

February 2015/\$10

*Journal of the Air Force Association*

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## **MAGAZINE**

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**Flying Wing Bombers  
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# *Journal of the Air Force Association* **AIR FORCE** **MAGAZINE**



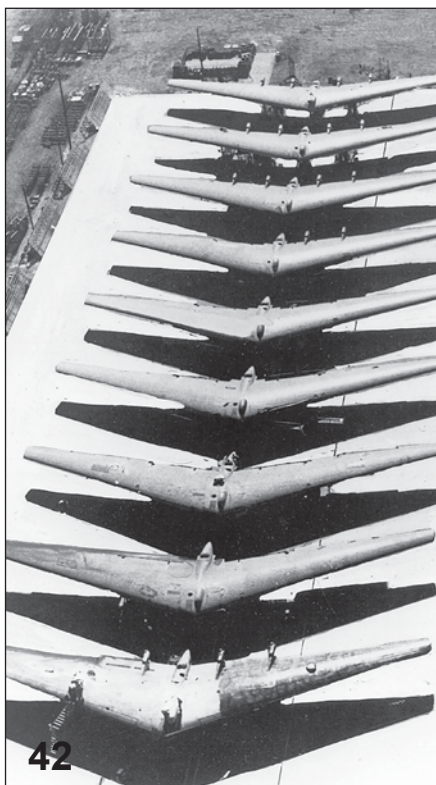
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**About the cover:** A KC-10 refuels an F-22 Raptor before a strike on ISIS targets in Syria. See "With the Raptors Over Syria," p. 26. USAF photo by TSgt. Russ Scalf.







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**Publisher:** Craig R. McKinley  
**Editor in Chief:** Adam J. Hebert

**Managing Editor:** Juliette Kelsey Chagnon  
**Special Content Director:** Michael C. Sirak  
**Editorial Director:** John A. Tirpak  
**News Editor:** Amy McCullough  
**Senior Editor:** Marc V. Schanz  
**Senior Designer:** Heather Lewis  
**Special Projects Manager:** Gideon Grudo  
**Designer:** Kristina Parrill  
**Assistant Managing Editor:** Frances McKenney  
**Associate Editors:** Autumn A. Arnett, Aaron M. U. Church, June L. Kim  
**Production Manager:** Eric Chang Lee  
**Photo Editor:** Zaur Eylanbekov  
**Media Research Editor:** Chequita Wood

**Contributors:** Walter J. Boyne, John T. Correll, Robert S. Dudley, Rebecca Grant, Otto Kreisher, Megan Scully, Barrett Tillman

**Advertising: Advertising:** Scott Hill, James G. Elliott Co., Inc.  
(312) 348-1206  
[airforcemagsales@afa.org](mailto:airforcemagsales@afa.org)  
1501 Lee Highway  
Arlington, VA 22209-1198  
Tel: (703) 247-5800  
Telefax: (703) 247-5855  
[afmag@afa.org](mailto:afmag@afa.org)

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## Targeting the F-35

*It doesn't work. It costs too much. Existing aircraft can do the job better.*

2015 is shaping up to be the year in which the F-35 strike fighter takes its long-anticipated place of honor as the No. 1 target of those who love to find fault with almost every major modern military aircraft program.

*It's behind schedule and over budget. It has no real mission. It's too fragile and complex.*

If you think you've heard these arguments before, you have. They were leveled, in essentially the same forms, against most of the Air Force's top modernization priorities of the past 40 years.

- To hear the defense "reformers" and their allies tell it, the E-3 AWACS flying command post had no mission and existed solely to keep money flowing to defense contractors.

- The F-15 Eagle was too complex to be successful in combat, and smaller, cheaper fighters were better.

- The C-17 transport was an overpriced ugly duckling hobbled by technical problems.

- The B-2 bomber was too expensive and featured stealth coatings that would melt in the rain.

- The V-22 Osprey was designed with aerodynamic failures that made it a death trap.

- The F-22 Raptor was a gold-plated boondoggle designed to fight an enemy that no longer exists.

We could go on, but you get the point: These aircraft all experienced growing pains, some significantly. All have also gone on to become vitally important and successful machines in the most effective air force in the world.

Development and flight testing exist for good reasons, namely to find and correct the problems early on.

Test and development work is treated as a final grade by military critics, but this is akin to judging the success of a baseball team by how it does during spring training—when the roster hasn't been finalized and the games don't actually count.

Now it's the F-35's turn in the crosshairs.

Last July, *Roll Call* published a William D. Hartung commentary. "It is still unclear why the armed services need more than 2,400 of these planes," he

wrote. "The most likely US adversaries in the foreseeable future cannot compete with current generation US aircraft."

Later, on Jan. 12, the *Huffington Post* published its own Hartung column. This one neatly hit an anti-F-35 trifecta in its second sentence, calling the fighter "overpriced, underperforming, and unnecessary."

Similarly, just before the New Year, *The Daily Beast* published a string of articles by Dave Majumdar with many familiar themes. The F-35 is "actually

### It is the F-35's turn in the critics' crosshairs.

worse than its predecessors at fighting today's wars," he wrote in one, adding that the fighter's targeting system is "more than a decade old and hopelessly obsolete."

"The end result is that when the F-35 finally becomes operational after its myriad technical problems, cost overruns, and massive delays, in some ways it will be less capable than current fighters in the Pentagon's inventory," Majumdar concluded.

Perhaps, but in more numerous and significant ways the F-35 will offer capabilities that current fighters never could. To offer airmen anything but the best equipment is negligent. The A-10 and F-16 continue to serve admirably and effectively, but their airframes are old and nonstealthy. They are at risk against any enemy fielding modern air defenses.

Another high-profile criticism can be found on the cover of *The Atlantic's* January/February issue. There, James Fallows offers a meandering 10,000-word commentary on today's American military. Fallows raises valid concerns but gets key airpower-related facts wrong. He declares that the nation has been at war for 13 years, when in fact the Air Force has been at war nonstop for 24. He says the last war that ended up "remotely resembling ... a victory was the brief Gulf War of 1991," overlooking successes such as the 1999 air war to free Kosovo.

Fallows' most egregious error concerns the F-35's cost. "The all-in costs

of this airplane are now estimated to be as much as \$1.5 trillion," he declares. F-35 critics love to cite an all-inclusive DOD cost estimate that includes development, production, and sustainment costs for 55 years. This covers everything from fuel to spare parts and construction costs—all inflated to "then year" dollars, which are in some cases a half-century in the future.

The current, all-inclusive F-35 cost estimate is \$921 billion in 2012 dollars (the baseline measurement year.) This is a huge figure to be sure, and one that must be carefully managed, but it is also more than a third less than \$1.5 trillion. Even the "with inflation" figure currently stands at \$1.415 trillion.

When critics round this off to \$1.5 trillion, they are actually rounding up by 85 billion dollars. That's no rounding error, and the total comes with no explanation or context. Indeed, F-35 costs declined by six percent between 2012 and 2013.

Fallows was one of the leading advocates for the reformers in the early 1980s, and he flatly declares that "many of the Pentagon's most audacious high-tech ventures have been costly and spectacular failures, including ... the major airpower project of recent years, the F-35."

Another longtime reformer, retired DOD analyst Franklin C. "Chuck" Spinney, wrote in a 2013 blog posting that "the F-35's high cost and complexity will guarantee much-reduced inventories, poor availability, and low sortie rates coupled with very high operational costs."

Yes, the F-35 is a failure before it has even entered service.

The Pentagon has made many mistakes with the F-35 program. It tried to create a jack-of-all trades family of aircraft for three services, set off on an unrealistic development program, and now has all of its future fighter eggs in this one basket. It absolutely must get the F-35 right. But similarly difficult programs have recovered and typically worked spectacularly well—and with costs brought back under control.

The F-35 still has a long way to go, but it should not be judged based upon its "spring training" performance. Remember that the next time you hear it doesn't work. ★





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Events..... [events@afa.org](mailto:events@afa.org)

Field Services..... [field@afa.org](mailto:field@afa.org)

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Member Benefits..... [membership@afa.org](mailto:membership@afa.org)

Membership..... [membership@afa.org](mailto:membership@afa.org)

Communications (news media)..... [communications@afa.org](mailto:communications@afa.org)

CyberPatriot..... [info@uscypatriot.org](mailto:info@uscypatriot.org)

Air Force Memorial Foundation..... [afmf@afa.org](mailto:afmf@afa.org)

### Magazine

Advertising..... [airforcemagsales@afa.org](mailto:airforcemagsales@afa.org)

AFA National Report..... [natrep@afa.org](mailto:natrep@afa.org)

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Educate the public on the critical need for unmatched aerospace power and a technically superior workforce to ensure US national security.

Advocate for aerospace power and STEM education.

Support the Total Air Force family and promote aerospace education.

### Help Those Who Help Themselves

I disagree with your editorial requiring that we either go all out at war with ISIS or abandon any effort against them [*Editorial: Win or Go Home, December 2014, p. 4*]. Instead, I believe the current implied strategy is the best route to the goal "degrade and ultimately destroy" ISIS. Note that I believe this is a goal—and not the strategy to reach the goal.

Our strategy appears to be in two parts. First is to degrade ISIS by reducing resources it needs to wage war. Financial resources are being attacked through destruction of refineries and financial sanctions. Facilities and equipment are being destroyed. This part of the strategy is apparently being implemented as forcefully as possible.

The second element could be summarized as: "Helping those who are willing to fight ISIS." You note that the US is capable of bringing far more direct military force than is now being applied. However, you suggest that our involvement should be based entirely on the potential long-term threat. We must also consider the questionable willingness of the American public to support another massive invasion, regardless of the threat. Additionally, regional resentment seems to follow our direct insertion of massive land forces—even from those who benefit from it. This part of our current strategy avoids those problems.

Afghanistan posed an unacceptable long-term risk of an unsophisticated terrorist organization that had seized control of an entire country. We initially removed that complete control through helping local tribal forces against that organization. Removing all terrorist control developed into a long, drawn-out, and expensive operation, which we have now turned over to newly organized forces.

ISIS is much better organized and presents a far greater threat. We should not ignore that threat. However,

unlike Afghanistan, ISIS faces much more than a temporary tribal collection. We have seized the opportunity to bypass massive direct involvement by supporting established local forces willing to fight ISIS. As their engagement increases, the total level of our support increases. We will not win; they will win. But we decidedly should not simply go home.

Michael R. Polston  
Blue Springs, Mo.

### Paying Respect, Yo

General Welsh's letter in the October issue (p. 6) [*About That Flight Suit ...*] has given me new respect for *Air Force Magazine*. To think that he took the time to not only read but respond to another letter makes me, well, kinda happy.

I hope the general reads the articles, too: Like "The Hearings That Revolutionized Airlift" (November 2014, p. 64). That article is a great example on why the Army doesn't trust the Air Force! Bring that thought to current [day], and you see getting rid of the A-10 and C-27 aircraft that have no purpose other than serve the needs of the Army, updates their mistrust. Nothing tells the Army we love them more than an A-10 overhead. But who cares what the Army thinks, right?

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



In the December edition, General Welsh said F-16s do more CAS than A-10s (p. 36). But that's because there are a lot more F-16s deployed. And just how does one justify retiring 283 A-10s as equaling 350 F-16s? That's all funny math to me. Just like replacing a paid-for \$18 million A-10 with a \$108 million F-35 somehow saves money. What accounting school did that come from?

Recently, James Fallows wrote a great article on our "chickenhawk nation" (*Atlantic*, January/February 2015). He states that we will spend more on defense than the total of nearly the next 10 countries *combined*. How much is enough? He quotes William Lind:

"The most curious thing about our four defeats in Fourth Generation War—Lebanon, Somalia, Iraq, and Afghanistan—is the utter silence in the American officer corps. Defeat in Vietnam bred a generation of military reformers. ... Today, the landscape is barren. Not a military voice is heard calling for thoughtful, substantive change. Just more money, please."

Is sequestration such a bad idea? Maybe it's time (again) to seriously re-examine roles and missions. For example, the F-35 does more than an A-10. But at what cost? Let's start with putting all the A-10s in the Guard and Reserve. Then, let's revisit how many F-35s are needed, as opposed to a mixed force. We have a near trillion dollar budget! *A trillion dollars!* Let's just look at promoting some of those who save money, not reward just those who justify spending more money. My grandkids will appreciate it.

Wayne P. Grane  
Hobe Sound, Fla.

### Time for Reflection

With the passing of the recent congressional spending bill for FY 2015, it seems likely the A-10C Thunderbolt II (or Warthog, as it has been known throughout its service) has yet another year's reprieve from retirement. This should give USAF sufficient time to reflect upon its purely business-driven decision to retire the A-10 early and instead determine what's best for the close air support (CAS) mission, the other critical missions performed principally by the A-10 community, and our nation's defense, in general. That discussion begins by clearing up some of the inaccuracies in Marc Schanz's December 2014 *Air Force Magazine* article, "What's Next for CAS?" [p. 34], then exposing the real problems behind the debate about the future of the A-10 that USAF, DOD, and Congress must solve to provide for CAS and the other A-10 missions in the future.

USAF has claimed for over two years now that it has "no choice" but to retire the A-10 due to the fiscal constraints of the Budget Control Act (sequestration). Yet the budgeting process is all about choices, cost-benefit analyses, and risk-reward trade-offs. What USAF planners appear to have done is what all the services typically do: projected the kind of future war they want to fight onto their assessments to determine the mix of capabilities they need (want). The A-10, as a supposedly single-mission platform built in the 1970s, apparently doesn't fare well in future defense projections in anti-access, area-denial (A2/AD) scenarios like a Taiwan Strait confrontation. But if you think you've heard this all before, you aren't wrong, as this is no less than the fourth time USAF has tried to retire the A-10 early. Nonetheless, after each attempt the real world—Operations Desert Storm, Deliberate Force, Allied Force, Iraqi Freedom, Enduring Freedom, Odyssey Dawn, and now Inherent Resolve—intervened to prove the A-10's worth and applicability. USAF leaders continue to decry the A-10's lack of survivability in the A2/AD environment, but A2/AD is a low-probability, high-risk scenario that consistently shows losses for all fourth generation platforms in training and exercises, not just the A-10. While USAF certainly needs to prepare to prevail in the low probability but high consequence A2/AD environment, it must also be ready to win in the much more likely, but less sexy, majority of the conflict spectrum, from battlespace shaping, through irregular warfare, to regional conflicts against non-A2/AD major powers. Not doing both is a failure for USAF to properly balance its capability portfolio for national defense—a business case USAF planners should fully appreciate.

Some of the debate's other inaccuracies, continued in the Schanz article, include:

- The need to retire the A-10 early to make the F-35 initial operational capability (IOC) date: The F-35 program is already years behind schedule, yet USAF has only recently made the claim that the A-10 is one of the key factors slowing IOC. It would be more correct to say that poor DOD acquisition policies (known for years and beyond the scope of this letter) and sequestration have slowed F-35 IOC and that the A-10 has simply become the public scapegoat for the true underlying issues.

- Eighty percent of CAS sorties in Afghanistan since 2001 flown by other aircraft: While this is very likely true, it is a classic example of the creative use of statistics to prove a point.

- The mission of CAS has "diver-

sified and changed": Capabilities, technology, and tactics, techniques, and procedures have evolved, but the mission of "air action against hostile forces which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces" has not appreciably changed since the start of World War II. Unfortunately, this argument is often used to show how "outdated" the A-10 is, which is laughable in the face of the precision-engagement A-10C upgrade started in 2007 (and long since complete), which brought digital connectivity, J-series precision weapons, a color moving map, and advanced targeting pods to the A-10A's already impressive CAS capabilities, an upgrade that, along with the Scorpion Helmet-Mounted Cueing System, has made the A-10C's tactical suite the envy of other fighters in air-to-ground mission sets.

- The idea that the US will conduct CAS in an A2/AD environment: A2/AD is a strategic and operational environment incompatible with executing modern CAS, where you need local air superiority (as you do for the successful conduct of most missions); that is, the joint force will need access to the battlespace before surface forces are introduced and CAS is needed, freedom of action that air, space, and cyber capabilities will provide prior to follow-on action by surface forces. CAS in an A2/AD environment might be something we'll be able to do someday but not in the next generation of CAS capabilities and certainly not with the F-35 whose A2/AD configuration would be extremely weapons-limited due to solely internal carriage. When the F-35 conducts CAS in the future, it will very likely do so with weapons and fuel tanks externally mounted, just like current fourth generation fighters and the A-10.

- Can't do air superiority with an A-10: This seems obvious on its face but depends again on perspective and consideration of all the facts. USAF, as an institution, thinks of air superiority in terms of freedom of action above the range of small arms, automatic weapons, and light anti-aircraft artillery (nominally 10,000 feet above the ground). Yet below that bubble is where helicopters have suffered hugely in the past 13 years and where air superiority also needs to be achieved. This is a regime USAF has spent little effort addressing—but with which a platform and pilots like those in the A-10 community can provide significant capability in terms of locating and suppressing enemy defenses and armed escort of more vulnerable platforms like helicopters and the V-22 Osprey.

- One of the biggest inaccuracies



in the debate is the number of omitted facts and issues, presumably cherry-picked to support USAF's early retirement case. These include three key additional missions performed by the A-10 community that are either unknown to most within the debate or intentionally omitted to strengthen the erroneous single-mission argument:

(1) Forward air control (Airborne) (FAC[A]).

(2) Combat search and rescue/ personnel recovery rescue mission commander (RMC, or Sandy One).

(3) Special operations forces support.

(4) Multimission versus single-mission capability: As shown above, the A-10 conducts three additional missions above and beyond CAS, belying the oft-seen argument that the platform and community are only "single mission." Detractors will argue that the above missions are all simply a subset of CAS. While certainly not true in the case of CSAR/PR, a rarely seen counter needs to be: How can and will USAF justify having communities dedicated to each of its classic functions—air superiority, strategic attack, and interdiction—and three of its more recently constituted ones—airlift, ISR, and CSAR/PR—and not have a community dedicated to provide CAS to the US Army, a specific function tasked to the service by the 1948 Key West Agreement?

The F-35 was slated to take over all A-10 missions and many of the F-16's and F-15E's missions, as well, in a graceful phasing out of the older platforms over time while the F-35 community stood up. What needs to be addressed by USAF, DOD, and Congress in this debate before the FY 16 Presidential Budget and spending bills are the real problems:

- What is the best way to provide CAS to the US Army?

- Does the joint community need USAF to conduct FAC(A)?

- Does the joint PR and USAF CSAR require a trained, qualified RMC?

- Does SOF need dedicated, integrated fighter air support?

- If USAF maintains the CAS mission for the US Army (and presumably the other missions above), how does the service institutionalize the CAS attack mission excellence developed and maintained by the A-10 community since the 1970s?

The youngest Hog airframe is over 30 years old, making it one of the oldest fighter fleets in USAF. A service life extension and the A-10C upgrade have added life to the platform, but even USAF's most liberal projections in the

past slated its retirement for 2028-30. The A-10 retirement debate needs to be less about retirement of an aging airframe and more about when and how that retirement is conducted in a way that preserves the attack mission excellence.

Lt. Col. Robert M. Chavez Jr.,  
USAF (Ret.)  
Las Vegas

For the USAF Chief of Staff and the Secretary of the Air Force Deborah Lee James to reinvent close air support and declare other "platforms" suitable for CAS, they are forgetting the ultimate benefactor and *raison de guerre* that we fly is the US Army soldier, the boots on the ground.

Yes, General Welsh has taken some heat over the controversy that has arisen concerning scrapping the A-10 and reassigning the CAS mission to "other platforms" as the bean counters and politicians like to characterize the discussion. I guess that's why he has four stars on his shoulders.

"It's not all about the A-10." Our obligation is in supporting the young Army troopers on the ground—referred to as troops-in-contact or TICs. My college roommate Maj. Pete Larkin, flying an AC-47 in Vietnam, explained it to me: "TICs are Army troops engaged in a firefight with NVA or Viet Cong. When confronted with a larger communist force, they usually call us for help. Then we kill the attacking enemy troops with our three Gatling guns."

Look at the typical munitions mentioned in the subject article that can be fired from the example fast jets "platforms" and drones when performing CAS: GBU-12 Paveway II, AGM-65 Maverick missile, and the AGM-114 Hellfire missile. These examples are all expensive, heavy, guided weapons.

Either way, the enemy will probably confront our troopers in small squads or platoon sized groups. Traveling in stolen vehicles, probably Toyota pickups "Desert Rat style" with mounted guns, seem very popular, as well as stolen Bradley Fighting Vehicles—and a tank or two. Another popular enemy tactic is to stage an ambush using mortars from dug-in positions. Are we going to send an F-16 after a mortar team or a Toyota pickup truck?

SECAF James, and Air Force Deputy Undersecretary Heidi H. Grant recently assured us other aircraft can pick up the CAS role: F-16s, F-15s B-1s, B-2s, and B-52s; and we will have a stronger Air Force even though we downsize, cut pilot flying time, and send masses of operating personnel home in cruel RIFs.

No ma'am, we are playing Russian roulette with our national defense and the lives of countless ground personnel—boots on the ground, remember? I would venture that if we asked ISIS if we should keep the A-10, they would vote to scrap it.

My first squadron commander—fresh out of UPT—had a sign on his desk that read, "The mission of the US Air Force is to fly and fight, and don't you ever forget it!"

Michael W. Rea  
Savannah, Ga.

## No Pressure

I must disagree with the statement at the bottom of p. 64 that the C-124 Globemaster II was derived from a Douglas commercial design [*"The Hearings That Revolutionized Airlift," November 2014*].

The C-124 was derived from the C-74, which built on the Douglas DC-4 in terms of aerodynamics and airframe structure, but was designed specifically as a military transport. Since the C-74 was never intended to be an airliner, it was not pressurized.

Paul Talbott  
Fayetteville, Ga.

## Exhaustingly Loud

Thanks for a most interesting piece on Eisenhower's B-25 [*December 2014, p. 70*]. I flew in the Marine Corps bomber version, the PBJ-1, as an aircrewman in the Southwest Pacific in 1944 and 1945. Postwar, with a USAF commission courtesy AFOTC, the TB-25J was my advanced pilot training airplane. The B-25 was well-described in the article, except for one "feature": It was *loud*. Note the individual exhaust stacks ringing the cowlings, giving each cylinder its own blast port. And I do mean blast. On p. 74, note in the picture that there are no exhaust ports on 34030's cowlings, the exhaust having been converted to a more modern—and quieter (relatively speaking)—collector ring system. I have never seen a preserved and operating Mitchell that has not been converted to collector rings. If there is one, clue me in, and I'll get my ear defenders and observe.

Col. Robert J. Powers,  
USAF (Ret.)  
Shreveport, La.

## Anti-aircraft Flak

I'd like to respond to retired Colonel Coffman's comments on General Hostage, the A-10, and the "bigger picture" [*"Letters," December, p. 8*]. I don't know when Colonel Coffman left the Air Force, but I'm a retired fighter pilot who trained almost exclusively against the Soviet-era threat, retiring in 1997.



I returned to Active Duty from 2009 to 2013. I can assure Colonel Coffman that, without going into specifics, the integrated air defenses possessed by many of today's military forces, including Syria, far (yes, far) exceed the threat we faced during the Cold War. The A-10 was designed to kill Soviet tanks pouring through the Fulda Gap. Today it remains an unequaled low-threat CAS aircraft. But there is no serious consideration among those with knowledge of the current environment, of being able to employ the A-10 against any enemy with modern air defense capabilities.

Incidentally, Capt. Mike Hostage was a student of mine in the F-16 in the '80s. I remember him being a receptive student, a gifted pilot, and a thoroughly likeable guy.

Lt. Col. Dale Hanner,  
USAF (Ret.)  
Loveland, Colo.

### More of the Same

Rebecca Grant's fine article (Fighting Through, December 2014, p. 40) brought back a flood of fond memories from my tour at Kunsan Air Base in South Korea.

In 1997-98, Korea was about as close as you could get to all-out war, and we regularly exercised to fine-tune our warfighter skills. As the senior airfield ops officer, I was assigned to an

exercise position as night shift mission coordinator in the "Wolf Pit," located in the bowels of the wing's operations center. From that not-so-lofty position I couldn't actually see but could monitor flying ops and other operations on the airfield.

Kunsan's airfield was somewhat operationally constrained by its one, and rather narrow, runway and accompanying limited ramp space—good enough to support fighters but challenging for big cargo aircraft. With that in mind we'd scratch our heads when we'd review war plans that identified numerous cargo aircraft projected to transit through that would make up the air bridge to support our war efforts.

Every exercise would come with those exhilarating moments when the incoming missile light would come on. We'd all scramble to top off our MOPP (Mission Oriented Protective Posture) gear by donning gas mask, hood, and gloves. We'd then hunker down in place to await the outcome.

Invariably the simulated missiles would hit on and/or around the airfield and cause considerable havoc. With the all clear we'd quickly dispatch fully MOPPED personnel out to assess the damage. A runway sweep would be conducted to identify any damage, and the various sensors on the airfield would be checked for chemical-biological presence.

These sweeps brought their own threat. One dark night we got a reality check when a fully MOPPED troop in a pickup truck was reported driving helter-skelter down the runway headed to check an onfield sensor. This would not necessarily be a problem except for the four-ship of Vipers that was taxiing into position for immediate takeoff at end of the runway. Expect to deal with communications breakdowns in war.

There were always runway cratering scenarios to cope with during exercises. The real showstopper was not necessarily missile impacts but what was notionally contained in their warheads. We not so affectionately called it being "spodged" when our contaminant sensors detected positive results—a potential showstopper.

For practical purposes, that would bring our exercise to a screeching halt. In a weeklong exercise you can't wait out long-term chemical/biological impacts. In a real-world scenario, I suspect that any continued ops would be a real challenge for the short or long term.

As I read Grant's article I couldn't help wondering what all has really changed since my Kunsan experience. I hate to cast a cloud over "fighting while degraded," but I sense: not much.

Col. Bill Malec,  
USAF (Ret.)  
O'Fallon, Ill.



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**Leaving Afghanistan, staying in Afghanistan; Sharing Bagram Airfield; A-10s not dead yet; Budget highs and lows; Listen to what the people say ....**

## NOT QUITE “END OF MISSION”

With the end of Operation Enduring Freedom in December, the 13-year US war in Afghanistan officially came to a close. Responsibility for combat operations in that country was handed over to the 350,000 members of the indigenous Afghan Security Forces, which the US has been training for years and which have increasingly taken the lead in joint missions with the US.

The American presence in Afghanistan is not over, however. Succeeding OEF is Operation Freedom’s Sentinel, announced by Defense Secretary Chuck Hagel in late December. The mission calls for some 13,000 US troops to remain in Afghanistan on an indefinite timetable, to assist Afghan forces by continuing to train them in various aspects of military affairs.

Combat-capable US forces providing advice and training will be part of the technically separate Operation Resolute Support. These troops will chiefly provide guidance to their Afghan colleagues, Hagel said in a statement, adding that they might be called on for combat in direct response to a specific al Qaeda or other terrorist plot against the US or Afghanistan.

A NATO release said its troops—including US forces—will work at the ministerial, operational, and institutional level to continue developing an Afghan military and government that is stable and capable of looking after its own internal and external defense. NATO personnel will assist the Afghan forces in getting comfortable with civilian control of the military, to develop defense budgets and learn the bureaucracy of running a military, to be transparent, and with other military-specific tasks.

About 20 percent of the US forces remaining in Afghanistan—about 2,600 people—will be Air Force personnel, according to US Air Forces Central spokesman Col. Edward T. Sholtis. They will be a mix of Active Duty, Guard, and Reserve airmen.

The 438th Air Expeditionary Wing, based mainly at the Afghan capital of Kabul but also at some other locations, “will train, advise, and assist the Afghan Air Force in developing a sustainable air capability and support ... Afghan National Security Forces with mission capabilities such as airlift, aeromedical evacuation, tactical reconnaissance, and ground attack,” the spokesman said.

The personnel involved are trained as instructors and advisors “in the flying and maintenance of platforms the Afghans use”—some of which are not in the US inventory—“as well as operational/tactical mission planning and the basic staff functions of an air service,” he said.

The 455th Air Expeditionary Wing, to be based at Bagram but also with some satellite locations, “will maintain a counterterrorism capability in Afghanistan to continue to target the remnants of al Qaeda and prevent an al Qaeda resurgence,” as well as to thwart “external plotting against US targets or the homeland,” Sholtis added.

It’s the 455th that will have the shooting mission if the US deems it necessary. Sholtis explained that “although under this mission we won’t target belligerents solely because they are members of the Taliban, as part of this mission we may provide combat enabler support” to the Afghan National Security Forces “in limited circumstances.”

Air Force combat and intelligence, surveillance, and reconnaissance aircraft will be in Afghanistan indefinitely; in early January, the mix was “predominantly” F-16s and remotely piloted aircraft, and the 455th will mainly be involved in flying and maintaining them. He described the numbers of aircraft as “several dozen.”

Besides those based at Kabul, Bagram, and elsewhere, the mission will be supported by airlift assets and tankers, either based in-country or elsewhere in the US Central Command area of responsibility, as well as aerial porters and their gear.

Force-protection personnel will also be involved at all locations, as well as “other mission support capabilities required for expeditionary unit operations,” he noted. Moreover, there will be other assets in the region on-call, and “we can shift assets to bases in Afghanistan as the [narrower] mission dictates.” There are also the various “reachback” capabilities in the continental US that are only an email or phone call away from airmen in Afghanistan.

Three years ago, the Air Force built modern, permanent dormitories and other housing at Bagram Air Base to replace dilapidated temporary structures that had seen 10 years of hard use and were in bad shape. Over the years, USAF also expanded the Bagram runway system and ramps to double its capacity. With the sharp reduction in the number of US aircraft transiting the base, the Air Force will go back to using just half the base; the Afghan Air Force will use the other half, and a joint team will staff the control tower.

## HURLING THUNDERBOLTS

The Fiscal 2015 defense bill, approved by Congress and signed by President Obama in December, denies the Air Force its wish to retire the A-10 Warthog fleet wholesale, but does let the service put some of the ground attack fighters in “backup” status.

The \$585 billion National Defense Authorization Act specifically forbade the Air Force from retiring the A-10 fleet, after spirited opposition from many members of Congress. USAF had requested the move to save some \$4.6 billion over the Future Years Defense Program, to spend on higher acquisition priorities such as the F-35 fighter, KC-46 tanker, and



*Hawks dodged the axe—for now.*

USAF photo by A1C Gustavo Castillo





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Long-Range Strike Bomber, but also to free up maintainers to transition to new F-35s.

The bill allows the Air Force to put 36 A-10s in “backup flying status,” which means the service doesn’t have to fully fund them with maintenance and assigned aircrew, but will occasionally fly them to keep them in working order. The move is expected to free up about 100 maintainers to go to the F-35, but USAF was counting on 800 experienced A-10 maintainers to make the transition, out of some 1,100 overall maintainers needed for the new fighter. The F-35 program executive officer, Lt. Gen. Christopher C. Bogdan, said in November that the lack of experienced maintainers is the biggest obstacle to USAF declaring initial operational capability with the F-35 on time in August of 2016. Without them, there could be a delay of a year to 18 months, Bogdan said.

The bill also requires the Pentagon’s Cost Assessment and Program Evaluation shop to study how the Air Force will perform close air support in the future, as well as other ways the Air Force could fill its F-35 maintainer needs. In its arguments to retire the A-10, USAF has consistently argued that some 80 percent of the CAS mission in Afghanistan was performed by other platforms, including F-16s, F-15Es, and B-1 bombers.

Champions of the jet, however, point out that A-10s are back in action against ISIS targets in Iraq and suggest that this is proof positive of their enduring value.

## OTHER BUDGET FALLOUT

The final 2015 defense bill also blocked the Air Force from retiring the U-2 spyplane. This was a move the service sought to afford mandates from Congress to continue buying and flying the RQ-4 Global Hawk unmanned surveillance aircraft.

Congress went along with a Pentagon-recommended one percent raise to military pay, after 14 years of real increases that were well above inflation.

Air Force research and development and test and evaluation accounts were flat compared with the Fiscal 2014 level of \$23.6 billion.

Of the \$585 billion appropriated, the overall Defense Department base budget accounts for \$521 billion. The remaining \$64 billion funds overseas contingency operations in Afghanistan, the European Reassurance Initiative to bolster support to NATO, counterterrorism operations, and \$5 billion to conduct operations against ISIS in Syria and Iraq.

The enacted budget of Air Force aircraft procurement—\$12.1 billion—was actually \$525 million higher than requested by the service. The additional funds will be spent on two additional

F-35A jets, the KC-46, and a new combat rescue helicopter program. No extra monies were appropriated for the JSTARS recapitalization program, upgrades to the E-3 AWACS, or development of the new Long-Range Strike Bomber, but the requested budgets for those programs were left intact.

To address US dependence on the Russian-designed RD-180 rocket engine used in Evolved Expendable Launch Vehicle boosters, Congress directed the Pentagon to find an alternative engine not later than 2019. There’s to be a “full and open competition” to develop the alternative motor, but Congress let stand existing orders and options for using the RD-180.

The Air Force will be allowed to transfer 12 MC-12 Liberty aircraft to US Special Operations Command. USAF said the aircraft, which were rapidly developed and fielded to meet operational needs in Iraq and Afghanistan, were excess to its needs.

## VOX POPULI

A solid majority of Americans think the world is getting more dangerous and want the US to increase defense spending and get rid of the 2011 Budget Control Act spending caps on military budgets, according to a Harris Poll conducted on behalf of the Aerospace Industries Association. It is a sentiment politicians and especially candidates for office in 2016 should ignore at their own peril, said AIA President Marion C. Blakey.

The poll was conducted in mid-November and surveyed 818 registered voters.

Collectively, 78 percent of those polled think the US is in more direct danger as a result of the activities of Islamist jihadists and al Qaeda operating in Iraq and Syria. The numbers were similar when respondents were asked whether they would support a candidate who favored increased defense spending, Blakey said. She urged politicians to set aside “the rose-colored glasses of a naïve isolationist” and the “green eyeshade of a fiscal ideologue” and heed the concerns of the American people. Blakey decried the “modernization holiday” which has persisted while the US fought the wars in Iraq and Afghanistan, saying it “simply must end” or the US will face real losses to its both on-call forces and industrial capacity needed to sustain them.

Blakey noted that Congress’ standing with the populace is at historically low levels, and one way to get back in the voters’ good graces would be to end this “dangerous procrastination” and repeal the budget sequester. Blakey said the sequester has been highly destructive already and could do worse damage if it’s reinstated in Fiscal 2016.

Asked if, given “evolving and increased threats” to US security, the US government should increase defense spending above the Budget Control Act levels set in 2011, 69 percent of the respondents said yes. Some 73 percent of the polled said that a combination of defense spending cuts and the sequester, which have taken about \$1 trillion out of defense spending from the 2012 to 2022 timeframe—with a 10 percent reduction in the last three years—have made the US less secure.

By political affiliation, this sentiment was the most polarized response, with 90 percent of Republicans, 71 percent of Independents, and 55 percent of Democrats saying the US is “less secure” due to spending cuts; still, a majority of all groups agreed that the nation is in greater danger from external threats.

Blakey warned candidates for office “to listen” to the sentiments revealed by the poll. In a statement accompanying the poll’s release, she said, “If this new Congress is to restore any faith in our political process, they can start ... by revisiting the budget caps to reflect today’s security needs.” ★



The new budget has room for two more F-35s, the KC-46, and a new combat rescue helicopter program.



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# Action in Congress

By Megan Scully

As he prepares to take over the helm of a Pentagon facing the threat of deep budget cuts, Ashton B. Carter brings with him a proven track record on Capitol Hill.

The Pentagon veteran walked onto the job as the department's chief weapons buyer in late April 2009 just weeks after then-Defense Secretary Robert M. Gates announced plans to gut many of the military's biggest and most expensive acquisition programs.

Before Carter had time to get acclimated to life as the Defense Department's No. 3 civilian, he had his first big assignment: Serve as Gates' lieutenant in selling cuts to Congress.

Lawmakers are reflexively resistant to eliminating weapons programs, particularly ones that bring jobs and money to their states and districts. But Carter and Gates succeeded, ultimately pushing through the vast majority of cuts in Gates' budget proposals, including ending production of the F-22 Raptor stealth fighter jet, terminating the second engine for the F-35 strike fighter, and killing the most expensive and ambitious Army modernization program in history.

Perhaps even more surprisingly, they managed to keep—and even strengthen—ties in Congress, where Carter remains highly regarded even among GOP lawmakers who have sharp differences with the Obama Administration on national security matters.

It was fitting, then, that President Obama alluded to Carter's work as acquisition chief at the outset of his Administration when he announced in early December that the popular technocrat was his pick to serve as the next Defense Secretary. Carter's intimate knowledge of the military will be particularly critical as he takes over a department facing another round of deep budget cuts.

"He's a reformer who's never been afraid to cancel old or inefficient weapons programs," Obama said. "He knows the Department of Defense inside and out—all of which means that on Day One, he's going to hit the ground running."

In the absence of a better budget deal for the department, the Pentagon's accounts will get hit by a round of across-the-board cuts in January 2016 that could force officials to slash \$35 billion

or more from the upcoming Fiscal 2016 request.

Carter, Obama said, will be involved in the Administration's efforts to negotiate a new budget agreement, a role that will require him to attempt to lessen the blow to his department while also preparing for the worst-case scenario.

Either way, weapons programs will be scrutinized and more could be on the chopping block, and there is perhaps no one in Washington better suited to the chore than Carter. His experience—he's worked for 11 Defense Secretaries—combined with his popularity on Capitol

closely with him on a number of issues, including defense acquisition reform," McCain said.

In his first weeks on the job, Carter will be tasked with selling the 2016 request that was more or less finalized before he was even nominated to the post.

That request is expected to blow past the budget caps and, as such, will not provide much of a look into Carter's own priorities or the priorities of a more fiscally constrained department.

If the caps stay in place next January, either Congress must make the cuts within the spending bill itself or allow



Carter (r) with Marine Corps Maj. Gen. John Toolan Jr. in Afghanistan in 2012.

Hill position him for the difficult job.

Indeed, his support among Republicans bodes well for his tenure as Secretary.

"Ashton Carter is a highly competent, experienced, hard-working, and committed public servant," Senate Armed Services Chairman John McCain said in a December statement.

That amounts to a ringing endorsement from the new chairman, who routinely battles with Administration officials over national security policies and decisions.

And in a nod to the challenges ahead, the Arizona Republican even harkened back to Carter's days as acquisition chief, pointing to an affinity between the two for changing the way the department buys its weapons.

"Throughout Dr. Carter's previous tenure at the Pentagon, I have worked

sequestration to go into effect, slashing most defense accounts regardless of priority.

But even as he is testifying on the 2016 request, Carter will begin directing work on the Fiscal 2017 budget, which the services have already started to draft.

The size and scope of that spending proposal—and the difficult decisions made within it—will depend mightily on the budget negotiations and the amount of relief the Pentagon gets from the stringent caps.

That proposal—and the Fiscal 2018 request that the Administration will complete on its way out the door—will bear Carter's mark and perhaps be his legacy as Defense Secretary. ★

Megan Scully is a reporter for CQ Roll Call.





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# Air Force World

## Defense Policy and Spending Bills Signed

President Obama on Dec. 19 signed HR 3979, the Fiscal 2015 defense authorization bill, into law. The legislation authorizes \$585 billion for the Defense Department and the Energy Department's national security programs in this fiscal year—running through Sept. 30—including \$495.9 billion for the Pentagon's base budget, \$63.7 billion for overseas contingency operations, and \$17.5 billion for DOE's nuclear weapons and defense activities.

Obama signed the bill one week after the Senate passed it, and some two weeks after the House approved it. On Dec. 16, Obama signed into law the \$1.1 trillion spending bill incorporating some \$554 billion for DOD in Fiscal 2015.

DOD's slice included \$490 billion in base spending and another \$64 billion in overseas contingency funds, as well as funding to continue fighting ISIS in Iraq and Syria and to combat Ebola in Africa.

## First Flight for KC-46 Program

A provisioned 767-2C freighter took off from Paine Field in Everett, Wash., on Dec. 28, marking the first flight for the KC-46A Pegasus engineering, manufacturing, and development program.

The Air Force said the aircraft is "the critical building block for the KC-46 missionized aerial refueler." It flew for three hours and 32 minutes, according to a Boeing news release.

★ screenshot





Boeing must still complete additional modifications, including installing the refueling boom and other military-specific equipment that are to be completed in time for the first flight of a KC-46 (EMD #2) this spring.

"We know flight testing will lead to some discovery; today's flight kick-starts that work. There is an aggressive schedule going forward into Milestone C decision point for approval to start low-rate initial production, but we remain cautiously optimistic we can meet the mark," said Col. Christopher Coombs, the KC-46 system program manager, in an Air Force news release.

Under a 2011 contract, Boeing will build four test aircraft, including two 767-2Cs and two KC-46As. The Air Force in-

tends to procure 179 Pegasus aircraft by 2027. The first 18 are to be delivered by August 2017.

#### Contract Court

The Air Force has launched a new initiative dubbed "contracts court," aimed at reducing the overall number of contracts issued by the Air Force each year, Secretary Deborah Lee James said during a Dec. 16 session with airmen.

Under the new program, senior leaders are required to justify the need for all contracts. If, during the defense of the particular item or service, "it doesn't appear that it is necessary going forward, then perhaps we need to do without it," said James in response to a question from an airman.

## 01.06.2015

*A maintainer stands on the flight line in front of a C-5M Super Galaxy blanketed with snow at Dover AFB, Del., in early January. Despite snow covering the aircraft and flight line, maintainers kept the C-5M mission moving.*



USAF photo by Roland Balik

"We have reduced contractors over the last year and I predict that we will continue to do so in the future." The system was implemented approximately six months ago "to make sure we are making every dollar count."

#### Korea, Japan, US To Share Intel

The US military will serve as an intermediary between US treaty allies Japan and South Korea to better share classified intelligence information on nuclear developments and missile threats posed by North Korea.

The formal agreement between the three countries, announced just before the New Year, creates a "framework" for the Defense Department, the Republic of Korea's Ministry of National Defense, and Japan's Ministry of Defense to pass classified data. This includes imagery, electronic intercepts, and human intelligence specifically related to North Korea's nuclear program, missiles, and protection requirements of US agreements with both Japan and South Korea.

The deal marks progress on efforts to get the two US allies to cooperate more closely on regional security matters, despite longstanding tensions.

The agreement will allow for a "more effective response" to future North Korean provocations and during contingencies, the Pentagon claimed.

The US recently agreed to expand missile defense cooperation with South Korea as it builds its own missile defense system, and another AN/TPY-2 missile defense radar was recently deployed to Japan to boost existing radar coverage.

#### C-17 Units Face Stand-Down

Air Mobility Command will stand down two C-17 squadrons over the next two years and move the units' 16 total airplanes into backup status as part of a cost-saving plan laid out in Fiscal 2015 defense legislation.

Officials will inactivate the 17th Airlift Squadron at JB Charleston, S.C., this fiscal year, followed by the 10th Airlift Squadron at JB Lewis-McChord, Wash., in Fiscal 2016, according to a Dec. 22 AMC news release.

Each squadron operates eight C-17s. Moving these aircraft from the Air Force's primary aircraft inventory to its backup aircraft inventory is expected to save the service approximately \$110 million per year since BAI assets are not assigned personnel or flying hours.

AMC's goal is to return these C-17s to PAI status at some point and transfer them to the reserve components as soon

#### Lightning Maintenance Abroad

Italy will carry out heavy aircraft maintenance for F-35s in Europe, while Australia and Japan will handle strike fighter work in the Pacific, the F-35 program office recently announced.

Turkey will tackle heavy engine maintenance for Europe. Pacific engine work will be done, once again, by Australia and Japan.

Lt. Gen. Christopher C. Bogdan said at a press conference that Italy won the right to do the work by virtue of its \$1 billion investment in an F-35 final assembly and checkout facility on its soil, thus sharply reducing what the other partners must invest.

Italy and Turkey are to be ready to do European work in 2018. In addition, Britain was designated to handle overflow aircraft work, and Norway and the Netherlands will provide additional engine capacity circa 2020.

Australia and Japan are to be ready for heavy airframe work not later than 2018, and Australia is to be ready for heavy engine work that same year, with Japan following "at least three to five years later."

Each country will work with its own industry to perform F-35 work "over and above their own F-35 needs," stated Bogdan.

Regional considerations such as forward basing, aircraft phasing, and transportation also contributed to initial assignment decisions," the system program office said.

These assignments do not bar other partners of future foreign military sales customers from future sustainment roles, according to the SPO.

Thus far, South Korea is the only other confirmed Pacific F-35 buyer, though Singapore is involved as a second-tier partner and is expected to buy some aircraft.

—John A. Tirpak

as Fiscal 16, said Maj. Gen. Michael S. Stough, AMC's strategic planning chief.

The 17th AS was the first operational unit to receive the C-17 back in 1993.

#### No Involuntary Uniformed Cuts

The Air Force will not continue involuntary uniformed-force reductions in Fiscal 2015 as previously planned, Air Force Secretary Deborah Lee James announced in December.

"Enough is enough. We are as low as we are going to go," the Secretary said during an online town hall-style meeting. "We have reduced far enough. We will not go leaner, and we will fight to hold on to the numbers now that we have." In terms of new airmen coming in and experienced airmen staying on, "we need both," James said.

The Fiscal 2014 force shaping was supposed to provide that balance. "Analysis is analysis and real world is the real world," James said, adding that in her travels over the last year, she has grown less convinced that involuntary force management is needed.

The Air Force will, however, continue drawing down its civilian workforce.

"Our hope is that through multiple rounds of voluntary civilian workforce shaping measures and the use of pre-reduction in force placement flexibilities we should be able to offset most of our civilian impacts," stated Air Force spokeswoman Rose Richeson.



**Roll Out the Barrel:** SSgt. Ronnie Simons, a weapons load team chief, inserts a 25 mm Gatling gun into an AC-130U Spooky gunship at Hurlburt Field, Fla., Jan. 12. The guns are inspected and the barrels switched out every 18,000 rounds.

USAF photo by SrA. Krystal M. Garrett





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USAF photo by TSgt. Marie Brown

**No Bang For These Bucks:** Explosive ordnance disposal technicians use sand as a drawing board to plot their movements while on a foot patrol during a training exercise at an undisclosed location in Southwest Asia.

### Sub Chasers' Gold

Civil Air Patrol World War II veterans were awarded the Congressional Gold Medal—Congress' highest honor—for their role in protecting the US homeland during the war, in a ceremony at the Capitol on Dec. 10.

"I salute CAP's founding members for their legacy of service and sacrifice in protecting the homeland during World War II," CAP Commander Maj. Gen. Joseph R. Vazquez said in a press release.

Some 40 wartime CAP members, including six "sub-chasers" who patrolled the US coastline for German U-boats, as well as Berlin Airlift hero retired Col. Gail S. Halvorsen, who learned to fly in CAP during the war, attended the ceremony.

CAP members flying civil light aircraft from 21 coastal patrol bases along the Atlantic and Gulf coasts were credited with spotting 173 U-boats, attacking 57 of the vessels, and escorting more than 5,600 allied shipping convoys. CAP members located 91 allied vessels in distress and 363 survivors at sea, according to officials.

Surviving wartime members were presented replica medals in recognition of their service.

### Suppression Practice

Fighter crews from a cross US Air Forces in Europe-Air Forces Africa gathered at Spangdahlem AB, Germany, in late December for five days of training in suppression of enemy air defenses (SEAD) operations.

Exercise Iron Hand 15-2 was unique as a US-only air combat exercise in Europe, said Lt. Gen. Darryl Roberson, commander of 3rd Air Force and the 17th Expeditionary Air Force.

### Mulling the Military Option

The US is mulling economic sanctions against Russia for violating the Intermediate Nuclear Forces Treaty, as well as potential military responses if Russia actually deploys nuclear cruise missiles in violation of INF, officials told members of the House Armed Services Committee.

"Russian possession, development, or deployment of a weapons system in violation of the treaty will not be ignored," said DOD Principal Deputy Undersecretary of Defense for Policy Brian McKeon, Dec. 10.

"We are actively reviewing potential economic measures in response to Russia's violation and the United States is assessing options in the military sphere to ensure that Russia will not gain a significant military advantage from its violation of the INF treaty," said Rose E. Gottemoeller, undersecretary of state for arms control, at the same hearing.

Russia has reacted to US negotiations since 2013 by accusing the US of treaty violations, which "we believe, are meant to divert attention from its own violation," McKeon added. "In our view, all of Russia's claims are categorically unfounded."

"Russia's lack of meaningful engagement on this issue, if it persists, will ultimately require the United States to take actions to protect its interests and security, along with those of its allies and partners," he said. This will without question "make Russia less secure."

The US aims to negotiate Russia back into compliance with the treaty but "the Joint Staff has conducted a military assessment of the threat, were Russia to deploy an INF Treaty range ground-launched cruise missile in Europe or the Asia-Pacific region," McKeon noted.

—Aaron M. U. Church



Participating units came from RAF Lakenheath, UK; Aviano AB, Italy; and Germany to practice SEAD skills along with Spangdahlem's 480th Fighter Squadron.

"We don't often get to plan, brief, fly, and debrief face-to-face with our fellow USAF fighter warriors," said Lt. Col. David Berkland, the 480th Fighter Squadron commander.

The F-16s of the 480th FS are the only SEAD assets based in Europe, and it was important that all three squadrons train together to sharpen skills and improve air readiness and combat capability, Roberson said.

#### **Crumpled at Creech**

An MQ-9 Reaper remotely piloted aircraft crashed during a routine training sortie from Creech AFB, Nev., early on Dec. 11, according to 432nd Wing officials.

The Reaper went down in an unpopulated area approximately one mile east of the base. Emergency responders were able to cordon off the wreck site, and no Air Force or civilian personnel were injured in the mishap.

The cause of the crash is under investigation.

#### **JazziER and Ready**

The extended-range variant of the stealthy Joint Air-to-Surface Standoff Missile completed operational testing and has been cleared to enter full-rate production, announced builder Lockheed Martin in December.

"The full-rate production decision demonstrates that our customer, at all levels of the US Air Force, has confidence in JASSM-ER," said Jason Denney, the company's long-range strike systems director. The weapon successfully struck 20 out of 21 targets, scoring a 95 percent hit rate, in operational test and evaluation that wrapped up last year, according to the company.

## **By the Numbers**

# **\$87.3 billion**

Total US military aerospace sales last fiscal year, a largely flat 0.8 percent increase from the preceding year, according to the Aerospace Industries Association.

JASSM-ER boasts two-and-a-half times the range of the standard JASSM, providing combatants with "a first-day, first-strike capability in an anti-access, area-denial environment," said Denney.

It is cleared for use on the B-1B, while the baseline JASSM has been integrated with the B-1B, B-2A, B-52H, F-16, and F-15E.

The Air Force earlier this year tasked Lockheed Martin to build 100 extended-range JASSMs during JASSM production lots 11 and 12, which also include orders for the baseline variant.

***And It's a Perfectly Fine Airplane, Too: A pararescue-man from the 31st Rescue Squadron leaps from the back of a C-130 during Jump Week at Yokota AB, Japan, Jan. 6. During the training event, members of the 31st join up with the 36th Airlift Squadron to practice rescue tactics and maintain mission readiness in preparation for real-world emergencies.***



USAF photo by Osakabe Yasuo

## The War on Terrorism

### Operation Enduring Freedom

#### Casualties

By Jan. 20, 2015, a total of 2,356 Americans had died in Operation Enduring Freedom. The total includes 2,352 troops and four Department of Defense civilians. Of these deaths, 1,846 were killed in action with the enemy while 510 died in noncombat incidents.

There have been 20,066 troops wounded in action during OEF.

#### Freedom's Sentinel Begins

The US and its coalition allies on Jan. 1 handed off combat operations in Afghanistan to the 350,000-strong Afghan military and security forces, kicking off Operation Freedom's Sentinel, the US training and advising mission to support the Afghan government.

As part of OFS, the US will pursue two missions, said Defense Secretary Chuck Hagel. The first is to work with NATO's Operation Resolute Support mission to advise, train, and assist Afghan forces, while the second continues counterterrorism activities against "remnants" of al Qaeda.

The Pentagon has made clear it will not be targeting al Qaeda members or leaders, unless they are linked to specific threats against US forces or Afghan allies. The 13,000 troops left in country working with NATO's ORS will focus on specific areas at the "ministerial, operational, and institutional level," according to NATO.

This will include budgeting, transparency and oversight, civilian control of the military, force generation, sustainment, strategy and planning, intelligence, and strategic communications.

—Marc V. Schanz

#### Higher Troop Levels for 2015

The Obama Administration is adjusting its planned troop drawdown in Afghanistan and will keep an additional 1,000 US troops in the country into 2015, Defense Secretary Chuck Hagel stated in a joint press appearance with Afghan President Ashraf Ghani.

Delays signing the US-Afghanistan bilateral security agreement (BSA) and new NATO status of forces agreement caused NATO's postcombat training, advising, and assisting mission to fall behind. As a result, up to 10,800 US troops could remain in Afghanistan through the "first

few months" of 2015, he said, up from the planned 9,800.

Operation Resolute Support will focus primarily around Kabul and at Bagram Airfield, with a "limited regional presence," said Hagel on Dec. 8.

US forces will provide "limited combat-enabler support" to Afghan forces. They would also take "appropriate measures" against Taliban forces that directly threaten US and coalition troops, or that provide direct support to al Qaeda, he said. Taliban attacks in and around Kabul have spiked in the aftermath of the country's parliament approving the BSA and the ORS mission.

### Operation Inherent Resolve

#### Casualties

By Jan. 20, 2015, a total of three Americans had died in Operation Inherent Resolve. All three troops died in noncombat incidents.

No troops have been wounded in action during OIR.

#### ISIS Leaders Fall to Air Strikes

Coalition air strikes have killed several senior ISIS leaders since November, negatively affecting the terrorist organization's operations and its ability to command and control forces, Pentagon officials said.

Since mid-November 2014, strikes have killed "multiple senior- and mid-level leaders within the Islamic State of Iraq and the Levant," said Pentagon spokesman Rear Adm. John Kirby in a Dec. 18 statement.

The loss of these leaders has degraded ISIS and its ability to command and control operations against Iraqi Security Forces and Kurdish fighters. Kirby did not specify individual leaders killed in the strikes, noting DOD would not discuss intelligence and targeting aspects of ongoing operations.

ISIS leader Abu Bakr al-Baghdadi is not among the dead, but unnamed DOD officials told Al Jazeera and other media outlets those killed included Haji Mutazz, one of Abu Bakr's deputies in Iraq, as well as Radwan Taleb al-Hamdouni, who was a senior ISIS leader involved in the occupation of Mosul.

The success of these air strikes are a clear sign of the coalition's resolve in enabling the Iraqi security forces to disrupt and degrade ISIS, as the Iraqi's prepare to retake control of contested areas of the country, Kirby said.

—Marc V. Schanz

### South Korea Buys Global Hawk

South Korea signed a hybrid \$657 million foreign military sales contract for four RQ-4B Block 30 Global Hawk remotely piloted aircraft after extensive negotiations, according to the Pentagon.

Deliveries will begin in 2017 and conclude by June 2019. The contract with Northrop Grumman Systems Corp. includes four RQ-4Bs, two spare engines, and applicable "ground control environment elements," each of them featuring an enhanced integrated sensor suite.

The deal is the culmination of extensive South Korean efforts to build up their own aerial intelligence, surveillance, and reconnaissance capabilities on the peninsula, as improved ISR sharing is a critical part of its efforts to build its own air and missile defense system, planned for initial operation by the mid-2020s.

Germany also announced it is considering reviving the RQ-4E Euro Hawk signals intelligence remotely piloted aircraft that was canceled last year, according to an *IHS Jane's* report.

The Luftwaffe identified airborne Sigint as a critical capability for security and is considering options for integrating Euro Hawk's sensor suite on one of several manned or unmanned platforms, stated *Jane's*.

### Canadians Bide Time on the F-35s

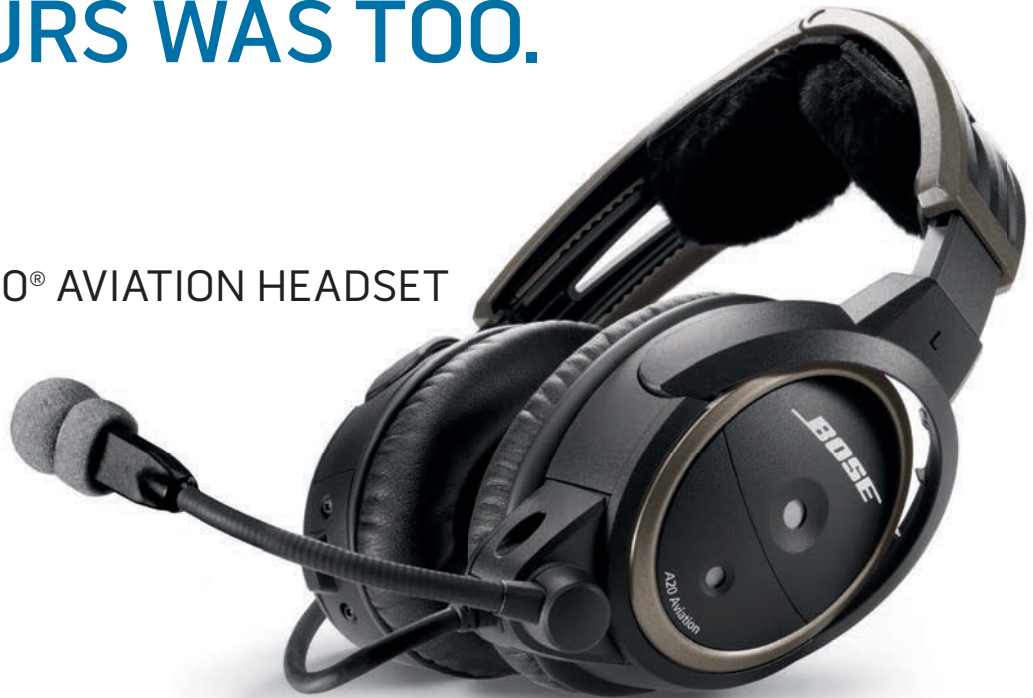
Canada will remain an F-35 development partner "to keep all options open until a decision is made" on what aircraft, or mix of aircraft, will replace the Royal Canadian Air Force's CF-18 Hornet fleet, stated an annual summary released Dec. 10.

The RCAF now plans to stretch its aged Hornet fleet out to 2025, and "the project to replace the CF-18 is currently in the options analysis phase," according to an annual update to Parliament on fighter procurement.



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The RCAF planned to acquire 65 F-35As, but relaunched its fighter replacement program in 2012 due to cost growth and political pressure, mandating annual cost-updates to Parliament.

Notional plans still call for a 65-strong fleet, if the F-35 is selected as the sole replacement. Canada has invested \$288.7 million (US dollars) in the F-35 program to date, and Canadian companies have gleaned \$587 million in F-35 contracts, according to the government's unclassified summary.

### First International F-35 at Luke

A Royal Australian Air Force F-35 Lightning II touched

### From Kandahar, With Valor

In a December ceremony, MSgt. Ivan Ruiz, a para-rescuer from the 56th Rescue Squadron at RAF Lakenheath, UK, was recently awarded the Air Force Cross—the military's second highest decoration for an airman—for his 2013 actions in Kandahar province, Afghanistan.

On Dec. 10, 2013, Ruiz, who was assigned to the 22nd Expeditionary Special Tactics Squadron at the time, conducted a raid in denied terrain along with a team of US Army Special Forces and Afghan commandos, according to his Air Force Cross citation.

Ruiz and two of his Special Forces teammates were confronted by four insurgents at point-blank range after being separated from the rest of their team. Although they quickly eliminated the threat, they became trapped in a courtyard by intense insurgent crossfire.

His two comrades were wounded, "rendering them immobile and exposed to enemy fire," states the citation. Ruiz "completely disregarded his personal safety and refused to withdraw to cover. Single-handedly suppressing enemy fire until reinforcements arrived."

Ruiz pushed through the crossfire to his wounded comrades, states the citation. The sheer volume of fire forced him to the prone position, but Ruiz refused to leave, "preventing enemy fighters from engaging his wounded teammates with direct fire weapons," according to the citation.

He is credited with saving the lives of his two teammates and killing 11 insurgents.

—Amy McCullough

down at Luke AFB, Ariz., becoming the first international F-35 partner to join the pilot training schoolhouse there on Dec. 18.

"Today, we take another tremendous step forward in our transition to the F-35 here at Luke," said 56th Fighter Wing Commander Brig. Gen. Scott L. Pleus in a news release.

"Australia is the first of 10 nations. ... Welcoming our first Australian F-35 is a special day for Luke," he commented.

RAAF F-35 pilots will train with the wing's 61st Fighter Squadron, as well as Italian and Norwegian F-35 pilots who are slated to begin training under Luke's future 62nd Fighter Squadron by next June, according to the wing.

Dutch and Turkish F-35 partners also will eventually train at Luke, in addition to current and potential foreign military sales customers. ★

## Senior Staff Changes

**RETIREMENT:** Maj. Gen. Paul H. McGillicuddy.

**NOMINATIONS: To be Brigadier General:** Tony D. Bauernfeind, Vincent K. Becklund, Steven J. Bleymaier, Richard A. Coe, William T. Cooley, Barry R. Cornish, Christopher E. Craige, Andrew A. Croft, Allan E. Day, Trent H. Edwards, Andrew J. Gebara, Gerald V. Goodfellow, John R. Gordy II, Stacey T. Hawkins, Cameron G. Holt, Kevin A. Huyck, James A. Jacobson, Darren V. James, David J. Julazadeh, Kevin B. Kennedy, Chad T. Manske, Michael A. Minihan, Wayne R. Monteith, Daniel J. Orcutt, Lenny J. Richoux, Carl E. Schaefer, John E. Shaw, Brad M. Sullivan, Billy D. Thompson, Paul A. Welch, William P. West.

**CHANGES:** Brig. Gen. (sel.) Allan E. Day, from Assoc. Dir., Resource Integration, DCS, Log., Instl., & Mission Spt., USAF, Pentagon, to Cmdr., Defense Log. Agency-Aviation, Richmond, Va. ... Maj. Gen. Timothy J. Leahy, from Dir., J-3, SOCOM, MacDill AFB, Fla., to Cmdr., Curtis E. LeMay Center for Doctrine Dev. & Education, AETC, Maxwell AFB, Ala. ... Brig. Gen. (sel.) Chad T. Manske, from Dep. Dir., Operational Log., Jt. Staff, Pentagon, to Dir., CENTCOM Deployment & Distribution Ops. Center, CENTCOM, Southwest Asia ... Maj. Gen. John K. McMullen, from Cmdr., 9th Air & Space Expeditionary Task Force-Afghanistan, ACC, Southeast Asia, to Dir., Ops., Strat. Deterrence, & Nuclear Integration, USAF, Ramstein AB, Germany ... Brig. Gen. Mathew H. Molloy, from Dep. Dir., Ops. (Protection), NORTHCOM, Peterson AFB, Colo., to Cmdr., AFOTEC, Kirtland AFB, N.M. ... Maj. Gen. Jon A. Norman, from C/S, PACAF, JB Pearl Harbor-Hickam, Hawaii, to Vice Cmdr., PACAF, JB Pearl Harbor-Hickam, Hawaii ... Maj. Gen. Scott D. West, from Cmdr., AFOTEC, Kirtland AFB, N.M., to Cmdr., 9th Air & Space Expeditionary Task Force-Afghanistan, ACC, Southeast Asia.

**COMMAND CHIEF CHANGE:** CMSgt. Lorraine F. Regan, from Supt., Natl. Guard Bureau, Manpower, Personnel & Svcs., ANG Readiness Center, JB Andrews, Md., to Spec. Asst., Total Force Enlisted Issues, USAF, Pentagon.

**SENIOR EXECUTIVE SERVICE CHANGES:** David R. Beecroft, to Dep. Dir., Security Forces, DCS for Log., Instl., & Mission Spt., USAF, Pentagon ... Nancy J. Dolan, to Dep. Dir., Strategy, Concepts, & Assessments, DCS, Strat., P&P, USAF, Pentagon ... Michael T. Eismann, to Chief Scientist, Sensors Directorate, AFRL, AFMC, Wright-Patterson AFB, Ohio ... Mark R. Engelbaum, to Dep. Dir., Mil. Force Mgmt., DCS, Manpower, Personnel & Svcs., USAF, Pentagon ... Keith W. Hoffman, to Senior Intel. Engineer, Data Exploitations Directorate, Natl. Air & Space Intel. Center, Wright-Patterson AFB, Ohio ... Dennis M. Miller, to Dir., Engineering & Tech. Mgmt., Air Force Life Cycle Mgmt. Center, AFMC, Hanscom AFB, Mass. ... Charles F. Nava, to Tech. Dir., AF Rapid Capabilities Office, Office of the Administrative Asst. to SECDEF, JB Anacostia-Bolling, D.C. ■

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*A KC-10 fuels an F-22 in September, before strike operations against ISIS targets in Syria.*

USAF photo by TSgt. Russ Scaff



# With the Raptors Over Syria

By Amy McCullough, News Editor

## The F-22 unexpectedly went to war on a night of dynamic combat.

Ramp space was limited in late September 2014 at an undisclosed operating base in Southwest Asia as the F-15E Strike Eagle and F-22 squadrons located there prepared to change out.

In fact, group and wing leaders at the undisclosed base had “asked and received permission” to let the F-22s head home to the 1st Fighter Wing at JB Langley-Eustis, Va., a week early to help ease the congestion on the ramp. The aircraft were configured for the long trip, complete with two extra fuel tanks, the normal configuration to fly across the ocean, when word came from the combined air operations center that the jets were needed for combat.

Maintenance immediately got to work, and within 24 hours airmen had downloaded and reconfigured the Raptors with two 1,000-pound Joint Direct Attack Munitions and everything else the pilots might need to face either an air-to-air or surface-to-air threat.

Up until that point, no one expected the F-22 unit, which was in the Middle East for strategic deterrence and as a safeguard for possible contingency operations, would make its combat debut against ISIS. The brutal-but-primitive terrorist organization lacked an air force for the predominantly air-to-air Raptor to destroy.

“It was awesome to see them work and get the jets reconfigured, and then we kind of sat in that mode, not sure if we were going to execute or not,” one of the pilots involved in the operation told *Air Force Magazine*. The unit received notice a day or two later that the operation would take place late on Sept. 22

through the early morning hours of Sept. 23 local time, he said.

The F-22 was part of the initial US-led air campaign against ISIS in Syria, which was conducted in three waves. The US did not know, at first, what Syria’s response would be to the presence of American combat aircraft in its airspace. Although ISIS lacks an air force, the Syrians certainly have one—and a fairly advanced integrated air defense system as well.

The USAF crews started doing some generic planning, mapping out the closest airfields and coming up with a basic fuel plan, but the real planning couldn’t begin until the airmen received their targets about 24 hours before takeoff. They were tasked with hitting an ISIS command and control facility about 50 miles from Aleppo.

There is a “joint team that looks at those targets and then says what’s going to be the best resources to put against that target,” said Maj. Gen. Jeffrey L. Harrigian, assistant deputy chief of staff for operations, plans, and requirements on the Air Staff. It made sense to use the F-22s “in the areas where they’re concerned about being highly defended, and originally, the first couple nights that was a concern until we understood how the Syrian integrated air defenses would work.”

Although the F-22, as a platform, didn’t have any combat experience, the crews “had been preparing since Day One,” said the pilot, who asked not to be identified because of security concerns.



**SSgt. Joshua Morgenstern approaches an F-22 in the maintenance area of a base in Southwest Asia last June. Raptor maintainers kept the aircraft combat ready in support of Operation Enduring Freedom, Combined Joint Task Force-Horn of Africa operations, and—eventually—Operation Inherent Resolve.**

Early in the deployment, the F-22s trained with the F-15E Strike Eagles based in the area, until President Obama authorized the use of force against ISIS in Iraq in early August and the Strike Eagles' operational tempo significantly ramped up.

## HEATING UP

"They were busy all through August and in to September, so [the F-22 unit] stopped participating. We were doing a lot of training with them prior to this time and we basically were on our own at that point, doing our own training in-house with the limited number of aircraft we had," added the pilot.

The aircrews also had spent some six months leading up to the initial air campaign studying Syria's surface-to-air missiles and aircraft. "We would try to generate all of our scenarios around those specific mission sets. ... A lot of our training when we got in theater was focused specifically on countries we were concerned with: Iran and Syria," he said.

Around June or July, "as things started heating up," the F-22s also shifted from a daytime training schedule to a night flying schedule. "We weren't sure what would happen, [and] it made sense for us to at least start preparing," said the pilot.

The F-22s were one of three cells scheduled to launch around 9 p.m. Eastern Standard Time Sept. 22. The lead group included F-15Es, the second

group consisted of partner aircraft, and the third included the Raptors, all from an undisclosed base in the region. Each cell was made up of four fighters and a tanker, said the pilot.

Anticipation was high and everyone wanted to be part of the historic event.

"The weapons folks don't often get a chance to load live munitions on the F-22, so those guys were out there, very excited," said the pilot. "We had four weapons crews total and three of the four were out there on the line. All of them wanted to be out there."

There was supposed to be a five-minute separation between each of the

cells, but the first F-15E had an engine malfunction on takeoff and had to execute a high-speed abort that ended up closing the runway for about 20 minutes, said the pilot.

"It's a 1,200-mile drive to get from where we were to the target. It took a little over two hours to drive direct ... to the target area and we had planned about 30 minutes of slop to allow for contingencies and various other things," he said. "So we lost almost all of that [flexibility] on the ground before we even got airborne. ... That was our biggest challenge out the door on the F-22 side, being the back end



**A 27th Expeditionary Fighter Squadron pilot climbs into a Raptor under a maintenance sunshade in Southwest Asia in June 2014.**



of the train as the front end is starting to have problems.”

At that point, the flight plan was still on track, but the time line was compressed. Everybody was rushed to make up time and that caused some problems for air traffic control, which was trying to de-conflict the aircraft and reconnect the three cells of fighters with the tankers.

The F-22s were held low and slow, delaying the mission another four to six minutes. Once the Raptors climbed to their cruising altitude of 28,000 feet, they were met with another challenge: The winds were “significantly higher” than they had expected, said the pilot.

“We had been flying there for six months and there had been virtually no wind at altitude the entire six months, then once we got to altitude the winds were about 60 to 80 knots [70 to 92 mph], which is not a big deal for short distances, but when you are flying 1,200 miles and you’ve got a two-hour drive, that creates a significant difference in your flight plan route.”

The unexpected wind speeds added another five or 10 minutes, making it more challenging to meet the planned time on target.



SrA. John-Anthony Centano, SrA. Nicholas Banducci, and SSgt. Colby Bostwick perform heavy maintenance on an F-22 in Southwest Asia.

## Going to the Mountain Top

In early August a distraught Iraqi Yazidi made an emotional appeal to parliament in Baghdad on behalf of her people—a mostly Kurdish-speaking religious minority group—who had been brutally pushed from their homes by ISIS terrorists and were now isolated and starving on top of a barren mountain in northern Iraq.

“An entire religion is being exterminated from the face of the Earth,” she said, according to the *Washington Post*.

Almost immediately after the plight of the Yazidi became known, the US began flying humanitarian assistance operations in support of those stranded on the mountain. Air Force C-130s and C-17s dropped thousands of pounds of food and water, as US, coalition, and partner aircraft conducted strikes on the ISIS fighters.

Months later, however, there were still many Yazidis calling Mount Sinjar home and despite the humanitarian operations, they still needed help.

On Oct. 25, 2014, a U-2 Dragon Lady took to the sky above Mount Sinjar, tasked with using its optical bar camera to not only update the enemy order of battle, but also the location, layout, and disposition of the nine refugee camps still scattered around the mountain. Lt. Col. Jason Arnold, director of operations for the 480th Intelligence, Surveillance, and Reconnaissance Wing at JB Langley-Eustis, Va., told *Air Force Magazine* in December.

The U-2’s OBC is a film-based system that produces incredibly high-resolution images. “Because it’s film, and it’s an older system, it’s inherently unclassified,” allowing the US to share the gathered information with partner nations capable of helping with the airlift operations, said Arnold.

The 9th Intelligence Squadron at Beale AFB, Calif., is the only unit in the Defense Department capable of processing such film, and for some unexplained reasons, the film was delayed in getting there.

The 10,500 feet of negatives—nearly two miles’ worth of extremely delicate film—arrived at Beale six days later, said Arnold. The airmen knew they didn’t have much time if they were going to provide relevant information to mission planners. What normally takes 12 to 24 hours to process, took just six.

The film then went to a group of geospatial intelligence analysts, who quickly looked through all 1,500 frames of the Mount Sinjar area “looking for refugee locations, the camp layout, and doing an analysis of the slope of the group, and the surrounding areas to figure out where it was safe to airdrop those food and supplies,” he said.

In just over 12 hours, the geospatial analysts were able to put together 47 intelligence products. They were sent electronically to the combined air and space operations center downrange.

“It was really inspiring,” commented Arnold. ■

## AVOIDING AN “INCIDENT”

“To make matters worse,” Iraqi air traffic controllers “started vectoring us toward Iran instead of toward Syria,” said the pilot, who said the Iraqis were not organized to deal with that many aircraft simultaneously operating in their airspace.

The US pilots had to figure out a way to meet the mission objectives without causing an international incident by blatantly ignoring host nation directives.

“Fortunately, we managed to get going in the direction I needed to go and I didn’t need to ignore their direction. It just took another minute here, another minute there, but it’s all cumulative, and it all adds up, and it all gets us much further behind than what we can afford,” he said.

The original plan was for the F-22s to fly toward the northern “two-thirds” of Iraq where they would hit an air-refueling track, then flow in to the west and hold on the western border of Syria.

However, once they passed Baghdad it became clear that wasn’t going to work.

“Even going direct [to the target], I wasn’t going to make it unless I started going much, much faster,” said the pilot.

The four-ship of F-22s got as much fuel as possible from a KC-10 circling midway through Iraq, then peeled off and started to climb directly toward the target area.

About 200 miles from the Syrian border, the F-22s went to afterburner, accelerating to Mach 1.5, and started the climb up to 40,000 feet—the intended cruising altitude for the 15-minute flight into Syria.

“We were pulling the power back to try to keep the jet from accelerating past 1.5 because 1.5 was actually the sweet spot for us to hit the time on target exactly on time,” said the pilot.

The CAOC did not want the F-22s to get there early. Although it was not “overly crucial” for all three cells to simultaneously hit their targets, that was definitely the “desired impact,” the pilot said.

Despite all the delays early on, things were starting to come together. The timing was actually looking good and the F-22s had enough fuel to strike the target and get out of Syria before they had to hit up another tanker.

The plan was for two Raptors to go in and take out a command and control center while the second two provided air cover. All four were configured the same way and could switch roles if necessary.

## More Air Strikes,

For the Air Force, the operation to degrade and ultimately defeat the ISIS terrorist organization actually began on June 11, 2014—some three months before the launch of the initial air campaign—when President Obama first authorized intelligence, surveillance, and reconnaissance flights over Iraq.


It had been nearly three years since combat operations in Iraq ended and most of the 480th Intelligence, Surveillance, and Reconnaissance Wing at JB Langley-Eustis, Va., had long since moved on to other operations across the globe. The 480th is the lead wing for the service’s Distributed Common Ground System and is responsible for exploiting the majority of the intelligence coming from Iraq and Syria. However, at the time there were few Iraq experts left.

“We maintained our current level of support to all the combatant commanders across the globe. ... All we did was layer on an additional set of requirements for our airmen. They took it with great aplomb,” said Lt. Col. Jason Arnold, the wing’s director of operations. “Those airmen were asked to exploit missions that they hadn’t really seen before, but that didn’t decrease the quality of products we were providing.”


Within 24 hours of the first medium-altitude ISR operations over Iraq, the airmen of the 480th successfully sorted through the information and created a set of intelligence products that were then handed over to the Kuwaiti crown prince. In the weeks that followed, thousands more intelligence products were exchanged with five other Gulf partner nations.

“We didn’t have the same basing rights or overflight rights back in June that we did when [the Iraq war] was in full swing several years ago, so we were really building those relationships anew,” said

USAF photos by TSgt. Russ Scaff



An F-22 takes off for a mission over Syria as part of a large coalition strike package against ISIS targets on Sept. 23, 2014.



SrA. Jared Mast signals an F-22 Raptor pilot to stop at the end of a runway inspection area at a base in Southwest Asia last summer.



"My two-ship was the first in the country and the farthest into the country at that point. We were the leading edge, making sure there was no air threat for the follow-on package," said the pilot. "Then my three and four would follow up in that max-range airspeed ... and they would hang out as long as possible to ensure we have actors on station in case Syria launched any airplanes."

With the F-22's advanced integrated avionics, the pilots had "very good situational awareness" and "we were not ever worried about being attacked [by] the Syrians," said the pilot. "It was obvious when we got about halfway through Syria that [their air force was] not going to respond to us," the pilot said. He "wasn't convinced" that air defenses would stay dark, though, until the mission aircraft actually got to the

target area and didn't see any air or surface threat become active.

Despite Syria's passive defenses, the F-22 pilots kept their guard up throughout the entire operation, keeping an eye out for threats not only to themselves, but also to the F-15Es, F-16s, and B-1s operating nearby.

Around 4 a.m. local time, within five seconds of the desired time-on-target, the JDAMS hit the target, an impressive

## More Intel, More Partners

Arnold. "We certainly aren't in there doing this alone. Those intel products were used as a type of currency to buy us the basing rights and access we needed so eventually the F-22 [and other aircraft] could go across the border into Syria."

The rate of overall air strikes has increased since air operations expanded to Syria from some five per day to around 15 per day. Both the number of deliberate and dynamic targets also has increased, Air Forces Central Command spokesman Lt. Col. Edward T. Sholtis told *Air Force Magazine*.

As partner nations began contributing more aircraft and aircrews to the mission, the USAF burden has decreased. Overall, Air Force support has declined from about 70 percent of all sorties in late September to about 60 percent in late November.

As of Nov. 25, US and coalition aircraft had flown more than 10,000 sorties—some 45 percent of them kinetic close air support or interdiction sorties, 30 percent of them tanker sorties, 15 percent ISR, and 10 percent "other types of support sorties, not including intertheater airlift," said Sholtis.

Partner nations have conducted about one-third of the close air support or interdiction sorties, while the US continues to fly about 90 percent of the air refueling sorties.

"Overall, air refueling represents nearly a third of all aircraft sorties and remains an essential component of wide-ranging and persistent air operations against [ISIS]," he said. "The majority of the US Air Force tanker presence in the CENTCOM area of responsibility historically has been in the Gulf region, and that remains the case."

KC-135s from the 340th Expeditionary Air Refueling Squadron at Al Udeid AB, Qatar, are among the tankers flying "many

sorties per day." The squadron is operating 24 hours a day, seven days a week, said squadron commander Lt. Col. Van Thai.

"As the linchpin in most air operations, manning and jets have increased," said Thai, adding that the squadron tries to support everyone, though it must prioritize where the fuel goes.

Maj. Gen. Jeffrey L. Harrigian, assistant deputy chief of staff for operations, plans, and requirements on the Air Staff, said airpower has been "indispensable" to the anti-ISIS operation, since dubbed Operation Inherent Resolve.

In Iraq, the coalition air campaign is providing Iraq's new government time to stand up and for the Iraqi security forces to recapture "several tactical operational objectives," giving them the confidence they need to defeat ISIS, said Harrigian.

Syria has provided an opportunity for airpower to show what it can do. After 13 years of combat operations in Iraq and Afghanistan, "we became very, very good at what we were doing in an environment where we owned the airspace," said Harrigian. "We could develop targets, we had several forces on the ground. This environment is different."

This new campaign required "innovative" targeting, he said, noting the Air Force had to rethink how it was going to determine where to strike, where the enemy was located, and how it would use its capabilities. Then it had to educate the joint force on how to leverage those capabilities and "develop these updated target decks."

For example, in northern Iraq, where the mostly Kurdish Peshmerga is based, joint terminal attack controllers are working from an air operations center trying to develop an understanding of the environment and then they are relaying that information to an MQ-1, MQ-9, F-16, or various other platforms.

In the south, however, the relationship is different because the JTACs are working "hand-in-hand" with their Iraqi counterparts, who are pointing out where their forces are, so the JTACs can call in a Predator or Reaper to get eyes on the ground, and they can determine the appropriate weapon to deliver, said Harrigian.

There are fundamental differences in how airpower supports the Iraq portion of the joint operations area and Syria, Harrigian said, "but from an airman's perspective, whether it's Iraq or Syria, we're able to do that really on the same mission if we have to, and that's what we bring to the fight and that's how we operate."

Without boots on the ground, the onus falls on the airmen of the 480th to quickly and accurately process available intelligence and get that information to the supported commanders for target discovery, said Arnold.

The 480th also has been exploiting weapon systems video from the targeting pods of aircraft "with pointy noses," a job that previously would have been done at the fighter units or wings.

"When we have a JTAC on the ground, they can point across the street and say, 'That is the building that the bad guys are in.' In this case, we're using persistent ISR, many different flavors, in order to identify the targets for strikes," said Arnold. "Our airmen are the ones exploiting it as it comes off the jet, so we are able to layer many different types of intelligence on top of one another. I'm talking about signals intelligence, geospatial intelligence, ground moving target indications—all the different types of ints that are out there, we layer them all together and we do analysis fusion and we provide a finished product." ■



USAF photos by TSgt. Russ Scalf

*SrA. Steven Hughes and SSgt. Stephen Halbert connect a liquid coolant supply hose to a Raptor in Southwest Asia on June 17, 2014. At that point, no one expected the F-22s, which were in the region for strategic deterrence and as a safeguard for possible contingency operations, to lead the attack on ISIS.*

feat given the distance and repeated delays the F-22s encountered.

During a Sept. 23 briefing at the Pentagon, Army Lt. Gen. William C. Mayville Jr., director of operations on the Joint Staff, showed before and after pictures of the command and control facility. He noted that the GPS guided munitions hit only the right side of the building, where the command center was located. That area was completely destroyed.

In a Sept. 25 press conference, Pentagon spokesman Rear Adm. John Kirby said the F-22s did “very, very well the other night, very well.”

## RAPTOR EYES ON SITE

Adrenaline was still running high as the first two F-22s quickly left Syria and headed to a tanker to fill up. The third and fourth F-22s stayed on station for about 60 minutes and continued to provide offensive counterair for the remainder of the strikes.

The assumption was that because of the long drive back to the tanker, the first two Raptors would top off just before the third and fourth F-22s would start running out of fuel and had to head to the tanker themselves. That way there were always Raptor eyes on site, said the pilot.

“It was a relatively uneventful night. We saw a lot of flashes with [night vision



*Amn. Matthew Sutton signals for the removal of the wheel chocks from a Raptor at a forward base in Southwest Asia in June.*

goggles] as the bombs were going off in various target areas, but we didn’t see a whole lot of action from Syria or their ground forces,” said the pilot. “It looked like the vast majority of the action was coming from the coalition bombs.”

With the sun just starting to rise in the east, the Raptors had successfully made it out of Syria and Iraq and were

heading back toward the Persian Gulf when they got a call from an AWACS saying the CAOC needed them to turn around.

Although they didn’t immediately know why, a B-1 needed an escort as it went in for a reattack, but at this point the F-22s had just enough fuel to get back to their home station. The tank-





SrA. Patrick Mooneyham verifies the pressure in a stored energy system on an F-22 in Southwest Asia.



ers they had launched with were in the same boat.

"Gas is always my biggest concern. We had looked at the fuel plan early on and we knew that there was extra gas available for contingencies, but we were completely off the script now ... so I had no idea where the tankers were," he said.

They quickly determined that only two F-22s were needed for the B-1 escort follow-on mission, so the third and fourth jets headed back without the tanker.

The remaining two pilots started running through a list of nearby airfields in case they had to divert. Though there were plenty to choose from, there weren't many where the pilots felt comfortable landing an F-22, given the security concerns associated with the aircraft.

"A lot of that is going through my mind as we turn north, not really knowing where to go, knowing that I have to support the mission, ... but then may very well be going to a divert someplace where I don't want to go," he said.

After flying north for about 10 minutes, the AWACS controller informed the pilots there was a KC-135 "over on the Iranian border" with enough fuel for them to top off. It wasn't until they got to the tanker that the two pilots learned the details of their new mission: Escort a B-1 to the western side of Syria so it can reattack some targets missed during the initial bombing campaign. The new target was the farthest point west so far for the pilot.

The first of the initial air campaign's three waves was mostly unmanned and included more than 40 Tomahawk Land Attack Missiles fired collectively from USS *Arleigh Burke* and USS *Philippine*

*Sea*, striking targets in the vicinity of Aleppo.

The F-22s participated in the second wave along with F-15Es, B-1s, and F-16s, striking ISIS headquarters, "training camps, barracks, and combat vehicles," said Mayville in September.

Carrier-based aircraft from the Persian Gulf and partner F-16s made up the third wave and focused on "targets in eastern Syria, to include [ISIS] training camps and combat vehicles" in the area around Dayr az-Zawr," stated Mayville.

By the time the F-22s left the KC-135 along the Iranian border, the third wave was just kicking off, said the pilot.

Deconfliction was not a problem for the F-22s, which were operating solely in an air-to-air capacity now, because they could climb higher than the other aircraft, but the B-1 had to worry about the other aircraft taking off.

The Raptors provided air coverage for the B-1 for another 30 to 45 minutes before refueling for a third time and then heading home.

"There was a lot going on in the mission, a lot to deal with, a lot of changes and contingencies that I didn't have to deal with in my previous combat experience, as limited as it was," said the pilot, who previously flew F-15s. "It was a great experience all in all."

As of Dec. 10, 2014, F-22s had flown less than 100 total combat sorties from their undisclosed operating base, including about a dozen strikes in which multiple weapons were employed, said Air Forces Central Command spokesman Lt. Col. Edward T. Sholtis.

Though it took nearly a decade for the fifth generation aircraft to see combat, the pilot said he doesn't think the Air Force will suddenly start using the aircraft more freely. The fact is the Raptor is still intended primarily to respond to threats in the air, not on the ground.

"I don't think it's going to change the perspective. When there is a threat that requires the F-22, whether it's an air threat or a surface-to-air missile threat, they will continue to use it. That's my guess," he said. "I don't think it will be as big of a deal [next time it participates in a contingency], but I don't think that means we're just going to start using F-22s for any mission, and I think that's held true in the time since I left." ★

By Robert S. Dudley

## McSally Doctrine

"We've got some Neanderthal people in the chain of command who now are going to feel like it's not their problem anymore, but it is their problem. ... It's not just about prosecuting the crime when it happens. They need to be the ones who create a culture to make sure there's no tolerance [for sexual abuse and harassment]. ... Sexual harassment, sexual assault is still a very significant problem."—**Rep. Martha McSally (R-Ariz.), first female fighter pilot to see combat, on what would happen if commanders were relieved of responsibility for abuse cases, quoted in USA Today, Jan. 7.**

## No Average Day at the Office

"This job isn't for everyone. We make life-and-death decisions every day."—**USAF Col. Timothy Haugh, commander of an RPA unit engaged in combat with ISIS in Syria and Iraq, Los Angeles Times, Jan. 5.**

## Down for the Revolution

"We are in need of a religious revolution. You imams are responsible before Allah. The entire world is waiting on you. The entire world is waiting for your word ... because the Islamic world is being torn, it is being destroyed, it is being lost. And it is being lost by our own hands. ... It's inconceivable that the thinking that we hold most sacred should cause the entire Islamic world to be a source of anxiety, danger, killing, and destruction for the rest of the world. ... I am not saying the religion—I am saying this thinking. This is antagonizing the entire world. It's antagonizing the entire world!"—**Egyptian President Abdel Fattah el-Sisi, speech in Cairo celebrating the birthday of Muhammad, CNN, Jan. 6.**

## Up in Smoke

"Rocket made it to drone spaceport ship, but landed hard. Close, but no cigar this time."—**SpaceX CEO Elon Musk, on the failure of his rocket to land on an ocean platform, Twitter message, Jan. 10.**

## From the Horse's Mouth

"I'm not for the policy of attaining goals by making things worse. I think that sanctions [against Russia for its

aggression against Ukraine] must stop now. ... Mr. Putin does not want to annex eastern Ukraine. I am sure—he told me so."—**French President Francois Hollande, interview with Inter radio in France, Jan. 5.**

## One View of Academies

"The service academies once had a purpose: When they were founded in the 19th century (the Air Force split off from Army after World War II), college was classics and religion for gentlemen, so it made sense to have technical training institutes for people who would be in charge of increasingly technical warfare. All the service academies have now to justify their cost and their pretensions, it seems, is their once-illustrious history. ... Service academies are feel-good hype factories that operate with virtually no accountability and little oversight, the very definition of government bloat on autopilot."—**Bruce Fleming, US Naval Academy professor of English, op-ed in Salon.com, Jan. 5.**

## The White House Says, "Yes"

"If you're asking me if I'm being micromanaged, I don't know. I better go check with the White House before I answer that question. ... The metric that we should be focused on is access and whether my advice influences decisions. ... Whether someone wants to characterize the desire—the almost insatiable appetite for information about complex issues—as micromanaging, they can have at it."—**Army Gen. Martin E. Dempsey, Chairman of the Joint Chiefs of Staff, remarks on Fox News Sunday, Jan. 11.**

## Schwack-Count Unavailable

"We very much see ISIL largely in a defensive posture inside Iraq, that whatever momentum that they had been enjoying has been halted, has been blunted. That has stayed steady over the last couple of weeks. ... We know we've destroyed hundreds and hundreds of vehicles, artillery positions, checkpoints. We know that we've killed hundreds of their forces. ... We don't have the ability to count every nose that we schwack."—**Rear Adm. John Kirby, Pentagon spokesman, remarks to reporters, Jan. 6.**

## Hardly "Remember the Alamo"

"It's important to have a clear understanding of what we ultimately seek. I don't believe that the President intended to imply the 'annihilation' of Daesh [another term for ISIS]. That is far beyond our thinking in this regard. We want to deny Daesh the ability to have safe havens either in Iraq or, ultimately, in Syria, to preclude its capacity to organize an existential threat to those countries. Annihilation requires a great deal of investment, resources, and time. The defeating, dismantling, and degrading of Daesh, and ultimately destroying the idea, is the long-term objective."—**USMC Gen. John R. Allen, special envoy for countering the Islamic State, interview with Der Spiegel, Dec. 31.**

## Him Again

"The American military is exotic territory to most of the American public. ... Citizens notice when crime is going up, or school quality is going down, or the water is unsafe to drink, or when other public functions are not working as they should. Not enough citizens are made to notice when things go wrong, or right, with the military. The country thinks too rarely, and too highly, of the one percent under fire in our name."—**James Fallows, The Atlantic, January/February 2015.**

## Mac's Brave New World

"We have to improve our acquisition system. ... In 1952, the Navy issued a requirement for a lightweight fighter. Two years later, the first A-4 Skyhawk flew. Four years later, the first A-4 squadron was operational, and we built nearly 3,000 of them. Compare that to the F-22. In 1981, the Air Force established a requirement for 750 Advanced Tactical Fighters. It wasn't until 2005, 24 years later, that the F-22 was first introduced, and instead of 750 jets, we bought 195. If Boeing can field a new commercial airliner in five years, if Ford can take a car from design to production in 24 months, then there is absolutely no reason that the Pentagon should take two decades to put a new fighter in the service. Things have to change."—**Rep. Mac Thornberry (R-Tex.), chairman of House Armed Services Committee, remarks to American Enterprise Institute, Jan. 20.**



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**T**his month, the Air Force will seek the blessing of Frank Kendall, Pentagon acquisition, technology, and logistics chief, to proceed with a new program to replace the E-8C Joint Surveillance Target Attack Radar System fleet. If the program is approved, USAF could have the first of a new generation of ground surveillance radar aircraft serving by 2023, and—if

the ambitious schedule holds—potentially replace the entire E-8 JSTARS inventory by the end of 2026.

Known for now simply as the “JSTARS Recap”—for “recapitalization”—the project surfaced a year ago, when Gen. Mark A. Welsh III, Air Force Chief of Staff, said replacing JSTARS had become the service’s fourth highest acquisition priority, after the F-35 fighter, KC-46 tanker, and Long-Range Strike Bomber. Air Combat Command chief

Gen. Gilmory Michael Hostage III, now retired, said in September that JSTARS operating costs “are eating us up,” and finding a replacement is urgent.

The Air Force pegs JSTARS operating costs at about \$14,000 per hour. After a brace of analyses of alternatives and extended talks with industry, program officials think that figure could be cut two-thirds. The Air Force is so sure a new system will be far cheaper than the old one that it expects the whole program

**Ground surveillance could get smaller, cheaper, and more powerful.**

# The JSTARS RECAP

By John A. Tirpak, Editorial Director

*The 751st Electronic Systems Group’s E-8C JSTARS test aircraft, T-3, undergoes flight testing with JT8D-219 engines in 2009. An up-engined JSTARS was ruled out, however, due to the airframe’s age.*



to pay for itself by 2030, only seven years after the first JSTARS Recap jet becomes operational. Across 25 years of life cycle costs, retiring JSTARS and buying a new system is expected to net a savings of \$11 billion.

## FILLING GAPS

Kendall will render what's called a materiel development decision. It improves a requirement, acknowledges that an analysis of alternatives (AOA) has been completed, and allows the Air Force to conduct detailed discussions with industry about potential solutions. If all goes as planned, a request for proposals for technology maturation and risk reduction will be out to industry this spring.

Lt. Gen. Ellen M. Pawlikowski, the uniformed deputy acquisition chief for the Air Force, told defense reporters in November that "we have spent a good portion of the last eight months" working with ACC to understand what it needs and "dial in those requirements" to the JSTARS Recap. She said the project aims chiefly to replace the existing function, but also fill "certain gaps" in capability that combatant commanders have identified. She didn't address what those gaps are.

She emphasized the main objective is to find "a more affordable way to provide" the surveillance and battle management command and control (or BMC2) products that JSTARS delivers today. The idea is not to "reinvent" or take "undue risk in terms of trying to explore new radar technology," but to use "existing technology" and package it in a smaller, more efficient system that provides at least what field commanders already get from JSTARS.

The Air Force has 16 E-8C JSTARS airplanes. Conceived and procured in the 1980s, the E-8's original, Cold War function was to use its 24-foot-long radar to map the battlefield and detect, track, and target moving ground vehicles. It can keep watch over 19,000 square miles with a 120-degree field of view; the radar can slew to look at one side of the aircraft or the other and detect ground targets more than 120 miles away.

Over time, improvements and variations of this function have been added, recording time-lapse imagery of an area to build up a library of patterns, capturing the flight of aircraft at low altitude, a maritime surveillance mode, and tracking the movements of smaller and smaller moving objects on the ground.

Still in development when the 1991 Gulf War broke out, two prototype E-8As were rushed to the Middle East and contributed substantially to awareness of what was happening in Iraq. This trial by fire helped developers improve the

system; it wasn't declared operational until 1997.

Although the sensor and onboard processing systems have been updated many times over its 25-year history, JSTARS has become so expensive chiefly because of the platform the Air Force picked to host it. The Air Force chose used 707-300 airliners—old, even then—to serve as the carrier for the JSTARS system, comprising the large radar under the fuselage (housed in what's called the "canoe"), antennas and communication gear, and a series of computer terminals and workstations aboard the aircraft. The idea was that the aircraft, built in the 1960s, would have some commonality with the C-135-series aircraft that served USAF in a variety of functions—such as KC-135 tankers, E-3 AWACS, and RC-135 surveillance airplanes—and thus save money on parts and maintenance. It didn't quite work out that way; the aircraft were all different, to varying degrees, and even today, a common configuration has been elusive.

William A. LaPlante, assistant secretary of the Air Force for acquisition, said at the Air Force Association's Air & Space Conference last September JSTARS sustainment is "costing upwards of \$1 billion a year, when you include modifications that will need to be done. It's not sustainable. So we need to make the investment today to build the new, recapitalized airframes." He added that the JSTARS airframes "are on



Courtesy photo

average 45 years old, so it's something we're just going to have to do."

Although a "joint" program with the Army—which puts some operators on board—JSTARS sustainment and operations are funded almost entirely by USAF.

Northrop Grumman got the contract to develop JSTARS and convert the used airliners to carry it. In 1998 dollars, the aircraft cost \$244 million apiece.

An effort to do a large-scale JSTARS replacement got underway about a decade ago, when the Air Force envisioned a massive sensor and battle management craft called the E-10 that would also have performed some of the E-3 AWACS mission. Notionally to be hosted on a Boeing 767, the system proved too complex and too expensive and was soon canceled.

A second attempt at recapitalizing JSTARS was made some four years ago, when commanders decided the E-8 needed more power to fly to efficient altitudes and generate electricity for the system's voracious electronics and cooling systems. An AOA concluded in 2011 that while re-engining the E-8C fleet would have been operationally useful, it didn't make any sense to invest more in airframes that were getting harder and harder to keep airworthy. A USAF spokesperson said these "additional expenses associated with the aging ... Boeing 707" included "diminishing manufacturer supply sources, corrosion, and structural integrity."

The service then decided it made the most sense to move to a new platform—probably a smaller, business jet-type

aircraft. But in 2012, then-Chief of Staff Gen. Norton A. Schwartz told Congress the budget simply didn't allow for it.

Through a spokesperson, the Air Force said the life cycle cost of maintaining the existing JSTARS fleet through Fiscal Year 2045 is estimated at \$38.7 billion. For a replacement system based on a smaller jet, the cost—including procurement of new airplanes and hardware—is expected to be \$27.6 billion over the same period.

### GET-STARTED MONEY

The JSTARS Recap is budgeted for \$2.4 billion across the service's Future Years Defense Program (FYDP), although Welsh has said he won't presuppose Congress' support for it.

To demonstrate USAF's seriousness about the need for the system, however, the service is borrowing against itself to pay for development. In the Fiscal 2015 budget request, the Air Force proposed retiring a test E-8 and taking five operational E-8Cs out of service to generate \$705 million of savings over the FYDP to be used to defray the cost of acquiring the E-8's successor.

"We are taking some risk with this," Hostage said in September, but the financial situation and operational reality had to be reconciled somehow.

LaPlante said the funds are "get started" money. The keys will be to use "mature technology, replicate the performance, more or less, of the JSTARS," and take the money from divesting some of the platforms now. "We are refining the acquisition strategy" with the Office of the Secretary of Defense, LaPlante noted.

Pawlikowski said the biggest risk on the program is the integration of the sensors, the battle management system, and the airplane. The battle management system itself is not risky, she said, because of "all the great progress we've made over the years" in that area.

"We seem to have a good range of aircraft that are in play right now," she said of potential contenders, and she reported being pleased "with what we've seen from industry" during the analyses of alternatives and various industry days and requirements clarifications sessions.

"Industry is ... leaning forward," she said, and there are "lots of demonstrations that are coming out to us. I like to say I want to get past the 'glossy brochure' piece in the engagement with industry and into the no-kidding, what-the-numbers-really-look-like" phase of the program.

LaPlante said requirements for the JSTARS should be set by the end of this year. Proposals would be turned in and a contractor selected in 2016.

Although the Air Force has yet to decide if it wants a single prime to integrate all the pieces that will have to be part of the JSTARS Recap, contractors are guessing that it will. Even so, industry reps from several companies all said they are waiting to see firmer requirements before choosing teammates to supply radars, other sensors, and aircraft.

"The size of the radar has a direct impact on the performance in the capabilities," Pawlikowski said. Much of the tradeoff analysis will be finding precisely the right size radar—the "knee in the curve"—where the cost of the JSTARS

*An artist's illustration of Boeing's proposal based on a 737-700 airframe.*







USAF photo by Mark Herlihy

**A Bombardier aircraft on display at Hanscom AFB, Mass. Aircraft and communications companies gathered at the base last April to discuss JSTARS Recap.**

Recap system greatly increases if the size of the radar increases.

She added that the program will be a “pathfinder” project for the Air Force—a guinea pig for some of the new acquisition practices mandated by Kendall’s shop under what he’s dubbed the Better Buying Power series of reforms. A key element will be building in “agility”: The system will have to have an open architecture to allow frequent and easy swap-outs for new technology as it becomes available and as the aircraft’s mission changes over time.

Although Schwartz, Welsh, and other top USAF leaders have talked about a business jet as the ideal platform for the JSTARS Recap, that’s not an ironclad requirement. A spokesperson said the Air Force “will not dictate the specific platform. That will be determined during the source selection for the EMD [Engineering and Manufacturing Development] phase. The Air Force desires an affordable, efficient aircraft with the ability to best meet the requirements” as

laid out in the Capability Development Document.

## THE CHALLENGES

“The Air Force used the term ‘business jet’ in the AOA as a generic term for a commercially available class of aircraft that are smaller and more efficient than the ... E-8C,” the service said in a written response to questions.

Contractors eyeing the JSTARS Recap prize have taken to heart that the biggest challenges of the program are affordability, speed to ramp—getting the airplane in service as fast as the Air Force wants it—life cycle cost, and adaptability to changing missions and hardware. The Air Force also wants an aircraft that can be refueled in the air.

During USAF’s flirtation with re-engining and upgrading the E-8C, Boeing had offered a variant of its 737-based P-8 Poseidon maritime patrol airplane, now in production for the Navy. The company believed with minor tweaking the P-8 could easily be adapted to meet

the JSTARS mission and USAF could have all-new airplanes for less than the price of re-engining and upgrading the hoary E-8 fleet.

As the Air Force’s AOAs seemed to settle on a more business jet-type aircraft, it became clear the P-8 “wasn’t going to meet some of those initial suggestions on those overarching requirements,” said Rod Meranda, Boeing’s business development lead for the JSTARS Recap.

Based on its conversations with the Air Combat Command, Boeing did its own six-month analysis and decided to offer a system based on its 737-700.

The 700 series “is the smallest of the 737 families,” Meranda said. “It’s about 110 feet, nose to tail,” and technically counts as a business jet, operated by many customers as a long-distance executive or luxury transport. A JSTARS is 152.9 feet long.

While larger than the business jets other contractors may offer, Boeing thinks the Air Force will want a somewhat larger size to provide amenities that a crew will want on missions of 12 hours or longer, as well as room for growth if the Air Force wants to add more battle management functions to the system, such as a designated control station for unmanned systems. Boeing’s notional offering would use the CFM-56 engine already in the Air Force’s inventory on the KC-135. It would also generate a lot of extra power for the electronics and can take advantage of 737 parts at facilities all over the world.

Growth capacity is important for a system expected to last 30 years, Meranda asserted. “We have a lot of orders for 737s in various configurations,” well



ANG photo by S/A. Karl Giles

**Capt. Brandon Rieker, an air battle manager with the Georgia Air National Guard, at a work station on an E-8C JSTARS. A new battle management system is not risky, said Lt. Gen. Ellen Pawlikowski, but integrating it with the sensors and airplane might be difficult.**



USAF photo by Mark Herlihy

**Northrop Grumman's Gulfstream demonstrator takes off from Hanscom. The program office is looking for smaller, more efficient aircraft as the new JSTARS.**

through the 2020s, Meranda said, so the company will still be there, making parts and offering engineering support for many years.

The Air Force wants to fly high and get there fast, Meranda reported, because the higher the aircraft flies, the farther it can see.

Alan Metzger, vice president at Northrop Grumman for next generation surveillance and targeting, said flying higher makes it easier to see in mountainous regions, allowing the crew to see things "you wouldn't see if you flew at a lower altitude."

He added that flying between 30,000 and 40,000 feet, as the Air Force has said it wants JSTARS Recap to do, provides "significant operational enhancements," especially in mountainous terrain.

Metzger said radar technology has come a long way since the JSTARS was created, with the advent of active, electronically scanned array (AESA) systems that vastly reduce the number of moving parts and multiply the combinations of modes possible.

USAF wants equipment that can be easily upgraded by swapping out circuit cards and boxes, and JSTARS wasn't designed with an open architecture in mind.

Metzger said Northrop Grumman has done trade studies on "over 120 different types of airplanes and racked and stacked them all. I would say there are three or four that are leading candidates, whether you want a business jet or business liner-type aircraft, and so any number of business jets will work." The company looked at 737s and Airbus products, and there are "pros and cons" associated with them all, Metzger said. The final choice for what Northrop Grumman may offer will be driven by USAF's requirements, he said.

One of the cost-cutting drives is to reduce crew size. The E-8 has a crew of up to 22 people: four flight crew,

15 Air Force specialists working at consoles, and as many as three Army specialists.

Meranda said cutting flight crew will be made easier by adopting a new aircraft and new processors that automate much of the work now done by separate individuals. For Boeing's concept, flight crew can be reduced from four to two, and with automatic diagnostic, test, and self-correction features, four onboard technicians could be taken off. Automating some of the tasks performed by the trackers can also reduce that contingent by at least a couple of people.

"The Air Force is looking for between 10 and 13 operators on this airplane. [That is] what they think is the right number," he said. "We agree with the Air Force that there is the technology to reduce the crew size. What the number is, is still being debated."

## IT DEPENDS

As for the radar, Meranda said the Air Force has expressed interest in a unit sized from 16 to 20 feet long, which "fits nicely on our particular airplane."

Metzger noted that Northrop Grumman has outfitted a Gulfstream 550 aircraft with a radar and workstations, proving out various concepts it could offer when the Air Force nails down its requirements. It has taken the jet to Air Combat Command headquarters at JB Langley-Eustis, Va.; to Hanscom AFB, Mass., home of Electronics Systems Center; to JB Andrews, Md., for members of USAF HQ and other Pentagon officials to look at; and to Robins AFB, Ga., where the current JSTARS is flown.

The demonstrator showed off "the aircraft itself, the outer mold lines, the things we have done [with] advanced BMC2 consoles, capabilities, and most importantly, the mission software, which I would characterize as an 85-90 percent solution." The G550 is also an airplane in USAF's inventory, as the basis of the C-37 executive transport.

Though the G550 is smaller than Boeing's approach, Metzger said it has plenty of room for growth.

"It has available room in racks and space inside" and can do the same mission the E-8C performs with fewer operators.

However, "if you take a look at the history of JSTARS over the last 25 years, we have gone through four major upgrades [but] these upgrades have not yielded an increase in overall weight or space," Metzger pointed out. At the same time, "we have increased exponentially the amount of capability that has been added to that platform," due to size reductions and processing power gains with each generation of computers.

"What used to be in desktops are now into blade computers," he said. "Tomorrow, what is on a blade will be on a chip, if it's not already. ... I have absolutely no reason to believe that you will not see the same effect ... over the next 20 years." Metzger said the Northrop Grumman concept has "margins ... today," and "we expect those margins to increase as time goes on."

Other companies expected to offer a JSTARS Recap solution declined to comment—most saying that they did not want to presume what requirements USAF will ultimately set or divulge competitive information.

Pawlikowski said the program has many moving and interrelated parts. When the last E-8s retire, she said, will be affected by "the price we can get for this replacement." But she also said USAF has a "bow wave" of recapitalization projects coming up fast and a determination to craft and stick to a 10-year "balanced budget."

The JSTARS Recap, Long-Range Strike Bomber, F-35, and KC-46 tanker "all go into play in terms of what we can buy and how many we can buy," Pawlikowski said. And so, "as often happens in the acquisition business," the answer to any question about JSTARS Recap right now is, "it depends." ★





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**I**n Feb. 9, 1949, an experimental Air Force bomber flew over the White House and down Pennsylvania Avenue, heading east and pulling up gently to clear the dome of the Capitol. It was the YB-49 flying wing, performing on orders from President Harry Truman. The aircraft had flown from Muroc AAB, Calif., to Andrews AFB, Md.

"I want the people to see what I'm going to buy," Truman reportedly told USAF Chief of Staff Gen. Hoyt S. Vandenberg. Photographers captured a stunning image of the flying wing over the Capitol looking like a messenger from the future.

Truman's jaunty remark notwithstanding, the stunt turned out to be only a tantalizing glimpse of American aeronautical ingenuity. In October, the YB-49 flying wing was canceled. Forty years passed before its successor flying wing, the B-2, took to the skies.

Today, B-2s make the news for their frequent shows of force in the Pacific. Their combat achievements over the last 15 years from Kosovo to Afghanistan, Iraq, and Libya are also well-known. What's often overlooked is the rare aeronautical achievement of this flying wing—and what it takes to keep those 20 precious aircraft flying as an effective fighting force.

At 25 years old, the B-2 remains the world's only combat-tested flying wing. For all its notoriety, the inherent grace and uniqueness of the B-2 in aviation history often escapes notice.

Flying wings began to take shape in the minds of aircraft designers as early as World War I. The Stout Batwing of 1918 attempted to blend fuselage and flying wing. Cartoons of cantilevered, batwing aircraft recurred through the 1920s and 1930s. Experiments in Europe and the US strove toward

# PROMISE FULFILLED

By Rebecca Grant

**It has never been easy, but the tiny B-2 fleet delivers range, payload, and stealth.**



the unique lifting qualities that could be achieved with the flying wing. A blended wing promised efficient flight through low wing loading—the ratio of wing surface area to aircraft weight. The Horten brothers built a prototype for the Luftwaffe during World War II, and the Air Corps invested in flying wings beginning in late 1941.

“The flying wing bombers enjoyed all the usual financial support and governmental interest normally associated with a wartime program,” noted one historian. Jack Northrop built the XB-35 with piston engines and propellers, and from the start, the design was revolutionary. Plans for the B-35 sketched out an aircraft with nearly three times greater gross weight and wing area than the B-17 Flying Fortress. The clean shape of the wing promised lean fuel consumption and long range, alluring essentials in the days before air refueling. The technology of the day could not

deliver engines or flight controls to match, but the flying wing bomber idea stayed alive even after the war ended. Postwar research converted a few XB-35s to XB-49s and refitted them with jet engines.

Northrop’s flying wing offered outstanding performance for a bomber of the 1940s. A movie short from the era talked it up: “With its knife-like leading edge, there is little air drag, and every portion contributes to its lift.”

The technological promise—in this case, reaching high altitude and spanning the continents—was too enticing to pass up. Globe-spanning missions could be carried out with a 10,000-mile range. Plans at one point included a sleeping area for a relief crew of up to six.

The glamour factor reached its peak with the 1949 coast-to-coast flight and aerial display over Washington, D.C. The YB-49 averaged 511 mph on the flight.



*B-2 bomber Spirit of Indiana flies over Whiteman AFB, Mo., in 2014.*



"All the trees made it very hard to see straight ahead as I roared low over the city," pilot Robert L. Cardenas, then a major, told Smithsonian's *Air and Space Magazine* 60 years later. "The YB-49 was beautiful," he said, but "way ahead of its time." Cardenas judged the YB-49 to be only marginally stable in flight. The Air Force built more than 300 Convair B-36s instead and quickly moved on to the B-52.

It would take a war to actually develop a flying wing—in this case, an upswing in the Cold War. US-Soviet tensions increased with the Soviet invasion of Afghanistan in 1979. The chill gave renewed resolve to the secret USAF efforts to build an advanced bomber. The requirements of stealth and new confidence in computerized control made the flying wing design a natural choice. Stealth demanded a design with few perpendicular surfaces to minimize radar return. High altitude was another plus. The flying wing design met these criteria all around.

The flying wing also turned out to have a hidden generosity. The Air Force added requirements for low altitude, high-speed operations two years into the research and development program. At Northrop, the designers stepped back to reconsider the bomber's basic design.

"Fortunately, we were a flying wing," recalled the B-2's first program manager, Jim Kinnu.

"There's no contest, it's the right way to go," designer Irv Waaland remembered. Fresh studies showed the flying wing was still the best design for the mission and could even add fuel in the wings. Later, modifications to the trailing edge and a gust load alleviation system sealed the deal.

## THRILL OF IT ALL

Back in 1948, with YB-49 tests underway, a Northrop promotional film touted the flying wing as a deluxe passenger design. The flying wing was spacious and company officials believed it might make a good airliner. Mock-ups showed well-dressed passengers viewing the ground through windows on the leading edge. "Snug as bugs in their magic carpet, air travelers can look down on mere Earthlings," the narration ran. "The sleek air Leviathan carries more cargo farther, faster, and with less fuel than any comparable plane." Stewardesses served drinks from a bar in the atrium-like passenger bay. This was the fantasy of flying-wing travel.

In reality, few have experienced the thrill of the flying wing—the B-2 cleared design hurdles but it was still a system ultimately destined for very limited production. That restricted the number of pilots and occasional passengers who would ever take flight in a flying wing.

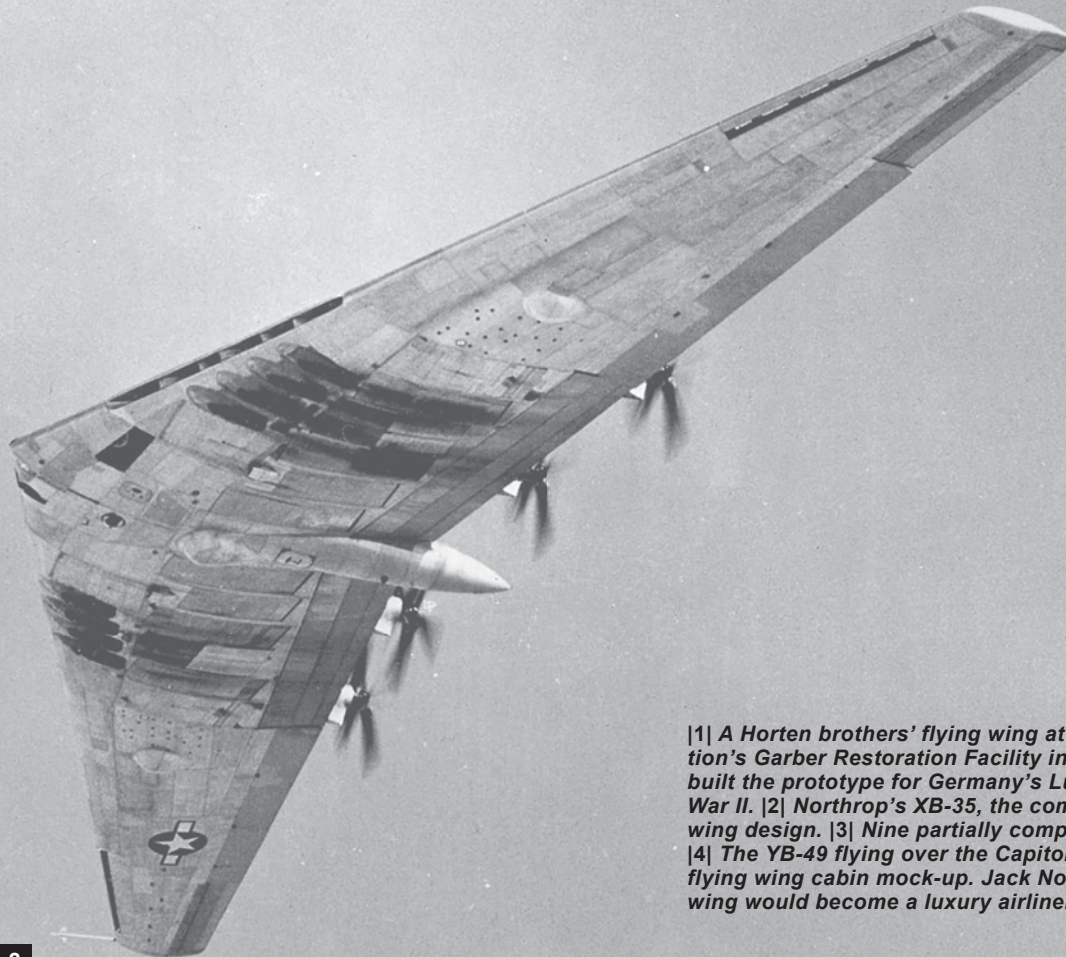
A handful of deserving crew chiefs and civilian officials and a smattering of plum lucky writers have been the flying wing's only passengers. Less than 600 individuals—including all the test pilots, crew, and wing commanders—have flown in the B-2 since its debut in 1989.

It turns out the claims in the Northrop short movie promoting the YB-49 weren't far off. The feel of the flying wing is different from the majestic B-52 or high-performance F-16 and F-15 fighters. There's no glass bottom view, but the panorama from the sloping windscreen in the cockpit of the B-2 is breathtaking. The flying wing laps the air



Photo by Michael Katzmann





[1] A Horten brothers' flying wing at the Smithsonian Institution's Garber Restoration Facility in Maryland. The brothers built the prototype for Germany's Luftwaffe during World War II. [2] Northrop's XB-35, the company's original flying wing design. [3] Nine partially completed YB-35B airframes. [4] The YB-49 flying over the Capitol in 1949. [5] A Northrop flying wing cabin mock-up. Jack Northrop hoped the flying wing would become a luxury airliner.

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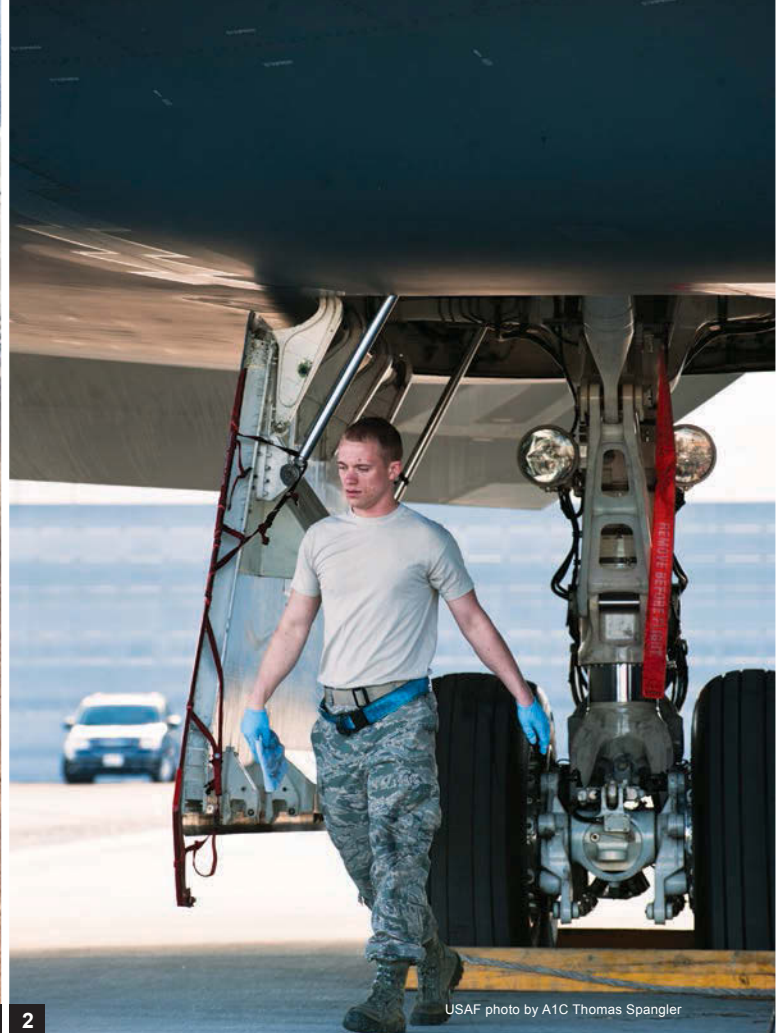






USAF photo

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USAF photo by A1C Thomas Spangler

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with a feel for every current and delicate bump, yet the stiff wings barely flex. The big bomber can flip its wingtips to 45 degrees as it banks like a ballerina. The flight controls and mission avionics generate a sense of teamwork between pilot and airplane. The green 1980s typeface on the displays manages to look both retro and futuristic all at once.

The B-2 almost gives off the air of a sentient being. “She’s a computer we’ve taught to believe she is an airplane,” as one pilot put it.

The B-2 was intended to be the Air Force’s only bomber for the early 21st century, replacing the B-52 and B-1. That plan ended in 1992 when Congress halted production funding.

Yet the flying wings have done more than fulfill an aeronautical ambition. Their range, survivability, and payload continue to make them the single manned weapon capable of taking on the most difficult targets adversaries may present. “The strategic arsenal we have today is not about the Cold War,” said Adm. Cecil D. Haney, commander of US Strategic Command. “We’re not hanging on to Cold War apparatuses. This is about 21st century deterrence.”

Today these B-2s handle America’s two absolutely critical aviation missions.

The first is nuclear deterrence.

The second, unique to the B-2, is the ability to stealthily strike anywhere on the globe with conventional weapons, in support of international security objectives.

“We’re America’s 911 force,” Lt. Gen. James M. Kowalski, deputy commander of US Strategic Command, said of the B-2 fleet.

Those who dreamed up the flying wings past and present could hardly have imagined the level of skill needed to keep the bomber ready for its mission.

Maintaining that capability falls to a Whiteman AFB, Mo., team of pilots, maintainers, civilians, and contractors. For the B-2 force of 20 aircraft, it’s all about the lineup. The B-2 fleet must meet numerous requirements: Contribute to the nuclear deterrence posture, prepare for conventional missions, and keep aircrews current. Schedules are strained by the tiny fleet. It has high maintenance requirements and also needs several airframes to be in overhaul at any given time.

The wing’s greatest challenge is balancing the go-to-war posture for the B-2s with operational training and requirements for their aircrews. Many factors contribute: “how hard do you fly, which jets do you fly,” and so on, according to Col. Chase P. McCown, commander of the 509th Maintenance Group.

Wartime requirements come first. The 509th keeps a few B-2s in what the wing calls “pristine condition.” Those B-2s will be the ones tasked with immediate action should a crisis arise.

“We keep a few airplanes in a posture where if we are called today, they are ready today,” said McCown. “That is what the B-2 is designed to do.” Actual numbers in the pristine posture have fluctuated up and down depending on leadership preferences and global events.

Overall, the 509th is well-prepared for the job. “Right now we have a very good mix of jets in pristine condition and others we rotate through the flying schedule,” McCown stated.



[1] A YB-49, the jet-propelled variant of the Northrop XB-35 bomber. [2] SrA. Dustin Childs, a crew chief with the 509th Maintenance Squadron, finishes cleaning the landing gear doors of a B-2 during Red Flag 14-1 at Nellis AFB, Nev. [3] Col. Chase McCown, commander of the 509th Maintenance Group, says the unit keeps a few B-2s in “pristine condition” at all times—ready for combat. [4] Spirit of Washington comes in for a landing. The B-2 was badly damaged when an engine caught fire in 2010, but each aircraft in the tiny fleet is so valuable that the Air Force spent four years bringing it back into service. [5] A1C Steven McCray, a 13th Aircraft Maintenance Unit crew chief, signals the operations center that a Spirit bomber is airborne at Whiteman.

AFGSC channel video screenshot

3



USAF photo

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USAF photo by SSgt. Nick Wilson

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The B-2s can't just sit in their hangars at Whiteman, however. Pilots must stay fresh on skills from formation flight to refueling. Because they typically fly just a few times a month, to sustain currency and work on tactics, they spend more hours in the simulators. Pilots also fly T-38 trainers to keep up their airmanship skills.

Scheduling maintenance in a way that meets deterrence demands and the flying schedule is intricate indeed. The B-2 is different from all the other steel and aluminum aircraft in the USAF inventory. “Our biggest maintenance driver is low observable [LO] work,” McCown said.

Whiteman has made readiness a priority, with exceptional results. Last year, the B-2 force experienced the best fleet health in the history of the program.

“Our three-year average for low observable maintenance man-hours per flying hour is 16.7,” reported McCown. In Fiscal Year 2014 we got it down to 13.5” man-hours per flying hour. A similar drop occurred as total maintenance man-hours per flying hour decreased from the three-year running average of 50.5 to a low of 46.2 hours in 2014.

Examining what goes into that statistic is a reminder that every flight of the stealth flying wing is a minor achievement in itself.

The flying wing shape flexes the entire bomber in flight. Such flexion isn't unusual in aircraft: The B-52's wingtip can reportedly bend 18 feet. However, on the B-2, the entire outer mold line flexes due to huge temperature differentials and other factors in flight. Vibrations and fuel can affect the tape and putty that seal the radar absorbent materials.

“Every time you fly the B-2 you generate low observable maintenance,” explained McCown. Over the years, modernization programs have greatly expanded the durability of each B-2's skin, but flight hours take their toll. Degradations grow worse on B-2s that haven't been in for depot maintenance, a process that takes place only once every seven years.

Keeping the fleet in shape is a complex process of diagnostics tools, schedule planning, and the expertise of experienced maintainers. According to McCown, the first line of defense is well-trained airmen who walk around the aircraft. They detect the visible flaws indicating where a B-2 may generate a signature hit from spots where the low observable configuration has degraded.

“We are responsible for keeping the radar cross-section of the B-2 as small as possible,” said MSgt. Aaron Thompson, 509th MXS signature diagnostics flight chief. “We identify all coating defects on the B-2 and drive the highest signature-impacting defects for repair.”

Maintainers also use a combination of handheld tools and larger equipment to perform diagnostics on sections of the B-2.

“Our main objective is buying the aircraft more radar detection time,” Thompson added. “We do that by visually looking for coating defects and also by nonvisual means, such as zonal radar imaging.”

“We have unbelievable diagnostic tools,” asserted McCown.

The combination of visual inspection and diagnostic analysis renders a status report on the overall low observable





USAF photo

1



USAF photo by SSgt. Nick Wilson

2

condition of each B-2. From that baseline, commanders prioritize work and select jets for routine flying operations or war-ready maintenance.

However, there's a twist. The 509th's mission requires that B-2s be ready to fight at any given moment. Overall mission capable rate numbers suffer as a result.

The process of prepping a B-2 can cause the aircraft to be listed as nonmission capable while specialized work is performed. In some cases, the 509th may take a single B-2, pull it out of mission capable status for 30 days, and perform underlying work to prepare it for war-ready status. Sometimes the jet is pulled for shorter periods of time; sometimes it may take longer, particularly after phase maintenance, a step necessary to overhaul engines, etc.

The rotation to meet rigorous low observable standards plays havoc with the standard method of calculating mission readiness. Simply put, the tracking of rates that give an accurate snapshot of an F-16 wing doesn't work for the B-2.

There's another twist. A B-2 may be listed as partially mission capable while maintainers correct a minor discrepancy in its low observables. However, that same B-2 "could still strike 805 of the targets in bad guy land," McCown explained. It just wouldn't be tasked against targets protected by the most advanced air defenses and fighters.

The complexities of low observable maintenance, diminishing spares, and so forth have created a tight relationship between the 509th and the B-2 system program office at Air Force Materiel Command at Wright-Patterson AFB, Ohio, led by Col. Robert A. Strasser. The SPO has rebalanced to focus as intensively on sustainment as on modernization programs. McCown praised Strasser, his counterpart, for efforts to meet today's requirements. The two often hold conversations about daily events on the flight line at Whiteman. "That kind of focus makes me very happy," McCown said.

USAF airmen—both Active Duty and reserve component—form part of the team. Department of Defense civilian employees, contract personnel, and specialists from Northrop Grumman are also part of the long-standing team for B-2 low observable maintenance. The civilians provide an enduring capability. "Some levels of expertise we just have not grown in the Air Force," noted McCown.

Can that work be accomplished away from the resources of Whiteman Air Force Base? The answer is yes.

"We deploy just like any other airframe," said McCown. B-2s on global missions "are chopped to the unit they deploy to," he said. They deploy as an autonomous package

**[1] Spirit of South Carolina rests in a hangar while another B-2 takes off behind it. [2] A1C James Fulton gives the thumbs up signal to a stealth bomber pilot as he marshals a B-2 at Whiteman.**

with good communications links to home station. However, the intent is for deployed maintainers to manage their own flow of work on flight lines at Guam, Australia, and other locations. "I try not to get out my 1,400-mile screwdriver too often," McCown joked.

## PRECIOUS CRAFT

Each aircraft is so valuable that the Air Force went to extraordinary lengths to return the B-2 named *Spirit of Washington* to service after an engine start fire inflicted extensive damage to the bomber at Andersen AFB, Guam, on Feb. 26, 2010.

"The stealth bomber burned in a stealth fire that did far more damage than the service initially thought," wrote Mark Thompson of *TIME* magazine.

From extensive testing, the Air Force already knew that composite materials could smolder and reignite, posing unusual problems in firefighting and damage repair. In 2000, USAF had taken a composite wing box and set it afire over a pool of JP-8 fuel. "Surface temperature of the composite wing box dropped to room temperature while the internal layers continued to burn at 1400 degrees Fahrenheit, producing a bright red glow," the test team reported.

Bringing that B-2 back into service took four years and more than 1,000 parts ranging in size from small clips to massive sections that support the structure of the aircraft, reported the *Los Angeles Times* in a March 2014 story.

"With only 20 B-2s—as precious as those aircraft are—no one even questioned whether or not we'd make the investment," retired USAF Chief of Staff Gen. Norton A. Schwartz, told the newspaper. "When we found out the aircraft could be saved, civilian and military leadership agreed without hesitation."

Now *Spirit of Washington* is back and flying well in the lineup, McCown said.

All eyes await the Air Force's next bomber, in development by competing industry teams. This newcomer will have a long way to go to match the mystique of the B-2. ★

*Rebecca Grant is president of IRIS Independent Research. Her most recent article for Air Force Magazine was "Jimmy Stewart's Air Force" in January.*



## Higher Power

Bibliothèque nationale de France



A priestly blessing.

Religion always has accompanied troops entering battle. This was certainly true of World War I, history's greatest bloodbath to that point. The newly devised airplane at times provided odd settings for the exercise of faith. In the large image, a French priest, on the Western Front in 1915, bestows a blessing on a French Blériot aircraft while airmen look on. The inset depicts a chaplain, in a pastoral setting at a French aerodrome, taking to the cockpit of a bomber to conduct Sunday morning services.



Words from the pulpit.

David McLellan, National Library of Scotland



**Operators help define the next tanker.**



# The KC-46 Enlisted Team

By Marc V. Schanz, Senior Editor





A KC-46 fuels F-22s in this artist's illustration.

**T**he KC-46 Pegasus is an Air Force top modernization priority and receives a high degree of funding and attention from senior service and Pentagon leaders. A small team of experienced enlisted airmen—working from the program office at Wright-Patterson AFB, Ohio, since the early days of the program—is also helping keep the tanker on track. They serve as one-of-a-kind subject matter experts and program advisors as the project advances into the flight testing phase.

Much hinges on the KC-46, formerly known as the KC-X. Without tankers, USAF's ability to project power with its fighters, bombers, transports, and intelligence aircraft would be severely degraded. The bulk of the tanker fleet comprises KC-135s that, though updated and re-engined over their 55 years, have long outlived their predicted life expectancy and must be replaced with Pegasus tankers as swiftly as possible. Thus, the Air Force has done everything it can to ensure the success of the KC-46. One of those precautionary measures was to add the enlisted maintainer's perspective to the acquisition process.

The KC-46 team's eight enlisted advisors—in a program office of some 190 personnel—explained their unique role influencing KC-46 development in a series of November interviews.

MSgt. Luis Rodriguez-Asad, the superintendent of KC-46 test operations on the team, came from JB McGuire-Dix-Lakehurst, N.J., where he worked in boom operations on KC-10s.

"It's a different angle from working in the boom," said Rodriguez, who also worked in F-16 avionics earlier in his career. He explained that his day-to-day effort now involves working with development engineers in the KC-46, going over issues like "center of gravity" operational limits relating to the boom—where, when, and how it can be safely operated—as well as matters relating to cargo and fueling.

They talk a lot about "how we use a tanker in an operational environment, just to see if we got it right, ... to meet the needs of the guys in the field," he said.

Bringing in experienced enlisted airmen and putting them alongside acquisition officials, contractors, and program managers provides a more holistic perspective on numerous aspects of the tanker effort, from avionics to environmental systems to boom operations. The enlisted airmen have also played an important role in the choice

and development of aircrew training systems for the tanker, Air Force Materiel Command officials said. They will assist in the design and development of training systems to ensure missteps and problems are caught early on. The extra eyes and experience will help a smooth transition as USAF steadily replaces its tanker fleet with future tankers, under the notional, future KC-Y and KC-Z programs.

The team has "a good mixture of everything," said SMSgt. Steve Hesterman, AFMC Tanker Directorate superintendent. The directorate oversees the command's entire workforce involved in the management and care of the legacy tanker fleet—the KC-135 and KC-10 (at Tinker AFB, Okla.)—as well as the KC-46 division at Wright-Patterson.

Hesterman is a veteran crew chief who has worked with C-130s, C-17s, C-5s, and even gunships. He was deployed as the superintendent of the aircraft maintenance unit, 379th Air Expeditionary Wing, at Al Udeid AB, Qatar, when he got the word he would then go to Air Force Materiel Command at Wright-Patt to supervise the KC-46 enlisted team program.

"You take all of us together, and we cover a large portion of knowledge in the Air Force for heavies, and we take that influence and experience and put it into the product," he said.

The knowledge of these enlisted airmen—with skill sets and background ranging from fuels to boom operations to environmental systems and life support—is tapped daily to influence the development of both the Pegasus aircraft and its subcomponents from design through testing, production, and sustainment practices.

Putting a team of enlisted advisors and subject matter experts inside a program office is not unprecedented in USAF's acquisition community. The "Big Safari" rapid acquisition office and the MQ-1 Predator and MQ-9 Reaper programs each have small elements of senior enlisted personnel involved in daily operations.

The origins of the KC-46 enlisted team can be traced back to April 2007, Hesterman said. The first two members were a boom operator and a loadmaster. From there the team grew steadily as the program progressed, adding members and aiding in delicate "source selection" acquisition work leading up to Boeing's contract award in February 2011.



When then-Brig. Gen. Christopher C. Bogdan assumed leadership of the KC-X program in 2009, he oversaw and encouraged the growth of an enlisted cadre inside the program office to serve as dedicated subject matter experts on a range of topics. Bogdan wanted the program office to get “a sense of the [view of the] maintainer who was going to handle this aircraft,” Hesterman said.

The office sought out experienced enlisted airmen with backgrounds in hydraulics, electronics, electro-environmental systems, fuel systems, avionics, boom operations, and load-master duties.

Today, six airmen with maintenance expertise and two with other aviation

specialties work side by side with AFMC procurement officials, contractors, and engineers on development and potential sustainment problems as they emerge.

#### BOTTOM LINE SCRUTINY

Those challenges have evolved as the program has progressed from initial concept to flight testing. MSgt. Brian Cantrell, the team’s superintendent of KC-46 development matters, arrived at Wright-Patt in the summer of 2011. With a background in flight systems on both C-130s and B-1Bs, Cantrell helped guide the development of the avionics specifications with an eye toward how maintainers would interact with them.

“Boeing knows how to build an aircraft,” Cantrell explained. “But we want to help better equip our maintainers to work with this new multirole tanker,” to have input from an operational view to help others understand what would or would not work, “to better understand the program, and pass that on to our customer.”

With so much scrutiny on the bottom line of the program—Boeing is widely viewed as having submitted a “lowball” fixed-price bid—the view of experienced aircraft maintainers in the program office has helped keep the effort on track.

“I just came back from [meeting with Boeing officials in] Seattle,” Cantrell



Photo by Sagar Pathak



Boeing photo



## Tanker Time Line

The first 767-2C—called a “provisioned freighter” because it has all the plumbing, decks, and connections needed to eventually make it into an all-up tanker—flew on Dec. 28, 2014. Another 2C and two all-up KC-46s, fully equipped with refueling booms and related equipment, will join the test force as well.

Last year, Boeing recognized it had a problem with the KC-46 in that it had run some redundant wiring in bundles with the main wires. Rearranging those wires so they would be physically separated, and restringing them in test and production aircraft, added a delay to the program, the scope of which was still under discussion in late December.

US Transportation Command chief Gen. Paul J. Selva told reporters in early December he remained optimistic that the KC-46 program will meet its goal of delivering the first 18 airplanes by 2017. However, he conceded that the initial schedule was “aggressive” and that a slip is possible.

The Air Force expects to achieve a maximum production rate on the KC-46 of 15 airplanes a year, finishing out the KC-X program of 179 airframes by 2027.

At some point before that, Air Mobility Command will decide how it wants to proceed with KC-Y—replacing the remainder of USAF’s KC-135 fleet—and KC-Z, replacing the KC-10.

*At left: Enlisted airmen have been brought onto the KC-46 program office team at Wright-Patterson AFB, Ohio. Here, a crew chief marshals a KC-135 at Transit Center Manas, Kyrgyzstan, in 2014. Even after the KC-X program wraps up in 2027, most KC-135s will still require replacement under future KC-Y and KC-Z programs. Below left: A bird’s eye view of Paine Field, Wash., shows the size of the 767-2C destined to become a refueler (center), compared to a 777 (at top) and a 787 (foreground). Below right: The engineering and manufacturing development KC-46 takes off for its first flight, Dec. 28, 2014, from Paine Field.*

said in a November interview. There, he and SMSgt. Derek Monroe, the KC-46 sustainment superintendent, went over development issues regarding environmental safety and occupational health parameters on the aircraft, looking to head off potential hazards. Topics included fire extinguishing systems, working in confined spaces, and performing centerline drogue operations around certain instruments. With flight-test operations soon to be underway, many of these issues got close scrutiny from the team.

“If a certain cable becomes [detached], what happens with maintainers” to fix it? Cantrell asked. His view is, “we’ve been around [these systems so]

we know these things happen, and want to make sure these things work well.”

From the program’s inception, the team engaged in verifying key performance parameters (KPPs) at the working group level and are now involved in helping stand up the first KC-46 operating bases in both Air Mobility Command and Air Education and Training Command. With 390 KPPs, the task was formidable. Some involve the ability to refuel both by boom and probe-and-drogue aircraft during the same flight, while others involve global air traffic control standards, fuel load capacity, multiple aircraft fueling capability, and provision to carry cargo and passengers or be configured as an aeromedical evacuation transport, among others.

A critical task for the team is making sure the first tranche of KC-46 maintainers are effectively prepared as flight testing gets underway.

“My role as the Type One training lead is to make sure those initial crews can do their jobs,” said MSgt. Sonya Jones, the superintendent of KC-46 maintenance and training efforts. She’s worked on the enlisted team since August 2012. Jones said training for the maintainer developmental test team wrapped up in November.

“They have to make sure everything is ‘maintenance friendly’ [and that] they can do their job with the tech data and resources available. And if they can’t, they have to provide us input,” she said.

That input to the program office will help to effect changes or even fixes.

The vast experience of the maintainers becomes crucial as the program progresses into flight testing.

“We are in a program that is going to fly this aircraft and test some things that would have been tested in the lab” on the ground, Cantrell said, describing the KC-46’s concurrent testing model that USAF hopes will enable a quicker delivery into the force.

“We’ve partnered with the development engineers to make sure there’s maintainability. Is it easy for me to change” a part out if needed, said Monroe. He’s been on the KC-46 enlisted team at Wright-Patt since July 2010—longer than anyone else. Two milestones during that period were the preliminary and critical design reviews. The next big juncture after flight test will be Milestone C, at which Boeing will be authorized to build KC-46s at a low rate of production.

“Between here and next year is a lot of testing and verification and specification requirements” that will have to happen, he said. “It’s going to be a busy, busy time.”

The stakes are high. The KC-46 program is a fixed-price contract; both USAF and Boeing need to keep costs and schedules as close to projections as possible. As of late November, Boeing’s costs were estimated by the program office to exceed the contract’s ceiling value by more than \$1 billion.



Boeing artist's concept

USAF photo by A1C Colby L. Hardin

**Left: The Pegasus tanker will employ both flying boom and probe-and-drogue refueling methods. Here, two US Navy Super Hornets get in place for a refill. Below left: MSgt. Luis Rodriguez-Asad, superintendent of KC-46 test operations, tries out a KC-46 boom operator demonstration at McConnell AFB, Kan.**



The Air Force won't have to bear any overages—Boeing believes it will make up the losses by future international sales and by being well-positioned for KC-Y—but it's still in USAF's interest to keep costs as low as possible.

The enlisted team's work on the front end will pay off in the long run, several team members noted. Their involvement early on will help prevent expensive fixes later, on problems that typically might not be revealed until operations begin.

An access door might be poorly positioned to reach from a hardstand, or a bulkhead might prevent access to an area needing routine inspections. The operator perspective often means that these problems can be avoided before metal is bent and designs become hard to undo. "It's not something that is easily understood" outside of the acquisition community, Hesterman said, but the experience will allow the airmen to be able to "speak acquisition" with Boeing counterparts and others as they move on to other assignments.

"We can pass down this [experience] down the line to somebody else," he

said. Since its creation, several senior enlisted airmen have been promoted from the office—and are passing on their lessons learned in senior enlisted billets elsewhere in the Air Force. For example, since its inception, the KC-46 enlisted team has seen four of its members promoted to chief master sergeant, three while serving in the office and one after departing.

## A HOST OF PROFESSIONALS

The experience is also a master class in teamwork for an experienced enlisted airman. The number of agencies involved in KC-46 and that have stakes in its outcome are numerous. The Office of the Secretary of Defense, AFMC, Air Force Life Cycle Management Center, AMC, AETC, Government Accountability Office, and Defense Contract Management Agency are among some of the organizations having inputs and needing regular updates about what's happening inside the program.

"We've all got working group-level counterparts, ... within the AFMC, within the Boeing Corporation," Hesterman said. This requires a lot of message

traffic back and forth. It also demands paying close attention to ensure proper rules and channels are followed, from the government side to the contractor side and up and down leadership chains.

"Not everything can be solved at the working level—and not everything at the senior level, either," Hesterman said. "It's a host of professionals discussing what needs to happen" and what the appropriate level of understanding is. In many interactions, the enlisted team members serve as a connection between the contractor, the test community, or others.

"We are here to disseminate information, to give subject options, to find people, and find and 'up channel' problems as they arise," Hesterman said. Just as often as having the right answer at their fingertips, the team serves as a resource to find others who might know better.

"Let's say for right now, I'm the only boom operator in the program office," Rodriguez said. "I get a call from Edwards [the testing cadre in California] or Seattle [the contractors] on a boom issue. ... If I don't know the answer, the best thing to do is call some of the experts." That may mean a call back to colleagues at McGuire, or a subject matter expert on the staff at AMC headquarters at Scott AFB, Ill., to find answers.

"If I don't give the right answer, I'm doing more damage than good" because that affects the user. "That comms line is so important," Rodriguez asserted.

The link at the program office also runs the other way, he pointed out, from the maintainers, aircrew, and operators in the operational force.

"When I first got here, I heard from the booms [that] they weren't sure what was going on" with the program, Rodriguez said. "I gave them my contact and said, 'Hey, if you have a question, call me and I will find an answer from the engineer. ... Ninety-nine percent of the time, I got the answer on the same day.'" ★





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Congress is no fan of base closures.

# BRAC's Long, Hard Slog

By Megan Scully



**L**awmakers on both sides of the aisle have a powerful hole card to trump the Pentagon's reasoned arguments in favor of another base realignment and closure round: the costs of the last BRAC round relative to the meager savings it produced.

The Defense Department calls the 2005 BRAC an anomaly. It argues that with the military in the midst of fighting two prolonged and manpower-intensive wars in Iraq and Afghanistan—and defense spending at a historic high—the last round focused on “transformation” (the popular catchphrase during the tenure of Defense Secretary Donald H. Rumsfeld), rather than cutting costs.

The next BRAC, defense officials promise, will be different. Its focus will be eliminating unneeded infra-

structure, rather than moving missions and consolidating facilities. As a result, it will cost less and savings will stack up a lot faster.

Lawmakers, who don't want to risk the loss of installations in their own districts, aren't going for it, repeatedly using the hefty \$35 billion bill from the 2005 BRAC to counter the Pentagon's case that it needs to urgently address the costly excess infrastructure problem.

With budget caps and other pressing priorities, lawmakers have argued again and again that the Pentagon simply can't afford another formal round of domestic base closures.

After Congress flatly denied several requests from DOD to authorize a new BRAC round, John C. Conger, the acting deputy undersecretary of defense for installations and environ-

ment, decided he needed to build a better case.

“We had spent a lot of time talking to Congress about the last BRAC round and always we used a very jargony phrase that said, ‘The last BRAC round was focused on transformation and that's why it did what it did and that's why it cost so much,’” Conger said in a recent interview. “And it occurred to me that many members of Congress might not know what the heck that meant. And in fact, I didn't know what the heck that meant. And I wanted to make sure we were more explicit as far as what we are actually talking about here.”

Conger, a former congressional aide himself, tasked his staff with studying the last BRAC, decision by decision, to determine why it was so different from the four rounds that came before



*Airmen walk toward AC-130H gunships on the flight line at Cannon AFB, N.M., in 2014. Some major installations such as Cannon were targeted for closure during the last round of BRAC but were ultimately saved by the independent commission tasked with reviewing the Pentagon's recommendations.*



USAF photo by SrA. Eboni Reece

it. What, specifically, were the department's motivations behind that BRAC? And what was the outcome?

"We have a rear-view mirror here. We can actually look at this and figure out what happened," Conger said. "So they did, and what they came up with, I thought, was illuminating."

Conger's staff found that the decisions fell into three categories.

One set of recommendations simply wasn't intended to save money; in fact, it cost money on a recurring basis over time.

A second set was meant to save money, but not for many years.

The third group of recommendations promised savings inside of seven years—more in line with the bulk of decisions in the BRAC rounds of the 1990s.

Half of all the closures or realignments didn't save any money or took so long to generate savings there was no real business case to be made for them. Those decisions, made in the name of transformation, cost the department \$29 billion and delivered an estimated \$1 billion in savings annually, meaning they won't pay for themselves for nearly three decades.

The other half of the decisions—those made with the express purpose of saving money and streamlining operations—cost the department just \$6 billion but produce annual, recurring savings of \$3 billion.

For Conger, this illustrated an important point that undercuts the arguments being made by lawmakers concerned about the up-front costs of another BRAC. "If we are trying to save money,

we can. If we are designing it to save money, we do," he said.

## TRANSFORMATIONAL BRAC

As early as 2002, Rumsfeld's direction to the department and the military services was to use the BRAC round to transform the US military's day-to-day activities.

DOD is limited by law in the types of domestic infrastructure changes and major personnel moves it can make outside of a formal BRAC round. When Congress authorized the 2005 BRAC, defense officials decided to use the opening to make management changes and focus on realigning some core business areas—moves that make sense but may not yield savings.

At the time, the Pentagon's accounts were growing at almost unprecedented



rates and the department could afford to make decisions that didn't have a direct financial benefit. The climate was thoroughly different from today's budget-driven need to shutter facilities.

"The reason the BRAC 2005 round cost so much money was we were willing to accept recommendations that did not save money," Conger explained. Those costly decisions helped fuel a \$24.5 billion military construction bill associated with the last BRAC. The four previous rounds collectively cost \$7 billion to implement.

Those management-type decisions didn't make the headlines, getting lost in the frantic political push to keep open major installations like Cannon and Ellsworth Air Force Bases in New Mexico and South Dakota, respectively. Those bases were targeted for closure but were ultimately saved by the independent commission tasked with reviewing the Pentagon's recommendations.

The management decisions were made, in many cases, for efficiency's sake, such as consolidating five investigative services—the Defense Counterintelligence Field Activity, Defense Security Service, Army Criminal Investigation Command (CID), Naval Criminal Investigation Service, and the Air Force Office of Special Investigations—at Marine Corps Base Quantico in Virginia.

While those moves may not have saved money, their results can't be completely discounted: Consolidating functions at one location makes good business sense. The price tag, though, has created a big obstacle to more BRAC rounds.

Charles Battaglia, executive director of the 2005 BRAC commission, said he knew about the focus on transformation before he signed on to the job.

"That was the hand that was dealt us," said Battaglia, who is now a lobbyist for the Principi Group, which

***A B-1 takes off from Ellsworth AFB, S.D., in 2012. Ellsworth, like Cannon, was saved from the BRAC chopping block by the review commission's intervention.***

focuses on base closures. "We knew what we were getting into."

Moreover, the Pentagon oversold the savings it could generate, even if it shifted focus from savings to management. Rumsfeld and other defense officials believed the 2005 BRAC would yield a \$49 billion return on investment over the following two decades, a projection the commission believed was "vastly overestimated."

In delivering its final report, the commission estimated that the round would save \$35.6 billion over 20 years, a much more modest (but still sizeable) sum.

Excluding the Defense Department's claimed cost avoidances attributable to military personnel actions—which both the commission and the Government Accountability Office believed were necessary—the commission estimated



USAF photo by Scott M. Ash





**Above:** Deputy Defense Secretary Robert Work speaks at National Defense University in 2014. Work says the best way to become efficient is to cut excess overhead, but USAF has not been allowed to do so. **Right:** Capt. George Cannon prepares to spin in the centrifuge during flight acceleration training at Holloman AFB, N.M., in 2010. He was Holloman's last student to do so—centrifuge training was consolidated with other missions at another base, as directed by the 2005 BRAC round.



actual savings to the taxpayer of just \$15 billion.

In the end, the cost of implementing the base closures and realignments totaled \$15 billion more than even the commission estimated, thanks in large part to a 72 percent spike in anticipated military construction costs. In a 2012 report, GAO projected the department would net only a \$9.9 billion savings through 2025, barely making a dent in the Pentagon's annual budget.

"Part of the problem is getting the Defense Department to come up with some realistic cost estimating on this thing. That has really caused a real problem with this particular BRAC," Battaglia said. "And rightfully so, by the

congressional people who say, 'Look, we still haven't accrued real savings out of the 2005 BRAC,' and they're right."

Eventually, even the 2005 BRAC will yield real savings, Battaglia emphasized.

For his part, Conger has decided to take a conservative approach to estimating cost savings, relying on the outcome of the earlier BRAC rounds. In discussions on Capitol Hill, he has told lawmakers that the next BRAC would yield \$2 billion in recurring savings.

Some of that is driven by DOD's plan to invest only \$6 billion in the next BRAC. That makes it much more constrained than the 2005 round, which, even with its costs, still yields \$4 billion in annual recurring savings: \$1 billion from trans-

formational actions and \$3 billion from the saving-money, streamlining actions.

Conger appears to have learned from Rumsfeld's mistakes, though, and doesn't want to oversell the potential for savings.

"We might be very conservative with \$6 billion in, \$2 billion out. It might be a lot more," he said. "But I think we're on firmer ground if we ... say, 'Let's look at past rounds and model it against that.'"

## INHERITED PROBLEM

The Air Force has been the most adamant that it needs to close down some of its bases. Going into the 2005 round, the Air Force said it had about 24 percent more real estate than it needed. By the end of the round, though, USAF

**L-r:** Lt. Gen. James Jackson, commander of Air Force Reserve Command, Gen. Mark Welsh, USAF Chief of Staff, Deborah Lee James, USAF Secretary, Army Gen. Frank Grass, chief of the National Guard Bureau, and Lt. Gen. Stanley Clarke, ANG director, testify in April 2014 before the Senate Appropriations Committee.





USAF photo by SSgt. Carlin Leslie

**Kathleen Ferguson, Air Force principal deputy assistant secretary for installations, environment, and logistics, reviews notes during a hearing with the Senate Armed Services subcommittee on readiness. She says USAF knows “intuitively” that it has excess infrastructure.**

had shed only one percent of its infrastructure, barely making a dent in its excess capacity problem.

That was due as much to the focus of the BRAC as it was to the commission’s decision to keep open bases like Cannon and Ellsworth. Those two facilities alone represented a total of nearly 7,000 jobs, and saving them became a key priority of their respective congressional delegations.

In retrospect, Battaglia now says they probably should have closed Cannon, which has since become home to the 27th Special Operations Wing.

“They could have put that special mission anywhere and I don’t know if they needed it there or not,” said Battaglia, who added that the commission’s compressed four-month time frame to do its work produced some rushed decisions.

Since the 2005 round, the Air Force hasn’t done a thorough analysis of its infrastructure; such work is politically sensitive and is typically done only during a formal base-closure round. Worth noting, though, is the fact that USAF has 500 fewer aircraft than it had a decade ago, and its end strength has been cut nearly eight percent.

“Even though we’ve not done an updated capacity analysis, ... we intuitively know we have excess infrastructure capacity and continue to spend dollars maintaining [bases] that could be put towards readiness and modernization,” said Kathleen I. Ferguson, principal deputy assistant Air Force secretary for installations, environment, and energy. She spoke at an April 2, 2014, hearing

before the Senate Armed Services subcommittee on readiness.

The Air Force estimates it spends \$7 billion operating, sustaining, recapitalizing, and modernizing its facilities. Money spent on excess infrastructure, officials have repeatedly argued, could be better spent elsewhere, including on higher-priority facilities.

“The Air Force has limited authority under current public law to effectively consolidate military units or functions and then divest real property when no longer needed,” the Air Force said in written testimony for lawmakers last year. “To save considerable resources, we request BRAC authority in 2017.”

Air Force Secretary Deborah Lee James has predicted that the Pentagon will keep asking Congress to authorize base closures, until it finally gets the green light to do so.

“As a person who came out of business, I can tell you the last thing that a corporation would do would be to spend money on facilities that they no longer needed,” James said at a June 18 breakfast with reporters. “That’s the first thing you would do in business, is consolidate your facilities, get them off your books, and harvest that money so you could plow it back either to the shareholders or to the people or to your R&D. You never, never, never run a business this way.”

James, who previously worked at Science Applications International Corp., acknowledged that the military isn’t a

business. But, she stressed, there are “certain principles that just make good common sense.”

With the looming threat of sequestration and the attending stringent budget caps expected to go back into effect in January 2016, Pentagon officials are unwilling to wait to take advantage of efficiencies.

“We’re constantly told we’re not being efficient,” Deputy Defense Secretary Robert O. Work said in November. “Well, the best way to get efficient is to get rid of excess overhead, but we’re not authorized to do so.”

While resistance to a BRAC remains strong on Capitol Hill, there are some signs that lawmakers’ resolve is weakening. House Armed Services ranking member Adam Smith (D-Wash.), and Sen. Lindsey Graham (S.C.), a vocal Republican on the Armed Services Committee, support another round of base closures, giving the Pentagon two influential allies on the issue.

Battaglia has been telling his clients that another BRAC is on the horizon. Lawmakers, he says, know that base closures have to happen—they just aren’t ready for it.

Some communities, perceiving vulnerability, have been seeking new missions for their local bases—particularly in cyber warfare and remotely piloted aircraft—in an effort to make themselves “BRAC-proof.” Or at least to make themselves feel as if they are BRAC-proof.

“Many, many installations are now trying to reconstitute themselves and their missions,” Battaglia said.

When Congress will authorize another BRAC round is uncertain, but 2015 may be as good a bet as any. That’s because it’s an off-election year, offering sitting members some breathing room with constituents. As the 2016 budget caps loom large, lawmakers may ultimately—and reluctantly—allow the department to streamline its budget, even if a BRAC won’t generate immediate savings.

“In the end, we’re not doing this because we’re trying to be mean. We’re not doing this because we think BRAC is a goal in and of itself. We’re doing this because the department has a huge budget problem and we need to figure out how to solve it,” Conger said. “This is one tool in a toolbox. If we save \$2 billion a year, it is not going to solve the department’s problem. But it will help.” ★

*Megan Scully is a reporter for CQ Roll Call and a regular contributor to this magazine. Her last article for Air Force Magazine, “The A-10 and the Rescue Helicopter,” appeared in the July 2014 issue.*



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*Markey leaps over an obstacle, as SSgt. Jason Albrecht runs the military working dog through an obedience training session at Shaw AFB, S.C., in July 2011.*

USAF photo by SrA. Kenny Holston





From foreign battlefields to the homeland, dogs serve airmen in countless ways.

# AIRMAN'S BEST FRIEND

Photos by DOD photographers

**J**BSA-Lackland, Texas, home of the Defense Department's military working dog program since 1958, has the world's largest training center for military dogs and their handlers.

With a heightened sense of smell that is stronger than what any human

possesses, the dogs are trained to detect explosives and drugs and to accompany their handlers on patrols.

The US military has predominantly used four working dog breeds since World War II: Doberman Pinscher, German Shepherd, Labrador Retriever, and Belgian Malinois.





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[1] Military working dogs fill a variety of roles. Here, Breston, from the 375th Security Forces Squadron, subdues an airman acting as an uncooperative suspect during a K-9 competition at Scott AFB, Ill., on May 17, 2014. [2] Then-SSgt. Leonard Anderson takes a break from training with his military working dog, Azza. [3] Maj. Regina Owens, a psychiatric nurse, pins an oak leaf on the newly promoted "Major" Goldie, a therapy dog from Walter Reed National Military Medical Center, Md., during a Nov. 12, 2014, ceremony at the Pentagon. Several nonprofit organizations provide service dogs for veterans. [4] SSgt. Christopher Ebeling, a military working dog handler assigned to the provost marshal's office at Camp Victor in Baghdad, Iraq, and his German Shepherd, Nero, search through a palm grove for weapons or explosives.

USAF photo by SrA. Sarah Hall-Kirchner



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USAF photo by SSgt. Mark Burrell



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USAF photo by A1C Zachary Perras



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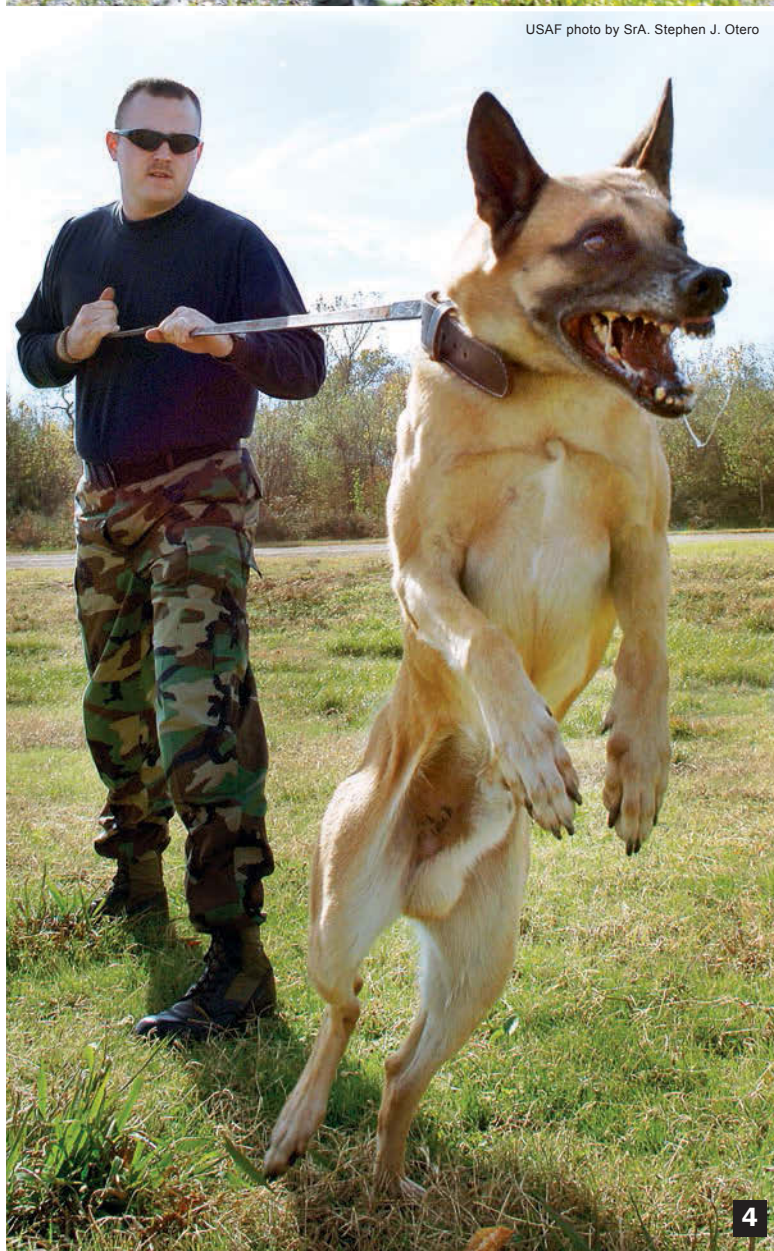
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USAF photo by SrA. Melanie Bulow-Gonterman



USAF photo by SrA. Justyn M. Freeman

[1] SSgt. Greg Maatta yells at a "suspect," played by TSgt. Robert Black, to stop before releasing Dusty during an exercise at JB Elmendorf-Richardson, Alaska. Both airmen were assigned to the 3rd Security Forces Squadron. [2] Alex, from the 6th Security Forces Squadron at MacDill AFB, Fla., lays next to his handler before a Coast Guard helicopter training flight. The experience conditions the dog to the loud noise and high altitude, assuring the handler that the canine partner can perform on deployment under hectic circumstances. [3] Retired SSgt. August O'Niell kisses his service dog, Kai, before swimming in the 2014 Warrior Games last Sept. 30 at the US Olympic Training Center in Colorado Springs, Colo. [4] SSgt. Kristopher Russ and Rouge, both with the 2nd Security Forces Squadron at Barksdale AFB, La., participate in an expeditionary combat skills training course. The dogs are integrated into it to provide a realistic patrolling experience.



**[1]** Iggy lunges toward SrA. Alexander Nutting, a 379th Expeditionary Security Forces Squadron MWD handler, during a working dog demonstration at Al Udeid AB, Qatar, on April 5, 2014. Nutting was deployed from Moody AFB, Ga. **[2]** Pintler waits patiently for his owner, retired

TSgt. Keith Sekora, to finish the track and field portion of the Warrior Games. The dogs are allowed all-access to every event and area, to maintain constant contact with the athletes. **[3]** SSgt. Dennis Browning, a MWD handler deployed from the 21st Security Forces Squadron at Peterson AFB, Colo., and King,

an explosives and patrol attack dog, search an area during a clearing operation south of Baqouba, Iraq, in 2007. **[4]** SSgt. Laura Felts, with the 386th Expeditionary Security Forces Squadron, releases her partner, Bert, to attack a decoy during aggression training in 2007 at a deployed location in Southwest Asia.



USAF photo by SrA. Hannah Landeros



USAF photo by SSgt. Tria Schroeder



USAF photo by SSgt. Torri Ingalsbe



USA photo by Sgt. Armando Monroig





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**[1]** SrA. Brian Claypool, with the 22nd Security Forces Squadron, encourages Rakker with a toy in September 2013, at McConnell AFB, Kan. Dogs at the squadron's kennel section receive training once a year at the base pool to familiarize them with bodies of water and encourage them to perform in different environments. **[2]** Security forces airmen and a MWD secure the area after getting out of a mine-resistant, ambush-protected vehicle during a training exercise at the Nevada Test

and Training Range. **[3]** Two military working dogs sit in front of their newly remodeled kennels in November 2010, at Offutt AFB, Neb. MWDs patrolled the base nearly 24 hours a day. **[4]** Petty Officer 3rd Class Andrew Barnhart restrains his dog during a session of working dog training at JBSA-Lackland. Military working dogs go through a 60- or 90-day training program where they learn to detect explosives and drugs. They also learn deterrence training and how to protect their handler.

USAF photo by SrA. Laura L. Valentine



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USAF photo by SrA. Christopher Griffin



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USAF photo by A1C Daniel Hughes



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USAF photo by Josh Plueger



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**[1]** Gabe, a 12-year-old German Malinois, takes a bite out of TSgt. Nathan Nash's padded sleeve during an attack demonstration on July 27, 2010, in Southwest Asia. **[2]** Service dog Kai lays on O'Niell's lap during an Air Force Wounded Warrior sitting volleyball practice at JB Andrews,

Md., last November. O'Niell was a pararescueman who was wounded in July 2011 in Afghanistan. **[3]** TSgt. Randall Blair, 20th Security Forces Squadron military working dog trainer, falls away from Markey during training at Shaw in July 2011. **[4]** Spc. Than Kywe, an Air Force

theater hospital patient at JB Balad, Iraq, in 2009, has a lighthearted moment with Cezar, a 332nd Expeditionary Security Forces Group explosives-detection military working dog, during a K-9 visitation program. The program furthers patient recovery through animal-assisted therapy.

USAF photo by SrA. Laura Turner

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USAF photo by SSgt. Dilia Ayala

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USAF photo by TSgt. Brian Ferguson

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USAF photo by SrA. Kenny Holston





USAF photo by Greg L. Davis

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USAF photo by Perry Aston

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USA photo by Pfc. William Servinski III

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USAF photo by SrA. Jette Carr

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[1] Johnny crouches down while running through a pipe at the 436th Security Forces Squadron's obedience course at Dover AFB, Del., last September. [2] Military working dog Ali goes after Seaman Andrew English in July 2010 at Al Asad AB, Iraq. [3] TSgt. John Mascolo and Ajax, left, await a helicopter pickup with SSgt. Manny Garcia and Jimmy outside FOB Normandy, Iraq,

on Feb. 28, 2006. The dogs wear "doggles" to prevent sand and debris from getting in their eyes. Mascolo and Garcia were assigned to the 35th Security Forces Squadron and had just completed a sweep, looking for weapons and materials used to make improvised explosive devices. [4] Moe, an Air Force service dog, watches retired MSgt. Kyle Burnett compete in the 2014 Warrior Games

archery competition on Oct. 1, 2014, at the US Olympic Training Center.

"As a nation, we owe our war dogs a tremendous debt of gratitude," said John Burnam, a scout dog handler in the Vietnam War and author of two books on military working dogs. "Their selfless service, loyalty, and sacrifices to our country must never be forgotten." 🐾



**Capt. Brian Walker, an Air Force Reserve judge advocate, runs a Commissioned Officer Training class at Maxwell AFB, Ala. In 2013, OTS produced 1,445 line officers, plus 1,582 officers in COT.**



**T**HE Air Force has taken a significant step forward in its effort to mold its Active Duty, Air National Guard, and Air Force Reserve airmen into a Total Force team, merging the previously separate training programs that commission new officers for the three components.

The first class combining officer candidates from all three components formed at the Air Force Officer Training School, Maxwell AFB, Ala., in January and is scheduled to conclude with a commissioning ceremony March 13 after eight weeks of sharing the same demanding regime of mental and physical training and character development.

That class will be the start of a unifying process that Col. Scott M. Lockwood, OTS commandant, calls “one furnace, one metal.”

And it will advance the strong emphasis on building a Total Force spirit that has been promoted by Air Force Secretary Deborah Lee James and Chief of Staff Gen. Mark A. Welsh III.

The combined commissioning program is a “natural follow-on” to the last 13 years of “going to war as a Total Force,” Lockwood said. “We train as a Total Force US Air Force for everything, except for the initial [officer] accession.”

Lockwood termed the unified officer development program a capital investment that will pay off years down the road. “We’re going to be a much better force for it. We’re going to have officers at the very senior levels that have grown up in a Total Force construct, and they’re going to better understand the different components, the vitality of each one, and what each one of them

brings to the fight, the capabilities, the limitations, the special nuances of every component,” he said.

“It really makes sense to get training at the accession level of our Total Force,” the colonel said. “And what that required was for us to go past some of the inhibitions that were out there.”

#### **SHARED, COMMON EXPERIENCE**

The proposal to merge the separate commissioning programs at OTS, which Lockwood said in 2013 produced more than half of all new Air Force officers, originated with the school’s leaders and was approved by Gen. Robin Rand, commander of Air Education and Training Command, and by the Air Staff.

But perhaps the most significant approval came from the National Guard leadership when the adjutants general (TAGs) of the states agreed to give up



# FORGED IN ONE FURNACE

By Otto Kreisher

## The Air Force is integrating its Active, Guard, and Reserve officer training programs.

the separate commissioning source for Air Guard officers.

In the past, candidates for commissions in the Active Duty Air Force and the Air Force Reserve were trained at the Basic Officer Training program, the 24th Training Squadron, commanded by Lt. Col. Ryan J. Aerni. Air Guard candidates were trained at the Academy of Military Science Det. 12, commanded by Lt. Col. Reid F. Rasmussen.

In January, both units were to receive the mix of officer candidates from all three components and be instructed by a faculty also made up of Active Duty, Guard, and Reserve personnel.

"I think there has been a lot of vision shown by the TAGs of the states to be able to provide us this opportunity to be able to go forward and build with one furnace, one metal and go with a common crucible for all the officers

going through officer training school so they can be leaders of moral character and go on and lead the world's greatest airmen that the world has ever seen," Lockwood said.

The Army National Guard provides three sources for officer candidates: 16 to 18 months of weekend sessions at state regional training institutions, an accelerated process at several National Guard Bureau facilities, and at the Regular Army's OCS at Fort Benning, Ga.

The unification of Air Force commissioning programs has been a gradual process that began as far back as 2006 when then-Chief of Staff Gen. T. Michael Moseley stated a goal of "a shared common experience" through a single site for Active Duty, Guard, and Reserve officer candidates.

In 2009, the Air Guard moved the Academy of Military Science from

McGhee Tyson Arpt., Tenn., to Maxwell as part of OTS.

AETC took the next step, starting a rotation between Active Duty and Air Guard officers as OTS commandant. Lockwood, who received an Active Duty commission through OTS and later switched to the Air Guard, is the second Guard OTS commandant.

Officer Training School then took several symbolic actions in 2014, first bringing candidates from the three components together for a ceremony called "crossing the blue line," during which the officer aspirants were sworn in to start their training in the two separate programs, and later holding a combined commissioning ceremony for the two schools.

During that phase, the OTS leadership was asking for the unified training because "we want a common officer training experience" to give Total





Force officers a shared foundation for their service, Aerni told *Air Force Magazine*.

The idea was welcomed by Mark Gunzinger, a retired Air Force colonel and former B-52 pilot, who thinks “bringing officer training together like that is a really good idea.”

Gunzinger, now a national security analyst with the Center for Strategic and Budgetary Assessments, noted that to help build the Total Force concept, the Air Force leadership wants to make it easier for officers to move across

the components at various points in their careers if they want.

An Air Force Academy graduate, Gunzinger said, “It never mattered to me, or any officer I knew, what the source of the officer’s commission was. What mattered was can that officer do his or her job? Are they proficient in their mission? Could they lead? That’s what really counts.”

If the commissioning unification “can help tear down artificial barriers between the reserve components and the active component, I’m all for it,” Gunzinger said.

## REAL BENEFITS

Lockwood said it was important to educate the Active Duty force about the Air Guard because they will be going to war together.

The Regular (Active Duty) Air Force, or “RegAF” understood “much less about the Air National Guard than the Guard understood about the Regular Air Force,” he said. “The reason for that is, there are a lot of Guard members like myself who were 10 years Active Duty before we jumped ship and went over to the Air National Guard. But you don’t have it going the other way. You don’t have Air National Guardsmen going back over to the RegAF. So their understanding was probably lacking.”

**Airmen at the first combined class of Basic Officer Training and Academy of Military Science—the former for Active Duty and Reserve and the latter for the Air National Guard—in October at Maxwell.**



USAF photo by Melanie Rodgers Cox

**L-r: Then-acting Air Force Secretary Eric Fanning, OTS Commandant Col. Scott Lockwood, and Lt. Col. Taran Hickie, then commander of the 24th Training Squadron, review newly commissioned Air Force officers in 2013. The first fully integrated Total Force class at Maxwell is scheduled to be commissioned in mid-March.**

Lockwood said the merger of the two programs provides “real benefit” for the Air Guard in that “they will get more opportunities to get trained at different times throughout the year, as opposed to just four or five classes a year. They will have a continuous opportunity to send officers in, a better matchup with other training down the line, for follow-on training.”

Rasmussen has reworked the entire syllabus at OTS, Lockwood said, so the Air Guard candidates “will get specific Guard training. A great example is the defense support for civil authorities,” a significant National Guard mission.

OTS also runs a third program, the Commissioned Officer Training course, providing the initial military indoctrination for individuals receiving a direct commission to serve in nonline specialties as lawyers, medical and dental professionals, and chaplains.

Although those directly commissioned officers “have always been Total Force,” Lockwood said, they have “always been trained separately, in a shorter program for accession than regular line officer training.” But the school officials would like to bring them together with the line officers with whom they will serve in the future.





Aerni said he has met nonlinear officers who appear to consider themselves separate from the line officers in their units. This can weaken cohesion, and Lockwood said, "As we look back over the last 12 years, particularly in Iraq and Afghanistan, we find that those individuals need the best leadership training that we can afford to give them. By virtue of the position they find themselves in, they simply need to be going through ... integration with the rest of the line officers training. That has not happened."

Although OTS has proposed integrating directly commissioned officer training with the line officers, "right now they still are stand-alone. They are training in the 23rd Training Squadron in a five-week program, 23 training days, [as] opposed to 47 training days" for the line officer candidates, Lockwood said.

The reaction to the proposal has varied among the leaders of the different specialties, he said. Some have agreed that the direct-commission officers could benefit from "a little bit better leadership experience" and that it would "be better for the entire officer if we integrated training from the very beginning." However, there are "some logistical concerns" about the time some of the doctors can afford between their educational programs at the universities and their Air Force duties, the colonel added.

Nothing that OTS is doing will affect the other two sources of Air Force officers, the Air Force Academy and

the Air Force Reserve Officer Training Corps at universities.

An Air Reserve Component Volunteer Program initiative began last July. It gives ROTC cadets the option of joining a Guard or Reserve unit on commissioning, rather than entering Active Duty, explained 1st Lt. Jose Davis, a public affairs officer at AETC headquarters at JBSA-Randolph, Texas, which manages the AFROTC program. That program runs only through Dec. 31, 2015, he said.

Because of reductions across the Air Force, the Air Staff decided last April to reduce the annual line officer production from AFROTC from 1,700 to 1,350, Davis pointed out.

### EXPEDITIONARY TRAINING

A significant change in the OTS training experience, completely separate from the Total Force integration of the two schools, is the addition of Air Expeditionary Training. AET matches the exposure to infantry-like field training that now is part of basic training for enlisted airmen. The training began several years ago in response to the increasing deployment of small Air Force units to austere locations, frequently in developing countries that lack the living quarters and other amenities usually available at US or allied permanent air bases.

***Prospective officers go through the OTS rope exercise conditioning course at Maxwell's Jeanne M. Holm Center for Officer Accessions and Citizen Development.***

"The AET site we have is 2,020 acres in Titus, Ala., where we will actually mobilize individuals and deploy them, and they will go out and train in a scenario, much like an Afghanistan or Eastern Europe scenario, with Blue on Red Forces, with an indigenous population, with all of the nuances that they're likely to run into," Lockwood explained.

"So they will get the full-up experience. They will be living in tents and have to plan and come up with a strategy and run a program out there and kind of go on dealing with the indigenous population, as well as fighting the Red Forces."

Lockwood called it "very excellent training." There was nothing comparable when he went through OTS 25 years ago.

But most of the officer candidates who currently are coming to OTS already have some experience in that kind of life, because about 85 percent of Air National Guard candidates and 45 percent of Regular Air Force trainees are prior enlisted, Lockwood said.

As a result, "when you ask the question, 'Who's been downrange in Afghanistan or Iraq?' more than half the room will raise their hand." ★

*Otto Kreisher is a Washington, D.C.-based military affairs reporter and regular contributor to Air Force Magazine. From August to November 2014, he also served as this magazine's senior correspondent. His most recent feature article was "Rising Safety" in January.*



A black and white photograph of a B-24 bomber in flight over a city. The aircraft is seen from a high angle, flying towards the right. Below it, several tall, dark smokestacks rise from a cityscape. The sky is dark and hazy. The overall tone is somber and historical.

The B-24s made their bomb run  
through fire and flak, less than 50  
feet above the targets.

# Twenty-seven Minutes Over Ploesti

By John T. Correll

*Over the Astra Romana refinery, Lt. Robert Sternfels of the 98th Bomb Group lifts the right wing of his aircraft, The Sandman, to clear some tall smokestacks. Turbulence from delayed action bombs, dropped by the previous wave of B-24s, rocks the aircraft.*



**G**ermany's greatest vulnerability in World War II was its dependence on foreign oil. The Germans had almost no petroleum resources of their own, and in 1938, imported 72 percent of their gasoline and lubricants. Domestic output accounted for only eight percent. The synthetic fuels industry produced the other 20 percent.

One of Adolf Hitler's motives for invading the Soviet Union in 1941 was to gain the Russian oil fields in the Caucasus Mountains. That failed, and with most of its former sources of oil behind enemy lines, Germany was forced to rely on the oil-rich Balkans, especially Nazi-controlled Romania.

A ring of refineries around Ploesti, 35 miles north of Bucharest, supplied about a third of Germany's gasoline and an even greater share of the high-octane aviation fuel, which was converted from lower-grade fuels by the cracking plants at Ploesti.

The importance of Romanian oil was well-understood. In July 1941, the Russians bombed Ploesti, doing considerable damage but with no lasting effect. In July 1942, a dozen US B-24 bombers launched an attack on Ploesti from Egypt. They found the city under heavy cloud cover and dumped their bombs to fall where they might. The only result was to stimulate the Germans to upgrade their defenses.

The stage was set for the epic US mission against Ploesti Aug. 1, 1943. It would be one of the most famous air operations in history, but it did not turn out the way the planners imagined.

## SOAPSUDS

Allied leaders decided at the Casablanca Conference in January 1943 that Ploesti should be bombed. For reasons long forgotten, the big mission was known at first as Operation Soap-suds. British Prime Minister Winston Churchill warned that this was "inappropriate for an operation in which so many brave Americans would risk or lose their lives" and that "I do not think it is good for morale to affix disparaging labels to daring feats of arms." The venture was renamed Tidal Wave.

Ploesti was beyond the reach of Allied bombers in England, but B-24s could get there from North Africa. Thus the mission was assigned to the newly organized US Ninth Air Force, which was operating from several bases around Benghazi in Libya.

The slab-sided, high-winged B-24 Liberator had a greater range and bomb load than the more graceful B-17 Flying Fortress, and a slight advantage in air-speed. For the long trip to Ploesti—1,350 miles each way—extra fuel tanks were installed in the forward section of the bomb bay.

Chief planner for the mission was Col. Jacob E. Smart at Army Air Forces headquarters in Washington. The targets were key installations in Ploesti's nine major refineries—grouped into seven target sets—most of them clustered around the city but one at Campina, about 20 miles to the northwest.

The bedrock of AAF doctrine was high-altitude precision bombing with the Norden bombsight, but Smart calculated that it would require at least 1,400 heavy bombers to do the job that way. Including B-24s borrowed from Eighth Air Force in Britain, fewer than 200 would be available.

To the horror of traditionalists, Smart concluded that the mission would be flown at low level, with the final bomb run at minimum altitude. Flying low would increase both bombing accuracy and target coverage and also aid in the evading of radar detection. The Norden bombsights were removed and replaced with simple aiming devices.

The plan was approved by the Combined Chiefs of Staff and Gen. Dwight D. Eisenhower, Supreme Commander of Allied Forces in North Africa, and was given to Maj. Gen. Lewis H. Brereton, commander of Ninth Air Force, to execute. A full-scale mock-up of Ploesti was built in the desert near Benghazi, where the B-24 crews—two Ninth Air Force bombardment groups and three groups on temporary duty from Eighth Air Force—practiced dropping dummy bombs from low level.

Motivation was high, especially after Brereton delivered a ringing exhortation to the crews at a large outdoor meeting where he emphasized the importance of the target. "If you knock it out the way you should, it will probably shorten the war," he said. "If you do your job right, it is worth it, even if you lose every plane."

Brereton figured he would be leading the mission himself, but AAF Commanding General Henry H. "Hap" Arnold ruled that Brereton would be too valuable to the enemy if shot down and captured. The next-ranking officer, Brig. Gen. Uzal G. Ent, commander of IX Bomber Command, would lead instead. Ent was well-regarded and capable but he was not a B-24 pilot. He would fly

the mission from the jump seat of the B-24 *Teggie Ann*, piloted by Col. Keith Compton, whose 376th Bomb Group would be first in the formation.

There was no photoreconnaissance of Ploesti prior to the mission lest the Germans be alerted, so US planners did not know that the defenses had been vastly improved and were now among the strongest in Europe.

## STRUNG OUT

The mission was laid out for a Sunday in order to minimize casualties among the impressed laborers at Ploesti. The aircraft were to maintain radio silence all the way to their targets.

As the B-24s rolled out to take off shortly after dawn Aug. 1, tank trucks met them at the end of the runway to top off the fuel in their regular wing tanks and the auxiliary tanks in the bomb bays. One aircraft crashed on takeoff, but 177 launched successfully from their various bases and formed up to cross the Mediterranean.

Compton's 376th Bomb Group led the formation. Behind him, in order, came the 93rd (Lt. Col. Addison E. Baker), the 98th (Col. John R. Kane), the 44th (Col. Leon W. Johnson), and the 389th (Col. Jack W. Wood).

An enduring bit of folklore involves the B-24 *Wongo Wongo*, which spun out of control and fell into the sea near Corfu, off the coast of Greece. *Desert Lilly*, flying on *Wongo's* wing, dropped down—contrary to orders—to check for survivors and could not regain altitude fast enough to rejoin the strike force.

According to an oft-told tale, *Wongo Wongo* and *Desert Lilly* were the lead and alternate lead aircraft for the mission, and their navigators had been given special maps and briefings not available to the others. This supposedly explains the trouble that ensued later. In fact, Compton's *Teggie Ann* was the lead aircraft, and Capt. Harold Wicklund, flying with Compton, was the mission navigator. The two lost aircraft were in the second element of Compton's group.

Of far greater consequence was the feud brewing between Compton and 98th Bomb Group commander Kane, a colorful figure known as "Killer Kane" after a character in the "Buck Rogers" comic strip. Compton and Kane did not like each other. They also disagreed about how to get the most out of the B-24.

Compton led the formation at a relatively high speed and expected everyone else to keep up with him. Kane thought





it best to save fuel with slower speeds en route and pour on the power as they approached the target. Kane, whose group was third in line, stubbornly flew the mission his way, and a gap developed gradually between the first two groups and the last three.

As the strike force crossed the border from Bulgaria into Romania, Compton and Baker were 20 minutes ahead of Kane, Johnson, and Wood.

With radio silence in effect, Ent and Compton did not order Kane to catch up. Unknown to them, the Germans

had intercepted information about the mission and had been tracking the B-24s by radar since they crossed the Mediterranean. The element of surprise was already lost.

However, that was not the worst of it. Compton was justified in faulting



Staff map by Zaur Eylanbekov





Kane for failing to maintain formation integrity, but he was about to make a colossal mistake of his own.

### WRONG TURN

The plan was for all five groups to enter Romanian airspace together, but the formation had already separated into two segments. Ahead lay four initial points: at Pitesti, Targoviste, and Floresti, which were, respectively, 65, 39, and 13 miles from Ploesti.

What happened next is the matter of some conjecture. Compton had his own maps and charts and he was consulting them constantly. *Teggie Ann* passed the first IP at Pitesti flying at about 200 feet, and fast. At that level, the landscape sped by and the hills and rivers all looked pretty much alike.

Navigator Wicklund had given Compton an estimated time of arrival for the turning point at Floresti. As the ETA approached, Compton saw a town and landmarks that resembled Floresti and he turned *Teggie Ann* onto its bomb run. Baker in *Hell's Wench* led his 93rd Group southeast, following Compton's 376th.

In fact, the town where Compton had turned was the second IP, Targoviste, not Floresti. It was 39 miles too soon and the two groups were heading directly for Bucharest—headquarters for Romanian defenses—not Ploesti.

Aircrews all through the formation saw the mistake immediately, and dozens of them broke radio silence, yelling

“Not here!” and “Mistake!” and “This is not it!”

Ent and Compton had their radio turned off and did not hear them. Years later, Wicklund said that he had given Compton a wrong ETA and had not corrected him when he made the turn at Targoviste.

Baker held formation with Compton but figured out before Compton did that they were on the wrong course and swung the 93rd Group back northward toward Ploesti. A few crews from Compton's 376th Group went along with Baker.

The three groups in the trailing segment of the task force had no way to know that the two groups ahead of them had gone wrong. At Pitesti, Wood, flying as navigator on *The Scorpion*, split his 389th Group off to the northeast toward the refinery at Campina. Killer Kane in *Hail Columbia* and Johnson in *Suzy Q* continued eastward. Their groups, flying the course as briefed, turned onto the assigned bomb run at Floresti.

Ent and Compton were near Bucharest before they realized their mistake. With Ent's concurrence, Compton broke radio silence and instructed all aircraft to turn back toward Ploesti and bomb targets of opportunity.

In Ploesti, the Germans were ready and waiting. The town was defended by 237 antiaircraft guns, barrage balloons, flak towers, and hundreds of machine guns. At an air base just to the east were four wings of Bf 109 fighters. Already in motion on a railroad track leading into Ploesti from the north—parallel to the course Kane and Johnson were following—was a flak train with dozens of

large-caliber antiaircraft guns mounted on flatcars.

### THROUGH FIRE AND FLAK

The battle plan had fallen apart and the four bomb groups were converging on Ploesti from three different directions, whipping along at 250 miles an hour. They dropped down to less than 50 feet above the ground for the bomb run.

The first group to reach Ploesti was Baker's 93rd and the elements of the 376th that had broken away from Compton. Baker's assigned target, the Concordia Vega refinery, was now on the opposite side of town, but Astra Romana—the top target of the entire mission—lay dead ahead. It was assigned to Killer Kane's group, but Baker decided to go for it anyway.

Three minutes from target, Baker struck a barrage balloon cable with his wing and *Hell's Wench* was hit hard by flak and caught fire. Baker and his copilot, Maj. John Jerstad, ignored an opportunity to belly land with a good chance of survival and led their group onward to the target, where *Hell's Wench* crashed and exploded.

The flak train, alerted to the attack, was moving at speed when the B-24s arrived, Kane's group to the right side of the track and Johnson's to the left. The big guns, some of them 88 mm cannons, opened up at point blank range and the aircraft returned fire with their .50 caliber machine guns.

The duel was over in less than 90 seconds. The B-24s managed to riddle the locomotive and stop the train but several aircraft had gone down.

**Above:** B-24s practice low-level formation flying against mock targets in the desert near Benghazi, Libya, in July 1943. **Left:** The route map from Benghazi to Ploesti.



Ploesti was an inferno as Kane and Johnson approached. Fires were leaping as high as the wingtips. Thick smoke concealed balloon cables and steeples, and the aircraft were rocked by explosions from delayed-action bombs. They chose to press on with the attack despite the hazards. The official Army Air Forces history said that “B-24s went down like tenpins, but the targets were hit hard and accurately.”

B-24s at different altitudes passed over and under each other with scant separation. The Germans were impressed with the complexity and precision of the attack, not understanding that they were watching a spectacular foulup.

Compton’s 376th Group, swinging back from Bucharest, had little chance

individually and in small formations, evading enemy fighters that pursued them to the Adriatic.

“I originally blamed Colonel Kane for not maintaining his position in the formation in accordance with the mission plan,” Compton said years later. “On the return trip to Benghazi I spoke to General Ent and asked him if he were going to initiate court-martial proceedings against Kane for not following orders. His reply to me was, ‘I don’t think we should as we did not stick to the mission plan either.’”

Six hours out of Benghazi, Ent sent Brereton a two-word message: “Mission successful.” That was true to a considerable extent, despite all of the things that had gone wrong.

“The hope for virtually complete destruction of the selected targets with results enduring for a long period of time had been defeated by errors of execution,” the official AAF history said.

The destruction would have been greater, of course, if the groups had made their bomb runs together on the right course against the assigned targets, but the planners were unrealistic in expecting one strike to put the Ploesti complex out of business.

## MEDALS OF HONOR

It was almost 10 o’clock that evening before the last returning B-24 landed at Benghazi after 15 hours in the air. Of the 177 bombers that had taken off in the morning, only 92 returned. Fifty-



of finding its target, the big Romana Americana complex on the far side of Ploesti, much less hitting it. *Teggie Ann* jettisoned bombs and led the way home. However, Maj. Norman Appold and six aircraft from the 376th seized the opportunity to bomb Concordia Vega, which had been the original target for Baker’s group.

Meanwhile, Wood’s 389th Group was pounding the Steaua Romana refinery at Campina. It was there that 2nd Lt. Lloyd Hughes, hit several times by ground fire and with sheets of gasoline streaming from his bomb bay and wing tanks, held his course and bombed the target before his aircraft exploded.

Twenty-seven minutes had elapsed between the first bombs of the operation, dropped on the edge of Ploesti, and the last ones, which fell on Campina. The surviving aircraft headed south,

The raid knocked out, for the time being at least, 46 percent of Ploesti’s oil production and destroyed about 40 percent of the cracking capability. That was a substantial achievement for a 177-airplane operation, especially when compared with results from the 500- and 1,000-bomber missions that came later in the war.

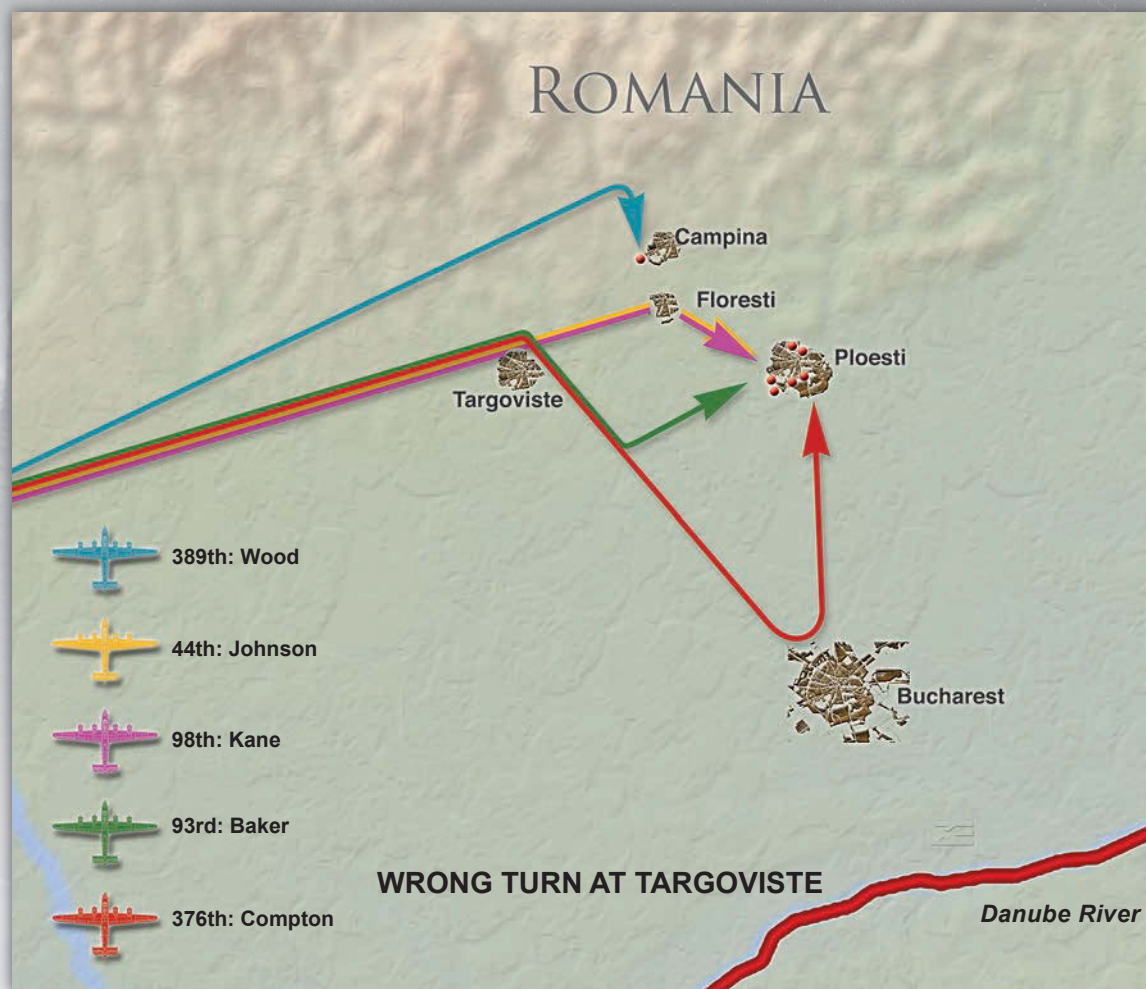
The damage was heavy but not permanent. One of the nine refineries was down for the rest of the war, but two others—including Romana Americana—were not bombed at all and continued production. US planners underestimated the maximum effort the Germans, desperate for Ploesti oil, would put into recovery. Facilities that had not been operating at full capacity were activated, and the repair of the major plants was speeded up. They were back on line in a matter of months.

**Above left:** *Teggie Ann* copilot **Capt. Ralph Thompson (l)** and **Col. Keith Compton (r)**, 376th Bomb Group commander, help **Brig. Gen. Uzal Ent** put on the standard flak jacket used by all crew members on the mission. **Above:** **Col. Leon Johnson (l)**, leading the 44th Bomb Group, and **Col. John “Killer” Kane (r)**, commander of the 98th Group, were 20 minutes behind the lead elements.

four were lost in the target area, seven set down in Turkey and were interned there, 19 landed at Cyprus and other Allied bases, and the others crashed. Personnel losses were 310 killed, 108 captured, and 78 interned in Turkey.

At least 54 of the aircraft that made it back to Benghazi were damaged too badly to ever fly again. Allegations persisted for years that the losses were even worse than announced. In any





event, it was the end of Ninth Air Force as an independent bomber command. What was left of it was transferred to England where it was converted to a tactical air arm to support the D-Day invasion of Europe.

Every airman who flew the mission received the Distinguished Flying Cross, and five of them were awarded the Medal of Honor, the most ever presented for a single engagement.

Soon after the battle, Kane and Johnson received Medals of Honor for leading their groups through the fire and flak to strike their targets. Shortly thereafter, the Medal was awarded posthumously to Hughes, who had pushed on in his flaming airplane to hit his target at Campina.

Baker and Jerstad were also awarded Medals of Honor posthumously—over the objection of some traditionalists in Washington who argued they had disobeyed orders by breaking away from the formation. Eventually, outrage from airmen who had been on the mission overcame the naysayers and the awards were approved.

Ent was promoted to major general. Colonel Compton retired in 1969 as a

lieutenant general and vice commander of Strategic Air Command. Colonels Johnson and Smart became four-star generals and retired in the 1960s. Killer Kane, despite his Medal of Honor, was never promoted again.

No plan had been made for follow-on attacks. Allied bombing missions were allocated to strategic targets regarded as being of greater priority and Ploesti went untouched until the late spring of 1944.

Gen. Carl A. “Tooe” Spaatz, commander of US Strategic Air Forces in Europe, argued for the continued bombing of German oil assets but the British view, which favored emphasis on marshaling yards and other transportation targets, prevailed. That changed as American influence on Allied strategy increased.

In April 1944, Fifteenth Air Force began sustained operations against Ploesti from bases in Italy. Over the next year, Fifteenth Air Force mounted 24 strikes against Ploesti, a total of 5,675 sorties

by B-24s, B-17s, and other bombers. Altogether, 254 aircraft were lost on these missions.

In addition, allied aircraft struck the German oil infrastructure elsewhere, including the synthetic fuel plants in Germany.

“A new era in the air war began,” said German armaments minister Albert Speer. Production from Ploesti was almost ended before Romania surrendered in 1944. By fall, the Luftwaffe was essentially grounded, unable to fly or train for lack of fuel, and the German army was immobile. German armaments production had been brought to a standstill.

Ploesti is remembered more for valor than for strategic results. However, the questions remain: What if Operation Tidal Wave had not been beset by the strange combination of mistakes that reduced its results and increased its losses? And what might have been possible if Ploesti had not been a one-shot effort in 1943? ★

*John T. Correll was editor in chief of Air Force Magazine for 18 years and is now a contributor. His most recent article, “The Lingering Story of Agent Orange,” appeared in the January issue.*



# Hard Targets

By Barrett Tillman

AP photo/Terry Ashe

**An attempt to destroy German U-boats in their pens was fraught with peril and frustration.**







*A B-17 (top photo) opens its bomb bay door as it nears the target, the U-boat pens in Toulon, France (bottom photo).*

**B**etween October 1942 and October 1943 the US Army Air Forces' Eighth Air Force flew more than 2,000 sorties against German submarine bases at Lorient, Saint-Nazaire, and Brest, in France, and against Bremen, Emden, Kiel, and Wilhelmshaven in Germany.

The missions accomplished little against the massive U-boat shelters, but the effort cost the Eighth 135 bombers (including 16 written off), for an unsustainable 5.9 percent loss rate. Shockingly, almost 1,200 airmen were killed or captured in the 119 missing aircraft.

Seven decades later, perspective and context help explain these frustrating and tragic events.

As with most segments of the US military at the time of Pearl Harbor in December 1941, the AAF's anti-submarine warfare (ASW) effort was forced to play catch-up. Informally organized and poorly equipped, the Army ASW mission badly needed long-range aircraft, notably the Consolidated B-24 Liberator, but had to rely on less capable types.

Unlike the Royal Air Force's Coastal Command, the AAF had no ASW flying boats so land-based aircraft were required. However, the Army was focused on strategic bombardment, and with B-24s also going to the British, the ASW campaign had to make do for months into the war.

Furthermore, Germany's submarine operating bases were beyond the new Eighth Air Force's reach for nearly a year. The only option at the time was to kill U-boats at sea.

It was not an easy task. From the start of the European war in September 1939 through the end of 1942, Allied forces sank 159 U-boats—merely four a month. Meanwhile, the “gray wolves” preyed on Atlantic convoys, typically destroying 36 ships of 180,000 tons per month throughout 1941. The monthly figure soared to half-a-million tons for 1942, when U-boats sank 12 ships for each sub lost.

Allied navies, led by Britain, made dramatic progress technically, operationally, and with ASW intelligence especially.

#### **A RARE KILL**

The decisive year was 1943, when escort aircraft carriers closed the deadly Atlantic gap that existed in the middle of the ocean beyond the reach of land-based aircraft.

In the second quarter of 1943 the German U-boat command wrote off 73 submarines for only 120 Allied ships sunk, and German losses exceeded production. As a result, the path to the Normandy landings of June 1944 led across the rolling gray expanse of the North Atlantic's shipping lanes.

However, sub kills were rare, mainly because U-boats were extremely hard to find. Knowing the locations of their lairs, the RAF attacked pens in France in early 1942 but soon lost interest owing to a clear lack of results. All the while, construction of U-boat shelters proceeded apace.

Submarine pens represented one of the most intensive building programs in the Third Reich. Before the Battle of Britain ended in 1940, construction

was underway at Hamburg and Heligoland. Ever methodical, the Germans conserved material by designing four types of structures: covers over locks to protect boats being raised or lowered; bunkers for U-boat assembly yards; postconstruction or “fitting out” bunkers where equipment was installed; and most notably pens for deploying submarines and those under repair.

Most operating pens were on the French coast at Bordeaux, Brest, La Pallice, Lorient, and Saint-Nazaire. Together they consumed 5.7 million cubic yards of concrete. Construction was mostly accomplished in 1942 though some facilities remained unfinished when the Allies occupied northern France in 1944.

Submarine pens were massive structures largely impervious to conventional bombing. The Saint-Nazaire pen, for instance, had walls 11 feet thick with a 16-foot roof. German engineers calculated that the roof could withstand bombs of 7,000 pounds—more than an American aircraft could typically carry.

The Todt Organization, a German construction firm, built 14 pens at Saint-Nazaire and 20 at Lorient, mainly completed in 1943. Some were immense: Saint-Nazaire's base measured 945 feet by 455, reaching 58 feet high. The nearby Keroman facility at Lorient began building in February 1941, and despite 200 workers killed in British bombings, the first of three pens accepted U-boats that August.

U-boat bases in Norway were an obvious benefit to Kriegsmarine operations in the Arctic Ocean, but the intended pens came to naught. Facilities at Bergen and





Photos by Rama

Trondheim, begun in 1941, were left largely incomplete owing to weather and a shortage of heavy equipment.

Airpower wisdom holds that any target worth bombing is worth defending. Lorient fit this description, surrounded by 20 naval batteries. Five lesser batteries were deployed farther afield.

USAAF only established a dedicated antisubmarine command in October 1942. Brig. Gen. C. W. Russell, AAF coordinator for antisubmarine activity, favored attacks on U-boat production facilities and operating bases rather than emulating RAF Coastal Command's policy of hunting submarines at sea. His opinion seemed to have merit—the RAF had long since abandoned daylight bombing operations as too costly, while accepting nocturnal bombing's inevitable reduction in accuracy.

But America's faith in daylight precision bombing seemed valid against targets such as U-boat shelters versus the RAF's aimpoints of city centers. The power brokers accepted the approach offered by Russell and others.

There were practical advantages as well. The Bay of Biscay, where the bases were located, was within easy reach of AAF bases in Britain—London to Saint-Nazaire was 300 miles, Brest even less. The entire approach could be made over water, largely avoiding Luftwaffe interceptors. That was a major concern, as the Biscay ports lay well beyond the escort range of RAF Spitfires and would remain beyond that of P-47s when they went operational in mid-1943.

In October 1942, the Eighth received a new list of priority targets. Topping the menu—above German industry—were submarine bases, in an effort to support the Battle of the Atlantic.

That month, German Adm. Karl Doenitz's 105 U-boats in the North Atlantic and Arctic sank nearly 90 merchant vessels of some 585,000 tons—and that was only part of the story. Since January 1942, U-boats had sent 779 merchantmen to the bottom, not counting other Allied sea losses to aircraft and mines. For the eventual Allied invasion of Nazi-occupied France to occur, the sea-lanes had to be more secure.

The new priority was not entirely welcomed among airpower strategists. They recognized the ASW campaign as defensive in nature rather than depriving the Third Reich of its production base. Nonetheless, the order stuck.

In October, Lt. Gen. Dwight D. Eisenhower responded to Maj. Gen. Carl A. "Tooe" Spaatz's concerns by declaring the U-boat campaign "one of the basic requirements to the winning of the war." Eisenhower linked bombing submarine bases to the success of Operation Torch, the invasion of French Morocco in November 1942.

At the core, Eisenhower was correct: Defeat of the U-boats was essential to D-Day's eventual success. But his optimism about the efficacy of bombing massive submarine pens—shared by other commanders—proved badly misplaced.

Some senior airmen saw the potential miscalculation. As early as the end of October 1942, Spaatz told Lt. Gen. Henry H. "Hap" Arnold, "Whether or not these operations will prove too costly for the results obtained remains to be seen. The concrete submarine pens are hard, maybe impossible nuts to crack." He leavened the tart message with the hope that damage to adjacent facilities might handicap the German submarine

effort. U-boat support infrastructure was frequently damaged—sometimes seriously—but the Germans became masters of repair and improvisation.

## A YEARLONG CAMPAIGN

AAF's yearlong antisubmarine campaign began on Oct. 21, 1942, with an inauspicious debut at Lorient. Of the four bomb groups committed, only the 97th Bomb Group penetrated heavy weather. Consequently, the defenders concentrated on Brig. Gen. Joseph H. Atkinson's 21 B-17s, which had descended through a convenient hole in the clouds. Luftwaffe radar controllers vectored 36 Focke-Wulf 190s onto the Americans. Three of the rearmost bombers were hacked down and six shot up.

The others pressed ahead, unloading their bombs across five sub pens, but not even their one-ton ordnance made an appreciable dent.

Frustrated by poor results, on Nov. 9, VIII Bomber Command directed a perilously low-level mission against Saint-Nazaire. An RAF deception drew off many German fighters, but the anti-aircraft gunners were presented a rare gift: a dozen B-24s at about 18,000 feet with 31 B-17s between 7,500 and 10,000 feet.

Plowing through heavy, accurate flak, the lower formation lost three B-17s while 22 took damage. Despite the expected greater accuracy, bomb plots were disappointing: Only about eight struck within 200 yards of either aimpoint. Nearby rail tracks were hit but easily repaired.

The Eighth's Lt. Gen. Ira C. Eaker drew the obvious lesson—subsequent attacks on sub bases were flown from





17,500 to 22,000 feet, encountering less accurate flak.

Lacking fighter escort, AAF stuck to its doctrinal guns: “The bomber will always get through.” Generally speaking, that was true, but it ignored the awful reality: Surviving bombers inflicted little worthwhile damage for the growing cost.

Eighth headquarters pressed on. In January, Eaker happily reported that bombers could knock down six fighters for every bomber loss. In truth, by that time German fighters were downing bombers better than at parity—a clear German victory.

By the end of 1942, photo interpreters reported visible damage at Lorient and Saint-Nazaire, more from repetition than accuracy. The five missions between Nov. 9 and 23, 1942, involved 158 bombers releasing 385 tons on the sub base or the port area. While submarine-affiliated support and transport facilities were damaged enough to affect operations, the pens withstood the battering.

Meanwhile, from late November to early January, Saint-Nazaire endured no attacks, permitting industrious work crews to repair the damage. RAF intelligence concluded that the port was fully operational the first week in December.

The operations continued. On Jan. 3, 1943, Col. Curtis E. LeMay’s 305th BG flew Eighth Air Force’s sixth Saint-Nazaire raid. His innovative staggered formation within the group pointed the way toward the Eighth’s evolution in tactics as the war progressed.

That same day the 303rd BG lost four B-17s over Saint-Nazaire. One was *Snap! Crackle! Pop!*, which took flak, killing seven airmen. The ball turret gunner, SSgt. Alan E. Magee, was pitched out of the stricken Fortress without his

chest-pack parachute. From 20,000 feet, he smashed into the roof of the train station and sustained serious injuries, including a nearly severed arm, but he miraculously survived.

Magee was taken to a hospital where he received excellent treatment. “I owe the German military doctor who treated me a debt of gratitude,” he said. The doctor told him, “We are enemies, but I am first a doctor and I will do my best to save your arm,” Magee recalled, according to a 1996 303rd Bomb Group newsletter.

Magee never knew the doctor’s name but the German had saved his arm. In 1995, the city of Saint-Nazaire honored Magee and the crew of *Snap! Crackle! Pop!* with a memorial plaque.

## RATE OF ATTRITION

Vegesack, Germany, became a frequent sub-pen target. Lying on the Weser River, 30 miles inland, the pen was the Eighth’s first target in Germany.

On Jan. 27, 1943, Col. Frank A. Armstrong Jr. shoved up the power to his 306th Bomb Group B-17F, leading 63 other B-17s outbound. He was among the most experienced commanders in the AAF, having led the first heavy bomber mission over France in August 1942.

Looping northward to avoid overflying hostile territory, Armstrong penetrated Reich airspace from the coast but found the primary target smothered by cloud. Thus, Vegesack was temporarily spared and the task force opted for the secondary target, Wilhelmshaven’s port area. Damage was moderate, and the B-17 bombers sustained only one loss to the surprisingly mild defensive effort.

On March 18, the bombers returned to Vegesack, again including the 303rd

***The hardened U-boat pens at Saint-Nazaire (above and above left). The town was both a rail center and a port, making it an obvious and valuable target for the Allies, who bombed it almost continuously.***

“Hell’s Angels” bomb group. The lead bombardier was 1st Lt. Jack W. Mathis, a 21-year-old Texan in 1st Lt. Harold L. Stouse’s *The Dutchess*. Flying his 14th mission, Mathis was well-regarded—the squadron would “drop on his lead.”

During the run to the target the formation met heavy flak that pummeled the low bombers flying at 24,000 feet. Less than a minute from bombs-away, a shell detonated near the right side of *The Dutchess*’ nose. Metal shards blasted through the plexiglass, hurling Mathis to the rear of the compartment.

Bleeding profusely, Mathis ignored his nearly severed right arm, crawled back to his sight, and dropped his bombs. Then he collapsed and died.

The 303rd did lose an airplane that day but Stouse got *The Dutchess* back to RAF Molesworth, UK. Mathis became the Eighth’s first Medal of Honor recipient.

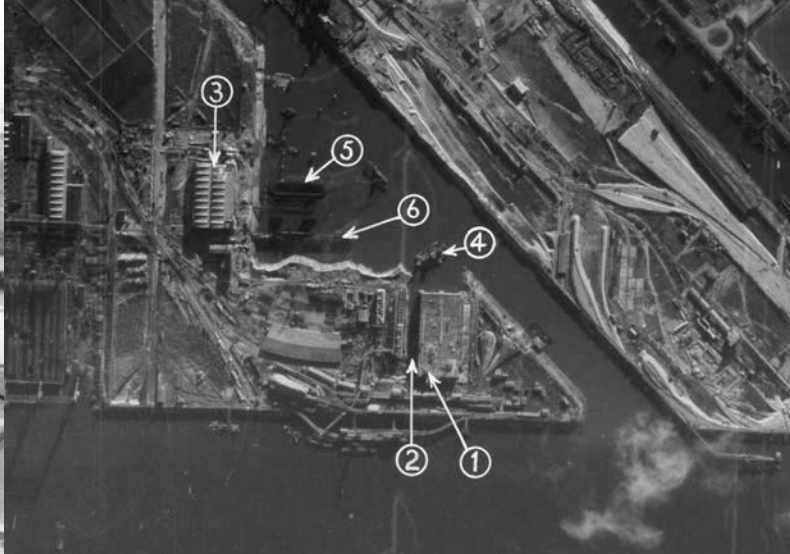
As the Eighth still lacked long-range fighters, on June 11, 1943, Wilhelmshaven provided another hard lesson in self-defense. Of 252 B-17s launched for the mission, 168 dropped on the sub base and 30 on the port of Cuxhaven. Eight B-17s were shot down and more than 60 damaged.

The B-17 gunners claimed an astronomically high figure of 85 German fighters destroyed, but in reality the Luftwaffe only lost four. Instead of a 10-to-one loss ratio, the B-17s were on the short end of two-to-one odds—and carried much larger crews to boot.





Bundesarchiv photo by Jesse



**Clockwise from left: The harbor at Marseilles before it was bombed by AAF B-17s. Nazi Gen. Wilhelm Fahrmbacher (center) leads Field Marshal Erwin Rommel (left) on a tour of the U-boat bunkers at Saint-Nazaire. Probable U-boat pens at Hamburg are marked number one.**

mote control, aiming via a television camera in the nose.

The Aphrodite “designated hitter” was the 388th BG at RAF Knettishall, UK. It dedicated a squadron to the project. US Navy patrol bombers also participated, and in August 1944 the seventh Aphrodite mission, targeting a fortress on the French coast, ended with an in-flight explosion. It killed Navy Lt. Joseph P. Kennedy Jr. and his engineer, Lt. Wilford J. Willy.

Among the 19 Aphrodite missions, five targeted the North Sea’s Heligoland pens in September and October 1944. Of seven aircraft launched, two were downed by flak and three crashed or missed the target.

Another specialized weapon used to hit pens was the 4,500-pound concrete piercing “Disney bomb,” a rocket-assisted “bunker buster” conceived by the British Royal Navy. With an extremely high impact velocity, the Disney was expected to penetrate 16 feet of concrete before exploding.

Though potentially effective, the Disneys arrived far too late to defeat the U-boats, only reaching combat units attacking the Bremen pens in March 1945, with the Battle of the Atlantic over.

In March and April 1945 RAF Lancaster bombers, employing 11-ton Grand Slam bombs, struck U-boat pens at Valentin and Hamburg, inflicting substantial

damage upon largely useless facilities.

Between July 1942 and August 1943, AAF aircraft are believed to have sunk seven U-boats at sea and shared three more. However, Army bombers sank or destroyed as many as 46 in port, including many at Toulon.

Eighth Air Force bombers struck sub pens at least 27 times from October 1942 to October 1943.

The official AAF history concluded, “Undoubtedly the AAF raids caused temporary dislocations during the early months, ... especially at Saint-Nazaire. Clearly, also, they harassed the enemy by destroying auxiliary construction plants and neighboring railway facilities.”

A postwar interrogation provided a reasoned assessment of the bombing’s effectiveness. Doenitz, the commander of the U-boat fleet, said the sub pens were “impervious to anything but the heaviest type of bomb,” although the bases included the subs’ maintenance and repair shops. He concluded that bombing adjacent installations did not significantly detract from returning boats to the Atlantic supply routes.

Some planners resented the campaign against U-boat bases, insisting that it bled off weight of tonnage that should have been more usefully expended on German industry. There is some merit to the argument, as the Eighth’s first penetration of Reich airspace in January 1943 overlapped the remaining submarine missions by 10 months.

The legacy and frustration of the 13-month campaign is still evident today. On the Biscay coast most of the massive shelters remain intact, with bunkers at Lorient and Brest serving the French Navy. ★

An inevitable consequence of World War II bombing was collateral damage—what some analysts called “spillage.” Because Saint-Nazaire was a rail center as well as a port, it received near continuous bombing, resulting in nearly 500 known civilian deaths and destruction of perhaps 85 percent of the city. Nearly all the residents were evacuated by the spring of 1943.

## LATE WAR EFFORTS

One of the war’s most technically ambitious programs was Project Aphrodite, an early attempt at precision weapons—which also targeted U-boat pens. “War-weary” bombers were stripped of unnecessary weight and crammed with as much as 15 tons of high explosives. A pilot and ordnance man took off in the bomber, armed it in flight, and bailed out. A guidance aircraft then flew the bomber by re-

*Barrett Tillman is an award-winning historian who has written 50 books, including his recent *Forgotten Fifteenth: The Daring Airmen Who Crippled Hitler’s War Machine*. His previous article for *Air Force Magazine*, “The Mustangs of Iwo,” appeared in April 2013.*

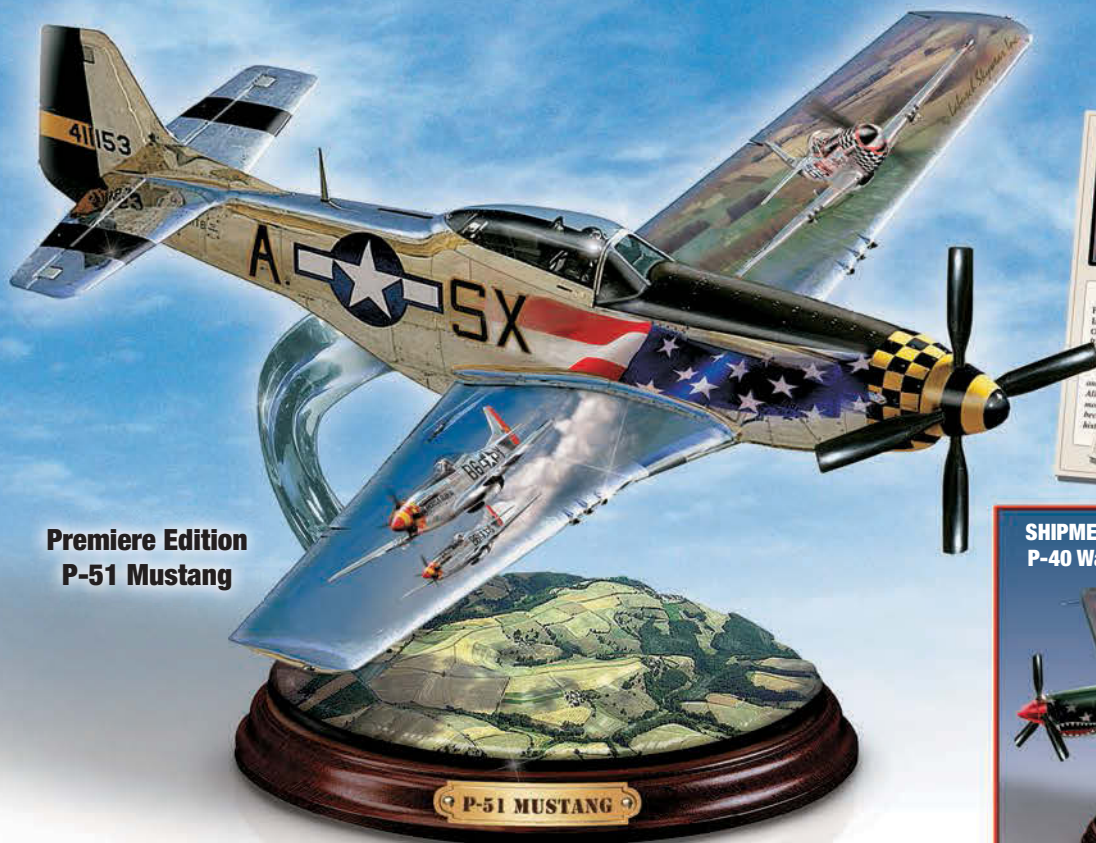


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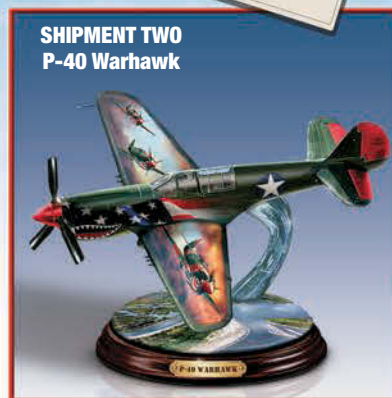
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# AFA National Report

natrep@afa.org

By Frances McKenney, Assistant Managing Editor



## Emerging Leaders

The Air Force Association's Emerging Leaders Program began in 2013 as a way to prepare volunteers for future AFA leadership roles. Emerging Leaders serve for a year. They participate on a national-level council, attend national leader orientations, and serve as National Convention delegates.

Emerging Leaders for 2015 are: Emilie S. Boschert, Shannon M. Farrell, Deborah A. Landry, Michael J. Liquori, Emily C. Shay, Christopher M. Talbot, James A. Thurber, Jeremy Trotter, and Daniel Whalen.

Here's the fourth profile in AFA's second group of Emerging Leaders.

### Michael J. Liquori

**Home State:** Massachusetts.

**Chapter:** Central Florida.

**Joined AFA:** 2000.

**AFA Offices:** Chapter Executive Committee member. Formerly Florida Central East Area VP, chapter president, and chapter VP.

**AFA Awards:** National-level Medal of Merit, Exceptional Service Award, and Chairman's Citation.

**Military Service:** 12 years Active Duty. Now an active Reserve lieutenant colonel (IMA).

**Education:** B.A., Boston University; M.A., University of Oklahoma.



## Q&A

**You have two teenagers. How can AFA increase its appeal to young people?** From my perspective, the key thing I try to focus on when I talk to my kids is the value of service and doing something that's bigger than worrying about yourself.

**Have you seen this actually work?** I had that experience when I talked to ROTC cadets at the University of Central Florida, when I brought them to the Air Warfare Symposium and AFA Gala [in Orlando, Fla.].

**What's kept you involved in AFA?** It's a cause I believe in—not only the impact that AFA has on the Air Force itself, but the chapter's scholarships and other events. ... To see the impact—that's got me involved in this group of people.



*Liquori's a big fan of water sports. In this 2012 photo, he's flowboarding on an artificial wave aboard a cruise ship in the Caribbean. He's surfed in the real ocean, too.*



Photo by Doris Goetz

*In Arizona, Frank Luke Chapter members volunteered at a Phoenix homeless shelter recently. Treasurer TSgt. Adria Baker (third from right) was among nearly a dozen chapter members helping with dinner. President Matthew Pulsipher plans to make this project a monthly event.*

## No Strong-Arm Tactics Necessary

To hear the **Frank Luke Chapter's** new president tell it, it's easy to sign up new members for the Air Force Association.

SMSgt. Matthew Pulsipher, superintendent at the 56th Comptroller Squadron at Luke AFB, Ariz., said, "All I did was spread the word. I didn't have to force them." He billed AFA as offering "the opportunity to be involved and excel," he said, "And bam! They were out at the next meeting."

Pulsipher continued: "What interested them was the potential and opportunities that existed out there."

He said chapter activities, such as the chance to work with Air Force JROTC cadets, to talk to first-term airmen, and to support dinners, awards, and other events that benefit Luke airmen all appealed to those contemplating joining AFA.

The chapter's newly elected leaders, headed by Pulsipher, are: A1C Adriana Van Wyk, inspection technician with the 56th Equipment Maintenance Squadron, who joined AFA in June and is now chapter VP; Treasurer TSgt. Adria Baker, chief of the Financial Services Flight, 56th Comptroller Squadron, an AFA member since April; and SSgt. LaKindra Favors, a budget analyst with the 56th, now serving as chapter secretary. She joined AFA in May.

Photo by Luisa Bailey



*Frank Luke Chapter's all-enlisted leadership (l-r): SMSgt. Matthew Pulsipher, A1C Adriana Van Wyk, TSgt. Adria Baker, and SSgt. LaKindra Favors.*



## How To Take Better Photos

The **Carl Vinson Memorial Chapter** in Georgia created a guide 10 years ago—and the advice still stands.

Good photos, says the chapter, “increase the chances of your news release being published.”

The chapter’s counsel appears on AFA’s Website: Go to the Field Leaders section, then the Library’s Guidebooks/ Handbooks, and click on “Public Relations 101.” Here are the chapter’s best photo tips:

- Take an action photo—an unposed, candid photo where the subject isn’t looking at the photographer.
- Avoid group pictures. When a group picture is expected, take one, but also take the candid photo. Give the group shot to the group. Submit the candid for publication.
- Take more than one photo. It’s better to have too many pictures than to miss a photo opportunity.



Photo by Cadet Daniel M. Iwata

These two photos—both taken by amateur photographers—illustrate candid, unposed action.

**Below: Long Island Chapter Treasurer Bill Stratemeier stands at the podium as a Navy detail presents roses to Pearl Harbor-attack survivors. Read about this Dropping of the Roses ceremony on the following page.**



Photo by Anthony di Fabio

**At left: Arnold Air Society cadets Anthony Coronato, Joshua Hensrud, and Scott Wolff (l-r), from University of North Dakota in Grand Forks, take in information from airmen at Minot AFB, N.D. The Gen. David C. Jones Chapter arranged this all-day orientation for the cadets in December and a luncheon for them at the all-ranks club, with North Central Region President Jim Simons as host.**

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## Dropping of the Roses

The **Long Island Chapter** in New York conducted their 19th annual Pearl Harbor memorial ceremony on Dec. 7. (See photo, p. 87.)

The remembrance took place at the American Airpower Museum in Farmingdale, N.Y., with local media coverage.

Called the Dropping of the Roses, the event included blessing 73 American Beauty roses, symbolizing the years since the Japanese surprise attack on Pearl Harbor that killed more than 2,000 US military personnel.

Taps and a ship's bell rung nine times reminded the audience that nine survivors of the attack had died since last year's ceremony.

Spectators then watched as Navy sailors handed the roses to pilots of a World War II-vintage SNJ Texan trainer. The warbird took off from Republic Airport—where the museum is located—and flew to the waters surrounding the Statue of Liberty in New York Harbor. The roses are always dropped from the SNJ at the exact East Coast time of the 1941 attack.

The Dropping of the Roses ritual began with Joe Hydrusko. He was aboard the hospital ship USS *Solace* when the Japanese airplanes began dropping bombs on the battleships, cruisers, and destroyers at Pearl Harbor on that Sunday morning. Hydrusko took a motor launch from ship to ship, picking up the wounded. In 1970 he decided to do a Statue of Liberty fly-by in a vintage aircraft to remember those who died.

At this 2014 ceremony, the more than 600 guests included several state political leaders and US Rep. Steve Israel (D-N.Y.). He presented US flags that had flown over the US Capitol to three special-guest Pearl Harbor survivors of the attack.

**Gold Coast Chapter member Virginia Knudsen coaches this all-girls, first-time CyberPatriot team from Parkway Middle School of the Arts in Fort Lauderdale, Fla. Making a fashion statement with just some of the swag—including the sunglasses—provided to all competitors are (l-r): Valerie Deris, Codi Mason, Tashadeen Thomas, Samantha Singh, and Anquinette Scarlett.**



Photo by Virginia Knudsen

## Writing for Publication

The **Lance P. Sijan Chapter (Colo.)** in October awarded winners of the Gen. Bernard A. Schriever Memorial Essay Contest.

The contest's purpose: to stimulate discussion on how USAF and Air Force Space Command provide space and cyberspace capabilities.

The prize? Publication in *Air and Space Power Journal* and \$1,000, \$750, and \$500 for the top three essays.

Lt. Col. Joseph lungerman of AFSPC headquarters' A8 won first place with his essay, "What Happens If They Say 'No'? Preserving Access to Critical Commercial Space Capabilities During Future Crises."

"Space Sustainment: A New Approach for America in Space," by Lt. Col. Kris Barcomb of 24th Air Force's A5X, earned second place.

Capt. Bryan Bell and 2nd Lt. Even Rogers coauthored the third-place winning essay.

You can read the essays at: <http://www.airpower.au.af.mil/>.

Retired Gen. Lance W. Lord, who headed AFSPC until 2006, led the committee of judges: six people from AFSPC, Air University, industry, and AFA. They evaluated 20 submissions.

George Bradley, AFSPC director of history, served as contest project officer. The Sijan Chapter's Roy Griggs was contest project manager.

## Michael H. Emig (1946-2014)

Michael H. Emig, president of the **Red Tail Memorial Chapter** in Florida and a former Florida Region president, died suddenly on Thanksgiving Day. He was 68 years old.

Born in York, Pa., he joined the Air Force in 1965 and served for three years, followed by three more in the reserve, according to information he provided for an AFA Membership Directory.

An Ocala (Fla.) newspaper reported that Mr. Emig's civilian career was in the dental and financial services fields.

He worked tirelessly on promoting AFA. In *Air Force Magazine*, his work—and tactics as a field leader—were most recently spotlighted in the December 2014 issue, p. 78.

## Richard F. Ball (1959-2014)

New Jersey's **Highpoint Chapter** president, Richard F. Ball, died in Newton, N.J. on Sept. 6, 2014.

He had served in the Army as a chaplain. Mr. Ball was also known for boundless energy. In 2011, for example, he worked an armed forces relief fundraiser all day and stayed till 1:30 a.m.

He had joined AFA in 2006 and became chapter president in 2010. When the chapter newsletter announced his taking on the top job, it also mentioned, "He has personally recruited seven new members and three new Community Partners." ❄

USAF photo by Duncan Wood



**Lance P. Sijan essay contest winners and principals (l-r): George Bradley, Roy Griggs, AFSPC Vice Commander Maj. Gen. David Buck, Chapter President Dave Shiller, Lt. Col. Joseph lungerman, Capt. Bryan Bell, and 2nd Lt. Even Rogers. Lt. Col. Kris Barcomb (not pictured) received his award from Buck at a separate ceremony.**

## Reunions

[reunions@afa.org](mailto:reunions@afa.org)

**F-86 Sabre Pilots Assn.** April 26-28 at the Gold Coast Hotel/Casino in Las Vegas. **Contact:** J. R. Alley, P.O. Box 34423, Las Vegas, NV 89133 (702-363-9880) (alleyoop3@cox.net).

**Nagoya/Komaki AB, Japan.** May 19-22 in Des Moines, Iowa. **Contact:** Hugh

Greenwood, 7700 NW 16th St., Ankeny, IA 50023 (515-289-1951) (hl\_re\_greenwood@mchsi.com).

**Three-War Veterans** (all services). May 18-20 in Las Vegas. **Contact:** Lee Yagle (888-452-3434) (All3Wars@aol.com). ■





**Above:** In New Jersey, Sal Capriglione Chapter officers attended a ceremony for Civil Air Patrol cadet Matthew Rojas. He received CAP's General Billy Mitchell Award. Lined up l-r are: CAP officials Jose Rojas, Frank Tino, and Michael Castania; Chapter President Joseph Capriglione; Matthew Rojas; Chapter VP Anthony Devino; and CAP officials Steven Tracy and David Isom.



**MSgt. Carolyn Russell** (left in each photo) represented the **David C. Jones Chapter** at November's **Community College of the Air Force** graduation at **Minot AFB, N.D.** She presented **AFA Pitsenbarger Awards** to **SSgt. John Williams** (left), **SrA. Morgan Shepherd**, and **SSgt. Antonio Tanksley** (below). The \$400 awards help **CCAF** grads go on to earn bachelor's degrees. The chapter also hosted a reception at the ceremony.



USAF photos by SrA. Stephanie Morris



**US Rep. Sam Johnson** (fifth from left) attended a **Seidel-AFA Dallas Chapter** meeting and congratulated these **Civil Air Patrol** cadets. They had just completed their summer solo encampment, sponsored by the chapter. A **Texas Republican**, Johnson served in **USAF 1950-79** and was a **Vietnam War POW**.

#### Have AFA Chapter News?

Email "AFA National Report" at: [natrep@afa.org](mailto:natrep@afa.org). Email digital images at highest resolution, as separate jpg attachments, not embedded in other documents.



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# AFA Field Contacts



## Central East Region

### Region President

#### F. Gavin MacAloon

4153 Monument Hill Way, Apt. 15101, Fairfax, VA 22030 (540) 295-2774 (gavin.macaloon@termiana.com).

### State Contact

**DELAWARE:** William F. Oldham, 246 York Dr., Smyrna, DE 19977 (302) 653-6592 (oldham10@msn.com).

**DISTRICT OF COLUMBIA:** Bruce VanSkiver, 5765 Fincastle Dr., Manassas, VA 20112 (703) 583-9473 (bruce.vanskiver@yahoo.com).

**MARYLAND:** Frank Sciafani, 508 Oakwood Station Rd., Glen Burnie, MD 21061 (386) 956-1851 (sciafani.frankie@gmail.com).

**VIRGINIA:** James H. McGuire, 5467 Chestnut Fork Rd., Bedford, VA 24523 (540) 297-6520 (james.hensel.mcguire@gmail.com).

**WEST VIRGINIA:** Herman N. Nicely II, 4498 Country Club Blvd., South Charleston, WV 25309 (304) 768-5301 (hnicely@yahoo.com).

## Far West Region

### Region President

#### Lee Barnby

4839 Stillwell Rd., Santa Maria, CA 93455 (805) 863-3690 (leembarnby@gmail.com).

### State Contact

**CALIFORNIA:** Juan E. Cruz, 4203 Polaris Ave., Lompoc, CA 93436 (805) 735-8820 (juancruz-afa@outlook.com).

**HAWAII:** Newton H. Wong, 3308 Paty Dr., Honolulu, HI 96822 (808) 258-0839 (newtonhw.afa@hawaii.com).

## Florida Region

### Region President

#### Dann D. Mattiza

1786 Bridgeport Colony Ln., Fort Walton Beach, FL 32547 (850) 314-6673 (flafa-dann@cox.net).

### State Contact

**FLORIDA:** Dann D. Mattiza, 1786 Bridgeport Colony Ln., Fort Walton Beach, FL 32547 (850) 314-6673 (flafa-dann@cox.net).

## Great Lakes Region

### Region President

#### Paul Lyons

4211 Fieldbrook Pass, Fort Wayne, IN 46815 (260) 755-3510 (paul.lyons.afa@gmail.com).

### State Contact

**INDIANA:** Milford Compo, 10655 106th Pl., Carmel, IN 46033 (317) 844-7054 (mecompo@gmail.com).

**KENTUCKY:** Curtis Meurer, 2256 Lancaster Rd., Danville, KY 40422 (859) 238-2146 (kyafapresident@gmail.com).

**MICHIGAN:** Bill Day, 199 Charlotte Pl., Bad Axe, MI 48413 (989) 975-0280 (freelance3@comcast.net).

**OHIO:** Jeff A. Liffick, 416 Greensward Dr., Tipp City, OH 45371 (937) 985-4152 (jliffick@afadaytonwright.com).

## Midwest Region

### Region President

#### Russell A. Klatt

10024 Parke Ave., Oak Lawn, IL 60453 (708) 422-5220 (russell.klatt@ameritech.net).

### State Contact

**ILLINOIS:** Don Taylor, 2881 N. Augusta Dr., Wadsworth, IL 60083 (210) 386-1291 (dontaylor@taylor.com).

**IOWA:** Ronald A. Major, 4395 Pintail Dr., Marion, IA 52302 (319) 550-0929 (ron.major@yahoo.com).

**KANSAS:** Gregg A. Moser, 617 W. 5th St., Holton, KS 66436 (785) 364-2446 (greggamoser@aol.com).

**MISSOURI:** Fred W. Niblock, 808 Laurel Dr., Warrensburg, MO 64093 (660) 429-1775 (niblockf@comcast.net).

**NEBRASKA:** Richard T. Holdcroft, 13701 S. 37th Cir., Bellevue, NE 68123 (402) 250-8152 (richard.holdcroft@atkc.com).

## New England Region

### Region President

#### Ronald M. Adams

5A Old Colony Dr., Westford, MA 01886 (978) 392-1371 (ronald.m.adams@comcast.net).

### State Contact

**CONNECTICUT:** John P. Swift III, 30 Armstrong Rd., Enfield, CT 06082 (860) 749-5692 (john.swift@pw.utc.com).

**MAINE:** Ronald M. Adams, 5A Old Colony Dr., Westford, MA 01886 (978) 392-1371 (ronald.m.adams@comcast.net).

**MASSACHUSETTS:** Joseph Bisognano, 4 Torrington Ln., Acton, MA 01720 (978) 263-9812 (jbisognano@msn.com).

**NEW HAMPSHIRE:** Kevin M. Grady, 140 Hackett Hill Rd., Hooksett, NH 03106 (603) 268-0942 (jaws15@hotmail.com).

**RHODE ISLAND:** Dean A. Plowman, 17 Rogler Farm Rd., Smithfield, RI 02917 (401) 413-9978 (dean695@gmail.com).

**VERMONT:** Raymond Tanguay, 6 Janet Cir., Burlington, VT 05408 (802) 862-4663 (rjtanguay@yahoo.com).

## North Central Region

### Region President

#### James W. Simons

908 Village Ave. S.E., Minot, ND 58701 (701) 839-6669 (minotranger@min.midco.net).

### State Contact

**MINNESOTA:** Glenn M. Shull, 7098 Red Cedar Cove, Excelsior, MN 55331 (952) 831-5235 (glennshull@gmail.com).

**MONTANA:** Lee Feldhausen, 808 Ironwood St., Great Falls, MT 59405 (720) 299-4244 (ugfeld@yahoo.com).

**NORTH DAKOTA:** Ronald L. Garcia, 1600 University Ave. W., Minot, ND 58703 (701) 839-5423 (trinidad.ron@gmail.com).

**SOUTH DAKOTA:** Ronald W. Mielke, 5813 Grand Lodge Pl., Sioux Falls, SD 57108 (605) 339-1023 (mielkerw@teamtsp.com).

**WISCONSIN:** Victor L. Johnson Jr., 6535 Northwestern Ave., Racine, WI 53406 (262) 886-9077 (racine.vic.kathy@gmail.com).

## Northeast Region

### Region President

#### Maxine Rauch

2866 Bellport Ave., Wantagh, NY 11793 (516) 826-9844 (javahit@aol.com).

### State Contact

**NEW JERSEY:** Howard Leach Jr., 11 Beech Dr., Morris Plains, NJ 07950 (973) 540-1283 (hbleach@aol.com).

**NEW YORK:** Charles Rauch, 2866 Bellport Ave., Wantagh, NY 11793 (516) 826-9844 (javahit@aol.com).

**PENNSYLVANIA:** George Rheam, 18 N. Wayne St., Lewistown, PA 17044 (717) 248-5665 (grheam@hotmail.com).

## Northwest Region

### Region President

#### Mary J. Mayer

2520 N.E. 58th Ave., Portland, OR 97213 (310) 897-1902 (maryjmayer@yahoo.com).

### State Contact

**ALASKA:** Harry F. Cook, 3400 White Spruce Dr., North Pole, AK 99705 (907) 488-0120 (hcook@mosquitonet.com).

**IDAHO:** Roger Fogleman, P.O. Box 1213, Mountain Home, ID 83647 (208) 599-4013 (rfogleman@msn.com).

**OREGON:** Mary J. Mayer, 2520 N.E. 58th Ave., Portland, OR 97213 (310) 897-1902 (maryjmayer@yahoo.com).

**WASHINGTON:** William Striegel, 3219 Cabrini Dr. N.W., Gig Harbor, WA 98335 (253) 906-7369 (whstriegel@comcast.net).

## Rocky Mountain Region

### Region President

#### Bob George

5957 S. Sharon Cir., Ogden, UT 84403 (801) 721-0664 (reegroeg@msn.com).

### State Contact

**COLORADO:** Stephen K. Gourley, 7037 S. Picadilly St., Aurora, CO 80016 (303) 693-7488 (stephen.k.gourley@gmail.com).

**UTAH:** Jay Mosley, 1749 Shoshone Dr., Ogden, UT 84403 (801) 475-0243 (jay.mosley@outlook.com).

**WYOMING:** Irene G. Johnigan, 503 Notre Dame Ct., Cheyenne, WY 82009 (307) 632-9465 (irenejohnigan@bresnan.net).

## South Central Region

### Region President

#### James M. Mungenast

805 Embarcadero Dr., Knoxville, TN 37923 (865) 531-5859 (bamaforce73@aol.com).

### State Contact

**ALABAMA:** Russell V. Lewey, 1207 Rison Ave. N.E., Huntsville, AL 35801 (256) 425-8791 (leweyrv@yahoo.com).

**ARKANSAS:** Jerry Reichenbach, 501 Brewer St., Jacksonville, AR 72076 (501) 837-7092 (jreichenbach@comcast.net).

**LOUISIANA:** C. Ben Quintana, 1608 S. Lexington Dr., Bossier City, LA 71111 (318) 349-8552 (cbenquintana@gmail.com).

**MISSISSIPPI:** Teresa Anderson, 2225 13th Ave., Gulfport, MS 36117 (228) 547-4448 (teresa@veterantributes.org).

**TENNESSEE:** Charles D. Bowker, 814 Trent Ln., Knoxville, TN 39501 (228) 671-6735 (cdbowker@hotmail.com).

## Southeast Region

### Region President

#### John R. Allen Jr.

225 Baldwin Rd.-12, Seneca, SC 29678 (864) 207-0827 (johnallen50@bellsouth.net).

### State Contact

**GEORGIA:** Jacqueline C. Trotter, 400 Stathams Way, Warner Robins, GA 31088 (478) 954-1282 (ladyhawkellc@gmail.com).

**NORTH CAROLINA:** Lawrence Wells, 4941 Kingspost Dr., Fuquay Varina, NC 27526 (703) 424-3920 (larrywellsafa@gmail.com).

**SOUTH CAROLINA:** Linda Sturgeon, 1104 Leesville St., North Charleston, SC 29405 (843) 963-2071 (lsturg1007@comcast.net).

## Southwest Region

### Region President

**ROSS B. Lampert**, 6984 S. Spruce Cir., Hereford, AZ 85615 (520) 220-6257 (afazona@cox.net).

### State Contact

**ARIZONA:** Joseph W. Marvin, 1300 S. Litchfield Rd., Suite A1020, Waddell, AZ 85338 (623) 853-0829 (joemarvin@psg-inc.net).

**NEVADA:** Robert Cunningham, 4509 Bersaglio St., Las Vegas, NV 89135 (719) 440-3433 (robertscdsk53@gmail.com).

**NEW MEXICO:** John Toohey, 1521 Soplo Rd. S.E., Albuquerque, NM 87123 (505) 294-4129 (johntoohey@aol.com).

## Texoma Region

### Region President

#### Richard D. Baldwin

3418 Candace Cir., Altus, OK 73521 (580) 477-2710 (riqb@cableone.net).

### State Contact

**OKLAHOMA:** Jerry McMahan, 4600 S.E. 29th St., Ste. 520, Del City, OK 73115 (405) 677-8500 (jerry.mcmahan@tetratex.com).

**TEXAS:** Gary L. Copsey, 29602 Fairway Bluff Dr., Fair Oaks, TX 78015 (830) 755-4420 (copseyg@hotmail.com).

## Special Assistants Europe

#### John Mammano

CMR 480 Box 699  
APO AE 09128  
(john.j.mammano.mil@mail.mil)

#### Paul D. Fitzgerald (United Kingdom)

americanairbase@rocketmail.com

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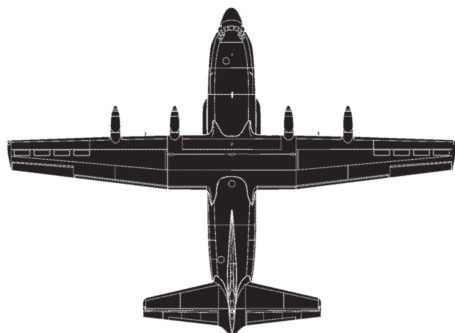
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## C-130 Hercules



The legendary C-130 Hercules is one of the—if not *the*—most successful military aircraft of all time. This versatile Lockheed-built workhorse has performed more kinds of missions, by more air arms, in more wartime and peacetime operations, for more years, than has any other airplane. It has been in continuous production for its first user—USAF—since 1954.

The four-engine turboprop Hercules was conceived as a simple, rugged tactical lifter able to use short and rough runways. Though designed for transport, it has taken on many other roles, modified into the AC-130 gunship, EC-130 electronic combat aircraft, KC-130 aerial tanker, MC-130 series of special operations forces transports, and more. It has been used for airborne assault, combat

search and rescue, aeromedical evacuation, weather recon, maritime patrol, and firefighting.

“The Herk” is vividly associated with Vietnam. It has, however, flown in virtually all US military and humanitarian operations of the past six decades. Its service life is nowhere near an end; USAF plans to keep acquiring the C-130J-30 for years to come.

—Robert S. Dudley with Walter J. Boyne

**This aircraft:** USAF C-130E—#63-7887—as it looked in June 2006 when assigned to 86th Airlift Wing, Ramstein AB, Germany.



USAF photo



A C-130 lands at a remote landing strip in Afghanistan.

### In Brief

Designed, built by Lockheed ★ primary use tactical transport ★ first flight Aug. 23, 1954 ★ number built 2,484 ★ **Specific to C-130H:** crew of five (two pilots, navigator, flight engineer, loadmaster) ★ four Allison T56-A-15 turboprop engines ★ armament none ★ max load 92 troops or six standard freight pallets ★ max speed 366 mph ★ cruise speed 353 mph ★ max range 2,745 mi ★ weight (loaded) 175,200 lb ★ span 132 ft 7 in ★ length 97 ft 9 in ★ height 38 ft 3 in ★ ceiling 33,000 ft.

### Famous Fliers

**Air Force Cross:** William Boyd Jr., Bernard Bucher, William Caldwell, Howard Dallman, Charles Shaub. **DFC:** Clay McCutchan (twice). **1980 Iran Rescue Mission:** Harold Lewis Jr., Lyn McIntosh, Richard Bakke, Charles McMillan, Joel Mayo (all KIA). **Mackay Trophy:** 1964—464th TCW; 1968—Daryl Cole; 1984—James Hobson Jr.; 1990—Crew of AC-130H; 1997—Crew of Whisky 05 MC-130H; 2002—Crew of Grim 31 AC-130H; 2005—Crew of Train 60. **Other USAF notables:** Charles Holland, Norton Schwartz. **Test pilots:** Stanley Beltz, Roy Wimmer.

### Interesting Facts

Flown by USAF, USMC, USN, USCG ★ boasts longest continuous production run (1954-present) of any military aircraft ★ chased, in first flight, by Lockheed designer Kelly Johnson in P2V ★ featured in 1968 film “Green Berets” and 1997’s “Air Force One” ★ flew secret mission to Lop Nor, China’s nuclear test site (1969) ★ holds record as the largest and heaviest aircraft to land on aircraft carrier ★ led formations of B-57 bombers over North Vietnam ★ used by Pakistan as heavy bombers in 1965 Indo-Pakistani War ★ nicknamed “Herk,” “Herkie Bird,” “Fat Albert” ★ dropped BLU-82 “Daisy Cutter” and GBU-43/B MOAB, world’s largest conventional bombs, in 1991 Gulf War.





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