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# AIR FORCE

MAGAZINE

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# Gulfstream

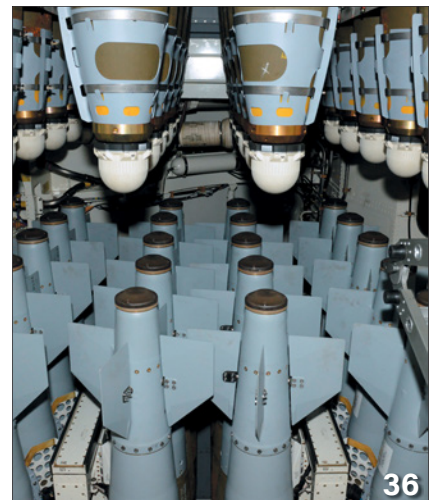
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RPA's are proliferating, but manned aircraft like this E-3 still play a vital role. See "ISR Explosion," p. 48.  
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# Silent Leadership—At a Cost

In early April, the US Navy launched a large attack against the airfield from which Syrian strongman Bashar al-Assad launched aircraft to egregiously attack his own civilians with sarin nerve gas.

News reports and Trump administration statements quickly laid out the details: Fifty-nine Tomahawk Land-Attack Cruise Missiles targeted Syria's al-Shayrat airfield in a strike designed to destroy aircraft and ground infrastructure.

The Tomahawks were launched from the Navy destroyers *Ross* and *Porter* in the eastern Mediterranean Sea. The Pentagon immediately released dramatic photos and videos of the missiles firing from the decks of the Navy destroyers.

The attack was perfectly described in the explanatory accounts, and the details helped readers and viewers understand the attack and how the Navy made it happen.

Compare this with another high-profile attack on ISIS later the same month.

On April 13, "US Forces Afghanistan conducted a strike on an [ISIS]-Khorasan tunnel complex in ... Afghanistan, as part of ongoing efforts to defeat ISIS-K in Afghanistan," read the Pentagon's official announcement.

"The strike used a GBU-43/B Massive Ordnance Air Blast bomb dropped from a US aircraft," the statement continued.

"This is the right munition to reduce these obstacles and maintain the momentum of our offensive against ISIS-K," said Army Gen. John W. Nicholson, commander of US Forces Afghanistan, in the news release.

Notably absent was any reference to the Air Force in describing a "US Forces Afghanistan" attack and a MOAB bomb dropped from "a US aircraft." This is technically correct, but it would also be correct to say US citizens conducted the strike from a flying machine.

When the Pentagon released video of this attack, a description began, "A GBU-43/B Massive Ordnance Air Blast bomb strikes an

ISIS-K cave and tunnel system," as if the MOAB delivered itself. In reality, America's most powerful non-nuclear weapon was developed by the Air Force Research Laboratory and was delivered by the crew of an Air Force Special Operations Command MC-130.

Unfortunately this is not an isolated incident. It is frequently difficult to learn of the Air Force's wartime contributions, for a variety of reasons.

Part of it is a service culture that avoids the limelight, with many airmen preferring to quietly get the job done without calling attention to themselves. Rather than proudly touting its accomplishments, something the other services relish, USAF often shuns the spotlight.

Part of it is the nature of today's wars. When reporters are embedded with ground units in war zones, they will see the war up close, but what they see will be war from the ground perspective.

**You may not have heard, but the Air Force is flying three-quarters of the missions against ISIS.**

The Navy has videographers at the ready (as was seen aboard *Ross* and *Porter*) and regularly brings reporters aboard its deployed vessels. Jennifer Hlad, a former *Air Force Magazine* senior editor, was recently invited aboard the carrier *George H. W. Bush* as it patrolled the Persian Gulf.

Meanwhile, it is difficult to gain access to wartime air bases. Many of them are officially in "undisclosed locations," as several Middle Eastern nations prefer to keep the fact that US forces are operating from their soil an open secret.

Part of it is misperception. Since 1992, the Air Force has made air war look easy, when it is not. The service has excelled against enemies that lack advanced technology or modern air defenses, leading many to conclude that aged B-52s, KC-135s, and F-16s are good enough for whatever the US may face. Old systems, no matter how well maintained, will not be good enough against a more sophisticated enemy—unless the US is willing to accept unnecessary deaths.

These factors accumulate to become a lack of appreciation for the Air Force's role defending the nation and winning its wars. Over time, this negatively affects USAF's stature, influence, and funding. For example, the Air Force has in recent years been repeatedly stymied in its efforts to shed excess infrastructure, retire old aircraft, and fund its modernization programs.

The Air Force fully embraces joint and coalition warfare—and is a full partner in it. No service should fight alone. When USAF's contributions remain behind the scenes, however, it reduces awareness and, ultimately, dollars. This is a real-world problem, as funding for Air Force programs is now down to 21.4 percent of the defense budget. That fact is rarely mentioned.

The Air Force alone is flying 80 percent of the sorties and dropping 70 percent of all bombs targeting ISIS. That fact is also rarely mentioned.



**An Alabama Air National Guard F-16 arrives at an undisclosed location in Southwest Asia. USAF has made air war look quiet and easy, but it is not.**



# Flying together for 70 years



Photo: U.S. Air Force

For seven decades, U.S. Air Force pilots have taken to the skies, and Rolls-Royce has proudly supplied thousands of engines to keep them aloft. From the early V-1710 engines powering P-51 Mustangs, to the current fleet of C-130Js, CV-22s and Global Hawks powered by Rolls-Royce AE engines, our facility in Indianapolis has kept those aircraft soaring.

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Rolls-Royce



**YF-16 Vs. YF-17**

I really enjoyed your article on the 16/17 fly-off, but there are a couple of things you may not know about [“Legacy of the Lightweight Fighter Competition,” February, p. 59]:

The fighter mafia was led by Col. John Boyd, who originated the whole concept of energy maneuverability focusing fighter design concepts to higher thrust and greater wing area to assure they could take on all comers and not have to face the issues F-4 drivers faced in Vietnam. Harry [Hillaker] was a dues paying member—but a contractor (General Dynamics).

It was not originally a fly-off. It was originally intended to be a technology demonstration. It was called the Lightweight Fighter (LWF) program without necessarily having an ending. It was only during the actual flying that the powers that be suggested the high/low mix—and that the LWF winner would be the low and get a full-scale development contract.

The evaluation team included a Tactical Air Command (TAC) contingent assigned to the 4486th Test Squadron (part of the Fighter Weapons Center at Nellis). Included on this team were Lt. Col. Duke Johnston, Capt. Dean Stickell (YF-16 pilot), Capt. Joe Bill Dryden (YF-17 pilot), and Capt. Hugo Heyns (aircraft maintenance officer), along with three aircraft specialists (avionics, engine, and crew chief).

At the end, the competition was not close. The YF-16 outperformed the YF-17

in just about every measure. I’ve got a bunch of stories behind that comment. It was really interesting. Everyone (operations, maintenance, logistics, finance, and politics) all agreed: The YF-16 was the right aircraft at the right time.

Following the January 1975 announcement, we conducted another test program (the beyond visual range evaluation) using a variety of aircraft from around the Air Force—all assigned TDY to Edwards. Ultimately this program was directed to define the specs for the F-16 radar—which was not considered as part of the LWF, because it was John Boyd’s thought that we needed something that could dogfight during daylight—ultimately to be a day VFR fighter (if it ever went into production).

In January-February 1975, the Navy sent in a team to help it define its next aircraft. The commander in charge came to my office and told me he was there to evaluate the two aircraft and make a recommendation to his bosses. He then asked me to show him where the aircraft with two engines was. He had been told which to pick, clearly knowing that the Navy had made up its mind and was not going to be confused by facts.

You noted the YF-16XL and its competition with what became the F-15E, but you did not address the F-16/79 where General Dynamics installed a J79 engine in a YF-16 in order to have something to offer the Chinese Air Force (CAF) on Taiwan. President Jimmy Carter would not allow CAF to buy the full F-16, at that point. As a General Dynamics employee following my eight-year USAF career, I participated in the F-16/79 program logistics and met with CAF leadership as part of the possible FMS.

I’m sure you won’t get a chance to redo this article, but thought you ought to know a little more about the program about which you wrote.

And by the way, if you ever get around to a similar story on the A-12 program that everyone thought was such a disaster, I’ll be happy to help you better understand the truth behind all the falsehoods in that program.

Hugo E. Heyns III  
Albuquerque, N.M.

**C&C and Pearl Harbor**

Your article “Command and Control Evolution” [February 2016, p. 64] was a very interesting read. It really hit the nail on the head, so to speak. I was a ground radio operator for most of my 26 years of Active Duty, primarily working long-range communication by either being in SAC or supporting SAC when in AFCS/AFCC. This would include several assignments to the old Alpha/Bravo net, later called Giant Talk. We also broadcast SAC EAMs when at the RAF Croughton aeronautical station. Then there was the PACAF Commando Escort network, when I was based in the Philippines.

I was a small part of the command and control evolution. Something I always told the “new guys” was that without comm, we would just be a bunch of folks running around bumping into each other.

I [also] thoroughly enjoyed the article “Pearl Harbor Rides” again [November/December 2016, p. 22]. It mentions there were 10 reviews after the attack, even as late as 1995. In 2015 the Navy turned down yet another appeal. However, Admiral Kimmel and General Short were never truly absolved of their alleged negligence prior to the attack.

And then there is the Philippines. General MacArthur who had about eight hours’ warning still had most of his aircraft on the ground when the Japanese attacked. This effectively eliminated his air force. So what was his punishment? He was praised for his defense of the islands, given the Medal of Honor, and sent

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—The Editors

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to Australia to raise an army to retake the Philippines, among other locations.

So I guess in 1941-42, what America needed was a new hero and two scapegoats. It appears we got both.

SMSgt. David R. Caron,  
USAF (Ret.)  
Las Vegas

### Helicopter Evolution

The UH-1N replaced the HH-1H, not UH-1H for missile site support service. ["Gallery of Weapons," June, p. 95]. The HH-1H replaced the UH-1F. The TH-1H is a modified single-engine variant, not twin engine, used for flight training.

MSgt. Hank Wiswell,  
USAF (Ret.)  
Spokane, Wash.

■ Retired Master Sergeant Wiswell's point about the single engine is correct, and the legacy variant can accurately be referred to as HH-1H (reflecting its original search and rescue role). SAR variants of the N model were similarly designated, though the UH-1N designation more accurately highlights its

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**NOMINATIONS: To be Lieutenant General:** Bradford J. **Shwedo**, Giovanni K. **Tuck**.

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missile field utility role. We will modify the "Gallery of Weapons" UH-1 Huey/Iroquois entry.

—Aaron M. U. Church

### I've Seen This Movie Before ...

Colonel Damm's letter ["Nukes Not for Everyone," June, p. 6] is another example of why I have the greatest respect for missileers. There are no truer patriots. For the record, I was never a member of that elite group.

However, I did spend 38 years acquiring and sustaining military systems, including eight years as the senior industry manager for the integrated sustainment of Minuteman. Thus I have some relevant but pessimistic experience regarding the prospects for a follow-on ICBM and what is likely to be happening to Minuteman today.

I've seen this acquisition scenario play out too many times. In this case, it is about the Minuteman system, an engineering marvel that can continue for decades to be a ready, reliable, and capable deterrent, with overwhelming destructive force. However, like all aging systems it needs



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James R. **Sears Jr.**, from Cmdr., 455th AEW, ACC, Bagram Airfield, Afghanistan, to Dir., Intel., Ops., & Nuclear Integration, AETC, JBSA-Randolph, Texas ... Brig. Gen. John E. **Shaw**, from Dep. Dir., Global Ops., STRATCOM, Offutt AFB, Neb., to Dir., Strat. Plans, Prgms., Rqmts., & Analysis, AFSPC, Peterson AFB, Colo. ... Brig. Gen. (sel.) Donna D. **Shipton**, from Sr. Mil. Asst., SECAF, Acq., Pentagon, to PEO, Tankers, Office of the Asst. SECAF, Acq., Wright-Patterson AFB, Ohio ... Maj. Gen. Bradford J. **Shwedo**, from Cmdr., 25th AF, ACC, JB San Antonio-Lackland, Texas, to Chief, Info. Dominance, OSAF, Pentagon ... Brig. Gen. Daniel L. **Simpson**, from Dep. Dir., Intel., US Forces Afghanistan, CENTCOM, Kabul, Afghanistan, to Dir., Intel. & Info., NORAD, NORTHCOM, Peterson AFB, Colo. ... Maj. Gen. (sel.) Robert J. **Skinner**, from Dep. Cmdr., Jt. Force Headquarters, DOD Info. Networks, DISA, Ft. Meade, Md., to Vice Cmdr., AFSPC, Peterson, AFB, Colo. ... Brig. Gen. (sel.) Jeremy T. **Sloane**, from Vice Dir., Ops., NORAD, Peterson AFB, Colo., to Commandant, AWC, AETC, Maxwell AFB, Ala. ... Brig. Gen. (sel.) Phillip A. **Stewart**, from Dep. Dir., Ops., USAF, Ramstein AB, Germany, to Cmdr., 438th AEW, ACC, Kabul, Afghanistan ... Brig. Gen. Brad M. **Sullivan**, from Dir., Intel. & Info., NORAD, NORTHCOM, Peterson AFB, Colo., to Dep. Dir., Ops., Ops. Team 2, Natl. Jt. Ops. & Intel. Center, Jt. Staff, Pentagon ... Maj. Gen. (sel.) Jon T. **Thomas**, from Dir., Strat. Plans, Rqmts., & Prgms., AMC, Scott AFB, Ill, to Dir., Ops, Strat. Deterrence, & Nuclear Integration, USAF, Ramstein AB, Germany ... Maj. Gen. Giovanni K. **Tuck**, from Dir., Ops. & Plans, TRANSCOM, Scott AFB, Ill, to Cmdr., 18th AF, AMC, Scott AFB, Ill. ... Maj. Gen. (sel.) John M. **Wood**, from Dep. Dir., Politico-Mil. Affairs (Europe, NATO, Russia), Jt. Staff, Pentagon, to Dir., Strat. Plans, Rqmts., & Prgms., AMC, Scott AFB, Ill.

**SENIOR EXECUTIVE SERVICE RETIREMENT:** James L. **McGinley**.

**SES CHANGES:** Amy K. **Mitchell**, to Spec. Asst. to the SECDEF for Protocol, Office of the SECDEF, Pentagon ... Robert **Soofer**, to Dep. Asst. SECDEF, Nuclear & Missile Defense Policy, Office of Asst. SECDEF for Strategy, Plans, & Capabilities, Pentagon.

a continuous flow of modifications and upgrades to stay healthy.

But the narrative goes like this: The Minuteman mods and upgrades are expensive, the Air Force is planning a follow-on ICBM called Ground-Based Strategic Deterrent, dollars are short, and therefore we need to wait for the results of the GBSB studies before we sink more money into Minuteman.

However, the studies drag on; problematic political and budgetary issues delay or cancel the GBSB.

Meanwhile, Minuteman degrades to such an unsatisfactory condition that deactivation is the only consensus solution. The cry for deactivation is usually fueled by the next accident or management failure, which will come sooner than later if Minuteman mods and upgrades are starved.

For many years, it's been clear to me that those seriously interested in maintaining deterrence should first fund and field the new bomber and the SLBM boats (or whatever the Navy needs) and upgrade the stockpile. Meanwhile, pay the much smaller bills to keep Minuteman healthy. Don't starve this ace-in-the-hole by deferring mods and refurbishments that are necessary to ensure Minuteman remains viable.

Seriously, does anyone think the future political and budgetary environment can possibly support new bombers, boats, stockpile upgrades, and ICBMs? That dog doesn't hunt.

The scenario I fear most: The new bomber and the boats are delayed, the stockpile continues to deteriorate, and Minuteman has been deactivated.

Brig. Gen. John L. Clay,  
USAF (Ret.)  
Las Vegas

## Clearing Up Taranto

In the June issue a critical line was left out of my response to Ray Panko about the British attack on the Italian battleships at Taranto. After citing the numerous operational accounts that report the average depth of the harbor at 39 to 49 feet, I further said that "Mr. Panko's data calls this into doubt, particularly in the area where the battleships were moored," acknowledging the new information he had provided. Other factors—such as the two battleships left with their decks awash but not completely submerged after the attack—complicate the question, but Mr. Panko's depth chart of the harbor has to be recognized and considered as well.

John T. Correll  
Annandale, Va.



## Air Force on ISIS; Africans solving African problems

### THE FIGHT FROM THE AIR

The Air Force continued to lead the fight against ISIS from the air through the spring.

As of early May, the coalition had dropped nearly 80,000 weapons in the conflict. Roughly 70 percent were dropped by the Air Force. But in the last week of April, the Air Force dropped 80 percent of the nearly 700 weapons delivered against ISIS targets in Iraq and Syria, US Air Forces Central Command spokesman Lt. Col. Damien Pickart told *Air Force Magazine*.

Still, there are aircraft from all US military branches and the US-led coalition under the control of the combined force air component commander, and “each one brings a unique capability essential to the fight,” Pickart said.

### DISASTER PREPPERS IN AFRICA

On a more peaceful note, USAF’s African Partnership Flights are all about strengthening alliances and building capacity in nations. The most recent APF—the 10th in five years—was no different.

APF Burkina Faso included about two dozen American airmen and about 60 airmen from several African nations. It was designed to share best practices for maintenance and logistics in a humanitarian assistance or disaster relief situation.

Burkina Faso, the host nation, chose the humanitarian disaster relief theme, said Col. Ric Trimillos, chief for the International Affairs Division for US Air Forces in Europe and Air Forces Africa. The event was entirely work-group based.

“We’re not teaching them; we’re facilitating this work group, so that way, the best practices between the countries come out. And more importantly, the African partners are building relationships between each other, and they know what each other is capable of doing,” Trimillos explained. “We’re really working to enable Africans to solve African problems.”

Burkina Faso, Chad, Mali, Mauritania, and Niger participated in the APF, with airmen from Côte d’Ivoire and Morocco observing, Trimillos said.

The countries have different capabilities and experiences, said Capt. Robert Kent of the 305th Aerial Port Squadron at JB McGuire-Dix-Lakehurst, N.J.

One of the “biggest focus items” was building and sustaining good relationships with other countries, because in the event of a humanitarian assistance or disaster relief crisis, they are likely to need help from other nations, Kent said.

Trimillos said APFs are not just designed to build aviation capacity but to enhance regional cooperation and the partners’ interoperability.

“That’s the big goal,” he said, “because we believe as a foundational concept that if the African nations are working together, that builds more stability to the region.”

US airmen from Joint Base McGuire-Dix-Lakehurst (JB MDL); Wright-Patterson AFB, Ohio; Spangdahlem AB, Ger-



**MSgt. Johnny Hall, right, of the 818th Mobility Support Advisory Squadron, talks with African Partnership Flight participants at a tabletop workshop in Burkina Faso.**

many; and Ramstein AB, Germany, participated in the APF.

“It’s bringing together a team of folks from across the Air Force as a whole to do this engagement, because [US Africa Command] does not have assigned forces,” Trimillos explained.

The first two days of the APF focused on sharing ideas about how to prepare for maintenance and logistics across the continent, said Capt. Megan Gallagher of the 818th Mobility Support Advisory Squadron, JB MDL.

### NOW, WORK IT OUT

The event ended with a tabletop exercise, dividing participants into small groups—with no more than one person from any given country in each group—to plan how to get people and cargo moved in a specific disaster.

“That tabletop exercise, I mean, honestly, it was a huge success. The amount of information they were sharing amongst themselves” was fantastic, and it showed everyone the strengths of each country, Gallagher said.

The US represented the host nation government in the exercise, so the groups had to “reach out” to it for authorizations and permissions, just like they would in the real world, she said.

Kent said that when the participants got engaged in the exercise, they were “planning like they were actually going someplace,” sometimes going deeper into the weeds than anyone had expected.

That “really shows how seriously a lot of these countries took it and how invested they are in trying to get everyone on the same level, share the ideas,” Kent noted.

“We’re actually helping develop their planning, and looking to the future, so that way, they can put plans on the shelf. And when a crisis happens, they already have something in mind on how they want to do it, instead of just reacting,” Trimillos said.

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



# Billions Under the Couch Cushions

**C**ongress is in the throes of its perpetual struggle over the federal budget, as lawmakers deliberate the Trump administration's detailed request for next year, just weeks after closing the deal on the budget for Fiscal 2017.

As always, the Defense Department's budget is at the center of that debate, with lawmakers divided over how and whether to boost the Pentagon's budget above the federally mandated spending caps.

In its first budget request, the new administration has already made clear that it wants to invest more heavily in defense, to the tune of \$54 billion above today's prescribed spending limits.

The extra money would buy more advanced fighters and ships than in the military's long-term plans from previous years. Military readiness, particularly for ground forces, also tops the priority list.

The pot for the Defense Department is expanding as lawmakers, particularly those who serve on the appropriations committees, are becoming much more adept at squeezing their priorities into the Pentagon budget.

Their preferences often mirror the items on the unfunded priorities lists provided by the military services, including the Air Force. Expensive but desirable weaponry that did not make the Pentagon's internal budget cut typically headline the services' wish lists, giving lawmakers justification to find room for them in the budget.

In January, for instance, the Air Force sent Congress a \$7.2 billion wish list that included five additional F-35A strike fighters and eight more C-130J cargo aircraft than requested in the

Fiscal 2017 proposal submitted by the Obama administration nearly a year earlier.

In the end, Congress granted the service \$495 million for those five F-35s and \$160 million for two C-130Js for the Air Guard.

The same dynamic will likely play out this year as the four congressional defense committees push their bills through their chambers and into bicameral conference negotiations. The goal is to stretch the defense dollar as far as it can go, including employing a few tricks learned over the last half-dozen years.

The final defense spending measure for this year totaled \$593 billion—\$19.9 billion over last year's levels and \$16.3 billion more than the Obama administration's original request for 2017.

That topline number was made possible by an earlier deal to relieve some pressure on both defense and nondefense budget caps and a reliance on overseas contingency operations funding. OCO funding is not subject to the stringent spending limits.

Indeed, the war accounts totaled \$76.6 billion for this year, including \$14.8 billion in supplemental spending requested by the Trump administration in March. The White House had originally asked for an extra \$30 billion, without realizing that Congress had already granted more than \$5 billion of the items listed in their proposal (including additional fighters).

The uncapped war accounts certainly serve as an overflow valve, although lawmakers this year resisted abusing them to fund billions in items not at all related to operations overseas.

The spending bill also axed a House-passed plan that would have shortchanged war spending by more than \$15 billion and used those funds for more weapons and other lawmaker favorites.

The House goal was to pass additional war funding later in the year. But Democrats, who have pushed for equal increases to defense and nondefense spending, saw it as an end run around the budget caps.

This is where the true art of budgeting—as refined in recent years by the Senate Appropriations Committee—comes in. Appropriators have become incredibly skilled at claiming unused spending from previous years and making hundreds of pinpricks across the Pentagon's expansive budget.

They are, essentially, finding change in the couch cushions, but that money quickly adds up. Last year, Senate appropriators trimmed \$15.1 billion from more than 450 accounts and redirected that spending to higher-priority items, like advanced fighters, ships, and more personnel.

It's a time-consuming and tedious drill but one that will almost certainly be repeated this year as Congress gets to work once again on drafting a defense spending measure within the constraints of the current budget law.

It will all pay off in the end, if it makes room for lawmaker and military priorities.

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



**A C-130J from Channel Islands ANG, Calif., flies over Jordan in 2014. This January, USAF asked to procure eight more C-130Js for the ANG. Congress approved funds for two.**

## X-37B mystery mission; Into space and back again; DARPA looks for aircraft-like operations in space; Beefing up RPAs ....

MAY 15, 2017

### BRING IT ON DOWN, NOW

Though the Air Force hasn't been very forthcoming about just what it's been doing with its two X-37B spaceplanes, some details emerged out of the fourth Orbital Test Vehicle mission. It landed at Cape Canaveral, Fla., on May 7, after setting a record of nearly 718 days on orbit. The two-ship fleet of the stub-winged, 29-foot-long robotic craft able to carry small payloads to space and back to Earth again has now accumulated 2,085 days in space.

Program Manager Lt. Col. Ron Fehlen said the mission was "another success." Not only did it "set an on-orbit endurance record," the landing marks the first time the spacecraft recovered at Kennedy Space Center in Florida, he noted. "We are incredibly pleased with the performance of the space vehicle and are excited about the data gathered to support the scientific and space communities," he said.

The landing in Florida signals the Air Force's desire to marry launch and landing activities for the X-37B at a single location. Disused NASA space shuttle facilities at Kennedy Space Center now host activities to prep the X-37B for flight and mount it on Atlas 5 boosters. Landing the spaceplane there saves the time, effort, and money needed to send a detachment of technicians to Vandenberg AFB, Calif.—where the first three missions landed—to safe the craft, remove its payload, and pack the whole thing up to be shipped back to Florida for processing and reuse.

"The ability to land, refurbish, and launch from the same location further enhances the OTV's ability to rapidly integrate and qualify new space technologies," Randy Walden, head of USAF's Rapid Capabilities Office, said in a press release. The RCO manages the X-37 program.

After receiving the order to return to Earth, the craft is capable of executing an autonomous re-entry and landing. A USAF official said capability for landing at Vandenberg will be retained for the time being.

Atypically, the Air Force in 2015 outlined some of what the X-37 would be up to on OTV-4. One of its tasks was to test "electric propulsion," and another was to expose a number of materials to the environment of space for a long period of time to see how they held up. The Air Force has said the thruster is of the Hall Effect type, which accelerates exhaust gas atoms in a magnetic field, and the testing would help refine propulsion on the Advanced Extremely High Frequency (AEHF) communications satellite. The engine was built by Aerojet Rocketdyne.

Such an ion drive would also be useful in sending robotic spacecraft out to and around geosynchronous orbit and would offer the advantage of getting a lot of mileage out of a limited supply of propellant on future satellites. Potentially, future spacecraft could refuel reconnaissance or surveillance satellites that have used up their propellant, saving the con-



The US Air Force's X-37B Orbital Test Vehicle 4 at NASA's Kennedy Space Center Shuttle Landing Facility in Florida on May 7.

siderable cost of replacing them if their sensors and other equipment are still functional. The Hall Effect being tested on the X-37B used xenon gas as its fuel.

The materials experiment harkens back to NASA's Long Duration Exposure Facility, a school bus-sized satellite parked in orbit by the shuttle for six years, then brought back to see the effects of radiation, micrometeoroids, and alternative high heat and deep cold on an array of materials. It was a precursor to building the International Space Station. Presumably, the Air Force is evaluating a new generation of space materials that could be used on future long-duration satellites.

By comparison, OTV-4 was the longest X-37 mission to date. OTV-1, with X-37B No. 1, flew for 224 days in 2010. No. 2 flew OTV-2 for 468 days between 2011 and 2012, and OTV-3, again with spaceplane No. 1, lasted 675 days from 2012 to 2014. The Air Force said it is preparing to launch a fifth OTV mission "later" this year.

### COOL STUFF

The X-37B was developed to be able to maneuver in space, but the Air Force tends not to talk about that or about how it might be taking advantage of that capability. According to satellite-tracking hobbyists, on OTV-4, the X-37 adjusted its altitude from a low of 190 miles up to as high as 225 miles, at a 38 degree inclination to the equator. That elevation of orbit would take it over China, Iran, Afghanistan, and Iraq, among other places. The payloads on previous X-37B missions are believed to have evaluated some new sensors for reconnaissance spacecraft, but the Air Force will not comment on those missions.

In 2015, shortly before the OTV-4 mission began, Air Force Gen. John E. Hyten—now head of US Strategic Command, but then head of Air Force Space Command—told the CBS TV magazine "60 Minutes" the X-37 is "for cool things."

The minishuttle "goes up to space, but unlike other satellites, it actually comes back. Anything that we put in the payload bay that we take up to space we can now bring back. And we can learn from that." Asked if the X-37 would someday become a space weapon system, Hyten replied, "I cannot answer that question."



The Air Force has not said how many trips to space it expects to get out of each X-37, but Hyten's predecessor at AFSPC, Gen. William L. Shelton, told *Air Force Magazine* in 2011 that no more of the craft were planned, and at that time, the Air Force was struggling to afford operating the vehicles and was considering terminating the project.

Boeing, builder of the X-37Bs for the Air Force, declined to comment when asked if it was developing a larger version for the service, as it publicly proposed in 2011. The scaled-up, 48-foot craft it pitched, dubbed X-37C, could be man-rated and serve as a space taxi for taking astronauts to and from the International Space Station or simply carry larger military payloads to and from orbit.

## "AIRCRAFT-LIKE" OPERATIONS

The Defense Advanced Research Projects Agency is working on an experimental spaceplane dubbed XS-1, with the goal of reducing both the time required to get to space and the cost of doing so, each by "orders of magnitude," versus traditional launch vehicles, DARPA documents show.

The program has three goals: to fly an XS-1 10 times in 10 days; to loft a 3,000-pound payload for under \$5 million per flight; and fly a demonstration system one time, orbiting a 900-pound payload. Program objectives—the high-end, hoped-for performance—are to get the craft into a 100 nautical mile circular orbit with a 1,500-pound payload at 90 degrees inclination to the equator. Another objective, according to DARPA, is to "fly XS-1 to Mach 10+ at least once and stage at high Mach to minimize the size and cost of the upper stage." Overall, DARPA is looking to achieve an "aircraft-like" operations tempo and cost in space access.

Three industrial teams have been working on the project: Boeing, partnered with Blue Origin; Masten Space Systems with XCOR Aerospace; and Northrop Grumman with Virgin Galactic. Northrop's Scaled Composites subsidiary designed the SpaceShipOne, winner of the Ansari XPrize in 2004 as the first to launch a private manned spacecraft to space. Virgin Galactic's tourist/commercial SpaceShipTwo is based on that design. Blue Origin is a new-entrant rocket company founded by Amazon magnate Jeff Bezos. It won a NASA contract last year to experiment with suborbital research flights. Masten Space Systems won the Google Lunar XPrize competition in 2009 to design a commercial lunar lander.

Phase II of DARPA's XS-1 spaceplane program—in which it will select a single competitor to proceed to the flying stage—is open to all comers, however.

The XS-1 will require breakthroughs in metals, composites, and "hybrid" materials, although DARPA documents indicate most of the required technologies are at Technology Readiness Levels of five or higher, meaning the technologies have worked in a lab and are ready for functional prototyping. (See "Infographic: TRLs, Explained," August 2016, p. 22.)

In mid-May, DARPA said it expected to award a contract to one company or team for Phase II "soon." According to plans on its website, a critical design review is expected in early Fiscal 2018, and a flight test should come in late 2019.

## CAF-UP THE REAL NUMBERS

The Air Force has in recent years talked about having 55 fighter squadrons—the fewest in its history—but that number doesn't count its sizable remotely piloted aircraft fleet. That will soon change, but exactly how hasn't been decided.

"One of the things on my to-do list" is to figure out how RPAs should be brought "into the discussion" of the Air Force's overall strike capability, newly minted chief of Air Combat Command (ACC), Gen. James M. Holmes, said in an April interview with *Air Force Magazine*.

The figure of 55 squadrons belies the fact that the Air Force has "60 lines" of RPAs in the Combat Air Forces, Holmes said. A line represents a combat air patrol, translating to about four aircraft each, for a total of about 240 to 250 MQ-9 Reapers. The Reaper's predecessor, the MQ-1 Predator, is being phased out and will exit the inventory by the end of next year.

"We renamed our MQ-9 squadrons 'attack squadrons' for a reason: They're attack squadrons," Holmes explained. An important part of thinking about the RPAs that way is that it forces ACC to consider "how you're going to replace them and what you're going to do with them."

Holmes said he can't "stop buying MQ-9s just because I've bought out what I need." To sustain a fleet of about 250 Reapers, he'll have to buy about 20 more per year to offset attrition losses. "I have to replenish them," Holmes said, until the time comes to switch to an "MQ-X" or "whatever comes next." The timing of such a program hasn't been decided yet.

It's a sure bet the Air Force will continue to upgrade the Reaper and experiment with using it in higher-end combat scenarios, Holmes predicted. The turboprop-powered aircraft has recently participated in a Red Flag exercise, but he cautioned that the event didn't signal the start of an "experimentation campaign" with the aircraft in a contested environment to "find out what it can do." Part of the problem in exploring the full capabilities of the Reaper, he said, is that every RPA and operating crew USAF has is needed for training or contingencies now underway.

The Air Force has begun upgrading the MQ-9 with longer wings and tail control surfaces, additional weapon stations, and external fuel tanks. The improvements extend the aircraft's time on station and have the effect of adding more aircraft to the fleet at a much smaller cost than buying additional airplanes.

Holmes acknowledged that ACC is looking at using the Reaper in ways it hasn't been used before and that a follow-on would probably have to be a more survivable platform. The time will come soon, Holmes said, when "we have to be looking at a replacement platform." But he is "not ready to do that, yet."

Just as he needs 20 RPAs a year to maintain the fleet, Holmes said he'll also have to buy 150 fighters a year to keep the fighter fleet at a reasonable average age—an ambitious goal that may not be in the cards. At only 100 fighters a year—still more than twice the Air Force's 2017 F-35 buy—"I'd be on a 20-year recapitalization schedule," Holmes said, adding, "I've been on more like a 50-year recapitalization schedule."

### Dept. of Understatement

"The use of that weapon for that [ISIS] complex is an outstanding idea. ... Strategically, you're looking for an effect for a wider area. Plus, the blast effect of the weapon itself ... sends a certain psychological message to your opponent and enemies who are watching."—**Retired USAF Gen. T. Michael "Buzz" Moseley, former Chief of Staff, on use of GBU-43 Massive Ordnance Air Blast bomb to wipe out terrorists in Afghanistan, military.com, April 28.**

### Go Ahead ...

"Our revolutionary forces are combat-ready to sink a US nuclear-powered aircraft carrier with a single strike."—**Official North Korea Workers' Party Rodong Sinmun newspaper, April 23.**

### ... Make My Day

"The weapons that North Korea would put against the *Carl Vinson* strike group are easily defended by the capabilities resident in that strike group. If it flies, it will die."—**Navy Adm. Harry B. Harris Jr., head of US Pacific Command, House Armed Services Committee, April 26.**

### Maximus Rex

"The [2013 US-Iran nuclear deal] fails to achieve the objective of a non-nuclear Iran. It only delays their goal of becoming a nuclear state. This deal represents the same failed approach of the past that brought us to the current imminent threat we face from North Korea. The Trump administration has no intention of passing the buck to a future administration on Iran."—**Secretary of State Rex Tillerson, *The Hill*, April 23.**

### Wish List

"We hope we can get F-35s. We have been waiting for updated F-16s for too long. Their time has gone. If we buy them now, in 10 years' time they'll be no use. ... We will submit our request to the US to purchase jets

in July. We hope the US understands our needs."—**Wang Ting-yu, head of Taiwan legislature's future and national defense committee, *South China Morning Post*, April 27.**

### Well, If They Insist

"Every single ISIS fighter that's left in Mosul is either going to be killed or going to be surrender. ... We're not seeing a tremendous number of those [surrenders]. A lot of the foreign fighters are very hardcore and they came here to die. They're not surrendering. They're fighting to the death."—**USAF Col. John L. Dorrian, spokesman for the anti-ISIS coalition, remarks to reporters, April 28.**

### Quantity Vs. Quality

"The future security environment is going to demand more Navy, a bigger Navy, but, I'll tell you what, if I build 355 of today's ships, and operate under today's concepts, and project them forward to the mid-2020s, that's probably not the force that's going to be decisive and able to protect America from attack and promote our interests around the world."—**Adm. John M. Richardson, Chief of Naval Operations, remarks at the Brookings Institution on the need for a Navy based on highly advanced technologies, April 27.**

### The Strong Horse

"I turned to the right and looked into an adjoining room. Osama bin Laden stood near the entrance, at the foot of the bed, taller and thinner than I'd expected, his beard shorter and hair whiter. He had a woman in front of him, his hands on her shoulders. In less than a second, I aimed above the woman's right shoulder and pulled the trigger twice. Bin Laden's head split open, and he dropped. I put another bullet in his head. Insurance."—**Former Navy Sr. Chief Petty Officer Robert O'Neill, member of SEAL Team Six that in 2011 killed Osama Bin Laden, quoted in *The Independent*, May 1.**

### The Strong Pigs

"It is likely their movement disturbed a herd of wild pigs, which inhabit the area as well as the nearby cornfields."—**Sheikh Anwar al-Assi, Iraqi chieftain, on how three ISIS fighters were mauled to death by boars, UK's, *The Times*, April 26.**

### Droning On

"In Somalia, Yemen, and Pakistan, it's clear that drones are creating more enemies than the US claims to ever kill. Drones are quickly turning the general population—many of whom the US would classify as the 'good guys'—against America. ... For every so-called 'bad guy' killed by a drone strike, there will be another person who witnessed that strike and who is motivated to assume the newly dead adversary's antagonism."—**Michael Shank, professor at New York University, quoted in *The National Interest*, May 1.**

### Expect Confrontation

"We will engage with Russia diplomatically. We'll do so where we can, but we're going to have to confront Russia where what they are doing is contrary to international law or denying the sovereignty of other countries."—**Secretary of Defense James N. Mattis, remarks to reporters in Kabul, Afghanistan, April 24.**

### The Law of Attraction

"The nature of the fight against ISIS will change into an intelligence war. Defeating ISIS militarily deprives them of territory and prevents them attracting and recruiting foreign fighters. This in turn discourages foreign fighters from staying in the so-called Islamic State and they will eventually try to escape or surrender. However, the threat foreign fighters can still pose upon returning to their countries should not be underestimated."—**Masrour Barzani, security chancellor for Iraq's Kurdistan Regional Government, *The Guardian*, April 26.**





05.06.2017

A B-17 Flying Fortress, B-29 Superfortress, and B-52 Stratofortress (top to bottom) fly in formation at the 2017 Barksdale AFB, La., air show on May 6. This heritage flight showcased bombers from World War II, the Korean War, and the conflicts of today.





## 24th SECAF Takes Office

The Senate confirmed Heather A. Wilson as the 24th Secretary of the Air Force on May 8, by a vote of 76 to 22. Wilson was then sworn in by Defense Secretary James N. Mattis at a May 16 Pentagon ceremony.

Wilson has extensive experience with the Air Force, Congress, and in education. Since she is only the second of President Trump's Pentagon nominees to be confirmed, she will probably wield significant influence in the new administration.

She takes the helm of the Air Force at a time when the Active Duty force is the smallest it's ever been and with the oldest aircraft inventory. During her confirmation hearing she urged lawmakers to repeal the Budget Control Act and avoid sequestration as the Air Force moves forward on several modernization programs, including the F-35 strike fighter, KC-46A tanker, B-21 bomber, Ground Based Strategic Deterrent, Long-Range Standoff missile, UH-1N replacement, and others.

Wilson "was a friend to the Air Force during her years in Congress," said AFA Chairman of the Board F. Whitten Peters. "AFA looks forward to working closely with her as we navigate the ongoing challenges our Air Force currently faces."

Wilson graduated from the Air Force Academy in 1982 and was selected as a Rhodes scholar, receiving both a master's degree and doctor of philosophy degree from Oxford University in England. She was the first female veteran in the US Congress, where she served on the House Armed Services Committee and House Permanent Select Committee on Intelligence. She also served as the president of the South Dakota School of Mines and Technology. Wilson was formerly a member of the Congressional Panel on the Nuclear Security Enterprise and serves on several nonprofit and advisory boards, including the South Dakota Science and Technology Authority.



**Heather Wilson testifies during her confirmation hearing on March 30.**

Wilson is "an inspiring leader with a deep knowledge of the Air Force and national security matters and has long been a supporter of our armed services," said AFA President Larry O. Spencer, adding, "We look forward to working with her on the Air Force's top issues."

### ■ **Combat Controller Receives Silver Star**

An Air Force combat controller received the Silver Star on April 7 for his 2015 actions in a 96-hour battle to liberate Kunduz City, Afghanistan, from Taliban control.

TSgt. Brian Claghusey, a combat controller with the 21st Special Tactics Squadron, was embedded with a US Army Special Forces team in Kunduz, when with no regard for his personal safety, he risked enemy fire to coordinate 17 air strikes against Taliban fighters. His actions ensured the safety of 150 friendly forces, the death of many Taliban fighters, and resulted in zero civilian



casualties.

Claghusey received the award during a ceremony at Pope Army Airfield, N.C. He is the latest airman from the 21st STS to be recognized for valor. The squadron has, since 2008, had five airmen receive the Air Force Cross and 10 receive the Silver Star, including one with an Oak Leaf Cluster.

**TSgt. Brian Claghusey at an undisclosed location. He received the Silver Star medal for his role in liberating Kunduz City from the Taliban and ensuring the safety of an Army Special Forces team during a firefight.**



Photos: Scott M. Ash/USAF; USAF



### ■ CyberPatriot Announces National Champions

The Air Force Association announced the winners of the CyberPatriot IX National Finals Competition, held in April in Baltimore. North Hollywood, Calif., High School's team "Togo" won the national championship in the Open Division, as well as the Leidos Digital Forensics Event and the Open Division of the Cisco Networking Challenge.

Colorado Springs Cadet Squadron team "Wolfpack," with the Colorado Springs (Colo.) Civil Air Patrol, won the national championship in the All Service Division. Summit Lakes Middle School's team "Error 37," from Lee's Summit, Mo., won the Middle School Division.

"Cyber Warriors 3" from Troy High School in Fullerton, Calif., won the AT&T Mobile Device Component, and the team "Falcons" from Poolesville High School, Md., won the Facebook Challenge. "TX-781st" from O. W. Holmes High School's Air Force JROTC unit in San Antonio won the All Service Division of the Cisco Networking Challenge.

Leon Gaulin of the "Marine Raiders" from Montachusett Regional Vocational Technical School in Fitchburg, Mass., received the Cyber All-American Award, presented to a student who competed in the National Finals for four consecutive years of high school.

### ■ StellarXplorers Announces National Champions

The Air Force Association announced the winners of the national high school space challenge StellarXplorers III, held in early April in Colorado Springs, Colo. The "Sky Dragons" team from San Pedro High School in San Pedro, Calif., is this year's national champion. The "Scintillators" team from the Kaiserslautern American High School in Kaiserslautern, Germany, finished in second place. The "Rocketeer Steers" team from Graham High School in Graham, Texas, finished third.

Ten teams participated in the finals, held at the Space Foundation's Discovery Center.

Each student in the top three teams received educational grants, sponsored by the USAF Science, Technology, Edu-

cation, and Math Program and the United Launch Alliance. During the first day of the competition, students had eight hours to define an optimal satellite orbit, choose spacecraft components, and select rocket boosters that meet a set of mission requirements. The students then presented their plan on the second day and were scored by a panel of experts.



### ■ D.C. Guard F-16 Crashes, Pilot Ejects Safely

A D.C. Air National Guard pilot sustained minor injuries after ejecting from his F-16C during a training mission April 5 near JB Andrews, Md. The pilot, who is assigned to the 121st Fighter Squadron at Andrews, was flying with three other Guard aircraft on a routine training mission in the Washington, D.C., area.

Shortly after takeoff, the pilot experi-

enced a mechanical issue and attempted to turn back to base. Realizing he wasn't able to make the return, the pilot was forced to eject. He has been with the squadron for about a year, in the Air Guard for four years, and is a "very capable pilot," Squadron Commander Lt. Col. Mike Croker said during a press conference.

The F-16 crashed near Oxon Hill, Md., at about 9:15 a.m. in a wooded area about six miles southwest of the base.

### ■ An F-16 from the 113th Wing flies near Washington, D.C., during a training mission from JB Andrews, Md.

There was no major property damage reported, according to a statement from the 113th Fighter Wing at Andrews. However, WUSA-9 TV station reported that about 20 homes were evacuated as a safety precaution, and the families were temporarily sheltered at an elementary school in Maryland.



## By the Numbers

8,000,000

Lines of code required to operate the F-35A Lightning II

400,000

Lines of code required to operate the US space shuttle

Source: <http://bit.ly/2pZ4Hgh>



USAF's space lead at the Pentagon will have plenty to do.

### ■ Air Force Creates a Deputy Chief of Staff for Space

The Air Force will “stand up a three-star deputy chief of staff for space,” Gen. John W. “Jay” Raymond, head of Air Force Space Command, said at the 33rd Space Symposium in Colorado Springs, Colo. When the position is finalized and filled, the Air Force will have someone at the Pentagon who will “come to work every day

focused on” integrating space into multidomain combat, Raymond said.

The new deputy will have plenty of work to do, Raymond said, as space leadership in the Air Force is currently focused on “getting after rapid acquisition processes” by shifting “milestone decision authority” from the Department of Defense down to the Air Force, as required by the 2017 National Defense Authorization Act.

### ■ Air Force F-35A Makes First Europe Deployment

Eight Air Force F-35As from Hill AFB, Utah, arrived at RAF Lakenheath, UK, in mid-April, marking the type's first overseas deployment. The aircraft and airmen from the 388th Fighter Wing and Air Force Reserve's 419th Fighter Wing, both at Hill, were to spend “several weeks” conducting air training in Europe as part of the European Reassurance Initiative, a DOD press release stated.

The deployment isn't meant to send any kind of political message, and the aircraft were not to be available for operational missions during their stay in the UK, USAF officers reported during a telephone press conference.

Tankers from four bases offloaded more than 400,000 pounds of fuel during the transatlantic flight to Europe. C-17 and C-5 aircraft supported the deployment by moving maintenance equipment and personnel.

Two of the F-35A strike fighters arrived at Amari AB, Estonia, on April 25, but then returned to Lakenheath a couple hours later. “The purpose was to show their presence,” Col. Jaak Tarien, the Chief of the Estonian air force, told *Air Force Magazine*.

Lt. Col. George Watkins, commander of Hill's 34th Fighter Squadron, told the Estonian newspaper *Postimees* the strike fighters did not land anywhere else during the three-hour sortie and had to tank once.

On April 28, two F-35As arrived at Graf Ignatievo AB, Bulgaria, for training.



An F-35 Lightning II from Hill AFB, Utah, participates in the aircraft type's first-ever deployment to Europe.

Photos: David B. Gleason; SrA. Christine Groening

## Leo K. Thorsness, 1932-2017

Retired Col. Leo Keith Thorsness, an American hero of the Vietnam War, prisoner of war, member of the Washington State Senate, and one of a handful of airmen to earn the Medal of Honor, died in Florida on May 2. He was 85.

Born in Walnut Grove, Minn., Thorsness enlisted in the Air Force in 1951. Through the aviation cadet program, he received his wings and a commission in 1954. Thorsness flew F-84s and F-100s before transitioning to the F-105 Thunderchief.

He was chosen to fly the F-105F and G variants of the “Thud” in the Wild Weasel role—the most dangerous combat mission. Weasels flew into enemy airspace ahead of strike groups, teasing enemy fighters and ground-based radars to track and shoot at them, so the Weasels could in turn target the defenses and clear a path for the following fighter-bombers. In 1967 alone, 26 Weasel aircraft were shot down.

Assigned to the 355th Tactical Fighter Wing at Takhli AB, Thailand, in the fall of 1966, Thorsness, then a major, quickly became known as the wing expert on the Weasel mission. He flew 92 such missions during the next seven months, evading some 53 surface-to-air missiles fired at him during that time.

On April 19, 1967, Thorsness was flying in an F-105F with backseater Capt. Harold E. Johnson, leading a flight of four F-105s on a Weasel mission.

As they entered enemy airspace, Thorsness split his group in two, to broaden their coverage and force the enemy missile batteries to shoot in different directions. Soon after a radar was detected, Thorsness destroyed it with a Shrike anti-radiation missile. A second radar came up suddenly and he attacked it with cluster bombs, scoring a direct hit while evading heavy anti-aircraft artillery fire. He fired the second Shrike at a third radar. Soon the strike package arrived, and a large battle ensued with enemy fighters and ground defenses.

One of the jets in Thorsness’ flight was hit and the crew bailed out. As they descended, a MiG-17 lined up to shoot the crew hanging in their parachutes. Though the F-105 wasn’t designed for dogfighting, Thorsness nevertheless pursued and shot down the MiG with his cannon.

He quickly returned to the scene where his wingmen were awaiting rescue on the ground. He orbited, flying cover for A-1 “Sandy” rescue planes and UH-1 helicopters. When MiG-17s reappeared, Thorsness and Johnson alone engaged four of them. Thorsness hit another MiG, a probable kill, but his gun camera was out of film. Dropping to treetop height—and below the firing arc of area anti-aircraft guns—Thorsness lured the remaining MiGs into chasing him. Using the Thud’s only advantage—its speed—Thorsness outran the MiGs. His action bought time for more American fighters to arrive. Unfortunately, the two downed airmen were captured.

Desperately low on fuel, Thorsness headed for a tanker, but one of the F-105s that had arrived to fight the MiGs called on the radio to say he was lost and running out of gas. Thorsness directed the tanker to help the other pilot and decided to nurse his own jet 70 miles to the closest airfield—Udorn Air Base, just inside Thailand. Carefully calculating the jet’s negligible glide ratio, he and Johnson touched down just as the engine quit. For the 11 hours of nonstop action, Thorsness was recommended for the Medal of Honor. The citation



**Then-Lt. Col. Leo Thorsness after receiving the Medal of Honor from President Richard Nixon in 1973.**

underscored his “extraordinary heroism, self-sacrifice, and personal bravery involving conspicuous risk” to his own life.

Before he was able to receive the medal, however, on April 30—just seven missions short of the magic 100 number that would allow them to go home—Thorsness and Johnson volunteered to fill in for an abort jet on another Weasel mission. They were surprised by two MiGs and were shot down.

Thorsness and Johnson ejected, and both survived, but Thorsness’s legs were badly injured. He was captured by villagers who tore off his clothes and forced him to march 10 hours to a North Vietnamese army outpost.

For the next six years, Thorsness was held prisoner in various POW camps, including the infamous “Hanoi Hilton,” where he was tortured, denied medical attention, and kept in solitary confinement for his refusal to cooperate. The treatment worsened his leg injuries and added back injuries. Thorsness and Johnson would occasionally see each other in prison, but were not able to talk again until after repatriation.

The Pentagon kept the Medal of Honor recommendation secret so the North Vietnamese wouldn’t heap even more abuse on Thorsness or further exploit him for propaganda. During the latter part of his captivity, he shared a cell with now-Sen. John McCain (R-Ariz.).

Shortly after the POWs were returned, Thorsness received the Medal of Honor from President Nixon on Oct. 15, 1973.

Too badly injured to resume flying, Thorsness retired as a colonel 10 days after the medal ceremony. Thorsness worked for Litton Industries as head of civic affairs until 1985. He moved to Washington state in 1986 and served as a state senator from 1988 to 1992.

In 2008, he published an account of his imprisonment in *Surviving Hell: A POW’s Journey*.

Commenting on Thorsness in May, McCain said his cellmate endured “unspeakable pain and suffering because of his steadfast adherence to our code of conduct. ... Leo never let this experience break his spirit and [he] inspired the rest of us with his patriotism, perseverance, and hope that we would someday be free.”

—John A. Tirpak

Photo: USAF



## ■ DOD Begins Nuclear Posture Review

The Pentagon on April 17 kicked off its new nuclear posture review. Defense Secretary James N. Mattis directed Deputy Defense Secretary Robert O. Work and Vice Chairman of the Joint Chiefs of Staff Air Force Gen. Paul J. Selva to lead the review. It was outlined in a presidential memorandum on Jan. 27.

The review will “ensure the US nuclear deterrent is safe, secure, effective, reliable, and appropriately tailored to deter 21st century threats and reassure our allies,” according to a Pentagon statement. The review will be presented to the President by the end of the year, according to the Defense Department.

**Second Lt. Nikolas Ramos (right) goes over a checklist with 1st Lt. Terrence Dale Duarte in a launch control center at F. E. Warren AFB, Wyo.**



## ■ PACOM Boss Wants Missile Defense in Hawaii

Adm. Harry B. Harris Jr., commander of US Pacific Command, told Congress the US likely needs an additional missile defense system in Hawaii. “Our ballistic missile architecture is sufficient to protect Hawaii today,” he told the House Armed Services Committee, “but it can be overwhelmed.”

An ICBM attack with the proper number of missiles, from an adversary like North Korea, would force the US “to make a decision on which one to take out or not.” His worry, he said, is that in such a situation, there is a possibility that “at least one [ICBM] ... would get through.”

As to North Korean capability, Harris said, “Kim Jong Un is clearly in a position to threaten Hawaii today.” While the US already has missile defense interceptors based in Alaska and California, Harris said, “we would be better served with ... radar and interceptors in Hawaii.”



**A Terminal High Altitude Area Defense (THAAD) interceptor is launched during a test on Wake Island in 2015.**



**An F-22 Raptor escorts a Russian Tu-95 Bear bomber near Nunivak Island, Alaska, in 2007. Russian flights near US airspace have increased dramatically.**

## ■ Russians Fly Near Alaska Four Times in Four Days

Russian bombers, four times in four days, flew close to Alaska in another series of provocations. On April 17, Air Force F-22s responded to Tu-95s flying near the Alaskan Air Defense Identification Zone. The next day an Air Force E-3 Sentry also responded to the Tu-95s. On April 19, two II-38 maritime patrol aircraft flew near Alaska, and on April 20, two Tu-95 Bear bombers again flew near the zone, according to CNN.

A NORAD official said although the heightened activity has not been seen “for a couple years,” it is not unprecedented, CNN reported. All the intercepts were conducted “safely and professionally,” Pentagon spokesman Navy Capt. Jeff Davis said.

## ■ Unintentional Stall Caused Fatal 2016 U-2 Crash

The fatal 2016 U-2 crash in California was caused by the aircraft entering an unintentional secondary stall, forcing the two pilots to eject. Instructor pilot Lt. Col. Ira S. Eadie was killed during the ejection sequence, and the second pilot received minor injuries in the Sept. 20, 2016, mishap near Sutter, Calif.

The TU-2S, assigned to the 9th Reconnaissance Wing at Beale AFB, Calif., was flying an acceptance flight training mission, according to an Air Combat Command news release. Selected pilots undergo three of these flights as part of their interview process. The flights are designed to give prospective pilots a chance to familiarize themselves with the aircraft.



**Eadie**

The aircraft was recovering from an “approach to stall” maneuver, when the unnamed interviewing pilot’s flight control inputs placed the aircraft into an unintentional secondary stall. The aircraft’s left wing dropped sharply and the U-2 fell into an excessive nose-low attitude. The aircraft was not controlled and was rapidly becoming inverted, prompting Eadie to command ejection. During this sequence, his ejection seat struck the U-2’s right wing, causing fatal injuries. The aircraft crashed into uninhabited hills and was destroyed.

## William L. Kirk, 1932-2017

Retired Gen. William Leslie Kirk, one of a number of USAF leaders credited as a "father" of the Aggressors and the Red Flag exercise, commander of US Air Forces in Europe, a two-time MiG killer, and a noted expert in electronic warfare, died April 26 in Florida at age 84.

Kirk was born in Rayville, La. He enlisted in the Air Force in 1951, training as a mechanic, but became an aviation cadet two years later and earned his wings and commission in 1954. In his early career he flew reconnaissance jets in the Far East, collecting airborne samples to monitor Soviet nuclear tests, and then flew the RF-101 Voodoo in Europe. He switched over to fighters in 1960 and was one of the first operational pilots to fly the F-4 Phantom II.

After USAF Weapons School, he went to Southeast Asia in 1967, serving in the 8th Tactical Fighter Wing at Ubon AB, Thailand. During that tour, he shot down enemy jets on two separate missions, downing a MiG-17 and a MiG-21. He earned a Silver Star for each of those actions.

In the first engagement, May 13, 1967, Kirk was flying MiG combat air patrol for a strike package of F-105 Thunderchiefs. He came to the rescue of a "Thud" being pursued by a MiG-17. On afterburners, Kirk lined up, obtained acquisition tone, and fired two AIM-9 heat-seeking missiles. One of them downed the MiG.

The second dogfight, on Oct. 24, was unusual at the time for its long duration—about seven minutes—and heavy maneuvering. Kirk, leading an F-4D group defending F-105s on a strike mission, engaged a MiG-21. He fired two radar-guided missiles. They seemed to miss, although one may have damaged the MiG slightly. Kirk ended up chasing down his opponent and destroying the aircraft with cannon fire from his 20 mm SUU-23/A gun pod, at a range of some 600 feet.

At the time, USAF doctrine suggested that air combat would likely take place at great distances, with missiles, and early Air Force F-4s did not have an internal gun.

Kirk racked up 130 combat missions in Southeast Asia.

After commanding the 4538th Fighter Weapons Squadron at Nellis AFB, Nev., Kirk returned to the Southeast Asia theater in 1971 to set up an electronic warfare system called Teaball. It helped detect and warn of the approach of enemy fighters. The system comprised a series of vans and communications nodes at Nakhon Phanom AB, Thailand, monitoring enemy voice communications and air movements, receiving further data from RC-135 and EC-121 aircraft, and relaying the correlated information to strike packages en route to and from North Vietnam.

After working out the bugs in the concept, the system turned in good results and was used for the rest of the war. Part of its success relied on Kirk traveling to fighter squadrons and convincing pilots to trust the information they would get from Teaball—even though he could not reveal the source of much of the information.

Back in the States, Kirk attended Air War College and in 1971 was assigned to the Pentagon as chief of the Tactics Branch and later as head of the Tactical Division in the Directorate of Operations. It was in these positions that he, along with other officers, collaboratively developed the concepts of



**Gen. William Kirk as commander, US Air Forces in Europe.**

the Aggressors and Red Flag. This led to extremely realistic large-force exercises to season young fighter pilots before they saw actual combat.

Kirk helped put together a survey of fighter pilots across the service's tactical units and briefed then-Chief of Staff Gen. John D. Ryan on the alarming results. Air Force fighter crews were largely ignorant of Soviet aircraft and their capabilities, tactics, and formations, Kirk explained, and didn't fully understand the systems of the F-4 Phantom—USAF's top fighter at the time—having missed potential kills in the Vietnam War because they had gotten switchology wrong or fired their weapons outside the effective envelope.

He urged realistic training against an adversary unit that would simulate Soviet-style tactics and formations, as well as instruction in adversary systems. These recommendations led to the Air Force placing a higher priority on dissimilar air combat training, or DACT.

Moreover, Kirk, along with other officers, reportedly told Ryan and other tactical Air Force leaders that the service culture of "fly safe" was dulling its combat edge. Inventing new tactics was largely forbidden if it meant risking loss or damage of an aircraft, and pilots were rarely permitted to fly at extremely low level or at the edges of their aircraft's envelope. Kirk and the others pushed for more of a "train as you'll fight" philosophy. Despite the inherent danger in highly realistic training, Red Flag dramatically increased USAF's combat skills and success.

After tours as an operations officer, he took command of the 49th Fighter Wing at Holloman AFB, N.M., in 1975. In 1979, he was Pacific Air Forces inspector general and in 1980 became director of electronic combat at the Pentagon. In 1985, he took command of 9th Air Force, headquartered at Shaw AFB, S.C. In 1987, Kirk pinned on his fourth star and became commander of US Air Forces in Europe.

He retired in 1989.

—John A. Tirpak



# The War on Terrorism

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

### ■ Casualties

As of May 15, a total of 37 Americans had died in Operation Freedom's Sentinel in Afghanistan, and 41 Americans had died in Operation Inherent Resolve in Iraq and Syria.

The total includes 75 troops and three Department of Defense civilians. Of these deaths, 35 were killed in action with the enemy while 43 died in noncombat incidents.

There have been 169 troops wounded in action during OFS and 36 troops in OIR.

### ■ US Drops "Mother of All Bombs" in Afghanistan

The United States' most powerful non-nuclear bomb made its combat debut on April 13 when an Air Force Special Operations Command MC-130 dropped a GBU-43 Massive Ordnance Air Blast bomb, also known as the "Mother of All Bombs," on an ISIS stronghold in Afghanistan.

At 7:32 p.m. local time, the bomb was dropped on an ISIS tunnel complex in the Achin district of Nangarhar province. "The strike was designed to minimize the risk to Afghan and US forces conducting clearing operations in the area while maximizing the destruction of ISIS-K [Khorasan] fighters and facilities," US Forces-Afghanistan said in a statement.

ISIS in Afghanistan is using bunkers, tunnels, and improvised explosive devices to build its defense. "This is the right munition to reduce these obstacles and maintain the momentum of our offensive against ISIS-K," Army Gen. John W. Nicholson, commander of US Forces-Afghanistan, said in the statement.

The GBU-43 was developed in just nine weeks to be ready for the Iraq War in 2003, but it has never before been used in combat. The GPS guided, 30-foot-long bomb weighs 21,000 pounds, 18,000 of that attributed to its high-explosive BLU-120/B warhead. The 30,000-pound GBU-57 Massive Ordnance Penetrator "bunker buster" bomb actually weighs more than the MOAB, but its warhead is a third of the size at 5,300 pounds.

The blast resulted in 36 enemy deaths, US and Afghan officials said. Nicholson said that the mission was not influenced by outside events and the decision to use the GBU-43 came from commanders in Afghanistan, not from Washington, D.C. Nicholson said US forces are on the ground and have so far not seen evidence of civilian casualties.

### ■ Squadron Sets Bombing Record On Deployment

The 332nd Expeditionary Maintenance Squadron recently wrapped up a historic deployment for Operation Inherent Resolve, the US campaign against ISIS in Iraq and Syria. Over six months, the unit kept their F-15E Strike Eagles consistently in the air as they dropped 5,018 munitions with "no tasked sorties missed," according to a US Air Forces Central Command (AFCENT) press release.

The team deployed from Mountain Home AFB, Idaho, and "surpassed every monthly bomb record for a deployed unit except for one," according to AFCENT.

The 332nd EMXS deployed nearly 500 maintainers and operators. "It's been a privilege to watch the Mountain Home team's



**An A-10 banks away from a KC-135 after receiving fuel during a flight for Operation Inherent Resolve.**

success throughout the past several months," said Capt. Jason Henderson, 332nd EMXS operations officer, according to the news release. "While over 5,000 munitions expenditures are certainly impressive, it's a by-product of something bigger: ... nonstop combat sortie generation. This deployment should be a case study in how to effectively generate and sustain combat airpower at the end of a challenging logistics pipeline."

### ■ Deployed Global Hawk Hits Sortie Milestone

A deployed EQ-4 Global Hawk, in the fight against ISIS, recently surpassed 1,000 continuous sorties without a maintenance cancellation. The Global Hawk, deployed with the 380th Air Expeditionary Wing, passed the milestone while on a surveillance mission April 1.

The aircraft used its battlefield airborne communications node (BACN) to help coalition assets communicate as part of Operation Inherent Resolve. Global Hawks regularly fly 25- to 30-hour missions to meet the constant demand. "Hitting 1,000 in a row speaks to the importance of the BACN mission regarding its direct impact on the warfighter, and I think that it says a lot about the stellar professionals filling the maintenance ranks from top to bottom," said a recent 99th Expeditionary Reconnaissance Squadron director of operations. (The Air Force does not release full names of its remotely piloted aircraft operators.)

### ■ Misdirected Strike Killed Friendly Fighters in Syria

A "misdirected" US-led coalition air strike on April 11 killed 18 allied Syrian Democratic Forces personnel, US Central Command announced. The air strike had been requested by partner forces that identified the location as an ISIS position. It was actually a forward SDF position.

"The coalition is in close contact with our SDF partners who have expressed a strong desire to remain focused on the fight against ISIS despite this tragic incident," CENTCOM said in a statement. The incident is the latest in a series of targeting errors, both confirmed and alleged, in the fight against ISIS. It came shortly after CENTCOM announced its investigation into a Mosul, Iraq, air strike that reportedly killed dozens of civilians.

Photo: S/Asst. Trevor McBride



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# **BREAKING BARRIERS: HERITAGE TO HORIZONS**

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A F A . o r g





# the **Rebuilding** **Ranks**

**USAF must act now  
to get an adequate number  
of airmen in uniform.**

By Amy McCullough, News Editor

The Air Force is trying to get creative in addressing a number of urgent and severe manpower shortages, looking for new ways to hang on to seasoned specialists who have grown weary of nonstop deployments. The service is also under pressure to build end strength, the total number of airmen in uniform, back up to levels adequate to accomplish its expanding missions. New initiatives are underway to help



F-35 maintainers like A1C Nathan Kusters—preparing to launch a Lightning II at Nellis AFB, Nev., in February—are in short supply.



Airmen returning from deployment head to a hangar at Mountain Home AFB, Idaho, where loved ones were awaiting them. Through selective re-enlistment bonuses, the Air Force is working to keep experienced NCOs in the ranks.

**A USAF C-130H maintenance advisor trains an Afghan Air Force airman at Kabul, Afghanistan. Mideast contingencies and tight budgets have forced USAF to make tough choices.**

attract and retain airmen in some critically short fields, such as pilots, maintainers, cyber experts, battlefield airmen, and acquisition specialists.

In recent years, despite being actively engaged in Middle East combat and other contingencies, USAF was forced by tightening budgets to make tough choices between modernization, recapitalization, and readiness. Trying to balance those three factors (given the way the world looked then), the Air Force in 2014 chose to reduce end strength, hitting 311,000 Active Duty airmen in Fiscal 2015—its lowest since 1947. It didn't take long, however, for service leaders to realize they had gone too far.

The original idea was to cut man-

power while simultaneously divesting hundreds of aircraft, including entire fleets, such as the A-10 and U-2. Congress didn't agree, however, and upset the service's carefully crafted plan by directing that both the Warthog and Dragon Lady keep flying for years to come. Now the Air Force is in a bind: It has to keep operating aircraft it had planned to retire but it has already shed the manpower needed to fly and maintain them.

### TOP FOCUS: END STRENGTH

Though USAF has carried out its missions, "what's masked is the fact that the shortage of people has fundamentally changed the way we do business in terms of the operational risk, day to day," said Air Force Chief of Staff Gen. David L. Goldfein last year.

The risk, as Goldfein described it, is not sustainable.

At AFA's Air Warfare Symposium in March, acting Air Force Secretary Lisa

S. Disbrow acknowledged many "acute shortfalls."

"I can say with confidence, the United States Air Force must grow. Our top focus is end strength. We need to increase the number of people we have," she maintained.

The Air Force closed Fiscal 2016 with 317,883 Active Duty airmen—6,000 more than the year before but still 38 percent less than it had during the first Gulf War. It's expected to end Fiscal 2017 with 321,000 Active Duty members—contingent on whether Congress approves the budget, something it has yet to do despite being more than halfway through the fiscal year.

Lt. Gen. Darryl L. Roberson, commander of Air Education and Training Command, said the service is projected to grow to 324,000 Active Duty airmen by 2022, but the time line probably is going to be accelerated, pending congressional funding.

"We need to increase the number to



at least 350,000 over time just to fill our existing units to 100 percent, and we may need to grow beyond that number in the future,” said Disbrow.

Lt. Gen. Gina M. Grosso, deputy chief of staff for manpower, personnel, and services, told *Air Force Magazine* in April the five- to seven-year 350,000 target was set before the incoming Secretary of the Air Force was nominated, and she may have different ideas. The personnel numbers must also be rationalized and paid for in the context of the bow wave of hardware recapitalization hitting USAF in the mid-2020s.

While “the mix of that manpower will change over time,” Grosso said, the 350,000 figure “just gets us whole today.”

The Air Force is making progress with its maintainer shortage, but is still in a deep hole in this regard. The beddown of the F-35 strike fighter and Congress’ refusal to let USAF divest aircraft exacerbated the problem, because the service couldn’t move as many airmen over to the F-35 from legacy platforms as it had hoped.

#### DO WHAT YOU DID—AND MORE

Although it has managed to narrow the maintainer shortage from 4,000 to 3,400 airmen by taking a large share of new accessions and recruiting more airmen into the maintenance field, the Air Force won’t close the maintenance shortfall until Fiscal 2019, said Grosso. That would cover the maintainers needed for new F-35 squadrons coming online, but if asked to accelerate that process—an idea that has been debated on Capitol Hill—it will further stress the maintenance force, she said.

Recruiting hasn’t been a problem, said Grosso, but there are other challenges to overcome. The Air Force is pushing about 9,300 airmen annually through the maintainer schoolhouse, but the bulge of people coming through can create a “leadership challenge” because the service must have enough noncommissioned officers (NCOs) to mentor and lead the new airmen.

“We’re working really hard to keep all the NCOs that we can” through selective re-enlistment bonuses and the voluntary limited period of Active Duty, which brings reservists on full time to fill midlevel management positions, Grosso said. For high-demand staff sergeants and technical sergeants, the Air Force is waiving high year of tenure, an up-or-out rule setting the maximum time an airman may serve



SrA. Thomas Goodnoe, left, and SSgt. Darryl Terry review systems against technical guides during a cybersecurity audit at Ramstein AB, Germany. Despite the demands for its expertise, USAF’s entire cyber force is only the size of a large wing.

“WE NEED TO INCREASE THE NUMBER TO AT LEAST 350,000 ... TO FILL OUR EXISTING UNITS TO 100 PERCENT.”

—Lisa S. Disbrow, acting Air Force Secretary

before he or she must separate or retire.

Growth in the commercial airline industry will affect the maintenance force. Airline hiring is already taking a big bite out of USAF’s pilot ranks, and as the airlines grow, “they will need more maintainers, so we’re watching very closely the maintenance retention,” Grosso said.

The Air Force finished Fiscal 2016 short 1,555 pilots overall, 1,211 of them fighter pilots. Given that it costs \$11 million to train a fighter pilot to the point of operational readiness, the deficit equates to about a \$12 billion capital loss, Grosso told the House Armed Services Committee during a late March hearing on pilot shortages.

Just as with maintainers, Grosso said USAF doesn’t have a problem recruiting new aviators, but it is struggling to retain midcareer pilots tired of the service’s high operational tempo and repeated deployments. The airlines are “actively recruiting the world-class experience of our rated airmen,” Grosso explained in the hearing, because USAF pilots have had “diverse experience and quality aviation training.” Airline expansion and their need to hire more pilots is “expected to con-

tinue for the next 10 to 15 years,” she pointed out.

To address the pilot problem, USAF will expand undergraduate pilot training to the “maximum capacity” of 1,400 pilots per year over the next two years.

“We produced 1,108 graduates from our pilot training program last year and we’re going to produce 1,200 this year,” said Roberson. USAF will work its way up to producing 1,400 with the assets available, but even that’s not enough to meet requirements.

#### SOLVING THE PILOT SHORTAGE

More student pilots moving through the schoolhouse means the Air Force must find more aircraft for them to fly, so it diverted two F-16 squadrons from Hill AFB, Utah, which is transitioning to the F-35, to serve in fighter production units at Holloman AFB, N.M. The 45 F-16s were going to be spread out among the Total Force, said Roberson.

“That’s going to increase the ... production rate from the 235 that we produced this year to 335 Total Force fighter pilots,” he added. “That’s going to help us in the short term just for fighter pilots, but we still have a much bigger problem overall.”



**Lt. Col. Ryan Hodges climbs into an A-10 at Whiteman AFB, Mo., in February. The Air Force is considering offering Active Duty pilots career sabbaticals, so they could join an airline and start building up seniority.**



**At NAS JRB Fort Worth, Texas, Capt. Michelle Curran inspects her F-16. If the part-time pilot concept works for the reserve, why not for Active Duty airmen?**

Though the pilot shortage in the fighter community generally gets the most attention, the problem looms in the mobility field as well. Air Mobility Command boss Gen. Carlton D. Everhart II told reporters in April his command will have about 1,600 pilots eligible to separate within four years. USAF must find ways to convince them to stay in uniform, whether in the Active Duty, Guard, or Reserve, he said.

The pilot shortage also affects USAF's

test pilot program, and that could become a big issue as new types of aircraft—driven by the big push in modernization—start to come online, Air Force Materiel Command boss Gen. Ellen M. Pawlikowski said.

Besides hiring and training more pilots, USAF is attempting to keep the ones it has by trying to reduce additional duties often imposed on them. The extra tasks are a distraction from flying and cut into family time at home

station. They run from administrative chores to scheduling and staff work. Goldfein has pledged to add more “white space” to pilot calendars, especially at home base.

Another way to attack the retention problem is with money. Last year, Congress authorized an aviation bonus of up to \$35,000 per year—the first increase in 18 years. Prior to the Fiscal 2017 defense authorization, it was \$25,000.

The Air Force spends about \$930 million a year across the force on special and incentive pay, such as the aviation bonus, Grosso stated. The amounts of the bonuses are determined using a mathematical model that takes into consideration current manning and retention as well as the cost and time needed to train an airman in a given specialty. The Fiscal 2017 Aviation Bonus Program offers various contract lengths—one, two, five, nine, and 13 years—depending on “platform type and business case,” said USAF spokesman Maj. Bryan Lewis.

Photos: SSgt. Timothy Moore; TSgt. Andy M. Kin; SSgt. Samantha Mathison



Grosso said USAF is still working out the “tiered structure” for the payment, including the length of time aviators must serve after accepting it. She expects those details to be rolled out in the near future, but said the service is considering asking Congress for new authorities.

“We’re finding that we’re not retaining enough [pilots] even at the 20-year point, so we’re looking at some authorities to incentivize people not to retire. We’ve had to do that before,” she said.

Though the service pays out some form of selective re-enlistment bonus for about 122 enlisted specialties, the aviation bonus is not yet offered to enlisted pilots, who have just begun to populate the remotely piloted aircraft community. In 2015, the Air Force announced it would allow enlisted airmen to fly the RQ-4 Global Hawk, and the first enlisted RPA pilot training class began last year.

Grosso doesn’t see that as a near-term issue because there won’t be any enlisted airmen eligible for the bonus for six years. Plus, the service already has enough authorities to offer critical skills retention bonuses to enlisted aviators, so “from the airmen’s perspective [they] would get paid the same.”

Goldfein and other senior Air Force leaders were scheduled to meet with airlines officials in May to discuss solutions to the national pilot shortage problem, in hopes of finding solutions that will benefit both the military and the US economy.

One idea under consideration is the Career Intermission Program. This would allow Active Duty pilots to take a three-year sabbatical—while still recallable as a member of the Individual Ready Reserve—allowing them to join an airline and start earning seniority before returning for another tour of Active Duty. The program gives them “time to meet personal or professional needs outside the service,” according to an Air Force press release.

Grosso said the airlines operate on a “first in, move up” system. “When you start determines everything else along the way,” she said. Pilots are often reluctant to see a military career through to retirement because they don’t want to start an airline career as a junior flight officer after being a seasoned aircraft commander.

If implemented, the intermission program could allow a pilot to get a line number much earlier, provide the commercial airlines with more predict-



**Lt. Col. Todd Larsen gets his helmet adjusted before a U-2 flight. USAF halted its plans to divert the spyplane’s pilots and maintainers.**

ability, and ensure USAF doesn’t lose all its experienced aviators.

“It’s an idea we think might work,” said Grosso, who called it a “win-win.”

Another idea is to allow Active Duty airmen to fly part-time for the Air Force and part-time for the airlines. “We don’t have a part-time program like that today,” Grosso noted. Yet if it works in the reserve, “is this something we should think about with the Active Duty?” she asked.

Exactly how such an idea might be implemented is still unclear. Grosso said one way might be to use such aviators to fill instructor pilot billets.

Another approach might be to find a

way to help civilian pilots obtain a pilot’s license—a costly venture—in return for some type of military service. However, allied nations offer similar programs. The idea is more challenging for the US, which doesn’t have a nationalized airline.

“We need to start to get the two-way communication with airlines going and see what they are thinking. This is a challenge for both of us,” observed Grosso.

## ONE LARGE CYBER WING

One manpower shortage that doesn’t get the spotlight it deserves is in the ranks of cyber experts.

USAF Maj. Gen. Burke E. “Ed” Wilson, deputy principal cyber advisor to the Secretary of Defense, said the Air Force’s entire cyber force is only the “size of a large wing,” yet overall requirements for this force continue to increase. The stand-up of the Cyber Mission Force (CMF) was a good start, he said at a December 2016 conference of the Armed Forces Communications and Electronics Association.

Though the CMF organized more than 6,000 military and civilian defense personnel into 133 teams, the Defense Department still needs to grow the cyber force and invest more in it, he said.

Grosso said one problem with Cyber Mission Teams, declared operational last October, is that they’re all field-grade positions—held by people at the level of majors, with 10 or more years of



**Maj. David Jones, right, speaks to Specialized Undergraduate Pilot Training students at Columbus AFB, Miss. USAF will produce 1,200 pilots this year.**

service. That makes growing the force a challenge.

The Air Force is considering bringing in qualified cyber experts from the private sector, direct-commissioning them at the level of a major rather than second lieutenant. How this would work has yet to be determined. Grosso said the service has to think about whether these cyber officers would need to attend traditional Officer Training School or if there may be a shorter program USAF could create for them.

“What do we do to set them up for success?” she asked, noting, “this may have applications in other skill sets as well.”

There is a chronic shortage of people in battlefield airmen career fields—pararescuemen and combat controllers particularly. Standards are very tough, and even if someone is admitted to the schoolhouse, there’s no guarantee that a recruit will complete the rigorous course. Attrition is quite high.

The Air Force awarded a contract about 18 months ago for a program called Scout, run by former battlefield airmen. The idea is to recruit athletes who could make it through the training program, then help mentor those recruits through the process, so they have a higher chance of success, said Grosso.



**SrA. Aaron Wilson, holds his son, Adrian, for the first time at Mountain Home. The two-month-old was born while Wilson was deployed to Southwest Asia. The Air Force is addressing the challenge of too few airmen covering too many missions.**

While most of the discussion around USAF’s manpower shortages understandably has centered around uniformed personnel, AFMC chief Pawlikowski faces her biggest problem in the civilian force.

#### **LINGERING CIVILIAN PAIN**

She said the command is “still in the throes of recovering” from the implementation of sequestration in 2013, with its civilian hiring freezes and furloughs of the AFMC workforce. When President Trump ordered a short-lived federal hiring freeze earlier this year, it compounded the problem, she contended.

Pawlikowski said in March that the command is “working through the process” of getting exemptions for personnel deemed critical to national security, but it slows her ability to fill shortfalls.

“Within AFMC in any month, on average, we lose about 400 people,” she said. That’s people who retire, go back to school, etc. AFMC has 60,000 civilians, so while 400 people is not a huge number, nonetheless, “if we freeze hiring, that adds up pretty quickly,” she said.

The command has struggled to balance the growth in new programs with the fact that older weapon systems are not retiring as soon as expected.

“We’re not getting any additional manpower on the acquisition side,” she explained. Standing up a new program office to do Ground Based Strategic Deterrent is tough when the expected manpower pool doesn’t have spare people from, say, the A-10 program,

since that fleet was not divested as planned. Properly staffing the program offices has been a “major challenge,” she stated.

Pentagon leaders rolled out a “should cost” initiative a few years ago. It focused on getting requirements right at the outset, instead of disrupting programs at great cost, by adding them later in the process.

To do that well, USAF needs really good people who have “expertise with pricing,” Pawlikowski explained.

“Over the years, we’ve atrophied that capability within the Air Force, so we have to build that back up again, but you can’t do that without people,” she said. “You can’t own the technical baseline if you don’t have sufficient engineers in the program office.”

In prepared answers to the Senate Armed Services Committee before her nomination hearing, Heather A. Wilson, President Trump’s nominee to be the next Air Force Secretary, said there is a “mismatch” between the Air Force’s strategic objectives and its ability to “confront and deter threats.”

“The Air Force is too small for what the nation expects of it,” wrote Wilson. “Unless the Air Force receives funds above the caps imposed by the Budget Control Act, it will not be able to achieve the readiness, modernization, and force structure required to meet emerging threats.”

The manpower challenges are already acute, and if USAF cannot begin rebuilding its ranks soon, the problems will multiply. ✪



# Combat Forces in PERIL

**Hawk Carlisle, former ACC and PACAF commander, offers a frank look at USAF's mistakes and opportunities.**



By John A. Tirpak, Editorial Director

**A**ir Combat Command has still not rebuilt from 2013's budget sequestration debacle, a funding disaster that left entire squadrons grounded, education and training aborted, and maintenance deferred. The previous chief of ACC, now-retired Gen. Herbert J. "Hawk" Carlisle, said this spring that "the best we've done is [to] stop the decline" in readiness at the command responsible for the lion's share of the nation's conventional airpower.

Though he wanted to report that "we've started to climb out, ... I think that would be awfully optimistic." Carlisle sat with *Air Force Magazine* for an exit interview shortly before his March retirement, also meeting with defense reporters in late February.

He assessed Air Force readiness, aging equipment, and prospects for the future. A boost in people, funds, and the speedy purchase of new equipment will go a long way to making the Air Force healthy again, but any further delay means things will only get worse—and much harder to fix—he said.

Carlisle, who retired March 10, was succeeded at ACC by Gen. James M. Holmes, who came to the job after serving as deputy chief of staff for strategic plans and requirements since 2014. Holmes, too, is a career F-15 pilot and has had many assignments in strategy, plans, and policy.

The pace of deployments for individuals is too high, Carlisle said, and there's so much to do when they return—often

going right back out to exercises or diving into schools—that "when they're home, they're not home."

## **BURNOUT**

There's a very real danger of "burning them out," Carlisle said of his people. "You burn them out for too long, then they vote with their feet."

The pilot shortage—almost 1,000 fewer fighter pilots than ACC needs—is nothing less than "a crisis," Carlisle said. "We're working hard to do everything creative we can" to ease it, he said, by shifting more fighters into fighter training units, relying more on "commercial adversary air"—private jet fighter sparring partners—mixing Active Duty and Reserve units to leaven "the mix

“YOU BURN THEM OUT FOR TOO LONG, THEN THEY VOTE WITH THEIR FEET.”

—Retired Gen. Hawk Carlisle



F-35s from Hill AFB, Utah, fly over the Utah Test and Training Range. Carlisle thinks the Air Force should buy at least 60 F-35s a year.

Then ACC commander, Gen. Hawk Carlisle speaks at JB Langley-Eustis, Va., in 2016. ACC is doing everything it can to halt a decline in readiness, he says today.

of experienced/inexperienced,” and boosting the aviation bonus.

The key thing is to address the capacity issue. The pace of deployments is just too high. Airmen “have to take care of their family and they have to get a break,” he said flatly.

Over a 39-year career, Carlisle held key positions, rising from an F-15 pilot at the tip of the European Cold War spear to top leadership jobs in the Middle East and Pacific. He also served as chief of legislative liaison, the Air Force’s main communicator with Congress. He headed air operations at US Central Command in Saudi Arabia and later commanded Pacific Air Forces.

As a young captain, he served a tour with the then-secret 4477th Test and Evaluation Squadron—the “Red Eagles”—flying covertly obtained Soviet aircraft. Carlisle and his squadron mates wrung out MiGs to learn their secrets and teach their weaknesses to US fighter pilots. Carlisle survived ejection from a MiG-23—listed as the YF-113 on his official biography—and would later fly the Su-27 Flanker in an exchange program with his Russian counterpart in the Far East.

After serving as commander of Pacific Air Forces, “Hawk” took over the reins at ACC in 2014, just a year after the Budget Control Act-driven sequester grounded many Combat Air Forces activities. But USAF’s troubles with capacity and readiness—not enough people, not enough aircraft, and lately, a growing shortage of pilots in every flying mission—really started in 2010, Carlisle explained.

Back then, “I made this comment—and I got in trouble for it—[that] ‘we’re a budget in search of a strategy,’” Carlisle said. The Cold War was long over, crises hadn’t yet started piling up, the one-and-a-half wars force-sizing construct was in disarray, and the Pentagon was

anxious to receive from the civilian leadership a coherent vision of what it should be preparing for.

At the time, Operation Iraqi Freedom was starting to wind down, as was—it seemed at the time—the war in Afghanistan. Russia was a “great friend” that had not yet invaded Ukraine, “China hadn’t asserted itself in the South China Sea, ... the Baltics weren’t afraid to death, Libya hadn’t fallen apart, Yemen was still functioning,” Carlisle pointed out. In the context of that world environment, the Air Force saw an opportunity to finally get at the long-promised but always-deferred modernization of its most elderly gear, Carlisle said—particularly its fighters.

The decision was made to do the CAF Redux, the reduction of 250-plus fighters from the Combat Air Forces, as well as take some risk by reducing personnel and using the cumulative proceeds to modernize. At that point, the average age of fighter aircraft was in the mid-20s, and bomber average age was nearing 40 years.

“It’s not that anybody intentionally put us in a negative position,” Carlisle said, “but based on what [Pentagon



leaders] were facing at the time, they made decisions that now are having repercussions, given the way the world's changed."

In the Air Force specifically, he told journalists, "we made some maintenance manpower reductions without thinking our way through it." Taking so many people out of the maintenance field was "a pretty big mistake," given that so much of the fleet is old airplanes that simply have to have more care. The new airplanes that need less attention—and thus fewer maintainers—just weren't being bought very quickly.

### TAKING RISK

The argument went like this, he recalled: "We have a brief period where, given the counterterrorism fight and other situations in the world, ... we can take risk in the fighter force structure to get to fifth generation," in the form of the advanced F-22 and F-35 fighters and what is now known as the B-21 bomber.

The projections were rosy. "That's the budget that said, in the year 2015, we're going to buy 110 F-35s" per year, Carlisle noted. It didn't pan out: Due to procurement money being siphoned off for current-fight operations that have erupted since then and delays in the program, USAF still is not buying even 50 F-35s a year.

"We took that risk, we never got to fifth gen, and by the way, the world changed and is significantly more challenging and demanding today than ... we thought it was going to be in 2010," he said. The F-22 production line was shut down by then-Defense Secretary Robert M. Gates after turning out just 187 aircraft—less than half the certified requirement.

"Quote unquote from the SecDef [Gates] at the time, 'We'll never fight China,'" recalled Carlisle. Between the CAF Redux, F-35 delays, and Gates' decision to halt the F-22, "that has put us in this position."

In that time frame, Pentagon leaders sought a "force sizing construct," Carlisle said, but "to do what? Do you want us to hold? What is an acceptable loss rate?" Direction never came.

Now, the Air Force has more contingencies than it can send people and airplanes to cover. Regional commanders are being told that, rather than have USAF fighters right at hand for a no-notice conflict, they must settle for the jets deploying quickly from the States—or other forward locations.



"WE MADE SOME MAINTENANCE MANPOWER REDUCTIONS WITHOUT THINKING OUR WAY THROUGH IT."

—Hawk Carlisle

The threats and demands span the globe:

- USAF has been carrying most of the load in the fight against ISIS, bearing some 80 percent of the sorties.

- ACC attack and intelligence, surveillance, and reconnaissance units have conducted most of the kinetic action in the Middle East.

- ACC units are regularly deploying for the European Reassurance Initiative to help guard the Baltic States and NATO broadly.

- Russian bombers are being intercepted with increasing frequency off the US coast.

- North Korea's belligerence demands frequent deployments of US fighters and bombers in the Pacific.

- China's island-building requires monitoring.

- Afghanistan still needs support from the air.

- ACC's battlefield airmen are fully employed.

Against those demands, "we're holding our own," Carlisle assessed. "I really would have hoped that two-and-a-half years after I started [at ACC], we would be moving in the right direction," but the Budget Control Act is "still in effect, so we're still fighting for every penny."

To improve hardware readiness, ACC has been deploying sortie pro-

duction assessment teams, populated with the most seasoned maintainers who help individual units "do everything they can with the resources they do have."

Even the calculation of mission capability rates is changing, and Carlisle prefers "aircraft availability" (AA) as a better metric. Even so, some aircraft are "as low as in the 60s" percent AA, and while a few are in the 70 to 80 percent range, "it's not where we'd like it to be."

### BUY RATE, BUY RATE, BUY RATE

So how to turn things around? The first step—and the first priority if the Trump administration's pledge to fund a rebuilding of the military actually materializes—is to rapidly ramp up production of the F-35, Carlisle said.

"Buy rate, buy rate, buy rate," he intoned. The F-35 should be bought at a rate of at least 60 for the Air Force per year, if not 80, and a long-ago goal of 110 per year would be optimal, but isn't in the cards. The reason why the F-35 has to come first is simple: There isn't enough Air Force to go around.

The expectation is that "all of us [in the Air Force] have to be ready all the time," but "there's not enough." While F-22s and F-35s are a leap ahead of fourth generation fighters, they can only be in one place at a time.





A-10s and F-16s in an “Elephant Walk” at Osan AB, South Korea, demonstrating combat airpower generation. Commanders are being told USAF fighters won’t necessarily be right at hand and may have to deploy from elsewhere.



AIC Jessica Wilkes carries out preflight checks on an F-16. With so many old aircraft in the inventory, maintenance manpower reductions have hurt readiness.



TSgt. Joshua Tocci, left, and TSgt. Kaisha Gurtner perform a weapons check at Bagram Airfield, Afghanistan. USAF is “woefully short of munitions,” Carlisle says.

If “something happened and we had to go into Korea or Iran, or ... [the] South China Sea, ... [or] somewhere in Eastern Europe” all at the same time, “we don’t have enough force to be able to do that. So it’s really a capacity discussion.”

While Carlisle said it would be no contest if an F-22 squared off against a Chinese J-20, such a discussion is irrelevant because it would never happen

that way. The American way of war is to fight in the enemy’s front yard—an “away game,” he said—where an adversary would have his full air force in the fight while the US would have very sophisticated aircraft but only in small numbers.

So “the first priority is the fighter force structure,” Carlisle asserted. “That’s the one that has been a billpayer for the last 10 years [and] more.” If a big

surge of funds comes, “that’s going to be the first place that we put money.”

Next—and in keeping with the new administration’s directives to put readiness first—Carlisle said, “We have to do more training.” Combat crew skills have atrophied during decades of operating without being seriously challenged.

“We’re woefully short of munitions,” Carlisle observed. “We have to buy more. We’re expending them at a rapid rate.” Precision guided munitions are preferred in the anti-ISIS fight where the enemy uses civilians as human shields and avoiding civilian casualties and collateral damage is the top priority. The munitions shortfalls have to be corrected and some reserve built up, because weapons are just as much a facet of the “capacity” issue as aircraft, he said.

“We need operation and maintenance money,” both to increase flying hours so pilots can retain proficiency and to address real property maintenance, an account routinely raided to pay for beans and bullets in the wars of the last 25 years. The Air Force needs to fix “places where the infrastructure’s falling apart,” Carlisle said.

Congress has been pestering the services for several years to definitively state a revised buy objective for the F-35, given that the existing inventory targets were set early in the program, long before any of today’s multiple contingencies erupted. At the current build plan, the Air Force won’t buy its last F-35s until the 2040s—a half-century after the initial design. The Navy and Marine Corps have actually revised their numbers downward, but the Air Force has resolutely stuck with 1,763 as its must-have number.

At the rate the F-35 is coming onboard, though, is that number still meaningful?

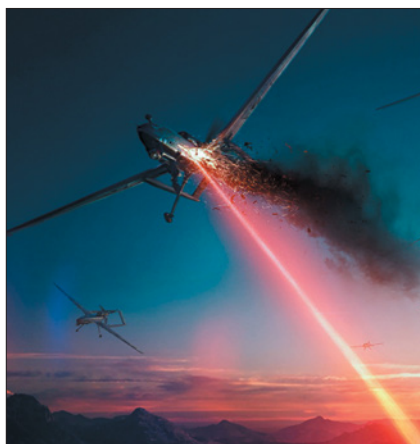
“I don’t know,” Carlisle said in the interview. “I do know that we need to get the buy rate up and get as many as we can as soon as we can.” He said that adversary defense systems and competitor fighters in other countries are being fielded “faster than we originally thought,” and “our adversaries are exceeding what we thought they would do.” This drives the need for an F-22/F-35 successor called the Penetrating Counterair aircraft, or PCA.

“Do we take the post-1,000 or post-1,200 F-35 money and put it into the PCA? Maybe that’s the right answer. Or maybe it’s a modernized F-35,” Carlisle said. The baseline F-35 will be





**An illustration of a directed energy (laser weapon) dogfight. High-speed weapons and hypersonics are potentially revolutionary technologies.**



**Lasers respond to a drone swarm in this artist's concept. RPAs will outnumber manned aircraft in the future, but don't write off the man in the cockpit yet.**

delivered early next year with the 3F build of software; but the services and international partners on the program have already begun mapping out the Block 4 and later versions that will have more weapons, better connectivity, and more tricks in the realm of electronic warfare.

Carlisle said USAF requires a big infusion of new technology in other areas, too. A smaller-size successor to the AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM) is necessary—so more shots can be packed into internal weapons bays on the F-22 and F-35—and with longer range and better kinematics. The Air Force also must have a follow-on to the Joint Direct Attack Munition (JDAM) satellite guided bomb that is stealthy and maneuverable enough to survive the last few miles of an attack on ever-improving air defense systems. The service needs a new electronic warfare platform, as well, to escort its

fighters deep into heavily defended airspace—a Penetrating Electronic Attack platform.

Add “high-speed weapons and hypersonics” to the list of urgently needed technologies. Hypersonics holds out great possibilities for quick attack at long range, he said, but ACC isn’t counting on it. One thorny problem is that the heat generated on the tip of such a system tends to play havoc with its sensors, but “we’re working on it.”

### **KEEP YOUR FRIENDS CLOSE**

The Air Force must replace its RQ-170 secret remotely piloted aircraft before too long, Carlisle said, but he doesn’t see the near-term sunset of man-in-the-cockpit.

“I think the mix is going to change,” he allowed, with a greater number of remotely piloted aircraft than manned aircraft, because with improvements in autonomy, “you get where machine-to-machine does most of the work,” and human beings are supervising and, when it’s essential, they “intercede.” More will be done with networks and humans controlling large numbers of RPAs, but “I don’t necessarily see that we’re going to take ejection seats out of every manned platform.”

Asked if the US is becoming too dependent on its allies to provide capacity in the event of a major war, Carlisle replied, “We know we have to” fight in coalitions “because we need international support and ... national support.” It implies that the nation is “supportive of what we’re doing.”

Together with allies, “we have enough [capacity] to meet the demand of the challenge or threat we’re facing,” and the modern way of war depends on alliances.

“I think we’re pretty good at doing that,” he asserted. “If you think about it, what allies does Russia have? What allies does [China] have? I think our belief [in] and use of alliances is very well judged, very well utilized,” and regional combatant commanders “spend a lot of time taking care of those relationships.” However, Carlisle would like to see a great reduction in the “red tape” that allies must plow through to get the same equipment used by the US. “It is painful,” he said, to promise an ally a tool and then take years to supply it.

“It makes our partners question whether we’re as supportive as we say we are,” he warned. That’s a challenge when the US is simultaneously saying, “Thanks for letting us utilize your bases.”

One of Carlisle’s deepest concerns regards the condition of the defense industrial base. The steep and steady drawdown of munitions stockpiles is symptomatic that the nation isn’t doing enough to keep the industrial base healthy, he said. (Carlisle is expected to become president and CEO of the National Defense Industrial Association this summer. NDIA describes itself as “America’s leading defense industry association promoting national security.”)

The reason why the Air Force is as good as it is “is because our national industrial base has been so good in getting us here,” he said. “We’ve got to continue to feed” it.

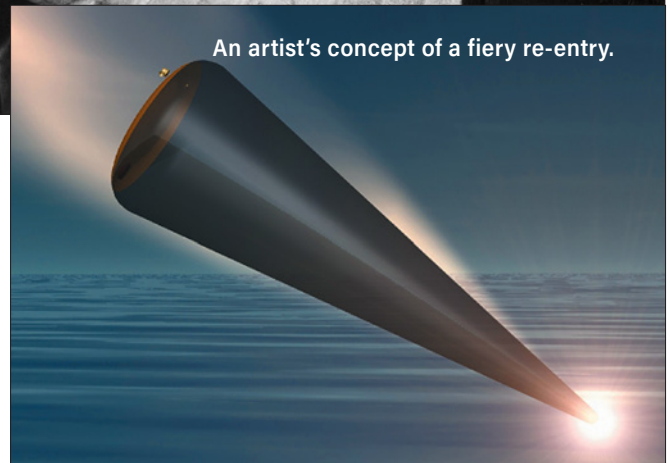
In the munitions category, “you run out of people that make solid rocket propellant, and ... start running out of people that ... make the warheads,” and then “you only have a couple of places that are doing the avionics or the seekers. ... That hurts us as a nation.” He also said that covering these issues only through the overseas contingency operations (the OCO) accounts won’t work; they must be addressed in the “base” budget.

The Air Force always tries “go against the high end, to be the best Air Force in the world ... and stay there, against adversaries that are trying to match us.” That standard is “pretty high” he said, “and that’s the one that we’re trying to get back to. ... I would never want to stop measuring against that.”

# RVX 1-5



Recovery at sea, 1959.



An artist's concept of a fiery re-entry.

In the 1950s, the Air Force worked hard to develop systems that could survive re-entry from space through Earth's atmosphere. One star of this effort was the Re-Entry Vehicle X program, which had several phases. RVX 1-5 was five feet long and two-and-a-half feet in diameter. On April 8, 1959, it was blasted off from Cape Canaveral AS, Fla., atop a Thor-Able rocket. It reached an altitude of 764 miles and covered a distance of 4,944 miles, during which it hit Mach 20 and heated up to a scorching 12,000 degrees. After re-entry, USAF fished it out of the Atlantic, near Ascension Island, making it the first RV recovered after an intercontinental flight. USAF donated RVX 1-5 to the Smithsonian in 1960. The ceremony was attended by then-Lt. Gen. Bernard A. Schriever (center), head of USAF's Air Research & Development Command.

Photos: Smithsonian Institution Archives; USAF artist's concept; USAF





Airmen prepare bombs at Whiteman AFB, Mo., on Jan. 18, 2017. B-2s flew for 16 hours from the base to carry out air strikes against ISIS training camps in Libya. Right: GBU-38 Joint Direct Attack Munitions arrayed inside the bomb bay of a B-2 before the mission.



# THE B-2 BODY BLOW

By Brian W. Everstine, Pentagon Editor





## Two bombers, 13 tankers, 85 bombs on target in the sands of Libya.

**F**ar above the ISIS training camp in the Libyan desert, some 30 miles southwest of the coastal city of Sirte, Air Force MQ-9 Reapers watched the group's tents for activity on the night of Jan. 18-19, 2017. This site was believed to be the terrorists' largest concentration of operatives outside of Syria and Iraq—a makeshift sanctuary for fighters attempting to secure control of territory in yet another nation with a weak government and minimally organized security forces.

For months, Reapers—remotely piloted aircraft (RPAs)—and Marine Corps jets had hammered ISIS in Sirte, forcing the group to retreat to the desert. Now, the coup de grâce was on its way from Missouri in the form of two B-2 Spirit stealth bombers.

Within 10 seconds of their planned time on target—and after about 16 hours of flight—the pair of bombers unloaded bombs on the camp. The entire ISIS tent city erupted. Video released the next day at a Pentagon briefing showed next to nothing left. ISIS had been dealt a severe blow just

as it was attempting to regroup for further Libyan operations.

The strike, launched in the waning hours of Barack Obama's presidency, was the culmination of seven months of US operations focused on ISIS. For the Air Force, it exemplified the concept of global precision strike.

USAF Chief of Staff Gen. David L. Goldfein told lawmakers in April, "These stealth bomber crews, refueled by 13 different tankers, delivered 85 bombs over two terrorist camps. Delivering precise, lethal effects" half a world away, at exactly the called-for time.

### TERROR BREEDING GROUNDS

In 2014, ISIS decided to expand its self-proclaimed caliphate beyond Iraq





**Backup plans: Munitions are readied for loading on Jan. 18. According to the head of Global Strike Command, Whiteman crews prepped five aircraft and some 400 weapons for the mission.**

and Syria, seeking a global presence. It saw good prospects for a foothold in North Africa, taking advantage of the near lawlessness that had engulfed Libya. The nation's Government of National Accord (GNA) could keep only a tenuous hold on the nation. Foreign fighters flowed into Libya, rising to a peak of almost 6,000 by April 2016.

"Anywhere you have a weak or unstable or no government, that's a breeding ground for ISIS," said Marine Corps Gen. Thomas D. Waldhauser in March. He is commander of US Africa Command (AFRICOM).

ISIS claimed the small seaside town of Sirte as its capital in Libya and soon began launching attacks within the



**Airmen from Whiteman's 509th Bomb Wing prepare a B-2 Spirit. The stealth bombers were tasked because range, payload, and surprise were essential.**



B-2 crews at Whiteman and Air Mobility Command tanker planners were put on alert in mid-January and given 96 hours to plan the mission.



**A B-2 takes off on Jan. 18. The mission's purpose was to help Libya's Government of National Accord reclaim territory around Sirte, a town ISIS was using as a base for attacks.**

country and planning foreign attacks from there. On Aug. 1, 2016, the US began kinetic action against the ISIS franchise.

President Obama, at the request of the Libyan government, approved the strikes on Sirte as an attempt to help Libyan forces reclaim territory in and around the city. The strikes came from

## BY THE TIME ODYSSEY LIGHTNING WRAPPED UP LAST DECEMBER, US AIRCRAFT HAD CONDUCTED 495 STRIKES.

USMC AV-8B Harrier II jets, stationed on the amphibious assault ship *USS Wasp* off the Libyan coast. USAF Reapers and Marine AH-1 SuperCobras joined the campaign. The first day, US aircraft hit one T-72 tank, one T-55 tank, two military support vehicles, an enemy fighting position, and two pieces of heavy engineering equipment.

The 2011 NATO operation to oust Libya's dictator Muammar Qaddafi was called Operation Odyssey Dawn. This new campaign was dubbed Operation Odyssey Lightning; it was expected to be quick—and harsh.

### THE NEW ODYSSEY

Odyssey Lightning launched almost daily air strikes, supporting GNA forces as they advanced throughout Sirte. AFRICOM released daily summaries, detailing what was hit, usually with pictures of USMC aircraft launching from *Wasp*.

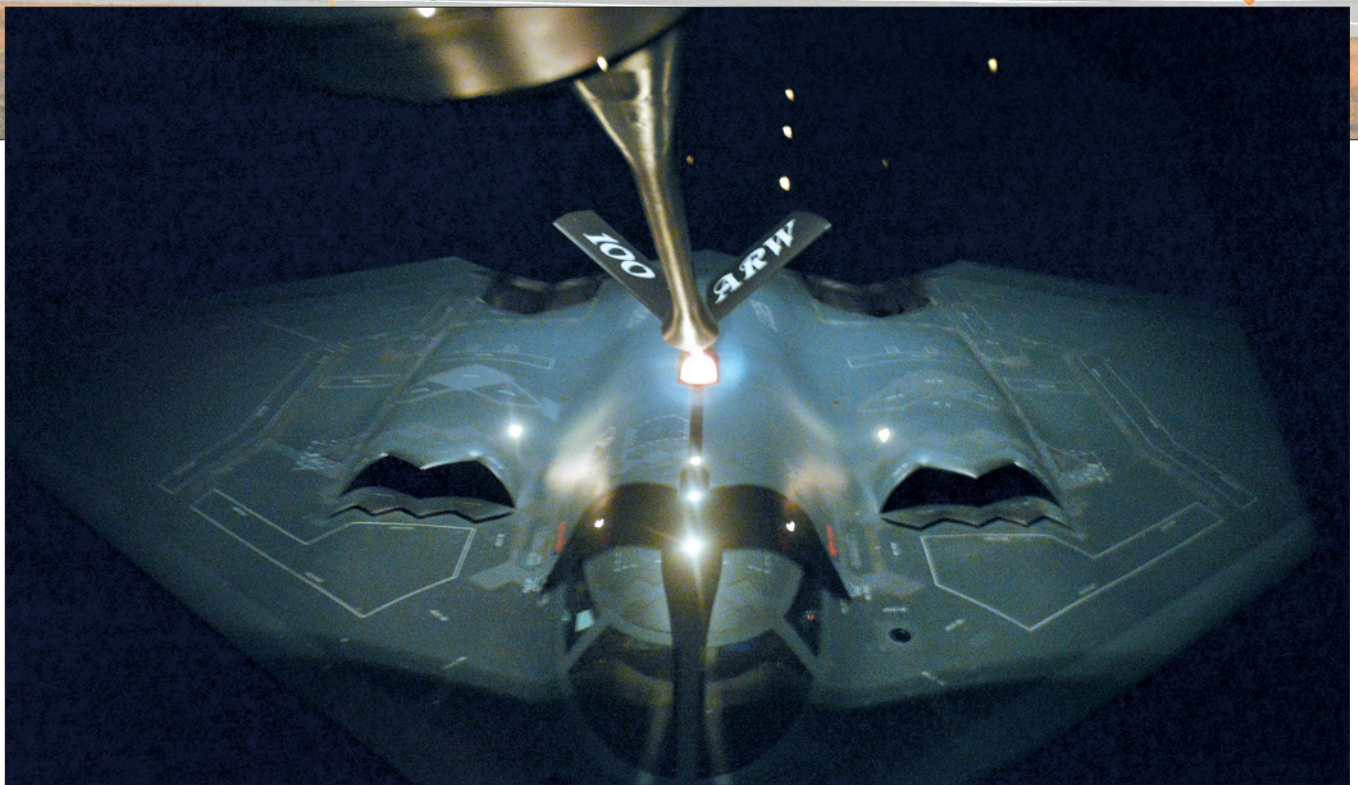
For the campaign, the US deployed special operations forces in the vicinity. They worked in "operations centers" near the front line to help direct strikes.

Their task called for precision air strikes and close air support in an urban environment, with rules of engagement calling for no civilian casualties and minimal destruction of nearby infrastructure, Waldhauser said.

"I don't think you can do an operation like that without somebody on the ground," he explained. "You have to have that contact; you have to have that face to face." With strikes coming from RPAs flown by crews half a world away and commanders making decisions in still other far-flung locations, "you need to have somebody on the ground talking to these people to make sure we can do it with this skill and precision that's required."

From the beginning, AFRICOM set out to be as careful as possible and





**In the late hours of Jan. 18, a 100th Air Refueling Wing KC-135, from RAF Mildenhall, UK, refuels a B-2 from the 509th Bomb Wing. Thirteen tankers refueled the stealth bombers.**

created a strike approval process optimized for speed. Libya was deemed an active area of hostilities. This gave the command the ability to promptly approve strikes. Teams on the ground needed to ensure that only ISIS fighters were hit, Waldhauser said.

“We had to know what we were shooting at,” he maintained.

While AFRICOM offered pictures of Marine Corps assets—Harriers—taking off for strikes and spoke publicly about SuperCobras in the operation, the Air Force’s involvement largely stayed under wraps. That was the case until early this March, when the head of Air Combat Command’s main

remotely piloted aircraft wing was permitted to detail its involvement. He did so at AFA’s Air Warfare Symposium in Orlando, Fla.

By the time Odyssey Lightning wrapped up last December, US aircraft had conducted 495 strikes. Sixty percent of those came from MQ-9 Reapers, flown by crews at Creech AFB, Nev., and at Air National Guard bases in North Dakota and Tennessee, said Col. Case Cunningham, commander of the 432nd Wing at Creech and the 432nd Air Expeditionary Wing.

The RPA crews at the bases coordinated directly with special operators in Libya. Seventy percent of the Reaper

strikes were conducted within “danger close” range of GNA forces, some less than 100 feet away.

Cunningham said that at times, RPA operators fired Hellfire missiles into specific windows of structures in Sirte to take out a sniper, but left the rest of the building intact.

On Dec. 19, 2016, AFRICOM officially closed out Odyssey Lightning as Libyan GNA troops reclaimed Sirte from ISIS. But that didn’t mean the end of US air strikes in the country.

Fleeing the town, ISIS fighters went south into the desert to regroup, forming a makeshift training camp. Even as they did so, US intelligence, sur-



# THIS WAS “NOT SOMETHING THAT B-2 PILOTS TRAIN FOR ON A REGULAR BASIS.”

—Capt. Nathan Mueller  
Mission flight lead



veillance, and reconnaissance aircraft overhead kept watch. US intelligence learned the group was attempting to plan attacks outside of Libya, including in Europe.

“We need to strike [ISIS] everywhere they show up,” then-Defense Secretary Ashton B. Carter said Jan. 19. “That’s particularly true in view of the fact that we know some of the [ISIS] operatives in Libya were involved in plotting attacks in Europe to our friends and allies there.”

In mid-January, B-2 crews at Whiteman AFB, Mo., and tanker planners in Air Mobility Command were put on alert. They had 96 hours to plan a strike in Libya to take out the ISIS camp.

Despite the fact that the targets were tents in the desert, USAF chose the formidable B-2 because its specific capabilities were required, Goldfein told reporters in February. Range, payload, and surprise were essential.

“Here’s the mission we’re given, and what is the family of systems required?” Goldfein asked. “That was the best weapon system we had for that mission.”

And while “we think about the Libya strike as a B-2 strike, let’s not forget, there were a bunch of tankers that had to get them there. There were all of the maintainers that had to get them loaded. There were all those loaders who had to build those weapons and load them. There’s a family that’s required to be able to get that B-2 finally on target.”

At Whiteman, crews prepared five

aircraft and loaded about 400 weapons, Air Force Global Strike Command chief Gen. Robin Rand said at the AFA symposium in March. The 509th Bomb Wing picked its best aircrews for the mission: officers who had graduated from the US Air Force Weapons School. “It was a very humbling experience when my squadron commander told me that I would be flight lead” for what would become the B-2’s only participation in Odyssey Lightning, 13th Bomb Squadron flight leader Capt. Nathan Mueller—call sign Shatter—said in a Whiteman press release. “The dynamic targeting and inherent integration that took place en route to Libya is not something that B-2 pilots train for on a regular basis.”

Air Mobility Command planned the refueling, preparing an air bridge of KC-10 Extenders and KC-135 Strato-

**This was the first combat mission for the B-2s since their 2011 strike on Libya. It took a big team to carry it out: tankers from three commands, maintainers, weapon loaders, and RPA crews, to name a few.**

tankers from New Jersey and Europe to get the bombers to the target.

AMC chief Gen. Carlton D. Everhart II told *Air Force Magazine*, “As soon as the requirement hits from Transportation Command, we start working those requirements. At Air Mobility Command, we’re very used to doing the pickup game.”

18th Air Force and the 618th Air and Space Operations Center at Scott AFB, Ill., looked across the air refueling enterprise to find tankers to perform the mission from US Northern Command, US Air Forces in Europe, and US Central Command.



**Surveillance of ISIS fighters unloading weapons from vehicles in Libya at a training camp near Sirte.**

Photos: SRA, Joel Pfeister; SSgt, Kate Thornton; USAF video





**A crew chief marshals in a B-2 at Whiteman on Jan 19. The aircraft's range, payload, and stealth capabilities made it the weapon of choice.**

"It's a big team that has to execute things on time to make it work right," said Col. Darren R. Cole, commander of the 305th Air Mobility Wing at JB McGuire-Dix-Lakehurst, N.J. His wing's KC-10s made some of the first refuelings of the three B-2s sent on the mission. "It's pretty impressive to be able to hit a target globally at a moment's notice with so many people participating."

On the night of Jan. 18, three B-2s launched from Whiteman with aircrews and cameras looking on. It was the first combat mission for the bombers since the previous strike on Libya, in 2011, which began Odyssey Dawn. The Spirits launched shortly after President Obama approved the mission. It was the final full day of his presidency.

A number of MQ-9s watched as two B-2s—the spare turned back before the target—dropped 85 weapons on the training camp. The camp was destroyed, and more than 100 ISIS fighters were killed.

"Importantly, these strikes were directed against some of [ISIS'] external plotters, who were actively planning operations against our allies in Europe," Carter said in revealing the mission. "These were critically important strikes for our campaign and a clear example of our enduring commitment to destroy [ISIS'] cancer—not only in Iraq and Syria but everywhere it emerges."




**Brig. Gen. Paul Tibbets IV, center, 509th Bomb Wing commander, welcomes two B-2 pilots home. The wing picked its best airmen for the mission.**

While the Jan. 19 strike was a blow to ISIS, it did not eliminate the group from Libya.

"The status of ISIS in Libya is, they ... are regrouping," Waldhauser said. "They've scattered" into "small numbers, small groups." The US is continuing to develop intelligence on their locations and activities.

While the Libyan government is relatively weak, it has been able to join with others such as the Misrata militia because "one [thing] that unites them"

is their shared desire that ISIS not be a force inside Libya, Waldhauser said. Given the volatility there, those groups will have to unite to avoid a civil war, he added.

As of late March, AFRICOM estimated that 100 to 200 ISIS fighters remain in Libya. US aircraft continue to ply the skies there, Waldhauser said. "We continue to observe, to develop intelligence." If the Government of National Accord asks for assistance again, "we'll provide that." 



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# IMPOSING COSTS ON THE ENEMY

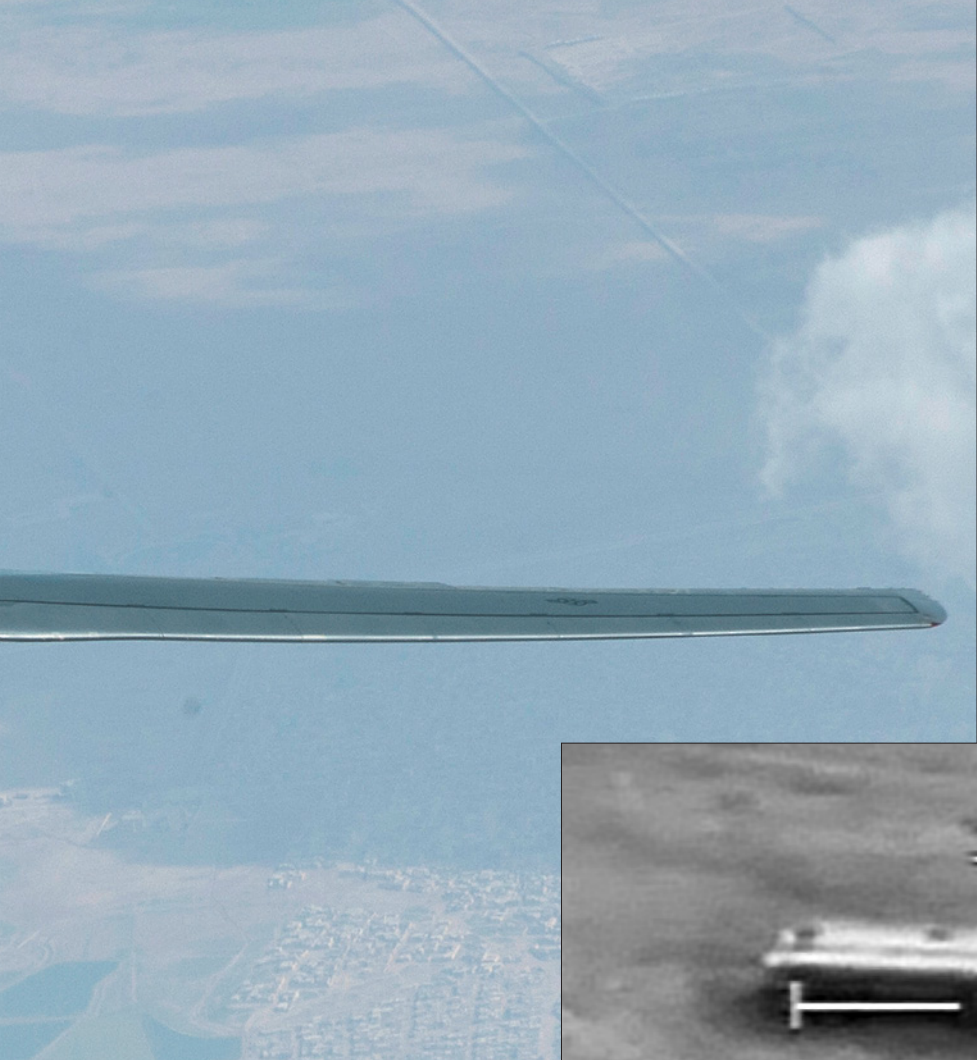
**Different adversaries value different things. The Air Force can target them all.**

**By Jennifer Hlad**

During a typical week of Operation Inherent Resolve, the US-led air coalition strikes dozens of targets in Iraq and Syria: wells, buildings, fighting positions, vehicles, and weapons. In January, the Air Force flew a pair of B-2 stealth bombers from Missouri to drop dozens of GPS guided bombs on a remote ISIS location in the Libyan desert. In April, the Navy fired 59 Tomahawk cruise missiles, costing roughly \$50 million, at a Syrian airfield. Later in April, an Air Force MC-130 delivered the Massive Ordnance Air Blast (MOAB) bomb against an ISIS-held cave and tunnel complex.

Are these wise uses of US resources? Perhaps not in a cost-vs.-cost comparison, but the US is not involved in total-war battles of attrition. Financial considerations are often secondary concerns for both America and its enemies in wartime, and airpower gives the US the ability to hit enemies wherever it is that they will really feel pain.

The idea is to “price your competition out of the marketplace of being able to even compete with you,” Lt. Gen. Steven L. Kwast, commander



**A B-1B from the 34th Expeditionary Bomb Squadron over the skies of Syria in 2015. The bombers were conducting air strikes against ISIS during Operation Inherent Resolve.**

and president of Air University, told *Air Force Magazine*.

Ideally, he explained, “when there’s a \$10 problem, ... you [try to] solve that problem for 10 cents and you force your competition to solve it for a thousand bucks.” Adversaries “will not behave badly if they know that there’s no way they can successfully counter you.”

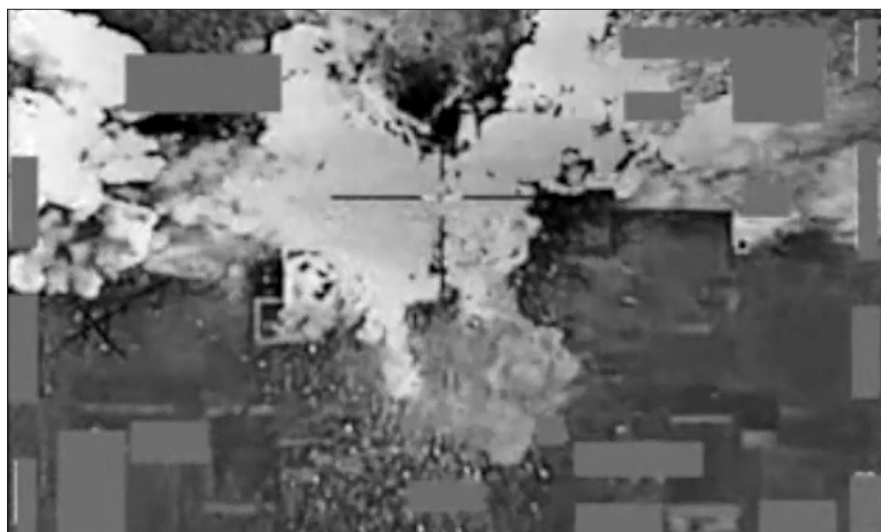
The idea of imposing costs on the enemy—without incurring high costs in the meantime—is not new. Since World War II, the US has been “so unilaterally dominant economically ... that we have had the luxury of spending money and being effective,” Kwast said.

However, “as we’ve watched the return on investment starting to wane a little bit” in recent years, the Air Force has had to “get back to these basics” and develop its concepts, organizations, and processes anew to “think deeply about affordability.”

The risk is that the service tends to focus on the fight at hand and underinvests in over-the-horizon programs. It’s human nature, he said.



**An image from a DOD video shows a fuel truck in an aircraft targeting sight. Coalition air strikes destroyed ISIS fuel trucks near Abu Kamal, Syria, in November 2015 to degrade the terrorist group’s oil revenue.**



**A DOD video image shows the aftermath of a coalition air strike destroying an ISIS cash and finance distribution center near Mosul, Iraq, on Jan. 11, 2016. Such attacks aimed to disrupt ISIS’ ability to fund its operations.**

Photos: SSgt. Perry Aston; DOD video; DOD video



“Even the most brilliant people can fail if they are not given the resources to do everything they should be doing,” he said.

Moreover, Kwast argued, the US government is designed to prevent drastic or rapid change unless there’s a major crisis. There’s little incentive to alter governance “when we are strong as an American society and when the American people do not have to really change their lifestyle.”

Politicians, he pointed out, don’t want to vote to close factories and surrender jobs in their districts if there’s no pressing reason to do so.

“We can talk all we want about China acting badly in the South China Sea, or Russia acting badly by invading Crimea, ... but if you do not motivate the American political system to actually take risks and do something different, the tools of national power that come out of this military complex will not change, and you are forced to continue using the tools of the past,” he said.

Is it worth it, though, to use a “\$15,000 bomb delivered by a \$100 million aircraft to destroy a \$20,000 truck?” asked retired Lt. Gen. David A. Deptula, dean of the Mitchell Institute for Aerospace Studies. That’s the wrong way to look at the equation.

“The issue is, what was that truck about to do? Who was that truck carrying?” Deptula said.

Sometimes, the intrinsic value of a target is far outweighed by the impact its loss will have on the enemy. When coalition air strikes destroyed more than a hundred ISIS fuel trucks in late 2015, military spokesmen said the effort delivered a harsh blow to the terror organization’s ability to fund its military operations. Strikes on cash storage and distribution sites were lauded for severely impairing ISIS’ ability to pay its fighters.

Deptula believes that even being able to use a very expensive system to precisely attack a fairly low-level tactical target, anywhere in the world, “is imposing costs on potential adversaries, just simply having that capability.”

It’s not cheap, he said, “but in terms of imposing costs on adversaries, look [at] what we’ve already done.”

In the 1991 Gulf War, Russia and China “saw ... what happens when the United States has unrestricted access to the aerospace environment of a particular nation.” They learned from Iraq’s disaster and “spent 25 years ...



continuing to build counters to ... our ability to achieve control of the aerospace,” Deptula asserted.

The Air Force is working hard to turn the tables on enemy costs.

Kwast said that at Air University, students study the principles of innovation, which is also a study of bureaucracies.

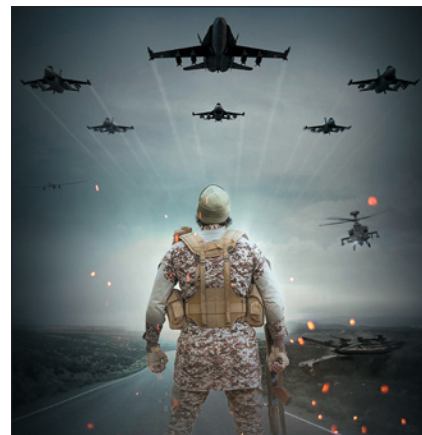
He asked how “do you get a bureaucracy that tends to perpetuate the past—that has been successful—how do you get it to be adaptable so that it evolves?” When innovations are made, “then ... how do you organize so that your organization does not kill the innovation?”

The students look at how to design routine innovation “into permanency,” Kwast said.

USAF is working to make its processes more strategic and is moving toward multidomain integration and command and control.

“We are really sitting on a very powerful moment in time,” he said, where the US “has the potential ... of leaping ahead for the next number of years in ways no other [country] can, so getting back to these basics of innovating is really important and fun.”

The US still tends to go to war in a linear way, he stated. Typically, if a



**Back cover detail of an ISIS magazine. USAF must concentrate its operations on the key systems of ISIS.**

contingency erupts somewhere in the world, the US sends troops to address it. In a networked world, though, the country that owns the network “can focus knowledge and power anywhere on that network with lightning speed” and can do it for multiple nodes for “very, very affordable prices.”

Doing something at one node or 100 nodes of a network “does not have that exponential increase in cost,” like the linear approach does, he said.

The Air Force is designing “a networked approach to the projection





SrA. Christopher Haynesworth, left, and SSgt. Daniel Eisenhart install a tail kit on a JDAM at Al Udeid AB, Qatar. Precise attacks on even a relatively low-level tactical target impose costs on adversaries; they know USAF has the capability to do it at any time.

of power” and to deliver on its five core missions, “so that we can more affordably apply airpower and power projection at many different places in the globe at once,” Kwast explained.

Moving away from traditional ground-centric approaches to military problems is a strategy to impose costs on the enemy as well, Deptula said.

In Operation Inherent Resolve, he said, the US military approached the conflict as though it were simply resuming the effort underway before the 2011 US withdrawal: training Iraqi forces and providing air support so the indigenous forces can eject ISIS.

Unfortunately, that approach “fit really nicely” with ISIS’ strategy, Deptula said, because the US focus “was on supporting Iraq, not eliminating the source of the Islamic State’s ability to operate.”

So what is the best way to impose significant costs? Kwast said leaders must first truly know their enemy.

“If you really understand them

WHAT IS THE BEST WAY TO IMPOSE SIGNIFICANT COSTS? LEADERS MUST FIRST TRULY KNOW THEIR ENEMY.



An aircraft engine lies before a demolished hardened aircraft shelter in Iraq after Operation Desert Storm. Russia and China learned about US capabilities from that 1991 war and have since been developing ways to counter them.

deeply, you know what they value, and you know how many resources they’re spending doing certain things,” he said. Then, “you find very, very cheap ways of taking away everything they value and everything that makes them effective.”

That calculus must be done on every aspect of the conflict, he continued, “because if you’ve got a lot of money, and the United States of America is unilaterally dominant economically, you can affect your enemy. But it’s easy to pick something that’s convenient, and oftentimes it’s very expensive.”

Kwast said, “Real cleverness” is driving costs down to do more with fewer resources.

Still, he said it would be unfair to say the US military hasn’t been innovative enough.

“The scientists and engineers out there in these silos of brilliance have all the tools to totally reinvent the way America projects power. And they could do it at affordable price points

that would give us competitive advantage over our enemies that would just water the eyes of the world,” he said. “But permission is not given to do that [because such an approach] would disrupt all of the current massive programs” in ships, aircraft, satellites, rockets, and nuclear weapons “that really fuel an economy.”

But by the same token, it would also be unwise to try to change overnight—because it would destroy the economy.

“Certain journeys need to take time,” Kwast said. The prescription for winning the cost-imposition contest is “to adapt rapidly enough to stay ahead of your competition, but not so fast as to kill the patient, which is the American economy and the military-industrial complex.”

**Jennifer Hlad** is a freelance journalist based in the Middle East. Her most recent article for *Air Force Magazine* was “Behind the Scenes Against ISIS” in the April/May issue.





# ISR EXPLOSION

By Wilson Brissett, Senior Editor

**New missions call for unmanned systems,  
but the old missions are as important as ever.**

The Air Force has faced significant operational challenges over the last decade to keep pace with the increased demands for intelligence, surveillance, and reconnaissance. The wars in Afghanistan, Syria, and Iraq have brought dramatic changes to the way these missions are conducted, including the retirement of some ISR assets, the rise and fall of others, and the emergence of the unmanned ISR mission as the wave

of the future.

Through it all, the Air Force continues to return to the phrase “insatiable demand” to describe combatant commanders’ calls for keeping a better watch on the world. While USAF leaders still say they struggle to fulfill these requests, the shape of the Air Force has shifted decidedly toward ISR. For example, ISR assets as a portion of the total aircraft inventory have more than tripled over the









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past decade. In 2007, ISR aircraft made up 3.2 percent of the USAF total inventory. Today, ISR assets represent 9.9 percent of all Air Force aircraft.

### RISE OF THE RPA

A large part of this shift has come with the rapid increase in remotely piloted aircraft. As of Sept. 30, 2016, the Air Force had 533 ISR aircraft in its total active inventory. Of that ISR fleet, 357 were RPAs: MQ-1B Predators (129), MQ-9A Reapers (195), and RQ-4B Global Hawks (33). The Air Force has more of each of these three platforms than any of its other ISR aircraft. If you combine all three versions of the E-3 Sentry, the Air Force has 31 of them. Next comes the U-2S Dragon Lady at 27.

These numbers are striking given that 10 years before, in September 2006, the Air Force's 11 RQ-4s were its most prevalent unmanned asset, and the service had more numbers of four different manned aircraft: the U-2 (34), E-3 (32), RC-135 (22), and EC-130 (16).

Today, 67 percent of the Air Force ISR inventory is made up of unmanned aircraft. A decade ago, there were only 24 unmanned aircraft in the entire ISR inventory, and they constituted less than 18 percent of the ISR active fleet. In the intervening years, ISR underwent a revolution of sorts.

While the direct predecessor of the Predator, the General Atomics Gnat-750, made its military debut as a CIA asset in the skies over Bosnia in 1993, unmanned ISR did not begin to approach its current prevalence in the Air Force until the post-9/11 wars had fully developed. They pushed USAF toward an "airborne-centric" ISR architecture, said Lt. Gen. Larry D. James, then Air Force deputy chief of staff for ISR, in 2013. The asymmetric nature of the counterinsurgency





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Previous pages: An E-3 Airborne Warning and Control System aircraft is refueled over Iraq during Operation Inherent Resolve. The wars in Afghanistan, Syria, and Iraq have increased the demand for intelligence, surveillance, and reconnaissance. /1/ The MQ-9 Reaper carries the Multispectral Targeting System, a suite of visual sensors. /2/ A pilot and sensor operator fly a simulated Reaper mission at Creech AFB, Nev., in 2014. /3/ A 380th Air Expeditionary Wing EQ-4 Global Hawk, with the Battlefield Airborne Communications Node, lands in Southwest Asia. /4/ A1C Paige Sager, left, and SrA. David Garcia examine connectors on an EC-130 Compass Call antenna in Southwest Asia in 2007. /5/ An E-9A surveillance aircraft takes off in 2008 from Tyndall AFB, Fla.

Previous pages: SSgt. Douglas Ellis. These pages: A1C Aaron Montoya; SSgt. Nadine Barclay; SrA. Tyler Woodward; SSgt. Phillip Butterfield; SSgt. Bennie J. Davis III



wars in Afghanistan, Syria, and Iraq offered fertile ground for innovation in ISR assets.

Commanders were feeling the need for more data on the ground and were putting pressure on the fleet for greater production. In March 2008, the Pentagon reported a 300 percent increase for full-motion video from ISR assets and said that demand was outpacing supply by a factor of four-to-one. By September of the same year, the Air Force announced that it wanted to more than double its number of RPA operators—from 450 to 1,100—by 2012. One of the ways it planned to achieve that goal was to train, for the first time, airmen with no previous flying experience to become RPA pilots. USAF also said it wanted to increase its MQ-1/MQ-9 combat air patrols (CAPs) from 33 to 50.

In many ways, and by Herculean effort, the Air Force began to achieve many of its ISR goals. By February 2010, the first group of RPA pilots from nonflying career fields had flown their initial in-theater MQ-1 missions from Creech AFB, Nev., and they were making a difference. In April 2012, USAF announced it had increased its ISR capacity by more than 4,000 percent since 2002 and that its airmen were flying 1,500 hours of airborne ISR and producing 1,000 hours of full-motion video per day.

In 2012, the MQ-1 and MQ-9 platforms were approaching a combined 1.5 million combat hours flown over Afghanistan and Iraq, and by June 2014, the Air Force had reached the higher goal, set by Secretary of Defense Robert M. Gates in 2009, of 65 CAPs for its RPAs. Still, the Air Force said it was barely fulfilling 66 percent of the “insatiable demand” for ISR.

### THE BRIEF, TRIUMPHANT CAREER OF LIBERTY

While the unmanned renaissance was ramping up, the manned ISR mission was by no means being neglected. In June 2009 at JB Balad, Iraq, the Air Force debuted a new platform, the MC-12W Liberty. It used a four-person crew to provide signals intelligence and live-streaming overhead video. The turboprop aircraft had been developed as a special project under an accelerated acquisition program, and the service initially acquired 37 specifically to strengthen ISR in Afghanistan and Iraq.

The MC-12 was a great success. Even Chief of Staff Gen. David L. Goldfein gained experience flying the MC-12W. The fleet was normalized in 2011 and bedded down at Beale AFB, Calif. The Liberty continued to perform heavy-duty service overseas. By September 2012, the 4th Expeditionary Reconnaissance Squadron at Bagram Airfield, Afghanistan, had flown 100,000 hours in its MC-12s in less than three years of operation. The pace was also quickening, as half those hours had been flown within the previous 12 months. “That’s about 11-and-a-half years’ worth of flying for the MC-12s in two years and nine months,” Lt. Col. Jeffrey Alexander, 4th ERS commander, said at the time.

Just one year later, in October 2013, the entire USAF fleet of MC-12Ws reached 300,000 combat flight hours. Col. Phillip A. Stewart, then Beale’s 9th Reconnaissance Wing commander, used a familiar catch phrase, noting “an insatiable demand” for this aircraft. At that moment, however, it was already clear that the Air Force would have to consider cutting the MC-12W because of budget constraints. Those fears were realized in 2015, when the 9th RW flew its final MC-12W mission.

The Air Force sold most of its 41-strong fleet to the Army and civilian contract operators. Air Force Special Operations Command asked Congress for authorization to retain 33



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/1/ An MC-12W is refueled by a forward area refueling point team at Hurlburt Field, Fla. The Liberty platform provided immediate intelligence and live video during this 2016 special operations exercise. /2/ A pair of MQ-1 Predators at JB Balad, Iraq, in 2009. The remotely piloted aircraft performed armed ISR missions throughout Southwest Asia. /3/ A maintainer attaches “pogos” to the wings of a U-2 after the spyplane returned to Beale AFB, Calif., from a sortie. /4/ An RC-135W reconnaissance aircraft from the 55th Wing, Offutt AFB, Neb., on a training mission in 2000. Rivet Joints have been in service since 1973. /5/ An airman completes a preflight inspection on an E-3 Sentry engine before a sortie for Operation Inherent Resolve in Southwest Asia.





TSGT. Gregory Brook; TSgt. Erik Gudmundson; SSgt. Kenny Holston; MSgt. Dave Nolan; SRA. Tyler Woodward





MC-12Ws to replace its U-28 mission, but AFSOC was only authorized to keep 13. Currently, Will Rogers ANGB, Okla., home of the recently transitioned 137th Special Operations Wing, has received 11 of the 13.

### THE FUTURE IS UNMANNED (AND MANNED)

The unmanned revolution has definitively reshaped the way the Air Force carries out the ISR mission, and the future of that mission is poised to bring more of the same. In 2019, the service plans to retire the venerable U-2 Dragon Lady high-altitude ISR aircraft. As a replacement, Northrop Grumman is outfitting the RQ-4 Global Hawk with new capabilities to take over the U-2's mission set. In February 2016, Northrop Grumman successfully demonstrated the RQ-4's Universal Payload Adaptor. It enables the RQ-4 to fly with an advanced Senior Year Electro-Optical Reconnaissance System-2 sensor. In October that year, the company announced that Global Hawk had flown with the U-2's Optical Bar Camera, and in February 2017 Northrop Grumman said it had demonstrated the RQ-4's use of the MS-177 high-altitude multispectral sensor.

Even within the manned ISR enterprise, the Air Force has spoken of the need to make use of machines to process collected data more quickly and accurately. ISR chief James, who in 2013 acknowledged the Afghanistan-based airborne-ISR revolution, also said then that new ISR assets were enabling data collection at such high volumes that "machines and artificial intelligence tools have to help the Air Force get control of all this information."

But the Air Force's manned ISR fleet remains crucial to its mission, and recapitalizing those systems is a service priority. The RC-135 Rivet Joint surpassed 25 years of continuous

service for US Central Command in September 2016 and is the most pressing need, Gen. Herbert J. "Hawk" Carlisle, then head of Air Combat Command, said that year.

The Air Force is already working to replace its fleet of 16 E-8C JSTARS—which reached one million flying hours in September 2016—with 17 new aircraft. With Northrop Grumman, Boeing, and Lockheed Martin competing, a contract is expected sometime in 2018.

Meanwhile, the E-3 AWACS aircraft have been undergoing upgrades that are likely to keep them operational into the 2030s. Clearly, manned ISR missions will continue to play a significant role even as unmanned capabilities extend their dominance—at the very least in terms of numbers—in this area.

The larger shift at play, however, is the remarkable way the Air Force—whether manned or unmanned—has become an ISR force. Beyond the rising share of service aircraft devoted to ISR missions, this transformation can be gauged by listening to the way Air Force leaders talk about the new ISR capabilities of the bomber and fighter fleets.

In March, Gen. Robin Rand, chief of Air Force Global Strike Command, said he is now telling his bomber pilots, "Frankly, the least important thing you might do is drop a bomb. The most important thing you might do is provide a critical piece of ISR that's going to save someone's life." Similarly, Lt. Gen. Darryl L. Roberson, chief of Air Education and Training Command, has said the F-35 is "more like an AWACS than an individual fighter."

When you have the bosses of the bomber fleet and of pilot training praising the ISR capabilities of the deadliest aircraft in the Air Force, it's safe to say the ISR revolution has arrived. ☛





/1/ An airman from the 62nd Expeditionary Reconnaissance Squadron conducts a postflight inspection on an MQ-9 Reaper at Kandahar Airfield, Afghanistan, in 2015. /2/ E-8C JSTARS aircrew perform preflight checks before a 2016 training mission at Robins AFB, Ga. The E-8C fleet reached one million flying hours that year. /3/ A1C Jeremy Cole, a 379th Expeditionary Aircraft Maintenance Squadron crew chief, guides a JSTARS at Al Udeid AB, Qatar. /4/ A 163rd Reconnaissance Wing MQ-1 Predator is inspected in 2012 at Southern California Logistics Airport—formerly George Air Force Base—in Victorville, Calif.



TSGt. Joseph Swafford; SMSgt. Roger Parsons; SrA. Miles Wilson; MSgt. Scott Wagers; TSgt. Effrain Lopez





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**We are YOUR Air Force Association  
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By John T. Correll

**The Defense Reorganization Act of 1958 took the services out of the loop and empowered the combatant commands.**



Gen. Dwight Eisenhower gives the order: "Full victory—nothing else" to paratroopers in England before they board airplanes for the invasion of Europe, June 6, 1944. World War II was the first time US forces fought in a truly integrated fashion.

# Eisenhower and the Eight Warlords

For more than 150 years, the US armed forces had no need for complicated organization. The army and the Navy fought their battles separately and there was seldom any overlap. Each of them had its own chain of command. Military actions taken in conjunction with allies were rare.

This division persisted until World War II and its huge expansion in the scope and complexity of combat. Airpower took away the clean distinction between land and sea operations and introduced new factors into the strategy. Combatant forces in the field were grouped into unified commands for joint (more than one service) and combined (more than one nation) operations.

"Many high officers are firmly convinced that there must be a merger of the Army and the Navy," *The New York*

*Times* reported in October 1943. Commanders on the fighting fronts had to overcome an "antiquated system" in which "the Army fought on land and the Navy on sea and their zones of operation seldom merged. ... Many officers say the old style of warfare will never return. And from here on, they contend, Army, Navy, and Air Force must fight together."

Wartime unified command worked better in Europe than it did in the Pacific, where relationships were such that the only solution was to draw a line down the middle of the ocean with Gen. Douglas MacArthur as joint commander on one side of it and Adm. Chester W. Nimitz in charge on the other side.

Postwar, the transition continued. The Army and the Air Force were in favor of further unification. The Navy was vehemently opposed, fearful that in any kind of consolidation, naval airpower might

be lost to the Air Force and the Marine Corps—which could be seen as a second land army—subsumed by the Army. In 1946, the Unified Command Plan formed US combat forces into unified commands but the individual military departments remained in control as agents of the Joint Chiefs of Staff.

The National Security Act of 1947 as amended in 1949 unified—at least nominally—the Army, Navy, and newly created Air Force under the new Department of Defense. However, the individual services, aided by supporters in Congress, managed to keep their forces effectively within their own chain of command.

Today, the Goldwater-Nichols Act, adopted with great fanfare in 1986, is widely accorded to be the cornerstone of "jointness." It clarified beyond any doubt that the chain of command runs directly



from the “national command authorities,” the President and the Secretary of Defense, to the combatant commands. The service Chiefs are not in it.

It is infrequently remembered that it was the Department of Defense Reorganization Act of 1958 and related executive actions that initially took individual military services out of the operational chain of command, which ever since has run from the President and the Secretary of Defense to the combatant commands.

### EISENHOWER LEADS CHARGE

In the middle of the transition to joint and unified operations all the way was Dwight D. Eisenhower, who understood from firsthand experience the necessity of unified command and control.

As an Army general in World War II, he commanded the combined US and British land, sea, and air forces in North Africa, the Mediterranean, and in the D-Day invasion of Europe. “There is no such thing as separate land, sea, and air war,” Eisenhower said in 1945. “At one time I was an infantryman, but I have long since forgotten that fact under the responsibility of commanding combined arms.”

As Army Chief of Staff after the war, Eisenhower was a strong advocate of unification. Later, as President, he proposed the Defense Reorganization Act of 1958 to Congress, which eventually followed his recommendations almost completely in passing the legislation.

In the 1960s, a plaque from a fighter wing in Thailand hung by the door to the office of the USAF Chief of Staff in the Pentagon. It said, “The mission of the United States Air Force is to fly and fight and don’t you ever forget it.”

That got the spirit and emphasis right, but according to Title 10 of the US Code, the assigned mission of the Air Force since 1958 had been to organize, train, and equip forces for the unified and specified commands. None of the service Chiefs held operational command over any of their combat units.

In 1958, there were eight combatant commands, six of them unified and two specified. Depending on what their missions required, the unified commands—responsible for large geographic areas—had air, land, and sea components. The specified commands—USAF’s Strategic Air Com-

“THERE IS NO SUCH THING AS SEPARATE LAND, SEA, AND AIR WAR.”

—Gen. Dwight D. Eisenhower

mand being the prime example—were single-service organizations under joint control.

As a popular saying from the time put it, the war-making powers of the United States were vested in the President, the Secretary of Defense, and eight warlords.

### A CHARTER FOR THE CHIEFS

A joint Army and Navy board was set up in 1903, but it was of minor consequence. Its best-known products were the “color” contingency plans in the 1930s, so called because each plan was designated by a color. Plan Orange, for example, was for a war with Japan.

With great reluctance, the Army put units of the American Expeditionary Force under foreign command in World War I. There was little choice, since the United States had only four divisions in France in December 1917. Up to the summer of 1918, US forces were “amalgamated” with the British and French at division level, although Americans below the grade of two-star general got their direct orders from US officers.

The Joint Chiefs of Staff were created in February 1942 as an interface with the British on the Combined Chiefs of Staff. They had nothing to go on except an instruction from President Franklin D. Roosevelt. There was no written charter, no definition of their authority and functions, and no statute or executive order to legalize their existence.

The Joint Chiefs were not established in law until 1947 and had no official chairman until 1949. Roosevelt designated his military advisor, Adm. William D. Leahy, to preside at JCS meetings, which he did for the next seven years. Leahy was not the spokesman for the JCS, deferring to the Army Chief, Gen. George C. Marshall, and the Chief of Naval Operations, Adm. Ernest J. King.

During World War II, the JCS acted as executive agents in dealing with the theater and area commanders. After the

war, a service Chief was selected as executive agent for each of the unified and specified commands, an authority they held until it was abolished in the 1950s.

In simpler times, orders from Washington tended to provide general guidance and leave details to the discretion of the commander in the field. Command and control took on new meaning with the arrival of nuclear weapons.

In July 1945, a specifically worded order to deliver the atomic bombs against Japan was given in writing from the War Department to Gen. Carl A. Spaatz, commander of US Army Strategic Air Forces in the Pacific. It was reviewed and approved in advance by President Harry S. Truman.

### TOWARD UNIFICATION

There was talk of a “merger” of the services, which meant different things to different people, but the term that caught on and remained in use was “unification.”

In 1943, the War Department proposed a single military service with air, sea, and land elements. Congress began hearings in 1944 on a “Proposal to Establish a Single Department of Armed Forces.”

The Navy and the Marine Corps were fiercely against it. Assistant Secretary of the Navy Artemus L. Gates said the only acceptable consolidation would be to merge the “whole military organization into the existing Navy,” which, with its air arm and Marine Corps, could already “operate on sea, under the sea, in the air, in amphibious operations, and on land.”

Some officers—notably MacArthur and Spaatz—favored “complete amalgamation” with “identical uniforms and ranks for both services.”

Truman, then a senator, was an early advocate of unification, convinced that service rivalry and competition led to duplication of effort, waste, and disjointed operations. As President in 1946, Truman attempted to combine the War and Navy departments, but was thwarted by congressional opponents.



This plaque hung outside the office of the USAF Chief of Staff at the Pentagon in the 1960s.



The Joint Chiefs of Staff meet in their Pentagon conference room in November 1949. From left: Gen. of the Army Omar Bradley, JCS Chairman, and the service Chiefs, Air Force Gen. Hoyt Vandenberg, Army Gen. Lawton Collins, and Adm. Forrest Sherman.



A ground crew pulls chocks from the wheels of a Strategic Air Command B-52. The massive bombers were mainstays in SAC, a specified command.

In 1947, Truman finally got a watered-down version of what he wanted in the National Security Act, which created a “National Military Establishment” headed by a Secretary of Defense. It also established the Joint Chiefs of Staff in law and made the Air Force a separate service.

The Secretary of Defense was given “general direction, authority, and control,” but the service departments kept their Cabinet-level status, alongside the Secretary of Defense who also had Cabinet rank. This arrangement was later described by Eisenhower as having been “little more than a weak confederation of sovereign military units.”

Amendments to the Act in 1949 converted the National Military Establishment into the Department of Defense and stripped the three service departments of their Cabinet status. The Secretary of Defense was upgraded to “direct” rather than “general” control. The service Chiefs remained in the chain of command as executive

agents for the unified and specified commands.

Resistance to unification continued. During the Korean War, the Navy was reluctant to place its carriers under control of the air component commander, even though carrier aircraft were used mainly for attack of land targets.

When Eisenhower became President in 1953, he took the Joint Chiefs of Staff out of the operational chain of command with an executive order that made the civilian service Secretaries—rather than the military Chiefs—the executive agents for the combatant commands.

In 1952, the Commandant of the Marine Corps was authorized to participate in JCS meetings when matters of interest to the marines were discussed. Full Marine Corps membership on the Joint Chiefs came in 1978.

#### SHORTENING THE CHAIN

In August 1957, the Soviet Union launched the world’s first ICBM and

two months later, used the same kind of rocket to put the Sputnik satellite into orbit. That drastically altered the time within which a strategic attack could occur as well as the responsiveness required from the US chain of command.

In his State of the Union address in January 1958, Eisenhower pointed to “the advent of revolutionary new devices” and “important new weapons which technology has produced that do not fit into any existing service pattern.”

Strategic planning and control were hampered, he said, by jurisdictional disputes, “harmful service rivalries,” and “mistaken zeal in promoting particular doctrine.” He would address part of the problem by executive action, he said, followed by recommendations to Congress on a defense structure to deliver top efficiency without friction.

Shortly thereafter, Eisenhower abolished the executive agent system altogether. That was as far as he could go on his own authority. That still left the lines of military command to “meander through subordinate elements of the Defense Department before they reach the fighting forces,” he said. “The Congress willing, we will free the flow of military commands from unified authority down to the man with a gun.”

In a message to Congress in April 1958, Eisenhower said the unified commands were the “cutting edge of our military machine” and “our entire defense organization exists to make



**Chief of Staff Gen. Nathan Twining (left), and Air Force Secretary Donald Quarles speak to the chairman of the House Armed Services Committee, Rep. Carl Vinson (D-Ga.), at a hearing in 1957.**



them effective." With few exceptions, operational forces should be organized into "truly unified commands" that were "in the Department of Defense but separate from the military departments."

The present chain of command was "cumbersome and unreliable in time of peace and not usable in time of war," he said, asking Congress to "repeal any statutory authority which vests responsibilities for military operations in any official other than the Secretary of Defense" and establish a command channel in which "orders will proceed directly to the unified commands from the Commander in Chief and Secretary of Defense."

The three military departments would continue "as agencies within the Department of Defense to administer a wide range of functions." The Joint Chiefs of Staff would serve as "operational advisors" to the Secretary of Defense. Eisenhower also asked that Congress "raise or remove" the statutory limit on the size of the Joint Staff, which would "provide the operational planning assistance heretofore largely furnished by staffs of the military departments."

#### **FROM AIR AND SEA**

Opposition to Eisenhower's proposal was led by Rep. Carl Vinson (D-Ga.), chairman of the House Armed Services Committee and longtime patron of the

Navy and the Marine Corps. Vinson warned of the danger in creating a Prussian-style general staff and said the expanded powers of the Secretary of Defense were an "open invitation to the concept of a man on horseback."

Both Eisenhower and JCS Chairman Gen. Nathan F. Twining pointed out that neither Prussia nor Germany ever had in actuality an all-powerful general staff of the kind sometimes imagined, but that was not the big issue anyway. The main concern of the sea services was the threat to naval airpower and the marines.

USMC Commandant Gen. Randolph McC. Pate said the reorganization plan could enable some future Secretary of Defense to give the Marine Corps the "bum's rush." Former Chief of Naval Operations Adm. Robert B. Carney said the bill would reduce the service Chiefs to the "status of glorified consulting staff advisors."

Adm. Arthur C. Radford, former Chairman of the Joint Chiefs, broke with most of his navy colleagues in supporting the proposal.

The strongest advocacy for change was expressed in April 1958 by the Air Force Association, which said the plan "does not go as far as we would like," by stopping short of establishing a single military service. This followed an AFA statement of policy in 1956



that declared, "We must have a single military service with one secretariat, one Chief of Staff, one promotion list."

This was an astounding position, coming less than 10 years after the Air Force achieved its hard-won independence as a separate service, but it reflected the view of many Air Force leaders, active and retired. The 1956 AFA policy was drafted by a committee that included Generals Spaatz, George Kenney, and Jimmy Doolittle.

Gen. Thomas D. White, USAF Chief of Staff, spoke in favor of "more complete unification" and "a military organization that will help all of us to be free of conflicting service loyalties and confusing influences." Thomas K. Finletter, former Air Force Secretary, called for putting the Army, Navy, and Air Force into a single service. Spaatz said the Defense Department would not be properly organized until the Secretary of Defense had control of "the whole shebang."

Air Force retrospectives do not dwell on this interlude and offer few expla-

THE PRESENT CHAIN OF  
COMMAND WAS "CUMBERSOME  
AND UNRELIABLE IN TIME OF  
PEACE AND NOT USABLE IN  
TIME OF WAR."

—President Eisenhower



**President Dwight Eisenhower, center, visits the Eastern Test Range at Cape Canaveral, Fla., in 1960. At the time, there were eight unified commands, and the services preserved their organize, train, and equip roles.**

nations. The best guess, formulated by USAF historian Herman S. Wolk, is that “air leaders reasoned that a stronger OSD [Office of the Secretary of Defense] would institutionalize the Air Force’s justifiable domination of the defense structure.”

By the time the bill passed Congress and was signed by Eisenhower in August 1958, Navy opposition had melted away. The reason is found in the first full paragraph of the new law—well ahead of the sections about the chain of command—which amended the National Security Act of 1947 “to provide for three military Departments of the Army, the Navy (including naval aviation and the United States Marine Corps), and the Air Force.”

## THE NEW ORDER

The Reorganization Act, repeatedly patched and pasted by legal technicians on Capitol Hill, was a mishmash of language that required considerable interpretation to decipher. It did not differ in any important way from the substance of Eisenhower’s proposal.

In December 1958, Secretary of Defense Neil H. McElroy issued the implementing directive, which said, “The chain of command runs from the President to the Secretary of Defense and through the Joint Chiefs of Staff to the commanders of the unified and specified commands.” The phrase “through the Joint Chiefs of Staff” was not in the law although it could be inferred from the tangled wording.

At that time, there were eight combatant commands: the US European, Caribbean, Atlantic, Pacific, Alaska, and Continental Air Defense Commands (unified), the Strategic Air Command, and the Eastern Atlantic and Mediterranean Command (specified).

The Joint Staff was increased to 400 from the previous limit of 210 and organized in conventional military style with functional numbered directorates, with J-1 as Personnel, J-2 as Intelligence, J-3 as Operations, J-4 as Logistics, J-5 as Plans, and J-6 as Communications and Electronics.

A separate administrative chain of command was preserved in which the services kept control of nonoperational units and matters pertaining to the organization, training, and equipping of their forces.

The Air Force proposed a unified strategic command to include the Navy’s nuclear submarines and USAF’s Strategic Air Command. The Navy would not agree, arguing that for coordination with naval forces, the ballistic missile submarines had to be allocated by geographic area to the unified Atlantic and Pacific commands, which were headed by admirals.

A US strategic command would not be established until 1992, after the Cold War, when SAC ceased to exist.

## AGE OF GOLDWATER-NICHOLS

The issue of joint control was renewed by Air Force Gen. David C. Jones near the end of his tour as Chairman of the Joint Chiefs of Staff in 1982. Jones said the individual services, which supplied the forces and resources for the combatant commands, still had too much influence and the JCS

was a “five-man committee,” which tended to muddle the advice it gave.

Jones argued that the Chairman rather than the full JCS should be the principal military advisor to the Secretary of Defense and the President and that the role of the combatant commanders should be strengthened. Advocates for another round of defense reorganization also said that the chain of command remained “confused and cumbersome.”

The services were lukewarm in their support for further changes but Jones and his reform agenda got a decisive boost from Sens. Sam Nunn (D-Ga.) and Barry Goldwater (R-Ariz.) and the sponsor in the House, Rep. William F. Nichols (D-Ala.).

The Goldwater-Nichols Department of Defense Reorganization Act, adopted in October 1986, designated the JCS Chairman the principal advisor to the national command authorities and gave additional authority and power to the combatant commanders.

It prescribed a previous joint duty assignment as mandatory for promotion to general officer. It was the beginning of a culture of jointness that prevailed thereafter with new generations of military members.

Goldwater-Nichols established unequivocally that the operational chain of command ran from the President to the Secretary of Defense to the unified and specified commands. The Chairman of the Joint Chiefs of Staff was not in it, nor were the service Chiefs.

The law, which weighed in at a whopping 162 pages, also said that “communications between the President or the Secretary of Defense and the commanders of the unified and specified commands be transmitted through the Chairman of the Joint Chiefs of Staff.” These provisions are unchanged in the current Joint Publication 0-2, Unified Action Armed Forces, which officially states the chain of command.

In this important respect, Goldwater-Nichols and everything since have clarified the chain of command and unified control of the combatant forces, but they essentially confirm the provisions of the Defense Reorganization Act and associated executive directives of 1958. ✪

**John T. Correll** was editor in chief of *Air Force Magazine* for 18 years and is now a contributor. His most recent article, “The Air Raid at Taranto,” appeared in the March issue.



# AIRPOWER AT THE BAY OF PIGS



Cuban revolutionary forces set up a four-barrel 12.7 mm anti-aircraft weapon at Playa Giron, Cuba.

For a few days in April 1961, the US government kept up the pretense that the failed invasion at the Bay of Pigs was the sole doing of “Cuban patriots” seeking to overthrow Fidel Castro. The cover-up went no better than the operation did. It soon became undeniable that the whole thing had been planned and conducted by the Central Intelligence Agency and that it was a complete disaster.

Almost nothing went right with the assault-style amphibious landing of a “brigade” of Cuban exiles on the southern coast of Cuba on April 17.

Of the 1,400 that went ashore, more than 100 were killed and about 1,200 were taken prisoner. The ships carrying their ammunition and communications equipment were sunk. Half of

# PIGS

It was a half-baked military operation run by the CIA and micromanaged by the White House.

By John T. Correll



The wreckage of two CIA B-26 Invaders shot down by Cuban fighters during the Bay of Pigs invasion. The aircraft, purchased by the CIA from USAF surplus, were similar to Cuban B-26s.



Fidel Castro

the obsolete airplanes supporting them were shot down.

It was a far-fetched venture, likely to have failed under the best of circumstances. One CIA official—Richard M. Helms, chief of clandestine operations and a future Director of Central Intelligence—would have nothing to do with the project, declaring it to be “harebrained.”

The idea was to establish a beachhead and hold out against the 32,000-man Cuban army until the populace arose to join in the liberation. Any remote chance of success depended

on preemptive air strikes flown by Cuban exiles to knock out Castro’s small air force ahead of time.

Three days before the invasion, US President John F. Kennedy—focused on political risk and plausible deniability—canceled half of the advance air strikes against Castro’s air bases. On the eve of the invasion, he canceled the next round of strikes altogether. As a result, enough of Castro’s airplanes survived to wreck the invasion.

All hands shifted into damage control. CIA officials blamed Kennedy and his advisors; Kennedy and his advisors blamed the CIA. Kennedy also blamed the Joint Chiefs of Staff for not warning him against the scheme.

Large parts of the story leaked right away but the CIA kept a lid on the

secret files. Almost 40 years elapsed before public acknowledgment that some of the air strikes had been flown by Americans, including airmen from the Alabama Air National Guard, four of whom were killed in combat.

## THE CUBAN BRIGADE

Castro was initially popular in the United States when he supplanted the corrupt Batista regime in 1959, but the approval faded fast as he made a trade alliance with the Soviet Union in return for economic and military aid. His firing squads executed political enemies by the hundreds. He lashed out against the United States in speeches that lasted for

Photos: Gramma archive; University of Miami Library





hours. Cuba extended diplomatic recognition to Red China and North Korea.

The US public and both parties in Congress demanded that President Dwight D. Eisenhower do something. In March 1960—a month after Cuba entered the alliance with the USSR—Eisenhower approved a CIA proposal for “covert action against the Castro regime,” including the training of a “paramilitary force outside of Cuba for future guerrilla action.”

At the CIA, the drive to oust Castro was led by Richard M. Bissell Jr., the deputy director for plans and heir apparent to the aging CIA director Allen Dulles, who mostly left covert operations up to Bissell.

Recruitment and training began within the month for a group of anti-Castro émigrés who would be remembered to history as “the Cuban Brigade.” The CIA built an airfield and training site at Retalhuleu, Guatemala, in the Sierra Madre mountains near the Pacific coast. There was also a staging base, “Happy Valley,” at Puerto Cabezas on the Caribbean coast of Nicaragua, about 600 miles from Cuba.

The air arm of the Brigade was called the Cuban Liberation Air Force, for



**Bissell Jr.**

which some 40 Cuban pilots with commercial or military experience were selected for further training in Guatemala. The primary Brigade aircraft were medium bombers purchased from US Air Force surplus storage by Intermountain Aviation, a CIA front organization. The CIA chose the Douglas B-26 Invader—not to be confused with the Martin B-26 Marauder of World War II fame—mainly because Castro’s air force had B-26s.

The Brigade B-26s were painted with Cuban colors and markings in hopes that they could be mistaken for Castro airplanes. CIA planners did not know or paid little attention to the fact that the Brigade B-26Bs had a solid nose that looked nothing like the transparent nose on the Castro B-26Cs.

The roster of the Cuban Brigade eventually grew to 1,390 volunteers. Its equipment included five M-41 tanks, two landing craft owned by the CIA, and seven chartered commercial freighter ships.

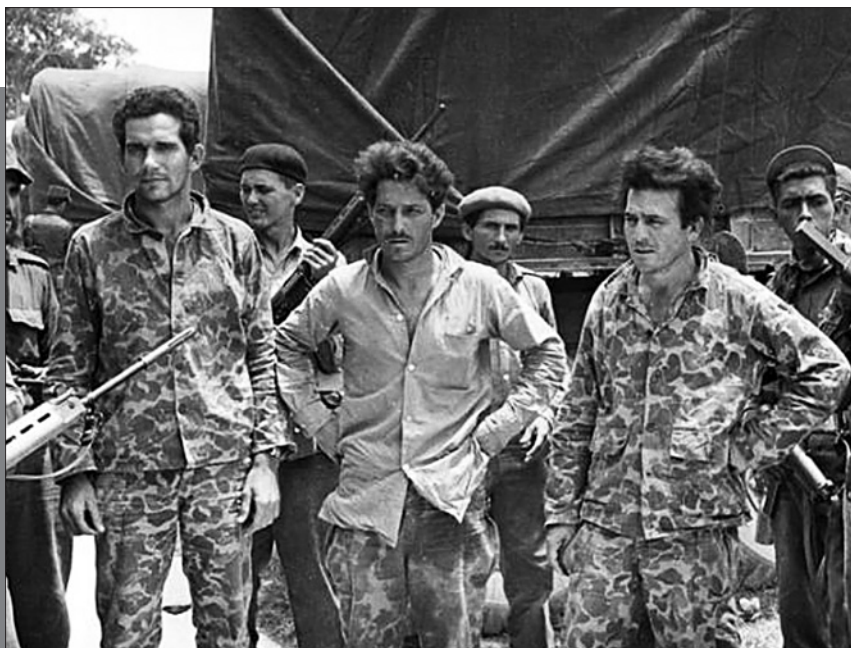
The CIA was able to arrange for the US Army special forces to train the ground crews. However, the official history of the operation noted “continuing difficulties” with the Pentagon and the Air Force “concerning the utilization of military personnel, particularly air crews.”

According to the CIA history, Bissell and his aides were “ready to joust with higher echelons in the Department of Defense” about airpower support when another option turned up. The Air National Guard was willing to help. A CIA cable in December 1960 reported that the ANG was the “most reliable and cooperative source of personnel.”

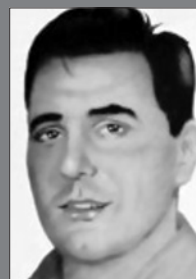
### THE ALABAMA CONNECTION

A CIA representative went to Birmingham, Ala., to talk to Brig. Gen. G. Reid Doster of the 117th Tactical Reconnaissance Wing of the Alabama Air National Guard. The 117th was the last USAF unit to fly B-26s before they were retired from service in 1957.

Doster agreed to recruit volunteers to be advisors to the Cubans, fly some transport missions, and maintain the airplanes. They would wear civilian clothing and carry ID with fake names.



Above: Three captured invaders—Cuban exiles—from the “Brigade” are guarded by Cuban forces. The CIA sent 1,400 men ashore during the invasion, and 1,200 were taken prisoner. Right: The four Americans killed during the raid.



Baker



Gray



Ray



Shamburger

Strict secrecy was to apply, and the participants could not even tell their families what they were doing.

About 80 ANG members signed up, some from Doster’s wing and some from other states. Additional volunteers came from organizations affiliated with the Air Guard. In all, the CIA put about 130 of them on contract.

Two from the Alabama ANG—Lt. Col. Joseph L. Shannon, commander of the 106th Bombardment Squadron and his friend and operations officer, Maj. Riley Shamburger—joined the CIA as full-fledged members. The others were employed by CIA cover companies.

When the first Alabama Guardsmen reached Guatemala in January 1961, they found 16 refurbished B-26s plus assorted transport aircraft waiting for them. They were outfitted with auxiliary fuel tanks to give them enough range for the round-trip to Cuba.

Castro’s air force consisted of 36 airplanes, of which 18 were operationally ready when the Bay of Pigs invasion went down: six Lockheed T-33 jet fighters, six propeller-driven Sea Fury fighters obtained from the British, and six B-26s. Castro’s best pilots were in Czechoslovakia at the time, training on the MiG-21s that had been made available to Cuba.

The key Castro airplanes were the T-33s, vintage trainers that were outfitted with guns and wing-mounted

rockets. It was a stretch to call them fighters, but they were better than anything the Cuban Brigade could put up.

#### MISSION CREEP

During the election campaign in October 1960, Kennedy attacked the Eisenhower administration for “permitting a communist menace” to “arise only 90 miles from the shores of the United States.” Soon enough, he would have his own chance.

Upon taking office, Kennedy found the CIA a good place to get advice. “If I need some material fast, or an idea fast, CIA is the place I have to go,” he said. He considered Bissell “one of the four or five brightest guys in the whole administration.”

There was a big difference between the CIA’s proposal to Kennedy and the program Eisenhower approved the year before. The original plan was to recruit, train, and infiltrate guerilla forces into Cuba. That had evolved into an overt assault-type amphibious landing of almost 1,500 combat troops.

Kennedy asked former Secretary of State Dean Acheson what he thought of the latest CIA plan. “It doesn’t take Price Waterhouse to figure out that 1,500 Cubans aren’t as good as 25,000,” Acheson said. In fairness, the CIA never intended for the Brigade to take on the Cuban army alone.

Bissell and others assumed the

landing would trigger an uprising by the Cuban populace. In reality, as a report by the CIA inspector general said later, there was “no intelligence evidence that Cubans in significant numbers could or would join the invaders.”

The Joint Chiefs of Staff were given to understand that the mission was the CIA’s and the Pentagon’s role was to assist and support. Information was tightly controlled.

In one instance, a JCS meeting was delayed until Gen. Curtis E. LeMay, Air Force vice chief of staff substituting for Gen. Thomas D. White, could be cleared for the briefing. LeMay asked a question but was told, “That doesn’t concern you.”

In response to Kennedy’s request for a review, a JCS report said the operation had “fair chance” of succeeding. The actual analysis put the probability of success at 30 percent. The “fair chance” wording was intended to mean “not too good,” but it was interpreted as an endorsement.

The report also said that with complete surprise and complete air supremacy—no Castro airplanes left at all—the Brigade might last up to four days on the ground.

It was impossible to keep the exile community in Florida quiet about the venture. A *New York Times* headline in January 1961 read, “US Helps Train an Anti-Castro Force at a Secret Gua-



temalan Air-Ground Base.” Kennedy complained that, “Castro doesn’t need agents over here. All he has to do is read our newspapers.”

The critical factor was to destroy Castro’s airplanes on the ground. Prior to the invasion, Brigade bombers were to strike the three major airfields, two of them near Havana and the other at Santiago de Cuba on the eastern end of the island.

### JFK CHURNS THE PLAN

Despite the CIA optimism and exuberance, Kennedy had his doubts, but rather than calling the operation off, he scaled it back by increments. The invasion was supposed to go ashore at Trinidad in central Cuba, a hotbed of opposition to Castro, but Kennedy decided that location was too “noisy.”

On short notice, the landing site was moved 100 miles west to the Bay of Pigs. The planners did not know it was Castro’s favorite fishing place, or that he was especially popular there.

Some on Kennedy’s staff were still fretful, as was Secretary of State Dean Rusk. They wanted the least airpower and the lowest US profile possible.

On April 14, three days before the invasion, Kennedy told Bissell to reduce the attack on the air bases and make it “minimal,” with six airplanes instead of 18.

Bissell was appalled, but grateful the operation was not canceled altogether. He decided that six B-26s plus two spares would meet JFK’s intentions and sent that order to Puerto Cabezas, where the aircraft were deployed and waiting. Case officers on the scene took the liberty of launching all eight B-26s.

Kennedy confidantes would claim



President John Kennedy congratulates Allen Dulles, retiring director of the Central Intelligence Agency, as he presents Dulles with the National Security Medal at CIA headquarters in Langley, Va., in 1964.



USS *Houston*, a troop and supply vessel, was damaged by Cuban airpower and deliberately beached by its captain on the western side of the bay.

later that it had not been made “entirely clear” that the whole operation depended on destroying Castro’s airplanes. No air defense was provided for the Brigade, which would be starkly vulnerable to any enemy aircraft that survived.

On April 15, two days before D-Day, Cuban Brigade air strikes knocked out half of the combat airplanes at the three bases. With any luck, a restrike to coincide with the landing on April 17 would get the rest. Castro still had two B-26s, two Sea Furies, and three T-33s left.

In yet another notion that went afoul, a Cuban “defector” landed his B-26 in Miami, part of a contrived cover story that the air strikes were the work of disaffected pilots from Castro’s own air force. Reporters quickly noticed that it was the wrong model of B-26. The machine guns, still sealed with tape, were mounted on the metal nose cone. Castro’s B-26s had plastic nose cones and guns mounted under the wings.

At the UN, Ambassador Adlai Stevenson—who had been kept largely in the dark—reacted impulsively and brandished news photos in support of the cover story. When the Soviet ambassador pointed out his mistake, Stevenson was embarrassed and furious. He complained to Rusk.

Late in the afternoon of April 16,

hours before the invasion and the air strikes were to begin, the CIA deputy director, Gen. Charles P. Cabell, stopped by the command post in Washington on his way home from playing golf. Cabell, like Stevenson, had not been told much, but with Dulles out of town, he was officially in charge.

Cabell questioned the authorization for the air strikes and called Rusk to check. Rusk, with Stevenson’s complaints fresh in mind, called Kennedy about Cabell’s question and added another round of cautionary advice. Kennedy decided the strikes might not be a good idea after all and canceled them.

### ON THE BEACH

The first ashore at the Bay of Pigs, around midnight, were a CIA case officer and frogmen to mark the landing channel. They were surprised to find the way to the beach impeded by coral reefs. CIA analysts, looking at aerial photos, had identified them as seaweed or reflections.

The analysts had also predicted the beach would be deserted and quiet. It was “lit up like Coney Island,” the case officer said, with a beach party in progress. The landing craft, blocked by the coral, stopped 75 yards out and the invasion force struggled through waist-deep water, carrying heavy equipment, to get to the shore.

# CASTRO'S AIRPLANES CAME AT DAWN, ATTACKING THE LANDING FORCE AND SINKING THREE OF THE BRIGADE'S SHIPS, DESTROYING COMMUNICATIONS EQUIPMENT, AMMUNITION, AND SUPPLIES.

The Bay of Pigs was about four miles wide and 18 miles deep, surrounded by a thick swamp with the only access by three gravel roads. The primary landing was at Blue Beach, just east of the mouth of the bay. Secondary landings were at Red Beach at the top of the bay and Green Beach, 20 miles down the coast. C-46 transports dropped paratroopers to seal off the swamp roads.

Castro's airplanes came at dawn, attacking the landing force and sinking three of the Brigade's ships, destroying communications equipment, ammunition, and supplies. Green Beach was abandoned. At mid-morning, the Castro militia counterattacked in waves.

The White House belatedly authorized B-26 close air support strikes for the ground force on the beachhead, but half of them were shot down by the T-33s and Sea Furies. The force at Red Beach retired to Blue Beach on April 18. Ammunition began to run short.

With the situation growing desperate, Bissell—supposedly without the knowledge of JFK—cleared American volunteers to fly combat missions. The cable authorization said, "Cannot attach sufficient importance to fact American crews must not fall into enemy hands."

Eight Alabama ANG people, four pilots and four crewmen, volunteered. Six B-26s, four flown by ANG pilots, launched before dawn on April 19. The two lead aircraft were hit but delivered their ordnance and returned to base.

Lt. Col. Joe Shannon outmaneuvered a T-33, but Maj. Riley Shamburger, flying on his wing, could not. Shamburger and his observer, Wade Gray, were hit by T-33 fire as they approached the target area and went down at sea.

Capt. Thomas W. Ray, flying with Leo Baker as his observer, was hit by T-33 and ground fire near a Cuban command center northwest of the beach. They survived the crash but were killed in a shootout on the ground.

The aircraft carrier *Essex* was in the area and authorized to provide "very

limited" air cover. What happened is still uncertain, but because of a mix-up between the CIA and the Navy about the time, *Essex* fighters were still on the deck when the B-26s went in.

On the afternoon of April 20, with only a sliver of the beachhead remaining, the landing force surrendered.

## FAMILIES IN THE DARK

The Air Guardsmen returning to Alabama were ordered not to talk about the mission. In May, a lawyer from Miami showed up in Birmingham and called a press conference. He said he represented a private group that supported the invasion and was there to arrange insurance payments to widows of four mercenaries shot down on a C-46 cargo mission off the coast of Cuba.

The *Chicago Tribune* quoted the lawyer as saying, "The men knew what they were getting into. It was a calculated risk. If they came back, they had a nice nest egg." The widows were told only that they would receive payments for the rest of their lives unless they remarried.

Shamburger's mother wrote to Kennedy and got a reply from his Air Force aide, Brig. Gen. Godfrey T. McHugh, who said that neither the CIA or any other government agency had any information about her son's disappearance. McHugh said later he had not known any better.

Bits and pieces of the story leaked out. Alabama newsman Albert C. Persons, a civilian pilot who flew C-54s in the operation, was not in the Air National Guard and did not feel constrained by the gag order. His story was picked up by national newspapers and wire services, which reported that American airmen had participated in the final air strike and that four of them had lost their lives.

The CIA did not tell the families the real story until 1978, when Shamburger, Gray, Ray, and Baker were posthumously awarded the Distinguished

Intelligence Cross, the Agency's highest medal for bravery. Even then, the families were asked to keep the information to themselves.

Another 20 years would pass before the CIA admitted publicly what happened at the Bay of Pigs.

## SECRETS IN THE SAFE

Dulles and Bissell were forced into retirement. In his memoirs in 1969, Bissell said that JFK's cancellation of the second air strike was "certainly the gravest contributory factor in the operation's failure."

Six months after the invasion, CIA Inspector General Lyman Kirkpatrick conducted an internal inquiry. His report said the CIA had "drastically converted the project into what became an overt military operation" that went "beyond the area of Agency responsibility as well as Agency capability." It also said the CIA "tends to assume responsibilities beyond its capabilities and does not give sufficient consideration to the ability of other departments of the government to conduct or participate in these operations."

John McCone, who succeeded Dulles as CIA director, gathered up copies of the IG report, destroyed most of them, and kept the others locked in a safe in his office. Between 1974 and 1978, Jack Pfeiffer, the CIA's chief historian, wrote a five-volume history of the operation. It was likewise critical and was likewise suppressed.

Peter Wyden had most—but not quite all—of it figured out in *The Bay of Pigs: The Untold Story*, published in 1979. Freedom of Information Act lawsuits by the National Security Archive at George Washington University forced the release in 1998 of Kirkpatrick's IG report, and in 2011 of three of the five volumes of the Pfeiffer history.

These documents, along with the reporting of Warren Trest and Donald Dodd in *Wings of Denial: The Alabama Air National Guard's Covert Role in the Bay of Pigs* in 2001, finally brought the full account of the ANG involvement to light.

A final perspective on the operation was offered by Fidel Castro. Asked why the invasion failed, he said, "They had no air support." ★

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



# DOD

# SENIOR LEADERSHIP

Compiled by Chequita Wood, Media Research Editor

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- USD Undersecretary of Defense

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Masters finished restoration of this 1955 Chevy Bel Air Nomad in 2015. It is a rare car with a completely stock look, but it has an updated engine and transmission.

By George Masters

# Vintage

## Restored from rust to beauty.

Throughout my two careers—20 years in the Air Force as a Hound Dog and Minuteman III missileer and another 19 as a civilian—I have loved and gathered up classic cars.

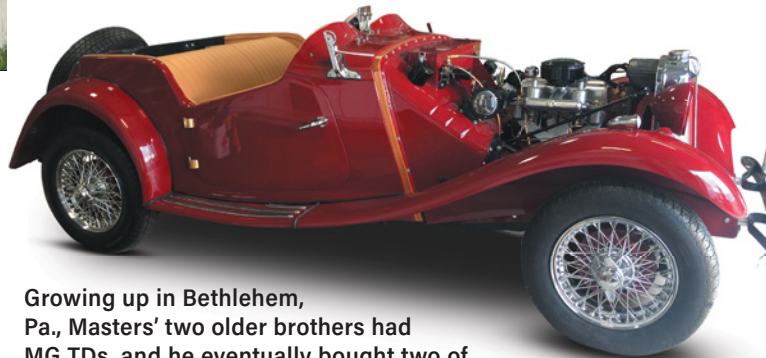
I would buy one, sell it at a profit, then buy an even nicer one. I would restore some to what is called a frame-off restoration, where a vehicle is dismantled to the bare bones and then rebuilt with all-new nuts, bolts, paint, wheels—just about everything.

At any one time, I have three to four cars in my garage workshop.

You might ask why I would want more than one collector car. I seem to enjoy “the hunt” as much as the car: finding it, settling on the price, transporting it home, and looking it over to see what needs to be done for restoration.

Each car is special in one way or another.

Retired MSgt. George Masters belongs to the Gen. David C. Jones Chapter in North Dakota and is a former North Central Region president.



Growing up in Bethlehem, Pa., Masters' two older brothers had MG TDs, and he eventually bought two of them. This one is a 1952 MG TD. It came with its main body intact, original engine and transmission—and about 65 boxes of parts.



Starting from scratch: This 1956 Chevy is about to be sand blasted down to bare metal.



This 1957 Bel Air has been fully restored with an original engine and transmission. The color combination is Tropical Turquoise and India Ivory.

# CHAPTER NEWS

By June L. Kim, Associate Editor

## FLORIDA WEST COAST CHAPTER

The Florida West Coast Chapter recently awarded four students for their science projects in a local science fair in Manatee County, Fla.

Lockheed Martin sponsored the fair and the February awards ceremony where Braden River High School student Beau Cunningham and R. Dan Nolan Middle School student Elijah Engel received their awards.

Cunningham's science experiment "measured the sound generated by Boeing 737 aircraft taking off and landing at Tampa International Airport. His conclusion was that the aircraft generated more sound during the landing phase," according to Chapter President Mike Richardson.

Engel was recognized for his project on wind turbines and how "the number of blades on a Savonius turbine affected the electrical output," wrote Richardson.

In another awards ceremony held the following month, the chapter recognized two more students for their projects with the chapter's "Dr. Y" Award, named after chapter member Michael I. Yarymovich, who was the Air Force's chief scientist from 1975 to 1977.

Jack Gallahan, a ninth-grader from Pine View High School, was awarded the high school-level award and Alanna Densmore, a seventh-grader from Pine View Middle School, received the middle school award.

Gallahan's project focused on the application of cyclic space theory to transfinite mathematics, and Densmore



Florida West Coast Chapter President Mike Richardson (left) and Michael Yarymovich (right) present award winners Alanna Densmore and Jack Gallahan with some of the items each won for their science fair entries.

used her bicycle to investigate speed and the Doppler effect, according to Richardson.

Cunningham, Engel, Gallahan, and Densmore all received the Dr. Y Award. Gallahan and Densmore received it directly from Yarymovich at the March awards ceremony, said Richardson.

The winners took home certificates, medals, a book about space, an AFA calendar, and \$50.

## SHOOTING STAR CHAPTER

The Shooting Star Chapter (N.J.) dedicated a painting to the Morris Plains Borough Museum in Morris Plains, N.J. The painter was none other than chapter member and aviation artist Keith C. Ferris.

Purchased by the chapter in March, the painting, "Old Number One," was donated in early April to mark the centennial anniversary of the US' entry into World War I, said Chapter Treasurer Howard Leach.

"Old Number One" depicts WWI ace and Medal of Honor recipient Capt. Eddie V. Rickenbacker in a SPAD XIII of the 94th Squadron. The number "1" and a "hat in the ring" insignia is on the side of the fuselage. The painting was purchased for \$350, said Leach. The chapter donated it "as part of [the

museum's] WWI displays," he said. The dedication was also in memory of Robert E. Hodges and Arthur R. Brooks, former chapter president and chapter member, respectively.

Chapter Secretary James H. Morgan and Leach were present for the dedication, as were borough officials.

## LANCE P. SIJAN CHAPTER

Members of the Lance P. Sijan Chapter (Colo.) attended a "sold-out" luncheon at the Space Foundation in Colorado Springs, Colo., early this year, said Chapter President Kristen Christy.

The "Lunch and Learn" event—similar to a brown-bag meeting—was the result of the two organizations joining hands "to highlight the Space Foundation, the Discovery Center, their corporate memberships, and AFA," said Christy.

The group watched a video on space technology and after a catered lunch that consisted of barbecue pulled pork, they went on a guided tour of the Space Foundation's Discovery Center and watched a presentation, said Colorado State President Linda Aldrich.

The Space Foundation's Discovery Center is the area's "first and only dedicated space, science, and technology center and museum," according to the foundation's website.

Chapter member and former Chapter President Gayle White was the one who brought up the idea to work with the Space Foundation for future events, said Christy. The Space Foundation is a Community Partner.

The attendees received 10 free passes to the Discovery Center, a value ranging from \$50 to \$100, said Aldrich.



## AFA EMERGING LEADER: SONYA R. A. YELBERT

### How did you first hear of AFA?

I first heard about AFA when I was an airman first class. ... I had won Airman of the Year and I was awarded with a one-year membership. ... I had no idea what it was and had only learned about [Air Force Sergeants Association] at the time. I went to my first AFSA meeting and AFA was there discussing what they do and what they were about.

### What compelled you to join?

I loved that it was open to everybody and that AFA wanted to build the Air Force's future generation as well as preserve the benefits for those who are already in.

### What do you enjoy most about it?

The ability to be a part of this prestigious society that is moving and shaping the Air Force and that my membership is helping play a part.

### What does AFA need to do to get more members?

I think AFA needs to stop being so hum-



Sonya Yelbert with her husband, Stephen, in 2015.

**Home State:** New York

**Chapter:** Concho Chapter (Texas)

**Joined AFA:** 2013

**AFA Office:** Chapter President, Concho Chapter, former vice president and acting secretary

**Military Service:** 2010-current, Active Duty

**Occupation:** Medical Administrator

**Education:** B.S., Actuarial Mathematical Sciences, University at Albany-SUNY; M.A., Economics and International Finance, University at Albany-SUNY

ble and show and broadcast all the great and amazing things that they are doing on a constant basis for airmen. Airmen do not know what AFA is doing behind the curtains and I think it is time to redirect our marketing campaign and start getting out there and tooting our horn and bragging on how amazing we are.

### How do we build awareness about it?

Social media and working with other organizations so that we have a constant presence. Get involved in basic training and [Officer Training School]. As an officer, many officers have no idea what AFA is and this is a shame, because we wear the uniform that was built on AFA.

Photo courtesy of Sonya Yelbert

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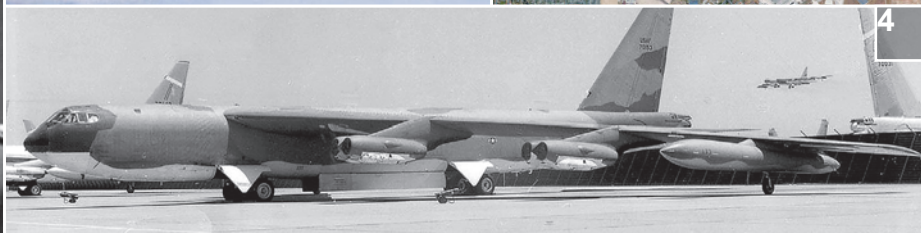
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1/ Frederick Castle. 2/ Two-Seat Sabres in 1958. 3/ A satellite view of what is now Castle Airport Aviation and Development Center. 4/ B-52s at Castle.

# CASTLE

## Whiz Kid and Combat Hero

The Dec. 7, 1941, Pearl Harbor attack drew America into World War II. By that time, Fred Castle had been out of uniform for almost eight years, but soon he, too, was at war. His heroism would lead to the naming of a major air base in his honor.

Frederick Walker Castle seemed fated for a career of arms. Born in 1908 at Fort McKinley in the Philippines, he was the son of 2nd Lt. Benjamin F. Castle, a West Pointer. Fred was the first child born to a member of Class of 1907 and was thus “class godson.”

In 1919, then-Col. Benjamin Castle retired from the Army and settled in New Jersey. Fred graduated from military school and spent two years in the New Jersey National Guard before entering West Point in July 1926, graduating in June 1930. Castle received wings in December 1931 and served two years as a pursuit pilot.

However, the cash-starved, Depression-era Air Corps, as an economizing measure, transferred Castle and many other pilots into the Civilian Conservation Corps. He resigned in early 1934.

For eight years, Castle worked in civilian industry. He was a managerial whiz kid. His last job was at Sperry Gyroscope Co., a defense contractor. Castle might have made it to the top of the company had the war not intervened, but intervene it did.

Air Corps Brig. Gen. Ira C. Eaker had heard of Castle’s business acumen. In

early 1942 he got Castle recalled to active duty to help set up Eighth Bomber Command. Within a year, Castle was promoted to colonel and named assistant chief of staff for supply.

Castle pushed for a combat assignment. In June 1943, he was given command of 94th Bomb Group, a B-17 outfit that in early going suffered heavy losses. He had soon whipped the group into shape and personally led many missions—most notably, a massive raid against an FW-190 plant deep in Germany. Despite bad weather, he decided to press on with just his group. The raid succeeded, with no losses. For this, Castle was awarded the Silver Star.

In April 1944, Castle took command of 4th Bombardment Wing. Soon he was promoted to brigadier general. On Dec. 24, 1944, with Germany engaged in its Battle of the Bulge offensive, Castle took off on his 30th mission. It would be his last.

He was a key part of a maximum 2,000-bomber effort against German airfields and communication centers. Castle’s B-17, with him flying as copilot, was hit multiple times by German fighters. Castle ordered the crew to bail out of the stricken B-17. He took the controls to allow the pilot to retrieve his parachute. Then, a wing tank exploded. Castle and the pilot perished in the resulting crash.

Castle posthumously was awarded

### FREDERICK WALKER CASTLE

**Born:** Oct. 14, 1908, Manila, Philippines  
**Died:** Dec. 24, 1944 (KIA), Hods, Belgium  
**College:** US Military Academy  
**Service:** US Air Corps, US Army Air Forces, New Jersey National Guard, New York National Guard, Air National Guard  
**Main Era:** World War II  
**Years Active:** USAC 1930-34, USAAF 1942-44  
**Combat:** Northern Europe  
**Final Grade:** Brigadier General  
**Honors:** Medal of Honor, Silver Star, Legion of Merit, Distinguished Flying Cross, Purple Heart, Air Medal (5)

### CASTLE AIR FORCE BASE

**State:** California  
**Nearest City:** Merced  
**Area:** 4.34 sq mi / 2,777 acres  
**Status:** Closed  
**Opened:** Air Corps Basic Flying School (Sept. 20, 1941)  
**Renamed:** Merced Army Flying School (April 7, 1942)  
**Renamed:** Merced Army Airfield (May 8, 1943)  
**Renamed:** Castle Field (Jan. 17, 1946)  
**Renamed:** Castle Air Force Base (Jan. 13, 1948)  
**Closed (by USAF):** Sept. 30, 1995  
**Returned to Civilian Use:** 1995  
**Current Owner:** Castle Aviation and Development Center  
**Former Owner:** Strategic Air Command

the Medal of Honor. The citation said his willingness to sacrifice his life was “in keeping with the highest traditions of the military service.”

Merced Army Airfield, Calif., was renamed Castle Field in his honor, and it became Castle Air Force Base in 1947. Castle was for most of its existence a major Strategic Air Command bomber base. It closed in 1995.





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