act that would restrict the way the service invests money in the Evolved Expendable Launch Vehicle (EELV) program. Rep. Mike Rogers (R-Ala.), chairman of the HASC strategic forces subcommittee, pushed back on the service's criticisms and clarified that the legislation is intended to limit the EELV program's investments to a more narrow focus on rocket engine development.

In a memo obtained by *Air Force Magazine,* the Air Force argues that HASC's proposal to limit nearly $300 million of EELV spending to investments only in new engines "handicaps the Air Force's eyes and ears in space." The memo says the bill's restriction, in section 1615, would force the service to end its investment in new launch systems and move forward with only the United Launch Alliance Delta IV and SpaceX Falcon 9 launch systems.

Such a move "would eliminate competition by driving a dual sole-source scenario that results in the highest cost for [National Security Space] launch," the memo says. If the Air Force can only develop new engines, and not new launch systems, it will be forced to rely on the Delta IV for heavier payloads, which the Falcon 9 cannot carry. The lack of competition from newly developed launch systems would also mean that "Falcon launch prices would be significantly higher than those achieved by today's competitive awards," according to the service.

Rogers later clarified the motivation behind the legislation and indirectly refuted the Air Force's criticisms. He said the bill focuses investment dollars on engine development to assure "continued focus on the development of a new American-made rocket engine to replace the [Russian-made] RD-180." The bill seeks to preserve competition for the RD-180 replacement, Rogers said, but it intentionally avoids funding a competition for new launch vehicles. (See also "On the Brink of Competition," this issue.)

A United Launch Alliance Delta IV EELV lofts a National Reconnaissance Office payload into orbit from Space Launch Complex 6 at Vandenberg AFB, Calif.

■ Lost Data Link Caused 2016 Predator Crash

A lost data link and the crew's misperception of a Predator's flight control settings caused an MQ-1 to crash March 8, 2016, in the Middle East. The Predator, operated by the 15th Attack Squadron at Creech AFB, Nev., was flying a combat support mission when the aircraft experienced a "rack lockup" and no return data link, according to Air Combat Command (ACC).

Software and communication anomalies prevented the aircrew from being able to control the aircraft. After going through a checklist procedure, the crew regained control of the aircraft but there were no "discernible indications at the ground control station that the data link had been re-established," ACC said.

As a result, the Predator impacted the ground. An Air Force accident investigation board report found "unclear guidance on emergency procedures and checklists" contributed to the crash, said an ACC press release. The MQ-1 and its munitions were destroyed, at a loss of about $4.2 million.

An MQ-1B Predator taxies after completing a combat mission in Southwest Asia on July 1. Despite the March 2016 accident that resulted in a crash in the Middle East, Predators continue to perform daily missions in the area of responsibility.

SSgt. Emiliano Canales marshals an F-35 at Luke AFB, Ariz.

■ F-35As Grounded, Return to Limited Flight at Luke

The Air Force on June 9 temporarily grounded F-35As at Luke AFB, Ariz., after five separate incidents where pilots reported hypoxia-like incidents. Between May 2 and June 8, five pilots assigned to the base had "physiological incidents while flying," according to an Air Force press release. Each time, the F-35A's backup oxygen system operated as designed, and the pilot was able to follow procedures and land the aircraft.

Fifty-five F-35As assigned to Luke, including international aircraft, were grounded. "The Air Force takes these physiological incidents seriously, and our focus is on the safety and well-being of our pilots," Brig. Gen. Brook J. Leonard, commander of the 56th Fighter Wing at Luke, said in a statement.

USAF senior leaders were aware of the incidents, and the F-35 Joint Program Office stood up a "formal action team" of engineers, maintainers, and aeromedical specialists to study the cases, but after one week of investigation, the cause of the physiological incidents remained a mystery. The only consistency was that the incidents occurred at about the same "cabin altitude," Leonard told reporters.

Nonetheless, the Air Force cautiously resumed limited F-35A flying at Luke on June 21 with pilots avoiding the "flight regime"—the altitude and maneuvers—associated with the five incidents, but Leonard declined to identify what those are for fear that it would preclude an open-minded approach to finding the true root cause of the problem.

On June 22, the US Marine Corps also temporarily suspended F-35B flight operations at its Arizona base for an unrelated reason, due to concerns with the jet's logistics systems. Operations resumed a day later.

■ Two F-16s Crash in Three Days

An Air Force Thunderbirds' pilot and a member of the Thunderbirds' enlisted team were in "good condition" after the F-16D they were flying in flipped over after landing in Dayton, Ohio, during high winds on June 23. Capt. Erik Gonsalves, Thunderbird No. 8 advance pilot and narrator, remained in the hospital for one night. Thunderbirds Commander Lt. Col. Jason Heard said Gonsalves suffered "some lacerations as well as some injuries to his leg, but he's in stable to good condition and doing very well."

The second passenger, TSgt. Kenneth Cordova, did not suffer any "visible injuries and he's going to be doing just fine," said Heard. It took nearly an hour-and-a-half to extract Gonsalves from the aircraft and "another 10 to 20 minutes" after that to extract Cordova, said Heard. The two-seat F-16D took off around 10:30 a.m. on a single-ship familiarization flight prior to the Vectren Dayton Air Show. The mishap occurred after landing around 12:20 p.m.

The F-16D after the crash.

The Thunderbirds performance at the show was later canceled. Heard said an accident investigation board will determine the cause of the incident, but he noted that the aircraft, which came to a stop some 300 feet off the end of the runway, "met all requirements" for landing in poor weather.

It was the second F-16 to mishap in three days. On June 21, an Oklahoma Air National Guard F-16, assigned to a detachment of the 138th Fighter Wing stationed at Ellington Field, Texas, caught fire and crashed during takeoff. The pilot, who was under direction of the North American Aerospace Defense Command (NORAD) at the time of the mishap, safely ejected from the single-seat aircraft.

■ Air Force May Retire Three A-10 Squadrons

The Air Force is considering retiring three of its nine A-10 squadrons, but lawmakers are already starting to resist the idea. In testimony to the House Armed Services tactical air and land forces subcommittee in June, Lt. Gen. Arnold W. Bunch Jr., the Air Force's senior uniformed acquisition official, said the Air Force is "committed to maintaining a minimum of six A-10 combat squadrons flying and contributing to the fight through 2030."

But additional A-10 force structure is "contingent on future budget levels and force structure requirements," Bunch said in prepared testimony. While he didn't explicitly say the remaining three squadrons would be retired, Rep. Martha McSally (R-Ariz.)—herself a former A-10 pilot—said Bunch's statement was the first time the Air Force publicly said it would drop three squadrons, and "I'd really like to know what those planning assumptions are of the six squadrons."

A-10s position for takeoff during an exercise in South Korea.

The commitment covers at least 171 combat-coded A-10s, of the 283 fleet. "The A-10s are now in the DMZ [demilitarized zone] in South Korea, they're kicking butt against ISIS, they're deploying with the European Reassurance Initiative," McSally said. "I was over in Estonia. They're welcoming them to come back anytime soon with the Russian aggression there. From my view and experience, if we need that capability, until a proven, tested replacement comes along, nine squadrons is the absolute minimum."

Photos: ULA; SrA. Damon Kasberg; SrA. James Hensley; Shaun Music/WHIO; TSgt. Travis Edwards

First Lt. Brittany Trimble runs a preflight inspection of an F-16 before takeoff at Korat RTAFB, Thailand.

KC-46A fuels an F-16 during tests in January 2016.

■ Bonus Aimed at Pilot Exodus

The Air Force is switching to a "tiered" pilot bonus system, to retain pilots in the most critically undermanned areas, and is adding more flexibility to service contract lengths.

Under the 2017 National Defense Authorization Act, the maximum pilot bonus goes from $25,000 to $35,000, but fighter pilots will get preference for higher amounts versus, for example, mobility pilots because the shortage is more severe in the fighter specialty. The service will conduct a "business case analysis to determine greatest need and appropriate monetary amounts," officials said.

"We hope this new approach will make it easier for more airmen to stay in the service," Secretary of the Air Force Heather A. Wilson said at an Air Force Association-sponsored, Air Force Breakfast.

The 2017 aviation bonuses options include "one-year, two-year, and five-year options for all eligible 11X aviators," along with the tiered payments, the service said. "Bomber, special ops, and mobility pilots have a nine-year contract option, while fighter pilots have nine-year and 24 years of aviation service [13-year maximum] options."

Pilots of remotely piloted aircraft, as well as combat systems operators, "are eligible for five-year contracts at varying amounts, tiered by critical needs."

■ USAF Expects Boeing KC-46 Delivery To Be Late

The Air Force now expects Boeing to miss its December 2017 deadline to deliver its first KC-46 aircraft. After completing its annual schedule risk assessment on the program—a standard method by which uncertainties are factored into a baseline schedule to determine if any changes may occur—the service expects "first aircraft delivery beyond Boeing's forecast," moving delivery "into late spring of 2018."

USAF's conclusions about the timeline echo findings by the Government Accountability Office as outlined in a March report about the KC-46 program. "There is risk to the current delivery schedule due to potential delays in Federal Aviation Administration certifications and key test events," according to that report. "Program officials agree that there is risk to Boeing's test completion rate until it obtains Federal Aviation Administration approval for the design of all parts, including the pods, but test mitigation strategies are underway."

By the Numbers

1,700 The number of fighter aircraft in China's air forces inventory.

Source: "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2017."

The War on Terrorism

US Central Command Operations: Freedom's Sentinel and Inherent Resolve

■ Casualties

As of July 11, a total of 41 Americans had died in Operation Freedom's Sentinel in Afghanistan, and 43 Americans had died in Operation Inherent Resolve in Iraq and Syria.

The total includes 81 troops and three Department of Defense civilians. Of these deaths, 39 were killed in action with the enemy while 45 died in noncombat incidents.

There have been 192 troops wounded in action during OFS and 44 troops in OIR.

■ Mattis Says US Is "Not Winning" in Afghanistan

Secretary of Defense James N. Mattis told Congress that "we are not winning in Afghanistan right now" when he appeared before the Senate Armed Services Committee (SASC) in June. "I believe that the enemy is surging right now," Mattis added. The "Taliban had a good year last year, and they're trying to have a good one this year."

In questioning, SASC Chairman Sen. John McCain (R-Ariz.) took the lead in delivering a series of sharp criticisms of the Department of Defense for not turning around what he said were the failures of the Obama Administration's "don't lose" strategy in Afghanistan.

"It's hard for us to act" and give the military what it needs, "when you don't give us a strategy," he told Mattis. "It's now six months," he reminded the Secretary. "We want a strategy, and I don't think that's a hell of a lot to ask."

Mattis told McCain that a new strategy for Afghanistan is coming soon. He also said that even with a victory and withdrawal of its forces, the US must be careful not to leave "ungoverned spaces" in the country where extremism can fester. A key marker of victory would be that "the Afghan government with international help will be able to handle the violence" within its borders, said Mattis. He said political corruption is currently the main challenge US and coalition forces face there.

■ Aerial War Heats Up Over Syria

The skies over Syria heated up in June as the US shot down three regime-backed aircraft that were threatening coalition ground forces fighting against ISIS.

On June 8, an Air Force F-15E shot down a pro-regime drone inside Syria. The drone was a Shahed 129, produced in Iran and flown by the Iranian Revolutionary Guard, Syrian-allied fighters, and Lebanese Hezbollah.

Army Col. Ryan Dillon, spokesman for Combined Joint Task Force-Operation Inherent Resolve, said the drone was armed and had been firing on coalition forces near the At Tanf Garrison. "The drone did drop a munition," Dillon said. "That munition did not have effects on the coalition forces."

Ten days later, a US Navy F/A-18E Super Hornet shot down a manned Syrian air force jet after it dropped bombs on US-backed fighters. The shootdown came after the US Combined Air Operations Center contacted Russia to try to stop the situation.

"The coalition's mission is to defeat ISIS in Iraq and Syria," a coalition statement said. "The coalition does not seek to fight Syrian regime, Russian, or pro-regime forces partnered with them, but will not hesitate to defend coalition or partner forces from any threat."

The shootdown was the first air-to-air kill for a Super Hornet, though F/A-18 Hornets recorded multiple shootdowns during the Gulf War.

On June 20, an Air Force F-15E again shot down a Shahed 129 flying near US-backed fighters inside Syria. The incident happened at about 12:30 a.m. after the drone displayed "hostile intent" and advanced on coalition forces near At Tanf, said US Central Command.

The drone had "dirty wings," meaning it was armed, and the F-15E pilot made the decision quickly to shoot it down to protect US-backed fighters, Pentagon spokesman Navy Capt. Jeff Davis said.

An F-15E fires flares during a mission for Operation Inherent Resolve in June.

■ Aircraft Set New High in Air Strikes Against ISIS

US and coalition aircraft in May conducted the highest number of air strikes against ISIS in Iraq and Syria, as US-backed forces worked to clear the group's two largest holdouts. Aircraft with the US-led Combined Joint Task Force-Operation Inherent Resolve released 4,374 weapons in 5,216 sorties with at least one bomb dropped, according to statistics released by Air Forces Central Command.

The amount eclipsed the coalition's second-highest tally, set in March, by about 500 strikes. So far this year, tankers have conducted 28,072 refuelings, and airlift aircraft have flown 3,543 airlift and airdrop sorties.

■ US Strikes al-Shabaab in Somalia

US aircraft struck an al-Shabaab training camp on June 11 about 185 miles southwest of Mogadishu, Somalia, as part of the increased campaign by the US against militants inside that country, Pentagon spokeswoman Dana White said. The operation was conducted "in coordination with … regional partners as a direct response to al-Shabaab actions, including recent attacks on Somali forces," White said.

The strike came under increased authorities approved by President Donald Trump in March. They allow the military to conduct "legal action" against al-Shabaab in support of partner forces in Somalia. The military said in April these authorities would translate to "additional precision fires" in support of African Union troops. Somalia has been designated an "active area of hostilities."

Photos: SSgt. Amber E. Jacobs; SSgt. Brandi Hansen; Danny Yu; SSgt. Trevor T. McBride

Building Momentum in Afghanistan

USAF advisors work with everyone from line pilots to the Afghan Defense Ministry in the long war against ISIS and the Taliban.

KABUL, AFGHANISTAN

American advisors in Afghanistan like to say their duty is to "work themselves out of a job." Though there's still a long way to go before that happens, momentum is building.

Once a week, Army Gen. John W. Nicholson Jr., head of all NATO and US forces in Afghanistan, meets with field commanders. During a telecon dubbed the "commander's visualization," US, NATO, and Afghan officers "share a common view of what's going on at the strategic level, the operational level, and the tactical level" in Operation Khalid, the name for the 2017 fighting season, Nicholson said in a recent meeting in Kabul.

For over an hour, regional commanders used maps and graphs to show where NATO and Afghan forces are pressing the Taliban and ISIS. More than ever before, the leaders cited the reliability and capability of the Afghan Air Force (AAF) in the fight.

The advise-and-assist mission has made tangible progress since the AAF's A-29 and MD-530 aircraft became operational less than two years ago. The Afghan air arm is flying more strike missions on its own, and the Afghan National Army

corps has come to rely more and more on the Afghan light strike aircraft and helicopters in the ground fight against the Taliban.

"The operational space remains changing, but we are gaining momentum," Nicholson said.

Training, advising, and assisting the new Afghan pilots and maintainers largely falls on a small group of US airmen in Kabul and in forward locations across the country.

"From my perspective, although the coalition has been here for 16 years, the Afghan Air Force has been here in the fight, real hot and heavy, for less than two," said Col. Lendy Renegar, the chief of staff for the 438th Air Expeditionary Wing, during an interview in Kabul. Though he said the AAF is still "in the growth phase," overall the progress they've made "in that short amount of time is impressive."

In 2016, Afghan aircraft flew 13,741 missions, including 1,689 air strikes. That tally is greater than that for 2014 and 2015 combined, with missions this year moving at an even faster rate. Afghan combat pilots now sit alert daily to respond to Afghan troops in danger, a mission set unheard of before the NATO Train, Advise, Assist Command-Air (TAAC-Air) mission hit its stride.

GOING HEAVY ON LIGHT STRIKE

The AAF's A-29 is proving to be the cornerstone of the advance against the Taliban, having been in the fight since its first combat strike in April 2016. The USAF advisors are pushing to increase training.

The Afghans now fly 12 A-29s, with just 13 qualified aircrew. The plan is to build up to a fleet of 19 of the turboprops. Yet, despite the limited number of pilots and maintainers, the Super Tucano accounted for 138 strikes in 2016.

Maj. Chris Larson, an air-to-ground integration advisor, coordinates with his Afghan Air Force counterpart in Afghanistan.

"Every corps that's out there wants the A-29's support," USAF Lt. Col. Johnnie Green, commander of the 438th Air Expeditionary Advisory Squadron, told *Air Force Magazine*. The squadron, based at Forward Operating Base (FOB) Oqab, attached to Hamid Karzai Airport, is responsible for training and advising both the A-29 and MD-530 attack helicopter squadrons.

With "the difficult terrain [and] the amount of operations that are going on throughout the country, the

Photo: Brian W. Everstine/Staff; TSgt. Veronica Pierce

"EVERY CORPS THAT'S OUT THERE WANTS THE A-29'S SUPPORT."

—USAF Lt. Col. Johnnie Green
Commander, 438th Air Expeditionary Advisory Squadron

An Afghan Air Force A-29 Super Tucano sits on the flight line at Hamid Karzai Airport in Kabul, Afghanistan. The A-29 is the most formidable strike aircraft in the AAF's fleet.

A-29 provides that ... attack aircraft capability that they didn't have necessarily before," Green said.

The A-29s operate out of three locations. Kabul serves as the main site of training, with two FOBs in the heart of the country serving as launching points for combat operations.

USAF trains Afghan A-29 pilots at Moody AFB, Ga., for about a year before they return to Afghanistan. In Kabul, the pilots fly their first solo, conduct their first live weapons drop, and then "go right into combat, killing the Taliban," Renegar said.

The training contingent, both at Moody and in Kabul, is largely made up of former USAF A-10 pilots who are familiar with the close air support role.

The Afghan pilots "come out with a very Western attitude—very well-trained," said USAF Maj. Gen. James B. Hecker, the commander of the 9th Air and Space Expeditionary Task Force-Afghanistan and commander of NATO Air Command-Afghanistan. "They are very sensitive to civilian casualties and making sure there's little to no collateral damage."

The USAF members of the Train, Advise, Assist Command-Air in Afghanistan have to balance the need to train more A-29 pilots with nonstop combat requirements.

"We are aircraft-limited," Green said. "The aircraft priority has to go to combat. It has to."

USAF advisors and Afghan pilots took advantage of the winter lull in fighting to get in as much training as possible. Pilots focused on building new capabilities that weren't necessarily fully addressed during initial training, such as night flying.

"We make sure that we are building and progressing toward night capability," Green said, explaining that it will take about three years before aircrews are fully qualified with night vision goggles. The pilots flew a familiarization flight at night at Moody, but it will take extensive training to fully be able to fly close air support at night.

USAF advisors are also working on developing the Afghan pilots' proficiency at dynamic targeting—adjusting targets and plans while on a mission.

"What we're trying to do is build a healthy, experienced

Left: TSgt. James Guthrie (l), a security forces advisor with the 438th Air Expeditionary Wing, works with an Afghan National Army soldier. Below: Guthrie debriefs ANA troops.

Lt. Col. Ryan Link, deputy commander of the 438th Air Expeditionary Advisory Group, checks out an Afghan Air Force C-208 before a training and resupply flight in Kabul.

An Afghan military truck waits for a passenger at a remote landing strip at a forward operating base south of Kabul.

base," Renegar said. "We're moving at a pace we're comfortable with. They take to these things way better than we give them credit for, sometimes."

In addition to training more pilots, USAF is developing a long-term plan for Afghan Air Force A-29 maintainers. About 80 percent of the maintainers working on the aircraft are US contractors, with the balance made up of Afghan service members. Within four years, TAAC-Air wants to invert those numbers.

"It takes time," Renegar said. "It takes patience to build a pilot, it takes patience to build a maintainer."

More Afghan maintainers are in training. While almost all A-29 maintenance is done by American contractors at Kabul, at the FOB near the city of Mazar-e-Sharif in the north, the maintenance support is 100 percent Afghan, Green said.

"It's just a numbers game." Afghanistan does not "have the numbers of maintainers yet to make that shift," he said. "As maintenance-trained Afghans come into country, we are pushing them out to FOLs [forward operating locations] and [as] they start operating on their own, they will start developing experience just as pilots do."

USAF advisors still have a lot more work to do, to train the pilot, maintainer, ground controller, and operations center personnel to a point where they are able to fight completely on their own, but they have made significant progress.

Green pointed to a recent mission that took place in early May. An Afghan air liaison officer was embedded with an Afghan National Army corps in contact with the Taliban. The officer, coordinating with the Afghan Ministry of Defense Air Command and Control Center, requested an air strike from an Afghan pilot. The strike was so effective, the pilot said it was one of the best he'd seen.

"That's that whole circle coming around. We want to get them to do this on a sustainable level, where they can do this themselves. We don't want to be hands-on here. ... We want them to be able to execute," Green said. "They [also] want to be able to operate on their own. They take a lot of pride in what they're doing."

A TINY, BUT VITAL CESSNA

About half the entire sortie count tallied by the Afghan Air Force last year was flown by 24 nondescript, single-engine Cessnas that are constantly taking off and landing on airstrips across the country.

The Cessna 208, a resilient and easy-to-maintain light airlifter, has "turned out to be an amazing airplane" for the Afghan Air Force, Renegar said. The aircraft has accounted for 6,207 out of 13,741 sorties flown by the entire AAF in 2016, he reported.

The Afghan aircraft, called the Caravan in civilian use, carried 28,257 passengers and evacuated 2,301 casualties in 2016.

USAF advisors at FOB Oqab work with everyone from line pilots up to the Ministry of Defense on air operations, including ensuring the C-208 fleet can carry the load needed in the fight against the Taliban.

Members of USAF's 538th Air Expeditionary Advisory Squadron fly alongside Afghan C-208 crews on training flights. Their goal is to have the Afghans execute the missions without

Photos: Brian W. Everstine/Staff

any American help, said USAF Maj. Randy Stubbs, the chief of C-208 operations for the 538th AEAS.

"They are pretty good at what they do for the most part, and we're here to sharpen their edge," Stubbs said. "They are professional, good people. It's really good flying with them."

The aircraft can carry up to 3,000 pounds of cargo and up to 12 soldiers, so it is often used to resupply Afghan National Army corps across the country. It is their "tactical airlifter," akin to how USAF uses its C-130 fleet, said Renegar.

"It's a pretty good fleet for what we have here," he said.

The Afghan Air Force also flies four ex-USAF C-130Hs, providing in-theater strategic airlift. Even though only four AAF crews are trained and fully mission capable, the Afghan C-130H fleet flew 1,065 missions in 2016. It was responsible for 2,483 casualty evacuation sorties and carried 29,939 passengers.

Along with training and advising pilots, the 538th in Kabul trains and advises airdrop specialists on both the C-208 and C-130. USAF CMSgt. Bill Wunderlin, the senior noncommissioned officer in the squadron, said airmen he works with on both aircraft have proved "to be very competent, and proficient at what they do."

USAF advisors work with Afghan loadmasters on understanding different mission sets, and they "know the jobs in the back of the airplane," from loading ammunition and people to strapping down helicopters. "They handle that mission very well," Wunderlin said.

CMSgt. Bill Wunderlin, the senior noncommissioned officer of the 538th Air Expeditionary Advisory Squadron, prepares to airdrop water from an AAF C-208 south of Kabul.

SHANAH BA SHANAH

The US Air Force security forces and the Afghan National Army battalion they advise in Kabul have a slogan in Pashto, "Shanah ba shanah"—shoulder by shoulder.

The phrase is meant to encapsulate how the Americans work with the Afghans they advise, working daily on training exercises and conducting them side by side. The advisors and ANA soldiers constantly repeat the slogan, both as a way to break a silence due to language difficulties and a way to ensure they are on the same page in training.

On a recent afternoon at Karzai Airport, the slogan was on display as six ANA soldiers and their commanders walked alongside USAF security forces airmen, demonstrating how to track and take out an active shooter.

Two ANA soldiers ushered fire teams through an abandoned barracks building as USAF TSgt. James Guthrie, a security forces advisor with the 438th Air Expeditionary Wing TAAC–Air walked behind, offering tips but mostly assessing the progress made by the soldiers in the 10-day program.

Bombs, Bombers, and Basing

There's been a significant increase in the number of American air strikes in Afghanistan recently, driven by broader authorities to strike both the Taliban and ISIS, along with a larger US bomber presence.

In April, coalition aircraft dropped 460 weapons in Afghanistan, the highest tally since August 2012. The number was more than double the previous month and came as the White House gave the military the ability to respond more quickly to support Afghan National Army troops in contact with the Taliban or ISIS. So said Maj. Gen. James B. Hecker, the commander of NATO Air Command-Afghanistan and the 9th Air and Space Expeditionary Task Force-Afghanistan, during a recent interview with *Air Force Magazine* in Kabul.

The change in the rules of engagement meant that "if the Afghan National Army or Special Forces are ... under attack, we could act in their defense. ... We could basically engage on their behalf," Hecker said. "That expansion of our authorities led us to be a little more lethal, [to] be able to use more strikes."

The White House and US Forces-Afghanistan Commander Army Gen. John W. Nicholson Jr. have called for the "annihilation" of ISIS-Khorasan (ISIS-K) in 2017. In this vein, Nicholson approved the April 13 strike on an ISIS tunnel complex using the Air Force's GBU-43/B "Mother of All Bombs"—the most powerful non-nuclear bomb in the US arsenal.

The GBU-43 was developed in just nine weeks and was to be ready for the Iraq War in 2003, but before its employment in April, it had never before been used in combat. The GPS guided, 30-foot-long bomb weighs 21,000 pounds, the high explosive BLU-120/B warhead constituting 18,000 pounds of that. It's sometimes confused with the 30,000-pound GBU-57 Massive Ordnance Penetrator "bunker buster" bomb, which is heavier than the MOAB but with a much smaller warhead, at 5,300 pounds.

ISIS in Afghanistan is using bunkers, tunnels, and improvised explosive devices to build its defense. Nicholson said the MOAB was "the right munition to reduce these obstacles and maintain the momentum of our offensive against ISIS-K," while reducing the risk of civilian casualties.

There's been a "large emphasis on that these past couple months, and that's led to a fair amount of air strikes as well," said Hecker.

However, the Taliban's recent use of a massive truck bomb to kill scores of civilians in downtown Kabul shows that the anti-terrorism fight in Afghanistan is far from over.

To further carry the load in the air war against ISIS and the Taliban, US Forces–Afghanistan has been able to take advantage of a formidable asset, the B-52.

A Stratofortress, deployed to another base in Southwest Asia, typically flies

Aerial port airmen with the "Mighty" 8th Expeditionary Air Mobility Squadron load a pallet for a resupply flight to Kandahar AB, Afghanistan.

"Some of them have been playing this game for quite some time," said Capt. Dayne Foote, the chief of security forces and lead security forces advisor with the 438th AEW. "They really are very, very good."

The inside-threat program, for example, includes about four hours of training and exercises every day. By the end, some of the more experienced Afghans are able to help train some of the others.

On the first day of Ramadan, the team of Afghan soldiers seemed tired due to fasting, but nonetheless quickly removed the simulated threats from the building.

The kandak—Pashto for a battalion—at this Kabul base includes about 450 soldiers, noncommissioned officers, and officers tasked with protecting the Afghan Air Force wing attached to the airport. The small group of USAF security forces personnel work daily to advise the Afghans on air base protection, along with tasks such as quick reaction force response and active shooter threats.

While the USAF advisors are experts at air base defense, some Afghan personnel are teaching the airmen lessons in return. For example, the kandak commander, a colonel whose service stretches back to when the Russian military was in Afghanistan, gives USAF personnel a different outlook on how to operate in the country, Foote said.

"What works with us is not always going to work with Afghanistan," Foote said. "They are two very different countries, two very different cultures. We want to make sure what we do is sustainable for them."

There's still a long way to go to build the Afghan military's proficiency and professionalism, but overall the desire is there.

"On a personal level, bottom line, they just want a better life," Stubbs said. "They want to be able to take care of their families and have a country where they don't have to ... worry about stepping on a mine or an IED [improvised explosive device]. ... We don't want terrorism here; they don't want it either. They don't want ISIS. They don't want the Taliban. They want a peaceful life." ✪

Technicians load munitions onto a B-52 Stratofortress in Southwest Asia in June. The bomber usually flies to Afghanistan once a week.

to Afghanistan once a week, sometimes carrying more than 30 bombs. Because of the long over-the-horizon mission, the B-52 loiters for about four to six hours with tanker support.

"In essence, if we had 30 targets, we could hit 30 targets," Hecker said. "It gives us a fairly large capability."

The B-52 flights complement a high operations tempo for remotely piloted aircraft over Afghanistan, as well as fighters based at Bagram Airfield. This summer, F-16s of the 555th Expeditionary Fighter Squadron, deployed from Aviano AB, Italy, were the main unit flying manned combat missions in Afghanistan. The requirement for air support is likely to grow as the fighting season continues in the country, and hundreds of marines are deploying to Helmand province.

The requirement for aerial refueling has been a limiting factor inside Afghanistan. The Air Force no longer bases KC-135s or KC-10s in-country, and instead relies on the tankers flying "up the boulevard" from bases in Southwest Asia. The long flight and sometimes weather restrictions have caused US commanders in Afghanistan and in the combined air operations center in Southwest Asia to adjust their plans.

Earlier this spring, fog covering the tankers' operating base meant they could not take off and fly to Afghanistan, and fighters there "lost a fair amount of sorties," Hecker said. Eventually, the Air Force moved some tankers to Kandahar Airfield in Afghanistan until the weather cleared.

Now the Air Force is "looking at options" to better prepare for limitations like this, including going back to basing tankers in Afghanistan.

Photos: Brian W. Everstine/Staff; SSgt. Trevor T. McBride

A United Launch Alliance Atlas V rocket launches a National Reconnaissance Office satellite in July 2016.

A SpaceX Falcon 9 rocket, carrying an NRO satellite, lifts off from the Kennedy Space Center, Fla., in May.

By Wilson Brissett, Senior Editor

On the Brink of Competition

The Air Force is as close as it has ever been to a legitimately competitive launch services program.

The Air Force's Evolved Expendable Launch Vehicle (EELV) program is the Department of Defense's primary pathway for launching new assets into space. At just over 20 years of age, the program has been remarkably reliable, meeting USAF's need for assured access to space. For over a decade, however, EELV has essentially functioned as a monopoly, and launch costs have become a problem. The reorganization of major launch service contractors and the arrival of new commercial service providers in the marketplace have given EELV growing pains.

The program has now reached the cusp of a sustainable, competitive launch services enterprise. But several key questions remain before the Space and Missile Systems Center (SMC), manager of the EELV program, can declare success. Foremost among these is the operational reliability of SpaceX, whose ability to safely and regularly launch National Security Space (NSS) mission payloads is critical to providing competitive, affordable, assured access to space.

RUSH TO CONSOLIDATION

The initial, concept validation, phase of EELV was completed in 1996. The stated goal of the program at that time was to build a launch capability that "satisfies both government and commercial payload requirements and reduces

Photos: United Launch Alliance; SpaceX

These Atlas boosters, then in production at Lockheed Martin, supported the 2002 maiden flight of Atlas V. Lockheed and Boeing later consolidated their launch services as United Launch Alliance.

USAF Chief of Staff Gen. David Goldfein, left, chats with the 45th Space Wing launch team April 30 at Cape Canaveral AFS, Fla. Goldfein was there for a close-up view of a SpaceX Falcon 9 launch and landing that took place the next day.

the cost of space launch by at least 25 percent," according to an Air Force fact sheet. In 1998, Boeing and Lockheed Martin won development agreements and had been awarded initial launch services contracts worth a total of $3 billion.

In August 2002, Lockheed's Atlas V rocket carried out the first EELV launch by placing a commercial Eutelsat payload into orbit. Three months later, Boeing provided the second program launch—with another Eutelsat payload—on its Delta IV rocket.

For a while, the Air Force had a viable competition between two tested providers of launch services. But it became clear this arrangement wouldn't last long when Boeing and Lockheed announced in 2005 that, to lower costs, they intended to consolidate their launch service businesses into one joint venture called United Launch Alliance (ULA).

An upstart rocket company called Space Exploration Technologies Corp.—SpaceX—filed a federal lawsuit that October seeking to block the merger. SpaceX's founder, Elon R. Musk, claimed that the joint venture would give ULA a monopoly on the business for government launch contracts. SpaceX also claimed ULA's alleged violation would be consistent with a history of noncompetitive practices in the launch services market, including DOD's payment to Boeing and Lockheed of extra-contractual subsidies, or assured access payments, that gave them an unfair advantage in technology development.

Despite Musk's concerns, the Federal Trade Commission approved the merger, formalized in December 2006. SpaceX was defeated in court, but refused to give up on its goal of matching, and if possible surpassing, the space launch heavyweights by offering reliable NSS launch services at more competitive prices.

In September 2008, the company successfully launched its small Falcon 1 rocket and was planning more demonstrations with a heavier, EELV-class Falcon 9. The Air Force agreed to license a launch complex at Cape Canaveral AFS, Fla., for Falcon 9 development work.

BUILDING TOWARD COMPETITION

Some in Congress began to see the EELV program as too expensive. A 2011 report by the Government Accountability Office found that the government's block buy approach to bundling launch services was locking in higher prices than necessary, and the 2012 National Defense Authorization Act included a requirement that the program demonstrate its response to the GAO's findings.

In light of the promising developments from SpaceX, SMC also wanted the program to refresh its original goals of producing lower costs through competition. In October

Recyclable? Used? SpaceX calls these "landed boosters." They are shown in an assembly hangar at Kennedy Space Center in 2016.

2011, the Air Force announced implementation of a new strategy for the EELV program that partnered the service with NASA and the National Reconnaissance Office (NRO) to prioritize missions that could offer a "new entrant on-ramp opportunities."

This strategy could put SpaceX's aspirations to work.

It would take nearly three more years before the Falcon 9 completed its three successful demonstration launches the Air Force required to become eligible to compete for EELV business. USAF had meanwhile announced its intentions to bid seven future launch contracts competitively. Before this could become a reality, SpaceX—on the brink of certification to bid for NSS launches—challenged EELV's December 2013 launch contract in federal court, arguing once again the agreement blocked competition. Musk claimed that SpaceX was producing launches at one-fourth the cost of the $400 million average launch awarded to ULA in the contract, and the American people were losing money.

Congress seemed to agree. Senate Armed Services Committee Chairman Sen. John McCain (R-Ariz.) asked DOD's inspector general to investigate why EELV had recently cut the number of competitive launch contracts from 14 to seven. After months of discussions, SpaceX and the Air Force reached an agreement in January 2015. Musk's company dropped its lawsuit and the service established a clear and efficient time line for certification of the Falcon 9 for NSS competition.

The Air Force granted that certification four months later, and SpaceX was finally cleared to compete for EELV launches. In September 2015, SMC released a request for proposal for an EELV Phase 1A round of GPS III launch contracts, to be awarded under the new competitive acquisition strategy with ULA and SpaceX as the certified entrants.

In April 2016, SpaceX was awarded the first Phase 1A contract to launch the second satellite in the GPS III constellation. The contract was worth $82.7 million, and SMC Commander Lt. Gen. Samuel A. Greaves said the winning bid was 40 percent cheaper than estimates for previous launch missions. The only problem was that ULA had not bid for the contract, throwing it to SpaceX by default. Brett Tobey, ULA's vice president for engineering, said the company withdrew because it wanted to avoid a "cost shootout" with SpaceX. He resigned following that comment, and McCain called for another investigation.

SpaceX could still claim victory for having won its first EELV contract—and having done so at a much lower cost. But the way forward would not be without difficulty of its own making. The company lost Falcon 9 rockets to explosions once after launch in June 2015 and again during prelaunch checks in September 2016.

Since these accidents, SpaceX has offered an upgraded configuration of its Falcon 9 rocket, and it says it has addressed the anomalies that led to the failures. The Falcon 9 upgrade has been certified by SMC for launch, and this March, SpaceX won the contract for the third GPS III launch—this time with ULA in the competition. SMC launch enterprise director Claire Leon made it clear, in a phone call with reporters, that SpaceX won out on price.

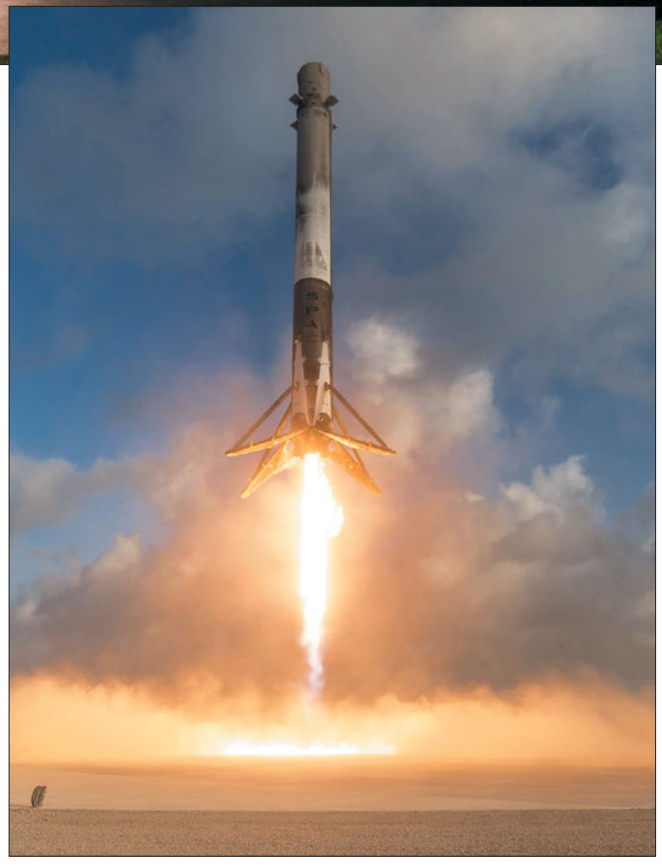
IDENTIFYING A NICHE

Today, SpaceX remains in an EELV limbo of sorts. It has won two competitive contracts, but has not yet successfully launched a payload connected to the program. This doesn't worry Leon, who told *Air Force Magazine* that SpaceX is on a typical path of assessment leading up to readiness for secure launch.

"We have agreement on what it takes … to qualify the vehicle for National Security Space," she said, "but there's still detailed work from a design verification standpoint."

While the Falcon 9 upgrade configuration is certified by SMC, the rocket will still have to undergo "a recurring flight worthiness process to ensure [that] the flight hardware for a specific mission meets our technical requirements," Leon said.

Photos: Lockheed Martin; Matthew Jurgens/USAF; SpaceX



And we're back: The first stage from a SpaceX Falcon 9 rocket lands at LZ-1 in May after launching an NRO satellite.

This July 2016 time exposure shows a Falcon 9 taking off (left) from Kennedy Space Center with supplies for the International Space Station, as its expended first stage lands (right) at Landing Zone-1 (LZ-1), a former Cape Canaveral Air Force Station launch complex.

Despite having lost two competitive contracts in a row to SpaceX, ULA CEO Salvatore T. "Tory" Bruno is optimistic about winning future launch contracts.

"The way those first two GPS competitions were structured," Bruno told *Air Force Magazine*, "the bidders meet a minimum standard, and then once they meet that standard, the only differentiator is the price." That's why SpaceX has a two-zero record in the Air Force's first truly competitive launch program, said Bruno.

"We do not expect to underbid SpaceX's price for any of these types of missions," he said. GPS III satellite launches are examples of "missions for which there is a higher risk tolerance on the part of the government"—the contract decisions can focus more singlemindedly on price. "It's those low risk tolerance missions," like the Space Based Infrared System early missile warning and Advanced Extremely High Frequency military communication satellite launches, "where we are the most competitive," Bruno insisted.

So instead of trying to beat SpaceX at their own game of extremely low-cost launch, "I intend to bring better value, more reliability, more schedule certainty, and higher performance. That's worth more than the higher price I'm going to offer," said Bruno.

In March 2016, ULA's Atlas V rocket launched from Cape Canaveral, also on an ISS resupply mission. ULA says it's focused on the high-end missions and has reduced costs.

SMC's most recent draft request for proposal (RFP) for launch services, released in May, includes three of the lower-cost GPS III missions. The other three missions will require a heavy configuration, versions of which ULA already has certified for both its Delta IV and Atlas V rockets. SpaceX is developing a heavy configuration for its Falcon 9 system, but certification is still in the early stages, Leon said. It is possible SpaceX's heavy could compete for the first batch of launches, she said, "but they have a fair amount of work to do."

A draft RFP for a second block of six launches is expected by the end of the year, and "within that there are some high-end missions that would likely put a real premium on reliability and schedule certainty," Bruno said. He thinks ULA will compete much better for those launches. While stressing that "every mission is unique, and we have a unique set of evaluation criteria for every RFP," Leon agreed that for some of the more technically demanding missions, "if ULA has demonstrated that capability before, then that gives us more assurance."

Despite ULA's focus on high-end missions, Bruno said it has also taken measures to cut costs in the last few years. The consortium has reduced the cost of its Atlas rocket by one-third, he said, and has eliminated a third of its executives. It has consolidated supply chains and plans to shut down three of its five launchpads. ULA is working on a second round of layoffs. The first round, last year, cut 350 positions, and the current round is "along that size or larger," Bruno said.

THE FUTURE IS RECYCLED

Despite the focus on cost in the media and Congress, Leon insists that price always comes second for the EELV mission.

"Mission assurance and high reliability is of even more importance," she said. But this is the kind of caution that has earned the EELV program consistent criticism from lawmakers, the GAO, and others. The Air Force maintains that the program is chasing innovation within the framework of the responsibility that comes with launching what Leon called "some of the nation's most precious assets and most capable satellites."

The cost equation changes dramatically if a billion-dollar payload is destroyed or fails to reach a functional orbit. The question now testing EELV's appetite for risk is whether the program will use recycled booster rockets.

In late March, SpaceX succeeded in relaunching a recovered Falcon 9 booster, an advance that promises enormous cost savings if its reliability can be consistently demonstrated. The cost to refurbish SpaceX's recycled Falcon 9 booster was "substantially less than half the build" cost of a new rocket, said Gwynne Shotwell, company president and CEO, at the 33rd Space Symposium in Colorado Springs, Colo., in April. Shotwell said the company ultimately wants to "refly a rocket within 24 hours."

THE AIR FORCE IS INTRIGUED

"I would be comfortable with flying with a reused booster," said Gen. John W. "Jay" Raymond, chief of Air Force Space Command, at a press briefing at the Space Symposium. "They've proven they can do it. We'd make sure that we can do it safely, but I'm pretty [sure] we'll get comfortable with doing that."

When asked if recycled rockets could be used for launches as soon as EELV Phase 1A, Raymond was unwilling to commit to a timetable, but said, "I'm open to it." SMC's Leon expressed similar optimism with a bit more caution. "We don't have a schedule for it yet" at EELV, she said. She thinks the Air Force is more likely to use recycled boosters first in "experimental-class programs" that can take advantage of rapid acquisition authorities. "You're not going to see it in phase 1A as far as I can tell," Leon said.

Congress is also interested in recycled rockets. At the House Armed Services strategic forces subcommittee markup hearing on June 22, Rep. Trent Franks (R-Ariz.) put forward an amendment that "the US government should fly reusable rockets when it's safe and makes sense to do so." The amendment was approved by voice vote and will be included in the House version of the 2018 National Defense Authorization Act.

As for EELV, "what we're trying to do is in future competitions not necessarily preclude the ability to use a relaunched vehicle," Leon said. While she thinks "it's a good thing" that Raymond has stated his openness to the possibility, "it's not the highest priority right now."

The top priority remains assured access to space for the US military. Reusing boosters, lower-cost launch, and competition are all techniques that are useful insofar as they help SMC achieve the goal of an ever faster and more reliable capability to get new assets on orbit for US military missions in a world that makes greater use of space-enabled combat with every passing year. ✪

Photos: SpaceX; SpaceX; ULA

By John A. Tirpak, Editorial Director, and
Mike Tsukamoto, Photo Editor

UNITED STATES AIR FORCE 70 YEARS IN PICTURES

IN SEPTEMBER, the Air Force celebrates its 70th year as an independent armed service, having previously been a branch of the Army. After a history arguably dating back to the American Civil War, the Air Force in 1947 began a new story of development and achievement under its own banner.

On the following pages, we have selected 70 photographs representing the Air Force's history and evolution, one for each year. They comprise leaders, acts of heroism, aircraft, missiles, tragedies, victories, and successes of many kinds.

It would be impossible to select the most important Air Force mission, person, or feat in any given year, nor is it feasible to represent in 70 pictures the more than 300 USAF career specialties or the hundreds of types of aircraft and other weapon systems it has operated. Rather, these images, taken collectively, are meant to illustrate and illuminate 70 years of progress, struggle, and accomplishment.

W. Stuart Symington, left, is sworn in as the first Secretary of the Air Force by Chief Justice Fred Vinson on Sept. 18, 1947, establishing the United States Air Force as an independent arm of the US military.

1947


1948


1949


1950


1951


1952

1947: Just 26 days after the Air Force became an independent service, Capt. Chuck Yeager flew faster than Mach 1, in the Bell X-1. **1948:** The Berlin Airlift began. The nearly 300,000 flights delivered food, heating fuel, and other supplies and broke the Soviet blockade. **1949:** Six Turnin', Four Burnin'—the B-36 Peacemaker with six turboprops and four jet engines made its first flight. **1950:** B-29s went into action over Korea three days after the North Korean invasion and only a day after the UN authorized a military response. **1951:** Capt. James Jabara became the first American jet ace, flying F-86s during the Korean War. His final tally was 15 enemy aircraft destroyed. **1952:** A UNIVAC computer was delivered to the Air Force. UNIVACs could conduct 1,905 operations per second.

Photos: USAF/National Museum of the US Air Force (NMUSAF); USAF (1947-48, 1951); Consolidated Vultee Aircraft Corp.; DOD; Arnold Reinhold

1953: The Thunderbirds, the Air Force's aerial demonstration team, flew its premiere season with the F-84 Thunderjet. **1954:** The Boeing 707's prototype made its first flight. A significantly modified military variant, the C-135, became the basis for a variety of USAF aircraft, such as the KC-135 tanker and the E-3 Airborne Warning and Control System (AWACS). **1955:** Construction began on the Air Force Academy at Colorado Springs, Colo. Students studied at Lowry AFB, Colo., in the meantime. **1956:** The Air Force initiated work on the Discoverer (later Corona) spy satellite. Photo capsules from the satellites were recovered in midair, as with this C-119 catch. **1957:** The Distant Early Warning, or DEW, Line became operational in the Arctic to detect attacking Soviet bombers and missiles. The series of radar sites stretched from Alaska to Greenland.

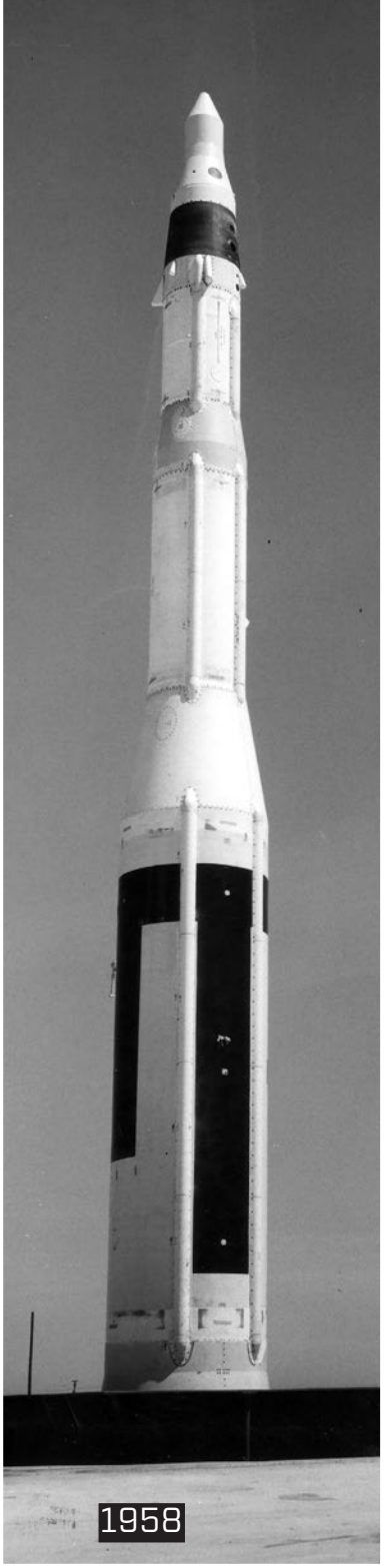
1953

1954

1955

1956


1957



1958: President Dwight Eisenhower approved the Minuteman silo-based ICBM program. **1959:** The Atlas ICBM went operational. Three years afterward, an Atlas rocket put astronaut John Glenn into orbit. **1960:** The B-58 Hustler, the first (and only) USAF double-sonic bomber, became operational. Costly to fly and limited in range, it was withdrawn in 1970. **1961:** Gen. Bernard Schriever, architect of the Air Force's ICBM program, received his fourth star. He led Air Force Systems Command 1959-66. **1962:** Air Force U-2 spyplanes revealed Soviet nuclear missiles being deployed in Cuba. Maj. Rudolph Anderson was shot down on one such mission and posthumously received the first Air Force Cross. **1963:** After his assassination in Dallas, President John Kennedy's body was flown back to Washington aboard Air Force One, the presidential transport.

Photos: USAF/NMUSAF; Boeing; USAF Academy; US Army; TSgt. Donald Wetterman/National Archives; USAF (1958-61, 1963); Lockheed

1964: The SR-71 Mach 3-plus spyplane flew for the first time. Retired in 1998, its air-breathing speed and altitude records remain intact. **1965:** The first air-to-air victories were recorded for the USAF F-4 Phantom II, against MiG-17s. All USAF Vietnam War aces flew the F-4. **1966:** B-52s bombed North Vietnam for the first time, striking a supply route 85 miles north of the border with South Vietnam. B-52s had previously been restricted from bombing the North. **1967:** Air Force pilot Maj. Pete Knight set an absolute speed record—still standing—of 4,520 mph (Mach 6.72) in the X-15 research craft. **1968:** First flight of the C-5A took place. The behemoth was the first USAF aircraft to carry outsize cargo—able to swallow whole tanks and helicopters and capable of launching vehicle rocket bodies, while still carrying passengers "upstairs."

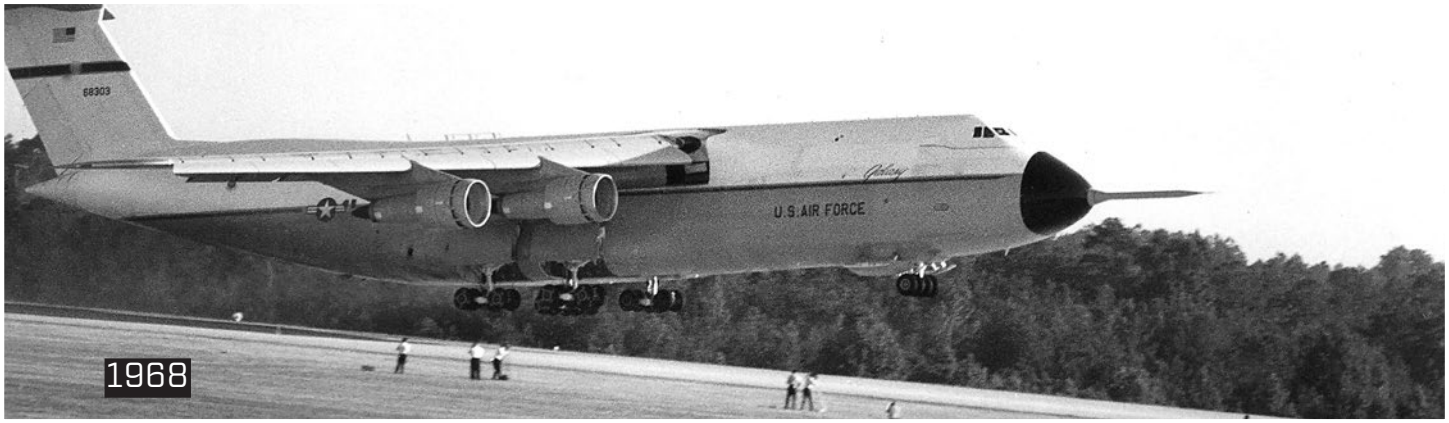

1964


1965

1966


1967


1969



1968

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1973

1969: Though severely wounded, A1C John Levitow threw himself on a lit flare that was rolling toward ammunition in his AC-47 gunship. For his selflessness, saving the aircraft and crew, he received the Medal of Honor. **1970:** Air Force ROTC admitted women, nationwide, for the first time. **1971:** Apollo 15 carried an all-Air Force crew, landing Col. David Scott and Lt. Col. James Irwin (shown saluting) on the moon. The crew—including Maj. Alfred Worden—named their lunar lander "Falcon." **1972:** After many unsuccessful attempts to destroy North Vietnam's Thanh Hoa bridge with conventional munitions, USAF F-4 crews demolished it with then-new laser guided bombs. **1973:** American POWs were repatriated. This group aboard a C-141 react to leaving North Vietnamese airspace. Some had been tortured, starved, and denied medical care for more than seven years.

Photos: USAF (1964-68, 1970, 1972-73); USAF/Air Mobility Command Museum; NASA

1974: Tactical airlift assets including C-130s moved to Military Airlift Command. **1975:** The first Red Flag air combat exercise took place. F-5Es soon began simulating Soviet fighters, although T-38s had the Aggressor role originally. **1976:** The 1st Fighter Wing at Langley AFB, Va., became the first combat-ready wing to take delivery of the F-15. **1977:** Have Blue made its first test flight. The top-secret experimental stealth technology demonstrator led directly to the radar-evading F-117. **1978:** Boeing delivers the last Minuteman III. The missile is still USAF's ground-based strategic deterrent. **1979:** The E-3 AWACS flew its first training mission over Central Europe. Controversial from the start, AWACS disproved its critics in countless air battles.

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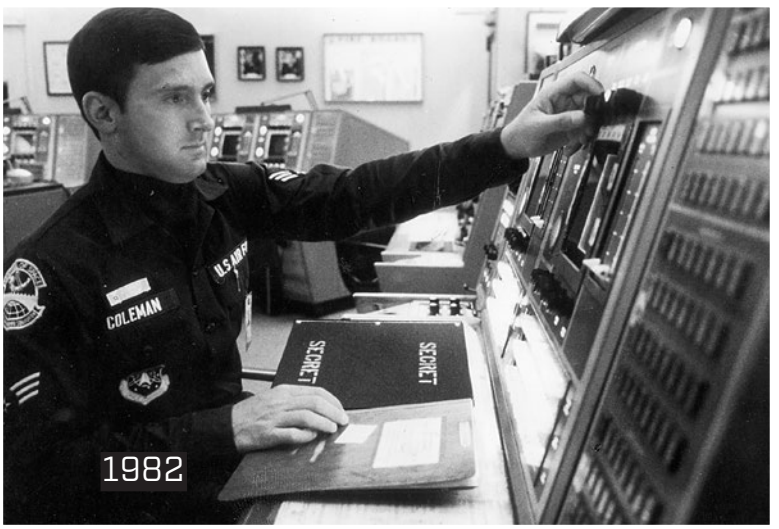
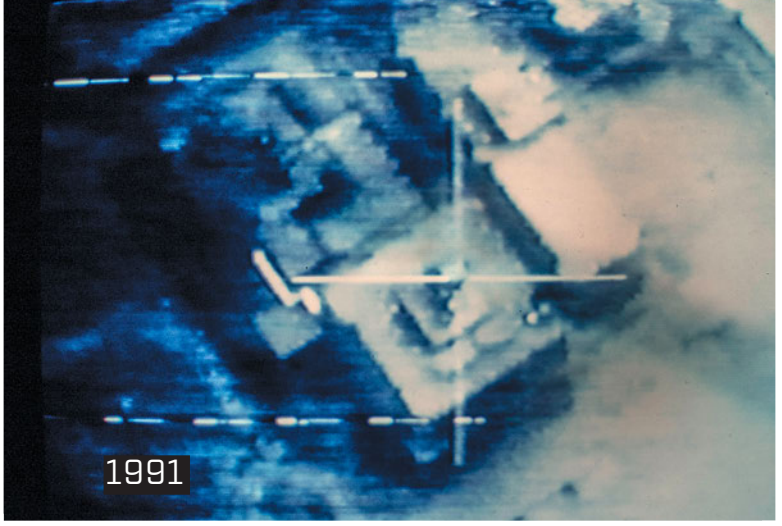
1978



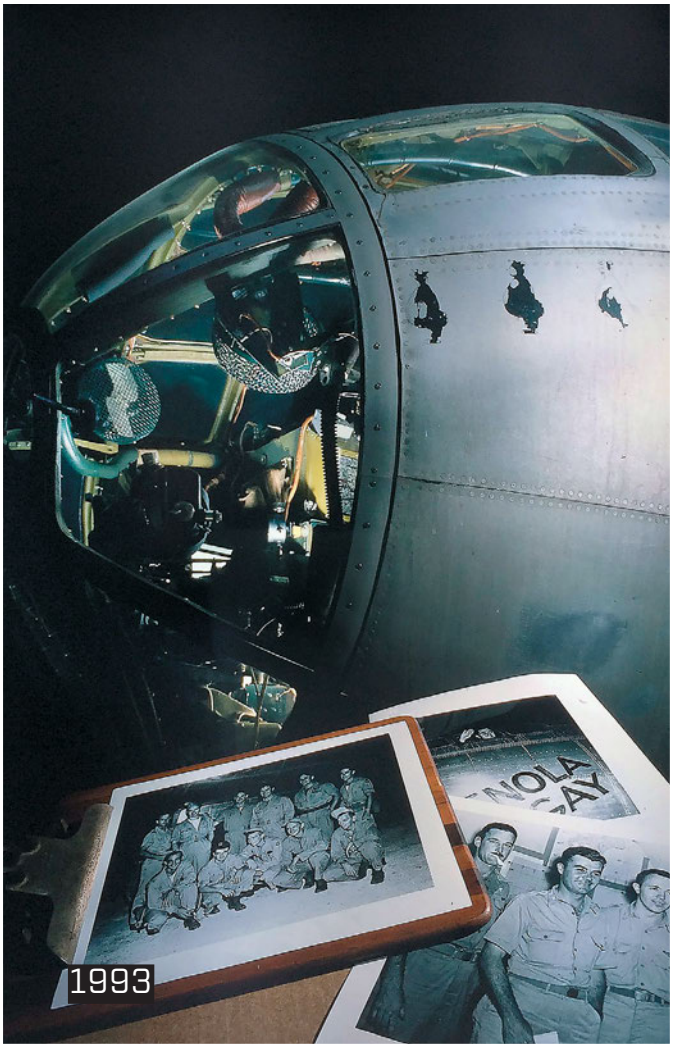
1980: US forces attempted to rescue American hostages in Iran. At the Desert One staging area in Iran, the mission was aborted. During the withdrawal, a Navy helicopter crashed into an EC-130H. Eight airmen and marines died. **1981:** The KC-10—one of just 60—entered service to augment USAF's aging KC-135 tanker fleet. It's adapted from the DC-10 widebody airliner. **1982:** USAF established Space Command (later renamed Air Force Space Command), which took charge of running USAF's satellite constellations and tracking thousands of objects in orbit. **1983:** The Air Force dropped paratroopers and landed soldiers and supplies in Grenada during Operation Urgent Fury. Lessons learned from the action led to "jointness" reforms. **1984:** The once-canceled B-1 bomber, revived as the B-1B, rolled out and made its first flight. Only 104 were built, to supplement the strategic bomber fleet until the B-2 arrived.

Photos: USAF (1974-76, 78-79, 81-82); San Diego Air & Space Museum; DOD; TSgt. M. J. Creen/DOD; John Lewis

1985: In a successful one-time test, an F-15 destroyed a target satellite with a missile. **1986:** UK-based American F-111s struck targets in Libya in Operation Eldorado Canyon. The raid retaliated for Libya's backing of terrorism in Berlin aimed at US servicemen. **1987:** The final USAF Gound Launched Cruise Missile (GLCM) wing was activated in Europe. The US and Soviet Union signed the Intermediate-range Nuclear Forces Treaty that same year. **1988:** The F-117, USAF's first stealth attack airplane, was revealed about four years after becoming secretly operational. **1989:** Military Airlift Command dropped some 10,000 paratroopers for Operation Just Cause, action to depose Panama's President Manuel Noriega. **1990:** After Iraq invaded Kuwait, USAF aircraft and airmen deployed to the Middle East in Operation Desert Shield, to prevent seizure of other Persian Gulf states.



1991: Operation Desert Storm saw USAF and coalition air allies rain destruction on Iraq's military infrastructure and fielded forces. This iconic image showed a laser guided bomb destroying an Iraqi headquarters building. **1992:** Second Lt. Jeannie Flynn was selected as USAF's first female fighter pilot. She graduated from F-15E training the following year. **1993:** The National Air and Space Museum began planning an *Enola Gay* exhibition portraying the US as the aggressor in World War II. *Air Force Magazine* exposed this bias, forcing the museum to change its approach. **1994:** The C-17 flew its first operational mission. Though initially a deeply troubled program, the C-17 straightened out to be a stellar performer. **1995:** Capt. Scott O'Grady (c) was shot down on an Operation Deny Flight mission against targets in Bosnia. He evaded Serb forces until his rescue six days later.

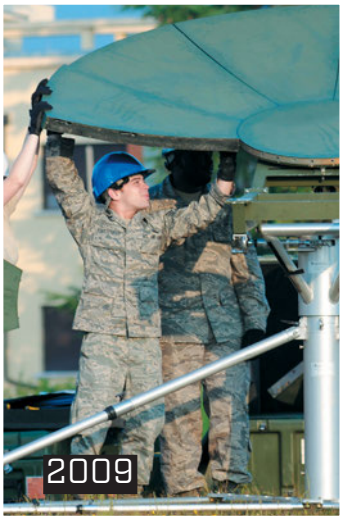


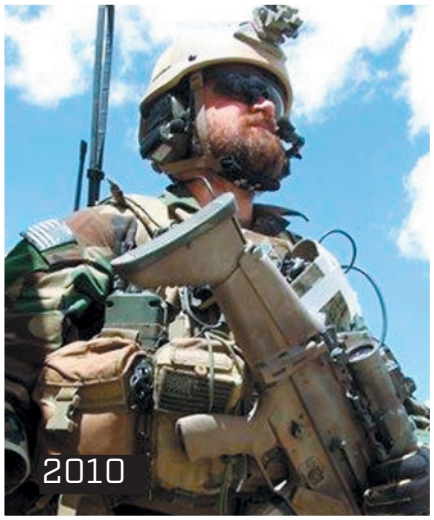
Photos: Paul Reynolds/USAF; USAF (1986, 88, 1991-92); USAF/NMUSAF; MSgt. Ken Hammond/DOD; Chad Vann/DOD; DOD; Paul Kennedy; TSgt. John McDowell; SrA. Tana Hamiliton/National Archives

1996: A terrorist attack killed 19 airmen at Khobar Towers in Saudi Arabia. US forces in the kingdom were later moved well away from civilian areas to be both less visible and less vulnerable. **1997:** The aerial blockade of Iraq—Northern Watch beginning in 1997 and Southern Watch beginning in 1992—required constant flights. Coming shortly after a major force reduction, the operations strained USAF's capacity. **1998:** The B-1B drew first blood as part of Operation Desert Fox, a series of punitive strikes against Iraq. **1999**: The stealthy B-2's first combat missions came in Operation Allied Force, attacking heavily defended areas of Yugoslavia. **2000:** During the tenure of Chief of Staff Gen. Mike Ryan (far right), USAF implemented the air and space expeditionary force (AEF) concept, spreading constant deployments more equitably among airmen.

2001: After the 9/11 attacks, USAF led a takedown of Afghanistan's ruling Taliban regime, making short work of its headquarters and air defenses, such as these destroyed aircraft at Kandahar Airport. **2002:** The Department of Homeland Security was created. USAF's Noble Eagle had already been flying intercepts since the previous fall on aircraft straying too close to sensitive sites and major events. **2003:** Fearing Iraqi weapons of mass destruction, the US invaded. USAF's "shock and awe" air campaign was followed by supply missions, close air support, aerial surveillance, and combat rescue. **2004:** Air Force special operators investigated leads on enemy forces in Afghanistan and Iraq. **2005:** USAF declared the fifth generation F-22—widely regarded as the most powerful fighter in the world—operational. **2006:** MQ-1 Predators became emblematic of USAF's attempts to meet the rapacious demand for combat intelligence.

Photos: DOD; SrA. James Harper; SSgt. Krista Foeller/DOD; SSgt. Ken Bergmann/DOD; SSgt. Jocelyn Broussard/Natl Archives; PH1 Ted Banks; SrA. Dennis Young; SSgt. Shane Cuomo/Natl Archives; TSgt. Brian Davidson; SSgt. Samuel Roger/DOD; SSgt. Tony Tolley





2007: Airlifter of choice in Iraq and Afghanistan, the C-17 fleet far outstripped planned utilization rates. **2008:** Defense Secretary Robert Gates fired Air Force Secretary Mike Wynne (shown) and Chief of Staff Gen. Mike Moseley, claiming neglect of the nuclear enterprise. Wynne and Moseley said it was because of their advocacy for the F-22, terminated by Gates. **2009:** USAF establishes 24th Air Force in recognition of cyber's growing military importance. **2010:** Under enemy fire, Capt. Barry Crawford guided a medevac helicopter to a landing zone in Afghanistan. He earned an Air Force Cross. **2011:** With Active Duty units fully engaged elsewhere, the Air National Guard stepped up for Operation Odyssey Dawn to oust Libya's Muammar Qaddafi from power. **2012:** Because of tight budgets, USAF recommended retiring the A-10, but Congress objected.

2013: Though exposed to enemy fire, SSgt. Chris Baradat coordinated air strikes that saved the lives of coalition troops in Afghanistan. In 2017 he received the Air Force Cross for those actions. **2014:** USAF marked 100 consecutive successful military space launches with zero failures, a streak going back to 1999. **2015:** Orbital flights of the X-37B, the Air Force's unmanned, reusable mini-spaceplane, became routine. Its activities remain largely secret. **2016:** The Air Force declared the F-35A operational. Successful deployments and exercises proved the type was ready for combat. **2017:** USAF announced experiments to gauge whether a fleet of light attack aircraft—like the A-29 shown here in Afghan service—would be beneficial for low-threat environments.

FOR 70 YEARS change has been a constant for the Air Force, continuously affirming the mantra that flexibility is the key to airpower.

Photos: TSgt. Shane Cuomo; SSgt. J. G. Buzanowski; SSgt. Patrick Dixon; USAF; SSgt. Brian Valencia; MSgt. Benjamin Bloker/ANG; Courtesy photo; Jeff Spotts/United Launch Alliance; Michael Stonecypher/USAF; Paul Holcomb/USAF; Brian Everstine/Staff

Left: The Eagle Modernization team starts work on an F-15E radar in October 2016 at Seymour Johnson AFB, N.C.

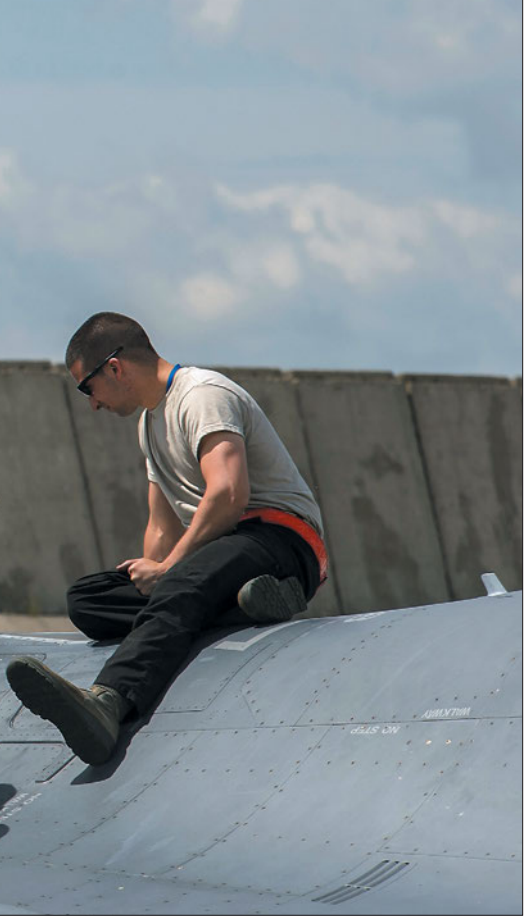
By John A. Tirpak, Editorial Director

SLEP Through the Cracks

The F-15 and F-16 need service life extension programs. What's needed, and how long should they keep flying?

After years of internal wrangling about whether to stretch the service lives of its old fourth generation fighters, the Air Force is moving forward with improvements to keep the F-15 Eagle and F-16 Fighting Falcon viable for at least another decade. Still to be decided, though, is just how much the Air Force will invest in capability upgrades for the jets—and just when the sun will set on the F-15 and F-16 in USAF service.

A number of fighters from both fleets are receiving new active electronically scanned array (AESA) radars and new computers. They will also need new or strengthened structural parts to replace elements suffering from fatigue stress. Fleetwide capability upgrades, however, depend on how fast the fifth generation F-35A is delivered and the results of studies in the works about op-



Airmen of the 31st Aircraft Maintenance Squadron work on an F-16, while a pilot observes at Krzesiny AB, Poland, during BALTOPS, a multinational exercise.

SSgt. Nathaniel Fisher, a crew chief, maintains an F-16 during Red Flag-Alaska 17-2 in June at Eielson AFB, Alaska.

tions for a new air superiority airplane, the Penetrating Counter-Air platform.

USAF is committed to updating 300 F-16s with structural improvements and capability upgrades, but to what degree it will extend the 245-jet F-15C/D fleet remains uncertain. In March, Maj. Gen. Scott D. West, then director of operations in the Office of the Deputy Chief of Staff for Operations, told the House Armed Services Committee that the service is reviewing the idea of retiring the F-15C fleet and employing upgraded F-16s for the homeland defense mission. The F-15C's age and its cost per flying hour are working against it, he said.

"We do have capacity in the F-16C community to recapitalize it with an improved radar to serve the same [mission] as the F-15 has done," he said. Air National Guard Director Lt. Gen. L. Scott Rice, at the same hearing, said such a plan is one option among many, and that no choice has been made.

"There is a risk in changing any of our force structure decisions," Rice noted, but capabilities that can be added to the F-16 to enable it to do the mission with that aircraft. "Our readiness and then our protection of the US will change, but I think, overall, we will be OK," he said of the idea.

MOVING PARTS

In an April interview, Air Combat Command chief Gen. James M. "Mike" Holmes said there are many moving parts to the air superiority mission in the coming years: the F-35, F-22, PCA, F-15, and F-16. Most likely, not all of those platforms can be in the Air Force at the same time, he said.

"We have to figure out whether we can afford" new aircraft and SLEPs [service life extension programs] of the old ones, Holmes said. "I don't know what my budget will be at the end of the 2020s, but I can assume it won't be radically different from what it is now." Given limits on the size of the force and the budget, "I have choices that I have to make. Something has to go and it will come down to, how much does it cost to operate" each platform.

The F-15Cs, he said, have been "used really hard" and need structural reinforcement to keep flying safely beyond the next few years. "You risk them coming apart" if flown to their full design envelope, he said.

That risk came into sharp focus when, in 2007, an Air National Guard F-15C broke in half in a high-G turn during dogfight training. The culprit was found to be a failed longeron, a structural element connecting the front and rear of the airplane that bears much of the load in a hard turn. The crash resulted in a new inspection regime and flight limitations on some F-15s. New longerons—considered life-of-the-airplane parts when the F-15 was new—are being purchased and installed through 2023. The upgrade will allow the F-15 to continue serving into the late 2020s.

Holmes said if he has to make a choice, he favors upgrading F-16s rather than F-15s because F-16s are generally younger and more versatile—having a ground-attack capability—than the F-15Cs, used strictly for control of the air.

The Viper would be "the most cost-effective service life extension," he contended.

For homeland defense, either aircraft would require an AESA radar because of the increasing threat from cruise missiles—small, potentially stealthy, and able to fly at very low altitudes. The advanced radar is needed to see and track cruise missiles among the clutter of trees and hills.

Holmes said it would cost about $1 million per F-15C to buy the longeron and other modifications needed to keep the fleet safe to fly out into the late 2020s, and "I think that is probably a good deal," but a hefty upgrade permitting the type to serve into the 2040s and beyond "may not be."

Photos: A1C Shawna L. Keyes; SSgt. Jonathan Snyder; A1C Haley D. Phillips

In an interview with *Air Force Magazine*, Boeing F-15 Vice President Stephen Parker said an overall SLEP cost of $40 million per F-15C, quoted previously by Holmes and others, was a "worst-case" scenario representing the cost of taking the F-15 essentially to a zero-time aircraft. This restoration would practically rebuild the airframe from scratch, making it capable of serving to 2045. USAF requested the information and Boeing provided it, but such a proposal is not currently under consideration, Parker said.

CAN THEY CARRY ON?

Before embarking on a SLEP, the Air Force needed to answer a basic question: Can the jets carry on? The F-15 and F-16 initially were warranted for service lives of 9,000 and 8,000 flying hours, respectively, and both fleets have aircraft technically past their original life expectancy. After nonstop combat deployments for the last 26 years, the jets are tired.

Lockheed Martin was tasked to put a representative F-16 Block 50 through a Full Scale Durability test to see how many more flight hours it could sustain and establish whether a SLEP would be cost-effective in terms of additional years of life. The jet was rigged with cables and bars that incessantly pushed, pulled, flexed, and bent it to simulate, on the ground, the forces it would endure through more years of heavy maneuvering. (See "New Life for Old Fighters," February 2011.) This torture test was finally called off after 27,713 simulated flight hours, showing that the F-16 could theoretically last beyond the 2030s.

The goal was to demonstrate that the F-16 could serve to 12,000 hours, and the result "gives us good confidence that we are likely even to be able to extend beyond 12,000 at some point," said Lockheed Martin's Susan Ouzts, vice president for the F-16 and F-2 fighter programs. The jet is similar enough to the Block 40 and 52 models that the test was considered valid for all. Fighters fly about 300 hours per year, so with the additional 4,000 hours, the F-16 fleet could safely fly a minimum of another 13 years or so—and probably much more. The test was completed near the end of 2015.

A depot field team member from Robins AFB, Ga., works with a maintainer to rewing an F-15C in Oregon.

Boeing is still conducting a durability test on the F-15. The fleet is at about the 10,000-hour mark, and the test is aimed at certifying it can reach 15,000 hours.

The Air Force has said repeatedly that the F-15 and F-16 cannot survive against modern air defenses in the mid- to late-2020s, and if they are retained, they would be relegated to battles where enemy air defenses are less advanced or have already been beaten down by the stealthier F-22 and F-35.

Lt. Gen. Arnold W. Bunch Jr., USAF's top uniformed weapons buyer, said in an interview with *Air Force Magazine*, "We ... know that there are places in an [anti-access, area-denial] environment that a fourth gen fighter is just not going to be able to do the mission. So it is constantly a balancing act of: What can I do for readiness today, how fast can we procure [new jets and upgrades, and] what's the cost to procure them."

The Air Force is hedging its bets. There are a number of improvement programs for the F-15C in development.

> "IT WILL COME DOWN TO, HOW MUCH DOES IT COST TO OPERATE."
>
> —Gen. Mike Holmes
> Commander, Air Combat Command

SSgt. Jair Hausheer services an F-16 at Kunsan AB, South Korea, in April.

"We're doing the radars" for sure, Bunch said. On the F-15C, it's the AN/APG-63(V)3, and "those are going to continue right now," he said. To go with it is the new Advanced Display Core Processor, called the ADCP II, to dramatically boost computing power. Also in the pipeline is the Multifunctional Information Distribution System Joint Tactical Radio System (MIDS JTRS); a new FAA-required transponder; improvements to the Identification Friend or Foe system; "and then we're starting the EPAWSS, the Eagle Passive Active Warning Survivability System," Bunch said. EPAWSS is an electronic warfare system that replaces an obsolete radar warning and response suite.

Work is also underway to develop an infrared search and track (IRST) system on the F-15, to allow it to detect stealthy aircraft and cruise missiles by their heat signature.

"It's in the early stages," Bunch said of the IRST.

Image from a video produced by Boeing as part of the Air Force's accident investigation reconstructing the in-flight structural failure of an ANG F-15C in November 2007. The breakup was caused by fatigue cracking of a forward fuselage longeron; the pilot survived.

Most of these upgrades are going to be common with the F-15E Strike Eagle—exception for the radar, which will be the AN/APG-82(V)1—so even if they aren't widely disseminated in the air superiority C fleet, they can be applied to the younger Es, likely to serve into the late 2030s.

The Air National Guard also announced recently that it will evaluate buying conformal fuel tanks such as those used on the F-15E for use on the F-15C fleet. The CFTs would expand the F-15C's range or loiter time and would not take away any weapon stations.

FOR THE VIPERS AND EAGLES

On the F-16, capability upgrades include the APG-83 AESA radar, MIDS JTRS as on the F-15, a new mission computer, FAA-required transponders, a programmable display generator, and Automatic Ground Collision Avoidance System, or Auto-GCAS. Among the F-16s already equipped with GCAS, four aircraft and their pilots have been saved by the system so far. (See "The Science of Avoidance," February 2016.)

The Air Force already has funding for 72 F-16s equipped with the APG-83 radar—it's a response to a Joint Urgent Operational Need, for the homeland defense mission—"and then we have options [for] more," Bunch said. Asked if all 300 F-16s scheduled to be updated will get the radar, Bunch said, "If we get the money, [they] will."

Bunch said the money's in the pipeline to start the F-16 SLEP. The Air Force has decided to make it a small-business set-aside contract for a company to buy the materials and build the SLEP kits for the Air Force. The F-16 depot at Ogden Air Logistics Complex at Hill AFB, Utah, will install the kits, comprising six different elements, Bunch said: canopy sill longerons, bulkheads, stringers, and skin for the upper and lower wings and upper fuselage. Lockheed Martin will provide tooling and technical support, as the original equipment manufacturer.

Of the capability improvements, broadly, "I think we're off and running for the Vipers and Eagles," Bunch said. "We've got to modernize these things and keep them relevant."

The F-15 and F-16 were frankly never intended to serve this long. The last F-15C/Ds—the air superiority version—were delivered in 1985. The F-22 Raptor was originally intended to start replacing it in the mid- to late-1990s, but didn't arrive until a decade later. The F-22 was terminated at half the planned production, so some F-15Cs were retained to supplement them. The F-16—operational since 1980—was planned for retirement starting in the mid-2000s, but delays with the F-35 added 15 years to that timetable.

The Air Force has long pushed for a faster buy rate on the F-35A, hoping to bring on enough of the jets quickly enough to make an F-16 SLEP unnecessary. Service leaders now say that an annual buy of about 46 F-35s—two squadrons' worth—are all the Air Force can afford in the coming years. USAF is faced with a mandate from the Trump Administration to increase readiness, add thousands of more people to the ranks, and preserve the rest of an oversubscribed modernization program.

Heather A. Wilson, the new Air Force Secretary, said in early June that she wants to buy F-35s "as quickly as possible," and noted that the 14 additional fighters called out in the service's Unfunded Priorities List for Congress would help USAF get to a goal of buying 60 a year. She wants a look at the conclusions of the new National Security Strategy before setting future ramp rates, she said.

The House Armed Services Committee not only approved the 14 additional F-35s in its markup of the 2018 defense bill, it added 10 more—making a total of 70—but the bill has a long way to go before becoming law.

It's not clear the Air Force could absorb that many aircraft, though, as it is struggling to fill fighter cockpits, and the F-35 training pipeline might not be able to supply enough new pilots to expand the fleet at such a rate. A buy rate of 60 F-35As per year is the official planning goal for the time being.

"Unless something gets added" to the Air Force's budget topline, "something's gotta come out," Bunch asserted.

Boeing, maker of the F-15C and E, believes the Air Force should not ignore the investments made in the aircraft so far. Parker said the Air Force has already spent "probably $4 billion" on the EPAWSS that will "allow the F-15C or E to get into the fight, working very closely with the F-22 … and F-35." The capabilities are classified, but "we are very, very bullish" on what the EPAWSS will bring, Parker said.

"It is going to be a game-changer for the F-15, getting into the contested environment—and also from a homeland defense perspective," he said. EPAWSS just passed critical design review, and flight testing will begin next year.

Equipped with the new radar, electronic warfare, conformal fuel tanks, and other upgrades, the F-15C would be a formidable homeland defense machine, Parker argued.

"Wouldn't you want the aircraft that's fastest, that can carry the most [weapons], longer?" he asked rhetorically.

Holmes said the F-15 "is a fantastic airplane, I flew 3,000 hours in it," it can carry "a big air-to-air payload," and it is "a good match for things we are asking it to do in homeland defense." However, he said, "if I'm going to make the decision to go forward with the Penetrating Counter-Air aircraft, then I have to prove to people that I can afford it."

The Air Force, for now, will keep sending the F-15s "through depot, like we have been doing," and fixing the jet up as Holmes and other leaders debate how much more to ask of the Eagle. ✪

Photos: SMSgt. Shelly Davison/ANG; Boeing Phantom Works/USAF; SSgt. Chelsea Sweatt

SSgt. Erick Vega, an avionics specialist, attempts to determine if his equipment was failing or if the space systems used by the F-16 were being attacked by simulated enemy forces during a Red Flag exercise in 2016.

A Kill By Any Other Domain

Red Flag still evokes images of aerial combat, but space and cyber capabilities are an increasingly important aspect of the training.

By Brick Eisel

An F-15 takes off from the runway at Nellis AFB, Nev., Jan. 21, on a mission for Red Flag 17-1.

"Blue Four is dead. Blue Four is dead."

Believe it or not, this is a good radio call to hear—if it appears over the lava-baked shades of brown landscape north of Nellis AFB, Nev., as part of a Red Flag exercise, that is.

For more than 40 years, the desert skies of the Nevada Test and Training Range (NTTR) have reverberated to the roar of jet engines, the boom of live ordnance being dropped on the many targets scattered across the terrain, and some variation of the radio call mentioned above.

Which is entirely the point. Red Flag exists so that combat airmen—in particular, inexperienced wingmen known as "Blue Four"—can learn from their mistakes in training and not make them when an enemy is playing for keeps. Countless aircrews have undergone this training, and today new operators are being added to the mix. The definition of who is Blue Four is evolving rapidly.

Each new generation of American military aviators needs to learn the lessons written in blood from past conflicts and to develop their skills through realistic training opportunities such as a Red Flag. Equipment and tactics have evolved over time, and today's warfare includes areas, or domains, that once weren't considered vital in a fight.

Traditional wars were fought on the land, on and under the

Airmen participate in the live, virtual, constructive portion at the CAOC during a Red Flag exercise at Nellis in 2015.

Capt. Brian Goodman, an Aggressor flight commander, prepares to test a fighter squadron's GPS capability without the squadron knowing, during a 2016 Red Flag mission.

sea, and in the air. Today, warriors of advanced nations, and many from less so, and even nonstate actors, also go to war in space and cyberspace.

Using cyber attacks to disable an adversary's command and control system can be just as effective (if not as satisfying or as permanent) as blowing it up. It also comes with a cost advantage: Cyber warfare can be much cheaper to wage and harder to attribute to an aggressor than it would cost for the US to send an F-35 or a B-2 to drop a guided munition on a target in response—if you even know who it was who attacked you in the first place. Not knowing for sure who attacked you or how or when they planned the strike most definitely crimps the options of leaders wanting to retaliate.

Space, meanwhile, hosts a unique blend of both hardware and computer software, on the ground and in orbit. The United States has invested many billions of dollars in its military space architecture to achieve a dominance in space-based information gathering. Other nations might not want the US to maintain that dominance and recognize the attractiveness of denying those capabilities.

If tomorrow's Blue Four dies because he or she didn't get the information needed about a deadly surface-to-air missile (SAM) site or the updated location of a high-value, but mobile, target, or is even given deliberately deceptive data, then past lessons from Red Flag will be for naught.

Enter today's Red Flag, incorporating space and cyber into the exercise.

Space forces first officially played in a Red Flag in 2011, with the first operational Blue cyber participation in 2013. In each year since, at least once during the four annual exercises, space and cyber warriors join the scrimmage along with the pilots, weapon systems operators, air battle managers, combat search and rescue crews, intelligence personnel, and maintainers employed in today's modern air combat domain.

Red Flag adversary forces today include not only the 64th Aggressor Squadron flying specially marked F-16s and the 507th Air Defense Aggressor Squadron replicating near-peer SAM systems, but also the 57th Information Aggressor Squadron (IAS) and the 527th Space Aggressor Squadron (SAS). The Air Force Reserves' 26th SAS and the Kansas Air National Guard's 177th Information Warfare Aggressor Squadron augment the bad guy forces as well.

The 57th IAS maps and mines the friendly Blue Force computer networks to discover useful information and disrupt Blue operations and support functions by degrading those same networks. The 527th SAS impairs GPS reception in the training range and disrupts Blue Force satellite-based communications.

AT RED FLAG 17-1

To fight their adversaries, the Blue Forces for 17-1, conducted Jan. 23–Feb. 10 of this year, had 98 aircraft ranging from the first operational F-35A squadron to B-1B bombers to F-22s, plus numerous dedicated space and cyber unit representatives. Other "firsts" for Red Flag included the inaugural appearance of the Royal Air Force's RC-135 Rivet Joint aircraft and the RAF KC3 Voyager tanker.

However, a real issue for the meshing of space and cyber in the more traditional Red Flag is the different command and control required for these new domains versus the old-school jets-attacking-the-bad-guys scenario.

Red Flag, to date, has been a tactical-level event. Crews receive the tasking, mission plan the flight, execute, then debrief that mission. It is a self-contained world that focuses on a narrow part of a military campaign to achieve one specific objective.

That focus involves a detailed and long day spent mission planning. Once the tasking order has dropped, the mission commander works on a plan, coordinating all the assets allo-

Photos: TSgt. David Salanitri; MSgt. William J. Buchanan/ANG; SrA. Thomas Spangler; TSgt. David Salanitri

cated—air-to-air escort fighters, strikers/bombers, electronic attack and/or suppression of enemy air defenses, intelligence gatherers, command and control, and the all-important tankers—to accomplish the day's tactical objective.

Adding space and cyber to the mix increases the level of difficulty of herding all those cats—and unlike the jets that deploy to Nellis, the infrastructure for space and cyber is largely fixed and located at various military installations around the globe. Thus, those units send liaisons to Red Flag who coordinate the mission commander's direction into tasking for those at-home units. This link introduces another layer of complexity to the process.

A second difficulty affecting the integration of space and cyber capabilities into a Red Flag is the level of experience in the tactical leadership sent. While the overall mission commander is usually a field grade officer, or a very senior captain at the least, the package commanders are also usually more experienced leaders. During 17-1, however, the space package commander alternated between a junior captain and a first lieutenant.

Cyber participants had a similar level of experience for their portion of the mission. Participants indicated that the dichotomy of the junior officer having to interact with the much more seasoned officer led, initially, to a reticence to speak up on the part of the space operators and the cyber forces.

LEARNING NEARLY THE HARD WAY

Integrating such a disparate group is challenging and one of the biggest learning aspects of today's Red Flag. Airmen must understand what each platform can and cannot do, dispelling misconceptions that many may have carried around. That satellite coverage depends more on Kepler's law (regarding orbits) than Bernoulli's principle (regarding fluid dynamics) is something that all must understand to be successful.

Just as a fighter might not have the gas to hang around for a long time waiting for a target to appear, a satellite might not be overhead at the exact moment the mission demands it see something critical; thus the effects desired simply aren't available. Therefore, a contingency plan must be developed to achieve that mission. The learning involved is extensive and can't be gained from academic study alone. Nothing brings urgency to a situation like looking a fellow warrior in the eye and promising, "I'll get it done."

However, regarding space, Air Force doctrine states, "Airmen should focus on employing space forces to achieve strategic and operational effects." Cyber has similar caveats on its use. Those levels of effects are oftentimes removed from that tactical promise of "getting it done now."

History on Display: The 414th Combat Training Squadron has been Red Flag's home from the beginning and upholds the military tradition of a unit presenting a memento essentially proclaiming, "We were here." The two-story-tall main auditorium is a veritable shrine to the hundreds of squadrons that have flown in the Red Flags since 1975.

By definition, "strategic and operational" are spheres above the tactical. How to synchronize the effects of systems and capabilities that can affect far larger areas and bigger target sets than a tactical strike mission, while keeping the tactical flexibility needed to react to enemy actions, is a problem that not only Red Flag but the Air Force itself struggles with.

Lt. Col. Eric A. Flattem, the deputy commander of Red Flag, said during an in-brief to the participants, "DOD says we will win using multidomain command and control and execution. Now, they haven't exactly spelled out how we are going to do that, but you guys are going to figure it out and show us and the department how it's done."

One officer who has had a leading role in figuring it out has been Col. DeAnna M. Burt, the 50th Space Wing commander at Schriever AFB, Colo., who was the first nonrated deployed wing commander for a Red Flag, specifically 16-3, held last year.

Burt said of just one of the challenges, "We had to look at the effects available from space, cyber, electronic warfare, and other nonkinetic capabilities," asking, "how do we integrate those effects with the kinetic forces in order to achieve successful mission results." Every target did not require a bomb,

The Debrief

After decimating foes in the skies during the later stages of World War II and Korea, the United States' air combat losses during the Vietnam War rose to alarming levels and reached near-parity at times.

The brainchild of then-Maj. Richard "Moody" Suter, the Red Flag concept developed as a direct result of those losses and the blunt "Red Baron" reports that highlighted the need for rookie airmen—the "Blue Four"—to experience near-combat levels of stress and tactical difficulty prior to adding enemy fire to the mix. (See "The Visionary Moody Suter," July 2016.)

Since its inception, generations of US and allied aircrews have experienced the sweat, dry mouth, and grunting effort required to fight their way across the range to strike a target while defending against the "enemy" forces known as Red.

Numerous adversary fighters and realistic radar-emitting simulators representing surface-to-air missiles take their toll on every mission, or vul. The good guy forces, called Blue, that are pretend-killed exit the fight.

Once the entire armada of aircraft lands back at Nellis AFB, Nev., the most important aspect of Red Flag becomes apparent. Each mission is painstakingly recreated and debriefed so that all aspects of the event can be critiqued, from the mission-planning to the fight itself.

Initially led by a senior Red Air pilot, the debrief reveals to both sides the game plans used by both Red and Blue to accomplish their missions. What went right is reviewed and discussed and noted both formally in reports and informally in each pilot's mental bag of tricks. More importantly, the Blue mission commander dissects what went wrong so that the unlucky Blue Four noted above sees why he would have died, had this been for real, and thinks about what to do differently next time.

The results have been resoundingly evidenced in the conflicts American airmen have fought since that first Red Flag.

but every target did need to be dealt with using the forces available, she said.

A method for melding tactical with operational is via the command and control interface in the combined air operations center (CAOC). For Red Flag, the 505th Test Squadron conducts its own CAOC training in conjunction and coordination with the exercise itself. While the tactical crews concentrate on their particular piece of the day's air war, the CAOC trains personnel for the operational level as executed in regions around the globe.

While Red Flag fliers perform their one mission per day—although there is both a day "go" and a night "go"—the CAOC uses the Red Flag mission as but one problem set to solve while it simulates a much larger and broader air war. It is in the CAOC that the space and cyber representatives operate, coordinating the desired effects for the Red Flag mission with their home stations where the actual operators of the satellites and servers are based.

These operators receive their tasking as part of a joint air and space tasking orders process, typically based on a three-day cycle, thus conforming more to the operational level of warfare's timeline. That tasking order, once produced, is distributed to the units who are executing and fulfilling the tactical role and actually delivering ordnance on target.

Except in today's multidomain fight, the ordnance might not literally go "bang." Instead, it could prevent an adversary's bang from harming allied aircrews or locating mobile threats and notifying inbound allied forces.

After the vul is over and dozens of jets have recovered back at Nellis, a many-hours-long process of various data-gathering commences, culminating in the mass debrief.

At the debrief, a gathering of nearly a hundred sweaty and tired aircrew join with the nonkinetic crews from the mission to assess what worked and what didn't, and an overall computer playback is run to show the mission as it unfolded. Simulated air-to-air and surface-to-air shots are evaluated, and the effectiveness (or not) of each shot is studied.

In the recent flags, however, the space and cyber forces likewise traded shots with their Aggressor counterparts, determining who was successful in attacking or defending their networks and their ability to detect and work through GPS and satellite communication voice jamming. It's not always the smoothest performance to observe, but the lessons gained far outweigh the occasional discomfort of having one's mistakes revealed to the entire audience.

Moody's Blue Four Inn

Generations of aircrews have concluded their missions by downing a cold, frosty adult beverage in the squadron bar. Along with fostering the all-important esprit de corps necessary for effective combat units, the informal setting has enabled some of the best learning regarding air combat.

Here, many an inexperienced wingman has learned how to stay alive in the deadly skies above World War I's trenches, on the steamy Pacific, over Europe again in World War II, in the icy skies over Korea, in skies filled with SAMs over Vietnam, and in the Gulf Wars.

So many watches have been shot down to illustrate a maneuver, that the squadron bar is considered a learning environment all its own. Red Flag has "Moody's Blue Four Inn" to house some of Colonel Suter's mementos—as well as those from various Red Flag participants. The learning continues in Moody's today as it has for more than 40 years.

Col. DeAnna Burt, standing, gives SrA. Brandon Myers, a satellite system operator, the final command to decommission a satellite at at Schriever AFB, Colo., in June.

Finally, the errors are analyzed, and the resulting learning points are briefed to the audience, along with the recommended methods to avoid those missteps in future flights when the stakes might be for keeps.

"I think a lot of the players really learned a lot about the timing and tempo of all the effects and to layer them with kinetic tactics," said Burt, from the 50th Space Wing. "We are talking about young captains, lieutenants, and airmen doing this, with this being their first exposure to a hectic combat ops type of experience. So what we are doing is not necessarily 10 combat missions but, rather, 10 full-up integrated multidomain missions to allow all of our airmen to go forward, should we have to fight a near-peer adversary someday."

The complexity of this multidomain approach to warfare is an exponential expansion, compared to the more traditional battles that first established the need for Red Flag. Blue Four's job is still to gain an everything-but-the-flak experience before facing flying lead, but today's Blue Four cadre also includes those personnel not yet expert at controlling satellites or analyzing adversary computer networks.

Although those Blue Fours aren't likely to die should something go wrong during an actual combat mission, their addition to today's fight might just keep the original, airborne Blue Fours alive as well.

"You are here to learn how to better kill bad guys and break their stuff," said the deployed 17-1 Red Flag air expeditionary wing commander, Col. Peter M. Fesler (then the 1st Fighter Wing commander at JB Langley-Eustis, Va., in his day job). During the first mass brief to the 17-1 personnel, Fesler said, "We all have to learn to integrate all of our capabilities to increase our lethality and to minimize our vulnerabilities."

At Red Flag, this means the Air Force's assets in air, space, and cyberspace must function as an integrated whole. ✪

Brick Eisel is a retired lieutenant colonel who served as an air battle manager in mobile radar units, E-3 AWACS, and E-8 JSTARS and is now a civilian Red Flag analyst. He is the author of two aviation nonfiction books, *Beaufighters in the Night* and *MAGNUM! The Wild Weasels in Desert Storm.* His last article for *Air Force Magazine* was "Tough Old Birds" in March 2006.

Photos: via Brick Eisel; A1C William Tracy

NO SHELTER Required

Combat Controller Christopher Baradat earned an Air Force Cross by ensuring 200 coalition troops survived an ambush in Afghanistan. He left shelter to coordinate air strikes from an exposed courtyard and a vehicle running board.

A-10s like these at Bagram Airfield, Afghanistan, and AC-130s provided close air support for the embattled troops on the ground.

By Wilson Brissett, Senior Editor

On April 6, 2013, SSgt. Christopher G. Baradat was sitting on alert for a quick reaction force (QRF) in Kunar province, one of the most notorious sanctuaries for Taliban and al Qaeda militants in all of Afghanistan. Baradat, a combat controller deployed with the 21st Expeditionary Special Tactics Squadron, and his team received a call that a group of 100 Afghan military and intelligence personnel had been ambushed and were pinned down in the Sono valley as they returned to base from an intelligence-gathering mission. Baradat's QRF was tasked with fighting their way into the valley, connecting with the stranded team, and getting everyone back out again safely.

Over the next three hours, Baradat would call in decisive air support as part of the ground rescue team, directing more than a dozen 500-pound bombs and nearly 7,000 rounds of ammunition to hold off 100 enemy fighters spread over 13 different positions. Because of the steep canyon walls, he would be forced to step directly into the line of fire time and again in order to maintain line-of-sight communication with two AC-130s and six A-10s overhead.

"A lot of the difficulty was just coordinating between the different air assets that were coming in for strikes and having to move other aircraft out of the way or make sure that they weren't in harm's way," Baradat said earlier this year.

Then-SSgt. Christopher Baradat left the relative safety of an armored M-ATV to call in more effective air strikes.

The QRF comprised 29 US Special Forces and infantry personnel, 73 Afghan intelligence operators, and one American OGA, or Other Government Agency, advisor.

As the rescue team proceeded deep into the Sono valley, they realized that their four well-armored Mine-Resistant, Ambush-Protected All-Terrain Vehicles (M-ATVs) were simply too wide to pass between the steep, rocky walls. So the special operators cross-loaded into lightly armored trucks and proceeded into the valley, leaving the infantry members behind with the M-ATVs.

Still, the rocky terrain and the narrow road made progress slow. Concerned about the condition of the stranded party, Baradat and eight other team members left the vehicles and went forward on foot ahead of the convoy.

When they closed to within 1,000 meters of the pinned-down element, they started taking heavy machine gun fire from the ridgeline to the south. Through a flurry of bullets, they dashed another 200 meters to a nearby compound with a mud hut, where they could take cover. Baradat established communication with an A-10 Warthog overhead and directed 30 mm fire at the enemy to give his team space to keep moving forward.

As they closed to within 200 meters of the stranded party, the enemy returned with a vengeance. This time there were about 100 militants delivering rocket-propelled grenades along with machine gun fire. Snipers were also taking aim at the team from the ridges to keep them from reaching their cut-off comrades. The QRF team ducked inside another mud building for cover, and Baradat again began calling for close air support.

Now that he was deeper in the valley, however, Baradat found it was much more difficult to establish communication with overhead assets. Walls that were thick enough to provide cover from enemy bullets were thick enough to block his comms. He had A-10s and AC-130s positioned to bring critical fire to the fight, but he couldn't tell them where to direct it.

Losing little time, Baradat left cover and planted himself in the compound's courtyard to re-establish communication and direct air strikes against the adversaries closing in on his team. He also gained a much better view of

Photos: SSgt. David Dobrydney; courtesy photo

enemy positions and was able to direct machine gun fire and 500-pound bombs with deadly accuracy. Despite the objections of his teammates and his team leader, Baradat remained in the open—braving wave after wave of bullets, with the dirt from the rounds spraying up against his body—to stay in contact with close air support.

The air strikes under Baradat's control proved decisive in keeping the enemy at bay while his team reached the stranded element and escorted them back to the main convoy. Once the entire QRF was reunified, along with the rescued personnel, the full group presented an irresistible target. The militants opened fire on them again with full force.

As the convoy hurriedly prepared to move west out of the valley, Baradat was aware that he would need to maintain communications with close air support overhead to give his team a chance to make it out safely. He couldn't do that from inside an armored M-ATV because the signal wouldn't be strong enough and he wouldn't have a choice view of the flanking enemy positions as his team egressed the valley.

So instead of taking his seat, Baradat jumped onto the running board of an M-ATV. One of his teammates grabbed onto his belt to secure his position as the vehicle made its way down the narrow valley road. Machine gun, rocket-propelled grenade, and sniper fire continued to pour down onto the convoy and the completely exposed Baradat.

At some points, the width of the valley left no more than two feet between the vehicle sides and the rock walls. With canyon rock scraping his back, head, and boot heels, Baradat was still directing A-10 and AC-130 strikes.

As the convoy approached the mouth of the valley, he noticed the trail vehicle had fallen behind. He left his perch on the running board, jumped to the valley floor, and charged through a hail of bullets toward the lagging element. With a better view of the enemy positions assaulting the vehicle, Baradat called in three 500-pound bombs to disrupt the militant fire and allow the vehicle to rejoin the convoy.

He then returned to his vehicle and jumped back on the running board as the entire convoy proceeded safely out of the valley. Through his courageous actions and willingness to put himself directly in harm's way, Baradat helped save the lives of more than 200 US and Afghan team members.

Air Force Chief of Staff Gen. David Goldfein shakes hands with Baradat after presenting him with the Air Force Cross at a Hurlburt Field, Fla., ceremony April 20, 2017. Baradat is separated from the service.

Baradat's commanding officer at the time was Col. Spencer Cocanour, currently commander of the 720th Special Tactics Group at Hurlburt Field, Fla. Cocanour told *Air Force Magazine* he was most impressed by Baradat's calm ability to sequence multiple close air support aircraft.

"He ends up Winchestering"—that is, completely emptying of all ordnance—"two AC-130s and six A-10s over the course of the engagement," Cocanour explained. One of the AC-130s had to perform an ordnance "emergency resupply."

At one point the enemy presence was so thick that Baradat requested a strike from a B-1 bomber. In all his deployments, Cocanour said, "it was the one time I actually heard someone request a B-1." The colonel said, "He needed something that was carrying a whole lot of ordnance." As it happened, a B-1 wasn't available that day, so Baradat's request went unfulfilled.

The special tactics airman was initially awarded a Silver Star for his actions in the Sono valley. But after a Department of Defense-wide review of medals received for the Afghanistan and Iraq wars, his medal was upgraded to an Air Force Cross this past January.

The award is the highest service-specific honor for valor in combat, second only to the Medal of Honor. He is only the ninth airman to receive the Air Force Cross since Sept. 11, 2001.

Chief of Staff Gen. David L. Goldfein awarded the medal to Baradat at a ceremony at Hurlburt Field, Fla., on April 20, 2017. Goldfein also presented an Air Force Cross to retired MSgt. Keary J. Miller that day, for actions Miller had taken, also in Afghanistan, 11 years before Baradat's deeds. (See "Survival on Takur Gar," August 2017.)

"You do what others cannot or will not do," Goldfein told Baradat during the ceremony, "and you do it because it must be done—and because there is no one better." He praised Baradat for his "remarkable humility" and for "the courage, the commitment, the sacrifice, the innovative spirit ... brought to the battlefield."

Before the ceremony, Baradat told reporters, "It was just very steep, rocky terrain so there was some difficulty in identifying where stuff was happening or coming at us from, so it just took some time to work through those issues."

"Very unassuming," is how Cocanour describes Baradat. "You would not pick him out" and say, "That guy's an operator."

That was certainly the case at his Air Force Cross ceremony. "We don't do the kind of stuff that we do downrange for attention," Baradat told reporters. "We do our job, and however we have to get it done, we do that."

Cocanour was willing to say more. "Chris epitomizes the confidence and courage" of Air Force special tactics operators, he said.

Or, as Goldfein put it, Baradat's heroism should remind us all that "there's very little that we do without our ground battlefield airmen." Goldfein told reporters, "We rely on our air commandos to actually gain the security we need to do our mission." ✪

Photo: SrA. Ryan Conroy

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By Robert S. Dudney

The ICBM Cometh

"They've flown it very high so that they can test the range of the missile. If they were to shoot it on a normal trajectory, it's probably going to go out 6,000 or so kilometers. By definition, anything over 5,500 kilometers is an ICBM."**—Bruce W. Bennett, Rand Corp., on North Korea's most recent ballistic missile test, CNN, July 3.**

Counting the Cost

"The cost of not having the right level of readiness is that it will take longer to win. We will win, but it will take longer, and [fewer] airmen will come home. … That ought to be unacceptable—and it's certainly unacceptable to me as a Chief—to ever send an airman in harm's way without being fully ready. But the reality is, if the nation calls on its Air Force to go, we'll go, just like those who've gone before us."**—Gen. David L. Goldfein, USAF Chief of Staff, *San Antonio Express-News,* July 1.**

41 Percent Air Force

"The Air Force is too small for the missions demanded of it, and adversaries are modernizing and innovating faster than we are, putting America's technological advantage in air and space at risk. We have the same level of taskings today as we did during Desert Storm [in 1991], but we have 55 [fighter] squadrons, rather than 134."**—Secretary of the Air Force Heather A. Wilson, remarks given in advance of Senate hearing, June 6.**

Horizontal Escalation

"We are a primary target for the Iranian regime. … We won't wait for the battle to be in Saudi Arabia. Instead, we'll work so that the battle is for them in Iran."**—Prince Mohammed bin Salman al-Saud, newly anointed Crown Prince of Saudi Arabia, quoted in theguardian.com, June 25.**

McPeak Looks at Russia

"We've made a big investment in airpower. It means that we can go anywhere in the world that we want to and create airspace control. And I don't want the Russians or anybody else thinking that they can eliminate that situation or make it deteriorate in any significant way. It's them that introduced themselves into [Syria] late in the game. Their presence has not been benign; quite the reverse. It's they that should back away, not us. And, by the way, I believe that, if they try to escalate, they will get their butt kicked, so that would be fine also."**—Retired Gen. Merrill A. McPeak, USAF Chief of Staff 1990-94, interview with airforcetimes.com, June 26.**

Bomber Gaps

"The Islamic Republic [of Iran], with its widely varying geographic characteristics, has 82,000 target points. Commanders believe that … [an anti-Iran air] campaign would require 103 bombers. A war against a rising great power such as Russia or China would pose an even greater challenge. … An air campaign against Russia is projected to last 180 days at a minimum and would require nearly 260 bombers. Today, the Air Force has fewer than 100 combat-coded bombers, well shy of the levels required to respond to two regional conflicts simultaneously."**—New bomber study by Jerry Hendrix and USAF Lt. Col. James Price for the Center for a New American Security, June 28.**

Thermonuclear Fears

"It's clear they know how to make tritium. We know that's official. They can make tritium so they have the basic element for a hydrogen bomb."**—Stanford Prof. Siegfried S. Hecker, former director of Los Alamos National Laboratory, news conference in Seoul, June 27.**

Cyber Mutants

"Whether it's North Korea, Russia, China, Iran, or ISIS, almost all of the flash points out there now involve a cyber element. I'm not sure we understand the full capability of what can happen, that these sophisticated viruses can suddenly mutate into other areas you didn't intend, more and more. That's the threat we're going to face in the near future."**—Leon E. Panetta, former Secretary of Defense and CIA Director, quoted in *The New York Times,* June 28.**

One For All, All For One

"The President is absolutely committed to our [1949 North Atlantic] treaty. We are signatories of the treaty, and he said we will never abandon those who stand with us, and he was very clear in saying everything but that explicit phrase that everyone was looking for, for some really odd reason. There's never been any doubt in the President's mind, anyone's mind, our allies' minds, about the commitment to Article 5."**—Lt. Gen. H. R. McMaster, Trump national security advisor, referring to the NATO "collective defense" provision, Center for a New American Security, June 28.**

We're Here to Help

"The Pentagon is complicated enough. This will make it more complex, add more boxes to the organization chart, and cost more money. If I had more money, I would put it into lethality, not bureaucracy. … I don't need another chief of staff and another six deputy chiefs of staff. We need to simplify, not make it more complicated and bureaucratic."**—Secretary of the Air Force Heather A. Wilson, remarks to reporters slamming congressional moves to create a separate space service within the Department of the Air Force, breakingdefense.com, June 21.**

Snowden Worship

"I think there is a phenomenon—the worship of [NSA turncoat] Edward Snowden—and [stealing] American secrets for the purpose of self-aggrandizement, or money, or for whatever their motivation may be, does seem to be on the increase. … It's tough. You now have not only nation states trying to steal our stuff, but nonstate, hostile intelligence services, well-funded folks like WikiLeaks, out there trying to steal American secrets for the sole purpose of undermining the United States and democracy."**—CIA Director Mike R. Pompeo, interview on MSNBC, June 24.**

Russia The Disastrous

"I never met with the Russians. Not worth it. They've got nothing to work with. Their economy is a disaster. Their demographics are a disaster. Their politics are a disaster. So they go with the second step, which is to undermine us, everywhere they can."**—Michael J. Morrell, acting CIA Director for a time in the Obama Administration, *The Daily Beast,* June 25.**

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Compacting Snowy Phoenix

A new runway in Antarctica helps passengers and supplies reach McMurdo Station.

By Gideon Grudo, Digital Platforms Editor

Building a runway in Antarctica isn't easy, but that's exactly what the National Science Foundation had to do when its Pegasus Airfield was set to retire.

NSF decided to make its own compacted-snow runway, which is exactly what it sounds like. Based atop an ice shelf, the new Phoenix Airfield is one of a kind: It supports wheeled C-17 aircraft. USAF's 62nd Airlift Wing and the 446th AW operate a majority of these mission aircraft.

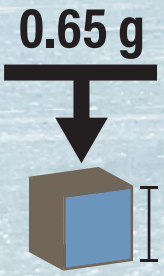
The latest C-17 airlift season into Antarctica's McMurdo Station ran from Sept. 28, 2016, to March 28, 2017. Airmen ferried nearly 3,000 passengers to the station, using both the Pegasus Airfield and the new Phoenix runway.

SNOW

Snowfall

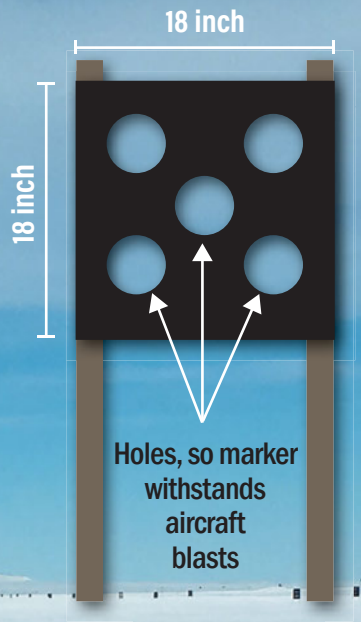
The approximate annual snowfall in the area is **18 inches.**

Density



The desired density of the runway snow is **0.65 grams per cubic centimeter,** able to support C-17s with maximum weights of **585,000 pounds.**

THE RUNWAY



The outline

Since painting on snow won't work, Phoenix uses above-ground markers to line the runway. **Ten red** ones mark the beginning and end of the runway, and **three black** ones mark the body of it in **500-foot intervals.**

Marker anatomy

Two wooden stakes hold each **18-by-18-inch marker** in the ground. The whole thing is four feet tall, and the marker itself, made of fabric, has **five large holes** in it to withstand aircraft blast.

Compacting

Tractors pulling weight-carts maintain the runway before, during, and after operations.

Pushing together a runway

It cost approximately **$2.3 million** to create the Phoenix runway.

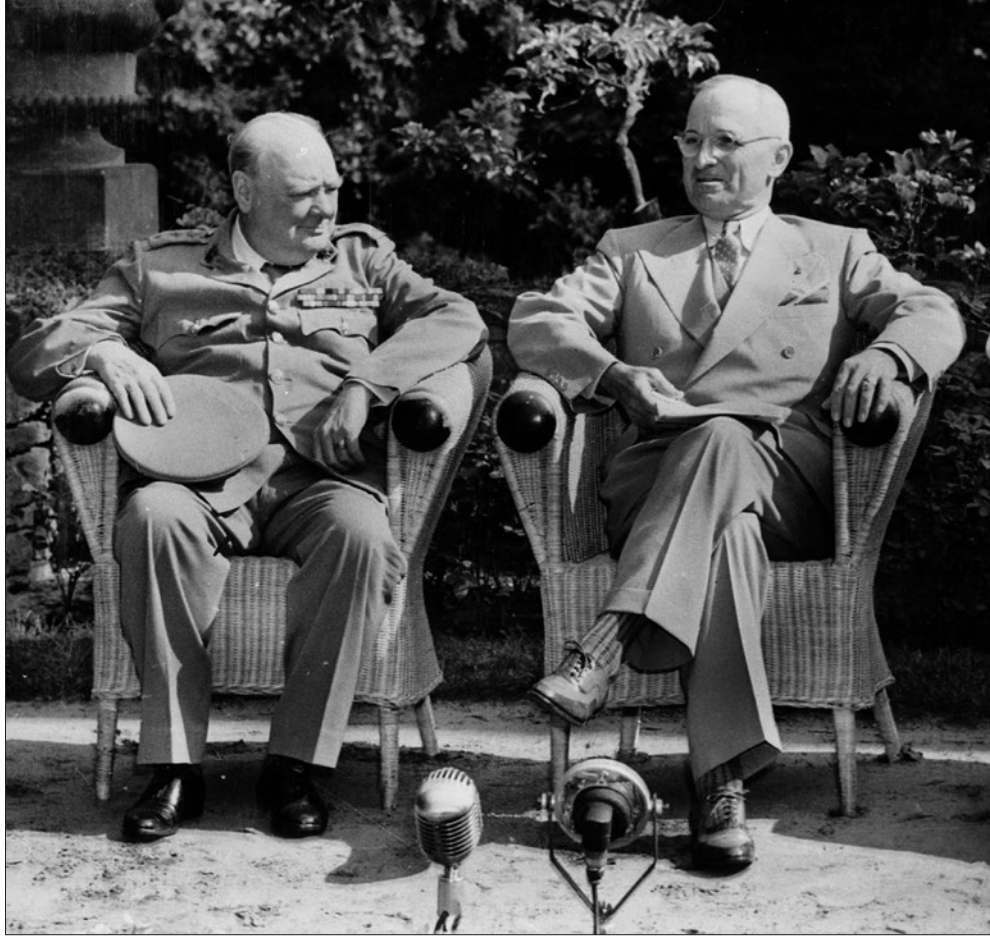
Civilian flights

Phoenix can handle **Boeing 757s,** and some are expected to fly in from countries such as New Zealand or Australia.

Human components

Seven to eight crew members, including pilots and loadmasters, rotate out of Phoenix C-17 operations during the active seasons every seven to eight weeks.

Photos: Courtesy Air Mobility Command and National Science Foundation; Mike Lucibella/NSF; Jack Green/NSF; Mike Lucibella/NSF



L-r: British Prime Minister Winston Churchill, US President Harry Truman, and Soviet leader Joseph Stalin in the garden of Cecilienhof Palace before meeting in Potsdam, Germany, in 1945.

Last Tango in Potsdam

On July 7, 1945—two months after the German surrender and less than three months since he became President of the United States—Harry S. Truman boarded the US Navy cruiser *Augusta* at Newport News, Va. He was bound for Germany to meet with Prime Minister Winston Churchill of Great Britain and Marshal Joseph Stalin of the Soviet Union to settle the future of Europe.

This third and last meeting of the wartime Big Three was to be held at Potsdam, a suburb of Berlin, from July 16 to Aug. 2. It followed conferences in Teheran in 1943 and at Yalta in February 1945.

At the two previous meetings, Allied leaders had reached tentative agreements on issues ranging from the postwar map of Europe to the degree of reparations to be imposed on Germany, but the final decisions were to be made at Potsdam.

In recent months, the situation had changed. With the war against Germany over, there was less need for the US and Britain to placate Stalin. And it was becoming increasingly clear—although not as clear as it would be later—that Stalin could not be trusted.

Truman (right) and Secretary of State James Byrnes on the bow of USS ***Augusta*** en route to the Potsdam Conference.

In many ways, Stalin held the whip hand in the disposition of control in Europe because the Red Army was in possession of conquered territory stretching as far west as the Elbe River, halfway across Germany.

Churchill outside the German Reichstag during a tour of Berlin before the start of the conference.

The war against Japan continued in the Pacific, but that was more of a concern to Truman and the United States than to Churchill and Stalin, who were focused primarily on the balance of power in Europe.

Truman, who took office when Franklin D. Roosevelt died in April, had to learn fast. Roosevelt—who selected Truman as his running mate

By John T. Correll

Elaborate preparations were made for the Potsdam Conference, including a Soviet star fashioned of red flowers in the courtyard between the main gate and entrance to the conference room at Cecilienhof Palace.

When WWII ended in Europe, the Big Three no longer shared a common purpose.

for purely political reasons in the 1944 election campaign—had told him almost nothing. During his short tenure as vice president, he was not included when important issues were discussed in the White House.

It was only after assuming the presidency that Truman learned the revolutionary secret he carried with him to Potsdam. The United States had developed an atomic bomb and was ready to test it at a remote site in the New Mexico desert.

Truman would not be the only new leader at Potsdam. Before the conference was over, Churchill would be gone as well, replaced as prime minister by Clement Attlee, who was as surprised as everyone else by the results of a general election back home.

The conference table at Cecilienhof Palace. The "Big Three" and their top aides are seated around the table, and US ambassador to the Soviet Union Averell Harriman is standing at the extreme left.

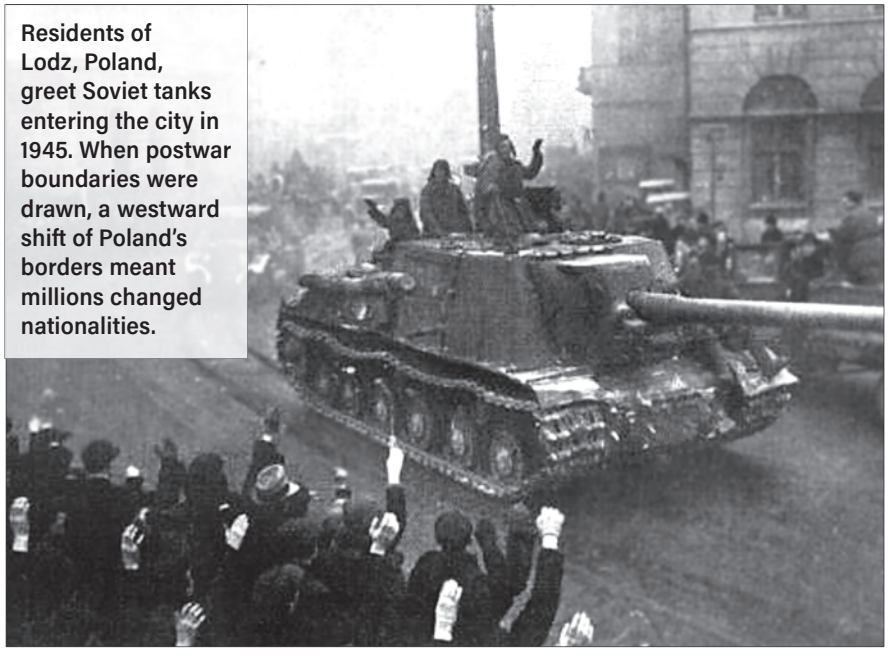
UNCLE JOE

Stalin seldom left Moscow and he flatly refused to venture beyond territory controlled by the Soviet Union. It was at his insistence that Potsdam was chosen as the location for the Big Three conference.

Potsdam, on the southwestern edge of Berlin and in the Soviet occupational zone, was relatively untouched by the bombing. It had been the capital of the German film industry before the war and numerous aristocrats

Photos: Truman Library via National Archives; Imperial War Museums

Henry Stimson, US Secretary of War, inspects the 2nd Armored Division in Berlin during the conference. In the lead armored car with Stimson are Maj. Gen. Frank Parks, Gen. George Patton, Col. W. H. Kyle, J. J. McCloy, and H. H. Bundy.



Residents of Lodz, Poland, greet Soviet tanks entering the city in 1945. When postwar boundaries were drawn, a westward shift of Poland's borders meant millions changed nationalities.

and movie stars had homes there. The Russians evicted all Germans for the duration of the meeting.

Churchill and Truman arrived before Stalin did, giving them time to see the rubble and destruction of Berlin, including the Reich Chancellery, which had been Hitler's headquarters. Churchill went down into the ruins of the Hitler bunker underneath the Chancellery, but Truman, traveling by a separate motorcade, did not.

Formal sessions of the conference were held in the Cecilienhof Palace, a spectacular 176-room country estate built in 1917 for Crown Prince Wilhelm and his wife, Cecilie. The Russians planted a huge Red Star of geraniums in the courtyard as a statement of power.

Up to the German surrender on May 8, the Americans and the British had set aside their differences with Stalin for the common purpose of defeating Hitler. A spirit of camaraderie prevailed and both Roosevelt and Churchill referred with some fondness to Stalin as "Uncle Joe." Truman picked up the usage as well.

As recently as his return from Yalta in February, Churchill reported to the House of Commons that "Marshal Stalin and the Soviet leadership wish to live in honorable friendship and equality with the Western democracies. I feel also that their word is their bond."

That perception had begun to wear thin as Stalin reneged on promises of free choice for liberated nations in eastern Europe. In his memoirs, Truman depicted himself as talking tough to the Russians. Indeed, there was some of that, but the main effort was toward cooperation.

Sitting alongside Truman at the table at Potsdam as diplomatic advisor was Joseph E. Davies, the former ambassador to the Soviet Union, noted for his uncritical admiration for Stalin. The current ambassador, hardliner Averell Harriman, was relegated to a seat in the second row with the staff.

"I can deal with Stalin," Truman wrote in his Potsdam diary. "He is honest—but smart as hell." In a letter to his wife July 29, he said, "I like Stalin. He is straightforward, knows what he wants, and will compromise if he can't get it."

DIVERGENCE OF INTERESTS

The Soviets had lost nearly a third of their national wealth and about 15 percent of their prewar population to

German aggression. Stalin felt justified in stripping to the bone what was left of Germany for reparations.

Truman and the British, on the other hand, wanted to avoid the mistakes of the Treaty of Versailles in 1919, which officially ended World War I. The harsh conditions imposed on Germany stimulated the rise of Hitler and the Nazis. Punitive reparations destabilized the international economy and provoked an extreme backlash in Germany.

The Germans defaulted on the reparations in 1923, but US banks lent them enough money to make their payments to the French and British. Germany soon defaulted on the US loans as well. In 1933, Hitler canceled the reparations outright.

"We do not intend again to make the mistake of extracting reparations in money and then lending Germany the money with which to pay," Truman said.

Truman's most urgent objective at Potsdam was to obtain Russia's entry into the war in the Pacific, where an invasion of the Japanese home islands was to begin in November 1946. The Russians, having their hands full in Europe, had never revoked a neutrality pact with Japan signed in April 1941. Stalin had promised to join the fight against Japan once Germany was defeated, but he had not yet done so.

Churchill's chief concern was the balance of power in Europe. The Americans had served notice that their troops would be going home. With France and Italy out of action and British strength depleted by the war, there was no effective check on the Soviets by the Europeans themselves. Churchill hoped the United States would fill the gap.

In April, Churchill had objected vigorously when the Supreme Allied Commander, Europe, Gen. Dwight D. Eisenhower, halted the US-British advance at the Elbe and left it to the Red Army to take Berlin. The postwar occupation zones had been decided already, and Berlin was 100 miles inside the Soviet sector. Eisenhower would not expend tens of thousands of casualties and risk a clash with the Russians for a prize that would be turned over to the Russians anyway.

At the time of the surrender, Allied troops held positions in parts of Germany, Austria, and Czechoslovakia that were designated for Soviet control. Churchill tried to persuade Truman to keep US troops in place instead of retreating back to the occupation zone boundaries established at Yalta.

Churchill thought it might be possible to gain concessions from Stalin by refusal to withdraw, but Truman refused to ignore the zone agreement, which was one of several struck previously when times were different.

DONE DEALS

The Soviets had provided most of the forces fighting Germany and they took most of the casualties. "More than 80 percent of all combat during the Second World War took place on the Eastern front," said historian Geoffrey Roberts. "The Germans suffered in excess of 90 percent of their losses on the Eastern front."

That greatly reduced the number of German forces available to oppose the US and British on the Western front, and it gave Stalin leverage in dealing with Roosevelt and Churchill.

Stalin pointed out that Russia had been invaded from the west three times, by Napoleon in 1812 and by the Germans at the beginning of both world wars. Now that he held what amounted to a large defensive buffer zone in Eastern Europe, he was not about to give it up.

"The Americans and the British generally agreed that future governments of the Eastern European nations bordering the Soviet Union should be 'friendly' to the Soviet regime, while the Soviets pledged to allow free elections in all territories liberated from Nazi Germany," a US State Department historian said later.

As Stalin wanted, the Polish and German borders would be moved to the west but the final boundaries were not confirmed until Potsdam. At Yalta, it had been decided that substantial reparations would be levied against Germany with half of the total amount going to the Russians. How much the Russians would be allowed to take away would also be determined at Potsdam.

The lines of the occupation zones in Germany had been drawn in 1943. The first plan, called "Rankin (C)," was devised by the British, who offered it for consideration at Teheran. The eventual map for the occupation, with the Russian zone extending to the Elbe, was basically a British product and was accepted at Yalta.

Churchill's push for the Americans to adopt a more aggressive stance at Potsdam ended when he was ousted as prime minister. The election was July 5, but the count was delayed until the votes from those serving overseas were in and counted. The expectation was that Churchill and his Conservative party would win. The British returned home for the tabulation on July 25, and to the surprise of all, Labour won by a big margin.

Labour leader Clement Attlee had come to Potsdam as deputy prime minister in the wartime coalition government. When the conference resumed July 28, he was prime minister. An outgoing Conservative official quipped

Soviet anti-tank riflemen fire on German troops during an engagement on the eastern front July 20, 1943. The Soviet Union lost about 15 percent of its population in the war.

Photos: National Archives; State Archive of the Russian Federation; RIA Novosti

EUROPE: 1939

EUROPE: 1945

that with the unprepossessing Attlee to represent Britain, the Big Three had become the "Big Two-and-a-Half."

THE MAP OF EUROPE

Configuration of nations in Eastern Europe changed repeatedly in the first half of the 20th century. When World War I began in 1914, the Russian empire included most of what had once been Poland and reached westward to abut the German state of Prussia.

In 1918, Soviet leader V. I. Lenin was desperate to get out of the war with Germany—which had been going disastrously for Russia—and concentrate on the revolution at home. Germany's price for the armistice was that Russia yield a huge swath of its territory, giving Germany a new border 130 miles east of Warsaw.

The Versailles Treaty in 1919 re-created Poland as an independent country. The Poles, fired up by their new aspirations, attacked Russia. When the fighting ended in 1921, the Polish frontier had been pushed deeper into the Soviet Union, almost to Minsk.

The Poles lost all of that and more in 1939, when Poland was subjugated and divided up between Germany and the Soviet Union as a function of their short-lived nonaggression pact. In 1941, Germany invaded Russia from bases in its part of Poland.

At the time of the Teheran conference, the Soviets had defeated the invasion and were pushing the Germans backward. A Polish government in exile had set up headquarters in London, but any idea that Stalin would let Poland go once he recovered it was wishful thinking.

At Teheran and Yalta, for wartime unity and other considerations, Roosevelt and Churchill agreed to shift the Soviet-Polish border more than 100 miles to the west and to compensate Poland with the addition of a similar-sized piece of Germany on the eastern side.

By these actions, the Soviet Union recovered all of the territory that Lenin had given up under duress in 1918 and the western border of a subservient Poland was established a mere 50 miles from Berlin. The final word on the Polish-German boundary would be at Potsdam.

Roosevelt and Churchill recognized the injustice to Poland but the reality was that they could not do any better without risking a breach in the alliance and a major confrontation with Stalin.

THE EXPLOSION AT TRINITY

The US effort to pull the Soviet Union into the Pacific war had begun with Roosevelt. At Teheran and again at Yalta, he was willing to concede to Stalin territorial gains in the Far East—including the Kurile islands and half of Sakhalin Island—in return for joining in the war against Japan.

It was also a priority for Truman. "There were many reasons for my going to Potsdam, but the most urgent to my mind was to get from Stalin a personal affirmation of Russia's entry into the war against Japan," he said in his memoirs.

Truman was elated on July 17 when Stalin gave his promise. "I've gotten what I came for," Truman wrote to his wife that night. "Stalin goes to war Aug. 15 with no strings on it."

When Truman got the news of the successful atomic bomb test at Trinity

site in New Mexico July 16, he told Churchill right away but did not inform Stalin until July 24. He avoided the word "atomic," describing it to Stalin as a "new weapon of unusual destructive power."

Stalin showed little reaction, and Truman and Churchill thought he did not understand the significance. In fact, Stalin was already aware of the atomic bomb from reports by the Soviet spy network in the United States. He had known about it before Truman did.

Soviet participation in the Pacific was still regarded as important. Truman's military advisors were not convinced that the atomic bomb would be decisive and the plan to invade Japan was still on.

Truman was aboard *Augusta* 800 miles from Newport News when word came that the atomic bomb had fallen on Hiroshima. The Hiroshima bomb Aug. 6 and a second one at Nagasaki Aug. 9 induced a rescript of surrender from the emperor Aug. 15, but the Soviets—who had declared war on Japan Aug. 8—continued to advance through Manchuria, inflicting casualties and capturing territory, until the formal surrender Sept. 2.

FINAL LINES

The final arrangement at Potsdam managed to avoid the Versailles syndrome and the disastrous consequences of punitive monetary reparations. This time the settlement would be in kind rather than in cash. Germany's remaining assets and industrial equipment, except for the minimum necessary for the peacetime economy, were subject to confiscation as wartime reparations.

Stalin claimed that the reparations he sought were equal to only 20 percent of the Soviet losses at the hands of the Germans.

The Russians stripped Germany clean to the extent they could. They had a free hand in their own zone but the formula for reparations entitled them to no more than 15 percent of the industrial equipment available in the western zones. To Germany's good fortune, the industrial base was concentrated in the west.

Nevertheless, the Soviets dismantled and shipped 2,885 German factories to Russia. According to historian Michael Dobbs, the meticulous records kept by Soviet statisticians show that the booty carried away included 60,149 pianos, 458,612 radios, 188,071 carpets, 941,605 pieces of furniture, 3,338,348 pairs of shoes, 1,052,503 hats, two million tons of grain, and 20 million liters of alcohol.

The Big Two-and-a-Half—Clement Atlee, left, replaced Churchill during the conference—enjoy a brief respite in the garden at Cecilienhof Palace during the last day of the Potsdam Conference in Germany.

The westward shift in the borders of Poland meant a change in nationality for almost 15 million people. Hordes of newcomers from the gaining nations surged into the transferred lands, pushing out the previous inhabitants and creating throngs of refugees in Eastern Europe. Many of these "displaced persons," mostly ethnic Germans, crowded into the US and British zones.

In Poland and elsewhere, Stalin placed puppet regimes in power. He had achieved his objective of a defensive barrier between the west and the Soviet Union and then some. He had locked in control of a Soviet empire in Europe and there was nothing that the United States and Britain could do about it.

Truman took one additional accomplishment home from Potsdam. He had secured Soviet support for organization of the United Nations, which was a cherished goal of Roosevelt's and now of Truman's.

LEGACIES OF POTSDAM

Truman was not likely as optimistic as he sounded in his Aug. 9 radio report on Potsdam, in which he looked forward to a "just and lasting peace." He said that "the three Great Powers are now more closely than ever bound together in determination to achieve that kind of peace. From Teheran and the Crimea, from San Francisco [where representatives of 50 nations met to draft the UN charter] and Berlin—we shall continue to march together to a lasting peace and a happy world!"

At Potsdam, the first clouds of the Cold War were already visible on the horizon.

In a speech at Fulton, Mo., in March 1946, Churchill declared that "an iron curtain has descended across the continent." Truman was in the audience to hear him say it.

The best that Potsdam had been able to produce was the creation of two great power blocs that would face each other in an uneasy standoff for some 50 years.

However, Churchill's hope at Potsdam for a new balance of power was fulfilled as Western Europe was rebuilt with aid from the Marshall Plan beginning in 1948 and US troops remained in Europe as part of the North Atlantic Treaty Organization, founded in 1949. ✪

John T. Correll was editor in chief of *Air Force Magazine* for 18 years and is now a contributor. His most recent article, "Vietnamization," appeared in the August issue.

Photos: Betsy Moore/Staff illustration; Truman Library via National Archives

AFA nominees 2017-2018

Candidates for national office and the Board of Directors.

The Air Force Association Nominating Committee met on May 6 and May 9 and selected candidates to send forward for National Officer positions and National Director positions on the Board of Directors. The Committee consists of three past Chairmen of the Board, one person selected by each of the two Vice Chairmen of the Board, two persons representing each geographic area, and one person each representing the Total Air Force, Air Force veterans, and aerospace industry constituencies. The slate of candidates will be presented to the delegates at the AFA National Convention in National Harbor, Md., in September.

CHAIRMAN OF THE BOARD

F. Whitten Peters, Washington, D.C., nominated for Chairman of the Board for a second one-year term. A Life Member, Peters joined AFA after becoming Undersecretary of the Air Force, a position he held from 1997 until 1999. He was subsequently confirmed as the 19th Secretary of the Air Force in 1999 and served in that position until 2001. Before then, he was the DOD Principal Deputy General Counsel. Peters was appointed an AFA National Director five times beginning in October 2008. He served on AFA's national-level Executive Committee and Development Committee and received the AFA Chairman's Citation in 2016. Peters received the W. Stuart Symington Award in 1999 and the DOD Distinguished Public Service medal three times. He is the first Secretary of the Air Force to hold the Order of the Sword. Peters earned a bachelor's degree from Harvard University in government, a master's degree in economics from the London School of Economics, and a juris doctor degree from Harvard Law School. He served in the Navy Reserve as a Computer Systems Division Officer and Company Commander. Peters has been a member of several advisory organizations, including the National Commission on the Structure of the Air Force, the Defense Science Board, and the presidential advisory Commission on the Future of the United States Aerospace Industry. He has been on the Board of Trustees for the Air Force Aid Society, the Air Force Academy's Falcon Foundation, and the Air Force Enlisted Village. Peters is a Lawyer.

VICE CHAIRMAN OF THE BOARD, FIELD OPERATIONS

F. Gavin MacAloon, Tyndall AFB, Fla., nominated for Vice Chairman of the Board for Field Operations for a second one-year term. A Life Member, MacAloon joined AFA in 1984. He has been the Central East Region President and served on the Field Council as Chairman of the e-Business and the Emerging Leader Program Subcommittees. He is a Founding Member of AFA's Wounded Airman Program. He served on the national-level Nominating Committee, as Supervisor of Elections, and in several State and Chapter offices, including Vice President for Fund-raising for the Virginia state AFA and President of the Donald W. Steele Sr. Memorial Chapter. He has received an AFA

VICE CHAIRMAN OF THE BOARD, AEROSPACE EDUCATION

Richard B. Bundy, Spotsylvania, Va., nominated for Vice Chairman of the Board for Aerospace Education for a third one-year term. An AFA member since 1971, he is on the Executive Committee of the Richmond Chapter and previously served as Delaware State President for nine years. At the national level, he has been on the Nominating Committee and the Aerospace Education Council. AFA awards include the Presidential Citation, Exceptional

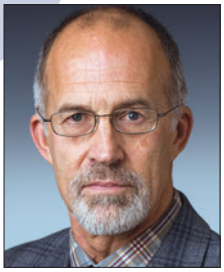
Chairman's Citation, an Exceptional Service Award, a Medal of Merit, and numerous awards from the region and chapter, most notably the 2012 Virginia Member of the Year. MacAloon earned a bachelor's degree in psychology from Southeast Missouri State University and a master's degree in administration from Central Michigan University. He served in the Air Force for 22 years primarily as a Master Air Battle Manager on AWACS and Airborne Battlefield Command and Control Center aircraft. MacAloon also served on the Air Staff, gaining leadership, management, and acquisition experience. Along with extensive AFA involvement, he is a member of the Association of Old Crows, the National Defense Industrial Association, Military Officers Association of America, and the Veterans of Foreign Wars. MacAloon retired after a second career with an aerospace and manufacturing corporation and is now a business development and acquisition Consultant.

Service Award, and Medal of Merit. Bundy served in the Air Force for 33 years as an Airlift Pilot and as a Staff Officer at major command, Air Staff, Joint Staff, and DOD levels. He commanded a squadron, group, and wing. He later served as the Executive Director of the Arnold Air Society and Silver Wings for 10 years as the direct liaison with senior officers and the staff of AFA and AFROTC. During this period, he convinced the Silver Wings members to join their Arnold Air counterparts as full members of AFA. Due to his efforts, all members of Arnold Air and Silver Wings are AFA members. He earned a bachelor's degree in transportation and logistics management from San Francisco State University and a master's degree in personnel management from Webster University.

NATIONAL SECRETARY

Ross B. Lampert, Hereford, Ariz., nominated for a first one-year term as National Secretary. A Life Member, Lampert joined AFA in 1975 through the Arnold Air Society. He was the Southwest Region President from 2013 to 2015 and has been Arizona State President and president of the Central Oklahoma (Gerrity) Chapter and the Cochise Chapter in Arizona. Lampert serves on the Field Council, is now Chairman of the Field Council Training Subcommittee, and is a CyberPatriot Advocate. In addition to state-level AFA awards, he received the national-level Chairman's Citation in 2010 and in 2015, two Exceptional Service awards, and a Medal of Merit. Lampert earned a bachelor's degree in physics from the University of Colorado, Boulder, and master's degrees in systems management from the University of Southern California and in English from the University of Central Oklahoma. Today an Author and Publisher, Lampert served in the Air Force for 22 years, primarily in airborne command and control. His community work includes organizations ranging from the STEM in Action Partnership and two writers' groups.

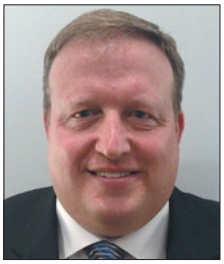
NATIONAL TREASURER



Steven R. Lundgren, Fairbanks, Alaska, nominated for a second one-year term as National Treasurer. An AFA member for more than 30 years, Lundgren was AFA National Treasurer from 2005 to 2010. He serves as AFA Alaska State Treasurer. Lundgren has been a Northwest Region President and served on the national-level Finance, Audit, and Executive Committees. He received AFA's Member of the Year Award in 2011 and was awarded a Presidential Citation in 2003. His volunteer and civic organization work includes the Alaskan Command Civilian Advisory Board, the American Bankers Association (ABA) Community Bankers Council, the Fairbanks Economic Development Corporation Board, and the Greater Fairbanks Chamber of Commerce Board. He is Vice Chairman of the Alaska Committee for the Employer Support of the Guard and Reserve program. Lundgren, who was President of the Alaska Bankers Association 2015-16, earned a bachelor's degree in business administration from Oregon State University and has attended ABA professional-school courses. Lundgren began his career in banking in 1978 and is President and CEO of a community bank in Fairbanks.

NATIONAL DIRECTOR AT LARGE

The Nominating Committee submits four names for National Director at Large. Two will be elected for a three-year term.



Mark R. "Buster" Douglas, Williamsburg, Va. A Life Member, Douglas joined AFA in 1990. He is the Langley Chapter President and was an AFA Emerging Leader in 2016. Douglas has been a member of the national-level Strategic Planning Committee and has served as State Aerospace Education VP and Chapter Executive Vice President and Secretary. He received an AFA Medal of Merit in 2016. Douglas earned a bachelor's degree in military history at the Air Force Academy and a master's degree in airline operations from Embry-Riddle Aeronautical University. Douglas retired from the Air Force after a 22-year career. Now a Program Manager for an aerospace and defense company, he is a member of the company's Veteran's Employee Resource Group.

Richard W. "Rick" Hartle, Layton, Utah. An AFA member since 1998, Hartle has served AFA on the national level as a National Director at Large from 2011 to 2014 and on three committees: Strategic Planning, Transition Constitution, and Development. Life Member Hartle has also been the Utah State President, Utah Aerospace Education Foundation President and Board Chairman, and Ute-Rocky Mountain Chapter President. He has received a national-level Medal of Merit, the AFA Utah State Presidential Citation, and the Utah AEF Exceptional Service Award. His community involvement includes board positions with the Utah Defense Alliance, Strategic Deterrent Coalition, and the Top of Utah Military Affairs Committee. Hartle earned a bachelor's degree in electrical engineering from New Mexico State University and completed National Defense University and Boeing Leadership Center courses in management, business development, finance, and leadership. Hartle is retired from a 35-year career with a defense contractor.

Blaine D. Holt, League City, Texas. Holt joined AFA through the Arnold Air Society in 1984 and became a Life Member in 2010. He earned a bachelor's degree in management information systems from the University of Georgia and master's degrees from the Air War College, in strategic studies, and from George Washington University in education technology. He served in the Air Force for 27 years, including assignments as an Airlift and Tanker Pilot and as a Military Fellow at the Council on Foreign Relations. His last assignment before retiring in 2015 was as the Deputy Military Representative to NATO. He has previously worked with AFA's national leaders, from 2011 to 2012, as Director of the Secretary of the Air Force's and Chief of Staff's Executive Action Group. Holt's community involvement encompasses the Wings Club of New York and the STEM Garden Institute. He is Executive Vice President of Operations for a privately held aerospace and automotive manufacturing company.

Mark L. Tarpley, Oklahoma City. AFA Life Member Tarpley joined the association in 1989 and is Oklahoma State President and Field Council Chairman of the Advocacy Subcommittee. Previously, he held office as the Central Oklahoma (Gerrity) Chapter's President, Vice President, and Aerospace Education VP. Tarpley served on the national level on the Credentials Committee in 2013 and in 2014. He has received a national-level Exceptional Service Award and Medal of Merit and was AFA Oklahoma's Person of the Year. Tarpley earned a bachelor's degree in business and computer science from Texas A&M Commerce and a master's degree from Embry-Riddle Aeronautical University. His Air Force career spanned 27 years, including time as an Expeditionary Operations Group Commander. Now a retired Consultant, he is a Rose State College Foundation Board Member and belongs to several military associations.

NATIONAL DIRECTOR, CENTRAL EAST AREA

The Nominating Committee submits one name for National Director, Central East Area, for a three-year term.

Tyler Johnson, Hampton, Va. Johnson joined AFA through AFROTC and the Arnold Air Society. He is a Life Member and the Central East Region President. Before that, he was the Langley Chapter President and Executive Vice President. Johnson has served on three AFA national committees: Development, Membership, and the Field Council. He has received a national-level Exceptional Service Award and a Medal of Merit. Johnson earned a bachelor's degree in economics and history from Vanderbilt University and a master's degree in communications from Johns Hopkins University. He served for eight years on Active Duty as a Program Manager before transitioning to the Reserves, where he worked as an Operations Research Analyst in the Air Operations Center weapon system. He is now an Air National Guard Tactical Air Control Party/Air Liaison Officer in the 116th Air Support Operations Squadron, Camp Murray, Wash. Johnson is an Arnold Air Society-Silver Wings National Administrative Consultant and a Senior Account Executive for a software company. ✪

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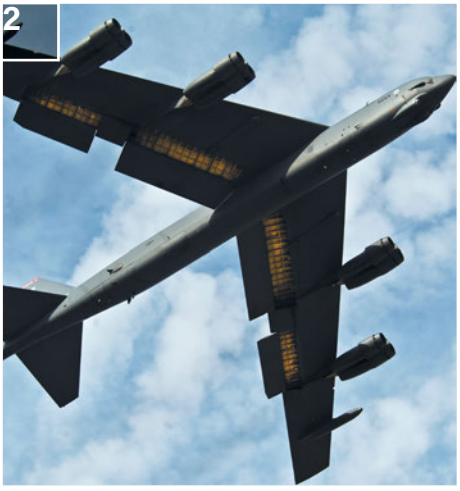

1/ Henry Davis Minot. 2/ A B-52H flies over Minot AFB, N.D. 3/ President John Kennedy congratulates a B-52 crew at Minot after a record-setting flight in 1962.

MINOT

A Boston Brahmin Goes West

Minot Air Force Base, located on the high plains of North Dakota, got its name from a nearby town. Of this there is no doubt. Citizens of Minot, N.D., donated land parcels, and USAF chose the name in their honor.

That, however, just leads to another question. How did Minot—*the town*—get its name, now famous throughout the Air Force?

Here's the answer: It came from Henry Davis Minot, a late 19th century American who never wore the uniform, never held office, and barely reached the age of 30.

He was a passionate ornithologist and investor with a killer instinct for railroad business. He probably never set foot in Minot.

Minot was a Boston Brahmin, born into a family whose lineage traced to a 1630 company of Puritan settlers. He was the fourth of five sons. A sickly child, Minot took to bird-watching and, at 17, published *The Land Birds and Game Birds of New England.*

Young Minot entered Harvard in the same year. There, he befriended another frail bird-watcher from a rich family—Theodore Roosevelt. Minot and the future president co-authored a book about birds.

Minot joined Jackson & Curtis, a Boston investment banking firm specializing in railroad securities. Soon he was traveling the West, researching railroad companies for investors. He was good—and soon very rich.

The young capitalist himself invested in steamships, streetcars, and most importantly, new rail companies. This brought him into contact with the famous railroad tycoon, James J. Hill. Minot became one of Hill's executives.

Hill planned a railroad running from St. Paul, Minn., to Seattle and began laying track westward. When the track-layers reached Gassman Coulee in North Dakota in late 1886, Hill bought the surrounding property and incorporated a new town.

He named it "Minot," after his young executive and investor.

Thus did Hill's Great Northern Railway beget the town of Minot. At one point, Henry Minot was director of this line. He also was president of the Eastern Minnesota Railway.

In time, Minot and Hill fell out over the older man's refusal to designate Minot as his successor. The Boston Brahmin continued in the western railroad business, however. He lived in St. Paul, where he maintained an elegant home in the posh St. Anthony Hill district.

Minot was killed on Nov. 14, 1890, in a major train collision near New Florence, Pa. Though only 31, he left a large fortune.

Nearly seven decades later, Minot Air Force Base came into being. It was for most of its history a Strategic Air Command ICBM and bomber base. Today, it is the home of Air Force Global Strike Command's 5th Bomber Wing, with its B-52 aircraft, and 91st Missile Wing, with its Minuteman III ICBMs. The missile field, with its silos and launch control centers, covers thousands of square miles of North Dakota prairie.

HENRY DAVIS MINOT

Born: Aug. 18, 1859, Forest Hills, Mass.
Died: Nov. 14, 1890, near New Florence, Pa.
College: Harvard University
Service: None
Occupation: Ornithologist, investment banker, railroad executive
Offices: President, Eastern Minnesota Railway; Director, Great Northern Railway
Books: *The Land Birds and Game Birds of New England, The Summer Birds of the Adirondacks in Franklin County, NY* (with Theodore Roosevelt)
Famous Friends: Theodore Roosevelt, James J. Hill
Famous Relatives: The Minot family of Boston

MINOT AIR FORCE BASE

State: North Dakota
Nearest City: Minot, N.D.
Area of Main Base: 7.7 sq mi/ 4,928 acres
Area of ICBM Complex: 8,500 sq mi
Status: Open, operational
Activated: Feb. 8, 1957
Former Owners: Air Defense Command, Strategic Air Command, Air Combat Command
Current Owner: Air Force Global Strike Command

Photos: *The Land Birds and Game Birds of New England;* Brittany Y. Auld/USAF; USAF

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