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Magazine



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ON THE COVER



100 years of airpower news coverage, featuring a vintage logo from 1942. See "Covering Air Force Magazine," p. 38.

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A Century of *Air Force Magazine*

This editorial that you are reading in your paper magazine, on your phone, tablet, or desktop computer, marks a milestone in a long, convoluted history. *Air Force Magazine* was published by the US Army for its first 28 years and has been an Air Force Association product for the past 72 years. It repeatedly changed names and formats, and this month it is 100 years old.

The very first issue of the Army Aeronautical Information Branch's *Weekly News Letter* was for the week of Sept. 15 to Sept. 21, 1918. It was a simple publication, a newsletter in the truest sense of the word—typewritten words on a page. But it began a philosophy that continues to do this day: Get useful information about airpower to the readers in an accessible, engaging way.

That first issue began with news that the Air Service needed more mechanics, pilots, bombers, observers, and balloonists. World War I was in full force.

"The fast moving overseas of air squadrons, planes, motors, and material for American airdromes, fields, and assembly plants in France and England" required skilled airmen, that first issue read. "The Air Service, alone, is now half as large again as the whole American Army was at the outbreak of the war," we noted. Yes, there were pilot and mechanic shortages in 1918.

The world, the Air Force, and technology have changed, and so have we. No one could have envisioned that this humble newsletter would someday be called *Air Force Magazine*, that it would be published by an Air Force Association, or that its products would include daily news distributed electronically through a website, email blast, and social media.

Name changes were common early on. Between 1918 and 1942, the *Weekly News Letter* became the *Air Service News Letter*, then *Air Corps News Letter*, and then *Air Forces News Letter*.

It is with great pleasure that we present this issue of the magazine, as we look forward to the next 100 years.

Finally, in December 1942, Army Air Forces published the first issue under the title *Air Force Magazine*. The name stuck.

Gen. Henry H. "Hap" Arnold and Gen. Carl "Tooe" Spaatz had made plans to transfer the magazine's ownership to the fledgling Air Force Association upon AFA's creation in 1946. The changeover occurred from June to July 1946.

"Hereafter, *Air Force* will be published as the official magazine of the Air Force Association, the organization knitting together all present and former members of the Army Air Forces," read a notice in the final government-published issue. "Membership ... includes a subscription to *Air Force*."

The magazine has been central in AFA's existence ever since, serving as a communication and educational tool without rival. Over the ensuing decades, we have reported on AFA, USAF, and national security news as it happened, wherever the Air Force operates. The Berlin Airlift, Korean War, Vietnam, Cold War, 9/11, and the wars in Iraq, Afghanistan, and Syria all played out in our pages, frequently with our reporters present.



In 2018, Pentagon Editor Brian W. Everstine has just returned from visiting Air Force units in Hawaii, Japan, and Guam. He met with airmen countering threats from China and North Korea, and with the crews that make USAF's continuous bomber presence possible. And at the time of this writing, News Editor Amy McCullough is at the Farnborough Air Show in the UK, before heading out to visit numerous USAF units on the front lines of the new Cold War with Russia.

We've documented the Air Force's evolution over the years as we've evolved ourselves. If you're not familiar with our website, you're obviously not reading us online. Set this magazine down for a moment, go to airforcemag.com, bookmark the page, and take a look around. We'll be here when you get back.

Likewise, if you have not subscribed to the Daily Report's email blast, go sign up using the simple form on our website—you don't have to wait for the monthly magazine to get your news from *Air Force Magazine*!

We'll be commemorating our centennial with a variety of special features through the rest of 2018. On p. 38 of this issue, we revisit many of our favorite and most interesting covers from the past 100 years. An even-more comprehensive version is available on our website.

We hope you've enjoyed the first 100 years of *Air Force Magazine*, because we've enjoyed creating them. It is through the support of you, our readers and AFA members, that we will make our next century even better.



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Droning On

I have noticed recent articles about retirement of the Predator drones from the Air Force inventory ["Elegy for the Predator," July, p. 18]. My first thought was, "already?" Has anyone considered transferring them to the Department of Homeland Security as part of President [Donald J.] Trump's "wall" to patrol our southern border? Surely there must be some dollars to be saved.

Maj. Donald S. Nicklin,
USAF (Ret.)
Papillion, Neb.

This article tells me how fast time goes by. I was one of the Air Force construction inspectors for the beddown at Creech AFB (Indian Springs, Nev.), and the Corp of Engineers was also involved in the beddown. I still remember when Gen. [John P.] Jumper came to Creech and told everyone that the Predator would not take any pilots out of the cockpits (ha ha). I was told by a major to keep my mouth shut when I started to laugh. During the beddown, one of the facilities that I inspected was the first arm/de-arm pad. I asked the military working on the Predator if they wanted the pad to have grounding points and was told there wasn't any need for them, and I replied what happens when they arm the Predator, and they just snickered at me like I didn't know what I was talking about. I installed a grounding system with a change order. I witnessed the first firing of a Hellfire missile at a [target] tank. I was able to fly the Predator during the beddown because of my involvement with the beddown. I received coins from the commanders of both the 11th [Recon-

naissance Squadron] and the 15th [RS]. One of the reasons for the high accident rate was the forward-only vision and confusion during training with the keyboard controls. That was one of the great times I had working for the Air Force.

Kenneth I. Tuttle
Kingman, Ariz.

A Different Breed

A recent *Air Force Magazine* headline declared (in a crisis way) that USAF had three emergency landings ("The Daily Report: USAF Osprey Makes 'Precautionary Landing' Follows KC-10, KC-135 Incidents," June 7).

The US Air Force lost 445 F-4s during the Vietnam conflict.

The list of these losses (<https://combatace.com/forums/topic/90897-usaf-f-4-phantom-vietnam-losses>) is worth a minute or two. Open the link and start scrolling. Note the names of the flyers. Remember each KIA or POW or MIA represents a domino that fell upon a family domino that knocked over another domino; and makes one wonder ... has the last domino stopped falling?

A lightning bolt of contrast strikes me that today's view of risk is dramatically and culturally different than a mere generation ago. The three recent landings were successful.

Today, our American culture has an altered perception that mandates an expectation of low-to-no risk. Today, our America knows nothing else. I wonder what a helicopter parent with a 30-something living at home would think about my Dad's B-26 crew in World War II flying out of England. The oldest crew member of the 10 was 21; that was the pilot, and he didn't have a driver's license.

Yet, our Air Force Vietnam experience spawned the golden era of the modern fighter pilot. Three new and specialized aircraft were designed and built—F-15, F-16, and A-10, and a vow by the collective fighter community to be acolytes of [ace] Randy Cunningham's axiom—you fight the way you train.

The lifeblood of this culture was a meritocracy of flying skills born by brutal fighter-pilot debriefs that humbled

everyone. Many upon many washed out. What was left was a brotherhood of "my life depends on your competence," and that code of conduct extended to the maintenance monkey wrenches, and eventually to the green-eyeshade support folks.

Today, I surmise each of us, who were bonded during this golden era, has been changed by that mentality. I know I have been; I see myself continually trying to optimize my life. It can be a bit annoying, having a fighter-pilot debrief every day with myself on getting the pantry organized right [ha].

I was and am changed forever. And as happens with every generation, ... my America of today has changed away from these standards and me.

History will be repeated.

Carl Van Pelt
Falls Church, Va.

NCOs, ADs, BDs, and MDs

I disagree with the opinion of Lt. Col. Gary L. Peppers as expressed in a letter he wrote in the July issue of *Air Force Magazine* regarding enlisted pilots ["Warrant Officers, Of Course," p. 3]. In the letter, he expressed that only officers should be pilots. He points to a study done in the 1950s that showed that college educated pilots had a 50 percent lower accident rate than noncollege-educated pilots. His assumption that enlisted members are not college educated is wrong and insulting to the hardworking enlisted members of the Air Force.

Lieutenant Colonel Peppers may not be familiar with the modern USAF. According to the Air Force Personnel Center website [current as of June 30, 2018], these are the education levels for NCO and SNCO members of the Active Duty Air Force:

NCO TIER

47% some college
41% have associate's degrees
9.0% have bachelor's degrees
1.0% have master's degree
0.01% have professional degrees

SENIOR NCO TIER

6.0% some college
51% have associate's degrees
31% have bachelor's degrees

WRITE TO US

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

—The Editors

10% have master's degrees
0.10% have professional degrees

My other objection with Lieutenant Colonel Peppers' letter is his misrepresentation of CMSAF Kaleth O. Wright's comments ["Air Force Almanac: Verbatim," June, p. 32]. Here is the complete sentence by CMSAF Wright: "If there's an enlisted airman that's going to be flying and employing weapons, it requires certain authorities we would have to get by. That's just part of our age-old doctrine, that the employment of weapons, that the authority and responsibility lies with officers." Lieutenant Colonel Peppers implies that CMSAF Wright feels that enlisted are unqualified to be pilots. That's not the way I read his statement at all. No pilot releases weapons without permission from a higher authority. Having an enlisted pilot over an officer pilot won't change that doctrine.

On a side note, there is a small ground-fighting force in the Air Force (Pararescue, TACP, Combat Controllers, Security Forces, SERE, Combat Weather), which is made up of mostly enlisted members. We successfully employ weapons daily without officer oversight. Since 1993, there have been 11 airmen who received the Air Force Cross. All of them came from the above mentioned, beret-wearing group. Only one (Capt. Barry F. Crawford Jr.) was an officer.

I agree wholeheartedly with Lieutenant Colonel Peppers' opinion of the need for warrant officers in the Air Force. The other services have used warrant officers very successfully in many positions. The Air Force would benefit from a similar program as well. A warrant officer program would be a great way to make pilots who are not officers.

I would argue that the enlisted force of the Air Force is well-educated. Members of the enlisted force have proven themselves very capable of employing weapons, making tough decisions during a fight, and coming out on top. Done correctly, without lowering flying standards (except for the officer requirement), there is no reason why NCO and SNCO personnel could not be pilots.

SMSgt. Thor Merich,
USAF
Cannon AFB, N.M.

A Pilot's Life

If DOD only captures whether a military pilot goes to work for an airline, it is missing a major distinction ["The

Pilot Shortage Quandary," June, p. 22].

There were at least two "pilot shortages" while I was Active Duty between 1971 and 1993 (never while I was in the zone for a bonus—nuts!). During a pilot shortage of early 1980s, I attended a talk by an Air Force general officer on the subject. A key point of his talk, and one it appears may be being overlooked is this:

Some pilots leave the military for the airlines because that is their long-term career plan. These pilots honorably serve their country for the better part of six or seven years, far more service than 99 percent-plus of the American public do, and are moving on by design. There is likely little or nothing the military can do to retain these pilots. At best, they might be enticed to join an Air National Guard or USAF Reserve unit so their expertise is not completely lost.

Some pilots leave the military because they come to dislike being in the military and find work with the airlines. This is a key point: These pilots are quitting a job they no longer find fulfilling, rewarding, compatible with family or other personal consideration, etc. They are not leaving because they want to fly for an airline; they are quitting a bad job and looking for a good one. Their particular skill set happens to be flying airplanes so they find work doing just that. There is some chance that these pilots can be enticed to remain on Active Duty, but it probably won't be cheap or easy.

If DOD only captures where the pilot is next employed after leaving Active Duty, it will miss a major data point that can inform what actions might help stem the outflow of this latter class of pilots.

Lt. Col. Michael Hansen,
USAF (Ret.)
Las Vegas

Raptor Rapture

The July edition of *Air Force Magazine* was of special interest to me, with one article about trading the F-22 for the

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B-21 ["From the Daily Report: Schwartz, in Memoir, Says F-22 was Traded for B-21 Bomber," p. 10] and the other about the "The Chinese Air Force's Great Leap Forward" [p. 44]. I served in the F-22 SPO here at Wright-Patterson AFB, Ohio, as a program integrator when former Secretary of Defense Robert Gates canceled the F-22. The reasons he gave at the time just didn't make sense and were exactly counter to what we learned in War College—you don't plan for the next war based on the current one. Gates said we need more Predators/Reapers, not high-tech weapons such as the F-22. I felt then that he was missing the mark in not considering what I often refer to as the re-emerging Soviet Union and China, and so I bought his book just to see if perhaps I had missed something. I studied that book from cover to cover, and I am convinced I missed nothing, and that the decision to cancel the F-22 was a big mistake. Confirming my opinion was the recent move to look at restarting F-22 production, which tells me someone must believe we need more of them. Your article indicates that China is not resting on her haunches (and neither is Russia). I still stand by

my opinion that canceling the F-22 program was a huge misjudgement, and your magazine provides excellent evidence of that.

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

Missing Bomber

I am sure you probably have heard from other readers, but in case you haven't, in the July issue on p. 4, the list of X-planes has a missing aircraft: XB-36H nuclear-powered bomber (located eagle's left wing tip feathers, 2 o'clock position).

Thanks to the artist for doing a fantastic artwork.

Harry Bryza
Warner Robins, Ga.

Tiny But Mighty Knob Noster

Having grown up in the shadow of Whiteman AFB, Mo., and with family and friends still living nearby, I enjoyed the "Namesakes" article regarding how Whiteman was named (August, p. 64). However, you have done a great disservice to the city of Knob Noster, which is adjacent to Whiteman, by indicating Sedalia is the closest city. While Knob

Noster may be small, about 2,700 residents, it is—and always has been—a staunch support of the base. Sedalia, the larger city, population about 22,000, is 15 miles east of Whiteman and although it too wholeheartedly supports our airmen and the base, it is not the closest city to Whiteman.

Maj. Dean Hayes,
USAF (Ret.)
Bellevue, Neb.

Dress Blues

Concerning Mr. Carter B. Endsley's letter concerning military dress codes: What he said (Letters: Dress for the Job You Want," p. 4).

Col. Gary R. Weaver,
USAF (Ret.)
Germantown, Tenn.

Barksdale Bombers

Good morning! One of my team noticed an error in fact in the story "The All-in-One Kill Chain," August, p. 34.

The B-52s that were in CENTCOM came from both Minot and Barksdale. Barksdale B-52s were there from spring 2016 to spring 2017.

Capt. Andrew Caulk
Barksdale AFB, La.



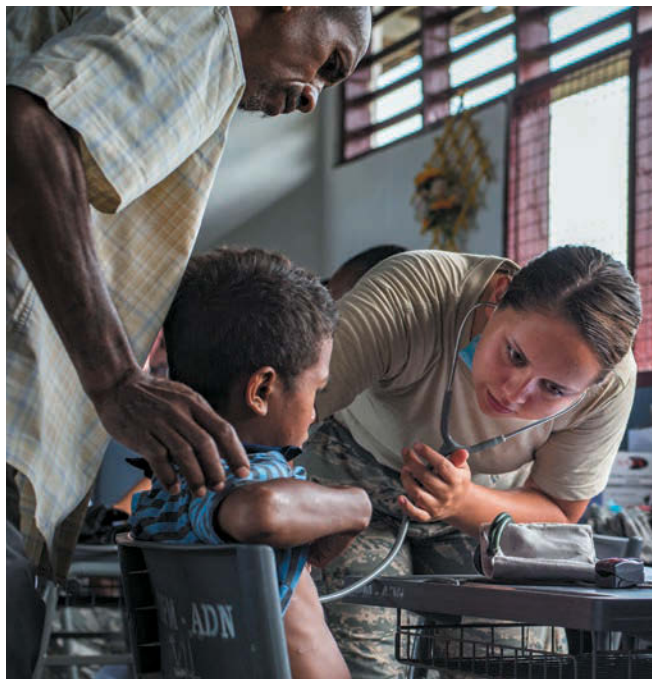
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SrA. Hannah Zink, right, during a health service outreach in southwest Timor-Leste on June 11. PAC ANGEL, a humanitarian assistance operation, also improves military-to-military partnerships in the Pacific.

FIGHT FOR YOUR RIGHT TO PILOT

Twenty-two new Afghan Air Force pilots graduated from Initial Entry Fixed-Wing school in the Czech Republic in June—including two female pilots, the Air Force announced. Officials with Operation Resolute Support have been working to recruit more women into the Afghan National Army, and, to that end, have placed gender integration advisors in the Train, Advise, and Assist Commands, the Air Force said.

One of the female graduates, Afghan Air Force 2nd Lt. Omari, said in a release that she and the other woman had “no experience driving cars or motorcycles,” so flying was “kind of unnerving.”

However, she said, “As we got used to it, it became easy.”

Omari added that it was “unbelievable” to get her wings, after a lifetime of wishing to be a pilot.

The other woman in the class, 2nd Lt. Salahshor, said she hoped she and Omari can be an inspiration for others.

“I just want to say, not only to girls in Afghanistan, but to girls all over the world, that whatever challenges you might face, it doesn’t matter.... Keep going, you should fight for your rights and you should follow your dreams,” Salahshor said.

MORE RESOLUTE EVERY DAY

The pilot graduation came as the deputy air commander for the Resolute Support mission praised the Afghan Air Force’s improving capabilities and proficiency. USAF Brig. Gen. Lance R. Bunch, vice commander of the 9th Air and Space Expeditionary Task Force in Kabul, told reporters via teleconference that the Afghan Air Force

has begun dropping laser-guided bombs and integrating the UH-60 helicopter into operations and has also conducted combat air drops.

The force “gets better every day,” Bunch said, and the “capability gap between the Afghan government forces and the Taliban continues to grow.”

CHECK OFF THAT CHECKLIST

Also in June, Air Forces Central Command started the second phase of a push to make the predeployment checklist a lot shorter for airmen heading to the AFCENT area of responsibility. The first phase started in March, when reporting instructions were cut from 23 pages down to nine, according to an Air Force news release.

The second phase shrinks the to-do list for predeployment airmen even more, reduces the amount of time airmen need to spend doing computer-based training, and cuts down on country-specific reporting instructions, USAF announced.

None of the changes are “dramatically different,” explained Col. Devin Statham, AFCENT’s director of manpower, personnel, and services. “We are just doubling down on our efforts, giving more time back, reducing guidance, and empowering commanders to make decisions,” he said.

PACIFIC ANGELS

In the Pacific, a team of USAF doctors and dentists helped nearly 5,500 patients over the course of six days in Timor-Leste, Asia, while civil engineers completed seven projects at two schools and a hospital, all part of Pacific Angel 18-1.

The goal of PAC ANGEL is to build partnerships and increase humanitarian assistance and disaster relief capabilities. Kathleen Fitzpatrick, US ambassador to Timor-Leste, said the work on the facilities alone will “improve the quality of education and health” for more than 65,000 people, according to an Air Force news release.

In addition to treating patients, the American doctors also worked with local hospital staff to share information and techniques.

Nazario Dos Santos, general medicine director of the hospital the team worked with, said his team will use the information they learned from the USAF team to treat patients.

“PAC ANGEL saves lives,” Dos Santos said.

MSgt. Damon Weigl, expeditionary engineer section chief with the 18th Civil Engineer Squadron, based at Kadena AB, Japan, said in the release the true impact of the exercise is “not about how much medicine has been handed out or construction projects completed, it’s about the lasting personal connections we make with our multilateral partners.”

MSgt. Justin Haggerty, the PAC ANGEL 18-1 antiterrorism officer, from the Kadena-based 18th Security Forces Squadron, said the effect is “immeasurable.”

“We’re able to come in and help people [who] have never had access to medical care in their entire lives, or very limited access, and bring advanced medical care, ... treatment, and equipment here for the Timorese,” Haggerty said.

The Timor-Leste engagement was the first of four PAC ANGEL humanitarian assistance engagements scheduled for 2018. The three others will be in Vietnam, Vanuatu, and Sri Lanka.



F-35s over the Utah Test and Training Range. The fifth generation stealth fighter could be threatened by Russia's Triumf air defense system, if the missiles are procured by Turkey.

TRIUMF OF THE WON'T

Perhaps the most serious rift in years between NATO allies and among development partners on the F-35 strike fighter has been playing out over the last few months. It's all about Turkey's decision to buy Russia's advanced Almaz-Antey S-400 "Triumf" air defense system.

In June, US senators inserted language into the 2019 National Defense Appropriations bill to block Turkey from fielding the F-35s that country has already purchased. The senators said they're immediately concerned about the F-35's stealth secrets leaking to Russia if the jet is flown in close proximity to the S-400. They're more broadly angered by the worsening authoritarianism of Turkish President Recep Tayyip Erdoğan, who was recently re-elected and has been further consolidating his power while cracking down on his political opponents and the press. The bill would keep Turkey from receiving the technical information or support necessary to maintain and operate the F-35s.

The already-passed House version of the Fiscal 2019 NDAA would stop *all* weapon sales to Turkey pending a Pentagon review of the tensions between the two countries.

Separately, in a July 5 letter, a bipartisan group of 44 US members of Congress urged Defense Secretary Jim Mattis to block the Turkish F-35 sale because of the S-400 deal. They said Turkey's decision to buy an air defense system not interoperable with NATO forces—but very much interoperable with the Russian military—reveals Turkey as “actively operating to undermine US interests around the world.” The group noted that Turkey has attacked Kurdish forces allied with the US in Iraq and Syria and is building a lamentable record of “degradation of human rights and democracy under President Erdoğan.”

Turkey has signaled its “clear intention to build a strategic partnership with Russia” and this has “completely eroded the US-Turkey relationship,” the lawmakers wrote. They said they have “no confidence” Turkey will employ the F-35 “responsibly”



Congress fears President Recep Tayyip Erdoğan (l) is cozying up to Russia with its planned purchase of the S-400 missile system.

and added they can think of no more “compelling case for re-evaluating the delivery of US military technology to a foreign state” than Turkey's actions on the S-400, in its domestic politics, and in Syria and Iraq.

Mattis has said he objects to the legislation and wants to work with Congress to have the provisions struck from the final version of the NDAA. In the ongoing fight against ISIS, the US relies on Incirlik AB, Turkey, as a base for aerial tankers and other aircraft and also as a storage site for tactical nuclear weapons.

The Triumf deal was inked last December, and it is reportedly worth \$2.5 billion and will provide Turkey with four batteries of the air defense system. US emissaries, including Secretary of State Mike Pompeo, have personally lobbied Turkey to dump the Triumf deal, urging Erdoğan to buy the US Patriot system, made by Raytheon, or at least a European system compatible with NATO forces. An Erdoğan spokesman has dismissed these overtures, saying the S-400 sale is a “done deal,” but he said Turkey will consider US or NATO systems when buying its next batch of air defense systems.

Photos: SSgt. Andrew Lee; Shealah Craighead/White House

In April, the US Assistant Secretary of State for European and Eurasian Affairs, A. Wess Mitchell, told the Senate Foreign Relations Committee "there will be consequences" if Turkey buys the S-400, threatening sanctions under the Countering America's Adversaries Through Sanctions Act. The law requires commercial action against countries that buy from Russia's defense and energy industries.

Russian state media, citing Turkish government sources, said Turkey opted against the Patriot because it couldn't get the technology sharing it wanted, nor could it get the systems as quickly as the Erdoğan government desired. Russia, on the other hand, was willing to "accelerate" the sale, with full technology transferred.

TECHNOLOGICAL TURKISH DELIGHT

Turkey was one of the original partners on the F-35, putting up nearly \$200 million in development money in exchange for technology transfer on the project and industrial work share. Turkey plans to buy 100 F-35s—which would make it the third-largest F-35 operator, after the US and UK—and is aiming to be the second source to Northrop Grumman on the aircraft's center fuselage. It also makes composite parts for F-35s deployed worldwide. Turkey has other hooks in the program, as well: it's been given the go-ahead to build F135 engines for the F-35 under license from Pratt & Whitney, and the regional depot for the F135 engine will also be in Turkey, at Eskişehir, midway between Istanbul and Ankara.

Under license, Turkish aerospace companies jointly built more than 230 Lockheed Martin F-16s and are upgrading those still in service to roughly the Block 50 capability configuration. Turkey has sold some to other regional countries, notably Egypt.

Turkey has already purchased 14 F-35 aircraft; the first two of which were delivered in a glitzy presentation June 21 at Lockheed Martin's Fort Worth, Texas, facility. However, those jets have flown to Luke AFB, Ariz., to serve as a training aircraft for allied F-35 pilots, including those from Turkey. It isn't clear when Turkey will stand up an F-35 unit on its own soil, but it is slated to receive its first 25 or so aircraft by 2022.

In late June, Turkish foreign minister Mevlüt Cavuşoğlu, in a TV interview, said President Donald J. Trump had personally assured Erdoğan that the F-35s would be delivered. The reassurance came when Trump called Erdoğan to congratulate him on his re-election, Cavuşoğlu said. He reported that the two leaders also expressed their resolve to improve their bilateral relationship and increase cooperation.

Cavuşoğlu also shrugged off the potential security issues attending the S-400, noting that Greece has an earlier version, the S-300. NATO partners and Israel routinely practice against Greek air defenses with Greece's cooperation.

MORE SENSITIVE, AND WITH LONG LEGS

The S-400 is, however, a significant though "incremental" improvement over the S-300, with "more sensitive sensors" and "increasing range," Air Combat Command chief Gen. James M. Holmes told defense reporters in Washington in late June. Russia touts the system as having capability against stealth aircraft as far as 80 miles away.

The S-400, as an adversary, "limits the range, particularly, of your legacy aircraft ... you have to work farther away" to be safe from the system's missiles, Holmes said. "It means you have to go farther off the tankers, so you have less time when you're forward."

Holmes said he would prefer not to fly the F-35 in close proximity to the S-400. The "how and when" is a "policy issue" on which he would not comment.

"We take steps—whenever we fly the airplane—to do the gain and loss analysis of 'where do we want to fly it, what do we want to do, who do we want to fly it with,' and we'll continue to work through those processes and make recommendations up the chain" of command, Holmes said.

A balance has to be struck, he said, "between demonstrating commitment and assuring your allies" and "preserving your state secrets."

It may be "hard to avoid" exposing the F-35 to adversary radars in the long term, though, Holmes said.

"The airplane's out there. We've accepted 300 of them" in the US services, and they will soon be based overseas by the US armed forces, "Alaska next, and to the United Kingdom after that," Holmes pointed out. Some European partners are already fielding their F-35s, he said. "So, I think the question ... is not so much about 'will you,' it's about 'how will' you do it" and still strike the balance of power projection and secrecy.

Although the Turkish government says that only Turkish troops will crew the S-400 system—a series of vehicles involving both radars and missiles—it is likely that Russian advisors will teach the crews how to operate the system against a variety of threats. Not widely known is that the S-400 is not just an air defense system. It can be employed as a ballistic missile system, striking at ground targets with high precision. Turkey has said it needs the system to defend against ISIS and the Kurds—neither of which have an air force—and also against Iran, which does.

Russia has deployed the S-400 in Syria, giving it an opportunity to attempt to spot and track stealthy F-22s operating there as part of the US-led coalition against ISIS.

The S-400 deal is just the latest in a series of moves in which Turkey and Russia have drawn closer together. The relationship has warmed markedly in the aftermath of the late 2015 shoot-down of a Russian Su-24 by Turkey when the bomber crossed into Turkish airspace during operations related to the Syrian civil war. One Russian pilot was killed in the incident, but the two countries agreed not to let the event escalate into war. A year later, shortly after Erdoğan beat down an attempted military coup against him, Erdoğan had one of the Turkish nationals that had fired on the Su-24 crew arrested and he apologized for the shoot-down. Russia has since voiced its support for Turkish attacks on Kurds and Erdoğan's characterization of Kurds in Iraq and Syria as supporting terrorism.

The Pentagon is loathe to alienate a long-term stalwart ally with a large military. Several Defense officials said that making the S-400 a loyalty test will only antagonize Turkey and, as one said, "drive them into the arms of Putin." However, a Senate staffer said things may already have gone too far in that direction, and the legislation should be a wake-up call to Turkey to turn things around or face the unappealing outcome of becoming a Russian client state. "We don't have to stay to the end to know how this movie turns out," he said. ★



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AFTER FATAL CRASH, USAF ENDS LIGHT-ATTACK EXPERIMENT FLIGHTS



An Embraer A-29 Super Tucano releases a laser guided bomb over White Sands Missile Range in New Mexico.

The Air Force in early July announced it will not resume the flying portion of its light-attack experiment, following the June 22 fatal A-29 crash that killed Navy Lt. Christopher Short and injured an airman from Air Force Special Operations Command.

Lt. Gen. Arnold W. Bunch Jr., USAF's top uniformed acquisition officer, said the service had been "very aggressively flying" until operations were paused following the crash. "We flew quite a bit of sorties, so when you combine what we did in the first phase, we have quite a bit of data," he told reporters at the Pentagon.

The service will continue to work with industry, Bunch added, "to com-

plete any remaining test requirements." At the time the Air Force stopped flying, the experiment had completed 90 percent of its scheduled sorties.

As of early July, Bunch said the Air Force was still working to analyze the data it has collected and had not yet decided how it will move forward. If the decision is made to continue, the goal is to issue a request for proposals by December with a down-select anticipated next fiscal year, he added.

"Our No. 1 priority right now is supporting the safety investigation board. After the mishap occurred we analyzed where we were with the flying portions that had occurred, and we decided we had enough data to not go forward

and do the flying portion anymore," Bunch said. "If we needed additional data, we could get that through our industry partners. We've done that on other programs."

He declined to say what may have caused the Super Tucano to crash, pending the results of the safety investigation board, or whether the aircraft was considered a total loss, and if so, whether the Air Force or industry would assume that loss.

Air Force spokeswoman Ann Stefanek said SIBs typically take about 30 days and are not releasable. Once the safety investigation board concludes, an aircraft investigation board likely will convene. The AIB findings will be

released, but Stefanek said she could not say when that might happen.

"Everybody wants us to go faster, and we would love to go faster. The reality is that buying the aircraft may be the easiest part of the equation," said Bunch. The Air Staff, he added, is still trying to figure out how many pilots and maintainers would be needed for this new mission, how the service can fill those roles, where the aircraft would be based, what the concept of operations would look like, and how to export the chosen aircraft to partner nations.

"Right now, we're still progressing down that path. We've not pulled back on the throttle in any shape or form," he added.

The goal of the light-attack experiment is to find a more affordable aircraft that can operate in permissible environments, freeing USAF's more advanced fighters to come home and train for higher-end threats.

The service launched the first phase of the experiment at Holloman AFB, N.M., in August 2017, with four participants: the Sierra Nevada/Embraer A-29 Super Tucano, which is already operational in multiple countries, including the Afghan Air Force; Textron AirLand's Scorpion multirole jet, once offered for USAF's T-X trainer program; the AT-802, a militarized crop duster offered by Air Tractor and L-3 Communications; and the Textron Aviation AT-6B, an upgraded version of the T-6 Texan II USAF operates as a primary trainer.

Though initial plans called for a real-life combat demonstration to follow phase one, the service later decided to move ahead with a second phase experiment at Holloman instead. The A-29 and the AT-6B were selected to participate.

The second phase kicked off in early May and was expected to last through late July. It is focused primarily on logistics and maintenance requirements, weapons and sensor issues, training, networking, and interoperability with partner forces.

Experimenters were tasked with finding a network that is "100 percent exportable," can be installed on a variety of aircraft, and then flown, said Bunch.



Lt. Gen. Arnold Bunch speaks during the light-attack experiment at Holloman AFB, N.M., in August 2017.

Although USAF has already done "quite a bit of experimentation" on the network, Bunch said the service planned to continue experimentation using what he called "surrogate aircraft," though he said that work will not necessarily take place at Holloman.

When asked why USAF didn't just continue testing the network on the AT-6, he said the "system we're trying to put in place is not just going to be limited to the light-attack aircraft, we're trying to develop a network we can put in other aircraft as well, and we can get the results out of that without necessarily flying the AT-6." He declined to say what aircraft would serve as surrogates, saying only it could be existing USAF assets or industry aircraft.

The Air Force also announced in early July it was "rescheduling" a July 19 distinguished visitors day, to which it had already invited "more than 50" allies and partners to come to Holloman and see what the service had accomplished so far.

Bunch emphasized that the DV day has not been canceled, saying the service is trying to be as transparent as possible with allies and partners as it looks for the "right time and right

location" to reschedule the event.

Air Force leaders have said the light-attack experiment was also a test to see if the service can partner with industry to deliver much-needed capability to the warfighter faster and more affordably.

"Our adversaries are modernizing faster than we are, and it's up to the United States Air Force to drive innovation," Air Force Secretary Heather Wilson said in August 2017 during the first phase of the experimentation. "We have to think about things in new ways and identify new capabilities faster than we've done in the past."

Though the fatal A-29 crash was tragic, Bunch said it doesn't necessarily mean the light-attack experiment can't still change the way the Air Force does acquisition.

"Anytime you lose an airman, you have to pause and think a little bit about where we're at," said Bunch. "The loss of Lieutenant Short is a critical setback for America writ large, so that's a big hit for all of us. Having said that, we were trying a different approach, we believe we have collected the data using that approach, and we believe we will use similar approaches in the future."

—AMY MCCULLOUGH



USAF'S OLDEST JET, ON THE FRONT LINE IN THE PACIFIC

ANDERSEN AFB, GUAM—

Before they can fly the newest air refueling tanker, airmen with the New Hampshire Air National Guard are refueling aircraft throughout the Pacific in the oldest.

The airmen are flying KC-135R, tail number 57-1419, the oldest Stratotanker—and the oldest aircraft—currently in the Air Force's fleet. The Block 40 variant of the refueler still doesn't have modernized avionics like the rest of the fleet, but its mission capable rate is high, which is "pretty impressive," given the operations tempo and environment in Guam, said Lt. Col. Nelson Perron, commander of the 506th Expeditionary Air Refueling Squadron.

"[Guam] is a harsh environment, bringing unique challenges," Perron said.

The aircraft is one of six KC-135s deployed to Andersen. The others include one from the Nebraska Air National Guard, two from the Alabama Air National Guard, one Active Duty aircraft from MacDill AFB, Fla., and one Reserve aircraft from Tinker AFB, Okla.

Guardsmen typically rotate through the base every 60 days and fly regularly, Perron said. The aircraft themselves need down days, which is why 57-1419 was parked in a hangar on a recent afternoon to be thoroughly washed to avoid corrosion. The KC-135s at Andersen need to be washed-down every 30 days, at a minimum.

The six tankers are responsible for supporting the continuous bomber presence at Andersen, regularly topping off thirsty B-52s as they fly both local training missions and longer deterrence flights through the Pacific. They also support "coronet" missions, where they refuel fighter jets that deploy across the Pacific, including F-35s and F-22s that deployed to Kadena AB, Japan. This means flying flights that range



The oldest airplane in USAF's fleet, KC-135 tail number 57-1419, in a hangar at Andersen AFB, Guam.

up to nine hours long, though that "isn't all that long" for a tanker, Perron said.

Perron himself said he first deployed to Guam in 2005 and has been here six times since. "Now we're flying more missions and more of a variety of missions," he said. The mission is "dynamic," because sometimes tankers surge for large-scale exercises, such as Cope North at Guam, or fly support for high-profile missions, such as the B-52's deterrence flights through the region. Supporting those missions make the airmen "proud, seeing how much people care about this," said SrA Clare Handy, a maintainer with the 506th EARS, who is at Guam on her first deployment.

The New Hampshire Guard will soon retire its KC-135s and move on to KC-46s. It's expected to receive its first Pegasus aircraft beginning next year.

—BRIAN W. EVERSTINE

USAF TO RECEIVE FIRST KC-46 IN OCTOBER

The Air Force will accept the first KC-46A tanker ready for operational duty in October, with the balance of the first 18 contractually obligated aircraft to be delivered by April of next year, the service announced in June.

The announcement puts firm dates to a plan that had been in flux, as Boeing missed delivering the first tanker by the original target of last summer. Recently, the company said it would deliver the first jet by the end of this year, while the Air Force said by its reckoning the milestone wouldn't happen until next spring or summer. In May, the service refused to accept any KC-46 deliveries because of deficiencies in its boom refueling system. The Air Force did not say whether the boom issue has been resolved to its satisfaction.

"While the KC-46A flight test program is nearly complete, significant work remains," Undersecretary of the Air Force Matthew P. Donovan said in a statement. "The Air Force is looking forward to KC-46A first delivery and will

continue to work with Boeing on opportunities to expedite the program."

Boeing, in its own statement, said the announcement shows the team has made "great progress."

"With first delivery now set, the men and women of the Air Force know when they will start receiving this warfighting capability," the contractor noted. The company asserted it has "the best of Boeing working to ensure the US Air Force gets [its] tankers as quickly as possible."

Boeing Defense President Leanne Caret said recently the KC-46 was the single top priority for the company, after USAF leaders complained Boeing was overly attentive to its commercial aircraft business, at the expense of the tanker.

The KC-46A, which is a derivative of Boeing's 767 freighter, has suffered a number of setbacks since the company prevailed over Airbus in the KC-X competition in 2011. The fixed-price development program for the aircraft has a ceiling price of \$4.7 billion, but Boeing has already

written down more than \$3 billion in cost overruns on the new tanker.

Boeing is to deliver 179 tankers in total to the Air Force by the end of 2028, at an expected rate of about 15 per year. The original estimate of the program's value was \$35 billion.

The Air Force also plans a KC-Y tanker program to replace most of the rest of its Eisenhower-era KC-135s and Reagan-era KC-10s. Air Mobility Command has said it may opt for a small, stealthy aircraft to complete its modernization of the tanker fleet, in a program still notionally called KC-Z.

AMC has also said it may forego a KC-Y competition and simply buy the next batch of tankers from Boeing.

—BRIAN W. EVERSTINE AND JOHN A. TIRPAK



A KC-46 undergoing final assembly in May at Boeing's Everett, Wash., facility.

SOUTHCOM WANTS TO BE NEW CAPABILITIES TESTBED

Like all combatant commanders, the head of US Southern Command wants more assets in theater, and he's willing to get creative to get them.

"Our bumper sticker is, 'If you have something new to try, try it here,'" SOUTHCOM boss Adm. Kurt W. Tidd told reporters in June in Washington, D.C. "We've had some good luck in bringing out some developmental programs that perhaps aren't quite ready for deployment to a higher risk theater. We're very interested in those types of things."

Tidd said it's "very much a work in progress," but the command regularly partners with Defense Department labs, which are looking to apply things like artificial intelligence and machine learning in the field. The goal is to take manpower-intensive processes "created to deal with conflicts in other theaters" and find significantly more efficient ways for them to work, and then develop that in a way that enables

the US to easily share information with its partners, he said.

"Because that's an interest to other theaters as well, we can be kind of a test platform for breadboard types of capabilities to try some things out on a smaller scale, but still a meaningful mission, and then feed that into development," he said.

When asked if the command was working closely with the Air Force and Army as the services explore ways to improve multi-domain command and control, Tidd said he's asked USAF Chief of Staff Gen. David L. Goldfein and Chief of Staff of the Army Gen. Mark A. Milley what they are looking for, and whether there was anything specific they were ready to "take on the road."

"Honestly, they are still trying to take it from the conceptual to the actual hardware, but those are the kinds of things we'd be very interested in hearing more about," Tidd said.

—AMY MCCULLOUGH

SHOULD CHINA FACE COLD WAR-LIKE TECH RESTRICTIONS?

China is the principal bad actor when it comes to both military and industrial espionage, and although there are others, "we have to prioritize" dealing with China because it is such a huge problem, Undersecretary of Defense for Research and Engineering Michael D. Griffin told Congress in June.

At a House Armed Services Committee hearing on military technology transfer, Griffin said the US has been hemorrhaging secrets to China for many years because the US "chose not to" recognize that great power competition didn't end 27 years ago, and China has a state policy to advance its technology through any means necessary.

Kari A. Bingen, deputy undersecretary of defense for intelligence, read out loud a Chinese law compelling Chinese state-run and nonstate-run industry and academic institutions to actively cooperate with Chinese intelligence.

It's now up to the US to decide whether it's going to take Cold War-era measures to rein in China's vast information-collection enterprise, Griffin said. He noted that it would have been unthinkable during the 1980s to have joint

ventures with Russia involving sensitive, dual-use technology or to allow thousands of Russians to study at American universities, but the US routinely relies on Chinese electronics used in defense systems and hosts more than 30,000 Chinese seeking technology doctorates from US universities.

Moreover, as China has undercut US prices and invested more heavily in electronics, it has gained a technology edge in this area. More companies seek to "buy the best" and so resort to Chinese vendors. With those products inevitably come electronic backdoors for spying, Griffin said.

Griffin called China's commercial joint ventures with US companies "predatory" and said he is working to create incentives for industry not to cooperate with China on sensitive technologies where "their objective is to put [American companies] out of business."

China, he said, "is playing the long game."

Most of the problem, Griffin said, is that permission to conduct business with Chinese companies, or allow student visas, or buy Chinese products, or allow Chinese companies



to buy US companies or real estate in close proximity to sensitive sites, etc., are decisions “made in isolation” from one other. The US needs to assess the whole of China’s campaign and look at such individual initiatives in the broader context. China, he said, is “an adversary ... acting in an adversarial manner” and should no longer be viewed merely as a mischievous trading partner.

Bingen said in addition to price, performance, and schedule, US contractors must now be assessed on security as well. Companies need to see that a robust effort to protect their secrets is not an expense but an investment in their own future competitiveness.

Members of the committee asked if the US is taking any offensive action against China—such as deliberately allowing that country to steal false information—to create a deterrent or throw a monkey wrench into its development efforts based on stolen technology. Griffin acknowledged such an effort but would not discuss it in open session.

Griffin and other witnesses were asked several times about the Trans-Pacific Partnership agreement and how it might



Mike Griffin testifies before the House Armed Services Committee during a hearing.

have had an effect on the Chinese industrial espionage situation, but they all demurred, saying such things were beyond their purview.

Several members complained that while the witnesses touted an “all-of-government” approach to dealing with China, there was no evidence of that in discussions of the TPP. “Whole of government is a phrase thrown around like candy at a parade,” Rep. Rick Larsen (D-Wash.) complained to the witnesses. “It’s frustrating ... you’re not living up to it,” he said.

Asked why the US seems to have lost its lead in hypersonics, Griffin responded that the US “let it lie for a while” after doing early pioneering work. “That was our choice as a nation,” he said, and one that “we are working to correct” with all possible speed. China, meanwhile, took full advantage of US research, combined it with stolen information,

and pumped it up with a massive infusion of funds to achieve the lead, Griffin explained. He acknowledged a similar situation with directed energy.

—JOHN A. TIRPAK

GEN. LAWRENCE A. SKANTZE, 1928-2018

Gen. Lawrence A. Skantze, who headed the E-3A AWACS development program and oversaw the buildup of Air Force stealth technology, died June 18 at age 89.

Skantze enlisted in the Navy in 1946, serving as a radio operator until his 1948 appointment to the US Naval Academy. Upon graduation, he accepted a commission in the Air Force. He earned his wings in 1953 and flew the B-26 bomber, taking a first assignment in Korea after the end of hostilities there. In 1959 he earned his master’s degree in nuclear engineering through the Air Force Institute of Technology, after which he worked on a commission exploring the feasibility of atomic-powered airplanes.

Following Armed Forces Staff College, he was assigned to Air Force Systems Command, where he headed system engineering and advanced planning for the Manned Orbiting Laboratory, USAF’s never-launched space station. Later he ran the AGM-69A Short-Range Attack Missile nuclear weapon program.

In June 1973, Skantze took over the E-3A AWACS program, shortly after its first flight. He directed its development through initial operational capability and frequently testified before Congress to explain the politically beleaguered system’s military worth. In 1977, he became deputy chief of staff of Systems Command, taking over Aeronautical Systems Division two years later.

In those jobs he oversaw prototype projects for stealth



Gen. Lawrence Skantz in 1986.

technology. He continued that work in his next post, as deputy chief of staff for research, development, and acquisition. In that job he presided over all USAF technology development and fielding programs, which at that time centered on the Senior Trend program (the F-117), the Advanced Technology Bomber (B-2), introduction of the F-16, and the restart of the B-1 bomber.

Skantze received his fourth star in 1983 and served as USAF Vice Chief of Staff until 1984, when he became head of AFSC, the position he held until his retirement in 1987. On his watch at Systems Command, he supervised the Air Force’s share of the 1980s US military reset, which included the buildup of the F-117 fleet to near-wing strength; the redesign and

production launch of the B-2; production of the F-15, F-15E, and F-16 fighters; launch of the Advanced Tactical Fighter program, which led to the F-22; and a number of classified space projects.

Skantze was planning to make a flight aboard the Space Shuttle as a mission specialist on a classified mission, but the 1986 *Challenger* disaster eliminated VIP astronaut flights and the shuttle did not resume missions until after his retirement.

Skantze was a consultant and advocate for aerospace education in his post-Air Force career. He received the Air Force Association’s Lifetime Achievement Award in 2010.

—JOHN A. TIRPAK

■ US Cancels South Korea Exercise Following Summit

The US has moved forward on President Donald J. Trump's announced step to cancel wargames with South Korea, nullifying the planned August Exercise Ulchi Freedom Guardian.

"We are still coordinating additional actions. No decisions on subsequent wargames have been made," Pentagon spokeswoman Dana White said in a statement.

Trump announced following his summit with North Korean leader Kim Jong Un that the US would cancel major exercises with South Korea, calling them "provocative" and overly expensive. Secretary of State Mike Pompeo in June said the exercises could quickly be resumed if North Korea stops acting in "good faith."



USAF Chief of Staff Gen. David Goldfein

■ More Promotions Coming to Air Force STEP Program

The Air Force said May 31 it is increasing the number of promotions commanders can award as part of changes to the Stripes for Exceptional Performers program, which is aimed at promoting early enlisted airmen who show unusual potential.

In addition, the service is changing time lines for the program. For Fiscal Year 2018, the number of such promotions has been raised from 96 to 180.

"Increasing STEP allocations is another way we're empowering commanders at every level to identify and reward their top performers," Air Force Chief of Staff Gen. David L. Goldfein said.



Kadena-based F-15Cs on the runway at Gwangju AB, South Korea, in 2017.

■ Kadena Resumed F-15 Flights After Crash, Pilot in Serious Condition

An F-15 Eagle out of Kadena AB, Japan, crashed into the ocean near Okinawa June 11. The F-15C pilot, who was assigned to the 44th Fighter Squadron, was listed in serious condition in mid-June.

The 18th Wing at Kadena halted flights for two days, conducted an inspection of its F-15s, and airmen reviewed initial facts and circumstances of the mishap to determine the fleet is safe, according to an 18th Wing release.

The pilot was rescued by the Japan Air Self-Defense Force after ejecting during a routine training mission.

■ Bud Day Posthumously Promoted

Air Force Chief of Staff Gen. David L. Goldfein posthumously promoted former prisoner of war and Medal of Honor recipient Col. George E. "Bud" Day to brigadier general on June 8. Goldfein used the stars he had received when he was promoted to brigadier general during the ceremony.

Senate Armed Services Committee Chairman John McCain (R-Ariz.), who was Day's cellmate in captivity in Hanoi, introduced the advancement, which was directed by the 2017 National Defense Authorization Act and became official on March 27.

Day—who died in July 2013, was flying his F-100 Super Sabre over North Vietnam when he was shot down and immediately captured on Aug. 26, 1967. He escaped from North Vietnam, the only American prisoner to do so, but was recaptured by the Viet Cong before he could reach safety. He was repatriated on March 14, 1973, and reunited with his wife and four children.

Day eventually returned to active flying status and retired from Active Duty in 1977 as one of the most decorated officers in USAF history.



Brig. Gen. George "Bud" Day.



■ Draken To Continue Flying ADAIR at Nellis

The Air Force has awarded Draken International a \$280 million contract to continue flying adversary air at Nellis AFB, Nev., through December 2023, according to a DOD contract announcement.

Draken has been the sole commercial provider of Red Air to the US Air Force since it received its first contract in 2015 to augment USAF's existing F-16 aggressors.

The Air Force announced last year it planned to open up the contract to competition, and industry competitors have been aggressively building up their opposing-force fleets in anticipation of this contract and a much-larger combat air forces adversary air (CAF ADAIR) contract.

CAF ADAIR has not yet been awarded but is expected to total some 37,000 hours at multiple bases.

Under the Nellis contract, Draken will provide, operate, and maintain the aircraft for "air-to-air tracking, targeting, and ADAIR operations."

■ USAF Moves Cyber Responsibilities to Air Combat Command

USAF is moving cyber functions from Air Force Space Command to Air Combat Command, the service announced.

The change, Air Force Secretary Heather Wilson said, will realign cyber operations and intelligence, surveillance, and reconnaissance missions within the same command. The move designates ACC as the lead command for organizing, training, and equipping air forces to conduct full-spectrum cyber missions and operations.

Realigning units include the 24th Air Force and subordinate units, the Cyber Support Squadron, Air Force Network Integration Center, and the Air Force Spectrum Management Office, which now directly report to AFSPC.

Gen. John W. Raymond, head of AFSPC, described the transition as a major step toward improving capabilities for multi-domain operations, while ACC Commander Gen. James M. Holmes said Air Force cyber capabilities are "intertwined with the intelligence, command and control, air superiority, personnel recovery, and precision attack missions that we are responsible for." Holmes said the move "streamlines how the Air Force presents forces to joint commanders, and it improves our ability to integrate cyber and air operations to improve our effectiveness in multiple domains."

■ USAF Looks to Create New Command and Control Structure

The Air Force's command and control structure is not designed to synergistically integrate capabilities across air, space, and cyber domains, but it needs to be if USAF is going to be successful in future conflict against a peer adversary, said Brig. Gen. Chance Saltzman, who leads the service's multi-domain command and control initiative.

"Multi-domain operations has to be characterized by high velocity, operationally agile operations," and information will need to be shared with and coordinated through multiple combatant commands, said Saltzman during Mitre's 2018 Space Computing and Connected Enterprise Resiliency Conference.

USAF is establishing an annual exercise focused on multi-domain command and control operations, called the "Doolittle Wargame series," with the first exercise to be held in October at Maxwell AFB, Ala. The players will be experts from the 505th Command and Control Wing at Hurlburt Field, Fla., joint and coalition partners, and students from Air Command and Staff College and Air War College.

The service is also establishing a new Air Force Specialty Code that will allow mid-career officers to cross-flow to a new field where they will spend the rest of their career focused on C2. USAF doesn't currently have a process to build command and control experts, said Saltzman, who noted roughly 86 percent of airmen assigned to work in an air operations center do one assignment, "never to return again."

"It's a very small percentage of people who do multiple tours in an AOC," he noted.

■ Shaw F-16 Pilots Receive DFCs for April 2017 Mission

Two F-16 pilots at Shaw AFB, S.C., received Distinguished Flying Crosses for actions in a 2017 firefight in Afghanistan, where they were credited with saving 88 American and allied lives.

Capt. John Nygard and Capt. Salvador Cruz, instructor pilots with the 79th Fighter Squadron, conducted four air strikes during a chaotic fight, where they received fragmented information before intervening to protect friendly forces.

"Every single person that was there really made a huge difference and really made a bad situation come together," said Nygard. "They trusted us to employ weapons really close to them, and ... we trusted them as well to give us the right information as what to target and where they were."

Two US soldiers were killed in the battle with ISIS in Nangarhar Province.

"I can't imagine what it's like," said Cruz to the family members of the killed soldiers. "But I can tell you what [they] mean to me: I'll never forget your sons. I promise you. I try to live my life in a way that honors their sacrifice. I tell their story so that other pilots, the new guys, are ready when their number is called."

■ The War on Terrorism

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

As of July 19, a total of 52 Americans had died in Operation Freedom's Sentinel in Afghanistan, and 62 Americans had died in Operation Inherent Resolve in Iraq and Syria.

The total includes 110 troops and four Department of Defense civilians. Of these deaths, 50 were killed in action with the enemy while 65 died in noncombat incidents.

There have been 270 troops wounded in action during OFS and 64 troops in OIR.



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SrA. Brett Campfield competes in the visually impaired classification of archery during the Warrior Games on June 7.

Warriors

By Amy McCullough

Everyone's path to the Warrior Games is a little bit different and each athlete has their own reason for competing, but the Air Force, which hosted this year's games, says its goal is for the athletes and their families to leave the games stronger than they were before.

Some 300 athletes from the US Air Force, Army, Navy, Marine Corps, and US Special Operations Command, along with international athletes from Australia, the UK, and Canada, competed in the Paralympic-style events held at the Air Force Academy in Colorado Springs, Colo., June 1 to 9.

The 39 members on team Air Force earned a total of 165 medals, including 70 gold, 56 silver, and 39 bronze, during the 2018 USAF-led games.

Air Force track and field athletes SrA. Brett Campfield, SrA. Heather Carter, MSgt. Kenneth Guinn, Capt. Lawrence Hufford II, and Lt. Col. Juliana Walker broke Warrior Games records, according to a USAF release. SrA. Rafael Morfinencisco was second place in the Ultimate Champion competition, while USAF Maj. Stacie Shafran finished in fourth place.

"These Warrior Games allow all of us, from both here and watching

from home, to recommit that no warrior takes the road to recovery alone," said Chief of Staff of the Air Force Gen. David L. Goldfein, during the opening ceremony. "Family, friends, and caregivers—we're on your wing for life. It's a full-contact team sport, and within the profession of arms it's family business."

About 25,000 people attended the opening ceremonies at Falcon Stadium on June 2. Singer Kelly Clarkson headlined the event for the second year in a row, and comedian Jon Stewart was the master of ceremonies for the third year.



SrA. Heather Carter and her service dog, Rocky, after a sitting volleyball match at the games in June.

for Life

USAF aims to have Warrior Games participants leave the event stronger than when they arrived.

USAF SMSgt. Israel Del Toro, who participated in the inaugural games in 2010, was the first to pass the torch. Stewart—who jumped with the Air Force’s Wings of Blue parachute team in the lead up to the games—gave USAF MSgt. Shanon Hampton an assist lighting the cauldron.

“Whenever I spend time with the athletes at the Warrior Games, I hope that just a fraction of their tenacity, their honor, their grace, their resilience, and their teamwork will inspire me to do better in my life every day,” said Stewart.

SOMETHING TO FOCUS ON

Retired SrA. Brett Campfield said

he loves the challenge of the games, which give him a reason to push himself physically, just as he did as an explosive ordnance disposal specialist at Scott AFB, Ill., before he medically retired from service in 2011.

Campfield, who volunteers as a strength coach with the 366th Training Group at Fairchild AFB, Wash., said he also wanted to experience firsthand what the Air Force has to offer wounded and ill airmen so he can “transfer it down to my guys in case they need it.”

When Campfield enlisted in the Air Force in 2007 as an EOD technician, he said he didn’t really know what he had signed up for. He deployed to Iraq in 2009 and was able to gain

some real-world experience without a “high risk of danger.” As his four-year enlistment was coming to a close, Campfield was offered a chance to deploy to Afghanistan. Though he was planning to get out, he quickly took the opportunity and deployed for six months to Kandahar Airfield.

After a few months at a forward operating base in Kandahar City, Campfield was sent to help set up a new FOB in a more remote location. As the team was cross loading equipment from one truck to another, a flare went off in his hand and shot into his eye, crushing the orbital wall of his skull.

“It didn’t flare out, so it was just a big piece of shrapnel,” said Campfield.

Photos: Roger Wollenberg/DOD; MSgt. David Long



MSgt. Kenneth Guinn approaches the bench before the powerlifting competition.

He says he's thankful he lost his right eye in a freak accident, instead of accidentally setting off an improvised explosive device that put his teammates at risk, saying the latter would have been a lot harder to bounce back from.

Doctors removed his eye during surgery at Kandahar, and then he underwent a second surgery in San Antonio to repair his skull.

Within weeks of that second surgery, Campfield was back in the gym. Though the Air Force Wounded Warrior program helped him through the medical board process, he said he lost touch with the program after retiring. That is until he heard about the Warrior Games and decided to give it a try.

Although he had never really competed before, Campfield liked the idea of having a physical fitness goal to focus on, something he hadn't really had since he retired. He called one of the team coaches and asked if he could come to the Wounded Warrior trials at Nellis AFB, Nev., in February. Most of the athletes there had participated in at least one AFW2 [Air Force Wounded Warrior] care event leading up to the trials, but he was a walk-on. He had missed the deadline to apply, but the



Maj. Stacie Shafran listens at the team USAF pep rally before the start of the Warrior Games.

Air Force said if he could find his own way there, he could participate.

At the trials he was introduced to various adaptive sports and was selected to participate in archery, cycling, field events, indoor rowing, and track.

A REASON TO CARRY ON

For Active Duty Maj. Stacie Shafran, a public affairs officer, the games are a "safe" place where she can surround herself with people who inspire her to keep moving forward.

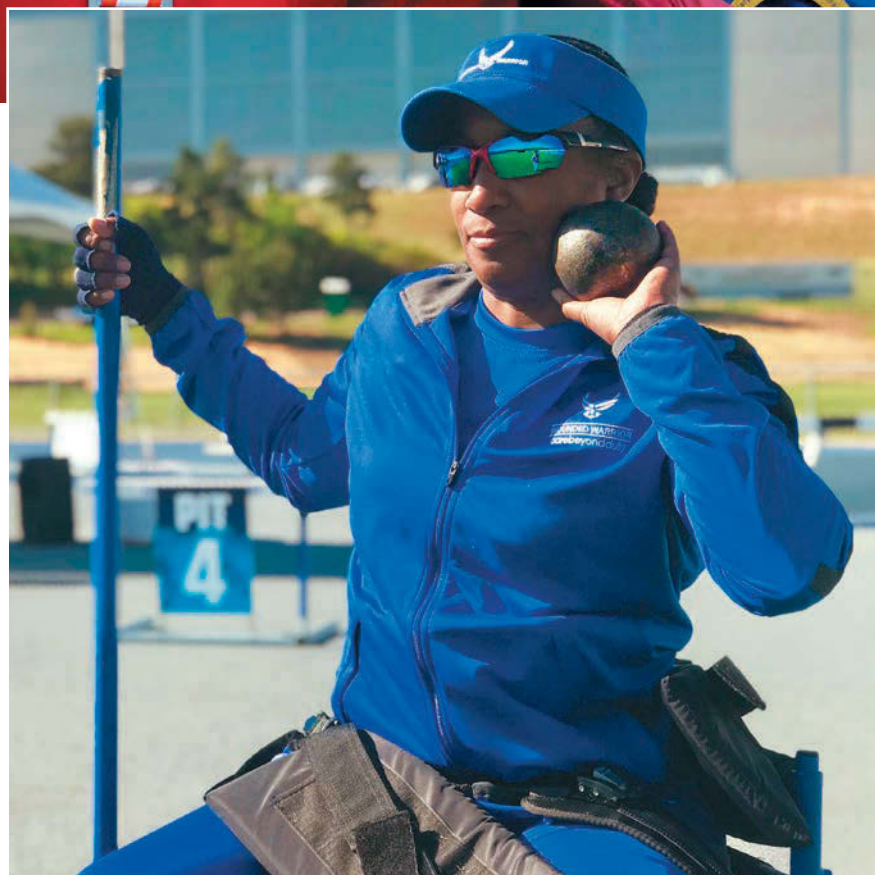
From 2008 to 2009, Shafran was

attached to a small provisional reconstruction team in Afghanistan. On Memorial Day 2009, four of her teammates, including her commander, were killed in an attack on a convoy that she was supposed to be on. For years, Shafran suffered from "survivor's guilt," struggling to come to terms with how some of her friends had to "make the ultimate sacrifice," when she didn't.

It took time for Shafran to seek help for her post-traumatic stress after returning to the States. "I didn't know I was supposed to," she said. But,



USAF veteran Rafael Morfinencisco (center) is flanked by Marine Corps veterans Carnell Martin (left) and Robert Oudone (right) after the powerlifting competition.



Lt. Col. Julianna Walker works on the seated shot put during field practice at the US Air Force Academy.

she eventually went through therapy, which helped her move on with her life.

"I realized I'm of better use to myself, and to my friends, and family, and to our airmen ... if I can move forward

and have a better mindset about it," she said. "That's something that being involved in this program has helped me do."

However, Shafran didn't actually get involved with the Air Force Wounded

Warrior program until 2016—seven years after her traumatic deployment. After learning more about the program during a commander's call, she decided to give it a try, and said, "It's been one of the best things I've done because it's opened the door to new possibilities and opportunities being exposed to new people."

Shafran attended an introductory camp at JB Lewis-McChord, Wash., that same year, where she was introduced to other wounded and ill airmen and the various adaptive sports available. "I was really nervous because I didn't know anything about it. I just went with an open mind, and looking back, I was probably pretty reserved about it, but I enjoyed it enough that I applied and went to a couple different events and eventually trained as a peer mentor," she said.

At the Navy-led 2017 Warrior Games in Chicago, Shafran—who has been tapped to be the next deputy commander of the program—earned a gold medal in shot put, a silver medal in discus, and bronze medals in the 400-, 800-, and 1,500-meter races. She also participated

Photos: MSgt. Stephen Schester/DOD; TSgt. Anthony Nelson Jr.; Sgt. Drew Tech/USMC; Alexx Pons/USAF



SMSgt. Israel Del Toro, a long-time Warrior Games competitor, hands off the ceremonial games torch to Lt. Gen. Gina Grosso, USAF deputy chief of staff for manpower, personnel, and services, at the opening ceremony.

in cycling. This year, she competed for Air Force Ultimate Champion, which meant competing in eight events.

BACK WHERE IT ALL STARTED

The Air Force hosted the games for the first time this year, though the inaugural games also were held at the Academy in 2010 when they were still run by the US Olympic Committee.

The Defense Department assumed responsibility for the games in 2015, because it wanted to focus more on the athletes' rehabilitation and needed more flexibility with the rules and competition categories to make that happen. Since then, the services have taken turns hosting the event, with each putting their own twist on the games.

Although, DOD includes a "very, very small line item" in its budget for the Warrior Games, the hosting service usually ends up picking up the tab for most of the games, said USAF Col. Gina Oliver, director of the 2018 DOD Warrior Games. This year, the Air Force awarded a \$23 million event management contract, which included advertising, running the opening ceremony, and other support services. That does not include expenses incurred by each team for travel costs and staff time.

Oliver said the Air Force really strived to make the games a "memorable experience" for both athletes and their families, noting planning took about 18 months and "when all is said and done, it will take about 200 to 400 people to make this happen."

The service worked with both the Navy and Army as it built its own model for the games, but said there are more similarities between the USAF and Army models because both were held at service academies.

"It's really cool for the Warrior Games to come back to Colorado Springs where this all started," Oliver said. "Folks in Colorado Springs are excited to see the progression of the games and the athletes participating in them. ... It really will give a great showcase for how this program helps the warriors make a positive change and really grow with their recovery process."

Adaptive sports help wounded, ill, and injured service members in their rehabilitation process by reducing stress and dependency on pain and depression medication, increasing self-confidence and mobility, and by lessening the chances of secondary medical conditions, according to a USAF release.

The process for getting to the Warrior Games is unique for each individual, but regardless of the path taken it requires "a lot of dedication, time, and passion to want to do sport," said Kallie Quinn, the Air Force team head coach.

The physical and emotional process each athlete goes through while pursuing sports is "part of their growth and feeds into their recovery process," said Quinn. "They are finding something else they can focus on in their lives that's a positive influence, and they

get a chance to see that they can be physically active again. ... Once we get them thinking along that line ... then the doors and opportunities start opening up for them."

After meeting with and talking with many of the athletes, the Air Force has added three new events to this year's schedule: indoor rowing, powerlifting, and time-trial cycling. That's in addition to the eight existing events: archery, cycling, shooting, sitting volleyball, swimming, track and field, and wheelchair basketball.

"The theme is not what you can't do, it's what you can do," said Oliver. "As we make this a really integrated, meaningful, and memorable experience for both our athletes and their loved ones."

All the events, except cycling, were held in one location, making it easier for athletes and their families to get to the events and providing extra time for rest. The service arranged to include the athletes' loved ones throughout the process.

For example, there was a race for family members during track and field events, an opportunity for family members to compete against each other during seated volleyball, and families also could try their hand at archery or shooting.

"Instead of family members just coming and being spectators, they have the opportunity to participate in nearly every event we've offered," said Oliver. She added, "We want them to have an opportunity to understand what the athlete goes through and also an opportunity for the athletes to watch their families."

The service also added several other exhibition-style events this year, including wheelchair rugby, wheelchair tennis, and pickle ball (a hybrid of table tennis and regular tennis).

During the expo, which was held June 3 to 4, athletes and families could participate in a clinic, where they could walk up, sit in the chairs, learn new techniques, and play in "smaller versions of the games," said Oliver.

"We hear so many stories about how adaptive sports and the camaraderie that comes with it has really saved lives. I believe it. I see it," said Oliver. "Nothing means more to the athletes than having someone in the stands, cheering them on. This is a really unique way for people from all walks of life to come out and see the resiliency and determination of the athletes. It's a win-win. We support them and are inspired by them as well." ❀

About That Space Force ...

"This [formation of a new space service] will mean nonstop bureaucratic arm wrestling for the next five years."—**John Hamre, former Deputy Secretary of Defense and now head of Center for Strategic and International Studies, Washington Post, June 26.**

Big Questions, No Answers

"Establishing a service branch requires congressional action. We still don't know what a Space Force would do, who is going to be in it, or how much is it going to cost."—**Rep. Mike Turner (R-Ohio), House Armed Service Committee member and major foe of the Space Force idea, defensenews.com, June 19.**

Four-Decade Snooze

"'Peace disease' has been a common symptom in our military for decades. If we do not make up our mind to eliminate these evils [corruption, unreadiness], we must pay a heavy cost in the event of a war. We can only stop a war when we are able to fight. Let the Army get back on the right track, concentrating on combat-ready training."—**Editorial in China's official People's Liberation Army Daily, July 2, noting that Chinese forces have not engaged in combat since 1979.**

Calling Out Germany

"As we discussed during your visit in April, there is growing frustration in the United States that some allies have not stepped up as promised. The United States continues to devote more resources to the defense of Europe when the continent's economy, including Germany's, are doing well and security challenges abound. This is no longer sustainable for us. Growing frustration is not confined to our executive branch. The United States Congress is concerned, as well."—**Letter from President Donald J. Trump to German Chancellor Angela Merkel, quoted in *The New York Times*, July 2.**

C'mon, You Can Trust Us

"We stand by the two percent [of GDP for defense spending] goal we've set. We're on the path there, and we're prepared ... to take substantial responsibility within the alliance. ... We don't want to impress anyone."—**German Defense Minister Ursula von der Leyen, responding to President**

Trump's claim that Berlin spends too little on military forces, July 3.

Russian Menace

"Moscow is developing new military capabilities, both conventional and nuclear, which lower the threshold for Russia's use of nuclear weapons in a potential conflict. This is extremely important to avoid. NATO is responding. ... We're not responding tank for tank, or missile for missile, or nuclear weapon for nuclear weapon, but of course we need to make sure that NATO adapts when we see a more assertive Russia investing heavily in new modern equipment and willing to use military force against its neighbors."—**Jens Stoltenberg, NATO Secretary General, interview with Deutsche Welle, June 27.**

Who Recruited Him?

"I consider myself a revolutionary socialist. I would encourage all soldiers who have a conscience to lay down their arms and join me and so many others who are willing to stop serving the agents of imperialism and join us in a revolutionary movement."—**US Army 2nd Lt. Spenser Rapone, 26, the "Commie Cadet," a West Point graduate recently given an "other-than-honorable" discharge, quoted in armytimes.com, June 19.**

Legitimate Fears

"I think we have legitimate fears—all of us do, as civilized society—about what happens if people are taken out of the loop, out of the decision-making [on use of weapons]. One of the points I made was that when it comes to the 'why' and then 'when' of the use of force, we still have to have a human, moral decision-maker [in the decision chain], and not just leave it up to machines."—**Secretary of the Air Force Heather Wilson, in a lecture delivered in Rapid City, S.D., June 25.**

Let 100 Robots Bloom

"To really get a large benefit from robotic systems, we have to break the 'one-soldier, one-robot' link. ... Right now, you generally need one operator for one robotic system. That is effective and interesting, but, when I can have dozens of robotic systems controlled by one soldier, now I have a significant advantage—large areas with fewer soldiers and many dozens of robotic systems. That starts to matter especially in con-

ditions such as dense urban environment. The problem with urban environments is they consume soldiers ... limited lines of sight, tunnels, buildings, all the things that just take manpower to overcome and control. If we can expand that with robotic systems, both air and ground, then that has significant impact."—**Don Sando, head of the Army's Capabilities Development and Integration Directorate, Fort Benning, Ga., in military.com, June 27.**

Need for Wargames

"There's a lot going on in the Pacific. The Korean Peninsula is clearly important, and it's a key component. But that readiness and that training translates across the entire [area of operations], in relationships and understanding and operations and planning and execution. I don't think people realize there's so much more to it. It's one less exercise where our young men and women get to practice in their field. Full-scale, large, combined joint exercises are fairly rare, and it's a skill set that you have to be able to do. So, the readiness for the line units is a factor. ... The consequences [of long-term cancellation of the exercises] would be that your operations would not be as effective, they would slow down, [and] your grasp of what the adversary is potentially doing would not be as good."—**Retired USAF Gen. Herbert J. "Hawk" Carlisle, former head of Pacific Air Forces and Air Combat Command, airforcetimes.com, June 25.**

For the Good of All

"What I would like to do is convince people that we're all in the business of avoiding major war. That's what we're trying to do. We're going to have to rely on our industrial capabilities ... on the AI side if we're going to do that. ... We're going to have to work through, as Americans, our comfort level on how technologies are used and how they are applied. I understand the views of the people there. ... I wield some pretty impressive technologies and our job is to make sure that we use them for good and in accordance with the rules that are laid out in the Constitution. ... These are all complex issues that we'll have to work through, but I'm not worried yet about AOC Pathfinder taking over as Skynet."—**Gen. Mike Holmes, head of Air Combat Command, remarks to Defense Writers Group, June 28.**

READY FOR TAKEOFF?

It's been a long road, but USAF's new Combat Rescue Helicopter is nearing reality.



By Brian W. Everstine, Pentagon Editor

The HH-60G Pave Hawk fleet, which dates to the 1980s, has been hard-used over 18 years of nonstop Middle East missions as USAF's combat search and rescue platform. A variant of the CH-47 Chinook was chosen in 2006 to replace the Pave Hawk, but after successful protests and other problems, the Boeing "CSAR-X" program was canceled in 2009.

It has taken another nine years to get to the point of production on a new Combat Rescue Helicopter, or CRH.

The CRH program is moving rapidly; so much so that the Air Force is adding funding to the program based on contractor Lockheed Martin/Sikorsky's pledge that it can accelerate deliveries by several months.

The Pave Hawk II, as the HH-60W is called, offers a new generation of avionics, more onboard room for rescuers

and rescued alike, and more life-saving capabilities for pararescuemen.

The Air Force plans to buy 112 of the aircraft; a figure that has remained stable for several years.

"We ... own the mission to be able to fight our way into a hot landing zone, fight our way in against an enemy, and pick up a wounded soldier, sailor, or airman, marine at the point of injury," USAF Chief of Staff Gen. David L. Goldfein told the Senate Armed Services Committee in May. "The Combat Rescue Helicopter allows us to do that mission."

NEXT GEN COMING ONLINE

As the Air Force's next generation of combat rescue aircraft, the Pave Hawk II is scheduled for a busy year of developments, as the first two development models are undergoing final assembly.

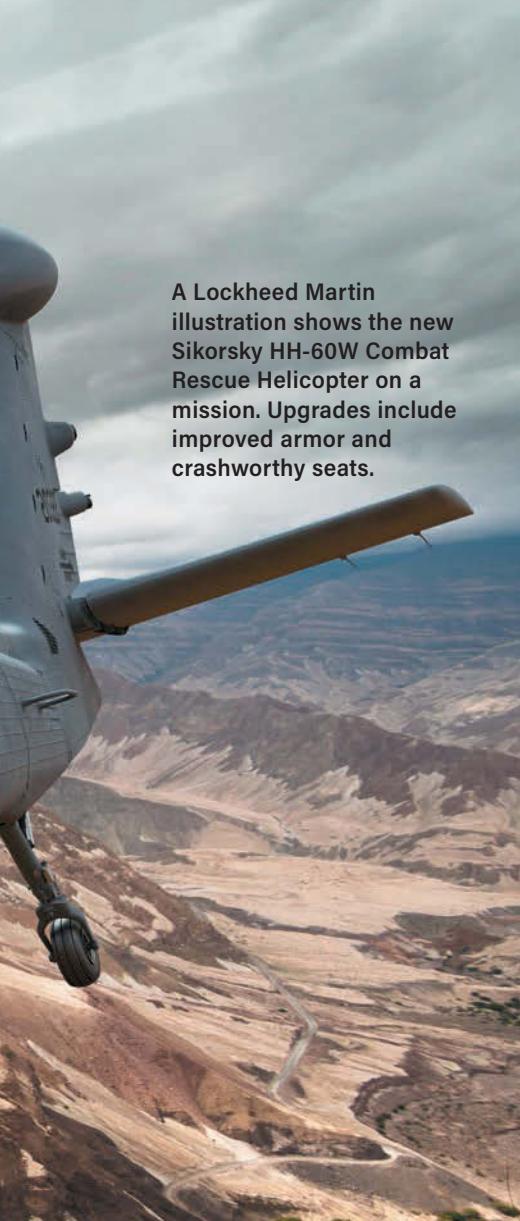
The Air Force is speeding the process along, requesting \$1.14 billion in Fiscal

2019 as an installment on a five-year, \$5.1 billion production effort. The idea is to convince Sikorsky it is safe to move quickly. The original \$1.28 billion contract was awarded in June 2014, beginning a 75-month program for delivery, ending in September 2020. Sikorsky, however, is so confident in its process, it thinks it will beat that by moving the Milestone C (production decision) to the third quarter of 2019 and delivery in March 2020.

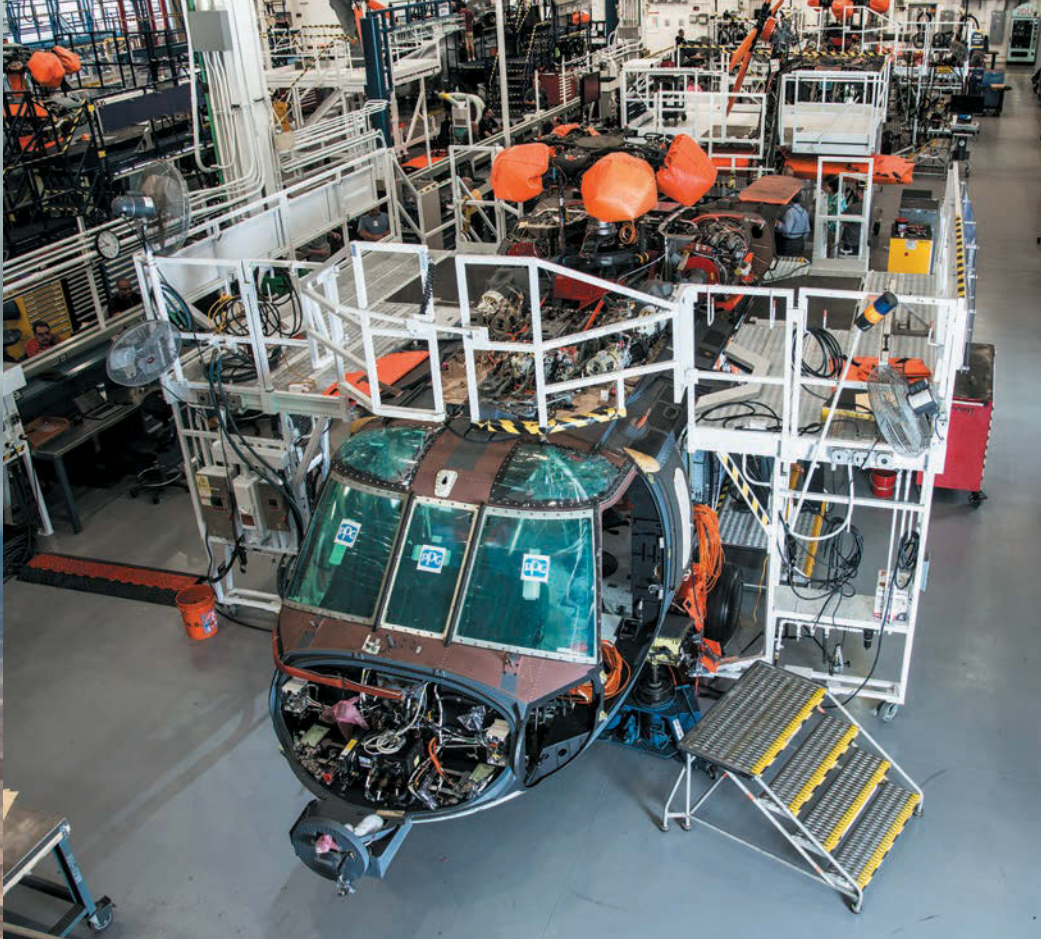
"We're gonna be in there," Tim Healy, Sikorsky's head of Air Force programs, said at the production facility on May 23. "We're gonna be close."

The goal of getting helicopters to the operators faster has been "pulled ... significantly to the left," Healy said.

Air Force Magazine, during a visit at the production facility in early May, was the first media organization to view the EMD models on the production line.



A Lockheed Martin illustration shows the new Sikorsky HH-60W Combat Rescue Helicopter on a mission. Upgrades include improved armor and crashworthy seats.



An HH-60W enters final assembly in Stratford, Conn. The aircraft may achieve first flight at the end of 2018—two months ahead of schedule.

The sprawling facility includes lines for Army Black Hawks, new MH-60R Sea Hawks for the Navy, and a hidden area for the next generation Marine One helicopter for presidential transport. The first “Whiskey” model to enter production was stuffed with thousands of feet of orange cable and hundreds of small sensors that will be used for collecting flight test data.

Work on these aircraft began with the award of a June 2014 contract, which called for four EMD [Engineering and Manufacturing Development] aircraft and a trainer for maintenance that will be produced just like an operational helicopter.

The Pave Hawk II passed critical design review last spring and began an air vehicle test readiness review. This evaluation is “looking at all the qualification and development thus far,” Healy said, answering the question, “Have we completed what we need to now move on to flight test?”

The first completed helicopter is slated to go to Sikorsky’s West Palm Beach, Fla., facility for a first flight, late in the fourth quarter of this year. It will be handed over to USAF in next year’s second quarter in preparation for the full production decision the following quarter, Healy said.

Under the revised schedule, deliveries would start six months earlier than the original 75-month program called for. That, in turn would get the CRH to “the men and women who need the platform ... one fiscal year earlier,” Healy said.

The helicopter builds upon the Army’s newest UH-60M, with a modernized cockpit outfitted with four large displays, fed by two advanced mission computers. The data presented includes information from the helicopter’s five radios, radar, infrared cameras, radar warning system, laser warning system, missile warning system, and multiple data links. They include Link 16, Situational Awareness Data Link, and Common Integrated Broadcast. The new avionics allow a pilot to set automatic hover over a location, freeing the crew to focus on the rescue.

Another major upgrade is the new helicopter’s fuel system. While the Black Hawk uses a 360-gallon fuel tank, rescue missions typically de-

mand much longer range, and USAF frequently has to add additional fuel tanks in the cabin. The Pave Hawk II’s internal tank is 660 gallons to meet the Air Force’s required profile: 195 nautical mile range, a 10-minute hover, and then another 195 miles.

Wider rotor blades on the Pave Hawk II will also improve range and hover stability; they are closer in size to those on the Marine Corps’ massive CH-53K King Stallion helicopter, also a Sikorsky product.

The HH-60W will have improved armor to stop armor piercing rounds and a more elegant side-mounted gun design. Special mission aviators and pararescue-men will have full-color displays to see mission data, and for the first time have crashworthy seats, which can fold up into the ceiling, instead of being forced to sit on the floor, with limited protection from sudden movements of the aircraft.

Speaking about procurement programs broadly, USAF’s top uniformed acquisition officer, Lt. Gen. Arnold W. Bunch Jr., told reporters in June he prefers not to give hard dates for when programs will proceed to their next milestone. “We will do it right,” he said, and taking this approach will likely save time and trouble “later.”



Kim Smith, a 54th Helicopter Squadron UH-1N mechanic, rewires an attitude director indicator in a hangar at Minot AFB, N.D., in January 2017. The replacement of this 1970s-era aircraft has taken a detour through legal limbo.

HUEY EVER AFTER

At some point, USAF will successfully replace its Vietnam-era UH-1s used for security missions and VIP transport.

By Brian W. Everstine, Pentagon Editor

The Air Force's two helicopter fleets are both in need of urgent replacement. The service is trying to replace them—and it's not the first time—but while the Combat Rescue Helicopter effort is moving along smartly, the Huey replacement program has gotten bogged down in the legal weeds.

The UH-1N fleet fills two roles: VIP transport at various locations and security at Air Force Global Strike Command (AFGSC) missile fields across numerous states. The aircraft monitor silos and provide quick response to security breaches. The service wants to buy 84 aircraft for the mission.

The UH-1N replacement (the Air Force has never gotten around to giving it a formal name) has taken a detour through legal limbo. First, the Air Force was refused permission by

Congress to simply buy 25 new HH-60 helicopters, on a sole-source basis, from Sikorsky.

Replacing the 1970s-era Hueys has been slowed most recently by a protest submitted in the current competition by Sikorsky; the delay has added so much time to the schedule that AFGSC has had to upgrade the fleet to keep the aircraft safe to operate.

The head of US Strategic Command, Gen. John E. Hyten, called the situation "unacceptable."

"It's a helicopter, for gosh sakes," Hyten said last year about delays on the Huey replacement. "We've been building combat helicopters for decades. ... I don't understand why the heck it is so difficult."

A PROTEST AND A DELAY

Sikorsky's complaint has to do with an Air Force initiative, started sever-

al years ago, to "own the technical baseline" of new-start programs. That meant the Air Force would get the basic drawings and software code of the system, allowing it to have open competition when the time came for upgrades, maintenance work, and software updates. Sikorsky balked that this amounted to surrendering intellectual property to which it claimed the Air Force had no right.

Sikorsky's entry—another H-60 variant, the HH-60U—was offered after the company had seen a draft request for proposals, attended an industry day, and participated in five rounds of questions and answers with Air Force acquisition officers. Sikorsky knew the planned rules of the contest.

Boeing announced it was entering with the purpose-built MH-139, based on Leonardo's AW139.



MSgt. Antonio Gueits is hoisted into a 459th Airlift Squadron UH-1N during a training exercise near Mount Fuji, Japan, in 2017.

Although protests typically are made after a competitor loses a contract award, Sikorsky made the unusual move of protesting before a winner was selected. In February, it asked the Government Accountability Office to look at whether USAF had the right to demand so much of the “technical baseline” of the aircraft. The company said in a statement that it had argued the point with USAF to no avail and had exhausted its other options.

The GAO on May 23 announced it had rejected Sikorsky’s claims, but only after USAF modified its conditions following Sikorsky’s protest. On March 8, almost a month after Sikorsky’s formal complaint, the Air Force issued a clarification letter saying it wouldn’t require the winning contractor to provide rights to noncommercial software or detailed manufacturing data. The letter, GAO said, rendered Sikorsky’s argument moot in “this part” of its protest.

“As a general matter, we will not consider a protest where the issue presented has no practical consequences with regard to an existing federal government procurement, and thus is of purely academic interest,” the GAO wrote. “We only consider protests against specific procurement actions and will not render to a pro-

tester what would be, in effect, an advisory decision.” Sikorsky, in reaction, said it was considering its next step.

The process wound up stretching out a program USAF wanted to expedite, and drew frustration from several USAF leaders. The service had planned to award a contract in June, but because of the protest, now doesn’t expect it can make a selection until October at the earliest.

Because of the delays, the Air Force has been obliged to continue upgrading the aged UH-1N fleet. The Fiscal 2019 budget request includes \$8.88 million for a service life extension program for up to 63 of the helicopters. Global Strike Command has already provided fuel and armament system upgrades to the fleet.

The protest delay is a source of exasperation at STRATCOM. Although the upgrades are reducing operational risk, new aircraft are needed as soon as possible, Hyten told the Senate Armed Services Committee in March.

“I’ve been working to try to get a helicopter in the hands of the folks in the missile fields for over a decade,” Hyten said. “And that’s where my frustration comes from.”

The four UH-1Ns at Yokota AB, Japan, were the last in the Air Force to be modernized. TSgt. Nicholas Poe,

an instructor and special mission aviator with the 459th Airlift Squadron, said the aircraft at the base received GPS upgrades, and all but one have received night-vision goggle capability. (That one aircraft still needs special lighting to help pilots fly at night.)

New avionics help the aircraft fly in bad weather, which is frequently the case in the vicinity of the busy Tokyo City Air Terminal, Poe said.

Two years ago, the Yokota helicopters received a rescue basket and hoist and are going to receive improved seats for their VIP mission. The helicopters regularly train alongside the Japan Air Self-Defense Force and also routinely fly VIPs on a regular “milk run” into downtown Tokyo. The upgraded aircraft are “a lot more capable” than just two years ago, Poe said.

The Yokota helicopters are all late-1960s models. Despite their age, they are among the most ready in the Air Force, however: The four assigned to the 459th AS have a mission capable rate of over 90 percent. “It’s super-reliable and cheap to fly,” Poe said of the improved UH-1N, but he admits that its lack of modern self-test sensors makes it harder to know when something is going wrong mechanically.

MAKE IT A DOUBLE



It isn't normal for an AC-130 gunship to fight during the day. Or to have to go back up. Or to go Winchester—twice.

By Steve Hirsch, Senior Editor

It was just another day for the gunship crew in Afghanistan supporting Operation Freedom's Sentinel.

Except that it wasn't. Guns overheated and jammed. The crew ran out of ammo.

The crew then had to race back to base and hustle over to an already-prepped and running second gunship, going from wheels down to wheels up in under 20 minutes.

Combat gunship missions are never really routine, but they do have some things in common. One key tactic: fly at night. Slow-moving and tracing predictable patterns in the sky, gunships are vulnerable in broad daylight. Typically, gunships also carry so much ammunition they almost never have to land, reload, and get back in the fight—let alone change airplanes on the ground because troops need support urgently.

The rules went out the window during a series of spring 2017 missions that led to Distinguished Flying Crosses for 24 airmen.

April 8—in particular—was “the perfect storm,” Capt. Joseph Tomczak, an AC-130U “Spooky” gunship commander told *Air Force Magazine*. “The enemy was amassing and ambushing, and we were repelling them,” and even after four hours, the battle raged on, so “we ... had to go get another gunship and get right back in the fight.” The battle ultimately lasted more than nine hours.

The fight was a hornet's nest involving Khorasan—one of the ISIS franchises in Afghanistan—as well as US and Afghan troops, Army AH-64 Apache attack helicopters, and Air Force F-16s.

The mission planned for that day was similar to what the 4th Special Operations Squadron “Spooky” crew had been executing “pretty much every single day for about a month up to this

point,” supporting friendly units on the ground, nothing “outside the norm,” Tomczak said. The exception was that this would be a daytime mission, flown in the vicinity of Jalalabad in Afghanistan's Nangahar Province. The city is known by US troops as “J-Bad,” both to shorten the name and indicate the hostility of the area.

“Gunship guys aren't used to packing sunscreen on deployment,” Tomczak said, “that's not really something that we do, so we were a little out of our element already, just going into” the operation.

Green Berets from the Army's 7th Special Forces Group were under attack, and the fight was “already hot when we showed up,” Tomczak reported. They learned who they'd be supporting on the way to the battle. They had a special relationship with Green Berets, who the air commando crews train with regularly.

An AC-130 gunship approaches a tanker for aerial refueling during a combat mission over Afghanistan in April 2017.



When the gunship showed up overhead, “engagements were already taking place, and so we just kind of jumped right in,” he said. “You’ve got Apache helicopters that were low level, there were fighters from the 79th Fighter Squadron out of Shaw [AFB, S.C.], who were there as well, who we also developed a really close relationship with, so we started engaging ... as soon as we rolled overhead,” Tomczak noted.

ISIS-Khorasan, also called ISIS-K, are among the group’s most vicious and cruel sects, Tomczak said, explaining, “we’re helping these Green Berets clear out some of the worst people in the country from these valleys.”

As soon as the Spooky arrived on the scene, TSgt. Brett M. Laswell, special missions aviator, said that he walked into the aircraft’s battle management center and could “just see the tracer fire



going toward friendly positions,” which was his cue to prepare to start shooting. From the time they put the guns on the line—ready to fire—the team “did not stop shooting until we were out of ammo,” he recalled.

Ground forces were taking contact from buildings and tree lines “so it was just consistent shooting on our part,” he added.

In addition to the Green Berets, the allied forces on the ground included Afghan army special forces that the Green


Berets had trained and local militias. It was “a small number of Americans, but a large number of Afghan forces,” Tomczak said. There were over 280 friendly forces on the ground, in trouble.

The gunship crew said, “when we heard the voices on the other end of the radio,” we knew “exactly who was talking,” because these particular Special Forces soldiers hailed from Eglin AFB, Fla., a short flight from Air Force Special Operations Command at Hurlburt Field, Fla., he continued. “We have a very close training relationship with them,” and in fact some of those deployed in the battle below had trained with the AFSOC unit in 2016.

I CAN’T DRIVE 335

As the battle raged, Laswell said the crew had to press their “right scanner”—the crewman who watches the

Photo: Capt. Amanda Farr; Mike Tsukamoto/staff map



An AC-130
Spooky gunship
flies over the
DFC ceremony
at Hurlburt Field,
Fla., on May 11.

right side of the aircraft for threats—into duty helping to load ammunition, so fast was the gunship firing. It was “hot and heavy that day,” he said.

“We ended up shooting 335 rounds, which exceeded the limitations for that gun,” he said. The weapon got so hot that the 335th round (the very last 40 mm round they had) died in the gun, which then jammed. It was Laswell’s fifth deployment, he said, and never before had he seen a gun overheat from combat fire.

In his view, the order to pull the scanner was “huge” because that took away a pair of eyes looking for threats, and to “Winchester the plane”—run out of ammunition—is “pretty rare these days.”

The Spooky by that time had orbited overhead for three hours, Tomczak recalled, and while the aircraft could have stayed longer, there was no point in an aerial refueling: They were out of ammo. Still, the fight was still raging; they had to come back.

Besides the Spookys, the AH-64 Apaches were shooting at low level with 30 mm rounds and Hellfire missiles. “Then we would engage personnel, we’d engage vehicles, but then, when there was a target that was bigger, we would integrate with the F-16s,” Tomczak said.

The F-16s, he said, “were dropping 500-pounders, dropping 1,000-pound-

ers,” but even the fighters ran out of weapons. But unlike the fighters, which could be replaced by others, “we were the only gunship crew available.”

After talking with the command and control battle managers, the AC-130U flew at maximum power back to Bagram Airfield while making arrangements for another, fully loaded gunship to be waiting, engines running.

“Instead of having to cold-start an airplane, we coordinated it on the way back so that we would land, pull into parking, shut down, literally run across the ramp to the airplane that had engines running, man all of our crew positions, and then take off again,” Tomczak reported.

The whole process, from touchdown in the exhausted aircraft to wheels up with the fresh one, he said, took 19 minutes.

“Every single person ... on that airplane knew exactly what we were going back into, and they knew that the guys on the ground needed the help, so you can imagine the hustle,” he noted. “Yes, we’re adhering to checklists, yes, we’re being safe the entire time,” but performing the regular tasks at a break-neck speed.

When the crew returned to the scene of action, Laswell said, things seemed slightly calmer: The fire had stopped, although the crew was continuing to

support ground forces for some time.

Then, as they began to run low on fuel again, “it just seemed like all hell broke loose ... when we’re getting ready to roll off station.” A “firestorm ... just came out in ambush style toward the ground party as they’re trying to move, and it pinned these guys down.”

The AC-130U crew “started putting down rounds, and then we lose communication with these guys, and we’re already close to min fuel,” Laswell said. The crew tried to coordinate strikes and restore communications with the ground forces. The ground troops generated smoke and the gunship put down fire on the marked spot—without radio communication.

“And something from that day that will [live] forever with me ... you could hear the desperation in the JTAC’s voice,” Laswell said, using the abbreviation for joint terminal attack controller. “That was one of the last transmissions ... it said we need effective immediate fire now, and that’s the last thing ... so we just continued to put down rounds until we ended up Winchestering the 40 again.”

He added, “We ended up shooting 416 rounds on the 40, and I think we shot 57 or 58 105 mm rounds, with a couple thousand 25 mm rounds as well in just a short period of time.”



Two AC-130U crews in Afghanistan in February 2017. Both crews, which included the “Spooky 41” team, spent four months deployed there last year.

Again, he said, the crew exceeded weapon limits. Again, the right scanner was pulled out of the window to pass ammunition. Meanwhile the crew was having “severe gun malfunctions,” so the gunners in the back were “working their butts off trying to get these guns fixed” because on the screens, “it was just nothing but tracer fire back and forth.”

At that point, Tomczak explained, sunset was an hour away, and the friendly force was “close to being back to where they would be safe” so a third gunship wasn’t needed. Moreover, there was ground-based rocket artillery and air-dropped bomb coverage offering protection.

“By the time that we eventually did have to break contact, we were pretty confident that the ground force had the coverage that they needed,” Tomczak said.

It was only days later that they learned there had been a ground casualty that day. He was identified by the Pentagon as Army SSgt. Mark R. De Alencar, 37, of Edgewood, Md., who had been a member of the 1st Battalion, 7th Special Forces Group.

For their “unparalleled airmanship and professionalism,” resulting in “successfully repelling multiple enemy ambushes, 32 enemies killed in action, 24 fortified fighting positions, and one

weapons cache destroyed,” the crew members were awarded Distinguished Flying Crosses.

“The outstanding heroism and selfless devotion to duty of this crew during this remarkably dynamic and complex combat situation reflect great credit upon themselves and the United States Air Force,” the DFC citation read.



Distinguished Flying Crosses

The members of the Spooky crew at Jalalabad in April 2017 were among the members of four gunship crews with the 4th Special Operations Squadron—24 airmen in all—who were awarded Distinguished Flying Crosses in May for four engagements in Afghanistan during a time span of less than a year.

The members of “Spooky 41” that day were:

The sentiments were echoed by Lt. Gen. Marshall B. Webb, commander of Air Force Special Operations Command, awarding the DFCs on May 11.

“These are the stories of legend and lore told around the squadron,” he said. “The men and women of this command live our ethos everyday. ... There is a way, we find it.”

- SSgt. Dillon Dummit, flight engineer
- SSgt. Jordan Gelnett, special missions aviator
- Maj. Christopher Goad, electronic warfare officer
- TSgt. Brett Laswell, special missions aviator
- TSgt. Gregory Matthews, sensor operator
- SrA. Cory Smith, special missions aviator
- SrA. Nicholas Snyder, sensor operator
- SSgt. Devin Stewart, special missions aviator
- Capt. Gene Strickland, fire control officer
- Capt. Joseph Tomczak, pilot
- 1st Lt. Nadeem Toor, navigator
- SSgt. Jerrel Williams, special missions aviator

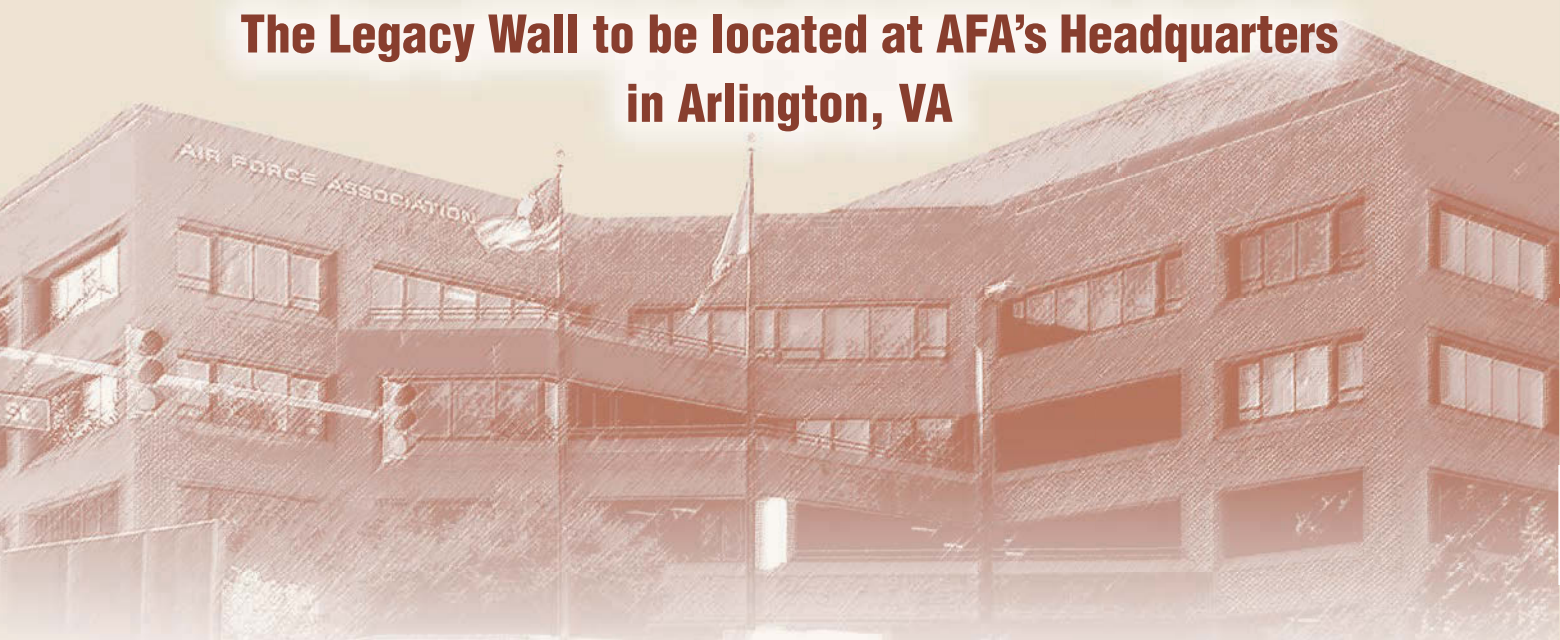
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Skunk Works at 75

Lockheed Martin's legendary and secretive advanced development unit threw a party only slightly restrained by government censors.

Skunk Works specializes in futuristic aircraft. This tailless delta-wing concept is one of many Lockheed Martin is evaluating for future air dominance work.

By John A. Tirpak, Editorial Director

Some 4,000 workers lined up for a slice of cake in the desert heat at Air Force Plant 42 in Palmdale, Calif., on June 14, celebrating the 75th birthday of the founding of their organization, Lockheed Martin's "Skunk Works" advanced development unit. Their numbers are about 33 percent higher than just a few years ago. The secret projects business is booming.

Jeff A. Babione, newly minted Skunk Works president, acknowledged to reporters that "the parking lot is getting pretty full," and the organization has a full plate of work to do. "There's more work here than there's been in a long time, maybe 10 or 15 years," he said. Babione credited Rob Weiss—who officially turned over the mantle of "Top Skunk" that day, after five years in the job—for having rebuilt the business to about \$1 billion a year; roughly its level of work during the early 1980s heyday of the F-117 stealth fighter program.

Skunk Works accounts for about two percent of Lockheed Martin's \$51 billion business, but the programs it has developed have sustained the company through many downturns in defense spending. Its innovations have often led to massive programs.

The multinational F-35 strike fighter—the Pentagon's biggest program, building stealth jets for the US Air Force, Navy, Marine Corps, and a dozen partner and customer countries—got its start at Skunk Works.

The list of Skunk Works projects



Clarence "Kelly" Johnson with a P-80 model. His team, which delivered the prototype 143 days after the go-ahead, became known as Skunk Works.



reads like a history of military aeronautical innovation. The company reckons its anniversary to that day in June 1943 when then-Lockheed chief engineer Clarence L. "Kelly" Johnson hammered out a brief contract with the US Army to design and deliver a prototype operational jet fighter to counter Germany's Me-262. The contract called for an aircraft to be provided in 180 days; Johnson delivered the XP-80 in 143 days.

Other "impossible" challenges followed, and Johnson developed a reputation for meeting them on time and on budget. Weiss, speaking with reporters before the anniversary celebration,

noted that Johnson once returned most of the money he'd received for a project codenamed "Suntan" when it became apparent the technology was still out of reach.

That cemented "the reputation for integrity" of the organization, Weiss said.

Noteworthy Skunk Works products also include the F-104 Starfighter; the U-2 "Dragon Lady" spy plane and the SR-71 reconnaissance aircraft, the latter of which set records for speed and altitude still unmatched more than 20 years after its retirement. The F-117 Nighthawk, a product of the 1970s and '80s, was the first operational stealth aircraft and paved the way for victory in two Persian Gulf Wars and one in the Balkans. The advent of American stealth is often credited as playing a big role in ending the Cold War by rendering Russia's massive investment in air defense obsolete.

Johnson famously bounded programs by insisting they use proven technology as much as possible, limiting them to "one miracle" each. The F-117, for example, used landing gear, engines, flight controls, and targeting systems from other aircraft; the "one miracle" was stealth.

Babione said the organization is not limited to things that fly, however. Touting artificial intelligence, directed energy, and other cutting-edge technologies, he said Skunk Works will go "where ... our customer needs us to be." He said the outfit prides itself on studying the security situation and an-



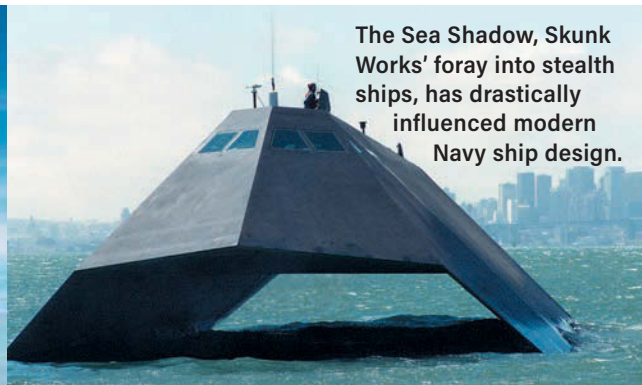
The SR-71 (top) and U-2 are two of the once-secret projects carried out by Skunk Works.



The X-44 UAV, recently declassified, demonstrated low-observable, autonomous drone operations in the early 2000s.



The Skunk Works mandate is “one miracle” per project. The F-117 stealth attack plane reused parts from many other jets; stealth was its huge innovation.



The Sea Shadow, Skunk Works’ foray into stealth ships, has drastically influenced modern Navy ship design.

ticipating what customers want before they even know it. Lasers, for example, may well be simply another weapon equipping future aircraft, he said. Sticking to aeronautical projects exclusively “narrows your field” of potential work unnecessarily, Babione added.

That said, Lockheed Martin is taking on several hypersonics projects, touting its long research in the field. Hypersonics, Babione said, is “a national need, and we look at it as the core of our defense policies.” Skunk Works has been involved in Mach 5-plus projects for many years, having famously offered an “SR-72” hypersonic platform several years ago.

Skunk Works also designed the AGM-158 JASSM stealth missile and “we even built the first batches, which is not really known,” former Skunk Works executive vice president and general manager Frank J. Cappuccio said during a panel discussion with previous leaders of the unit. The JASSM subsequently has been manufactured at Lockheed’s Troy, Ala., facility.

Weiss also has publicly revealed an unsolicited proposal for a “TR-X,” high-flying unmanned intelligence, surveillance, and reconnaissance aircraft that would complement and eventually supplant the U-2 in Air Force service. Skunk Works is also starting to build a “quiet supersonic” X-59 research craft for NASA that could

usher in a new era in high-speed commercial passenger travel.

Recent revelations include the MQ-25 proposal for the Navy, which would provide an unmanned tanker to extend the range of Navy carrier-based aircraft (shaped to suggest it could also be a stealthy target-spotter); a battlefield Marine Corps drone; an open missions systems (OMS) translator box called Einstein (the name inspired by the similarity of the acronym for Multimission Command and Control to Einstein’s $E=MC^2$ equation), which will allow sensors to interface with any aircraft and put the sensor “take” on the military network for all affected platforms to make use of.

Yet another operational system hailing from Skunk Works is the RQ-170 Sentinel, a stealthy Air Force ISR drone which reportedly was instrumental in finding Osama bin Laden. Only two official photos have been released of the aircraft, though pictures have been snapped in forward operating areas by amateurs, and Iran has displayed an RQ-170 it claims it brought down through cyber attack in December 2011.

All those “known” or “white world” Skunk Works projects only amount to about 15 percent of what the company is working on, a spokeswoman said, leaving the vast majority in the “black” or secret world.

At the Palmdale birthday party, the company also showed off a small, all-white flying wing called X-44. A placard next to the aircraft noted that it pioneered the exploration of autonomous combat operations in the early 2000s, before the Boeing X-45 or Northrop Grumman X-47. Previously, the label “X-44” was believed to be assigned to a tailless F-22 concept that was never built.

A former head of Skunk Works told *Air Force Magazine* at the event, “Yeah, there are a lot of tricks in our bag that we use to misdirect attention.”

The X-44 had recently made a static appearance at a California air show, but the company had promised a revelation at the anniversary event. The spokeswoman reported that government security agencies failed to approve the disclosure in time for the celebration. Instead, a Lockheed World War II P-38 and ‘30s-era Lockheed Vega made an appearance, along with a stealthy, generic mockup of a flying wing.

Babione acknowledged that the unit’s success is making it tough to get all the engineers, software code writers, and other specialists the unit needs to execute its projects. Because it is pursuing projects beyond aerodynamics, he finds himself competing with the likes of Google, SpaceX, Amazon, Apple, and other organizations

not usually, or only recently, involved in aerospace.

For that reason and others, Babione said Skunk Works will be “collaborating” with Silicon Valley entities and other organizations who perhaps know more about networking and artificial intelligence to supplement what Wiess said is Skunk Works’ unrivaled “domain expertise” in defense. That collaboration will be matured in the next few years, he added. Again, the outfit doesn’t want to recreate something already available, he said.

In a panel discussion with four former Skunk Works chiefs, Cappuccio, who led the organization from 2001 to 2011, noted that he was the last engineer hired by Kelly Johnson personally. He tried to cultivate an atmosphere of “entrepreneurship,” in which engineers would come forward with new ideas and try to find ways those ideas could be used in other products; not necessarily those of the company. Key to this was not punishing people who took risks and failed.

“It has to be a creative environment for young people,” Cappuccio said. His people knew—and he reminded them with his actions—that “if they took risks, and it didn’t work, they would not be shot.” He also said it was imperative to “keep magic alive in a culture” that didn’t like magic.”

Cappuccio recalled that his predecessor, Ben R. Rich, who spearheaded the F-117 program and persuaded the Air Force to help keep Skunk Works alive with a healthy contract to “upgrade”—really, remanufacture—the U-2, was at first dumbstruck when approached with an idea to build a stealth ship.

To the employee who brought the idea to him, “Ben said, ‘we’ve never done a ship, but if you think you can do it, I’ll give you a staff,’” Cappuccio recalled. “Our engineers knew nothing about ships. But we learned.” The project produced the hyper-secret Sea Shadow stealth ship, built inside the Hughes’ Mining Barge. The lessons it taught the Navy about being low-observable at sea are now evident in the slab-sided *Zumwalt* class destroyers and other vessels.

Alton D. Romig, head Skunk from 2011 to 2013, said Johnson “set the stage by pulling together people who thought they could do the impossible.” The Skunk Works culture, he said, is “easy to lose” without constant vigilance by its chief, who must ward off



A Skunk Works’ concept for a future transport/tanker combines stealth with fuel efficiency and capacity.



The X-59 Quiet Super Sonic Technology (QueSST) research airplane, which Lockheed Martin is building for NASA, will muffle sonic booms.

tinkerers from upper management and outsiders who want to involve themselves unnecessarily.

That culture was largely encapsulated in what has come to be known as “Kelly’s 14 Rules,” which are posted inside the Skunk Works facility. The rules spell out that program managers must have total authority over their programs; a short reporting chain, preferably to the head of the company; and minimum oversight, both from within Lockheed and by outsiders who really have no value to add.

The military should provide its own, very small and empowered program staff, and the number of people working on the project should be limited “in an almost vicious manner,” Johnson wrote.

Kelly also insisted on minimal reports; cost updates on a monthly basis; preference for a commercial, rather than government bidding process from vendors, and early and frequent test flights. Success, he said, would stem from reliable, locked-in funding so the company didn’t have to “constantly keep running to the bank” and get loans.

He insisted on an atmosphere of trust between the government and the

contractor, and paying people based on their contributions, not based on how many people they supervised.

Sherman N. Mullin, top Skunk from 1990 to 1994, said Johnson’s rules instilled “a sense of accountability,” a determination to “only invest what you have to,” and “stay within your budget.”

Johnson’s 15th rule, Cappuccio quipped, was “never work with the Navy.”

Romig warned Babione to pay attention to the rule about vendors. “It’s easy to have too much trust in someone else’s supply chain,” he said.

Jack S. Gordon, head Skunk from 1994 to 1999, said a critical rule is, “we should be allowed to test what we’re developing,” to make sure it works. “That’s where you find out what the real problems are,” he said. He noted that both “Have Blue” demonstrators—the proof-of-concept aircraft that led to the F-117—crashed. In today’s risk-averse culture, the program might have ended there, but patient Air Force and corporate leaders saw the value in the flight test data and pressed on.

He also said flight testing “took the ‘dither’ out of the system.” Fixes were often decided off the cuff, and even if

they were wrong, projects kept moving forward until successful, he noted.

The X-33 Space Shuttle successor program, Gordon said, was one of the great “almost” successes in Skunk Works history. The company wanted to use fuel tanks of certain materials, but NASA insisted otherwise. Against the company’s better judgment, Skunk Works acceded. The same technology was to have equipped the National Aerospace Plane. One day, the tanks were fueled and defueled six times, and hours later, failed. “I’m convinced that’s what killed the X-33,” he said. “Something we could have fixed for ... \$12 million,” after NASA “spent \$1 billion on it.”

The former leaders said they rarely had trouble with recruiting. “The SR-71 had a lot to with that,” Cappuccio reported. “After people saw that, they wanted to be part of us.”

He said there were “downsides” to the hyper-security of the organization and its projects.

“Some ... pilots gave their lives to their country” testing Skunk Works designs, he said, and it was a monumental task getting permission to tell their families what had happened. Sometimes, permission never came, or came years later, and “that wasn’t right.”

There were humorous moments related to security, though, Cappuccio said. Emphasizing his strong New York-area accent, he related how, in early days, he was paid in cash, because Skunk Works was so secret there couldn’t even be an employee paper trail. After several weeks of coming home with a bag of cash as his salary, he said his wife asked him, “‘Frank,

you didn’t go into the ‘family business,’ did you?’ ”

Babione said when he gets together with other high-tech companies—and collectively, when they talk to Congress about how to speed up the sluggish government development process—“they all recommend the same thing, right? Removing the bureaucracy and allowing the contractor more control over the design. So the message is there, and the Trump administration has set an expectation that that’s the way they’re going to behave.” What industry hasn’t seen yet, he said, is whether that will be “the way we’re going to do this.” But, “industry is excited and ready to respond.”

Defense leaders from the Obama administration (notably former Deputy Defense Secretary Robert O. Work) and the Trump administration (such as Air Force acquisition chief Will Roper) have said government needs to emulate the Skunk Works model—citing the company by name—to obtain the speed of technological innovation the new world situation demands.

HOPE IS NOT A STRATEGY

The organization is mindful of budget pressures looming, that Fiscal Year 2020 may not be as generous as the last two years, and “we look at where the customer is likely to get the funding, and we adapt ... our pursuits around that to some extent,” Babione said. “What we know is, if we have the technology the customer wants, we can build a program out of it.” Funding will likely be secure as long as the company delivers “on time with the capability they [the customers] need.

... If you don’t do that, then you risk those budgets being taken away.”

Weiss also said that if the administration is serious about the new National Defense Strategy, “then the nation has to resource to it. I think that will be the big question, on the macro level. A couple of years of strong DOD budgets will not enable the nation to execute that ... strategy. It’s essential that the nation commit itself to resource that vision.”

Otherwise, Babione chimed in, it’s a strategy of “hope.”

Babione transitioned the F-22 from production to sustainment and took the F-35 from flight test to the start of big production numbers. Asked if that’s why Babione was picked to be the new head Skunk—because there are programs about to make the leap from prototyping to operational capability—Weiss said the choice reflects all of Babione’s work history.

“Not only is Jeff going to transition these programs from initial prototyping and conceptual design to production, but he’s going to keep the innovative side of things going as well,” Weiss said.

He, too, advised Babione to “protect the culture” of Skunk Works, warning him that there will always “be the desire to give [the customer] more than maybe [he] needs.” He urged Babione to “take the goodness” offered by other companies and within Lockheed and “be quick, be affordable.”

Although there are other intensive innovation shops that have adopted the Skunk Works approach and even added the suffix “-works” to their name, “this is the only Skunk Works,” Weiss said. ☛

The F-35 and the Future

PALMDALE, CALIF.—

Outgoing Lockheed Skunk Works chief Rob Weiss was asked to look into his crystal ball and divine whether future Air Force aerial systems will be mass-produced or built in small lots and then quickly changed out as technology rapidly moves on. He answered that there will definitely be a place for large numbers of like platforms. The military force structure—particularly fighters—“needs to be recapitalized,” he asserted.

The F-35, he said, was designed to be adaptable and evolve, through “plug-and-play” open mission systems architecture. He said it’s probable that the F-35 will, before too long, carry lasers for more than just targeting and range-finding, likely for self-defense and possibly offense.

He noted that “we’ve done analyses on where the threat is going and what needs to be done to meet the threat. That’s the fundamentals behind what we do here at the Skunk Works, and when we project where the threat is going, and how to most effectively deal with that threat, getting the F-35 out there in substantial numbers, getting them out there quickly,” and rapidly modernizing the jet will be critical.

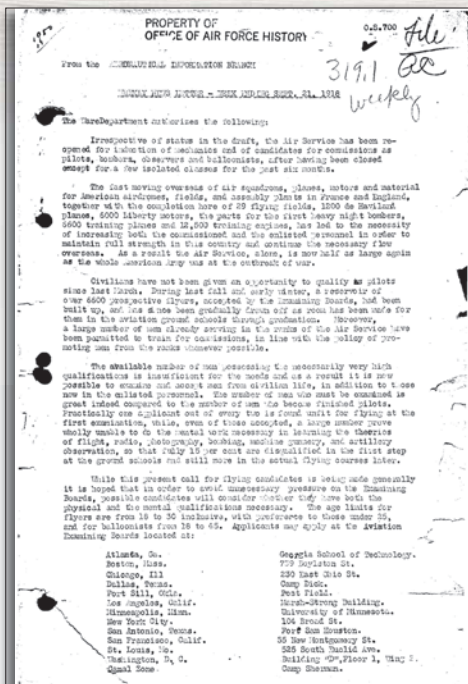
Beyond the F-35, he said, “there’s a place for some more innovative technologies ... in the multi-domain command and control, the unmanned air systems ... artificial intelligence, manned/unmanned teaming ... next-gen air dominance, those all have a place.”

COVERING AIR FORCE MAGAZINE

On the occasion of the magazine's centennial, we look back on some of our favorite covers from the past 100 years.



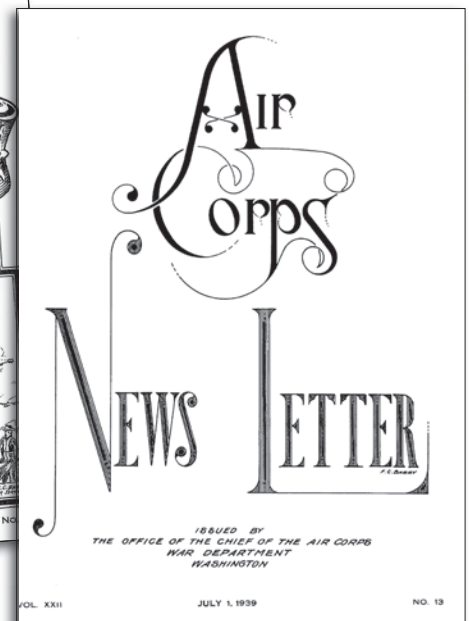
By Adam J. Hebert, Editor in Chief



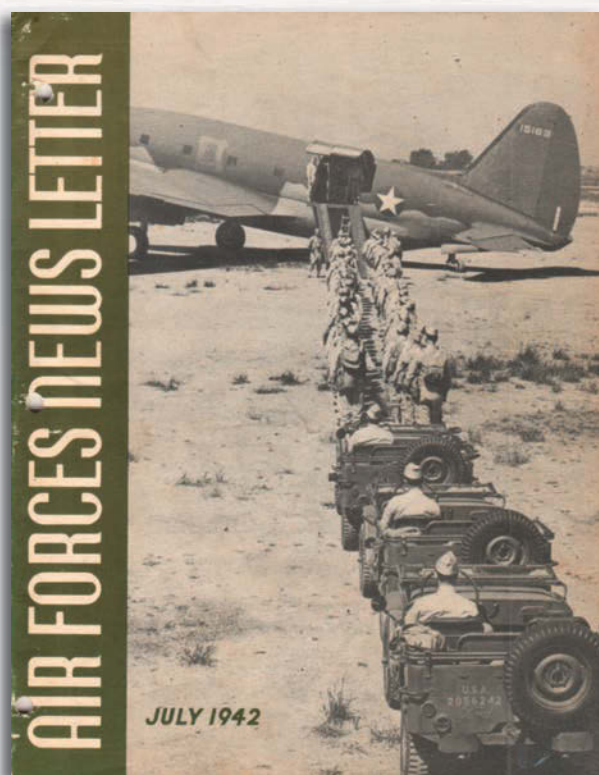
In the beginning the US Army created the Aeronautical Information Branch's *Weekly News Letter*. Our very first issue, for the week of Sept. 15-Sept. 21, 1918, began with a typo. The lead article's headline read, "The Ware-Department Authorizes ..." Things got better after that, and we reported on World War I, as it happened.



The interwar period included some great cover art and several name changes. *Weekly News Letter* became the *Air Service News Letter* ...



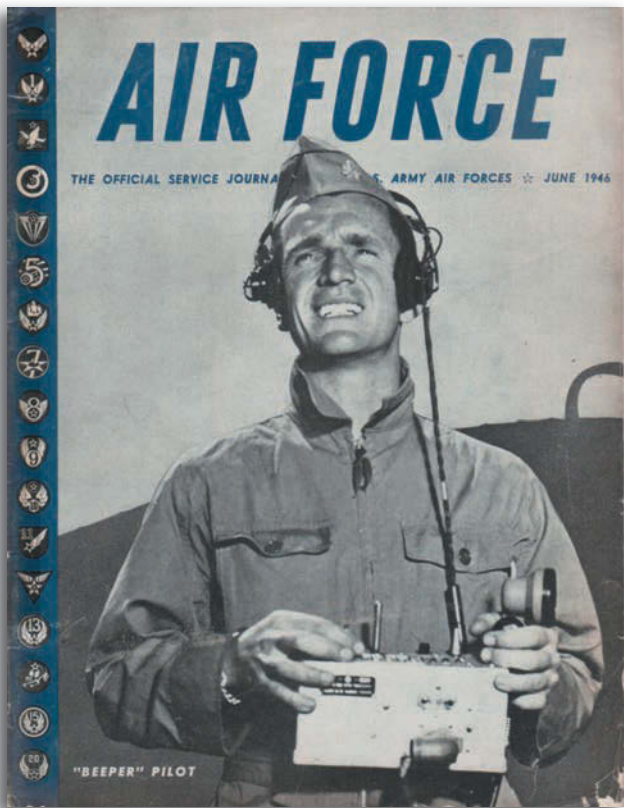
... and then *Air Corps News Letter* ...



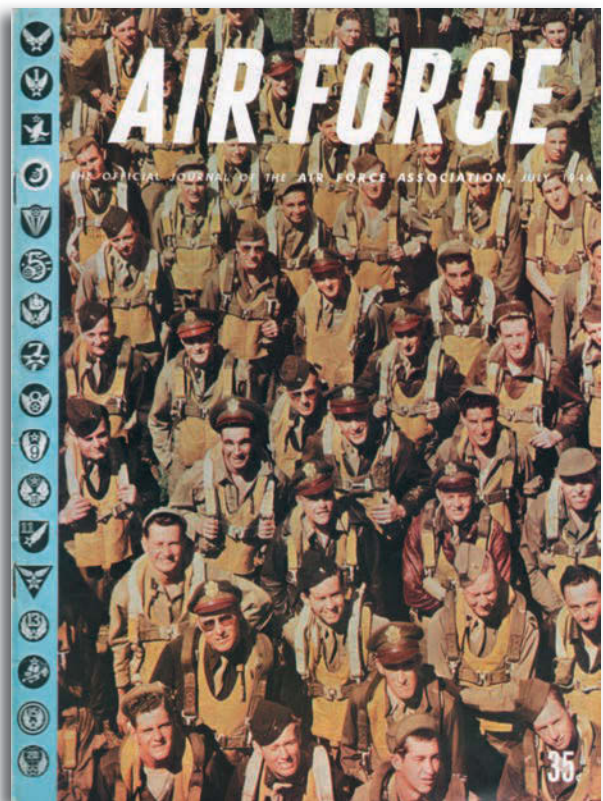
... followed by *Air Forces News Letter*.



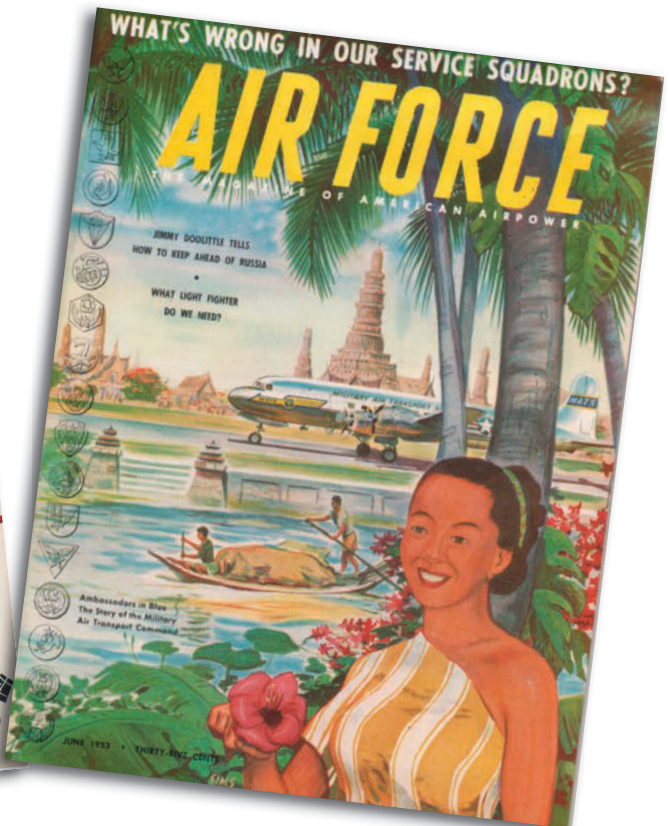
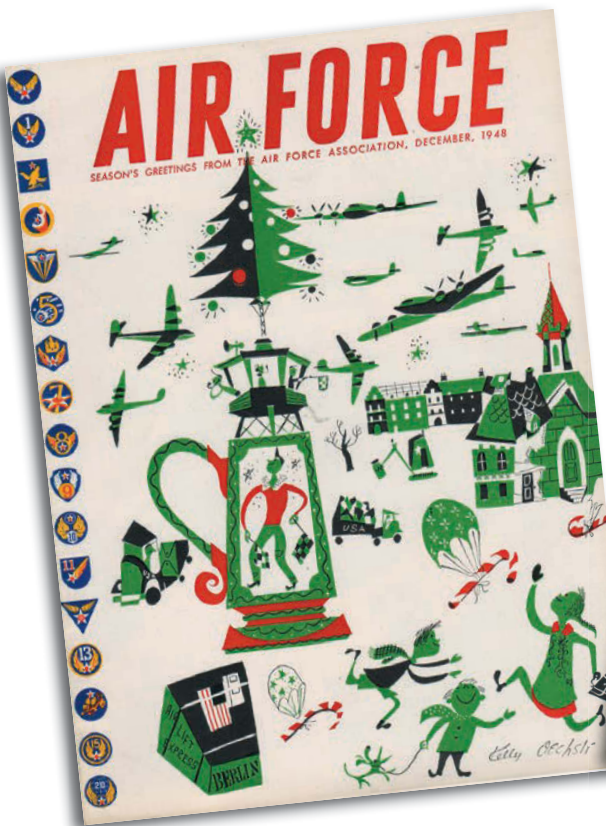
The first issue with our current (and final!) name, *Air Force Magazine*, arrived in December 1942. We reported on World War II, as it happened.



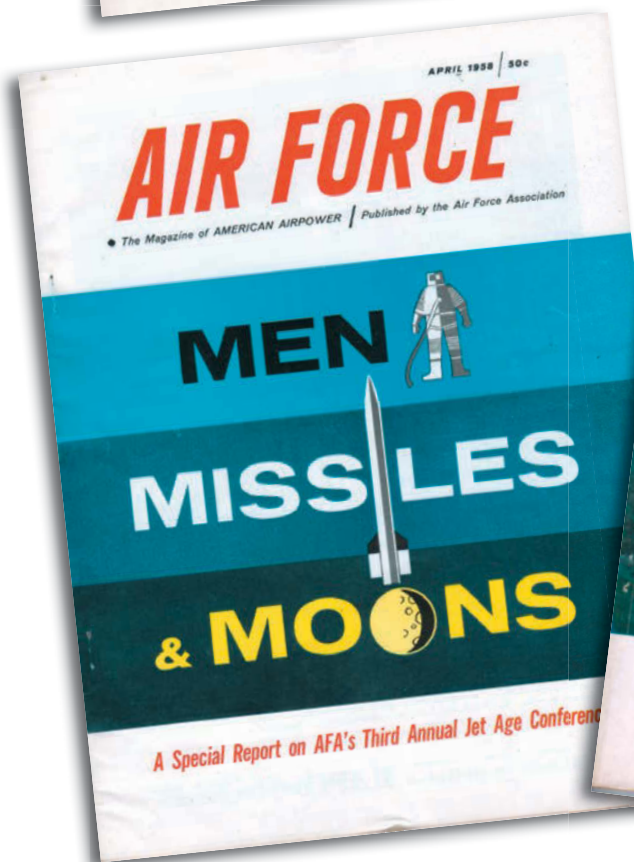
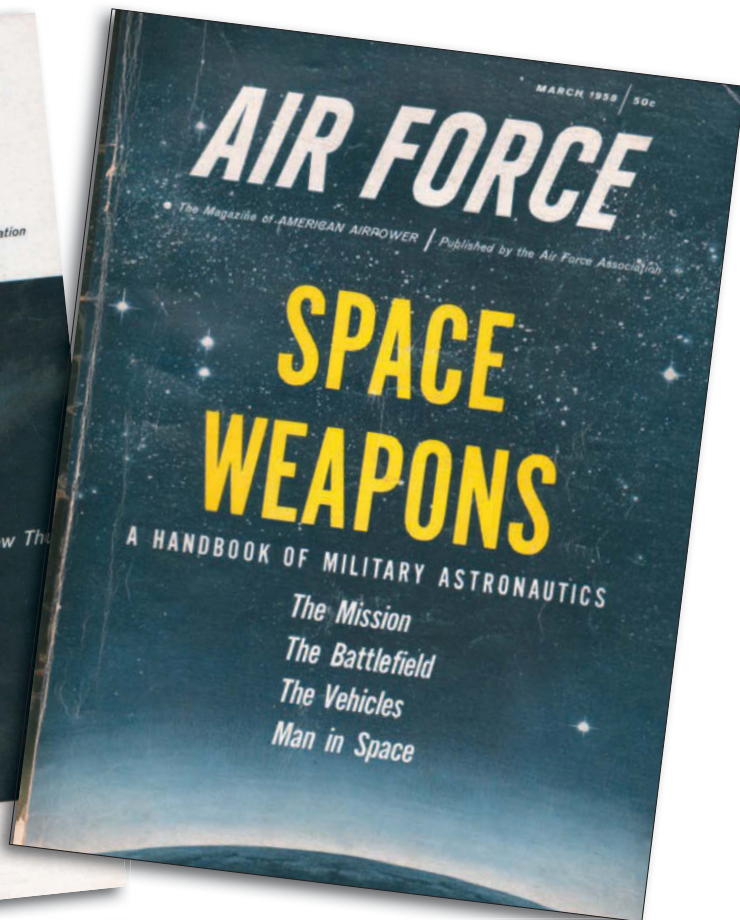
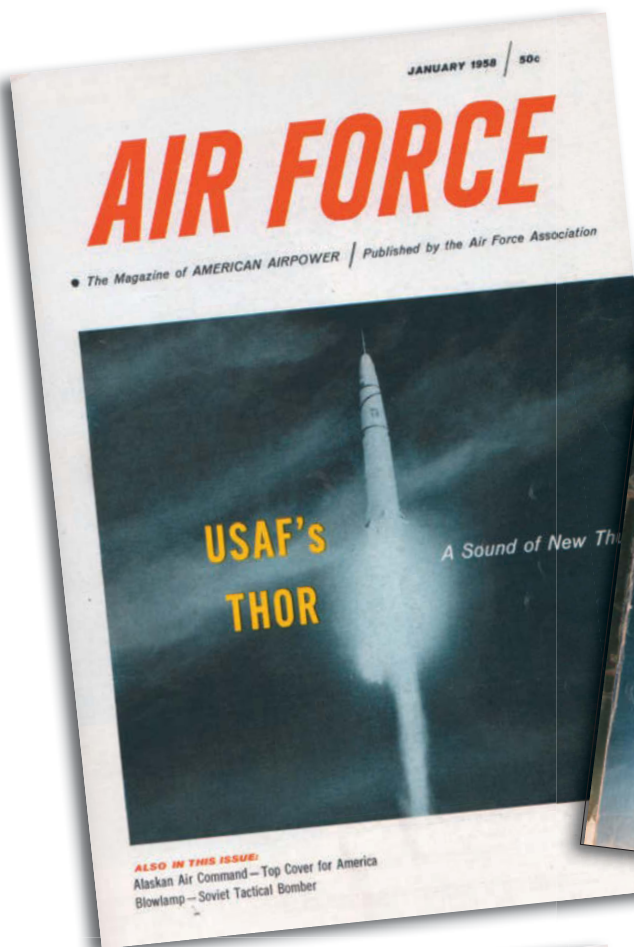
June 1946, the last issue published by the Army. The official service journal of the US Army Air Forces then transferred to the brand-new Air Force Association.



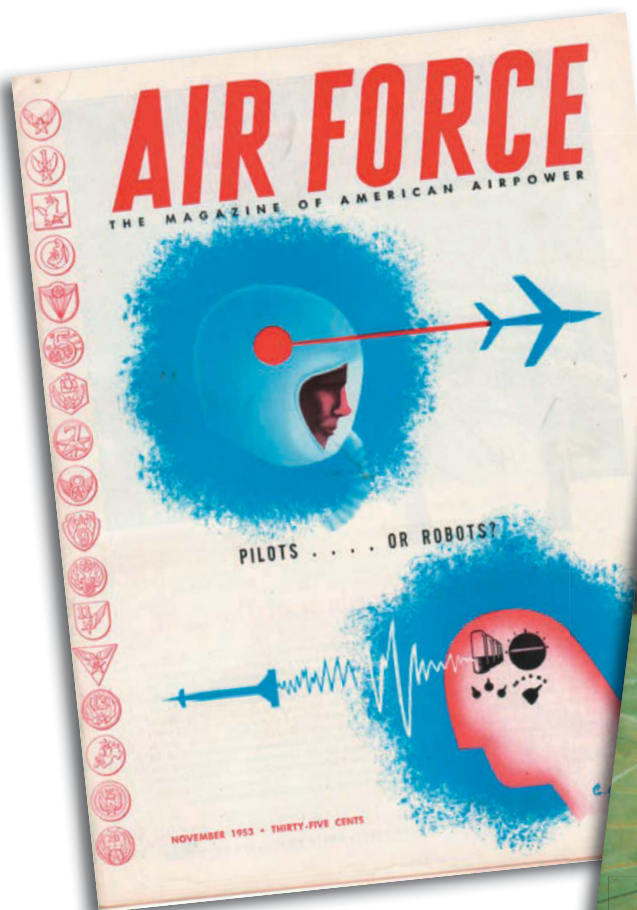
July 1946, the first issue published by AFA. Our association was five months old; the US Air Force did not yet exist.



Left: Season's Greetings from the Air Force Association, circa 1948. "Dr. Seuss," Theodore Geisel, wrote "How the Grinch Stole Christmas!" nine years later. Right: June 1953. We described Lt. Col. Harold H. Sims' painting as "typical of many overseas bases through which MATS operates."

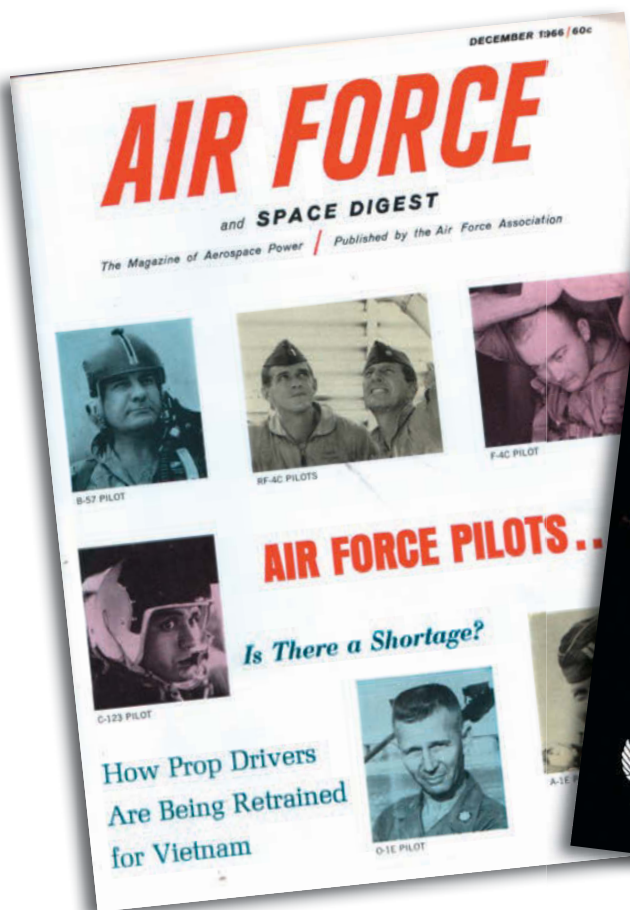


The Space Age was well-represented. 1958 was all about space and missiles, leading AFA to add Space Digest to the magazine's branding that November. The co-branding lasted, in a variety of ways, until January 1971.

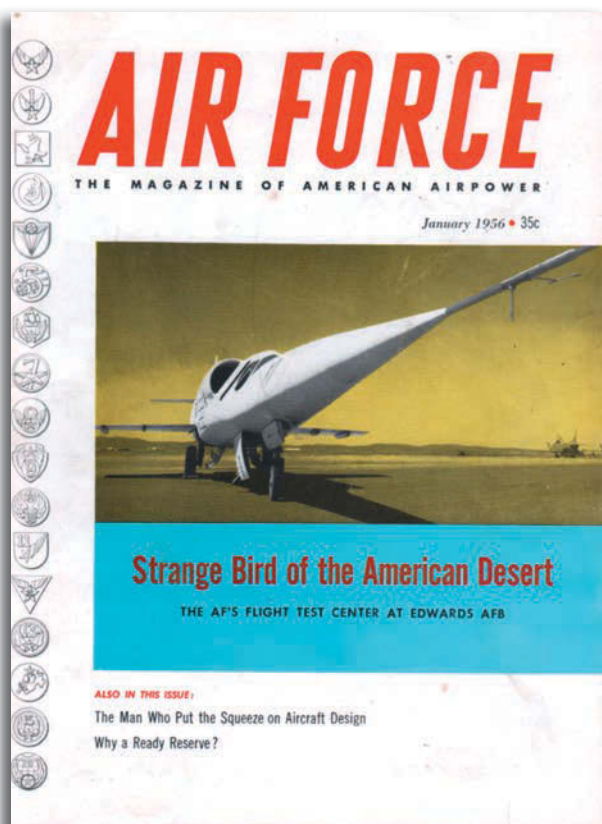


Mount Washington Test Station looked like a refreshing destination for those MATS airmen tired of the tropical basing seen two pages prior.

"Pilots ... or Robots?" we asked in November 1953. The answer, so far at least, is "both."

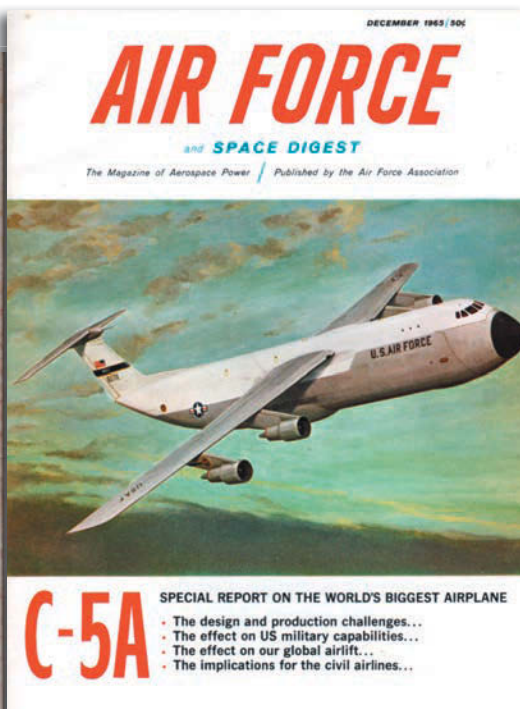


Pilot shortages, 50 years apart. And there were others. During your time in the service, you may experience a pilot shortage.

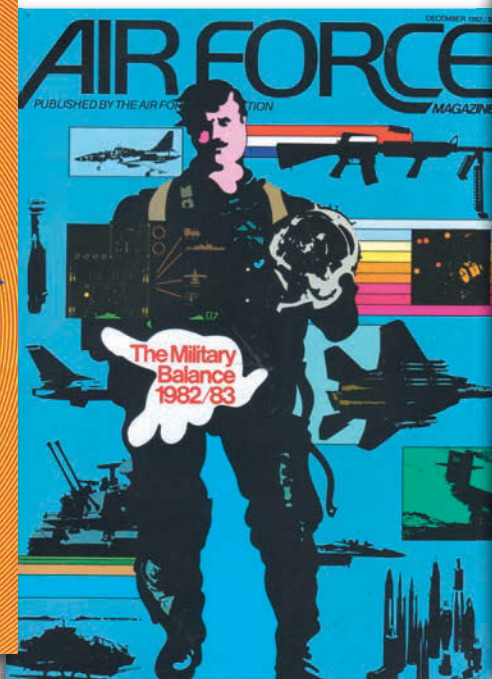
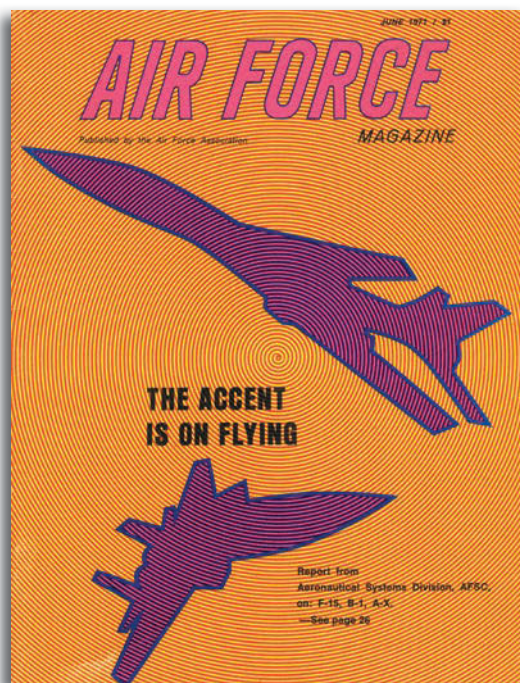


January 1956: Strange and wonderful aircraft aren't a mirage in the desert. They're at Edwards.

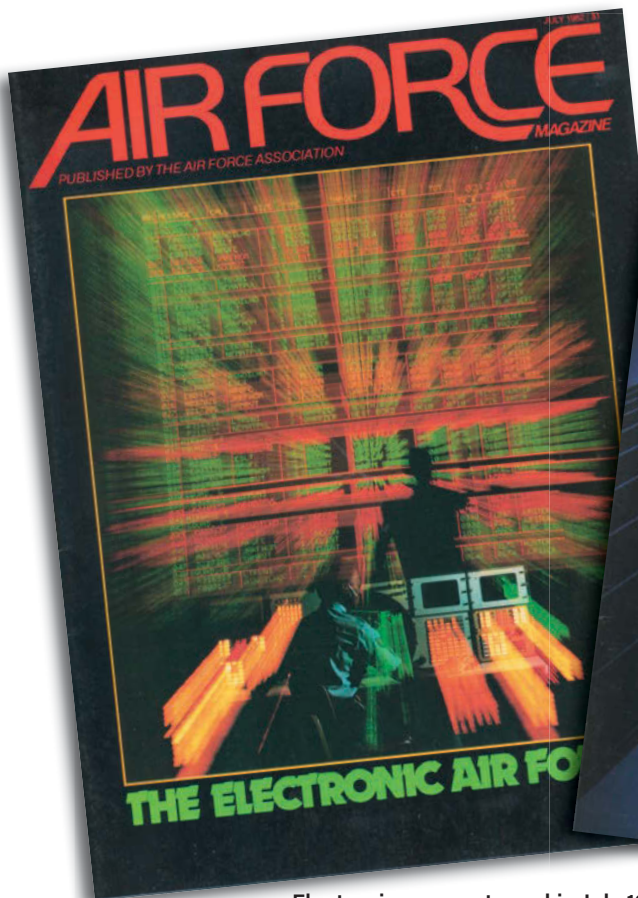
November 1957: The Red Menace.



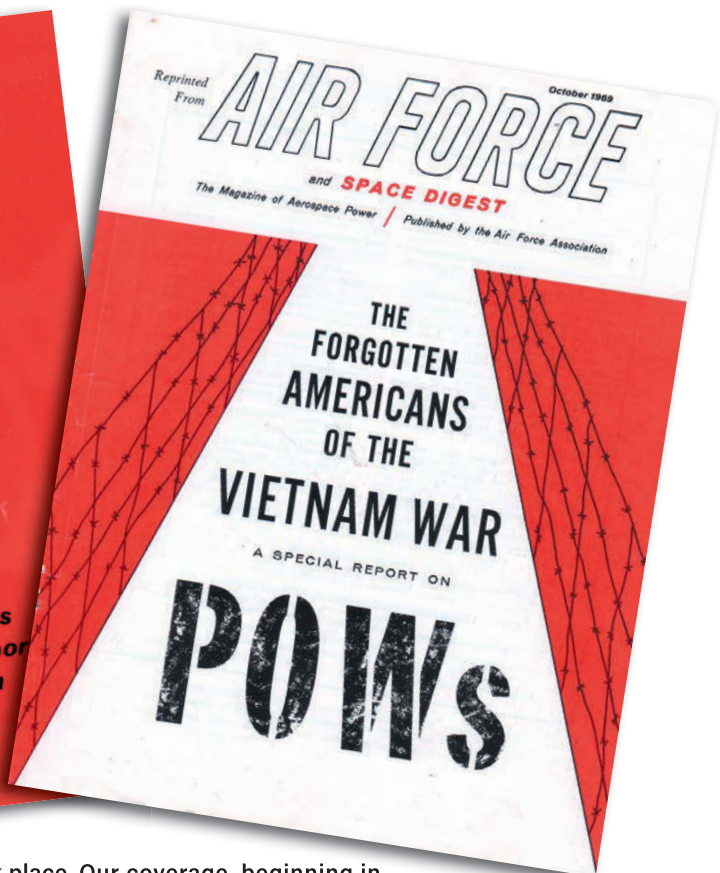
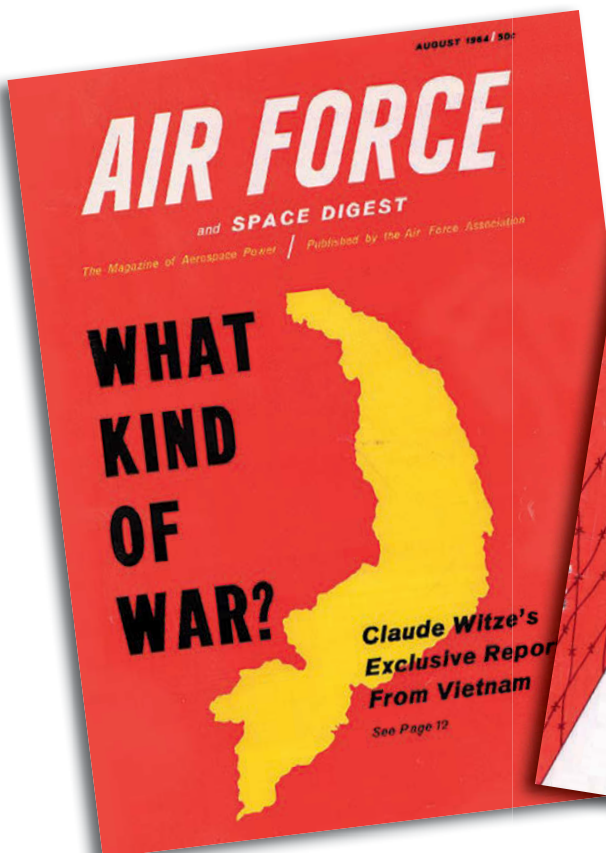
Mobility has had its ups and downs. The Berlin Airlift (left) was a high-point, and we reported on it as it happened. The C-5 (center) and C-17 have also had good times and bad. Both aircraft are out of production, still in service, and now having some of their most reliable and valuable years for the mobility community.



June 1971, December 1982, and January 1990: Visual assaults from three decades. Please sit down if you begin to feel dizzy.



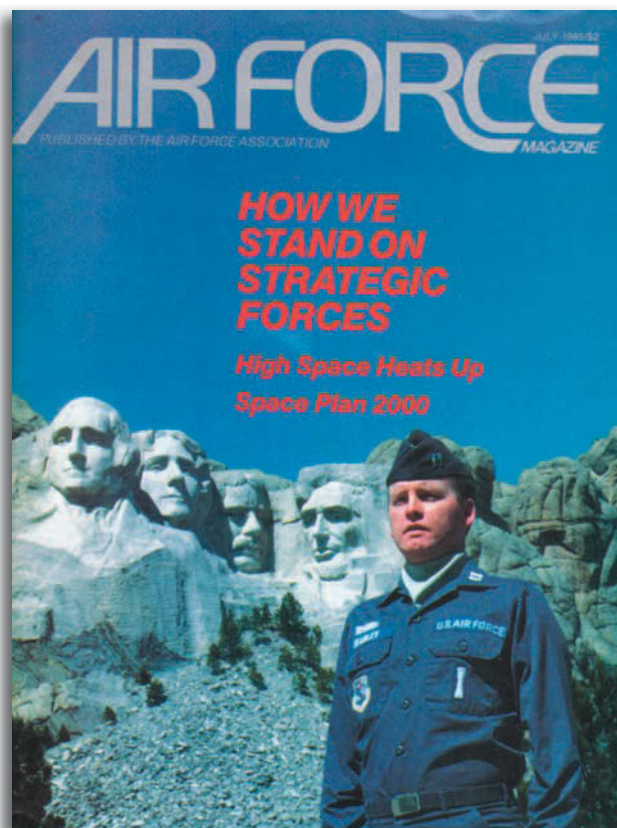
Electronics, as portrayed in July 1982 (the same month Disney released "Tron"), and July 1986. To this day, it is tough to find good ways to illustrate electronics.



The Vietnam War, as it took place. Our coverage, beginning in 1969, of America's forgotten prisoners of war helped focus national attention on the POWs and their plight.



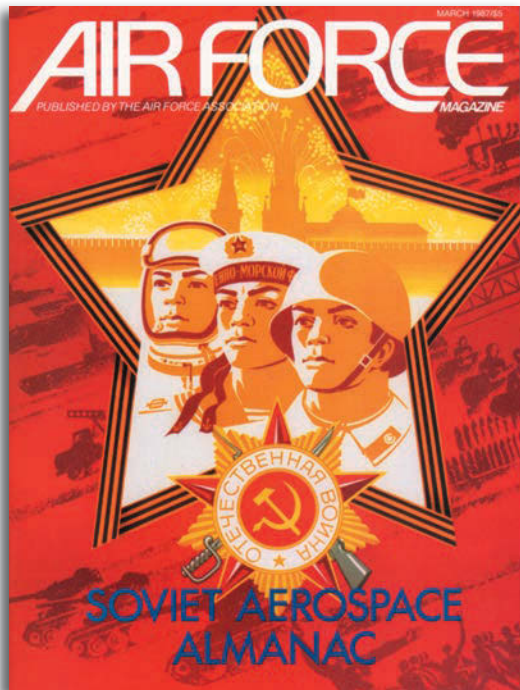
November 1982. Paramount released "Top Gun" four years later.



July 1985. Honestly? We have no idea what effect we were going for here.



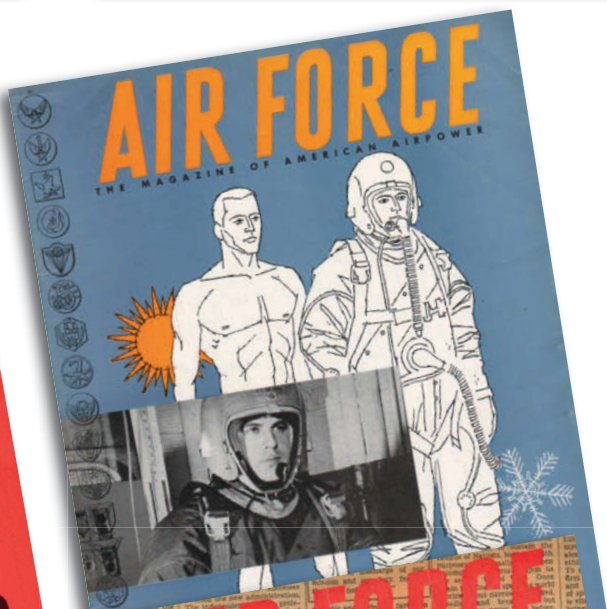
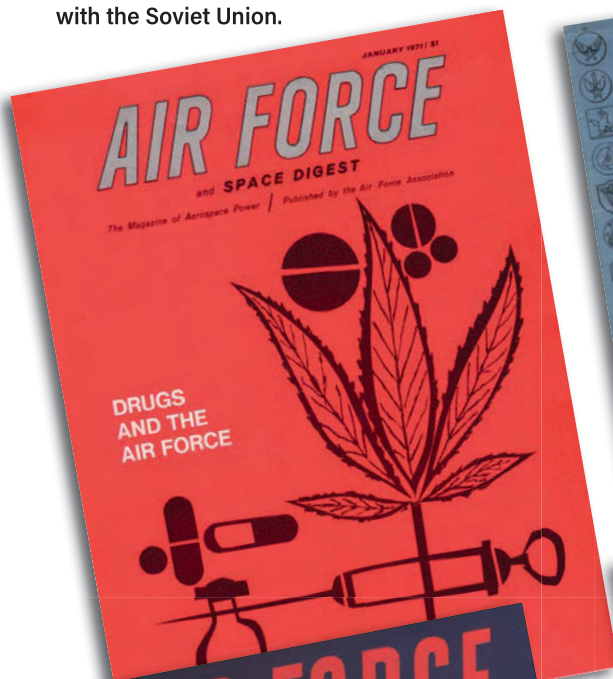
In 1984, we took a look at what was coming up for the 21st century. Five years later, we were on the threshold of the 1990s.



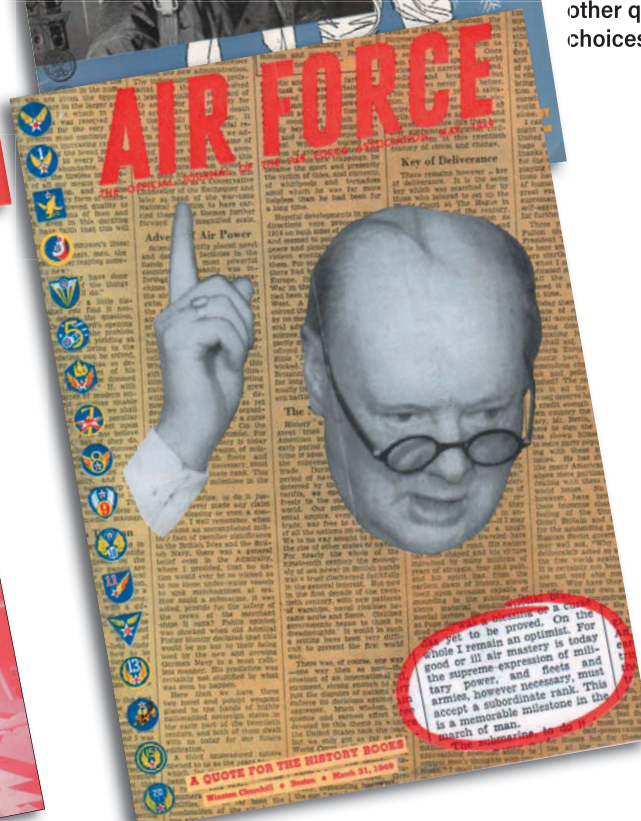
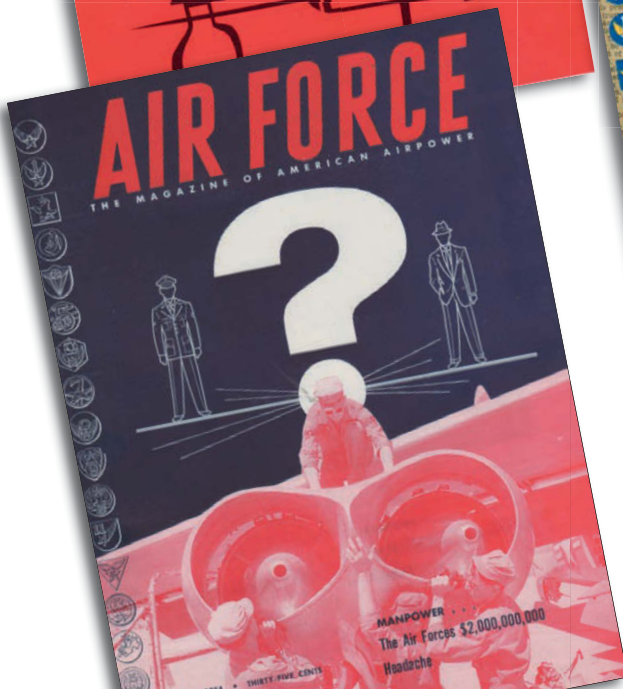
March 1987. The annual Soviet Aerospace Almanac was a staple in the 1980s. It died with the Soviet Union.

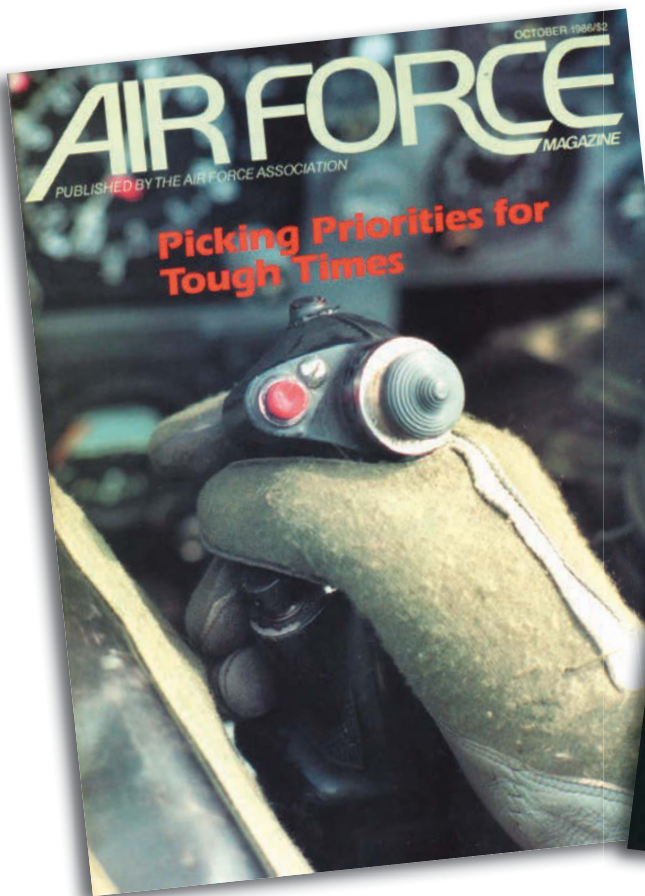


The Bald Eagle was our USAF Almanac branding for more than two decades. Eagles first appeared on the Almanac cover in May 1992.



Readers: Please don't do drugs or make other questionable choices.

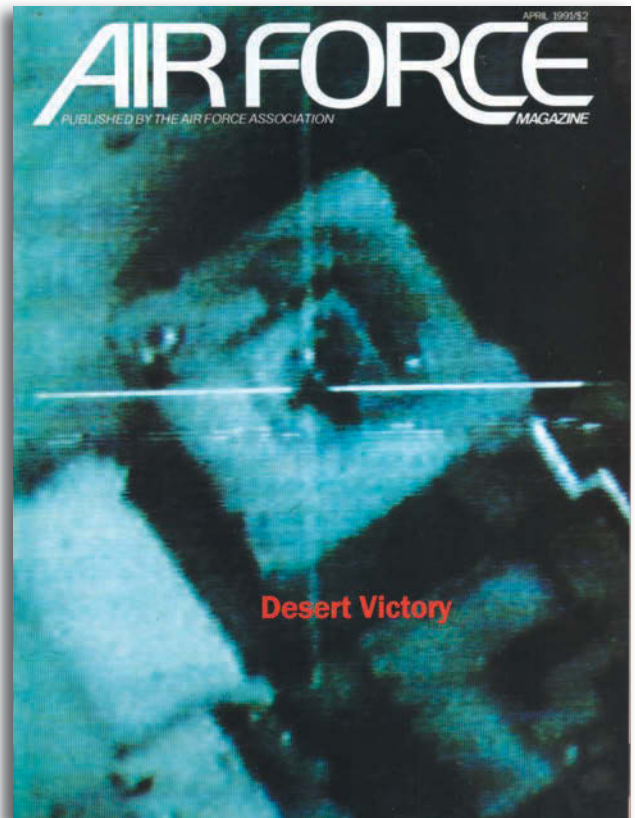




October 1986; August 2015.



August 1989. Logistics, for when you must have guns *and* butter.



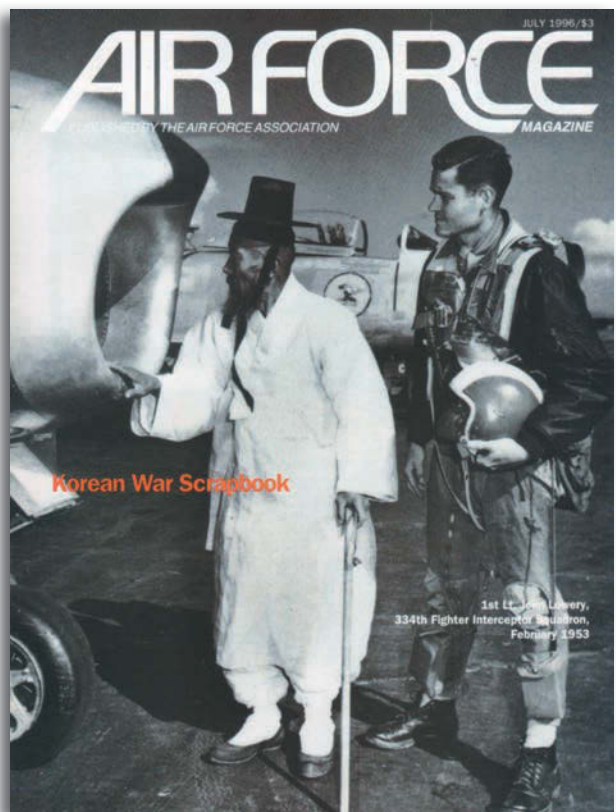
April 1991. The iconic image of the Gulf War, as it happened.



The Air Force Association turned 50 in February of 1996. The US Air Force followed suit 19 months later.



The attacks of 9/11, and USAF's response, as it all happened.



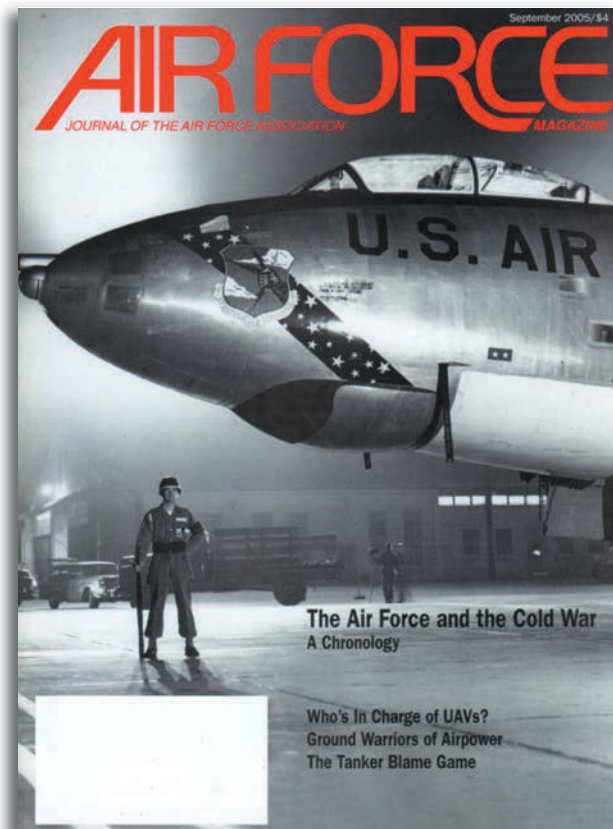
July 1996. Some of our favorite photos have been submitted by members and readers, such as this one from John Lowery of his time in the Korean War.



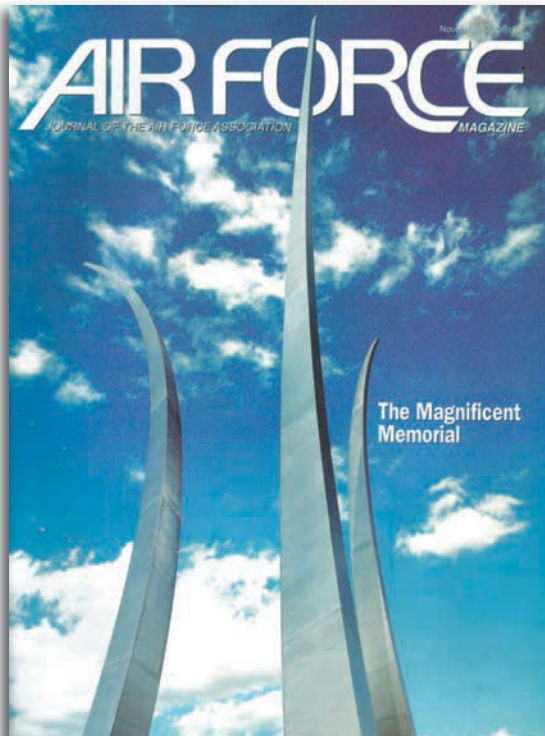
In December 2003 we marked the 100th anniversary of the Wright Brothers' historic first flight.



Operation Iraqi Freedom, as it happened.



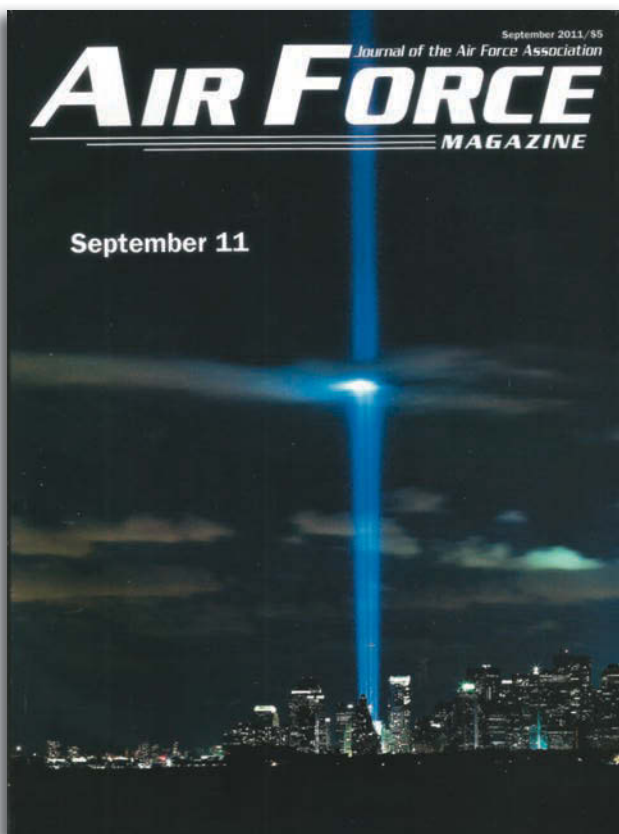
September 2005 featured a Cold War Chronology.



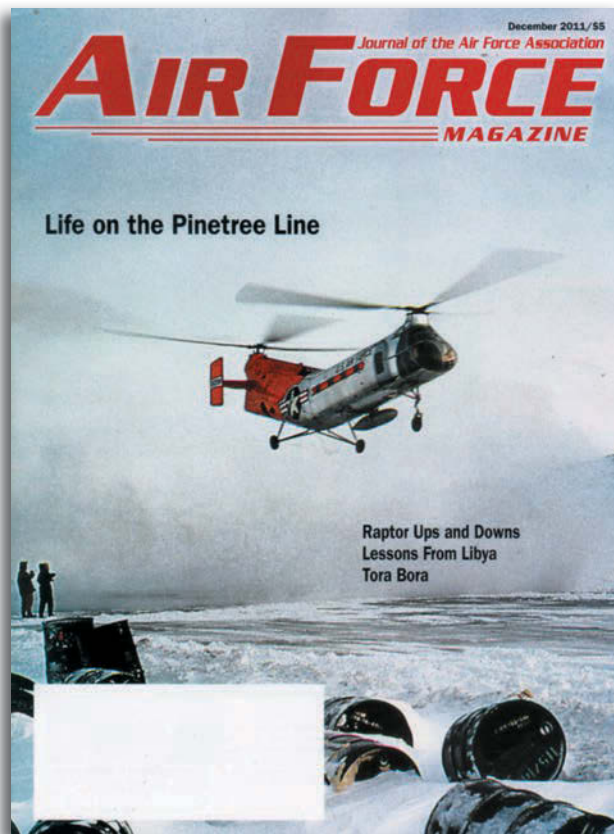
After years of planning and many fits, starts, and reboots, the Air Force Memorial opened in October 2006 in majestic splendor. The Air Force Memorial Foundation, an AFA affiliate, brought the memorial from concept to reality. AFA managed day-to-day memorial operations until 2017, when the Air Force assumed responsibility.



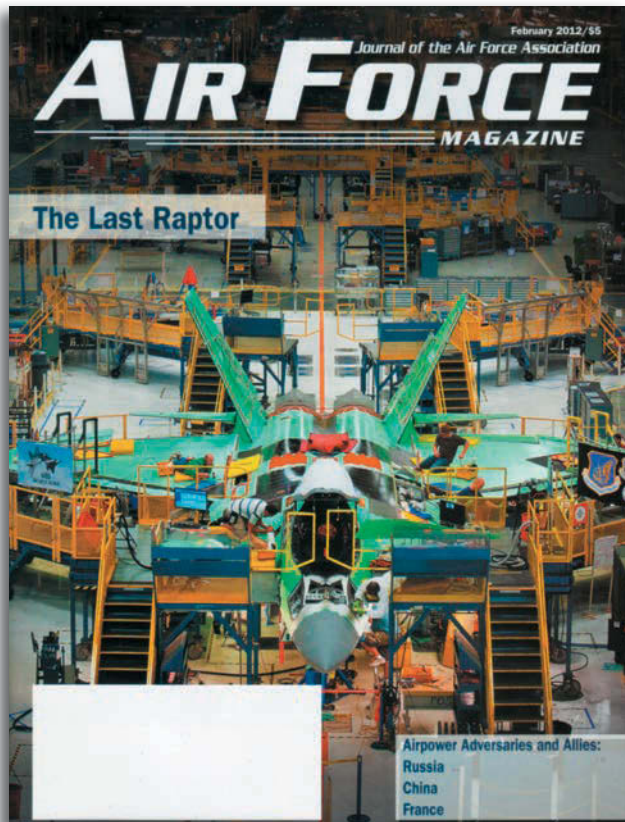
Keith Ferris has been a titan of aviation artwork for more than seven decades.



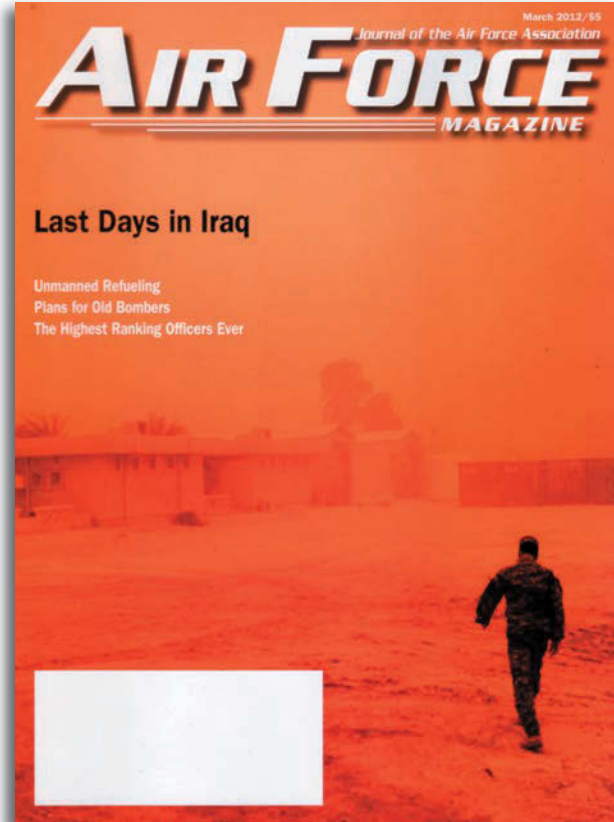
For our "Airmen on 9/11" feature, we profiled 10 airmen who unexpectedly found themselves caught in the middle of the horror and heroism of that day.



Another reader-submitted photo, from a collection of extraordinary photographs documenting Robert W. Knowles' yearlong assignment on the Pinetree Line.



The last Lockheed Martin F-22 Raptor rolled off the assembly line at the end of 2011. We've been debating the wisdom of the decision to halt production ever since.



Maj. Gen. Russell Handy, senior airman in Iraq, braved a sandstorm at Al Asad Air Base as operations came to an end in Iraq—until the rise of ISIS, at least.



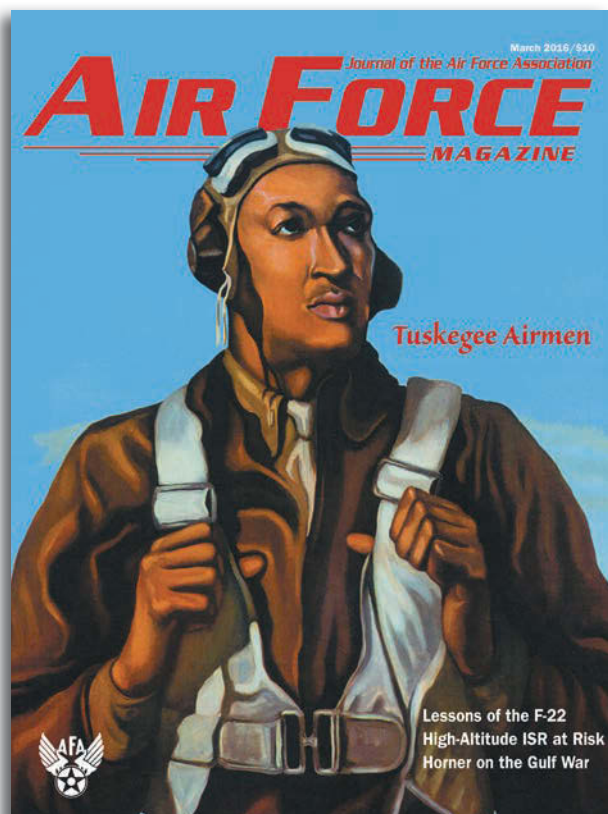
By 2016, the Air Force had been at war for 25 years in the Middle East. These wars have required heavy doses of close air support, ISR, mobility, and courageous airmen on the ground and in the skies.



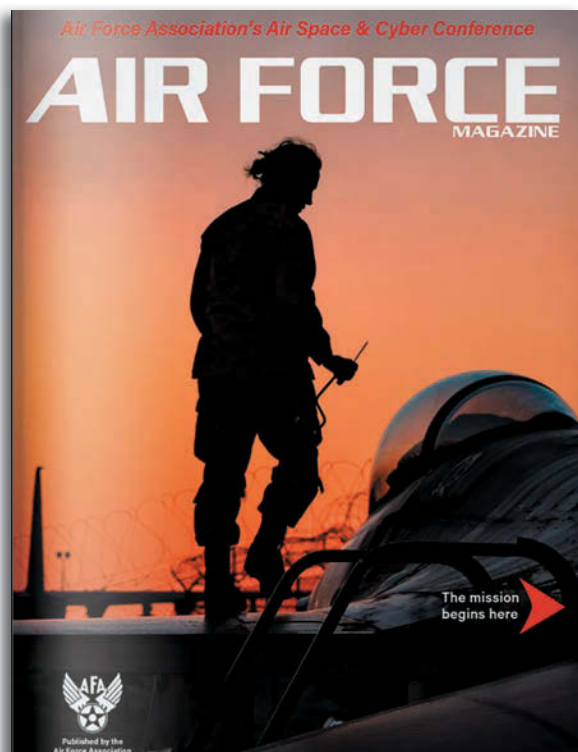
Both the U-2 and Global Hawk will continue to offer high-altitude reconnaissance for the nation, until they don't.



Air Force Space Command was notably ambivalent about this cover, perhaps worried we were going to jinx USAF's extraordinary run of space-launch successes.



The full-sized version of this 1943 War Bonds poster, featuring a Tuskegee Airman, implored readers to "Keep us flying!"



Our first digital special edition, launched in March 2017. *Air Force Magazine's* first 100 years have brought constant evolution and contemporaneous looks at USAF's wars, heroes, successes, and struggles. We expect our next 100 years to be even more exciting. Thank you for joining us on this journey.

The Making of MAD

McNamara moved by stages to a stark balance of terror with the doctrine of Mutual Assured Destruction.



Secretary of Defense Robert McNamara in 1967.

By John T. Correll

When Robert S. McNamara came to the Pentagon as Secretary of Defense in January 1961, he was appalled by the war plan he had inherited. In the event of an attack it called for launching US nuclear weapons in a single massive flush, which McNamara dismissed as “spasm war.” The new president, John F. Kennedy, wanted more strategic options and a “flexible response.”

McNamara moved within months to a new doctrine called “Counterforce/No Cities,” in which deterrence of nuclear war would rely on a credible US counterforce capability, targeted on the Soviet military power structure. Attack of urban areas—if resorted to at all—was a reserve secondary option. McNamara elaborated on that policy in his “No Cities” speech at Ann Arbor, Mich., in June 1962.

However, McNamara made an amazing U-turn. In February 1965, he announced a radically different strategy called “Assured Destruction,” aimed primarily at Soviet cities. Deterrence would depend on “the capability to destroy the aggressor as a viable society,” causing more than 100 million fatalities.

Assured Destruction did not require strategic superiority, not even parity. According to the computer calculations of the systems analysts on

McNamara’s staff—derisively called the “Whiz Kids”—a US force that could hold Soviet urban centers and industrial capacity at risk would be enough to ensure deterrence. That result could be achieved, McNamara said, with 400 nuclear weapons “delivered on the Soviet Union” and “sufficient to destroy over one-third of her population and one-half of her industry.”

Oddly, McNamara’s proclamation in 1965 did not attract much immediate notice or comment. The big military news was from Vietnam, where US aircraft struck targets in North Vietnam for the first time in reprisal for Viet Cong attacks on American bases.

In time, the new strategy became infamous as “Mutual Assured Destruction” or “MAD”—the acronym devised in 1969 by McNamara was later amended with the mutual “M” prefix by critic Donald G. Brennan of the Hudson Institute.

McNamara did not like the pejorative term, but he came to use it himself. “It’s not mad!” he said in an interview in 1997. “Mutual Assured Destruction is the foundation of deterrence.”

Despite its notorious reputation, MAD did not actually amount to that much. McNamara never changed the target list, so MAD did not go into effect in the war plan. McNamara left the Pentagon in 1968. His successors moved away from MAD and eventually returned to counterforce.

In the years that followed, nuclear protesters typically attributed MAD to the armed forces, especially the Air Force, which in fact opposed it. MAD drew its support from the nuclear weapon minimalists who feared that counterforce might provoke the Soviet Union.

McNamara’s turnaround in 1965 is well-documented in lengthy position papers, but the logic of his shifting decisions is difficult to comprehend.

MASSIVE RETALIATION

In the aftermath of World War II, the United States realized—even at a time when it had a monopoly on the atomic bomb—that a nuclear war was to be deterred rather than fought. Much of the early conceptual work on deterrence was done at RAND, a think tank in Santa Monica, Calif., established with the sponsorship of the Air Force.

The official view in the 1950s was that deterrence was best achieved by strategic superiority. Deterrence was the declared basis of the “Massive Retaliation” doctrine adopted by the Eisenhower administration in 1953.

There were two basic concepts on how to employ nuclear weapons, initially known as “Counterforce” and “Countercity.”

Counterforce targeted military forces, installations, and assets.

Countercity, which was soon renamed “Countervalue,” targeted the enemy’s economy and population.

Counterforce cost more and required



Poet Robert Frost watches McNamara speak with University of Michigan president Harlan Hatcher before the start of commencement exercises in 1962. It was here, in Ann Arbor, that McNamara gave his famous “No Cities” speech.

a more capable force. Its great champion was the Air Force. The Navy, seeking to capture the primary strategic mission from the Air Force, proposed a variation on Countervalue called “Finite Deterrence.”

According to the Navy, deterrence could be assured by holding at risk a “finite” list of urban-industrial and command centers in the heart of the Soviet Union. This could be achieved by a force of only 200 Polaris missiles launched from Navy submarines.

The Single Integrated Operational Plan—the nation’s first comprehensive nuclear war plan—was created in 1960, to go into effect in 1961. It called for firing right away the entire nuclear alert force, 1,459 weapons against 654 targets, in accordance with the Strategic Air Command’s “optimum mix.” About 80 percent of the targets were counterforce.

During his first weeks in the Pentagon, McNamara had a briefing on a Navy study called “WSEG-50,” a repackaging of Finite Deterrence that touted the merits of Polaris missiles and submarines. He also heard a presentation from William Kaufmann, a foremost advocate of counterforce and one of a coterie of RAND analysts McNamara had brought in as advisors to the Department of Defense. McNamara was impressed with what Kaufmann had to say.



Gen. Thomas Power led SAC from 1957 to 1964. McNamara was reportedly “disgusted” by the acerbic Power.

In February, McNamara visited SAC headquarters for a full rundown on the SIOP by Gen. Thomas S. Power. He was reported to have been “disgusted” with both the SIOP and Power, a blunt hardliner with an acerbic personality. On his return to Washington, he ordered a revision to the SIOP for counterforce options to avoid major cities.

NO CITIES

McNamara conveyed his recommendations for change to Kennedy through a series of “draft presidential memos,” or DPMs, that became policy when the president signed off on them. The first such DPM in Sep-

tember 1961 rejected “the extremes of a ‘minimum deterrence’ posture”—as suggested by WSEG-50 and the Navy—as well as the “full first strike” capability of the old SIOP.

“The forces I am recommending have been chosen to provide the United States with the capability, in the event of a Soviet nuclear attack, first to strike back against the Soviet bomber bases and missile sites and other installations associated with long-range nuclear forces, in order to reduce Soviet power and limit the damage that can be done to us by vulnerable Soviet follow-on forces, while second, holding in protected reserve forces capable of destroying the Soviet urban society, if necessary, in a controlled and deliberate way,” McNamara said in the DPM.

Of the 1,350-2,200 target options projected by the DPM, only 200 were “urban-industrial aimpoints.” The others were counterforce: bomber bases, nuclear storage and production facilities, submarine bases, and—the largest category—450-1,300 ICBM sites.

The new policy disturbed the Europeans, especially the French, who saw it as “decoupling” of Europe from the extended US nuclear deterrent. To the Europeans, the key to their security was the threat of early escalation to massive retaliation in the event of a Soviet attack.

In his “No Cities” speech at the University of Michigan in 1962, McNamara was even more emphatic about the dangers of minimum deterrence. In focusing on the enemy’s forces instead of the civilian population, he said, “we are giving a possible opponent the strongest imaginable incentive to refrain from striking our own cities.

“Relatively weak national nuclear forces with enemy cities as their targets are not likely to be sufficient to perform even the function of deterrence,” he said, “In the event of war, the use of such a force against the cities of a major nuclear power would be tantamount to suicide, whereas its employment against significant military targets would have a negligible effect on the outcome of the conflict.

“Limited nuclear capabilities, operating independently, are dangerous, expensive, prone to obsolescence, and lacking in credibility as a deterrent.”

His conviction was not as strong as it sounded. Even before the Ann Arbor

speech, McNamara had developed doubts, which were about to spill over into another change.

COUNTERFORCE UNRAVELS

The Air Force, understandably enough, sought to increase its capabilities to meet the higher requirements of Counterforce/No Cities. However, Kennedy and McNamara did not want to build up the force. They wanted to cut it.

The Skybolt missile for the B-52 bomber had been killed, and the B-70 bomber was downgraded to R&D status. The Air Force's Minuteman ICBM program was reduced from 2,000 missiles to 1,600, then to 1,000. McNamara would have cut it further if he had been able to get by with it politically.

"The Air Force and, by this time, the entire JCS kept up their pressure for more weapons, rationalizing their wish lists with language deliberately modeled on the Ann Arbor speech and in McNamara's DPMs," said Fred Kaplan in *The Wizards of Armageddon*.

"Increasingly, McNamara began to fear that the counterforce strategy presented no logical limit to the size of the arsenal; that as long as targets of potentially military value could be found or so long as the Soviets added more weapons to their own arsenal, someone could always claim that we did not have enough; that his own endorsement of counterforce was promoting an unlimited nuclear arms buildup that he had gone out of his way to suppress," Kaplan said.

McNamara decided to withdraw from "No Cities" and instructed his staff to no longer cite counterforce as the official strategic concept. The pullback was first seen in a November 1962 DPM.

"We should take all measures that offer a reasonable prospect of effectively limiting damage to ourselves and our allies in the event that deterrence fails and thermonuclear war does occur," the DPM said. "Such measures include active antibomber and antimissile defenses and civil defenses. Strategic offensive forces can also make an important contribution by striking back against Soviet bomber bases, missile sites, and other vulnerable elements of Soviet follow-on forces."

Thus counterforce was reduced in McNamara's mind from the central point of the strategy to an "also" con-



A B-52 armed with four air-launched nuclear missiles in 1961. That year's SIOP called for firing off the entire alert force in the event of nuclear war.

sideration, listed after the defensive measures taken to limit damage.

McNamara was not interested in US strategic superiority. In an interview with his friend and tennis partner, Stewart Alsop, for the *Saturday Evening Post*, he said that a nuclear exchange was more likely to be limited to military targets "when both sides have a sure second-strike capability. Then you might have a more stable balance of terror."

(MUTUAL) ASSURED DESTRUCTION

McNamara turned again to the RAND enclave in the Pentagon for a new look at deterrence. Alain C. Enthoven, the deputy assistant secretary of Defense for Systems Analysis, and staffer Frank Grinkl designed a computer program to analyze the capabilities actually required to forestall a Soviet attack.

They gave McNamara a cold-blooded answer on how much was enough. "The ability to destroy in retaliation 20 to 25 percent of the Soviet population and 50 percent of its industrial capacity was sufficient," Enthoven said, and that could be done with a US force much smaller than the one needed for Counterforce/No Cities.

In a December 1963 DPM, McNamara named this concept "Assured Destruction" and said it would "give us a high degree of confidence that, under all foreseeable conditions, we can deter a calculated deliberate nuclear attack."

In early 1964, McNamara received a report on the combined effects of

counterforce and defensive measures to limit damage from Air Force Brig. Gen. Glenn A. Kent, who was assigned to the Defense Department directorate of Research and Engineering. According to Kent's studies, civil defense and missile defense could limit US losses in an attack, but the Soviets could offset any such gains at an expense of two-thirds less on additional offensive forces.

McNamara committed himself to a strategy of assured destruction in a DPM on Dec. 3, 1964. Damage limitation was a distant second in consideration and counterforce had become a minor planning factor. McNamara reported on the new strategy in a presentation to Congress in February 1965 and thereafter expounded regularly on it.

In a speech in San Francisco in September 1967, McNamara declared that assured destruction was "the cornerstone of our strategic policy" and "the very essence of the whole deterrence concept."

"Our alert forces alone carry more than 2,200 weapons, each averaging more than the explosive equivalent of one megaton of TNT," he said. "Four hundred of these delivered on the Soviet Union would be sufficient to destroy over one-third of her population and one-half of her industry."

That, of course, was precisely the strategy and targeting concept he described at Ann Arbor as dangerous and lacking in credibility.

In McNamara's last posture statement before leaving office in 1968, he told Congress, "To put it bluntly, nei-



Gen. Russell Dougherty, SAC commander during the mid-1970s, said the US never targeted cities as such.

ther the Soviet Union nor the United States can now attack the other, even by complete surprise, without suffering massive damage in retaliation. ... It is precisely this mutual capability to destroy one another and, conversely, our respective inability to prevent such destruction, that provides both of us with the strongest possible motive to avoid a strategic nuclear war."

Strangely, Assured Destruction was "never a US strategic 'doctrine' in the military sense of the term," said McNamara's biographer, Deborah Shapley. "It was not put into the war plans. McNamara never went back to change the SIOP to allow the president to execute Assured Destruction—a retaliatory strike limited to Soviet cities and industry. Actual targets of US forces remained overwhelmingly programmed for counterforce." McNamara never made this clear in his pronouncements.

RESET

Mutual Assured Destruction soon lost its following, except among academic theorists and antinuclear activists in Congress and elsewhere who warned that any improvement to US strategic forces might incite the Soviet Union to launch a surprise attack.

"The doctrine of 'assured destruction' led to the extraordinary conclusion that the vulnerability of our civilian population was an asset reassuring the Soviet Union and guaranteeing its restraint in a crisis," said Henry Kissinger, national security adviser and Secretary of State in the Nixon administration. "For the first time, a major country saw an advantage in enhancing its own vulnerability."

Nixon's first Secretary of Defense, Melvin Laird, did not directly repudi-



A Minuteman missile during an R&D test flight in 1961.

ate the assured destruction concept, but the strategic forces kept using the targeting prescriptions in the SIOP.

"We never targeted a city as such," said Gen. Russell E. Dougherty, commander in chief of Strategic Air Command from 1974 to 1977. "We had many targets, discrete targets inside a city, the effect of which would be to destroy that city by peripheral effects. As our weapons got better, we could limit that collateral damage very considerably. But Moscow was a lucrative target because that was the heart of the command and control and anybody that thinks the command and control is not part of the military structure doesn't understand the military structure, and it had to be taken out."

In 1965, McNamara had opined that "there is no indication that the Soviets are seeking to develop a nuclear force as large as ours." He guessed wrong. The United States abandoned the goal of strategic superiority but the Soviets did not. The US ICBM force was frozen at 1,054 missiles. The Soviets achieved parity around 1969, then built their force to 1,440 and fielded four new ICBMs with significant gains in capability.

Faced with that relentless challenge, the United States returned to an avowed counterforce doctrine, definitively so in 1980 with the "Countervailing" strategy of the Carter administration. Ironically, the prime architect of that policy was Secretary of Defense Harold Brown, who had been on McNamara's team in the Pen-

tagon from 1961 onward as director of defense research and engineering and then as Secretary of the Air Force.

MCNAMARA LOOKS BACK

Until his death in 2009, McNamara wrote and spoke in defense of MAD. "Today it's a derogative term, but those that denigrate it don't understand deterrence," he said in an appearance on CNN's "Cold War" series in 1998. "It's not mad, it's logical."

For "MAD is Not Bad" in the *New Perspectives Quarterly* in 2000, he said, "There is no other basis for stability of deterrence between two nuclear-equipped opponents than the confidence on each side that they have the capability to absorb a first strike from the other side with sufficient weapons surviving to inflict unacceptable damage on the opponent when launching a second strike."

Writing in *Foreign Policy* ("Apocalypse Soon") in 2005, he said that, "for decades US nuclear forces have been sufficiently strong to absorb a first strike and then inflict 'unacceptable' damage on an opponent. That has been and (so long as we face a nuclear armed adversary) must continue to be the foundation of our nuclear deterrent."

However, the official history of the McNamara years published by the Office of the Secretary of Defense quotes a 1986 interview in which McNamara said he did not intend the Ann Arbor speech to reflect "a shift to counterforce doctrine, but rather a statement of policy, which we hoped would influence the Soviets."

"I never did believe in counterforce per se," he said. "What I was trying to suggest without labeling it as such was a damage-limiting strategy premised on attacking military targets as opposed to population centers."

In his *Foreign Policy* article, he said, "To launch weapons against a nuclear-equipped opponent would be suicidal," a conviction he claimed to have held from his first days as Secretary of Defense to the end of his tenure. "Although I believe Presidents John F. Kennedy and Lyndon Johnson shared my view, it was impossible for any of us to make such statements publicly because they were totally contrary to established NATO policy."

Taken in sum, the body of McNamara's statements, writings, and explanations leave open the question of what his core beliefs really were—or, indeed, if he had any.



The Dawn of American Airpower

A century ago, at St. Mihiel, American airpower came of age.

By Rebecca Grant

Col. William L. “Billy” Mitchell had a lot to prove at the Battle of St. Mihiel—fought between Sept. 12 and Sept. 15, 1918—and so did General John J. Pershing. It was the first attempt at a combined-arms ground and air operation and is viewed by historians as marking the dawn of modern airpower.

“The St. Mihiel attack ... was the first operation in the world war carried out by a complete American army under the independent control of its own commander,” according to the official American Battle Monuments Commission.

After the battle, President Woodrow Wilson sent congratulations on the “brilliant achievement,” while Field Marshal Ferdinand Foch called it a “magnificent victory.”

These were generous words, for in the end, the Battle of St. Mihiel wasn’t ranked as one of the major engagements of World War I. The four-day offensive, though, meant everything to the Americans.

By the summer of 1918, the US was still very much the junior partner among the Western allies, despite the 1.2 million American soldiers on the Western Front. The Americans were still firing French

artillery, flying French planes and being schooled by French officers.

Marshal Petain summed up the prevailing view at a commanders’ conference when he said: “There is no American army as such, as its units are either in training or are amalgamated with the British and French.”

St. Mihiel was meant to change all that. There were 550,000 troops, 3,000 pieces of field artillery, and over 1,000 aircraft preparing to assault a residual bulge in the German lines after German forces failed in their attempt to encircle Verdun in 1914. Pershing yearned to command American troops in combat and to teach the French and British a thing or two about modern warfare.

Pershing’s army concentrated all energies on preparing for the battle. A brilliant lieutenant colonel named George Catlett Marshall, age 38, was pulled back from command of a regiment to take charge of the operational planning for the offensive. Tanks—including some led by Pershing’s former aide, 32-year-old Col. George S. Patton Jr.—also had a role in the plan.

Mitchell believed St. Mihiel could raise the profile of the Air Service in Pershing’s eyes “if we delivered the goods.” The problem was, Mitchell had nowhere near enough aircraft to pull it off.

COMMAND OF THE AIR

A “bare dozen” squadrons; that’s what his British friends figured Mitchell could muster in August 1918. They were right. The US Air Service had



Above: The St. Mihiel sector after the infamous battle. Left: Then-Brig. Gen. Billy Mitchell (l) and Gen. John Pershing in France during World War I. Mitchell gained his first star for his actions at St. Mihiel.

226 pursuit aircraft, 219 observation planes, and 42 bombing aircraft available. Of those, the observation planes were pledged to corps and division commanders for artillery spotting. "This kind of air work has been done now for three years and is well-understood," Mitchell said.

Mitchell had more in mind, though. His real ambitions hinged on the aviation units assigned only to First Army, which were directly under his command: pursuit, bombardment, and some balloon and observation units. Neither the corps nor the division generals—all of whom outranked him—had any claim on these air forces. With his own force, "I intend to change the ordinary procedure and employ massed air attacks against the vital points in the enemy's rear," Mitchell wrote.

For this air campaign, Mitchell planned to concentrate 2,000 aircraft so he could "hit first from one side of the salient, then from the other, just as a boxer gives a right hook and a left hook successively to his opponent." With strafing and light bombs, Mitchell's airmen were going to churn up the enemy troops caught in the salient and destroy as much as possible. It all depended on whether he could get the airplanes.

The answer? Charm. Mitchell borrowed 800 aircraft from the French and persuaded Britain to lend him half of British Air Marshal Maj. Gen. Hugh M. Trenchard's independent bombing force to strike point targets such as rail junctions, airfields, and supply centers.

Mitchell managed to amass almost 1,500 airplanes for the St. Mihiel of-

fensive. Of these, however, only about 1,100 to 1,200 were mission-capable. Never before had this many aircraft massed on the Western Front. The allies had created the most spectacular air armada of the war and placed it in the hands of an upstart American.

Trenchard's massive Handley Pages and other bombers would attack the night before the battle. Mitchell had Pershing sign out a list of bombing targets, sending the British deep to strike railroad ammunition dumps, the airdromes at Mars-la-Tour, and the rail station at Metz.

At first light, the pursuit squadrons would destroy all hostile aviation in the salient to "insure the absolute liberty of action of our observation aviation and attack balloons throughout this zone," as stated by Pershing in First Army's official orders. Pursuit flights of five or six aircraft would set up a double tier, some operating at 7,000 to 11,000 feet, with another layer above 11,000 feet to as high as 20,000 feet to ensure air superiority.

Then, within a few hours, the pursuit aircraft would swing into armed reconnaissance and battlefield interdiction roles. As directed by Mitchell and spelled out in First Army's official orders, the Air Service would "take every occasion to attack troops, trains, and important targets" on the ground. Low-flying pursuit patrols "should attack with bombs and machine guns" against enemy reinforcements "marching to the attack or enemy elements retreating." The airmen would bomb enemy concentration points,

command posts, and conduct “aerial bombing and fighting in close liaison with our own infantry.”

At the same time, daytime bombardment units—some American, many French, and even a few Italian—had a related mission to attack the rail and road junctions in the salient plus “all important objectives such as large gatherings of troops, material, air-dromes, and command posts.”

“Nothing like this had ever been tried before,” declared Mitchell. “It marked the beginning of the great strategical air operations away from the troops.”

That last remark was frequently misinterpreted (and got Mitchell in trouble for decades) but it is important to realize what Mitchell meant by it. “Strategical” in the fall of 1918 meant “air attack of enemy material of all kinds behind his lines,” not bombing Berlin.

Mitchell flew over the lines one last time on Sept. 10. It looked like the German forces were preparing to retreat. Back at First Army headquarters, staff counseled delaying the battle due to bad weather. Mitchell told Pershing flatly that “there was not going to be much of a battle at St. Mihiel anyway,” adding that “all we had to do was to jump on the Germans, and the quicker we did it, the better.”

On Sept. 12, the artillery barrage started at 1 a.m. The first observation balloon ascended at 4:40 in the morning, and the troops prepared to go over the hill at 5 a.m.

“It was the greatest Army ever assembled under the American flag,” marveled Mitchell.

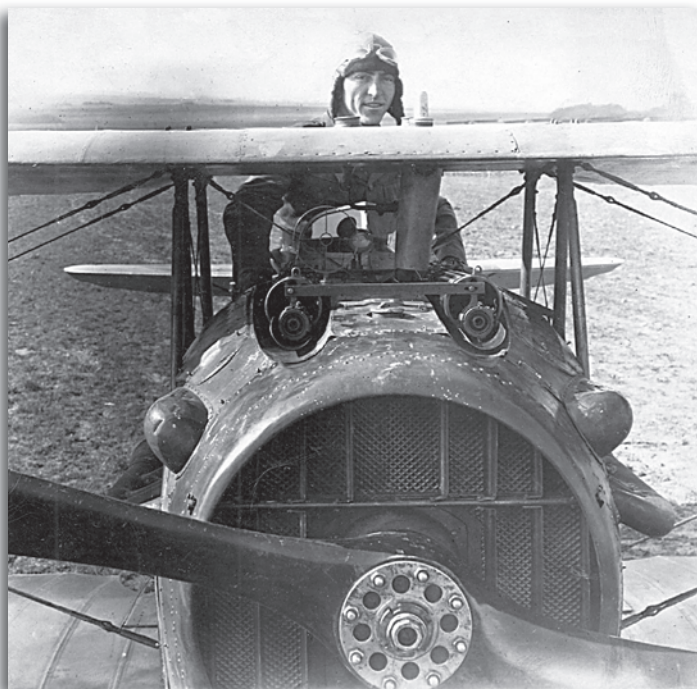
BATTLE IS JOINED

The St. Mihiel salient was abuzz with air activity right from the start of the battle. Pilots compensated for morning fog and rain by flying at extremely low altitude. Pursuit planes from the 147th Aero Squadron reported visibility “good at 500 meters” so that was where they flew their mission from 9:15 a.m. until just before 11 a.m. Some of the observation planes dipped down to between 50 and 100 meters.

Most of the pursuit patrols and ground attack sorties were flown within a relatively small area over the four American divisions advancing from the south. The “various layers of clouds did not prevent constant patrolling,” noted another airman.

Future ace 2nd Lt. Frank Luke Jr.

Capt. Eddie Rickenbacker (at St. Mihiel a lieutenant) became the leading ace of World War I and a recipient of France's Croix de Guerre and the US military's Medal of Honor.



of the 27th Aero Squadron got his first balloon kill at nine minutes past eight that morning. In the 22nd Aero Squadron, a pursuit pilot glimpsed a German observation plane. Its crew saw the Spad and dove to get out of range, but to no avail. “Result—one Hannoveraner diving through a layer of mist to its crash,” the squadron recorded.

With the sky full of allies the defending Germans were outmatched. “Many Allied planes, including bombers, going over lines all over sector,” reported 2nd Lt. Arthur H. Jones of the 147th.

Now Mitchell waited for the roads to fill so he could unleash more pursuit planes and bombers. He kept several squadrons on alert. In the 3rd Pursuit Group, the 103rd Aero Squadron received orders that “all available planes, including those with bomb racks installed, will be held on alert from 8 o'clock, ready to leave within 10 minutes.”

By noon, American ground forces were speeding ahead. Retreating Germans began to jam the roads. By afternoon, “roads leading out of the salient between the two attacks were filled with retreating enemy troops, with their trains and artillery,” said Pershing. He ordered the ground troops to accelerate their forward push.

Air attacks escalated. Shortly after 1 p.m., aviators spotted 2,000-3,000 German troops on the roads into Dampvieux, now only about six miles ahead of the advance line of the 42nd Division. At 4:15, Mitchell scrambled the 103rd

and three other squadrons to bomb and attack retreating German troops. Striking so close to advancing lines of the US, 1st and 42nd Divisions posed a problem. They needed a bomb line to use as a marker. Commanders quickly designated roads between Vigneulles and St. Benoit to control this close air support.

Mitchell's bombers were in the fight, too. At half past one, the 96th Aero Squadron launched nine bombing aircraft to fly at 2,500 feet to their targets at Dampvieux. Eight made it there and dropped 248 bombs, returning two hours later.

The Germans were losing men and supplies in the pell-mell flight.

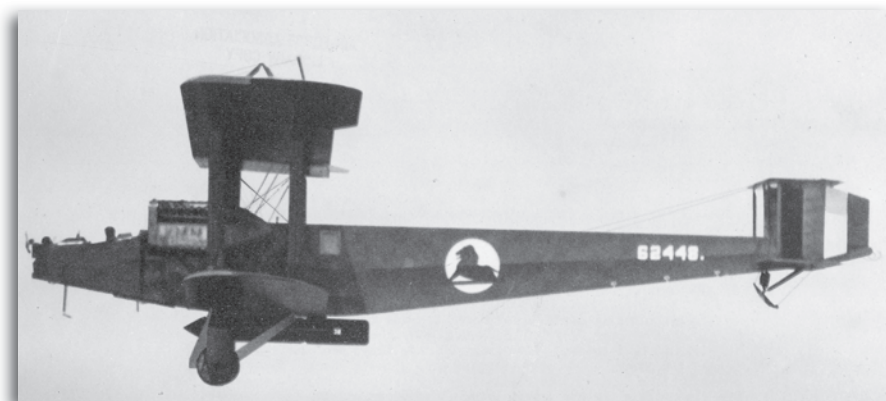
Mitchell was delighted with the air operations. “I was very much pleased with the fact that virtually no German airplanes got over our ground troops,” he said.

“The American fliers made themselves very disagreeable,” said the German commander at St. Mihiel, Gen. Max von Gallwitz. “I have experienced a good many things in the five years of war and have not been poor in successes, but I must count the 12th of September among my few black days.”

BATTLING ON

Air activity and interdiction picked up on the second day, Sept. 13, as American troops pressed toward their second-day objectives.

Two pilots of the 94th Aero Squadron flew three sorties each, hunting for targets. Just before 10 a.m., Lt. Edward



A British Handley Page bomber in World War I. Mitchell amassed some 1,500 international aircraft for the St. Mihiel offensive.

Rickenbacker and Lt. Reed Chambers of the 94th Aero Squadron went up the lines toward Vigneulles in poor weather but saw only French and American wagons and German prisoners.

Unsatisfied, the pair returned to base, refueled, rearmed, and took off again at 12:26 p.m. West of Vigneulles, just ahead of the 26th division's advance, they spotted eight German 155 mm artillery pieces drawn by six horses each. Rickenbacker circled and the artillerymen fled as he "fired probably 20 or 25 shots" before the gun jammed. "Horses and wagons scattered everywhere," recounted Rickenbacker. The physical damage was not great but the disruption worked. "Now let's see you straighten up that mess," Rickenbacker thought as he and Chambers departed.

Back at base, at 3:17 p.m. Rickenbacker went up alone for a voluntary patrol over German positions north of the salient, nearly 10 miles ahead of the front lines. At 3:45, Chambers, with a new wingman, took off for his third armed reconnaissance patrol in front of the 26th, 1st, 42nd, and 89th Divisions, who were digging in on new phase lines.

This was just what Mitchell wanted. Conditions for harassing enemy ground forces were "ideal" in the salient since "the enemy's withdrawal was limited to a minimum of well-defined and exposed routes." He was especially satisfied that his air force had piled up the roads "with debris so that it was impossible for many of their troops to get away quickly, resulting in their capture by our infantry."

However, Mitchell's concerns about holding on to air superiority had been correct. One patrol bumped into 20 Fokkers late in the afternoon on Sept. 13.

The concentration of allied airpower

in the salient provided rich pickings for German aces. Lt. David E. Putnam, the top-ranked US ace to that point, got his thirteenth kill at 6:30 p.m. on the first day of the battle when he shot down a Fokker D.VII near Limey. An hour later, his luck ran out, as 20-year old German ace Georg von Hantelman shot Putnam down, killing him instantly. Hantelman shot down seven allied aircraft during the battle.

By the third day, Sept. 14, the Germans were rushing airpower to the St. Mihiel sector. "From an early hour, it became apparent that the enemy had very materially augmented his aerial forces," noted the operations summary that evening. Clear weather brought the enemies in contact.

First Pursuit Wing now swung to a pure air superiority role. They could still strafe, but in contrast to the beginning of the battle orders now stated: "No bombs will be placed on any pursuit aeroplanes."

Mitchell described the terrifying ordeal of a French bombing squadron that failed to link up with its pursuit escorts on Sept. 14. Eighteen planes "huddled together as a flight of geese might when attacked by falcons" and pressed on to the rail junction target at Conflans. But the German aviators tore into them. Only five of 18 bombers returned.

Sorties flown that day surged to 1,140 as pursuit patrols drove the enemy air force to operate at least three to four miles back from the lines. Even as the Americans reached their final ground objectives, the aviators had to wage their toughest battles for air superiority to protect the advance and let bombing aircraft continue their missions.

Fierce air activity continued on Sept. 15. The "enemy aerial activity was very

pronounced in its aggressiveness" to the point that "practically every pursuit patrol which crossed the lines was engaged in combat with the enemy," attested the operations summary.

The 94th Aero Squadron encountered tough resistance about three miles ahead of the 2nd, 5th, and 90th Divisions at the extreme right of the line. Rickenbacker was flying at about 13,000 feet just after 8 a.m. when he spotted six enemy aircraft. He shot down one Fokker D.VII near the Bois de Warville. His squadron mate Lt. Joseph H. Eastman was jumped by four Fokkers barely a mile in front of French troops to the left.

Most of the leading aces scored kills during the last days of St. Mihiel. Eugene S. Coler—who always got his kills two at a time—brought down a pair of Fokker D.VIIs near Esnes. Oren J. Rose, August T. Iaccaci, Elliot W. Springs, and Frederick Libby also shot down German planes in the salient on Sept. 15.

By Sept. 16, the salient was completely under American control and the German bulge had ceased to exist. The US First Army took 16,000 German prisoners.

In the five days from Sept. 12 through Sept. 16, observation aircraft flew just under a thousand sorties in support of First Army's various divisions and corps. Aircraft under Mitchell's operational control flew about 3,357 pursuit and bombardment sorties.

For Pershing, the battle had been his first opportunity to lead a full American army into battle. For Mitchell, he had successfully planned and commanded the single biggest air offensive of the war.

A strong believer in critiques, Mitchell pointed out the difficulties of the bad weather, deficiencies in liaison between pursuit, observation and the antiaircraft stations, and the increasingly heavy antiaircraft fire. His achievement, though, marked the true introduction of airpower into combined-arms warfare. Thanks to Mitchell, the First Army had seen up close how well wide-ranging air attacks worked in open warfare.

"I am proud of you all," Pershing enthused.

For his achievements with airpower at St. Mihiel, Pershing promoted Mitchell to the rank of Brigadier General. At 38, he had made his mark at last.

Members of Team Air Force
at this year's Warrior Games.



By Russ Lewey

DOD WARRIOR GAMES

This year's Department of Defense Warrior Games were held June 1 to 9 and hosted by USAF at the Air Force Academy in Colorado Springs, Colo. (See "Warriors for Life," p. 18.)

The Air Force Association was on hand to support the athletes, their caregivers, and families. Led by Vice President of Member and Field Relations Kari Voliva, who also manages AFA's Wounded Airman Program, AFA did an outstanding job of showing the athletes, their families and friends, and spectators how the association does things "first class." Numerous volunteers, Voliva, and her AFA team members Sharon Kayira and Christine Brown pulled it all together.

Only Active Duty airmen are eligible to receive funds directly from USAF. But, through corporate and field donations raised in support of AFA's Wounded Airman Program, Voliva's team helped raise over \$120,000 to cover the Trials and Warrior Games. These funds helped support 25 veterans compete in the Trials. From those 25, eight of the AFA-supported veterans were selected and funded to round out the 40 members who made up Team Air Force.

AFA set up a hospitality tent, loaded with drinks, snacks, and ice cream for the athletes and their families. All were pleased with the support shown to our wounded airmen. I believe that our support played a small part in the success

Right: Capt. Hunter Barnhill
interacting with young fans.
Below: Athletes, families,
and spectators gather
at AFA's hospitality tent,
funded by the Wounded
Airman Program.



Russ Lewey is AFA's South Central Region President.

of Team Air Force, which won the most medals, winning 165 over the course of these games (64 more than the nearest competitor, the Navy). Next year's games are being hosted by SOCOM at MacDill, AFB, Fla.

AFA's Wounded Airman Program also provided memorial bracelets for all attendees to wear in honor of two fallen heroes who the program had supported throughout previous Warrior Games: Capt. Austin Williamson and Christopher Cochrane.



The competition looks fierce among the Indoor Rowing athletes, a new event added to the Warrior Games in 2018.



All smiles from the medal winners.



Memorial bracelets honoring the memory of previous competitors.



Airmen taking care of airmen.

Photos: MSgt. David Long; Russ Lewey (3); McKinnon Pearce/AFA Staff (6)

The graphic features the CyberPatriot National Youth Cyber Education Program logo on the left, which includes a circular emblem with an American flag and the text "CYBERPATRIOT", "INTEGRITY, SERVICE, EXCELLENCE", and "NATIONAL YOUTH CYBER EDUCATION PROGRAM". To the right of the logo are five circular icons: a blue shield with a padlock, a green circle with a person and a computer monitor, a yellow circle with a person and a book, a purple circle with an open book, and a teal circle with a computer mouse. Below these icons is the text "THE FUTURE IS CYBER." and "Visit www.uscyberpatriot.org to learn more." At the bottom right, it says "A STEM program of the Air Force Association" next to the AFA logo.

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A STEM program of the Air Force Association



SELFRIDGE

Life Before Death

Today, Thomas E. Selfridge is usually remembered simply as the first person to die in an airplane crash. He was riding in a Wright Flyer that fell to Earth on Sept. 17, 1908, at Fort Myer, Va. The pilot, Orville Wright, survived. Selfridge did not.

So historic was First Lieutenant Selfridge's death that it has tended to obscure the rest of what was a truly remarkable life.

Selfridge was the first US military officer to pilot a heavier-than-air system. He was the first to design an airplane. He was the first officer to pilot a dirigible. He helped Wright set world air records. All of this he had accomplished by age 26.

Thomas Etholen Selfridge, born and reared in San Francisco, came from a renowned Navy family. In 1899, however, he entered West Point, graduating (with Douglas MacArthur) in the Class of 1903.

Young Selfridge was commissioned a second lieutenant of artillery but soon fell in love with aviation. He studied the work of Alexander Graham Bell with large, heavy-lift kites. Selfridge wrote to Bell, who acceded to his requests to witness his experiments in Baddeck, Nova Scotia.

Bell persuaded President Theodore Roosevelt to make Selfridge an official US observer to the Nova Scotia experiments. In the summer of 1907, he met aviation pioneers F. W. Baldwin and Glenn H. Curtiss.



1/ Thomas Selfridge. 2/ Maintainers and Warthogs at Selfridge ANGB, Mich. 3/ Selfridge (left) and Orville Wright at the outset of the fatal flight.

THOMAS ETHOLEN SELFRIDGE

Born: Feb. 8, 1882, San Francisco

Died: Sept. 17, 1908 (KIF), Fort Myer, Va.

College: US Military Academy, West Point, N.Y.

Occupation: US military officer

Services: US Army—Artillery (1903-07); Aeronautical Div., Signal Corps (1908) Massachusetts Militia

Main Era: Pioneering Era

Years Active: 1903-1908

Final Grade: First Lieutenant

Famous Friends: Alexander Graham Bell, Glenn H. Curtiss

Buried: Arlington National Cemetery, Arlington, Va.

SELFRIDGE ANG BASE

State: Michigan

Nearest City: Mount Clemens

Area of Main Base: 5.6 Sq mi./3,600 acres

Status: Open, operational

Opened as Joy Aviation Field (private): 1916

Leased by US Army: May 1917

Renamed Selfridge AFB: Sept. 17, 1947

Renamed Selfridge ANG Base: July 1, 1971

Current Owner: Air National Guard

Former Owners: US Army 1917-47 (Air Pilot School, 1st Pursuit Group, GHQ Air Force, Air Combat Command, 1st Air Force, Continental Air Forces), and USAF 1947-71 (Air/Aerospace Defense Command)

Bell's group built a huge kite, called "Cygnnet I." Towed on a nearby lake, the kite, with Selfridge at the controls, caught wind and soared at a height of 168 feet for seven minutes.

In early 1908, Selfridge designed Bell's first true airplane—"Red Wing." On March 12, 1908, Baldwin flew it for 318 feet.

Next, the Bell group built a more-capable airplane, "White Wing." On May 19, 1908, Selfridge boarded it and became the first US military officer to pilot a powered aircraft. His three flights covered 100 feet, 200 feet, and 2,400 feet.

Selfridge supervised the construction of a third airplane, "June Bug." First flown by Curtiss, Selfridge later flew it several times. June Bug won the Scientific American Trophy that year.

In August 1908, Selfridge was detailed to the Signal Corps' Aeronautical Division, which was engaged in testing a dirigible. He was the first to fly it.

He was next assigned to a board conducting trials of the Wright airplane at Fort Myer. For the next two weeks, the Flyer broke record after record.

Late in the afternoon of Sept. 17, Selfridge climbed aboard the Flyer, followed by Wright. At 5:14 p.m., it lifted off the fort's Summerall parade ground. At 5:18 p.m., the Flyer took an unexpected dive from 75 feet. It crashed, hard. Selfridge suffered a fractured skull. By 8:10 p.m., he was dead.

In 1917, the Air Service acquired a small private airfield near Detroit and rechrist-

ened it Selfridge Field. It has been open ever since. Today, it belongs to the Michigan Air National Guard and is home to the 127th Wing, operating KC-135 tankers and A-10 attack jets. Selfridge also hosts several Air Force Reserve, Navy Reserve, Marine Corps Reserve, Army Reserve, Army National Guard, and Coast Guard units.



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