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Journal of the Air Force Association

AIR FORCE

MAGAZINE



Homes for F-35s

Allies in the Gulf
The Readiness Crunch
Tech Firms and Defense





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Journal of the Air Force Association **AIR FORCE** **MAGAZINE**



March 2015, Vol. 98, No. 3

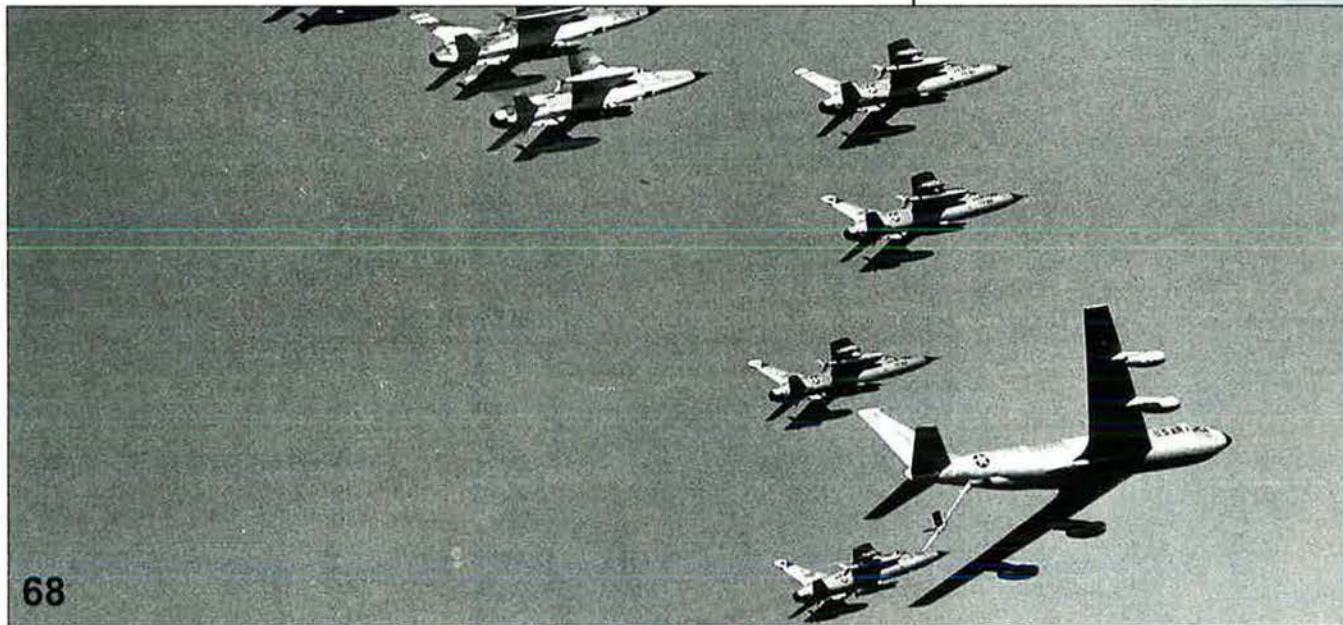
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About the cover: US and Australian F-35As fly over the Grand Canyon on Feb. 18. See "Building Homes for F-35s," p. 22. Photograph by Jim Haseltine.





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Pay and Benefits and National Security

IN 1973, the United States ended the draft and created an all-volunteer military force. Without conscription, how would the Defense Department get the right number of people—and the high-quality people—it needed to fill its ranks?

The answer was simple: Pay military members fairly, give the troops benefits commensurate with their needs, and make sure they have the tools, training, and support needed to do their jobs.

There has been a recurring theme over the past four decades. When compensation was fair, the military was able to fill its rolls. When compensation lagged, DOD had trouble getting and keeping the right people.

In the late 1970s and early 1980s, large pay raises were needed to fix flagging recruiting and retention. The problem went away, until military compensation again began to lag the civilian sector during the mid-1990s. By 1999, a so-called pay gap stood at 13.5 percent, and the Air Force missed its recruiting targets for the first time in 20 years. This was a huge problem, and it took years of military compensation increases to fix.

Today, recruiting and retention are again rock solid. This is true even though the Air Force has been continuously deployed to Middle Eastern war zones since Operation Desert Shield in 1990. Large numbers of troops from all services have been fighting overseas for more than 13 years.

Pay and benefits should be continuously reassessed and adjusted, however. The civilian job market, demographics, and expectations all change over time. And so, 42 years after the advent of the all-volunteer military, the Military Compensation and Retirement Modernization Commission's recent report on how to improve DOD's pay and benefit systems is perhaps overdue.

The US has the world's finest military because of its people, but compensation, to put it bluntly, is a means to an end. Pay and benefits are critical components in building the military America needs, but the systems have changed little in decades.

To cite one anomaly, DOD has a 20-year "cliff" pension. Active Duty troops who serve 20 years in uniform can

retire and immediately begin drawing a military pension, typically at age 38 for enlisted troops or age 42 for officers. It is an all-or-nothing system. Those who serve less than 20 years—and this is fully 83 percent of enlisted troops—get nothing for retirement when they leave the military.

After spending 18 months studying these issues, the MCRMC ("the commission") found this system archaic and suggested in its final report that it be replaced with a hybrid system containing both a 20-year pension and a

Military compensation should be continuously assessed and adjusted.

401(k)-style savings plan that has value to many more troops.

Pay and benefits questions are complicated, emotional, and tied to national security. The Air Force Association will have to take time to study the details and ramifications of the commission's numerous specific recommendations, but its final report, issued earlier this year, is a thoughtful search for ways to offer improved compensation more efficiently. The specifics will certainly be debated throughout the year.

Compensation is tied to national defense. Military personnel costs, when measured on a cost-per-troop basis, have skyrocketed in recent years. The overall portion of the DOD budget dedicated to personnel expenses has remained relatively flat, but this is largely because the size of the force has declined by 40 percent since the mid-1980s.

The Air Force is faced with a dangerous choice: With Pentagon budgets declining and manpower costs rising, USAF is forced to slash personnel, readiness, or modernization expenses to make ends meet. If these cuts are not kept in balance, national security will suffer.

Why are pay and benefit costs a problem? According to a 2012 study by the Center for Strategic and Budgetary Assessments, if budget and manpower levels remain constant, personnel spending will consume the entire defense budget by 2039. Similarly, Gen. Mark A. Welsh

III, Air Force Chief of Staff, said in late 2013 that "we must address the issue of compensation or it will consume our warfighting spending over the next few decades."


If the nation can provide troops with fair compensation more efficiently, it should do so. As the commission noted this year, it may be possible to provide troops with a pay and benefits package they prefer to today's model—while simultaneously saving taxpayers \$12.6 billion per year in the future.

The commission believes that the military pay tables should be preserved, because they offer transparency and predictability the troops value. In the future, the pay levels within the tables should be adjusted as needed to keep military recruiting and retention at the desired levels. Pay is easy to adjust, to great effect.

The Air Force Association believes that through their service, service men and women willingly choose hardship for the good of the nation. The nation must in turn honor its commitments to the troops. For that reason, any changes to military compensation—notably to retirement programs—must be made in such a way that they do not break promises made to the troops.

Few things would damage morale, recruiting, and retention more than breaking faith with the men and women in uniform. They have sacrificed, endured hardships, and faced danger for the sake of the nation. Future changes must ensure existing troops are "grandfathered in" to the old systems, or be made optional for today's troops. This will slow the rate of change, but keeping promises is a moral imperative.

The commission's mandate lists laudable goals: to ensure the long-term viability of the force; to enable a quality of life that fosters recruitment, retention, and careers; and to "modernize and achieve fiscal sustainability for the compensation and retirement systems."

AFA believes today's compensation system can be improved, so that it is generous, fiscally sustainable, and appropriate for today's and the future's needs. The specifics can and should be debated, but the commission's report is an important step toward a sustainable future force. 

Action in Congress

By Megan Scully

The Air Force's Fiscal 2016 budget request would add more than 100 new aircraft to the fleet, boost the service's capabilities in space and other areas, and improve readiness rates. But with the Defense Department's budget exceeding mandated caps on spending by \$35 billion, it is unclear how much of the Air Force's proposal will actually become reality.

The request provides a starting point for the congressional defense committees, which will soon get to work in earnest on the 2016 budget, essentially weighing the Air Force's priorities against its own and attempting to squeeze as much as possible into the constrained budget.

Congress has numerous tools at its disposal to stretch the department's dollars, including tapping unused money from prior years and shifting programs from the base budget to the unconstrained war accounts. They can—and do—make cuts to hundreds of programs across the Pentagon's massive budget, essentially lessening the pain by spreading it across the department.

It is, to be sure, a tedious job. But it can be effective. In the Fiscal 2015 spending bill, appropriators managed to find \$14 billion in savings across the department—and half of that did not involve cuts to individual programs, according to an analysis conducted by the Congressional Research Service.

All of this bodes well for the Air Force as it attempts to sell its ambitious requests on Capitol Hill, even if the topline for next year remains uncertain. The Air Force's budget totals \$122.2 billion, or 23 percent of the department's entire spending request.

The majority of the service's request—\$77 billion—supports day-to-

day operations, including military and civilian pay, flying hours, weapons system sustainment, and facility requirements and installation support.

But it is the smaller procurement and research and development accounts that will likely draw the most attention on Capitol Hill in the coming months.

The Air Force proposal includes funding for 112 new aircraft—40 more than last year. Those include 44 F-35 strike fighters, 12 KC-46A aerial refueling tankers, eight MC-130J special operations tanker aircraft, 29 MQ-9A remotely piloted aircraft, five HC-130J personnel recovery aircraft, and 14 C-130J cargo airplanes.

The request also includes funding for five Evolved Expendable Launch Vehicles and one GPS III satellite. Meanwhile, ammunition procurement nearly triples, rising from 660 last year to 1,759 in the 2016 request.

In terms of research and development programs, the long-range bomber would receive \$1.2 billion. The combat rescue helicopter would receive \$156 million in R&D funds, with the goal of initial operational capability for the fleet in 2021.

"The FY16 [presidential budget] request can start the recovery for the Air Force we need, an Air Force that supports the defense strategy and provides capabilities combatant commanders need now and in the future," Maj. Gen. James F. Martin, Air Force budget director, told reporters Feb. 2. "But even at PB levels, we still had to make tough choices."

Indeed, the Air Force is preparing to go another round with lawmakers over the retirement of the A-10 Warthog close air support fleet, rejected by Congress last year amid concerns that

the venerable aircraft are needed to protect combat troops on the ground.

The proposal would phase out the A-10 fleet by 2019, with the goal of focusing available resources and manpower on multirole platforms like the F-35 that can perform close air support along with other missions. The Warthog retirements would save \$428 million in Fiscal 2016—and much more over time.

But A-10 supporters on Capitol Hill, including Senate Armed Services Chairman Sen. John McCain (R-Ariz.), have already said they will battle the Air Force over this proposal again this year, making it seem unlikely—at least at this point—that the service will win this argument.

The Pentagon, meanwhile, is also requesting Congress authorize another base closure and realignment round to begin in 2017. The Air Force, perhaps more than any of the other military services, has said it needs another BRAC to shed unnecessary infrastructure that is inefficient and expensive to maintain.

But lawmakers have repeatedly blasted the department's calls for another BRAC, arguing that the upfront costs of shuttering installations are too great, even if the closures ultimately yield savings.

Several key members, including House Armed Services Chairman Rep. Mac Thornberry (R-Texas), have already rejected the department's calls for another BRAC, likely kicking any possibility of another round of closures into the next presidential Administration. ★

Megan Scully is a reporter for CQ Roll Call.



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AFA's Mission

Our mission is to promote a dominant United States Air Force and a strong national defense and to honor airmen and our Air Force heritage. To accomplish this, we:

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

Advocate for aerospace power and STEM education.

Support the Total Air Force family and promote aerospace education.

Micromanaging Carter

The recent editorial, "Carter's Coming Challenges," was right on target [January, p. 3]. The facts as presented certainly leave many to believe that his tenure back in the Pentagon, albeit at a higher level of responsibility, will be micromanaged by the Administration. Secretary-designee Carter is a brilliant man with many years inside the Beltway and in the Pentagon, so given the chance to excel, he might do very well by our national security interests. If, however, the current trend of micromanagement by people who have little or no military experience continues, we will see yet another SECDEF leave early. We will be watching very carefully the dialogue between the new chairmen of the Senate and House Armed Service Committees and Mr. Carter.

Again, many thanks for the great article in the January edition.

CMSgt. John "Doc" McCauslin,
USAF (Ret.)
San Antonio

Vipers Down Under

Vipers in Australia, Round 1?

I enjoyed reading "Back in Black" in the January 2015 issue [p. 34]. It reminded me of Viper South 92, when the 35th Fighter Squadron from Kunsan AB, South Korea, deployed through Darwin to RAAF Base Williamtown in September 1992.

We had planned to depart Kunsan at the end of August, but we were delayed until Sept. 1, when we deployed 12 F-16s and a KC-10 to Darwin. We could not make it to Williamtown (near Newcastle, NSW) that day, possibly because of a weather delay out of Kunsan. The Australians were magnificent hosts, putting the USAF team up for the night in the Darwin Travelodge downtown, and launching all of us out on Sept. 2. We were able to spend some time walking around Darwin the afternoon and evening of Sept. 1.

We arrived at RAAF Williamtown Sept. 2, in the afternoon, where we

were welcomed by the RAAF with a barbecue. The 77 Squadron (F/A-18A and B at the time), 2 Operational Conversion Unit, and the 3 Control & Reporting Unit were our hosts and training partners during the two-week DACT exercise. We were able to celebrate the 50th anniversary of the 77 Squadron, too, as it had stood up in 1942. According to an 8th Fighter Wing public affairs article, the 35th Fighter Squadron was the first F-16 unit to deploy to RAAF Williamtown. These F-16s may have been the first Vipers to deploy to Australia, too.

We participated in air-to-air and air-to-ground training during the exercise, with the aerial engagements primarily taking place over water.

Our lodging during the deployment was in Newcastle, at Noah's On the Beach, and we were hosted by the local community much like our RAAF friends at Darwin and Williamtown had hosted us.

We redeployed to Kunsan with a KC-10 on Sept. 13, 1992, meeting up with KC-135s on the way. Col. Steve Polk, the Wolf, met each jet as it parked that afternoon. All in all, a great training deployment!

On a related note, in an attempt to help update the record on USAF fighter deployments to Australia, the 132nd Fighter Wing (ANG), Des Moines, Iowa, also executed DACT at Williamtown

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in February to March 2011 (Sentry Down Under).

In addition, the 18th Aggressor Squadron from Eielson AFB, Alaska, deployed to Williamtown from February to March 2013, and to RAAF Base Amberley in February to March 2014 (Lightning Viper). There may have been other USAF fighter deployments to Australia in the last 10 years as well.

Thanks for a great article—and for the memory jogger!

Col. Pat Miller,
USAF
JB Elmendorf-Richardson,
Alaska

This was a very well-written article about how the United States uses its Total Force to project power around the world. However, it neglected one very important part of the story. Please allow me to answer your question from the title page: How do F-16 units get from Washington, D.C., New Jersey, and South Korea to Australia? The answer: a whole lot of tankers!

Now ask AMC how many tankers these moves required. You may be surprised the level of dependency we have on air refueling. Remember: Nobody Kicks Ass Without Tanker Gas—nobody!

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

Baby, It's Cold Outside

In June of 1982, I had the privilege of leading the Air Force's first KC-10A support team to the annual Operation Deep Freeze midwinter airdrop of supplies for the Antarctic science personnel at McMurdo Station and the South Pole [*"Ice Boxes," December 2014, p. 52*]. Our lone Extender replaced three KC-135 Stratotankers previously required to refuel a cargo-laden C-141B Starlifter. We landed a couple of days early at the Auckland, New Zealand, airport, with its lengthy runway on North Island. Our receiver was already parked at the Christchurch Airport on South Island. The mission plan was simple: The C-141B would take off heading south, and we would launch and overtake our receiver with an en route rendezvous.

Arrival at the busy civilian airport did not go unnoticed. I was marshaled right up to a jetway putting me at eye level with a flock of Kiwi travelers filling the second story lobby, gawking at our brand-new Air Force jumbo jet. Later, it was our turn to gawk when a bubbly, petite woman marched right up to our crew waiting for a bus. She announced: "My name is Shirley Temple Black!" And indeed it was the world famous Shirley Temple, child movie

star and former US ambassador to Ghana. She was in town to visit New Zealand's Prime Minister and never passed up an opportunity to say Hi to the troops. We invited her for a grand tour of our KC-10, which she graciously accepted. She even autographed the ship's maintenance log.

On mission day, we rolled onto the big runway at our maximum take-off gross weight of 590,000 pounds. Against that, we applied 157,500 pounds of thrust from three yowling General Electric CF6-50C2 turbofan jet engines. The time was 0500; we probably woke up some of the neighbors. It was the shortest day of the year Down Under, albeit scheduled to be a very long day for us. We soon had good radio contact with our receiver, and he was on course/on time for our join up. Of note, we were heading due south toward Antarctica and the South Pole, without the benefit of a navigator onboard. However, we did have a fine triple INS (inertial navigation system).

The weather conditions were good, with the exception of the outside air temperature registering a brisk -95 degrees Fahrenheit. Our boom operator noted that his controls were sluggish but usable.

We caught up with, and pulled ahead of, our receiver, then cleared him to the contact position. He immediately began taking on fuel. The heavy cargo jet wallowed a bit as the refueling progressed. We were only scheduled for the single off-load, but offered to orbit nearby in case we were needed. The drop over McMurdo Station went as planned and we were released to return to Auckland. The C-141 headed toward the South Pole Station. During the McMurdo drop, the cargo team opened the large clamshell petal doors in the aft section of the aircraft. However, there was concern that the harsher weather at the pole could cause the doors to remain stuck in the opened position, causing greatly increased fuel consumption. Also, there would be difficulty with aircraft pressurization. The alternative required using the smaller side troop doors, plus a lot of muscle. The cargo section could easily become a death trap with the cold air and low oxygen levels. We were well on our way back to Auckland when we received an urgent call from the C-141: The port troop hatch could not be secured. We were too far away to render any assistance. The situation looked pretty grim. Then, out of the blue, we received an all-clear call. Whew.

The next day, after some well-deserved crew rest, we joined up with our new friends and pumped 44,000 pounds of fuel to them, allowing their nonstop flight to the West Coast. We

still had enough fuel to fly 16 hours nonstop back to our home station at Barksdale AFB, La.

The 1983 KC-10 Deep Freeze team made sure that their C-141 receiver was scheduled for at least two air refuelings!

Lt. Col. Charles E. Bailey,
USAF (Ret.)
Placentia, Calif.

Frederick Johnsen's great article about the 1983 midwinter Antarctic airdrop ("Ice Boxes") in your December edition highlighted the danger had the C-141's petal doors frozen open after a drop. Fortunately, that didn't happen, but it prompts me to recall, as accurately as I can, a "frozen episode" that did occur over Antarctica in October of 1985.

Every year, an ice runway at McMurdo Station, Antarctica, is used for landings during the Antarctic summer and then is abandoned during winter. As the ice is transient, each year a new runway is established—different location, orientation, etc. In 1985, a ground-based Precision Approach Radar (PAR) was available and installed on the ice, but obviously it could not be flight checked until the first flight came in. My Strategic Air Command (SAC) KC-10 crew and I deployed from March AFB, Calif., to Christchurch, New Zealand, to provide refueling support to a Military Airlift Command (MAC) C-141 from McChord AFB, Wash., to initiate the summer's resupply flights between Christchurch and McMurdo. MAC controlled the US flight operations out of Christchurch and had a lieutenant colonel in charge.

The plan was to have our KC-10 refuel the C-141 a few hours after takeoff and return to Christchurch while the C-141 continued to McMurdo, about 2,200 miles south of Christchurch. The details of the C-141 fuel plan are lost to me, but I believe the C-141 was to receive enough fuel from us to be able to fly to McMurdo and shoot a missed approach if need be and still have sufficient fuel to return to New Zealand. The C-141 aircraft commander was a Captain Surratt, if I recall correctly, and he came to me during mission planning to ask if, instead of us accompanying the C-141 only part way to McMurdo, could we take off with sufficient fuel to go the distance and also refuel the C-141 on the way home "in case something went wrong." That was easily within the KC-10's capabilities and I readily concurred with his thinking. We went to the lieutenant colonel with the new plan and he shot it down, not wanting to burn the extra fuel or flight time for a long-shot contingency. We captains huddled a bit, decided to hit

the center of the line one more time, and the lieutenant colonel reluctantly relented, "just this once."

Long and exciting story short, we conducted the planned refueling and continued south, while the weather at McMurdo unexpectedly also went "south." We orbited overhead McMurdo listening to the C-141's approach on the radio and what an exciting approach it was: The ground controller was calling headings, distances, and descent information from the PAR that did not correlate at all with what the McMurdo-experienced navigator on the C-141 was seeing on his scope as he conducted an Airborne Radar-Directed Approach (ARDA) using radar reflectors that had been positioned at the ends of the runway. The discrepancies resulted in much confusion, and with no outside visibility, Captain Surratt conducted a missed approach from a few hundred feet above the ground. Anxious personnel on the ground reported that they heard the aircraft go by (somewhere close) in the blowing snow. A little regrouping and much discussion resulted in a second attempt, with similar conflicting approach guidance and lack of any visual contact with the ground, so Captain Surratt wisely chose to go missed approach again and this time head for Christchurch.

Here's the "frozen episode" and the salute to foresight: As the C-141 climbed out to join us for the trip back to Christchurch, I believe it was the nose gear that remained frozen, refusing to retract and creating a drag condition that would have precluded the still-loaded C-141 from making any landfall outside of Antarctica. Although the condition eventually was resolved, I can guarantee that the crew of the C-141 was very happy when the KC-10's air refueling boom seated in their refueling receptacle and the fuel began to flow! Upon hearing the story, I believe that the lieutenant colonel was thankful as well. Subsequent missions enjoyed better weather, a recalibrated PAR, and much success.

I salute all those who continue to have the honor to execute the Air Force mission today.

Brig. Gen. Thomas E. Stickford,
USAF (Ret.)
Burke, Va.

Show Me the Money

I am skeptical of Mr. Tirpak's claim in the next-to-last paragraph of subject article that the Pentagon compensation system has "ballooned to consume more than two-thirds of defense spending" [*Aperture: Top-level Transition*, January, p. 8]. If he can support such a claim, it would be interesting to see all of the

ifs, ands, and buts and other disclaimers that go with the data.

Joe Higgins
Greenville, S.C.

The Will to Kill

I don't get it: How did we win World War II? We certainly could not have won it today with our current President, Congress, Supreme Court, military leadership, and weapons acquisition system.

Concerning weapons acquisition, how much time and ink and how many millions of dollars must be expended concerning the A-10 [*What's Next for CAS?*, December 2014, p. 34]? Has any weapons system other than the M-16 (problems in Vietnam) ever received this much congressional attention?

The problem is that the weapons acquisition process has two aspects: a military aspect and a political aspect. The political aspect seems to be winning with the A-10, with congressional meddling in the decision whether to keep or to retire the A-10. What is astonishing about Congress is its lack of understanding of the military. Although some Congress members are veterans, what does the average Congress member know about the military? How many times has the average Congress member called for close air support (CAS)? How does that member know if the A-10 is the best means of delivering CAS? What happened to deferring to experts such as military members who have flown or used the A-10 or who know something about it based on real-time experience with the A-10?

Imagine the angst, delay, and lost lives in World War II if it had the weapons acquisition process we have today. The B-29 would have been delayed for years, costing countless lives.

Talk about sequestration: Here is an idea. Sequester the service Chiefs and their weapons experts in a room with the President and determine what weapons are needed. Then tell Congress what the military requires. If Congress balks, the President will veto every piece of legislation until Congress defers to the experts.

Two adjuncts to our dysfunctional weapons acquisition process: One is our lack of competence in employing our military might, and two is our lack of a national will to kill in using our military. The title of Adam Hebert's editorial in your December issue says it all: "Win or Go Home." We have spent years in Afghanistan for what result? The British were cruel and could not conquer it; the Soviets were crueler and could not conquer it. What makes anyone think that we can conquer it? Had we a national will to kill and military leaders such as we had in World War II, the Afghanistan

War could have been won and quickly.

We lost our national will to kill after World War II. Israel has it, which is why it still exists as a country. When it found the Iraqi nuclear facilities to be a menace, it did not raise its hand at the United Nations and say, "Mother may I?" Instead it unilaterally took action: Problem solved.

Sadly our defense establishment is at best in neutral, spinning without results, and at worst in reverse, going backward at a dangerous speed.

Col. Charles A. Jones,
USMC Reserve (Ret.)
Greensboro, N.C.

"The A-10 and the Rescue Helicopter" noted that the A-10 performed 20 percent of the CAS missions in Afghanistan [July 2014, p. 28]. In "What's Next for CAS," the author noted that Gen. Mark A. Welsh III argued that 80 percent of all CAS missions in Afghanistan were flown by other aircraft. In addition, General Welsh said that the F-16 alone has flown more CAS sorties than the A-10 during the last eight years. These are misleading and incomplete statistics.

The above statements, when taken alone, imply that the A-10 was not needed to conduct CAS during this century. However, this is from *Joint Publication 3-09.03 Close Air Support*, July 8, 2009: "CAS can be conducted at any place and time friendly forces are in close proximity to enemy forces. The word 'close' does not imply a specific distance; rather, it is situational."

Therefore, CAS does not equal troops in contact (TIC). In fact, with Type 3 control, aircraft are cleared to engage or initiate attacks within parameters.

Missing statistics are total and types of aircraft available for each mission, type of CAS sortie, length of sortie, time over target, and results. In other words, all factors have not been included in any analysis provided in any articles discussing the A-10 in relevance to CAS.

I am well aware of the A-10's limitations on a modern battlefield, even though my 2,000-plus hours ended in 1988. But having combat experience as both an air and ground FAC, I know that results are what counts. Let's be honest and consider all of the factors prior to making any proclamations.

Maj. Milan J. Franceschi,
USAF (Ret.)
Landenberg, Pa.

I'm Just Fine, Thanks

As youths, my buddy and I had our own bug spraying enterprise. I recall spreading DDT by hand around porches and foundations and spraying bushes with chlordane from a small pressure

sprayer. Both those substances have been banned for many years and some would suggest I should be dead from exposure.

Coincidentally I found myself back in the spraying business with Ranch Hand when it was an aerial spray flight located in the VNAF compound at Tan Son Nhut Air Base. We parked on Charlie Row, and behind the aircraft were decent-size puddles of rain water with ample defoliant residue floating on the surface. That was in the latter part of 1966.

May 2015 will mark the 50th anniversary of the insertion of troops into the war in Vietnam. It is absolutely mind-boggling that there is still debate over the effects of Agent Orange resulting from spraying in Vietnam ("The Lingering Story of Agent Orange," January, p. 50). The Air Force Health Study was an effective and thorough effort lasting over 20 years. The suggestion that blue water sailors and National Guard or Reserve crews have been exposed to dangerous levels of dioxin is preposterous.

The criteria for spraying a target required advanced coordination with MACV, province chiefs, and ground units in the area. We knew exactly where we sprayed. Spraying was done early in the morning with temperatures low enough to assure the defoliant settled into the jungle. If conditions weren't met, we didn't spray. We didn't spray military installations with Agent Orange; however, we did spray with malathion to kill malaria-bearing mosquitoes.

Admittedly we did infrequently spray where US military would have been exposed, such as when we sprayed the Long Binh ammunition storage site. That exposure would have been nominal.

Nearly all Ranch Hand personnel had higher levels of dioxin in their blood than the peer group in the Air Force Health Study, but as the article pointed out, their mortality rate was comparable to those not exposed.

I flew over 160 spray missions, was wounded three times, had significant exposure to Agent Orange, and I am 81 years old, in good health.

Lt. Col. Clyde Picht,
USAF (Ret.)
Fort Worth, Texas

Your article on Agent Orange in the January 2015 issue was great. The only issue I have is not with the magazine but the Air Force Health Study conducted between 1982 and 2003. Although the Air Force solicited volunteers with the help of The Ranch Hand Association, they left out a huge population of airmen who worked on these aircraft and were directly exposed to this chemical in liquid undiluted form and were not part of the Ranch Hand organization. I

was one of those many who were never considered for the study.

I served at Tan Son Nhut AB, RVN, from January to December in 1966. I was an airframe repairman assigned to one of the aircraft maintenance squadrons. During that year, I can't begin to think of the number of repairs we performed on these C-123B Ranch Hand aircraft, from patching minor bullet holes to major repairs conducted in the shop on removable parts such as flaps, ailerons, rudders, landing gear doors, etc. While performing my duties, I came in daily contact with Agent Orange, on the ground, on aircraft parts, and even dripping on my head as I walked underneath the wings where the spray nozzles were located. This stuff was nasty, and I got the liquid on my skin while lying in puddles underneath the fuselage and even in my mouth from time to time, as the liquid leaked over my head from various parts of the aircraft. As a matter of fact, one day while wearing a brand-new pair of combat boots with neoprene soles, I noticed several holes in the bottom of my boots. I went to my supervisor and explained that this Agent Orange stuff was really nasty, as it ruined a new pair of boots. His response, like that of everybody in the chain of command, was that this stuff was harmless and the holes in my boots were caused by something else. Therein lies the problem and the controversy with Agent Orange: short and long term effects—if we can blame these illnesses on other causes, then let's take the low road and deny our veterans any real benefit of the doubt!

For many years after I was discharged in 1967, I had a mystery rash reoccur on both my arms every summer when the heat and humidity were high, as they were in Vietnam. No one could explain the outbreak, and I never knew until many years later that there were many different studies by USAF, the VA, and the Institute of Medicine. I don't know what if any future complications will arise from my encounter with this Agent Orange, but to say that veterans should be given the benefit of the doubt is as far from reality as a reasonable person could ever get.

I hope some day we'll really examine all of the hundreds if not thousands of airmen who were exposed to this stuff before we all die of some sort of cancer "caused by other causes."

Lt. Col. John C. D'Auria,
USAF (Ret.)
Mays Landing, N.J.

Agent Orange used in Vietnam was used against the VC against their cover. It killed not only food crops, but also pot plants—the same pot sold to American troops who smoked it with pleasure. Most Americans over there did not

understand what Agent Orange could do outside of killing plants. The lack of MSDS sheets back in those days and, usually, lack of basic information on any chemicals did not help the matter. Today we know the difference on how to handle that chemical—or for that matter any type of possible lethal chemical.

How many people who claim problems from being exposed to Agent Orange have since Vietnam exposed themselves to other harmful chemicals?

Richard Cornell
Des Plaines, Ill.

Tire Out Someone Else's Airplanes

I read with interest the changes being made to how the Civil Reserve Air Fleet program is executed ("CRAF to the Future," January, p. 22). I don't agree with the idea that since the Air Force has more C-17s than initially planned that the service should shoulder more of its airlift requirements organically. Aircraft have a finite life span, and procurement cycles seem to take longer and longer due to political considerations and increasing cost. Private-sector aircraft get refreshed on a much shorter cycle. Because of this, I say we should pay those companies to put hours on their own airframes. That way, we can extend the service life of our military aircraft, saving them for when they're really needed—especially getting into places that even CRAF-committed jets and crews may not be able or willing to go.

Lt. Col. Chris McMartin,
USAF
Fort Leavenworth, Kan.

This Is Innovation?

[Former Air Force] Secretary Donley was correct in his complaint about congressional inaction on the budget, but if this conference is the best thinking of the Air Force for "innovation," I can understand why they give reluctant support ["*Innovating for Airpower*," January, p. 18]. The speakers provided a murky mix of psycho-babble about paradigm shifts, breaking the rigid processes of the industrial era, buying more from foreign sources (except for RD-180 rockets), sharing capability with allies, wasting less manpower on email, and spending more money on research of "test capabilities."

I believe "the rigid processes of the industrial era" provided excellent aircraft and missiles on time, budget, and performance—a real contrast with decades-long F-35. On the operational side, I would like to see some "shock and awe" in lieu of our piecemeal effort against ISIS.

Lt. Gen. Aloysius G. Casey,
USAF (Ret.)
Redlands, Calif.

A-10 redux; Aging aircraft; Sequestration's awful aftermath; What maintainers?; Our biggest problem;

HIT ME AGAIN

The Air Force is doubling down on its Fiscal 2015 request—which was denied—to retire the venerable A-10 attack jet, seeking in its Fiscal 2016 budget to phase out the fighters by 2019. Paradoxically, the reason to keep pushing the Warthog's retirement is because the world is getting more dangerous, not less, according to Chief of Staff Gen. Mark A. Welsh III. Money spent on the A-10 robs funds from new jets that can do more kinds of missions and survive the modern battlefield, he said.

When asked what new argument the service can offer to retire the A-10—after Congress responded with a loud, unambiguous “no” to the idea last year—Welsh told *Air Force Magazine* the world “looks different” this time.

“Operations in Iraq and Syria are new, operational tempo

solete airplanes while adversaries in China, Russia, and elsewhere field new gear that increasingly matches or surpasses what USAF has is “not a formula for success over time.”

He also observed that “air forces that fall behind the technology curve ... fail.”

Welsh said he understands Congress has “other factors that weigh” in its decisions. However, “we’ve done the operational analysis, we’ve compared it to multiple options, and this”—retiring the A-10—“is the best option in that particular portfolio.” He warned that if Congress fails to repeal the BCA, “we’re going to have discussions about lots of other things that will have to go away. And those discussions will be just as difficult.”

In the service’s budget documents, released Feb. 2, it said sequester, if it goes back into force in Fiscal 2016, will

USAF photos



If B-17s (l) had been used in the 1991 Gulf War, they would have been younger than the B-52 bombers (r) still in use today.

hasn't come down, we haven't been able to reset after coming out of Afghanistan, as we had anticipated. ... Eastern Europe looks different,” and the service’s funding is dropping to sequester levels dictated by the Budget Control Act.

Isn't that all a good reason to hang on to as much force structure as possible?

“We’d love to keep force structure. We don’t have the money to keep it all,” Welsh said. Hanging on to squadrons that can’t all be flown, maintained, and updated at optimum levels simply subtracts from all USAF accounts, he said, especially those that pay for modernization. Renewing the service’s gear—postponed in 2000, again in 2005, and again in 2011 because of pressing wartime priorities—can’t be put off any longer, he said.

“We have fleets of aircraft that are getting increasingly older and older,” Welsh said, observing that if World War II-vintage B-17s had been used in the 1991 Gulf War, they would have been younger than the KC-135 tankers, B-52 bombers, and U-2 spyplanes the service is flying today. Moreover, USAF is smaller than it has been since its 1947 founding, but combat demands continue to mount.

“Nobody’s complaining about that,” he said of the stresses. “We’re just stating facts.”

The Air Force “can’t keep holding on to everything we’ve had in the past if it’s costing us the ability to modernize and recapitalize,” he insisted. Continuing to patch up ob-

compel the Air Force to also retire the KC-10 tanker, RQ-4 Global Hawk Block 40 fleet, and delete a squadron’s worth of F-35 fighters from its buying plans, along with thousands of munitions and research into a new, more powerful and fuel-efficient engine. In addition, USAF would eliminate modifications to the Global Hawk Block 30 force.

“Sequestration means ... we have to make difficult decisions,” Welsh said.

Retiring the A-10 over time offers a way to “hedge our bet a little,” given the rising instability in the world, he added. “If there’s a way” to do that, “why wouldn’t we?”

He also acknowledged that Congress, in forbidding the service from retiring the A-10s last year, at least provided the funds needed to continue operating them, instead of forcing USAF to raid other accounts to pay the bill.

“Which is great. As long as we have the airplane, we’re going to use the airplane,” Welsh said.

The A-10 went into battle against Islamist jihadists in Iraq late last year—a fact trumpeted by the save-the-A-10 community as proof positive of the jet’s enduring value. Welsh said he was not pressed into sending the A-10 to the fight, however.

US Central Command “requested capability in that particular mission area,” he explained. The capability requested was in strike, close air support, and personnel recovery. But CENTCOM did not “specifically” ask for the A-10 by name, he said.

In mid-January, at a Pentagon press conference, Air Force Secretary Deborah Lee James said she did not regret proposing the A-10's retirement, despite the strain it put on USAF relations with Congress.

"The A-10 is a great contributor" to the anti-ISIS fight, she said, "but so are the other aircraft" that have been performing strike missions in Iraq and Syria, such as F-15s and F-16s.

Welsh, at the same press conference, said, "For the Air Force, it's not an emotional issue. It's a sequestration-driven decision."

THE CASE OF THE MISSING MAINTAINERS

Congress' funding of A-10 operations didn't solve all the Air Force's A-10-related problems. The Air Force 2015 budget was an interrelated scheme that intended to transition about 800 maintainers from the A-10 enterprise to become the seasoned crew chiefs on brand-new F-35s entering the inventory. If the A-10 doesn't go away, the Air Force doesn't have a source of manpower for F-35 maintenance.

In the 2015 National Defense Authorization Act, Congress did allow 36 A-10s to be put in "backup inventory status" to help with the problem—keeping the jets out of the "Boneyard" but not assigning regular flight and ground crews to them—but that still left the service 700 maintainers shy of its need.

Outgoing Defense Secretary Chuck Hagel wrote to Congress Feb. 2, saying he was taking advantage of the authority to put the 36 A-10s in "a lower flight status" because the maintenance manpower shortage "is already degrading fighter fleet readiness and the planned fielding of F-35A aircraft."

He also said that a quick-turnaround study by the Pentagon's Cost Assessment and Program Evaluation shop about how to address the A-10-inflicted F-35 maintainer shortage looked at eight options, and by far, the best thing to do is follow the original plan.

The CAPE concluded "the transfer of A-10s would be the most effective alternative available to close [the] Air Force's significant shortfalls in experienced maintainers," Hagel wrote, but even that wouldn't "fully eliminate" the shortfall.

Welsh, in his interview with *Air Force Magazine*, said the options looked at included taking some maintainers from the reserve component or hiring civilians to do some of the work.

The problem with those approaches, he said, is that the reserve component needs their experienced maintainers "as badly as the Active Duty component ... so there will continue to be a shortfall there, although it will help a little bit." Contracting the work "doesn't help ... build our internal maintenance force, which will be required for deployments and contingency requirements over time." Another source is to rob the maintainers from other Active Duty platforms, but that in turn will hurt the readiness of those systems.

"It's going to be a kaleidoscope of things to make it work," Welsh said, "and the problem will be volume. If you don't take squadrons down to bring on new squadrons, then it's got to come out of hide."

The Air Force asked for a few thousand additional airmen in its Fiscal 2016 budget, but they are not meant to fix the maintainer shortage alone.

Some of the increase—blessed by Defense Department leaders even as the Army shrank and the Navy's end strength remained flat—"is for mission areas that we just did not divest" because of Congress' objection, Welsh said. "Some of it is to help with [remotely piloted aircraft] manning, some of it is to 'plus-up' maintenance manpower [and] security forces

manpower," as well as "intelligence units, where we are really stressed, and have been stressed for a while."

PICK YOUR FIGHTS

More is riding on the Fiscal 2016 budget than just the number and timing of new hardware programs. It's the whole national military strategy, and if the armed forces can't be predictably funded at an adequate level, it simply won't be able to do all the things the nation asks.

Introducing the Fiscal 2016 budget at a Pentagon press briefing Feb. 2, Joint Chiefs of Staff Vice Chairman Adm. James A. Winnefeld Jr. noted that in the last few years, defense resources have shrunk while the world has become "more chaotic" and "potential adversaries are eroding our technical advantages."

However, "there's been no corresponding change in the ends of the strategy that we're trying to serve," Winnefeld pointed out. Consequently, if the budget proposed for Fiscal 2016 isn't enacted largely intact, the "best military advice" of the Joint Chiefs of Staff is to change the strategy to something less demanding.

"Any decrease below the [President's Budget 2016] request ... will require adjustments to our defense strategy to restore balance. It doesn't mean the strategy completely breaks, but we will have to make adjustments to that strategy if we're going to stay in balance," Winnefeld explained.

That will mean, ultimately, "reduced American leadership and freedom of action, and that's, of course, an option, but not one that I think most of us would prefer." He also said that while he respects Congress' role in deciding "not only how much money we spend, but how ... unfunded changes to this submission are the same as a reduction and would require adjustments to that strategy as well."


Less than a week after the budget was released, the White House unveiled a new national defense strategy, though it's not a significant departure from the 2010 strategy.

Welsh, in his interview with this magazine, said, "The biggest problem that we, ... the Air Force, specifically, has ... in meeting the strategic guidance is the concept of simultaneity: the idea that ... we are required to be able to defeat one adversary, deny a second adversary, and defend the homeland" all at once.

Intelligence, surveillance, and reconnaissance and aerial refueling, for example, "are stressed in every one" of the potential scenarios, "and so if you have multiple things going on around the world, and a large scenario arises, we're going to have to make choices" about where, when, and how much the nation will fight, Welsh asserted. "We just don't have the force structure anymore to do otherwise. We've been cutting force structure now for 30 years, and we're at a point now where there is no bench to go to."

Welsh pointed out that when the Air Force was called to the first Gulf War in 1991, it had "188 fighter squadrons," leaving plenty of capacity for other contingencies. "This budget will take us to 49" fighter squadrons in total. "That's an incredible change," he said.

The 2016 budget proposal would fund a long-term effort to get USAF back to adequate readiness levels by 2023: 80 percent across the board. Welsh said he and James have made restoring readiness a priority, and two years after the damaging sequester, which sidelined dozens of squadrons for months, the service is starting to crawl out of the readiness hole.

As a result of tight focus on readiness since then, "in our combat-coded squadrons, the percentage ... that is currently fully combat-ready has improved to over 40 percent," Welsh asserted. Asked what the level was before then, he would only say, "lower than that." 

By Robert S. Dudney

The Stolichnaya Strategy

"The Putin regime needs an end to sanctions—not because they are crippling in themselves but because, in combination with the growing crisis of the economy and the unpredictable trajectory of the war [in eastern Ukraine], they could help lead to the destabilization of Russia. ... It is a measure of the government's concern that it has cut the price of vodka. ... This is a transparent attempt to use vodka to tranquilize the population."—*David Satter, Soviet-Russian expert, op-ed in Wall Street Journal, Feb. 3.*

Regime Change?

"The last time the [Obama] Administration made a diplomatic overture [to North Korea] in early 2012, the North responded with a ballistic missile launch, so we wouldn't be surprised if this latest attempt at a rapprochement ends the same way. That is all the more reason for the US to abandon 21 years of failed North Korean diplomacy and adopt a policy of regime change through coercive financial sanctions, support for North Korean refugees and dissidents, and enhanced deterrence on the Korean Peninsula. This is the only policy that will denuclearize the North."—*House editorial about White House effort to restart nuclear talks with Pyongyang, Wall Street Journal, Feb. 3.*

Just Like Jimmy

"Although Barack Obama won't admit it, his foreign policy instincts and Jimmy Carter's have much in common. Like Carter, Obama took office in the wake of a disastrous war. And like Carter, he has responded by attempting to discard the doctrine that underlay it. For Carter, the war was Vietnam and the doctrine was global containment. For Obama, it is Iraq and the 'war on terror.' ... Obama, like Carter, believes he inherited a doctrine shaped by excessive fear. ... Carter never succeeded in moving beyond the Cold War. To the contrary, after the Soviet invasion of Afghanistan, he largely embraced the containment doctrine he had tried to discard. These days, Obama's efforts to move beyond the 'war on terror' don't look much more successful."—*Liberal political pundit Peter Beinart, writing in the National Journal, Jan. 31.*

Good Luck

"The taxpayer cannot comprehend, ... let alone support, the defense budget when they read ... of cost overruns, lack of accounting and accountability, needless overhead, and the like. I his must stop."—*Ashton B. Carter, hearing on his confirmation to become Secretary of Defense, before Senate Armed Services Committee, Feb. 4.*

Bad News I, and ...

"We are now the smallest Air Force we've ever been. When we deployed to Operation Desert Storm in 1990, the Air Force had 188 fighter squadrons. Today we have 54, headed to 49. There were 511,000 Active Duty airmen in 1990. Today there are 313,000. ... We can't continue to cut force structure to pay the cost of readiness and modernization or we risk being too small to succeed."—*Gen. Mark A. Welsh III, USAF Chief of Staff, statement to the Senate Armed Services Committee, Jan. 28.*

Bad News II

"Our smaller aircraft fleet is also older than it's ever been. If World War II's venerable B-17 bomber had flown in the first Gulf War in 1991, it would have been younger than the B-52, the KC-135, and the U-2 are today."—*Welsh, Jan. 28.*

Give Them Guns

"Unfortunately, sanctions alone are unlikely to deter [Russian President Vladimir] Putin. As such, Ukraine needs an immediate infusion of effective defensive military equipment and financial aid to thwart Putin's naked aggression. ... We believe it is time to increase military assistance to Ukraine and urge the US and NATO to move quickly."—*Letter from a 15-member group of senators, led by Sen. Rob Portman (R-Ohio) and Sen. Dick Durbin (D-Ill.), delivered to President Obama, Feb. 3.*

Note to Brian Williams

"Sorry, dude, I don't remember you being on my aircraft. I do remember you walking up about an hour after we had landed to ask me what had happened. Then I remember you guys taking back off in a different flight of

Chinooks from another unit and heading to Kuwait to report your 'war story' to the 'Nightly News.'"—*Facebook post, Jan. 31, from Lance Reynolds, who in 2003 was flight engineer on an Army CH-47 helicopter in Iraq—the one in which NBC's Williams falsely claimed he was riding when it came under fire. Williams has admitted the falsehood.*

Ayotte on A-10

"I am deeply disappointed that the Air Force has again decided to seek the premature divestment of the A-10, despite the fact that A-10s are actively engaged in combat against ISIS."—*Sen. Kelly Ayotte (R-N.H.), Senate Armed Services Committee, statement released Feb. 2.*

A 10-Year Look

"It's not about not liking or not wanting the A-10. It's about some very tough decisions that we have to make to recapitalize an Air Force for the threat 10 years from now."—*Gen. Mark A. Welsh III, USAF Chief of Staff, briefing on the budget, Jan. 15.*

Generation Six

"It will be ... a program that will be initially led by [the Defense Advanced Research Projects Agency], but it will involve the Navy and the Air Force as well. And the intent is to develop prototypes for the next generation of air dominance platforms—X-plane programs, if you will."—*Pentagon acquisition chief Frank Kendall, describing a new "sixth generation" fighter initiative, House Armed Services Committee, Jan. 28.*

No Rubber Stamp

"Congress determines the size, shape, and soul of the military. ... Sometimes the Pentagon is penny-wise and pound-foolish. Sometimes the Pentagon can be parochial. Sometimes the White House tries to cut military spending to put money in other parts of the budget. ... Sometimes their priorities are just wrong. ... Congress should not give any president a blank check and Congress should not be a rubber stamp."—*Rep. Mac Thornberry (R-Texas), chairman of House Armed Services Committee, American Enterprise Institute, Jan. 20.*



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Air Force World

First Weapons School F-35s

The US Air Force Weapons School at Nellis AFB, Nev., received its first F-35A, announced base officials. The aircraft was delivered from Lockheed Martin's production facility in Fort Worth, Texas, to Nellis on Jan. 15.

Over the next year, the school's instructors and staff will develop curriculum for the first F-35A Weapons Instructor

Course (WIC), and the aircraft will initially operate under the umbrella of the 16th Weapons Squadron, the F-16 WIC unit, said Lt. Col. David Epperson, the squadron's commander.

The school is scheduled to receive 24 F-35As, tentatively beginning USAFWS F-35 courses in January 2018.

Nellis has hosted a separate force of F-35As for developmental and operational testing since March 2013.

★ screenshot



European Base Consolidation

The Defense Department plans to return use of 15 sites, located in the United Kingdom, Germany, Belgium, the Netherlands, Italy, and Portugal, back to their host nations.

The base closures will be implemented under the European Infrastructure Consolidation plan, announced by US European Command on Jan. 8.

The biggest change for the Air Force will be the closure of RAF Mildenhall in England where the US' only European permanently stationed aerial tankers are based. The 15 KC-135s will move to Germany, and Mildenhall's other assets will be dispersed to other European locations.

The Defense Department also announced plans to continue with the streamlining process at Lajes Field in Azores, Portugal.

02.08.2015

MSgt. Rebecca Jackonic, a flight engineer with the 758th Airlift Squadron, runs a preflight check on a C-130 at Pittsburgh Arpt./ARS, Pa., prior to an airdrop mission.

USAF photo by SSGT. Justyne Obeldobel

DOD, USAF Budget Proposal Goes to Congress

The Defense Department on Feb. 2 proposed a \$585.3 billion Fiscal 2016 budget to Congress, including \$50.9 billion for overseas contingency operations.

The Air Force's proposed budget is \$167.3 billion, including \$122.2 billion in Blue, service-specific program spending. The rest is divided between \$34.5 billion in joint initiatives, and the service's \$10.7 billion share of OCO funding.

USAF's request would begin the process of recovering from three years of cuts, said Maj. Gen. James F. Martin Jr., deputy assistant secretary for budget, briefing the rollout. "We have the fewest number of airmen and aircraft since our creation in 1947, and the average age of our aircraft is almost 27 years," said Martin. "We simply can't afford to get smaller."

The Blue topline includes \$47.8 billion for operation and maintenance (up from the \$43.5 billion in the enacted Fiscal 2015 defense legislation); \$29.0 billion for military personnel (a tad more than the \$28.8 billion in Fiscal 2015); \$25.3 billion for procurement (a hefty bump compared to Fiscal 2015's \$19.0 billion); \$18.0 billion for research, development, test, and evaluation (compared to \$16.1 billion in Fiscal 2015); and \$2.1 billion for military construction (up from \$1.4 billion in this fiscal year).

Requested procurement hikes support new fighter and tanker production, as well as munitions purchases, particularly small weapons for remotely piloted aircraft.

The KC-46A tanker would be funded at \$2.4 billion to buy

12 tankers. The F-35A is budgeted for \$6.0 billion to procure 44 jets. Twenty-seven C-130Js of all variants, including cargo and special operations types, are funded for \$2.4 billion. The request would also buy 29 MQ-9 Reapers in Fiscal 2016, up from 24 in the enacted Fiscal 2015 budget.

In addition to the \$15.6 billion for aircraft, a further \$2.1 billion would go to missiles, \$1.8 billion to ammunition, \$2.6 billion to space, and \$3.2 billion for other items.

The request reaffirms USAF's commitment to sustaining and modernizing the nuclear enterprise, investing in ICBM fuze replacement and Ground Based Strategic Deterrent. It also fields converted Army UH-60A Black Hawks as a replacement for Vietnam-era UH-1N helicopter fleet.

If the Budget Control Act-mandated sequester is not repealed, the Air Force would need to clip an entire F-35A squadron—14 aircraft, divest the Global Hawk Block 40 fleet, drop Block 30 modifications, and cut 10 RPA combat air patrols—equivalent to the force level operating over Iraq and Syria, leaders cautioned.

The KC-10 fleet would be retired early, eliminating 13 percent of the Air Force's refueling capability, and USAF would defer replacing the 27-year-old Air Force One fleet until after the next two presidential terms.

Even without the sequester, the Air Force aims to divest the A-10 fighter and EC-130H electronic warfare platform to live within proposed budgets and must have a base closing and realignment round in Fiscal 2017 to get rid of at least 20 percent of its facilities.

"The Air Force originally chose to streamline US operations on Lajes as the current presence exceeds requirements to support transiting aircraft," stated the release. "The Air Force will adjust the size of the unit to reflect the level of support required while keeping forces at the installation."

Lakenheath To Get F-35As

The Air Force will base the first European F-35As at RAF Lakenheath, UK, officials announced in January. The eventual 48 aircraft will arrive in phases beginning in 2020 and will be assigned to two fighter squadrons of 24 aircraft each, stated a Jan. 8 press release.

Then-Defense Secretary Chuck Hagel and Air Force officials based the decision on Lakenheath's air space, in-

frastructure, and combined training opportunities. The F-35 "assures allies and partners alike and provides a credible deterrent," said Gen. Frank Gorenc, commander of US Air Forces in Europe-Air Forces Africa.

The decision was not part of the two-year European Infrastructure Consolidation (EIC) study, but was announced in conjunction with its results. The EIC decision to close RAF Mildenhall and realign its missions allows for the two F-35A squadrons. Officials previously announced plans to build shared F-35 maintenance facilities in Italy and Turkey.

By the Numbers

1,500 to 2,100

The number of Air Force Reservists exposed to harmful levels of Agent Orange by contaminated C-123 spray aircraft after the end of the Vietnam War, according to a recent Institute of Medicine report.





Auxiliary Airfield Reopens at Randolph

Flying resumed at the Seguin Auxiliary Airfield at JBSA-Randolph, Texas, for the first time in three years, following a \$12.4 million construction project.

"The previous runway was so rippled that when standing at one end, you couldn't see someone standing at the other end," said Maj. Matthew Reynolds, with the 12th Operations Support Squadron. "The new runway is crowned so that water drains. The old runway was flat and water puddled creating safety issues."

"Being able to fly again at Seguin Auxiliary Airfield gives us a 30 percent increase in training opportunities due to a shared familiarity with T-38C/Talon operations," said Lt. Col. Joel DeBoer, commander of the 560th Flying Training Squadron. "It also allows us to distribute training throughout the area, reducing the volume of operations over our primary patterns."

Airmen With C-130s Train in Bangladesh

Airmen from Yokota AB, Japan, worked with Bangladesh air force personnel and one BAF C-130 during the bilateral airlift exercise Cope South at BAF Base Bangabandhu, Bangladesh, in January.

Some 80 airmen and three C-130Hs from Yokota's 36th Airlift Squadron ran cooperative flight operations, including aircraft generation and recovery and day-night low-level navigation, and conducted subject-matter-expert exchanges on issues like maintenance practices and cargo rigging.

"Cope South provides valuable training for US and Bangladeshi airmen in air-land and airdrop delivery," said Lt. Col. Andrew Campbell, 36th AS commander. "Our work here is vital in contingency and disaster-response operations."

Bangladesh has sought to expand its tactical airlift capabilities and has replaced its older C-130Bs with refurbished US C-130Es. The exercise ran Jan. 24-30.

Gummy Mess and One Less Predator

A turbocharger failure doomed an MQ-1B remotely piloted aircraft, which crashed due to severe turbulence as it

Remember the Alamo: SrA. Cory Brown secures a tactical vehicle in a C-5A before takeoff Feb. 7 on the JBSA-Lackland, Texas, flight line. Brown and his teammates had to quickly upload, tie down, and offload a pallet and vehicles into the aircraft as part of the 433rd Airlift Wing's Operation Alamo Stampede competition. It pitted two teams of operations, maintenance, and aerial port airmen against one another. The exercise was meant to improve C-5A employment techniques.

lost altitude in the mountains of Afghanistan last spring, Air Combat Command investigators determined.

The RPA lost power as the operator at Creech AFB, Nev., attempted to increase power to maintain its assigned flight level on a sortie near Jalalabad on June 25, 2014.

According to the abbreviated investigation, downdrafts in the mountain valley caused the aircraft to lose additional altitude and slam into terrain.

The turbocharger failure was blamed on oil residue caused by high temperature inhibiting its proper functioning, according to the inquest. Loss of the RPA and its weapons was pegged at an estimated \$4.8 million.

No damage was caused to private or unassociated government property, according to a Jan. 8 news release.

Turkey Buys More F-35s

Turkey is upping its initial F-35 buy from two airframes to six, the country's prime minister, Ahmet Davutoglu, announced in January. "It is planned that Turkey will buy 100 F-35 warplanes in the project," Davutoglu said, quoted by Reuters on Jan. 7.

"We previously ordered two in this framework. We have now decided to order four more," he said. The Turkish air force's first batch of F-35As was planned as part of low-rate initial production Lot 10, to be delivered in 2015.

Turkey is one of the nine F-35 strike fighter program partners and was recently designated the European region's heavy engine maintenance pole for multinational F-35 operators, including the Air Force.

Turkey's planned F-35A buy is estimated at approximately \$16 billion.

Four-Seven Dash-8 for Air Force One

The Air Force will base the next presidential aircraft on Boeing's 747-8, the service announced. The Dash-8 "is the only aircraft manufactured in the United States" that when "fully missionized" can meet the project's stringent requirements, according to service Secretary Deborah Lee James. The Dash-8 resembles the legacy VC-25, but adds an extended upper deck and new high-efficiency wings.

The existing VC-25s are 747-200Bs that have been flying since 1987. They've performed well, but are afflicted with "parts obsolescence, diminishing manufacturing sources, and increased downtimes for maintenance," James said on Jan. 28.

USAF will acquire three aircraft. Separate requests for proposals—one for the airframe and one for mission equipment—will be issued this year, with a contract award expected in 2017.

The first airplane that will be ready for modification to the VC-25 configuration is to be delivered in late 2018 and is to be operational in 2023.

Air Force Approves Bombing Range Expansion

The Air Force approved the plan to quadruple the airspace of the Powder River Training Complex in several Great Plains states to give B-52H and B-1B crews from the Dakotas more realistic training close to home.

The expansion decision to create the largest training airspace over the continental United States was signed on Jan. 16. The Federal Aviation Administration must now approve the plan and then modify and establish the requisite airspace.

Among the advantages, the extra airspace will allow the Air Force to conduct several large-force exercises each year where some 20 airplanes will train together as they would fight in actual combat, states the record of decision.

Eagles by Association

Air Force officials recently stood up the F-15C active associate unit that will support the F-15C/D schoolhouse run by the Oregon Air National Guard's 173rd Fighter Wing at Klamath Falls. "It's very invigorating. This is the first active association for the F-15C in the Air Force," said Lt. Col. Chris Clark who took command of the newly minted Active Duty 56th Operations Group, Det. 2, in December.

The Air Force is injecting 84 Active Duty airmen to increase pilot production at the service's sole F-15C/D schoolhouse. The first of them arrived late last year and the detachment will swell to eight pilots, 68 maintenance personnel, and eight support airmen by spring.

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Getting all Hyper

Hypersonic flight is one of the key leap ahead technologies suggested as a way to keep the US ahead of its competitors over the next 30 years, as called out by top defense and Air Force leaders in recent speeches. Indications are the technology is getting more attention and is closer than ever.

The Air Force Scientific Advisory Board, in a January release, revealed the results of a yearlong exploration of the feasibility of useful hypersonic flight. It determined that, based on a survey of advances in propulsion, aerodynamics, materials, and structures, a "tactical-range hypersonic strike weapon has substantial operational utility in projected anti-access, area-denial (A2/AD) environments and can be fielded for use in the 2025 timeframe." In a study abstract, the SAB said that hypersonic weapons would "place defensive challenges on any potential adversary."

Based on previous work, including the successful X-51 Waverider project, which ended in 2013, hypersonics is already at technology readiness level 5 and will reach TRL 6+ by 2020, the SAB reported. A TRL of six indicates a technology is mature enough to be worked into a practical weapon.

The key priorities to work on now, the SAB said, are terminal seekers and maneuverability in the terminal phase of flight. It suggested the Air Force fund these efforts and make sure wind tunnels are ready to test these systems. The next priorities would be integrating payloads and munitions.

Air Force Research Lab chief Maj. Gen. Thomas J. Masiello, in an exclusive January interview with *Air Force Magazine*, reported that the Air Force has partnered with the Defense Advanced Research Projects Agency to pursue two distinct hypersonic projects in the coming years.

"We've each invested about \$300 million ... on two follow-on demonstrations" to the X-51 project. One is a larger version of the X-51 technology, called Waverider, "and the other is a tactical boost-glide vehicle, where there's no scramjet power. You're just basically taking a booster, accelerating it to hypersonic speed, then it glides to the target." Substantial work will be done on "integrating a sensor, so you're able to hit mobile targets, and then integrating a payload," Masiello explained.

He cautioned that as yet, "there is no Air Force program of record" to create a hypersonic weapon. However, he predicted a test flight in 2018.

"Independent of DARPA," he said AFRL is looking to have a larger vehicle available circa 2030, which would be "a reusable platform, that's maybe 10 times the scale" of what USAF is calling the High-Speed Strike Weapon. Though it wouldn't be large enough to carry a crew, it would be able to perform intelligence, surveillance, and reconnaissance missions.

"And then in the 2040 timeframe—2040-plus—is where we would envision a no-kidding, reusable persistent, penetrating hypersonic vehicle that could be manned or unmanned," Masiello said.

—John A. Tirpak

The War on Terrorism

Operation Enduring Freedom

Casualties

By Feb. 18, 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 20,067 troops wounded in action during OEF.

Permanent Bases in CENTCOM?

The Air Force is working closely with US Central Command to determine which of the service's operating locations in Southwest Asia will transition from an expeditionary posture to a more permanent role.

USAF has increased its military construction activities at places like Al Udeid AB, Qatar, and expanded accompanied tours that allow families to join airmen abroad, much as with assignments to Europe, Chief of Staff Gen. Mark A. Welsh III said in a briefing on Jan. 15.

As CENTCOM identifies the bases and facilities it wants to invest in and agreements are made with the host nations, USAF will "provide investment to build that capability ... whether it's a new air operations center or it's trying to expand family presence so we can build stronger relationships with the community and the [host] nations," he said.

Engine Failure Downed Predator

The Air Force lost an MQ-1B Predator remotely piloted aircraft in a crash last year near Kandahar AB, Afghanistan, due to engine failure, Air Combat Command announced.

The Predator was on an information-gathering mission on July 14, 2014, when the engine failed, rendering the aircraft incapable of producing sufficient thrust to remain airborne, according to ACC's news release, summarizing the findings, Jan. 26.

The aircraft was destroyed on impact at a loss of approximately \$4.6 million, states the release. Since no portion of the wreckage was recovered, investigators could not determine why the engine failed.

The Predator was assigned to the 432nd Wing at Creech AFB, Nev. Airmen assigned to the North Dakota Air National Guard's 178th Reconnaissance Squadron in Fargo were controlling the aircraft at the time of the mishap.

Operation Inherent Resolve

Casualties

By Feb. 18, a total of three Americans had died in Operation Inherent Resolve. All three were troops and were killed in noncombat incidents.

OIR's Target Tally

US Central Command has released the details of targets struck by US and partner warplanes in Operation Inherent Resolve in Iraq and Syria from Aug. 8, 2014, to Jan. 7, 2015.

Many strikes targeted heavy vehicles, many of them captured by ISIS fighters during their lightning advance through Iraq last summer.

Allied air strikes destroyed 58 tanks, 184 Humvee vehicles, 26 armored personnel carriers and mine-resistant, ambush-protected vehicles, and 303 makeshift armed "technical vehicles."

Some 79 artillery pieces, anti-aircraft weapons, and mortar emplacements have been hit as well.

Aircraft hit structures and fighting positions hard, destroying 980 barracks and buildings, 673 fighting positions, 16 command posts, 92 checkpoints, 17 guard facilities, and 52 bunkers.

Aircraft carried out 259 strikes on "oil infrastructure," 23 arms stockpiles and caches, 41 "staging areas," and even 14 boats.

Ellsworth B-1Bs Deploy to Support OIR, OFS

Some 350 airmen from Ellsworth AFB, S.D., deployed on Jan. 20 to Southwest Asia, where they will support B-1B operations in both Operation Inherent Resolve and Operation Freedom's Sentinel in Afghanistan.

The aircrew members, maintenance, and support personnel from Ellsworth's 28th Bomb Wing are deploying to the 379th Air Expeditionary Wing at Al Udeid AB, Qatar, where they will help provide US Central Command air presence, precision strike assets, and surveillance and reconnaissance capabilities, while other airmen will work to assist sortie generation and mission assurance tasks.

The 28th Bomb Wing deployment will replace airmen of the 9th Bomb Squadron from Dyess AFB, Texas, who deployed to CENTCOM in summer 2014.

Ghostrider Test Schedule Delayed

Modification and developmental testing of the second AC-130J Ghostrider gunship has been delayed due to integration setbacks and component availability, according to the Fiscal Year 2014 Director, Operational Test and Evaluation report, released Jan. 20.

The new aircraft vibrates more than legacy AC-130Ws, causing problems with the accuracy of the electro-optical/infrared sensors. "Erratic" sensor movements caused by aircraft systems interference with the mission systems also "inhibits target tracking" and increases the "risk of fratricide" during weapon employment, according to the report.

The second MC-130J airframe was delivered for conversion to AC-130J standards last September, but changes to the intercom system and parts availability have delayed the aircraft's readiness for developmental testing.

In February 2014, the first test aircraft also "experienced a temporary departure from controlled flight" during flying and handling qualities testing near the stall limit. This re-

quired a brief suspension of flying for inspections and the addition of more test flights for safety reasons.

Operational testing is now slated to begin in October 2015.

Europe Goes Talonless

The last Europe-based legacy MC-130H special-mission aircraft departed RAF Mildenhall, UK, as new-build MC-130Js officially took over in January.

The last Combat Talon II, assigned to the 7th Special Operations Squadron, departed Mildenhall on Jan. 8, according to a base news release. The unit now operates a mix of CV-22 Osprey and MC-130J Commando IIs and will eventually shift to a base in Germany with the closure of Mildenhall. Its MC-130Hs are now joining the 15th SOS at Hurlburt Field, Fla.

The 17th SOS at Kadena AB, Japan, also began phasing out legacy MC-130P Combat Shadows, preparing to transition to MC-130Js in the Pacific. Kadena received its first new-build MC-130J late last year.



And Then There Were Three

Retired Lt. Col. Edward J. Saylor, one of the last four surviving Doolittle Raiders, died in Washington state at the age of 94, Jan. 28.

Saylor enlisted in the Air Corps on Dec. 7, 1939, and served as an enlisted airman throughout World War II. On April 18, 1942, he joined 79 other volunteers led by Lt. Col.

May I Escort You?: Two F-7BG fighters from the Bangladesh Air Force escort a USAF C-130H near Kishoreganj, Bangladesh, during Exercise Cope South on Jan. 28. Cope South is a PACAF-sponsored bilateral tactical airlift exercise focusing on cooperative flight operations, day and night low-level navigation, tactical airdrop, and knowledge exchanges in the operations, maintenance, and rigging disciplines.

Court Denies Schwalier A Second Star

Retired Air Force Brig. Gen. Terry J. Schwalier, who commanded the 4404th Wing (Provisional) at Dhahran, Saudi Arabia, at the time of the terrorist attack on Khobar Towers in 1996, cannot challenge the Clinton Administration-era ruling to pass him over for promotion, according to a US appeals court ruling in January.

Schwalier and his supporters, including the Air Force Association, have long argued the decision made him a scapegoat for the attack and that he had actually improved defenses at the facility prior to the attack. Schwalier was first approved for promotion in 1995, with the Senate confirming the nomination in March 1996. In the aftermath of the June 1996 attack, then-Secretary of Defense William S. Cohen recommended President Clinton remove Schwalier's name from the promotion list—forcing his retirement in 1997.

In 2003, Schwalier filed an application to retroactively correct the record, arguing his promotion was a matter of law, and sought to have records corrected. While the Air Force Board for Correction of Military Records had twice agreed with his case, this time the US Court of Appeals for the Federal Circuit decided the retroactive promotion would allow Congress to “compel the President to appoint senior officers of the United States,” and that presidential approval is required for a promotion to be finalized, not just a Senate vote.

—Marc V. Schanz

James H. “Jimmy” Doolittle on a top-secret mission to bomb targets in Japan. Saylor was an engineer in the 15th of 16 B-25 Army bombers to launch from the aircraft carrier USS *Hornet*. The mission was a huge success in boosting American morale and wounding that of the Japanese, because it proved Japan's home islands were not beyond the reach of US sea- and airpower.

Saylor received his commission as an aircraft maintenance officer in October 1947. He served at bases in Iowa, Washington, Labrador, and England.

The Doolittle Tokyo Raiders received the Congressional Gold Medal in 2014. In addition, Saylor earned the Distinguished Flying Cross, Air Force Commendation Medal, and the Chinese Army, Navy, and Air Corps Medal, Class A, 1st Grade, according to a Doolittle Tokyo Raiders press release.

Legendary Test Pilot Dies

Fitzhugh L. “Fitz” Fulton Jr., a highly decorated Air Force and NASA test pilot, died on Feb. 4 at the age of 89.

Fulton joined the Air Corps in 1943. He flew some 200 Berlin Airlift missions from 1948 to 1949 in C-54s. During the Korean War, Fulton flew 55 combat missions in the Douglas B-26 Invader and was awarded the Distinguished Flying Cross and five Air Medals for combat heroism.

In 1952, Fulton graduated from USAF's Experimental Test Pilot School (later being honored as a distinguished alumnus). He is credited by the Air Force Flight Test Center as “perhaps the greatest multiengine test pilot of his generation” and was awarded an additional three Distinguished Flying Cross medals for his test pilot work.

The Saga of SpaceX

SpaceX reached an agreement with the Air Force on the future of the Evolved Expendable Launch Vehicle program, dropping its lawsuit in January, according to a joint statement.

"Under the agreement, the Air Force will work collaboratively with SpaceX to complete the certification process in an efficient and expedient manner," according to the statement. Air Force Space Command aims to certify SpaceX as a second launch provider to boost defense payloads into space "no later than midyear," said Lt. Gen. Samuel A. Greaves, commander of the Space and Missile Systems Center at Los Angeles AFB, Calif., said in a Jan. 7 statement. The company is working with USAF to certify its Falcon 9 rocket.

"The Air Force is committed to reintroducing competition into the extremely complex Evolved Expendable Launch Vehicle program and getting new entrants certified as

quickly as possible," service Secretary Deborah Lee James said in the joint statement. James said she is "directing a review" of the space launch certification process to see if, and how, it can be streamlined and improved in the future.

In addition, the Air Force "has expanded the number of competitive opportunities for launch services under the EELV program while honoring existing contractual obligations," the statement continued.

The California-based SpaceX company filed the lawsuit last April, claiming the service's latest contract with the United Launch Alliance—a joint venture between Boeing and Lockheed Martin—blocked other companies from competing for national security space launches.

"Going forward, the Air Force will conduct competitions consistent with the emergence of multiple certified providers," stated the release.

—Aaron M. U. Church and Amy McCullough

Fulton was chief of the Bomber Transport Test Operations Division at Edwards AFB, Calif., and was the only USAF pilot to fly the atomic-powered NB-36H. He set an international altitude record of 85,360 feet flying the B-58 in 1962 and was awarded that year's Harmon International Aviation Trophy for his work with the program.

After a 23-year Air Force career, Fulton retired as a lieutenant colonel and became a civilian research pilot for NASA. He participated in tests of the 747 shuttle carrier aircraft, the XB-70 prototype supersonic bomber, as well as the YF-12A and YF-12C. By the time he retired from NASA in 1986, Fulton had more than 15,000 hours in more than 200 types of aircraft. ★

Senior Staff Changes

RETIREMENT: Maj. Gen. Brian T. Bishop.

NOMINATIONS: To be Major General: Nina M. Armagno, John D. Bansemer, Abel Barrientes, Casey D. Blake, Michael T. Brewer, Anthony J. Cotton, Clinton E. Crosier, Thomas H. Deale, Brian E. Dominguez, Timothy G. Fay, John C. Flournoy Jr., Timothy S. Green, Joseph T. Guastella Jr., David A. Harris, James B. Hecker, Scott A. Howell, James C. Johnson, Kathryn J. Johnson, Mark D. Kelly, Kenneth D. Lewis Jr., Mark L. Loeben, Vincent M. Mancuso, Ronald B. Miller, Matthew H. Molloy, Dixie A. Morrow, Karen A. Rizuti, Michael D. Rothstein, Kevin B. Schneider, Richard W. Scobee, Barre R. Seguin, Thomas J. Sharpy, James C. Slife, Scott F. Smith, Giovanni K. Tuck, Glen D. VanHerck, James C. Vechery, Sarah E. Zabel. **To be Brigadier General:** Christopher A. Coffelt, Jeffrey A. Kruse, Randall Reed.

CHANGES: Brig. Gen. (sel.) Tony D. Bauernfeind, from Cmdr., 27th SOW, AFSOC, Cannon AFB, N.M., to Dep. Cmdr., Spec. Ops. Jt. Task Force-Afghanistan, US Forces-Afghanistan, CENTCOM, Kabul, Afghanistan ... Maj. Gen. Warren D. Berry, from Dir., Log., AMC, Scott AFB, Ill., to Dir., Log., ACC, JB Langley-Eustis, Va. ... Maj. Gen. (sel.) Michael T. Brewer, from Cmdr., 412th Test Wg., AF Test Center, AFMC, Edwards AFB, Calif., to Dir., Strategy, Plans, Prgms., & Analyses, AFMC, Wright-Patterson AFB, Ohio ... Brig. Gen. Ronald D. Buckley, from Dep. Dir., Ops., Ops. Team 2, Natl. Jt. Ops. & Intel. Center, Jt. Staff, Pentagon, to Dep. Dir., Ops., (Protection), NORTHCOM, Peterson AFB, Colo. ... Maj. Gen. Richard M. Clark, from Vice Cmdr., AFGSC, Barksdale AFB, La., to Cmdr., 8th AF (Air Forces Strat.), AFGSC, STRATCOM, Barksdale AFB, La. ... Brig. Gen. Patrick J. Doherty, from Dir., AF Svcs., DCS, Manpower, Personnel, & Svcs., USAF, Pentagon, to Cmdr., 82nd Tng. Wg., AETC, Sheppard AFB, Texas ... Maj. Gen. Michael E. Fortney, from Dir., Ops., AFGSC, Barksdale AFB, La., to Vice Cmdr., AFGSC, Barksdale AFB, La. ... Maj. Gen. (sel.) Peter E. Gersten, from Dep. Dir., Politico-Mil. Affairs (Western Hemisphere), Strat. Plans, & Policy, Jt. Staff, Pentagon, to Dep. Cmdr.-Air, Combined Jt. Task Force-Operation Inherent Resolve, CENTCOM, and Cmdr., 9th Air Expeditionary Task Force-Levant, ACC, Southwest Asia ... Brig. Gen. Gregory M. Gutterman, from Dir., Strategy, Plans, Prgms., &

Analyses, AFMC, Wright-Patterson AFB, Ohio, to Dir., AF Security Assistance & Cooperation Directorate, AFLCMC, AFMC, Wright-Patterson AFB, Ohio ... Maj. Gen. Jeffrey L. Harrigan, from Asst. DCS, Ops., P&R, USAF, Pentagon, to Dir., F-35 Integration, USAF, Pentagon ... Brig. Gen. (sel.) Stacey T. Hawkins, from Cmdr., 10th AB Wg., USAFA, Colo., to Dir., Log., AMC, Scott AFB, Ill. ... Maj. Gen. Scott W. Jansson, from AF PEO, Weapons, AFLCMC, AFMC, Eglin AFB, Fla., to AF PEO, Strat. Sys., AFLCMC, AFMC, Kirtland AFB, N.M. ... Brig. Gen. Scott A. Kindsvater, from Cmdr., 82nd Tng. Wg., AETC, Sheppard AFB, Texas, to Asst. Dep. Cmdr., AFCENT, ACC, Shaw AFB, S.C. ... Brig. Gen. (sel.) Shaun Q. Morris, from Dir., AF Security Assistance & Cooperation Directorate, AFLCMC, AFMC, Wright-Patterson AFB, Ohio, to AF PEO, Weapons, AFLCMC, AFMC, Eglin AFB, Fla. ... Brig. Gen. (sel.) Carl E. Schaefer, from Spec. Asst. to SECAF/CSAF for Jt. Strike Fighter Integration, USAF, Pentagon, to Cmdr., 412th Test Wg., AF Test Center, AFMC, Edwards AFB, Calif. ... Brig. Gen. Kevin B. Schneider, from Asst. Dep. Cmdr., AFCENT, ACC, Shaw AFB, S.C., to C/S, PACAF, JB Pearl Harbor-Hickam, Hawaii ... Maj. Gen. Scott A. Vander Hamm, from Cmdr., 8th AF (Air Forces Strat.), AFGSC, STRATCOM, Barksdale AFB, La., to Asst. DCS, Ops., P&R, USAF, Pentagon ... Brig. Gen. Glen D. Vanherck, from Cmdr., 509th BW, AFGSC, Whiteman AFB, Mo., to Dir., Ops., AFGSC, Barksdale AFB, La. ... Brig. Gen. John M. Wood, from Dep. Dir., Strat. Plans, Rqmts., & Prgms., AMC, Scott AFB, Ill., to Dep. Dir., Politico-Mil. Affairs, Jt. Staff, Pentagon.

COMMAND CHIEF RETIREMENTS: CMSgt. Scott A. Fuller, CMSgt. Oscar D. Mackin.

COMMAND CHIEF CHANGE: CMSgt. Frank H. Batten III, from Command Chief, 86th AW, USAF, Ramstein AB, Germany, to Command Chief, 9th AF, ACC, Shaw AFB, S.C.

SENIOR EXECUTIVE SERVICE CHANGES: Keita M. Franklin, to Dep. Dir., Sexual Assault Prevention & Response Office, USAF, Pentagon ... William E. Marion II, to CIO and Dep. Dir., Plans & Integration, DCS, Manpower, Personnel, & Svcs., USAF, Pentagon ... Frank R. Washburn Jr., to Dir., 448th Chain Mgmt. Wg., AF Sustainment Center, AFMC, Tinker AFB, Okla.

As the F-35A strike fighter begins to enter the inventory in significant numbers, the Air Force is already hard at work establishing homes for all 1,763 of the advanced stealth jets it plans to buy. The massive undertaking requires the Air Force to plan decades into the future, accommodating the aircraft, the support facilities, and gear they'll need and the airmen who will fly and maintain the F-35s at bases worldwide.

In January, the Pentagon announced that RAF Lakenheath, UK, will be the

first European base to permanently host Air Force F-35s, starting in 2020. The base is home to F-15C and F-15E fighters today.

Many decisions related to this project remain in flux or are years away. Some of these relate to deciding where the aircraft should be stationed, while others relate to the task of bedding them down.

"We will probably make the last basing decision in the early 2030 time frame, and the beddown would probably last into the latter part of the 2030s," said Mark

A. Pohlmeier, the Air Force's chief of strategic basing, in an interview.

The Lockheed Martin-built F-35As will form the backbone of the Air Force's future fighter fleet. Some 1,420 of them will be spread across units of the combat air forces, replacing legacy platforms like the A-10 and F-16. The goal is to field the F-35A at locations now hosting fighters and in squadron sizes closely matching those of the legacy units to minimize the cost of conversion.

Another 315 or so F-35As will support training, said Air Education and Training



USAF photo by Samuel King Jr.

Command officials, while a small number will perpetually be involved in testing.

The F-35A today operates from four Air Force bases, not including Marine Corps and Navy locations operating the F-35s unique to those services. Test F-35As fly from Edwards AFB, Calif., and Nellis AFB, Nev., while training of pilots and maintainers alike is being done at Eglin AFB, Fla., and Luke AFB, Ariz.

At each location, USAF has invested millions of construction dollars to enhance the infrastructure to support the jets and associated people. Those proj-

ects range from expanding ramp space to new hangars, maintenance facilities, and housing.

There's nothing inherently more difficult about bedding down F-35s than previous fighters, despite the scope and magnitude of the effort, said officials across the Air Force's three components. It doesn't have overly complex or unique infrastructure requirements, said Pohlmeier, who noted that the F-22 Raptor was more challenging to bed down due to its somewhat more finicky stealth skin.

The Air Force is also prepping Hill AFB, Utah, to host three squadrons of F-35As, replacing F-16s there. Hill's first assigned F-35A is expected to touch down in September, although other F-35s have visited previously for form, fit, and function checks. The base will be USAF's first operational location, so the buildup there is crucial to the service's goal of declaring combat readiness with the jet in August 2016.

Air Force initial operational capability is about one year after the Marine Corps' planned July 2015 IOC date for

Building Homes for F-35s

By Michael C. Sirak, Special Content Director

It will take decades to bed down 1,763 F-35As.

An F-35 pilot taxis on the runway at Eglin AFB, Fla.



its short-takeoff F-35Bs and about two years before the Navy's carrier-optimized F-35C is to be combat ready in 2018.

Air Force officials said the F-35A will achieve full operational capability when it has two wings' worth of aircraft with the highest level of capability.

Work also continues at Luke to ready the F-35A combat training mission and initial prep is underway at Burlington Arpt., Vt.—the Guard's first F-35A operating location—to support the new mission coming there in 2020.

The F-35A basing puzzle will take clearer shape in the coming months. During that period, USAF will make final the details of the second F-35A fleet basing strategy. This planning document will set the conditions for choosing the next three or more operating locations, said Pohlmeier. Once complete, the strategy will go to Air Force Secretary Deborah Lee James for approval. It could include plans for a Reserve F-35 site.

After that, the next round of basing selections should be announced in spring 2016, according to Air Combat Command.

The first F-35A fleet basing strategy established how USAF would choose the first set of training and operational homes for the F-35A. It dates to 2009.

"We have an acquisition strategy that lays down all 1,763 aircraft coming down the production line. The fleet basing strategy takes that and packages it into a rational set of decisions as to what we want to do with these aircraft in a logical flow," said Pohlmeier.

TAKE THAT HILL

The strategy set conditions for the Air Force's first two pilot training centers. Eglin has hosted preliminary training for all three services, while Luke will be the training base for the Air Force and certain international F-35A partners.

The initial strategy also set the rules for establishing the first four F-35A operating locations. These were:

- Ops 1: an Active Duty three-squadron wing;
- Ops 2: an Active Duty two-squadron wing in the Asia-Pacific region;
- Ops 3: an Air National Guard one-squadron wing; and

Ops 4: an Active Duty two-squadron wing in Europe.

Ops 1 became Hill. The base is also site of the Air Force's F-35A depot and is slated to receive its full complement of 72 F-35A primary assigned aircraft, or PAA, by late 2018. There will be 24 airplanes in each of the three squadrons. The base's Active Duty 388th Fighter Wing will own the jets and maintain them with airmen from Air Force Reserve Command's 419th Fighter Wing. This is the classic association partnership they have today with Hill's F-16s. The F-16s are all scheduled to depart the base by spring 2018.

According to Hill officials, for USAF to declare IOC in the latter part of 2016, it must have the following: between 12 and 24 combat-configured F-35As with enough pilots, maintainers, and spare parts to conduct sustained operations. The F-35A must also be able to perform close air support, interdiction, and suppression or destruction of enemy air defenses in a contested environment.

For Ops 2, the Air Force in August 2014 announced it had selected Eielson AFB, Alaska, as its preferred site. The base is home to the 354th Fighter Wing, flying F-16s in the aggressor role today.

By the spring of 2016, Air Force leaders are expected to announce the final record of decision on whether to bed down 48 F-35A PAA, with 24 in

Airmen prepare to load an AIM-120 missile onto an F-35 at Edwards AFB, Calif. Edwards is the site of developmental and operational testing for all three variants of the jet fighter.



Lockheed Martin photo by Chad Bellay

A hangar for F-35s is constructed at Hill AFB, Utah. Hill will have three Active Duty F-35 squadrons and the depot for Air Force Lightning II aircraft.



each of the two squadrons, at Eielson. That decision will only come after USAF completes a congressionally mandated environmental impact assessment of basing the new aircraft there.

If the service leadership gives the green light, Eielson would become the first F-35A operating location in the US military's Pacific area of responsibility. It would receive its first F-35As in 2019.

Regarding Ops 3, the Air Force leadership announced its selection of Burlington in December 2013 at the same time it released the news on Hill. Burlington's 158th Fighter Wing is expected to receive its 18 F-35A PAA for its one flying squadron over a one-year period starting in May 2020, said Vermont National Guard officials. The jets would replace the unit's F-16s. The wing operates and maintains its F-16s together with the Active Duty 495th Fighter Group, Det. 134, under an active association. That relationship is set to continue for the F-35A mission.

"We look forward to the arrival of the F-35," Brig. Gen. Richard N. Harris Jr., the Vermont National Guard's assistant adjutant general-air, told *Air Force Magazine*. "It will be a significant milestone."

In August 2014, a group of local residents opposed to the basing decision filed an appeal to the Vermont Supreme Court, arguing that the F-35s would create unbearable noise levels over parts of the Burlington area, ren-

dering some nearby homes unsuitable for occupancy. As of early January, the court had not yet ruled on the appeal, but the Air Guard continued preparing for the new aircraft.

UP NEXT: OPS 5, 6, AND 7

"We are pressing ahead because we believe that Burlington is a good location and that the concerns raised will not keep the unit from converting to the F-35," said Lt. Gen. Stanley E. Clarke III, ANG director, in an interview. "Honestly, I have been on the ramp where F-35s and F-16s were flying at the same time in the pattern. When I closed my eyes and tried to distinguish one from the other—and I have got over 2,000 hours in the F-16—I couldn't tell the difference."

Clarke also said he believes Burlington could commence F-35A operations "faster" than the current schedule, if the Air Force leadership desired it, due to the experience of the Air Guardsmen there and their established partnership with Active Duty airmen.

As for Ops 4, stationing 48 F-35A PAA at Lakenheath should deepen the

close military relationship between the US and Britain and offer new opportunities for collaboration, said the Pentagon in its Jan. 8 basing announcement. The Defense Secretary is the decision authority for overseas basing.

"From the beginning, the United States and the United Kingdom have been side-by-side on F-35 program development," said Col. Robert G. Novotny, commander of Lakenheath's 48th Fighter Wing, on the release of the news. "This is about continuing to work together with our allies and partners to ensure a secure future for Europe."

The F-35A mission will bring an additional 1,200 US military personnel to Lakenheath, according to a Pentagon statement.

The Air Force's forthcoming fleet basing strategy will pick up where the first one left off—beddowns starting in the early 2020s. It's expected to address at least the Ops 5, Ops 6, and Ops 7 locations, said Pohlmeier. There will be no training sites in this next

USAF photo by SSgt. Siuta B. Ika



Capt. Brent Golden taxis the first Lightning II assigned to the USAF Weapons School at Nellis AFB, Nev., on Jan. 15.



Photo by Jim Haseltine

An F-35 banks over Luke AFB, Ariz. Luke is slated to field 144 F-35s across six squadrons to support training for USAF and F-35A partner nation pilots.

of things in the decision hierarchy, so we do not want to tie our leadership's hands," said Pohlmeier.

LOCATION, LOCATION ...

The Air Force will continue to apply the same transparent and repeatable process it has used to date to choose F-35 basing locations. First, it will draw from its pool of data on all of its bases to identify sites best aligned with the attributes laid out for each location in the basing strategy.

Next, it will survey each candidate location, looking at details such as what it would cost to bring the F-35 to the base, including infrastructure changes, and what effect the new mission would have on the local community and environment.

Armed with that data, USAF leaders will then pick a preferred location. Once the environmental assessment is done, they will issue the record of decision to codify the choice.

The findings of an environmental impact study, coupled with public feedback, can have a big effect on the outcome of a basing decision. For example, at Eglin, the Air Force opted against basing up to 107 F-35s there due to concerns about the noise impact on a local community. Instead, it capped the number of F-35s that could operate from there at 59.

Once a basing decision is final, the process shifts to bedding down the aircraft. This involves synchronizing the brick-and-mortar upgrades at the installation with the arrival of the F-35s and the departure of the jets they're replacing, and the availability of maintainers and pilots trained on the new airplanes so the host unit can start operating with them.

"You are not going to get a whole wing's worth of airplanes tomorrow," said AFRC's Rydholm. "So there is a very delicate balance" to ensure that a huge number of pilots and maintainers aren't in place early, waiting around to fly or work on a handful of jets.

The Air Force's goal is to have a Total Force association at every F-35 base. Such associations refer to a partnership between an Active Duty unit and a reserve component unit, with one of them owning the aircraft and the other providing additional manpower to help fly and maintain them. That may not be

set of locations, since there is "quite a bit of capacity" for the time being with the F-35A training fleet, given the six squadrons standing up at Luke and the one at Eglin, he said.

Eventually, however, the Air Force will require about 12 F-35A training squadrons in all to support the fleet size on the books, said AETC officials.

Luke's 56th Fighter Wing is slated to field 144 F-35As across its six squadrons to support training for Air Force pilots and their counterparts in partner air forces. Eglin's 33rd Fighter Wing operates a squadron of 24 F-35A PAA, along with some Marine Corps F-35Bs, Navy F-35Cs, and international partner F-35As and F-35Bs.

While the Air Force's first basing strategy was more heavily weighted on the Active Duty side, the coming iterations should show more balance across the service's three components, said Pohlmeier.

"When you field a brand-new weapon," he said, there is an understanding that the Active Duty will manage training and "the first tranche of tactics, techniques, and procedures, and for working out all of the kinks." Consequently, the Active forces will have a "disproportionate" amount of the first aircraft "in the early stages of a large beddown." The "overhead part of the equation is pretty much past us," he added. "Moving forward, [the basing] is going to look much more proportional" among the components.

Air Force Reserve Command anticipates the new basing strategy will include its first F-35A ops base, said Maj. Gen. Derek P. Rydholm, who oversees AFRC plans, programs, and

requirements. "We fully expect that," he said in an interview. "If the Active Duty already got Ops 1 and we have already identified Burlington [for the Air National Guard], ... the Air Force leadership understands that we have got to now start to look at the first of the Air Force Reserve Command locations that will get those airplanes."

Current planning indicates AFRC would get its first F-35As "in the early 2020s," he said. AFRC wings assigned F-35As likely will get between 18 and 24 of them, he said.

ANG Director Clarke said he hoped the Guard would be included in the next strategy, too, since his component "currently flies the oldest fleet" in the overall USAF inventory.

"We feel like, as we have to divest more legacy airplanes in the Air National Guard inventory, ... we would be included in any of these future ops beddown locations," he said. "We think all of our units compete very well for that."

He noted, for example, that the Guard conducts 100 percent of the air defense mission over the continental United States.

"There is no doubt that Air Force senior leadership is confident in the capabilities of the Air National Guard, now and in the future. ... And when they are making beddown decisions about the F-35, without hesitancy, they will pick an Air National Guard location to do that," he said.

Beyond those items, Air Force officials are withholding the details of the new basing strategy at this point. "We are sensitive about getting too far out ahead because there are a lot

Maj. Gen. Jay Silveria (l), USAF Warfare Center commander, greets Golden after the flight of the Weapons School's first F-35. Silveria was the first general officer to qualify in the strike fighter.

USAF photo by SSGT Silvia B. Ika



possible in every case, said Pohlmeier. Resources are limited.

"If you do not have an association now with legacy aircraft, and then you convert to a new aircraft, there would be a bill associated with standing up a brand-new association," he said. "But I can tell you the Air Force desires to associate wherever practical."

The advantages of associations are clear. For example, at Burlington, pairing experienced Air National Guard maintainers with junior Active Duty airmen of the associate unit will help quickly build a larger seasoned workforce of F-35 techs. They can then move on to where the Air Force needs them as more F-35A bases stand up, said ANG's Clarke.

"That is something that I have added to the conversation," he said. "We are going to get a head start on cranking out experienced members of the Regular Air Force from that location."

At Luke, for example, Reservists support their Active Duty counterparts with F-16 training. An association for the F-35A is in the works, said Air Education and Training Command officials.

"We anticipate that we will have a very strong presence in the F-35 training as we move forward," said AFRC's planning director Rydholm. That support will include training pilots of nations that buy F-35As through foreign military sales.

Pohlmeier said he thinks the biggest challenge with the F-35 beddown has to do with the training squadrons because they'll be integrated with partner nations' airmen and airplanes to an unprecedented degree.

At Luke, for example, a single squadron could comprise Air Force aircraft, pilots, and maintainers, plus Australian pilots and trainers, he said.

"I think that is really unique, and the best we can tell, we are doing a good job to orchestrate that process."

Australia is set to start F-35A pilot training at Luke this summer, followed by Italy and Norway in 2016, according to AETC.

Another issue is getting maintainers trained on the F-35A and ready for their units in time. "Right now, across the Air Force, there is a shortage of combat air forces maintenance personnel," said Rydholm. "That is a huge issue and we are in discussions and negotiations

where we may very well try to help the Active Duty as they move out of those F-16s at Hill and into the F-35."

ANG's Clarke said he thinks more than one course of action is needed to deal with this issue. "You can't do this entirely with just people coming just out of basic military training and sending them to tech school," he said. "You have got to have a combination of experienced maintainers and new people who come onboard at the same time in a Regular Air Force unit."

Congress' decision to prevent the Air Force from retiring the A-10 fleet in Fiscal 2015—and swinging freed-up A-10 maintainers over to the F-35A—may compound this issue. At the end of 2014, Air Force officials were still measuring the impact, if any, this decision would have.

At Hill, USAF expects to spend about \$100 million on some 36 infrastructure projects for the F-35A mission. The work is scheduled to conclude in 2019, said base officials.

At Burlington, while officials don't expect to add new hangars or facilities, there will still be upgrades to existing infrastructure to support the F-35As.

Luke is scheduled for some \$57 million in infrastructure improvements, including a \$47 million F-35A academic training center that opened in October.

At Edwards, site of developmental testing and operational testing for the F-35A, F-35B, and F-35C, the Air Force has already invested some \$28 million on various improvement projects. These include extending a ramp; renovating offices, a hangar, and work areas; and constructing a new munitions maintenance facility and warehouse. Edwards

will eventually host a force of 34 F-35s of all three variants.

Among the construction projects at Nellis is the \$20.6 million maintenance hangar completed in March 2014. The Nevada base will host 36 F-35As at full strength: 24 for the Air Force Weapons School and 12 for the operational flight testing.

At Eglin, home of DOD's initial F-35 schoolhouse, there have been more than \$350 million in facility improvements so far to support the training mission for the Air Force, Marine Corps, Navy, and international partners. Among them were adding hangars, dormitories, academic training facilities, a dining facility, taxiway, and an apron. Another \$55 million in US-funded projects is planned through 2020, including more dorms, another dining facility, a new headquarters facility, and additional academic training facilities.

Eglin, which had been training F-35A, F-35B, and F-35C pilots and maintainers, is undergoing a transition. The Marine Corps will complete relocating F-35B training to MCAS Beaufort, S.C., this summer, and international F-35A training is moving to Luke. This will leave Air Force F-35A and Marine Corps and Navy F-35C pilot training at Eglin. The Florida base will also remain the primary training site for Air Force, Marine Corps, Navy, and foreign air force F-35 maintainers, said Eglin and AETC officials.

The F-35 beddown process is far from complete, but when the job is done, the stealth jet aircraft will be hosted at Active, Guard, and Reserve installations across the United States, Europe, and the Pacific. ✪

A student pilot takes off in a T-38 Talon at Sheppard AFB, Texas. A new cost versus capability analysis process will be tried out on the Talon's replacement aircraft, now called T-X.



BETTER

THE next dozen years or so paint a grim picture for Pentagon leaders. Even if sequestration is not reimposed next year, budgets won't be big enough to maintain forces at their current size and strength. At the same time, adversaries are making rapid technological advances, putting them at near parity with many US capabilities. To confront these challenges, defense leaders will have to change their thinking about how to prepare for and fight future wars and what "winning" looks like.

While the US was preoccupied with Iraq and Afghanistan over the last 13 years—wars that pulled resources from developing next generation capabilities—other militaries caught up. Precision weapons, battle networks, remotely piloted aircraft, space assets, and all the other sinews of an American-style modern military have proliferated and are now in foreign hands and even in those of some nonstate actors. These rivals have shown they can develop (or steal) and field technology with gathering speed—faster than the ponderous Pentagon weapon-buying apparatus can match.

To confront these strategic realities, defense leaders are taking a two-pronged approach.

First, they are seeking game-changing technologies that will overcome the very same kinds of systems that have given the US its edge for decades.

Second, Pentagon leaders are trying to accelerate weapons development and the buying process, by removing obstacles that slow it down. At the same time, they are making the system more efficient to squeeze every bit of capability possible from the dwindling dollars available.

The Air Force will play a big part in this transitional period. When defense leaders talk about "leap ahead" technologies, they usually mention hypersonics, extreme stealth, directed energy, automated intelligence analysis, remotely operated or robotic systems, additive or 3-D manufacturing processes, and better interfaces between weapons and the people who operate them. The Air Force's last two technology roadmaps emphasized all of these areas of research, and they are central to its new "Strategic Agility" vision for the future.

The service has also embarked on its own acquisition acceleration initiative, seeking greater industry partnerships and streamlined, fast-tracked work-arounds to rapidly acquire and field technologies to become more efficient or effective.

The Pentagon and the Air Force must revolutionize what they buy and how they buy it.



BUYING

By John A. Tirpak, Editorial Director

It's essential to accelerate the acquisition process and eliminate as much no value-added effort—and cost—as possible. To that end, Pentagon acquisition, technology, and logistics chief Frank Kendall was expected to issue the final version of his Better Buying Power 3.0 initiative in early 2015. Kendall had briefed industry and the press in November on earlier drafts and spoke about what would be in the acquisition overhaul.

FIGHTING ON CAPITOL HILL

At a Navy League breakfast in Arlington, Va., Kendall said he has grown concerned about the pace that challengers are advancing their military strength. The US can't be complacent, Kendall said. "I think we've gotten so accustomed to our technological superiority, militarily, that it's just a given, and it's one of the things I kind of fight against when I ... try to have these conversations" with lawmakers on Capitol Hill.

Kendall said that when he came back to the Pentagon in 2010, after studying intelligence reports, "I realized that the United States had a problem. The problem was the modern-

ization rate of other powers—in particular, ... China has been investing for a long time in a number of systems which are essentially focused on keeping the United States out of the part of the world closest to China."

The Chinese benefit "from their ability to acquire technology commercially. They're certainly building up their own organic capability to develop technology. And they're benefitting from the technology that they can obtain through the Internet without other people's permission." While he said, "I do not envision war with China," Kendall does expect "confrontations with China" and that military power will be "an important part" of influencing that country. He expects China to sell the hardware it's developing, and it "may very well show up in other places that we might be more likely to be engaged [with] in a conflict."

Kendall decried the "lack of appreciation of this problem." When he briefs members of Congress and their staffs about the advances being made by China, Russia, and other countries, "I get a reaction that is sort of surprise ... and just disbelief, perhaps, as well." The situation, he said, "continues to deteriorate."



Kendall pleads with Congress to repeal sequestration at every speaking opportunity, but he also acknowledges that the Pentagon can't wait and see if that will happen. It must act swiftly to get greater value out of the dollars it has and speed up the rate that it can insert new technology into the force.

Better Buying Power 1.0 was started when Ashton B. Carter—now Defense Secretary—was in Kendall's job. It emphasized best practices and cost consciousness, Kendall said. Version 2.0 was about building professionalism in the acquisition corps. Version 3.0 covers all of those things, plus technical excellence and innovation, he said.

"It's about what we deliver" to fighting forces, he said. "It's about keeping the US dominant in the world."

A keystone of the reforms in 3.0 is that "any program we start, we ought to be able to anticipate having an adequate budget to field it in adequate numbers for the force." Kendall said he's seen "far too many programs" where billions were spent in development and then there was "none or a little bit of production and then [we] stopped." To be affordable, realistic goals must be set, and realistic costs assumed. Programs not deemed affordable will simply not get launched; the capability will have to be obtained through other means.

"We behave differently when budgets are tight," Kendall observed.

Program managers "talk themselves" into believing things will go much better than they likely will. For example, the idea that testing can be eliminated "'because modeling is so good.'" Or that "'we're going to do things differently this time, so it won't cost as much.'" And then you ... budget according to that assumption."

Air Force Secretary Deborah Lee James says she saw good sharing of lessons learned in Lockheed Martin's C-130J and SBIRS teams through USAF's Matchmaker Project.

These kidding-ourselves behaviors are specifically targeted by BBP 3.0, he said, in that unrealistic schedules and cost profiles won't be allowed. Managers will be encouraged to be honest with their bosses if something can't be done with the money or time available.

"Instead of ... saying, 'No, you can't do that,' people saluted and they awarded contracts to do it." This leads to "gambling. You start assuming how long it's going to take you to do things. You do things concurrently that you should not. ... You make decisions before you've really done the analysis to support them. And you make it much worse." The result is contracting "disasters."

However, programs will not be started unless there is sufficient maturity in the technologies to be developed in order to hold down risk and cost. At the same time, Kendall said it's essential that there be technology demonstrations and rapid prototyping. This will keep company design teams together during periods when there is no major program in that area, and so that when the time comes to actually build a new system, much of the risk reduction has already been done and a new technology can be smoothly transitioned into production.

Other BBP 3.0 elements involve providing the right incentives to industry and increasing competition. To this end, the Pentagon will give rankings of how well companies are doing compared to other companies. Those that do

Photo via Internet



China's J-20, a new fighter, takes off on a test flight. China benefits from technology it can buy commercially—or steal.

consistently well will get preference in future competitions. Those that don't will have to explain it to their stockholders. There will be incentives for innovative approaches that save money and provide more value. There will be more communication between the Pentagon and its vendors, involving them in setting requirements and explaining exactly how much more the Pentagon might be willing to pay for additional capability. The minimum technically acceptable solution will not necessarily be the right one.

At an Atlantic Council event in January, Air Force acquisition executive William A. LaPlante was asked about involving industry in setting requirements. Is it risky, and won't industry be prone to litigate if someone else gets the work a particular company helped define?

"Industry is going to do that regardless of what we do," LaPlante answered. Better to be "transparent about it" and take that risk in order to get the valuable input up front. Industry has consistently complained that requirements are kept under wraps for too long and the government isn't clear about how much it's willing to pay for "objective" capabilities versus those that simply meet the "threshold." They've asked USAF to "just tell us what the darn thing is and give us a couple of years to prep for it," LaPlante said.

There will not be a one-size-fits-all contracting method anymore. Kendall, in a January memo, laid out new 5000-series rules for his managers, giving examples of different kinds of contracts ranging from fixed price to incentive type, but giving managers flexibility to invent types to suit the products being acquired.

IMPROVING THE DIALOGUE

The Air Force's take on BBP 3.0 is what service Secretary Deborah Lee James calls "bending the cost curve," a reference to graphs of program cost that consistently go "up, up, up." At the Atlantic Council in January, James said, "What we have to do is ... bring those costs down, down, down."

James noted that it takes the Air Force, on average, about 17 months to award a sole-source contract. "That's simply too long," she said, and applying BBP 3.0 practices should bring that figure down to the single digits.

However, "unlike Better Buying Power, which is a broader set of practices and techniques for the workforce to employ, bending the cost curve is a targeted initiative designed to encourage innovation and active industry partnerships to improve the way we procure our systems and drive down cost," James said.

To do it, she's pushing for an "improved dialogue with industry" so USAF can better understand how its buying practices and choices "can inadvertently contribute to rising costs, the stifling of innovation, and slowing down of processes."

Talking with companies at meetings organized by the Air Force Association, Aerospace Industries Association, and others, James said she's been asking industry for its ideas on speeding acquisition up, the barriers to innovation, and improved transparency.

There will be more data collection to discover knee-in-the-curve points where asking for a bit more capability adds greatly to cost.

THE THIRD OFFSET

Deputy Defense Secretary Robert O. Work, speaking in November, said the Defense Department must maintain its competitive edge, and may be able to, with new systems and operating concepts, employing what he's dubbed a "third offset" strategy. In the 1950s, he pointed out, the US overcame the conventional advantage of the Soviet Union with nuclear weapons. In the 1970s, the second offset was an investment in revolutionary technology such as stealth, miniaturized electronics, precision navigation, and precision weapons.

"It turned out to be a wonderful strategy," he said. "We've ridden it now for about 40 years." Today, however, "everyone is duplicating our second offset strategy," with the result that all the tools that gave the US such a lopsided victory in the 1991 Gulf War and military dominance since are widely available.

What's different now, Work said, is "we have competitors who can not only steal" US weapons technology using cyber intrusion, "but they can duplicate things very fast" and match US advances before new American hardware even gets fielded.

There're also sharply limited budgets ahead, restricting how much can be invested while maintaining a high operating tempo.

Consequently, although "the last offset strategy lasted us four decades," Work observed at a Defense One conference, "it is unlikely the next one will last that long." Not only will competitors catch up faster—or even keep up—the technologies they copy could be used against the US "in ways that we did not foresee," he warned.

The new philosophy, Work said, necessitates rapid prototyping, advanced concept technology demonstrators, more frequent and larger war games—especially in concert with allies—and fielding new hardware faster. New platforms will be modular and easily upgraded with fresh capabilities to keep them on the cutting edge.

Most new capabilities probably won't be spurred by defense spending, either, Work said. Today, "much of the innovation is being led by the commercial sector," moving at much faster pace than the

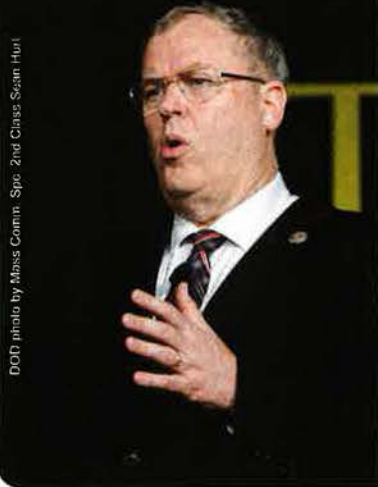
Pentagon's development process can match. The key will be for the acquisition system to discard time-consuming make-work efforts—often driven by well-intended but counterproductive legislation—and adopt flexible, best practices that speed putting new gear in the hands of the military while still being fair and efficient, Work said.

There's no time to lose. The draw-down from Iraq and Afghanistan has been "chaotic," he said, afflicted not only by the funding uncertainties caused by incessant continuing resolutions and sequester, but by Congress answering Pentagon offers to cut overhead and force structure with a litany of "no, no, no, no."

The Pentagon faces a \$31 billion liability because proposed force structure cuts like the A-10, U-2, and Navy cruiser retirements were rejected by Congress, Work said. Congress won't touch compensation reform or base closings, so "that's another \$11 billion to \$39 billion" of "nos" over the Future Years Defense Program, adding up to \$70 billion in cuts the Defense Department will have to find elsewhere. It has wanted to improve readiness—or at least not degrade it further—but with no opportunity to reduce bases, force structure, or compensation, that leaves only readiness and modernization accounts to pay the bill.

"This is fundamentally different from all the other [postwar] draw-downs," Work said. "The range of uncertainty is enormous."

Work promised more insight into the game-changing strategy with release of the Fiscal 2016 budget.



DOD photo by Mass Comm. Spc. 2nd Class Susan Hurt

Robert Work

Lt. Gen. Ellen M. Pawlikowski, LaPlante's deputy, said in November that USAF is looking for just the right size radar for the new JSTARS airplane, to get the most coverage for the least cash.

James said USAF will use this information "to make trade-offs in how we develop the request for proposals. ... In some cases, we may even choose to modify our requirements." It's an approach that's been tried before, she said, but there was no formalized process for industry to get onboard. Now there will be.

These cost versus capability analyses will be tried out on four new programs, she said: the T-X trainer, the Long-Range Standoff Weapon, the Multiadaptive Podded System, and the follow-on to the Space Based Infrared System. These four were picked "because they represent a range of use cases and segments within our industry." The results will be used to understand "how to best evaluate our objective and our threshold requirements," she said.

The Air Force is also expanding an industry fair concept called PlugFest Plus, where companies can demonstrate a ready-to-go, "plug and play" capability upgrade in live demonstrations. They're well-regarded events, but if the government was "wowed" by a demonstration, then "everybody goes home and there's no easy way to follow up." Under new rules, vendors could "walk away with a contract just a few weeks after an event," James said. The first one was held in January and demonstrated ways to upgrade the Distributed Common Ground System, the Air Force's system for capturing, processing, and distributing intelligence, surveillance, and reconnaissance data, mostly from remotely piloted aircraft.

James also announced a \$2 million prize competition dubbed the Air Force Technology Challenge. This first competition—and the richest yet offered—will be for innovative solutions to developing "a midsize turbine engine for use on commercial and military platforms" that the Air Force would apply to RPAs. James said these competitions are hoped to lure in

"nontraditional contractors" and thus expand the knowledge base it can draw from while also increasing competition.

TACKLE HEAD-ON

Other initiatives include creating an information technology business analytics capability for the Air Force—something James said it's never had—and the Matchmaker Project, where the Air Force will share its success stories with other divisions of the same company, hoping to apply lessons learned on pending projects.

"We don't always collaborate across our companies as well as we should," James said. She reported good results pairing Lockheed Martin's C-130J team and its SBIRS team in this fashion.

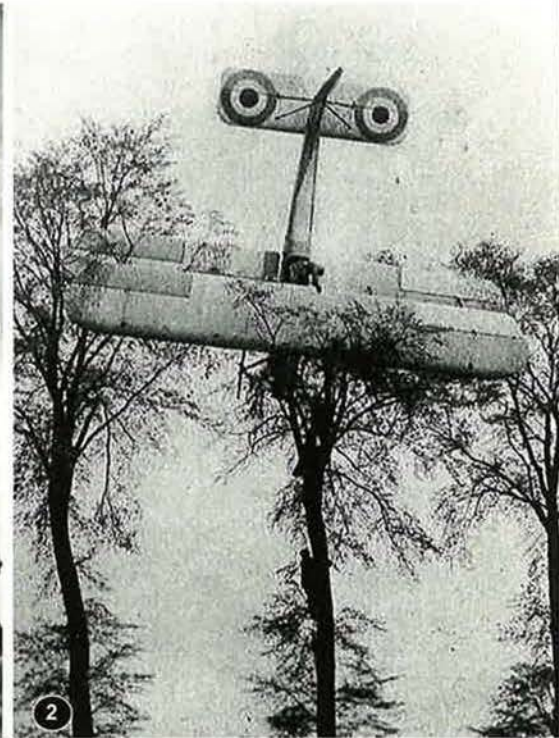
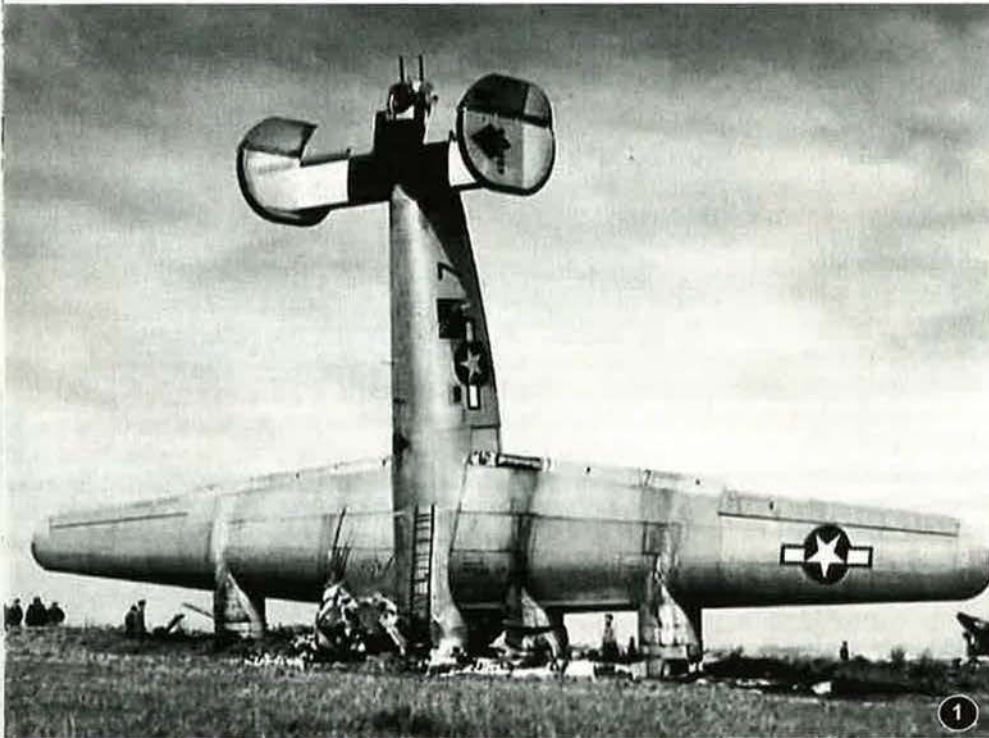
China has gone to school on American military prowess, Kendall noted in his Navy League address, and has been "building systems since then designed to counteract some of the things that we have." He cautioned that the US has developed fine technology, like the F-22, but always in "very small numbers," and that this lack of depth "makes us vulnerable. ... We have to ... address that vulnerability." The US is cutting defense spending while China's defense budget is growing by 12 percent a year. Though it's not as large as that of the US, "at the rate that it's going, it will be before too many years go by," Kendall noted. Moreover, China's defense budget is far, far less tilted toward personnel than that of the US, so it gets more hardware for the same outlay of funds.

"We have a very expensive cost structure on the personnel side—moreso than they do," he stated.

Kendall said there's little option but to tackle these strategic and financial challenges head-on.

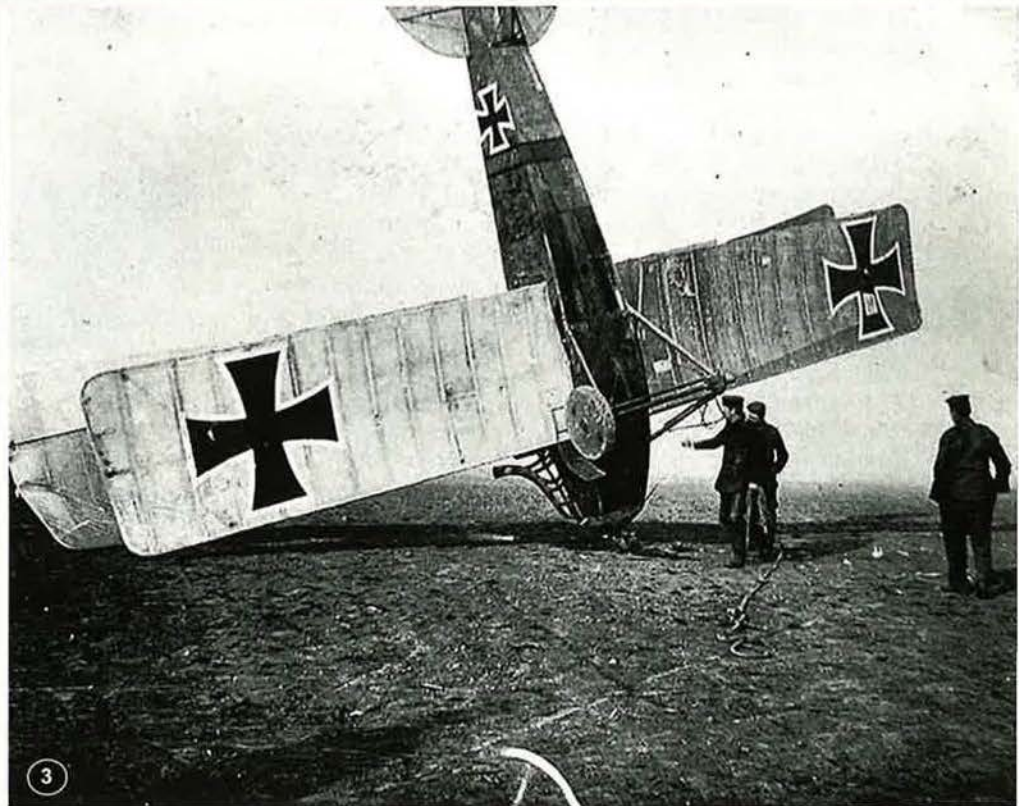
"I do not want to try living in a world where we are not the dominant military power on the planet, to see what it's like. I do not want to do that experiment. And I don't want our warfighters to ever be in a situation where they're in a fair fight. I want them to always have an advantage over anybody they go up against. So that's what I'm going to be doing." ❖

Head First



1: US bomber 2: French fighter 3: German fighter

Manned, powered, controlled, heavier-than-air flight has been going on for 111 years, so you would expect that aircraft would wind up in strange positions. The nose-down crash is a case in point. The first image on this page records the deadly crash, on takeoff, of a USAAF B-24 Liberator on April 12, 1945, at San Giovanni Field in Italy. It was part of the 740th Bomb Squadron. Six of the 10 crew members died; the bomber ended up perched on its nose. The image above right shows a similar orientation. In 1915, a World War I French pilot made an emergency landing near Brussels, plunging head first into a tall tree. (Note the men climbing to help.) The third image, also from World War I, captures a trio of German soldiers inspecting an upended German biplane in an open field. How it came to be in that position is not recorded.



Air attacks on the self-styled ISIS—strikes that have weakened and stalled the terrorist group’s gains of last year, when it took cities and captured large stocks of weapons—are not purely a US- or NATO ally-only affair. The air forces of Bahrain, Jordan, Qatar, Saudi Arabia, and the United Arab Emirates are playing a big role in the anti-ISIS campaign.

This coalition effort took on great urgency last year, when ISIS rampaged through Iraq and Syria, routing the Iraqi army, surging into Iraqi Kurdistan, and nearly taking the city of Irbil, threatening Baghdad itself.

Seven months into Operation Inherent Resolve, the broad coalition of allies striking ISIS targets from the air includes several Persian Gulf allies that were previously severely publicity-shy. It highlights the long program of low profile training, personnel exchanges, liaison programs, and capacity building activities with the US that helped these military forces get combat-ready.

The participation of Gulf Cooperation Council state air arms in the OIR campaign is a “very significant” development for US military-to-military relationships in the Gulf region, said USAF Lt. Gen. David L. Goldfein at an Air Force Association breakfast last September. Goldfein, now the director of the Joint Staff, previously served as the commander of US Air Forces Central Command from August 2011 to July 2013, where he oversaw the expansion of training and liaison programs with GCC countries as well as other Arab states in the region. Many of these states are now engaged in OIR operations and “making a difference, against a threat that’s an existential threat to them,” Goldfein said.

AN OPEN SECRET

The sea change in the relationship of the US with the GCC militaries is evident by the open acknowledgement of the latter’s combat role. For decades, the US has cultivated alliances with the Gulf States and supported them with large numbers of troops across the region. Until recently, though, these relationships were treated delicately due to the sensitivities of the Arab monarchs who rule over these countries.

The presence of large numbers of US troops in the countries of the GCC was long treated as an open secret. Throughout the Afghanistan and Iraq wars, for example, Al Udeid Air Base in Qatar hosted thousands of USAF airmen of the 379th Air Expeditionary Wing, along with a combined air and space operations center. Only in December 2013, following the renewal of the US-Qatar defense cooperation agreement, did the Pentagon lift restrictions on identifying the exact location of these forces. Previously DOD would say simply that the CAOC and 379th were located in “Southwest Asia.”

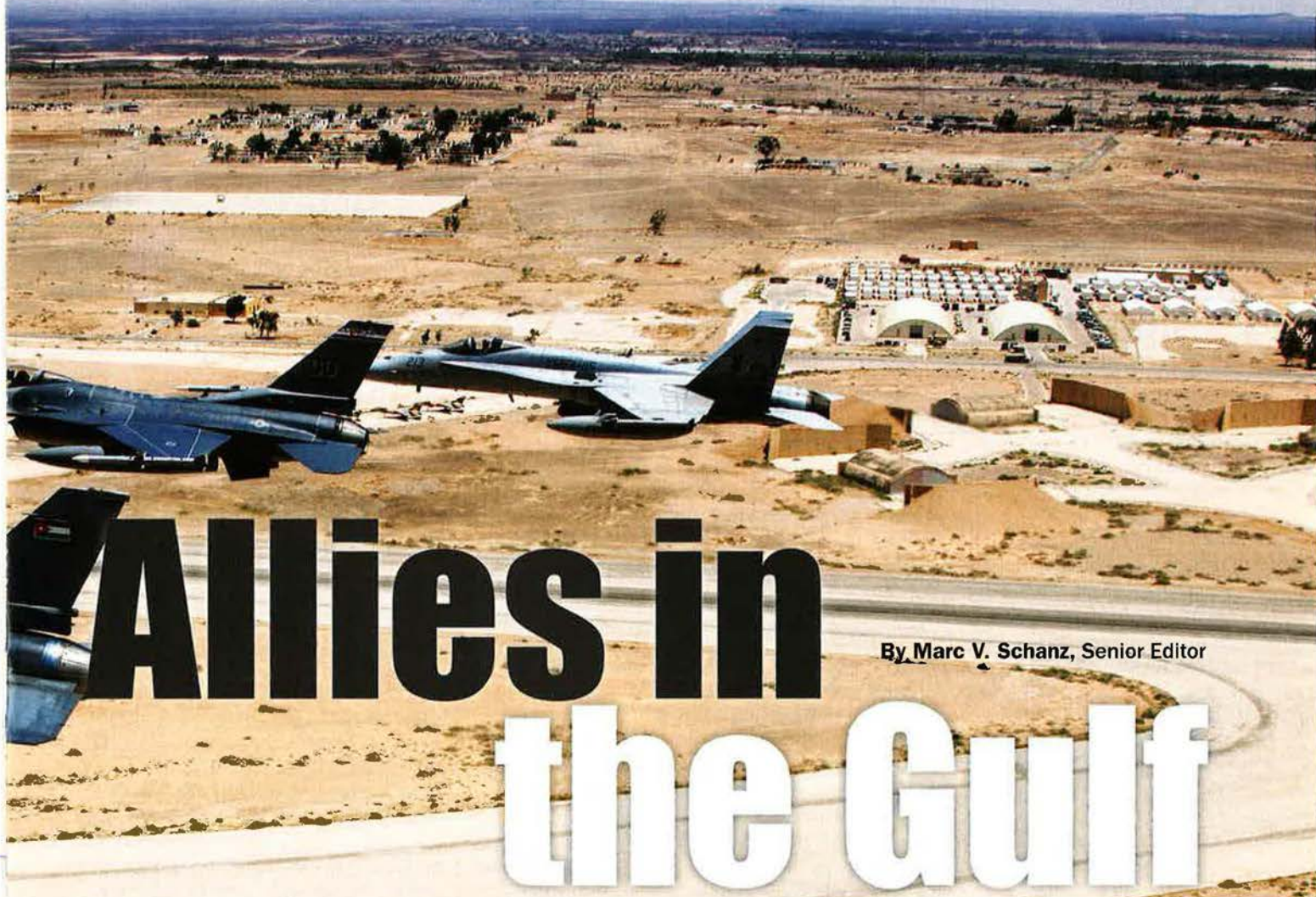
A senior defense official, visiting Qatar with Defense Secretary Chuck Hagel at the time, said the change acknowledged the base’s role in regional security and was part of an effort to raise the visibility of US-Qatari cooperation. Both nations, the official said, wanted to “reassure our allies and our partners.”

The interest of GCC states in showing their collective muscle increased last year, as ISIS burst into a regional threat, startling America’s Arab allies. Saudi Arabian Foreign Minister Prince Saud Al-Faisal, after the first wave of strikes on Syria, said his country and its neighbors face a “very dangerous situation where terrorist cells have turned into armies” girding for war from Syria and Iraq to Yemen and as far as Libya. “Faced with these dangerous facts, today we are required to take serious policy decisions to confront this vicious attack with full force,” he said.



A Jordanian F-16 leads another Jordanian F-16, a Colorado Air National Guard F-16, and two USMC F/A-18s over a training base in Jordan during Eager Lion.

Years of prep led to Persian Gulf air forces being key partners in the war against ISIS.



Allies in the Gulf

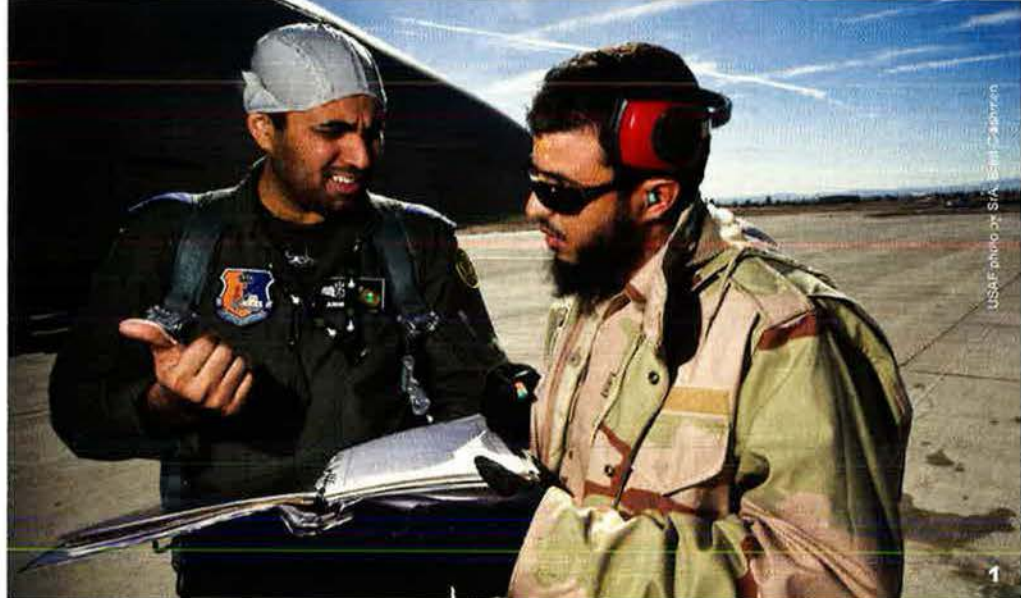
By Marc V. Schanz, Senior Editor



The Royal Hashemite Court/Facebook photo

Jordan's King Abdullah II, supreme commander of his country's armed forces.

USAF photo by MSgt. John P. Rohrer



USAF photo by SFC Samir Johnson



USAF photo by SMSgt John P. Rehner

The Gulf states, as a result, came together in a coalition unprecedented since Operation Desert Storm in 1991.

Goldfein, speaking just after the first waves of OIR strikes in Syria, said the coalition's first test in combat was a "pretty successful event." While US warplanes had struck ISIS targets in Iraq since early August, it was the campaign's expansion into Syria that marked a critical moment for the coalition.

On Sept. 23, the first night of air strikes against ISIS targets in Syria, several Arab allies flew combat missions deep into ISIS-controlled territory. Bahrain, Jordan, Saudi Arabia, Qatar, and the United Arab Emirates all struck targets on their own or supported the operations.

Unusually, the countries proclaimed their involvement. The Royal Jordanian Air Force declared its F-16s had "bombed and destroyed a number of selected targets used by terrorist groups to dispatch their members for terrorist attacks" and said Jordan would continue to take "decisive measures" against ISIS. Bahrain announced its fighters had struck "selected targets of terrorist groups and organizations and destroyed them," and the UAE also reported its air forces launched coordinated strikes.

According to senior OSD and USAF officials who have worked closely with these states in the last several years, the assertive policy is neither accidental nor insignificant.

"We have robust relationships with our Arab allies, particularly the Gulf states," Elissa Slotkin said in December during her Senate Armed Services Committee confirmation hearing for the post of assistant secretary of defense for international security affairs.

The OIR campaign is a "real proof of concept of the work that we've done with the Gulf states in particular to

build up their capabilities," Slotkin said. Along with flying combat missions and performing activities such as targeting for strikes, she noted GCC air arms are performing other functions "that we do and that they're doing in our stead." These countries believe there is a "real threat" from ISIS and an unstable Syria. "We work very closely with those states to try and counter it . . . and get them engaged."

JORDAN ON THE FRONT LINES

Several Gulf states, such as Saudi Arabia and Kuwait, have long-standing military ties with the US, largely stemming from Iraq's 1990 invasion of Kuwait. Since 2001, though, this cooperation has broadened, as GCC governments agreed to host both air and naval assets, as well as thousands of US troops, to support operations first in Afghanistan and then in Iraq. GCC countries also modernized their militaries, adding advanced assets such as UAE's Block 60 F-16s—the most sophisticated version of the fighter on the market—and Patriot air defense missiles. The growing influence and military power of Iran helped propel this modernization, as well as joint efforts between the US and its Gulf allies to make their forces more interoperable.

Saudi Arabia and the UAE, for example, have participated several times in USAF's Red Flag exercise. In the aftermath of the US drawdown from Iraq, US Central Command expanded Exercise Eager Lion—an annual multinational, multiservice training event hosted by Jordan. It has become the premier combined arms exercise in theater.

Jordan, slated to become a member of the GCC, is on the front lines of OIR. Bases in Jordan where USAF aircrews have trained extensively are just a short flight away from the Syrian border and ISIS targets. Jordan has played a heavy

role in OIR strikes and has paid a heavy price: a Royal Jordanian Air Force F-16 flying a mission near Raqqa, Syria, crashed on Dec. 24 and the pilot—Lt. Moaz al-Kasasbeh—was captured by ISIS and burned alive on Jan. 3. The killing of Kasasbeh sparked an angry response from Jordan and its Gulf allies—with Jordanian leaders vowing an "earth-shattering" response. The RJAF, in the days following ISIS' announcement of Kasasbeh's killing, launched Operation Martyr Muath—carrying out some 56 air strikes in just five days, many against "targets of gravity" in and around Raqqa, according to the country's air force chief, Lt. Gen. Mansour Jbour. The UAE deployed six of its Block 60 F-16s to a Jordanian air base in early February as well, along with mobility and airrefueling assets, escalating its contribution to the anti-ISIS fight.

The closeness of large military airfields in Gulf countries to ISIS targets is another reason the air campaign is succeeding. Besides Al Udeid in Qatar, the coalition operates from a host of other bases in the Gulf region—many of them remaining officially unnamed by DOD. Jordan, Kuwait, Qatar, and the UAE have all served as staging areas for strikes by both US and coalition aircraft.

Some construction has been necessary to handle the surge of people, equipment, and missions. At the 386th Air Expeditionary Wing (located in a still-undisclosed Gulf nation) late last year, USAF airmen helped construct living accommodations. Also, they expanded areas for mission planning as OIR grew. This was needed to aid Gulf allies and others in accessing a "combined coalition network" to get planning documents and information necessary to build air tasking orders. Airmen helped complete a facility for coalition members to plan missions



independently at the base. “Our partners bring a lot to the fight,” said Capt. Peter O’Neill. Without the planning facility “they would not be able to fly any of the sorties or perform any of the missions.”

The importance of coalition air campaign basics, such as information sharing, intelligence gathering, air battle management, and other tasks, is at the heart of many capacity building efforts by AFCENT. Perhaps the nerve center of these efforts is the AFCENT Air Warfare Center in the UAE, based at Al Dhafra and other satellite locations throughout the country. The result of a 2006 bilateral agreement between the US and the UAE, the facility—known colloquially as the Gulf Air Warfare Center—has grown into one of the most significant centers for capacity building in the Middle East, according to Col. Mark E. Blomme, the center’s commander. With OIR’s success, AFCENT officials are openly touting the center’s work in these areas for the first time.

The AWC resembles the model USAF has constructed at the Air Warfare Center and Weapons School at Nellis AFB, Nev. At the center, both AFCENT and the UAE Air Force and Air Defense Force maintain a staff of subject matter experts who conduct both academics and integrated training operations for “regionally focused” air and missile defense missions. Representatives from other non-GCC allies, such as France, Germany, and the United Kingdom, also participate in the center’s efforts. About 2,000 people from 10 countries every year, most from Gulf states and the broader Middle East, train there.

The Air Force contributes under \$10 million annually to support the AWC’s operations and programs, and the UAE provides most of the rest. The effect on capability across the region’s militaries,

however, from readiness to combat tactics to leadership skills, has been transformative, Blomme and others say.

“Whereas many other [building partnership capacity] efforts tend to be bilateral in nature, the Air Warfare Center is focused on building GCC-wide capability and capacity,” Blomme said. These efforts have served as the “cornerstone of coalition air operations and regional missile defense.”

One of the core offerings at the center is the seven-week Advanced Tactical Leadership Course, held at the AWC’s Al Dhafra facilities. This program helps students develop mission commander skills in live-fly training, enabling pilots and aircrews to lead large coalition packages of aircraft in complex operations.

On the missile defense side, the AWC operates the Integrated Air and Missile Defense Center at Al Bateen AB, UAE. Instead of live operations, the IAMDC uses simulations and modeling and trains students to defend against both ballistic missile and cruise missile threats. The center supports several other programs as well, such as the joint terminal attack controller schoolhouse, combat search and rescue training, and academics, helping attendees “bridge the gap between pilot training and fighter training,” Blomme said.

Exchange programs and liaison training between AFCENT and GCC nations have expanded in the last several years as well. Efforts initiated by Goldfein and continued by his successor, USAF Lt. Gen. John W. Hesterman III, include providing an Air Defense Liaison Team and Intelligence Engagement Cell at Al Dhafra through the AWC. These help build command and control and intelligence sharing partnerships—both areas that have proved vital to the conduct of OIR.

[1] The Royal Saudi Air Force Red Flag commander, Colonel Ammar, goes over a preflight checklist with Staff Sergeant Obaidallah, a crew chief, before a Red Flag 12-2 mission at Nellis AFB, Nev. [2] Maj. Christopher Southard introduces the Royal Jordanian Air Force team (l) and a team from the Colorado Air National Guard (r) before a “scramble” to test the abilities of pilots and crew chiefs to quickly launch aircraft during Eager Lion. [3] Maj. Jamal Al Awani (l), the commander of United Arab Emirates’ Rodeo team, talks with Maj. John Caplinger, a pilot from USAF’s 10th Airlift Squadron, in the UAE tent at McChord AFB, Wash., during the 2007 Rodeo competition.

Today, at the Al Udeid Air Base CAOC in Qatar, US airmen work with coalition counterparts from some 14 nations as they plan and execute OIR strikes. It’s the fruit of an effort by AFCENT’s security cooperation and plans office called the Gulf Cooperation Council Liaison Officer Program. Begun in 2013, it recruits around 15 officers (typically O-5s) for a four-month course in CAOC operations and regional air management.

The program has proved so successful that the most recent graduates immediately were sent back to the CAOC as liaison officers (LNOs) for their countries’ air forces, said Maj. Brian Hans, the AFCENT Coalition Coordination Cell deputy chief at Al Udeid.

“When [current] operations kicked off, we saw a few of the former students come back [to the CAOC]. ... These officers are at the captain, major, lieutenant colonel level, and they have a lot of experience working with the US,” he said. As a result, despite the regional politics, the coalition’s communication and coordination efforts have gone very well and Hans said the LNO program has been key to ensuring this.



USAF photo by SSGT Thomas Troner

1



Photo by Erin Kiefe-Caputo

2

Simultaneously, AFCENT sends USAF officers to the air operations centers of GCC states and regional partners—an initiative known as the Air Defense Liaison Team Program. Every GCC nation except Oman hosts ADLTs, and one stood up late last year in Iraq.

The ADLT program is just a few years old, begun with a full staff and concept of operations in 2012 during Goldfein's tenure. The teams are the link between AFCENT's air operations and the operations of partner nations in the region, serving as the combined force air component commander representative to the participants. The teams work issues such as access to airspace and diplomatic clearances for personnel and help them become knowledgeable with the country's customs, laws, and political sensitivities. LNOs help determine what each country can contribute to any coalition operation or exercise and as such become versed in the country's air assets and operational capability.

"We have a senior duty officer in each country, and they integrate in the air operations center of each nation," said Maj. Trace Dotson, the AFCENT Air Defense Liaison Team chief. "We [build] a regular relationship with each nation, as well as work with the US Embassy and the leadership [of the host nation military] to keep the line of communications between them and the CAOC here at Al Udeid open," he said.

The ADLTs serve as conduits for exercising and training requests as well. ADLTs develop objectives with each nation, communicate with AFCENT, and decide areas needing improvement—whether simple command and control drills, testing integrated air and missile defense plans, or performing large force aerial exercises with multiple threats. "Sometimes our stuff integrates well, sometimes it doesn't," Dotson said. "We have to work on that, be it missile defense or some other scenario."

The GCC nations each have a different level of capability, and over time

their participation has throttled up or down with the evolving regional political situation.

"It comes back to relationships ... and knowing how people work," Dotson said. "Keeping that [political-military] relationship going, we always respect each other regardless of what happens."

In the future, AFCENT officials say, both the US and its Gulf allies want to continue to work on information and intelligence sharing—a frequently tricky issue due to strict US guidelines regarding sharing some types of information with non-US entities.

GROWING THE GCC

"This OIR coalition, I think has been an exercise in flexibility," Hans said, noting that the level of classification for information exchange varies with each country, "but we have worked to find a common level." Progress in information sharing also accompanies growth in foreign military sales to some key allies—such as Qatar, which signed an \$11 billion arms agreement with the US last summer. The sale included modernized Patriot anti-missile batteries and AH-64 Apache attack helicopters.

"We've had longer [FMS] relationships with other countries," Hans said, but there is a lot of new work in some places. Large weapon deals by countries such as the UAE and Qatar are driven by the GCC's desire to expand its own interoperability and collective military strength. These goals were emphasized during the bloc's annual meeting in December in Doha, Qatar. The GCC is also seeking to build its ties with NATO. While the GCC is not a formal military alliance, its members' concerns about both external and internal threats are leading to breakthroughs in areas such as joint exercises and building joint military forces.

On AFCENT's end, it is seeking to expand programs at the AWC. Though it's now staffed with a joint cadre of experts from the Air Force and Army, Blomme noted, there are now "signifi-

[1] A UAE F-16 drops back from a USAF KC-135 after receiving fuel over the Mediterranean Sea in 2011 during an Operation Unified Protector mission.

[2] Then-Defense Secretary Chuck Hagel meets with Gen. Mohammed bin Zayed al Nahyan, crown prince of Abu Dhabi and deputy supreme commander of the UAE armed forces (center), and Sheik Abdullah bin Zayedin al Nahyan, UAE foreign affairs minister, in Abu Dhabi in 2013.

cant efforts" underway to get the Navy involved, to provide its ballistic missile defense and tactical air electronic warfare expertise. AFCENT and the UAE also seek to integrate the various training venues under the AWC, through a live-virtual-constructive environment, to aid distributed training operations for both US forces based in the region and GCC air and missile defense personnel.

Blomme said the campaign against ISIS shows the long-term payoff of the AWC's initiatives in staff and officer exchanges.

On the first night of OIR's Syria strikes, he said, the US strike commander and the flight lead for the UAE contingent worked to coordinate their target packages. Flying into combat, they already knew each other, having been classmates at the AWC several years earlier.

"Relationships pay huge dividends, but they take time to develop," Blomme said. Though low profile, the strategic value of the center's security assistance programs "cannot be overstated. ... It has given nations in the region the confidence to participate in coalition operations in Libya, Afghanistan, Iraq, and Syria." Blomme said he routinely receives feedback and comments from airmen who attend from GCC states, pointing out their that experiences in real-world operations have proved very similar to the training they received at AWC.

"It is common to witness participants from various nations reconnecting during Air Warfare Center events," Blomme said, and these relationships prove resilient as they continue in their careers. ★

The Vandenberg Flip

It was late in World War II. Up until the moment he spoke, Sen. Arthur H. Vandenberg of Michigan, the Republican party's senior voice on foreign affairs, seemed to be what he long had been—a hard-line isolationist. However, the senator, whom one critic called "a big, loud, vain, and self-important man," had had a change of mind. He was forsaking isolationism—dropping the idea of going it alone and supporting a major US role in the postwar world. The speech cleared the way for a bipartisan foreign policy. If you want to know where America's postwar internationalism began, this is the place.

There are critical moments in the life of every nation which call for the straightest, the plainest, and the most courageous thinking of which we are capable. We confront such a moment now. ...

We still have two major wars to win. I said "we." That does not mean America alone. ... We not only have two wars to win, we also have yet to achieve such a peace as will justify this appalling cost. ... Otherwise we shall look back upon a futile, sanguinary shambles and—God save the mark—we shall be able to look forward only to the curse of World War III. ...

The ... thing we need to do ... is to appeal to our allies, in the name of reason, to frankly face the postwar alternatives which are available to them and to us as a means to preserve tomorrow's peace for them and for us. There are two ways to do it. One way is by exclusive individual action in which each of us tries to look out for himself. The other way is by joint action in which we undertake to look out for each other.

The first way is the old way which has twice taken us to Europe's interminable battlefields within a quarter-century. The second way is the new way in which our present fraternity of war becomes a new fraternity of peace. I do not believe that either we or our allies can have it both ways. They serve to cancel out each other. We cannot tolerate unilateral privilege in a multilateral peace. Yet, that seems to be the fatalistic trend today.

I think we must make our choice. I think we must make it wholly plain to our major allies that they, too, must make their choice.

I hasten to make my own personal viewpoint clear. I have always been frankly one of those who has believed in our own self-reliance. I still believe that we can never again—regardless of collaborations—allow our national defense to deteriorate to anything like a point of impotence.

But I do not believe that any nation hereafter can immunize itself by its own exclusive action. Since Pearl Harbor, World War II has put the gory science of mass murder into new and sinister perspective. Our oceans have ceased to be moats



which automatically protect our ramparts. Flesh and blood now compete unequally with winged steel. War has become an all-consuming juggernaut. If World War III ever unhappily arrives, it will open new laboratories of death too horrible to contemplate. ...

I want maximum American cooperation, consistent with legitimate American self-interest, with constitutional process, and with collateral events which warrant it, to make the basic idea

of [a United Nations peacekeeping organization] succeed. I want a new dignity and a new authority for international law. I think American self-interest requires it.

But ... this also requires whole-hearted reciprocity. In honest candor I think we should tell other nations that this glorious thing we contemplate is not and cannot be one-sided. I think we must say again that unshared idealism is a menace which we could not undertake to underwrite in the postwar world. ...

I propose that we meet this problem conclusively and at once. There is no reason to wait. America has this same self-interest in permanently, conclusively, and effectively disarming Germany

and Japan. It is simply unthinkable that America, or any other member of the United Nations, would allow this Axis calamity to reproduce itself again. ...

The Commander in Chief should have instant power to act, and he should act. I know of no reason why a hard-and-fast treaty between the major allies should not be signed today to achieve this dependable end. ★

"American Foreign Policy"

Sen. Arthur H. Vandenberg
Address to the Senate
Washington, D.C.
Jan. 10, 1945

Find the full text on the
Air Force Magazine's website
www.airforcemag.com
"Keeper File"

Sen. Arthur Vandenberg (l) with Secretary of State George Marshall in 1947, just before the unveiling of the Marshall Plan.

The Air Force is struggling to turn around a bad situation long in the making: After 24 years of nonstop combat operations, the full-spectrum readiness of combat-coded flying units is subpar. The high operating tempo has meant that many units—especially Active Duty—don't have enough time between deployments to train and qualify aircrews in their full range of assigned missions.

Chief of Staff Gen. Mark A. Welsh III has set a goal of getting 80 percent of combat-coded flying units—bomber, fighter, tanker, and intelligence, surveillance, and reconnaissance, etc.—up to full-spectrum combat readiness by 2023. The levels are considerably lower now; the Air Force declines to specify just how bad they really are.

Since the launch of combat operations in Afghanistan in 2001—worsening with the start of the Iraq War two years later—“that’s when we saw the readiness of flying units really take a nosedive,” said Col. Robert D. Sagraves, operational readiness division chief on

the Air Staff. By necessity, units put a priority on training for the missions they’ll fly in upcoming deployments, at the expense of core competencies, especially training for “high-end” threat scenarios.

“If you asked the Air Force to go out and do CAS [close air support] in a nonpermissive environment, we’re good to go,” said Sagraves. “We’ve been doing that for 10-plus years. But if you ask the Air Force to fight a near-peer adversary in a highly contested environment, ... the full-spectrum readiness of the Air Force right now is not where it needs to be,” he admitted.

Sagraves thinks 80 percent readiness is an achievable target, based on historical readiness rates pre-2001. However, with new demands for airpower popping up everywhere from Eastern Europe to the Middle East and budget-imposed groundings still possible, it won’t be easy.

“We’ve been there before—we’ve actually been above 80 percent readiness, but you’d have to look pre-9/11 for those sort of statistics,” he said.

“Our readiness just went in the tank, and we are still in the process of digging out of that.”

DEFINING “READY”

For a combat-coded flying unit, readiness has a concise definition and quantifiable standards of measure.

“Readiness for a flying unit comes down to the unit having the right people, equipment, training, and support that enables that unit to go out and fulfill its wartime mission successfully” and survive to fight again, explained Sagraves. These elements are tracked and reported by supervisors. They are assigned squadron-level monitors from individual airmen up through the wing, where they are assessed on a monthly basis to determine if the unit is prepared to meet its aerospace expeditionary force tasking.

Noncommissioned officers assigned as AEF Reporting Tool monitors look at “four monitored areas, down to the individual level,” said SMSgt. Hali Confer, 113th Wing deployment manager at JB Andrews, Md.

Between deployments, combat units struggle to keep their full range of skills sharp.

The Readiness Crunch

By Aaron M. U. Church, Associate Editor

Every airman must answer: "Am I healthy, am I trained, is there equipment that goes along with [my job], do I have it, does it work?" she said. The results are then briefed to the wing commander and fed into the Air Force's overall monitoring system, known as the Status of Resources and Training System (SORTS).

SORTS generates a forcewide snapshot of the Air Force's preparedness for war.

"It's a monthly update that all units do that feeds into a big database that aggregates up from the squadron, to the group, to the wing, to the major command, to the headquarters level," said Sagraves. "So we, at the headquarters, can drill down to see at the unit level what the various issues are as to why a given unit may not be ready—whether it's a personnel issue, an equipment issue, or a training issue."

SORTS works in tandem with—and feeds into—a Defense Department-wide system called the Defense Readiness Reporting System (DRRS). The classified DOD system allows the Pentagon to "drill down based on various

war plans" to see if Air Force units are ready to play their role in a joint force, theater-specific scenario, Sagraves explained. On the Air Staff, "we use both of those in a complementary fashion to write up an overall broad-brush picture of where we think the Air Force is, readiness-wise."

Air Force doctrine dictates a continually ready state across all three components—Active Duty, Air National Guard, and Air Force Reserve. Unlike Army brigades which can flow into theater over a period of a month or two, in "any of the major war plans out there, the bulk of Air Force forces are required very quickly in the theater," Sagraves pointed out. Since the Active Duty force is no longer large enough to meet this demand alone, "we don't treat or measure [reserve component units] any differently than we do the Active Duty forces," he said. "The Air Force doesn't do tiered readiness. We can't afford to."


GETTING IT DONE

Meeting these standards is ultimately the wing commander's responsibil-

ity. Achieving readiness depends on properly balancing five inputs: the flying hour program, weapon systems sustainment, critical skills, training resources, and the unit's ratio of deployments versus time at home station. "If any one of those is out of whack, then you're going to have difficulty meeting your readiness goals," Sagraves said.

The flying hour program—getting pilots the flight time they need to certify and stay current in each of their wartime skill sets—gets the most attention, but each of these levers is vital and mutually interdependent.

Weapon systems sustainment, for example, is more than simply upgrading aircraft to handle current threats. It's also ensuring aircraft and engines flow through programmed depot maintenance and return to the flight line in a timely manner to support operations and training requirements. The same applies to cockpit simulators, which have to be kept up-to-date with the aircraft they replicate. If jets are stuck at depot and you "run out of iron on the flight line, you can't execute your flying hour program," Sagraves said,



A B-2 stealth bomber during a training mission over Whiteman AFB, Mo. More than two decades of high optempo have meant a lack of time between deployments to train and qualify aircrews in their full range of missions.

TSgt. Bruce Rick, an NCOIC of combat arms, observes a C-130 takeoff at Yokota AB, Japan. The high optempo is wearing out equipment and people.

pilots won't get the training they need, and the unit will be unable to fulfill its assigned role.

In terms of critical skills availability, maintenance is a key choke point for flying units, especially on the flight line. If a unit doesn't have enough five- and seven-level qualified crew chiefs—the midlevel and senior maintainers—there aren't enough people to supervise, train, and certify junior personnel and still repair and launch aircraft.

"If you can't generate enough jets to meet the flying schedule, then your training is going to suffer" just as much as if the aircraft were stuck in depot, Sagraves pointed out.

"Training resources" encompass everything from simulator availability to training ranges and access to exercises—especially high-quality, full-spectrum training opportunities like Red Flag, or weapons employment drills such as Combat Hammer and Combat Archer. If an F-16 unit has range access but no aggressors to battle, or an A-10 unit has no opposing ground forces to challenge or friendlies to coordinate with, the unit's not preparing for what it will realistically face in war.

"I can't knock out these certain training events because I don't have access to the range ... or I can't get to Red Flag, so there're various different issues," Sagraves said.

"The fifth lever is outside the Air Force's purview, and that's the deploy-to-dwell issue," he noted. Not surprisingly, this is a "large part of why the Air Force is in such a full-spectrum readiness hole right now."

THE READINESS HOLE

When a combat flying unit is deployed—an F-16 squadron provid-

ing close air support to allied forces in Afghanistan, for example—there's little to no opportunity for pilots to practice skills outside their current mission. Without practice, essential skills in missions such as offensive and defensive counterair, suppression of enemy air defenses, or forward air control quickly deteriorate.

"This is pretty much an accepted view, that when you deploy a flying unit, ... [its] readiness begins to erode," because for however long the unit is in a real-world mission, it is "not using the full complement of capabilities," Sagraves said.

As a result, units returning from deployment have to move fast to schedule training sorties and recapture crew competency in neglected skills. Before their next AEF rotation to theater, units have to "hit the range—go to Red Flag, go through operational readiness inspections to bring that readiness back up," Sagraves explained. The problem—especially for Active Duty units—is that there simply isn't enough time between deployments to get everything done.

Deployment-to-dwell ratios for some high-demand communities like combat rescue or intelligence, surveillance, and reconnaissance are "less than one to two," meaning that for every month deployed, the heavily tasked units get less than two months at home. "It wears out equipment—it wears out people," said Sagraves.

While most fighter units don't fall into this category, due to the wide variety of missions they're expected to do, they still don't have sufficient training time to regain full spectrum readiness before redeploying.

"Right now, training is probably the biggest driver, and that goes back to not



having enough white space on the calendar between deployments to knock out that training," Sagraves observed.

The heavy back-at-home training schedule also cuts into time when units are expected to catch up with their families and resume some sort of normalcy in their lives—another of Welsh's priorities.

Readiness rates began a painfully slow climb with the pull-out from Iraq in 2011, only to run headlong into the sequestration stand-down that grounded 13 combat-coded flying units for several months in 2013.

"It was a pretty significant dip and pretty quick dip" in readiness rates, Sagraves said. Specific readiness figures are classified, but Sagraves said the grounding "hit the pause button" on the recovery, setting units back six to nine months just to regain their pre-stand-down readiness levels.

Although sequestration and government shutdowns seriously damaged



readiness in the short term, the long-term systemic readiness problem is the deployment rate, especially for flying units in small, specialized communities such as command and control, combat search and rescue, and ISR.

“Until the deploy-to-dwell ratio is fixed, the Air Force is going to be challenged with providing sufficient, full-spectrum, ready units” for contingency operations, Sagraves predicted.

Everyone from the Secretary of Defense and the Joint Chiefs of Staff on down is aware of the problem, he said, but in many cases, combatant commanders simply can’t achieve the strategic goals they’ve been given without the Air Force assets, regardless of their readiness state.

Sagraves said that some within the Air Staff believe deployment-to-dwell ratios will begin to improve with the end of combat operations in Afghanistan, but no one knows what contingency may pop up in its place. As part of the overall forces committed to Iraq and Syria to deal with ISIS, or to Eastern Europe confronting a resurgent Russia, Air Force flying units make up a disproportionately high percentage, simply due to the strategic nature of the operations.

While the Active Duty force is about as small as it’s ever been, the demand for airpower is undiminished.

“There’s always going to be demand” even if it’s not in Afghanistan, and in certain mission areas “we just don’t have enough” capacity to meet demand, Sagraves said. “What crisis is going to pop up next month ... that’s going to call for additional Air Force capabilities?” he asked rhetorically. “We don’t know, ... so [units] never really dig out of the hole.”

USAF leaders say they’ve made a priority of readiness accounts in upcoming budgets, emphasizing those levers that the Air Force has control over. This includes funding Red Flag, USAF’s premier full-spectrum training event, which was canceled due to sequestration. Other priorities are depot maintenance and keeping the flying hour program intact.

“We’re pressing hard to make sure our readiness accounts are funded in the manner that we think they need to be to keep us on a positive vector,” Sagraves said. “We’ve been able to maybe turn the vector around a little bit as far as readiness is concerned.”

“Down at the wing and squadron level, the guidance has been, ‘Fly your

Here: SSgt. Noel Jones, a loadmaster deployed from Yokota, prepares to board a C-130H at a Bangladesh air base during Cope South, a bilateral training and joint cooperation exercise. Below: Airmen ready F-16s for takeoff from Eielson AFB, Alaska. Tight deployment-to-dwell ratios are one of the biggest challenges to readiness, and no one knows what contingencies may pop up in place of Afghanistan combat operations.

program.’ Zero out your program, because we need the training. Congress is willing to provide us these dollars, ... so we’re expected to execute, and the wings have followed through,” he said.

Flying units’ full-spectrum readiness “is not where it needs to be at all,” said Sagraves. Even without the return of sequestration stand-downs, the combat Air Force as a whole is “still recovering” and will require budget stability and improving deployment-to-dwell rates to achieve the 80 percent readiness goal by 2023. ★



Entrepreneurs from Silicon Valley and other American innovation hotspots are turning their attention—and investment dollars—to areas once perceived as the sole domain of the defense industry.

Facebook bought drones, Google has balloons plus drones, and Amazon wants to build a fleet of autonomous craft for delivery right to the doorstep.

What if revolutionary technologies for the offset strategy come from players new to the defense industry?

“The race to put the first man on the moon was led by the US and Russian

Seeking advanced technology from new players is at the core of the offset strategy articulated in November by then-Defense Secretary Chuck Hagel. Specifically, the offset strategy’s innovation initiative will “help identify, develop, and field breakthroughs in the most cutting-edge technologies and systems—especially from the fields of robotics, autonomous systems, miniaturization, big data, and advanced manufacturing, including 3-D printing,” Hagel said.

Under this new strategy, “many, if not most, of the technologies that we seek to take advantage of today are no longer in the domain of DOD development pipelines or traditional defense contractors. We all know that DOD no longer has exclusive access to the most cutting-edge technology or the ability to spur or control the development of new technologies the way we once did. So we will actively seek proposals from the private sector, including those firms, and from those firms and academic institutions outside DOD’s traditional orbit.”

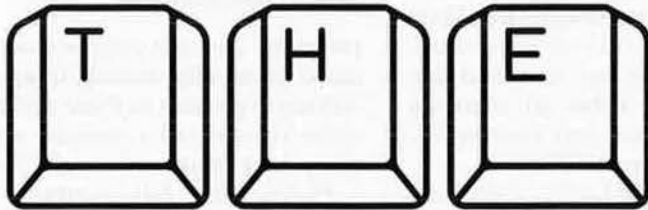
NEW BAZAAR

The Pentagon will find that Silicon Valley money is on the hunt for many of these same “cutting-edge” technologies and talent. Entrepreneurs appear to have

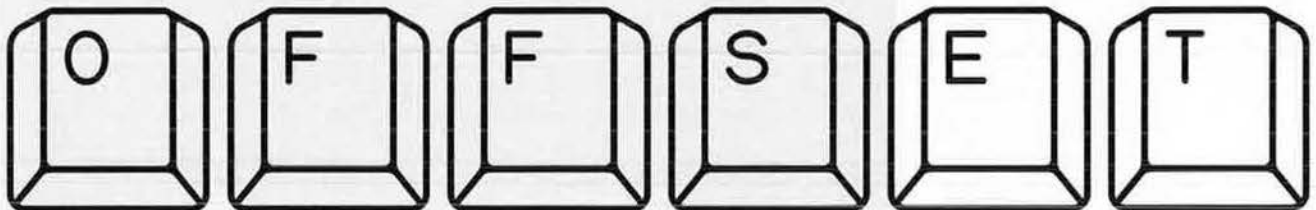
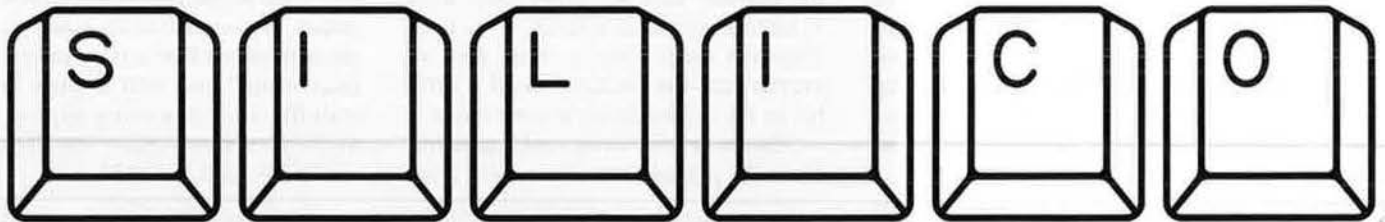
Future breakthroughs may come from America’s innovative tech sector.

governments, but today it is private companies—the cash-rich digital corporations of Silicon Valley—that are driving the sub-space race,” trilled the Manchester *Guardian* after Facebook scooped up a British dronemaker.

The Pentagon isn’t directing this change. But under a new initiative, DOD may extend a warm welcome.



By Rebecca Grant



an appetite for raw technology even when proven results aren't yet in hand.

Both Google and Facebook have made recent acquisitions that overlap the aerospace sector. For the tech behemoths, these buys were only a tiny fraction of their overall acquisition activity. Facebook's acquisitions focused far more on information sharing and analytics. They did not seek "entry" into the defense sector as traditionally defined; their motives were to carve out new commercial markets. However, the moves could impact the defense sector over time by creating a new stream of products relevant to security applications.

Google bought start-up Titan Aerospace out from under a rumored Facebook bid of a reported \$60 million in 2014. Titan made the sale on the persuasive powers of a concept demonstrator for a long-endurance unmanned airplane called Solara. The surface of its long, thin wing and horizontal stabilizer would be covered by 3,000 or more photovoltaic cells to recharge solar batteries. On the 164-foot wing, they could produce seven kilowatts of power, according to statements made by Titan Aerospace before the acquisition. Solara would fly at 60,000 feet, above commercial traffic and FAA regulations. From that perch a single Solara

could cover 6,564 square miles, an area equal to 100 cell towers. Multiply the coverage and the profit appeal becomes obvious.

Industry experts recall similar projects as far back as the 1970s. A small solar-battery airplane called Sunrise flew in Fort Irwin, Calif., in 1974, as did the Gossamer Penguin in 1980.

"If you look at the history of these projects, you'll notice almost all were destroyed because they flew through a little bit of weather," Kevin D. Jones of the Naval Postgraduate School told *IEEE Spectrum* in December 2013.

Stronger, lighter composites, better guidance, and more efficient solar cells solved some of the early troubles. A more recent and much more robust success was the Zephyr made by British firm QinetiQ. Zephyr logged a flight of 14 days and 22 minutes at the US Army Proving Grounds in Yuma, Ariz., in 2010.

Despite Zephyr's encouraging success, challenges remain at altitude and in the basic concept. Lithium batteries are limited to around 200 recharge cycles, according to Jones. Under those conditions even the best air vehicle could draw power only for about six months.

With Titan in the Google fold, Facebook acquired British UAV maker Ascenta in March for \$20 million. Facebook CEO Mark Zuckerberg billed the acquisition as part of his wider connectivity initiative. Yet he could not resist mentioning that the Facebook Connectivity Lab team was already a powerhouse.

"Our team has many of the world's leading experts in aerospace and communications technology, including from NASA's Jet Propulsion Lab and Ames Research Center," he said.

Not all of the activity is in mergers and acquisitions. Some comes from in-house work. Google had its own development underway with Project Loon. Lighter-than-air technology is at the core of the initiative. Balloons will travel in the stratosphere and use varying currents there for power and direction. Users with phones or other LTE devices could in theory connect directly to the balloon network instead of space satellites.

"Project Loon is a network of balloons traveling on the edge of space, designed to connect people in rural and remote areas, help fill coverage gaps, and bring people back online after disasters," Google says.

Google has in this case invested internal research and development in a product devised by the Google X lab. A pilot test of 30 balloons forming a network was run near Canterbury, New Zealand, in 2013.

Providing Internet to underserved areas is part of the concept. However, the company recently received a patent for technology to help the balloons cluster in areas with high broadband demand. Its application cast a wide net of potential customers.

"The user of the balloon network could represent an individual user, a corporate user, a government, or any other entity that may have an anticipated need for bandwidth (e.g., Internet services, communications services, etc.) at a specified future time period in a specified area," Google said.

Granted, some of the featured technologies seem unproven at best, compared to standards in the aerospace industry. "Mystery surrounds the tiny company," said Britain's prestigious *Financial Times* as the Facebook-Ascenta deal closed.

Google has come in for criticism, too. Famous balloonist Per Lindstrand all but ridiculed the concept based on the difficulties of operating in the stratosphere.

"Balloons blow away. Wind speeds at that altitude can reach up to 120 knots, so they won't stay there for more than a minute," Lindstrand told *Techradar.com*. "And if you set off a lot of balloons simultaneously around the world, sooner or later they're just going to collect at the North Pole or the South Pole. They can't stay in position."

But the Silicon Valley ventures have cash and time to close the gaps.

Other areas named in the Pentagon's new offset strategy have long been on the shopping lists of Silicon Valley. Robotics companies have also sold particularly well. Google acquired Boston Dynamics in late 2013. The company is well-known for its military and industrial robots. Others include Schaft, Inc., developing humanoid robots; Meka Robotics, specializing in robot arms; Hololmi, maker of robotic wheels; and robotic camera company Bot & Dolly.

All signs indicate the new players are in for the long term.

"Facebook's purchase of Oculus VR, the maker of virtual reality head-mounted displays, and its attempted acquisition of Titan Aerospace, show

facebook





All those technologies are potentially at the heart of the new offset strategy.

Infrastructure investment is another indicator. With infrastructure, Google is not unlike other aerospace ventures building light industrial facilities at out-of-the-way airports. Google announced it would invest \$15 million in a 60,000-square-foot combined research and development, light manufacturing, and office facility for administration, engineering, and test personnel in Moriarty, N.M. With the move, Google is building a test base for the Titan Solara products, much to the excitement of the mayor of Moriarty, Ted Hart.

“By strategically investing in infrastructure between the city of Moriarty and the state, we expect to see great economic development take place,” said Hart in a Sept. 23, 2014, press release.

Then there is SpaceX, the new entrant striving to become a major player with contract launches to resupply the International Space Station.

SpaceX was fueled by the 1990s success of PayPal cofounder Elon Musk. Musk first founded SpaceX in 2002, then went on to join Tesla Motors. To get into the launch business, Musk invested \$100 million of his own money and raised hundreds of millions more with venture capital. The big dollars, however, came when NASA awarded SpaceX a contract in 2008 potentially worth \$1.6 billion to make 12 deliveries to the International Space Station. With NASA work, SpaceX is taking a time-tested route of leveraging government financing to accomplish research and development. It’s an example of how entrepreneurial management and private cash can work together.

Of course, the most productive overlap may come with sophisticated information technologies. One area of convergence is advanced application of autonomy concepts. Google has said its Project Loon balloons will behave as a flock.

“In my early simulations, each balloon does something similar to what birds do,” a Google team member named Dan explained to Slashgear journalist Chris Davies in a 2013 interview. “They just look to their near neighbors and try to spread themselves out nicely compared to the others.”

The reason for exploring autonomous vehicles as information nodes is to increase data rates, conserve precious bandwidth, and create a network that won’t shut down if a few of the platforms stop operating. A smart flock may be

that CEO Mark Zuckerberg is focused on the distant future,” stated Bret Kenwell on the website TheStreet.

Virtual reality is a significant market. Zuckerberg explained Facebook’s buy of gaming and virtual reality leader Oculus as part of a shift from building out mobile to the next big thing, virtual reality connections. “We have a lot more to do on mobile, but at this point we feel we’re in a position where we can start focusing on what platforms will come next,” blogged Zuckerberg.

Virtual reality as made by Oculus enables lifelike simulations. “When you put it on, you enter a completely immersive computer-generated en-

SPY



Top: An artist's illustration of Titan Aerospace's long-endurance unmanned airplane called Solara. Google bought the start-up company in 2014. **Here:** BigDog robots trot around in the shadow of an MV-22 Osprey. The dynamically stable quadruped robots were created in 2005 by Boston Dynamics—a company known for its military robots—and partners. Google acquired Boston Dynamics in 2013.

vironment, like a game or a movie scene or a place far away,” wrote Zuckerberg. “People who try it say it’s different from anything they’ve ever experienced in their lives.”

Simulation is set to become an ever-larger share of training. Advanced applications offer a test method for tactics, unmanned swarming, and more.



Photo from The West Studio/Flickr

just the solution for innovative communications techniques, too. Orbital angular multiplexing transmits radio waves on the same frequency in twisted shapes that multiply capacity.

“I could have a wave that twists slowly and one that twists a little faster, and those waves are now orthogonal to one another,” explained Alan Willner, of the University of Southern California, in an *IEEE Spectrum* article. Experiments transmit, split, then untangle the waves. The USC-led experiment achieved a data rate of 32 gigabits per second across about eight feet.

Cluster platforms in the air at a distance conducive to transmission, and the result may be a shifting, high-

data-rate network. Position that formation over a disaster site or battle area, and it brings rapid and regenerative communications—a sure winner in the new offset strategy.

EYE ON THE FUTURE

Is there any chance the pace will slow? Driving the acquisitions is the burgeoning market capitalization of the buyers. Google’s market capitalization stood at \$338 billion on Jan. 11, with Facebook’s at \$216 billion. Compare that same-day snapshot with Boeing at \$93.7 billion, Lockheed Martin at \$61.6 billion, Raytheon at \$33.2 billion, or Northrop Grumman at \$30.8 billion. Even the diversified defense, civil, and commercial manufacturer United Technologies clocked in at \$103.9 billion.

Market capitalization admittedly reflects the value of stock but indicates the relative scale of available capital. At a time when defense sector acquisitions have been relatively quiet, the ability of new money to cherry-pick innovative start-ups has the potential to shift the center of gravity of competitive advantage over the long term.

Technology companies like Google and Facebook invest for myriad rea-

A Project Loon balloon at Google’s launch event in Christchurch, New Zealand. A network of such balloons will travel on the edge of space, providing Internet connectivity in remote areas, helping fill coverage gaps, and bringing people back online after disasters, states its website.

sons. Their entrepreneurial culture and huge cash flows make it possible to buy a product just because it sounds cool. Simply put, it’s money they can easily spare. Buying a nouveau dronemaker may appeal to broaden a portfolio, to prevent a rival from making a key acquisition, or to scoop up talented engineers.

Acquiring talent is a major goal. “They take an interest in the firm, but for the most part they seem to want to acquire the people,” commented US tech analyst Rob Enderle in a CBC News analysis. Zuckerberg pointed out that some of the Ascenta team he bought included founders who had worked on Zephyr.

Currently, few upstarts can match the technical virtuosos in the defense industry. However, time, money, and a go-for-it attitude can enable new entrants and their info-money backers to cover significant ground. The situation is not unlike the 1920s when the obscure start-ups were headed by men named Donald W. Douglas Sr., James S. McDonnell, William E. Boeing, John K. Northrop, and Allan K. and Malcolm Loughead.



A miniature turbine produced by a 3-D printer. As Defense Secretary, Chuck Hagel included 3-D printing as one of the key technologies at the core of the offset strategy for technology.



Photo via QinetiQ

The large, solar-powered, ultralight, hand-launchable Zephyr aircraft created by the British firm QinetiQ logged a flight of 14 days and 22 minutes at the US Army Proving Grounds in Yuma, Ariz., in 2010.

amazon.com

LIGHTSQUARED

That said, there's no guarantee Silicon Valley money will be sympathetic or even respectful when business goals clash with military requirements.

Take the case of Lightsquared. Back in 2004, the FCC authorized Lightsquared to use the 1525-1559 MHz spectrum in L band as the basis for a 4G LTE network spanning the nation. Lightsquared then attempted to change the plan to a terrestrial system with 40,000 base stations. The problem was that GPS signals operated right next door at 1559 to 1610 MHz and the new ground stations created interference. The FCC gave Lightsquared a conditional waiver as long as they resolved any potential interference with GPS.

What ensued was a battle royal. Lightsquared, backed by a major hedge fund, campaigned hard for their new plan. Ads popped up in Washington, D.C. Stories circulated about campaign donations by Lightsquared's hedge fund masters and rumored White House pressure. Gen. William L. Shelton, who was then head of Air Force Space

Command, had to explain to Congress and others that under the new plan the Lightsquared signal "would effectively jam vital GPS receivers." Added Shelton: "To our knowledge thus far, there are no mitigation options that would be effective in eliminating interference to essential GPS services in the United States."

The GPS signal was too weak at the front end to resist such high-powered interference from the ground-based network. Shelton likened it to putting a rock band in a quiet neighborhood.

Shelton won the point. Lightsquared filed for bankruptcy in May 2012 and Wall Street continued to sort out its restructuring through 2014. Although this was a battle won, it was unsettling to see a business plan boldly pitted against national security requirements and a fight driven by investor interests.

Open combat may be rare. Perhaps an even greater risk is indifference: the reluctance of high-tech firms to learn

their way through the arcane process of being a DOD contractor. SpaceX's grumpy litigation against the Air Force illustrated the clash of business styles.

Could the tech titans like Google, Facebook, and Amazon be the incubators for must-have defense products of tomorrow? It is too early to say, but one thing is certain: The confluence of entrepreneurial cash and the Pentagon's quest for new technology advantages could reshape how defense "industry" is defined.

Which leads back to the "third offset." Deputy Defense Secretary Robert O. Work noted of the second offset of the 1970s, "If we go after stealth, guided munitions, and information technology, and we blend them together, we utilize the strengths of the American armed forces [and] we will have an offset strategy that will allow us to rule the battlefield conventionally for the foreseeable future. And we were right."

Circa 1975, those technologies resided in or were cultivated by the traditional defense sector. Developing them further offered enticing market share.

Today's business conditions are different. In 2015, it's hard to imagine a true offset strategy without the new tech titans.

The worst case is that the tech titans will lack an incentive to do business with the government. Best case, the third offset strategy can be a two-way street blending defense sector expertise with some of the more wild-eyed projects to cultivate the best of American innovation. ✪

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DOD Senior Leadership

Compiled by Chequita Wood, Media Research Editor

(As of Feb. 18, 2015)



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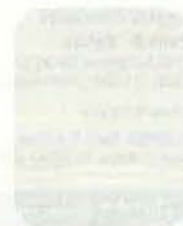
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- DASD** Deputy Assistant Secretary of Defense
- DDI** Director for Defense Intelligence
- PDUSD** Principal Deputy Undersecretary of Defense
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Ten years ago this June, the Air Force—along with the rest of the Department of Defense—stood up new offices focused on sexual assault. Ten years later, the service is leading DOD in its efforts to combat sexual assault.

About 800 fewer Active Duty airmen experienced some form of unwanted sexual contact in Fiscal 2014 compared to 2012. However, reports of sexual assaults across the Defense Department are on the rise, according to new data released by the Pentagon. “The increase in the reporting shows us that victims are more comfortable coming forward and believe they will get the services they need to recover from the trauma,” Maj. Gen. Gina M. Grosso,

the director of Air Force sexual assault prevention and response, said in December.

Even as reporting continues to increase, recent data show the Air Force has the fewest incidents of unwanted sexual contact across all DOD Active Duty components, with 2.9 percent of women and .29 percent of men reporting any type of sexual assault in the past year. This is significantly lower than the DOD average of 4.87 percent of women and .95 percent of men. Air Force officials cited a cultural shift across the service for the low numbers, noting that leadership is key in facilitating a culture of trust and support for victims.

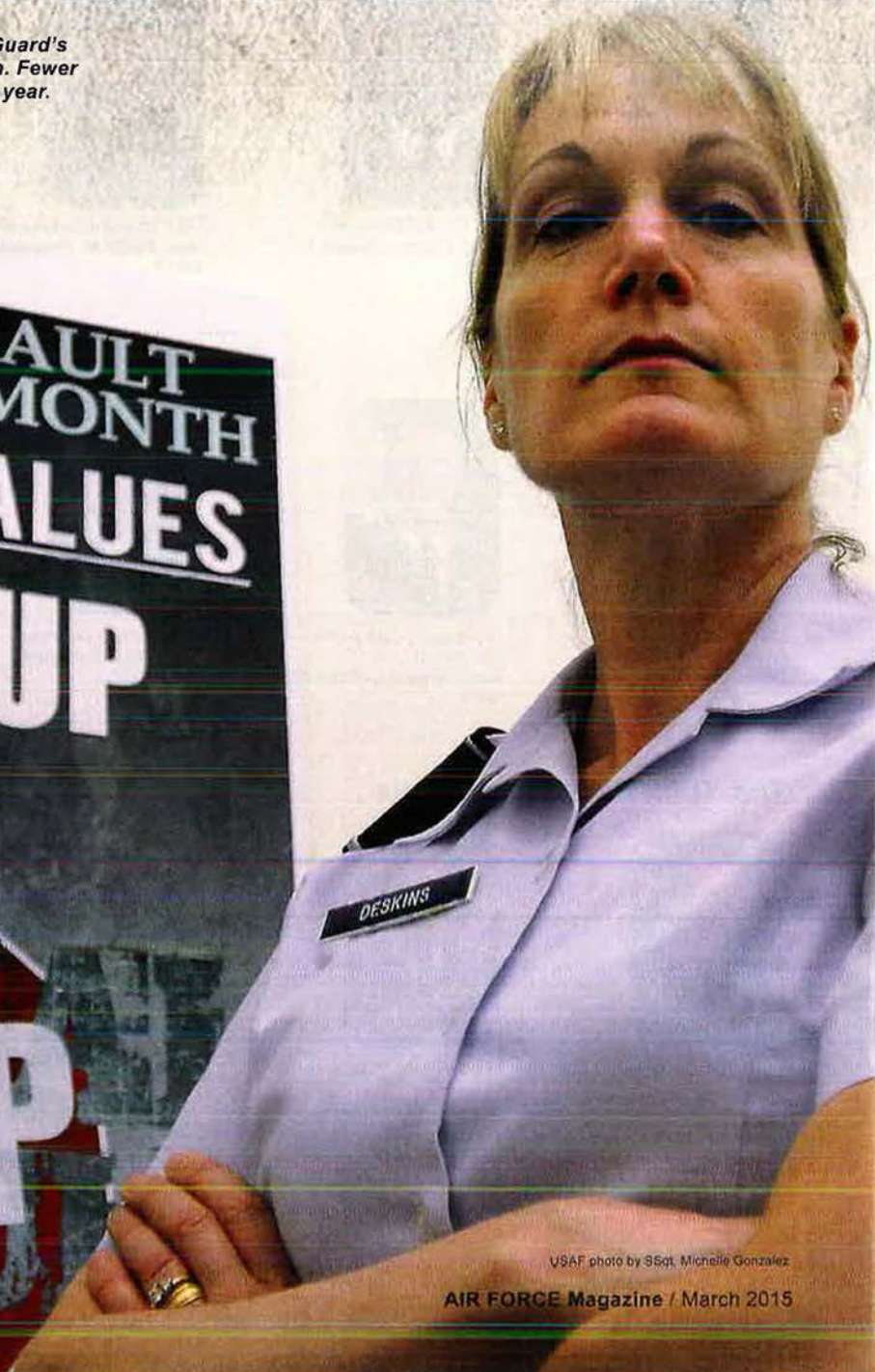
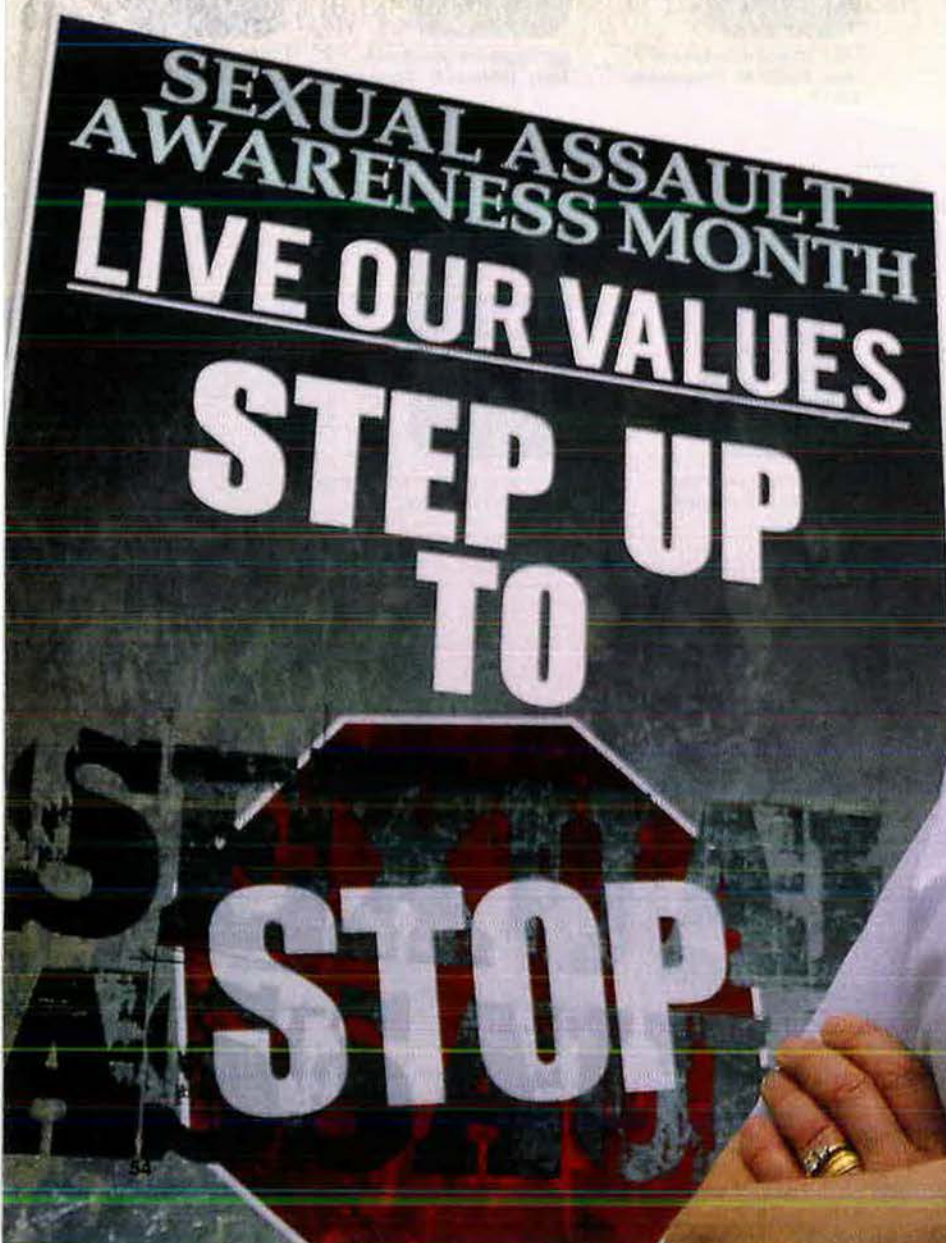
“I think 10 years ago there was maybe a little pushback, but that culture has changed and evolved in a very positive way,” said

Cindy Graver, 2013 sexual assault response coordinator (SARC) of the year.

Graver, who has served as the SARC at the 78th Air Base Wing at Robins AFB, Ga., since 2005, said there is “absolutely” still more work to be done, “but leaders are taking sexual assault extremely, extremely seriously, and they are very supportive of anyone, male or female, who has been sexually assaulted.”

Women comprise just under one-fifth (18.9 percent) of the Active Duty Air Force, with a slightly higher representation among officers (19.9 percent). Despite a male-dominated environment, there is an overall culture of respect for female airmen; the Air Force is not a boys’ club, Graver said.

Brig. Gen. Dawne Deskins leads the Air National Guard's Sexual Assault Prevention and Response program. Fewer airmen experienced unwanted sexual contact last year.



USAF photo by SSGT. Michelle Gonzalez

USAF is at the forefront of reducing military sexual assaults.

A Culture of Change

By Autumn A. Arnett, Associate Editor

"I think when you talk about culture, the big Air Force, I think we have a very healthy culture," Grosso told *Air Force Magazine*. "But we know that there are some pockets of subcultures that exist, [but] we are the most integrated service of all the services. And we are the service that has the most positions open to women. ... There are definitely pockets. ... I've never experienced that. But I'm only one person."

Despite all of the positive trends in the decline of the number of sexual assault incidents and the increase in reporting, sometimes assault happens.

Keny, who asked to be identified only by her first name, survived an incident in 2009 in which the husband of a fellow airman assaulted her. For her, the support of her commander during the process made all of the difference. Few in the Air Force seem to agree with the idea that commanders should be removed from the process.

Grosso said in December that a review of climate assessment data in the Survivor Experience Survey—the DOD-wide effort to measure effectiveness of the response to sexual assault incidents—shows airmen have "an incredibly strong confidence in their commanders. I was shocked at how confident, frankly, airmen feel in their commanders."

Calling the proposal to strip commanders of authority in the sexual assault prosecution process "a terrible idea," Grosso told *Air Force Magazine* in January that the key to eradicating the problem is "we have to change social norms and culture. ... And the people who do that in the military and in the Air Force are leaders, and they're leaders across every level, but particularly commanders are specifically charged with the authority and the responsibility to make that happen."

Of the countries that have made the decision to remove the commanders from the process—Germany, Canada, Israel, England, and Australia—Grosso said she is dismayed that the reasoning behind the change was concern for the rights of the accused, not the victims. "So I find that, one, very interesting. But, two, it has had no impact on reducing sexual assault in their force," she said. "So we have real cases that have shown that removing the commander is not going to get you to the end state that you're looking for."

Sen. Kirsten Gillibrand (D-N.Y.) has been the most vocal proponent of removing military commanders from the chain of prosecutorial command. "I'm not interested in an innocent soldier going to jail any more than I'm interested in a guilty perpetrator going free," Gillibrand said in a February 2014 interview on MSNBC. "We need an objective, trained prosecutor making these decisions about whether a case should go forward, not politics, not the discretion of a senior officer or a commander who may like the perpetrator or might like the victim, who may value the perpetrator more than the victim."

COMMANDERS IN THE LOOP

Grosso said the idea that, first of all, the current process is not guided by trained prosecutors and, second, attorneys approach cases without their own implicit biases is just untrue. "This problem is very serious and the crime is very devastating. So people want an easy solution, and I understand that," she said. "I also think that if you don't understand a lot about the military, it's very attractive [to suggest the commander should be removed from the process]. It's hard to understand, if you've never spent a day in the military, ... why we have a trained legal system but

that the person who makes the ultimate decision is the commander."

Graver agreed. "Commanders need to be in the process. This is a commander's program. ... These are their people. They need to feel that they are responsible for their people, for their health and their welfare and their well-being, and I think that if they have a problem, if sexual assault is a problem, if one of their airmen has been hurt, either by another airman or someone downtown, a person who is totally not a part of the installation, their job and their role is to ensure that their airman is taken care of," she said.

Grosso acknowledged the argument made by Gillibrand and others is "on the surface ... a really easy argument to make. Why would you not have a trained lawyer make that decision?" But the process utilizes trained legal professionals. "There's no commander who's not advised directly by an attorney. That attorney reports directly to that commander, [but] that attorney also has a direct line to the chief attorney in the Air Force, so there're all types of checks and balances." Further, if a commander makes a decision not to prosecute a case, it goes to a second level of review, which includes yet another attorney and an even higher commander.

"People are biased, period," said Grosso. "So I don't buy the discussion that an attorney will make a less biased decision than a non-attorney."

The key is trusting the process to do what it was set up to do, rather than leaving these decisions to any one layer of review.

The process, by some accounts, has come a long way. "Just in the past five years, I've seen it grow tremendously," Keny said of SAPR efforts. She said that when the investigation into her case



DOC photo by Casper Manalang

Then-Defense Secretary Chuck Hagel delivers closing remarks at the January conference on sexual assault prevention.

was taking place in 2009, there were no Special Victims Council representatives. The SVCs are Air Force lawyers trained to advise sexual assault victims and help them navigate the criminal justice system. The SVC Program started in 2013.

"I didn't have somebody to stand on my side and tell me, 'Oh, yeah, you can answer that,' or 'No, don't answer that because it's not pertinent to the investigation,'" Keny said. "That can hinder you. I had that challenge." She also didn't have a victim advocate, but this does not hinder her passion in her work as a victim advocate today. Some questioned her credibility in the absence of an advisor to guide her in the investigation. Despite all the obstacles she faced, the process did exactly what it was intended to do. Keny's attacker was eventually convicted and sentenced to five years in prison. He was dishonorably discharged, demoted to

an E-1, and stripped of all rights to pay and benefits.

Today, Keny said, SARCs, victim advocates, and SVCs are extremely supportive of the victims and helpful in the process. Several years ago, sexual assault response coordinators were not as supportive a resource. "I don't think SARCs were as—I don't want to say present, because they've always been here, but I don't think they were as attuned to" the needs of the victims, she said.

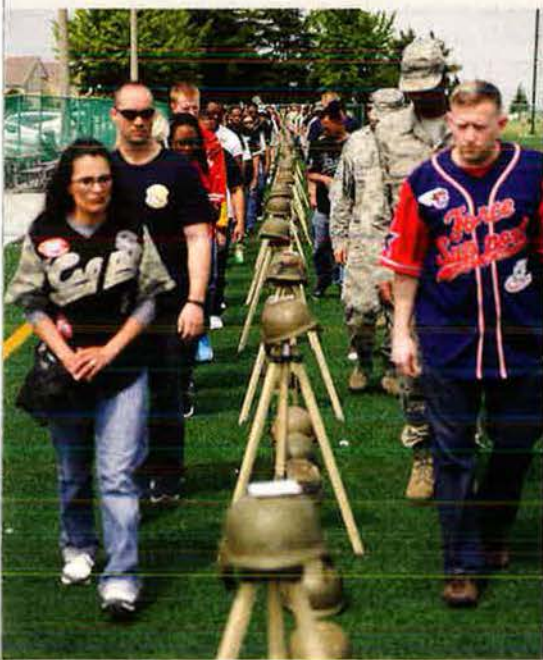
"My SARC came in after [the Air Force Office of Special Investigations] was called, about two, three hours later, so I obviously was not her priority." Keny said that in the last several years, "I've seen that change a lot. The people who are in the SARC positions, the ones ... I've come in contact with at least, love their job. They love what they're doing, and they know that they're helping people. And they're pulling victim advocates in and they're training them, and the VAs are following in the SARCs' footsteps—they're great."

To Keny's point, SAPR has added several more full-time SARCs, bringing the total to 121. There are now 91 victim advocates in the department, meaning "every installation now has at least one SARC and at least one victim advocate. Some have more than just one," Grosso said.

VICTIM BLAMING

Since the 2013 reorganization of the Air Force Sexual Assault Prevention and Response Office—which took it from a four-person program to a staff of 32

During an awareness day, airmen walk past helmets, representing the sexual assaults reported—and probably unreported—over a 10-year period at Kunsan AB, South Korea. Below: Maj. Gen. Gina Grosso, director of USAF's Sexual Assault Prevention and Response Office, speaks to wing commanders in 2014.



USAF photo by SrA, Armando A. Schwier-Morales



USAF photo by Scott M. Ash

At the conference, USAF Secretary Deborah Lee James underscored a drive toward the goal of zero sexual assaults.

reporting directly to Vice Chief of Staff Gen. Larry O. Spencer—it has been able to direct "a lot more bandwidth and a lot more depth of experience and a lot of different people working together towards this problem," Grosso said in the January interview.

Graver, the SARC, said airmen know the do's and don'ts, the rules, and expectations. When she goes in to provide sexual assault prevention and response training, "the first thing they say is, 'We know this.' So our test to them is, 'OK, then you teach it to us.' And they do. And they're accurate and they're right."

Keny said she believes the Air Force has made great headway in the response component of its efforts; the work to be done now is in prevention. Of particular importance, she said, is to cut down on victim blaming by realizing the perpetrator is the problem.

Vice Chief of Staff Spencer agreed, citing recent reports showing that the Air Force's anti-sexual assault education and victim response efforts are paying off. The "next push that we're taking on now is prevention," he said in a December



ANG photo by MSgt. Merdin R. Preston

One Victim's Long Road to Recovery

In 1993, "Don't Ask, Don't Tell" was instituted as Pentagon policy, a change that allowed homosexual troops to quietly serve. The Department of Defense was just starting to attempt to deal with sexual assault. In March 1994, Deputy Secretary of Defense John M. Deutch directed the establishment of a task force on discrimination and sexual harassment to review complaints, and he conducted a DOD-wide survey on sexual harassment, the first since 1988.

Still, in 1994, there was relatively little support for victims of sexual assault, and it certainly wasn't a prominent discussion topic, as it is today.

For male survivors, there was even less support.

Rape victim Dean, who asked to be identified only by first name, said in a January interview with *Air Force Magazine*, "There wasn't any" support for him when he was attacked by two men in 1994.

Not only was there no support, Dean, who was an enlisted man in the Navy at the time, said people were extremely rude, accused him of being a homosexual, and blamed him for his own attack. Following the attack, he sought help at the naval hospital, but was told to clean himself up and leave.

"The physician who was supposed to help me called me a faggot and told me I must like it rough," he recalled. Dean said after that incident, he was too embarrassed to tell anyone else about the assault. He went into a really "dark place" and contemplated suicide often.

In August 2002, Dean left the Navy to join the Air Force, and while stationed at Minot AFB, N.D., he found himself

battling depression over the attack that had taken place years earlier.

He found "things were starting to dim again. I started to go back into that dark place." One day, while having dinner at a friend's home, he learned about the Air Force's new Special Assault Response Coordinator program by way of the friend's wife, who had to leave dinner unexpectedly following a call from a victim. Dean said he later inquired about and knew he had to get involved in the work she was doing.

Dean said his work as a victim advocate over the years—and finally being able to tell his story—is what finally helped him to get over the attack. "Talk to somebody," he advises other victims, because being able to talk about the assault is "the best thing that's ever happened to me."

"I never had formal counseling, don't need formal counseling," thanks to his work with victims and his ability to at last talk about the incident, he said. Dean retired from the Air Force last month.

DOD today is "leaps and bounds" ahead of where it was on sexual assault two decades back. "It's apples and motorcycles," he said. "We're not where we need to be, but we're damn sure headed in the right direction."

One bit of constructive criticism for the current process, however, lies in the mandatory third-party reporting of incidents. "It should be up to [individuals] to decide what level of help they want and how they want to go about deciding to get that help," Dean said.

Overall, it is estimated that .95 percent of DOD's sexual assault victims are male.

interview with *Air Force Magazine*. "We've done a lot to educate people, we've done a lot to make certain our victims are cared for, ... but in an ideal world, the crime would never happen."

That effort to ensure the crimes never happen was part of the motivation for a January conference on sexual assault prevention held at JB Andrews, Md. Over four-and-a-half days, airmen covered definitions and barriers, cultural and climatic factors—including social media and healthy relationship education—and future action plans.

Overall, the sentiment is that airmen are taking the issue of prevention very seriously.

But as Grosso pointed out, "Prevention is a really complex thing."

Keny said although attitudes about prevention "have gotten better," there are still airmen who "don't have that personal interaction with it, ... don't believe it, don't want to believe it, or don't know anybody who's gone through it."

There is still work to be done on figuring out "how ... we make it safe for airmen to come forward and say, 'That's not going to be tolerated in this environment,'" Grosso said.

There is also still some room for improvement on the support side for victims, Keny said. For example, investigators should give victims a little time and space to deal with the incident personally before being subjected to questioning. "When you have something traumatic like that happen to you, you're not going to just

be like, 'Oh, here's every single detail. Take every bit of it. I'm open to sharing that right away.' It's personal, it hits you hard," she said. "I don't think if somebody's child passed away, they're going to want to open up about it all the way. They're going to have that emotion and the hurt from it. It's the same thing with sexual assault."

For victim advocates, it is critical that they provide support, "constantly stay with that person and help them, but don't help them too much to the point that they can't stand on their own," she said.

The victim-turned-advocate, the sexual assault response coordinator, and the major general all believe USAF is trending in the right direction in its efforts against sexual assault. "I know there's a lot of people out there who appreciate the SAPR world and appreciate the ability to reach out," Keny noted.

Grosso believes the more the SAPR office talks about the problem, the more people are comfortable reporting incidents to leadership, which contributes to the force's ability to continue to combat the issue. And the Air Force continues to receive DOD-wide recognition for its efforts in the fight. "We're doing a lot right," Grosso said. ★

USAF photo by Scott M. Ash



Air Force Chief of Staff Gen. Mark Welsh speaks to a gathering of Total Force wing commanders at a 2013 sexual assault prevention summit.


The national youth cyber education program is making a measurable difference in students' lives.

Growing STEM Students Through CYBERPATRIOT

By Peter Grier



AFA photos by Evan Keith



Left: Maxime Dowla (l) and Giovanni Betti Hernández (r) from Marine Military Academy in Harlingen, Texas, compete in the National Finals, Middle School Division, of CyberPatriot VI. Their team made it to the National Finals again this year, this time in the high school category. Here: Savannah Clemente (r) and Luke Robinson (l) from Rangeview High School in Aurora, Colo., work during the National Finals, High School Open Division, of CyberPatriot VI.

The Air Force Association's CyberPatriot youth cyber education program is six years old and still growing fast. What began in 2009 as a one-round, face-to-face cyber defense contest between eight Orlando, Fla.-area, Junior ROTC and Civil Air Patrol units expanded into a multidivision virtual reality competition that drew more than 2,100 teams from all 50 states, Canada, and Europe in 2014-15.

The cyber defense education effort has also broadened its offerings, morphing into more than an online battle. CyberPatriot's cyber education initiative aims to teach elementary school kids about staying safe when they surf the Web. The program launched trial CyberCamps last summer to engage students in computer security education year-round.

But CyberPatriot's biggest gain, according to its commissioner, may be that it has begun to have a measurable effect on its participants' higher education and occupation choices. Almost 90 percent of past competitors now in college are focusing on a STEM (science, technology, engineering, and math) field, according to a CyberPatriot-sponsored survey. The vast majority of these respondents said that CyberPatriot itself had at least somewhat affected their choice.

YOUNG CYBER EXPERTS

"That's huge. This is a validation of the investment by our sponsors—and a validation of the program. We're impacting their choices for education and subsequent careers," said retired Air Force Brig. Gen. Bernard K. Skoch, CyberPatriot's national commissioner.

The need for more national cyber defenders has become increasingly obvious since Team Spaatz from Osceola High in Kissimmee, Fla., won the initial CyberPatriot challenge six years ago. In late 2014, Sony Pictures suffered an intrusion into its computer systems—launched, according to the FBI, by North Korean hackers. Sony wouldn't have to look far to find the personnel needed to protect their data in the future. A team from North Hollywood High won the Open Division in the 2014 CyberPatriot finals, and local media sought them out as expert commentators in the wake of the Sony fiasco.

The kids felt that given the scale of Sony's losses, the attack had to have been carried out by a highly sophisticated group of hackers. "They probably spent a whole year or so trying to find a single vulner-



AFA photo by David Heath

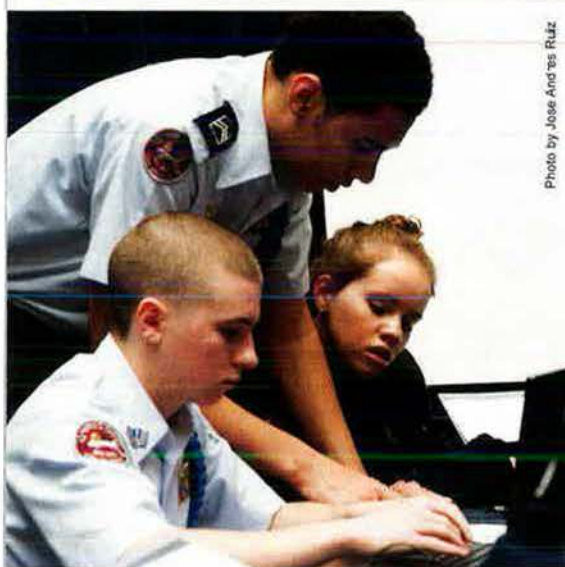


Photo by Jose Andres Ruiz

Above: The CyberPatriot VI second place team, Open Division, from Gressom High School in Huntsville, Ala., pose for a selfie with Bernie Skoch, CyberPatriot national commissioner, and Kathy Warden, president of Northrop Grumman Information Systems (second from right). Team members are l-r: Chris Sutton (coach), Morgan Wagner, Angela Cheng, Jeremy Lochner, James Brahm, and Christopher Lin. Left: Team members from Lee's Summit North High School in Missouri work together during the CyberPatriot VI National Finals. They are: Mitchell Bruce, AJ Baker (standing), and Michaela Ditterline.

ability," North Hollywood High senior Isaac Kim told a local NBC affiliate.

CyberPatriot is meant to bolster America's cyber workforce by producing as many Isaac Kims as possible. It uses an innovative, fun approach to steer students toward computer science and other STEM fields. So far, its vector is upward.

Following the 2009 Orlando pilot competition, CyberPatriot II went national, attracting about 200 JROTC and CAP teams from across the country. CyberPatriot III expanded to include teams unaffiliated with military organizations, in a separate Open Division. More than 1,000 teams registered for CyberPatriot IV in the 2011-12 school year. It passed the 1,500 mark in CyberPatriot VI. A national middle school category was added for the 2013-14 year. More than 200 middle school teams signed up in 2014-15, pushing CyberPatriot VII's registration to more than 2,150 teams.

"We grew by over 40 percent in registration [this academic year], so yeah, growth has been strong," said Skoch.

A substantial part of the increase comes from cities and school systems that have

placed special emphasis on cybersecurity education. Often they are located in areas having a strong military or defense industry presence. CyberPatriot labels these areas Centers of Excellence, and they are Los Angeles, Northern Virginia, Oklahoma City, San Antonio, and Spokane, Wash. Open Division teams have also been ramping upward. They have now reached approximate parity with the JROTC and CAP units, which in the early years were easier for CyberPatriot to reach due to their military affiliation.

"That's a big deal. Open teams are where our greatest opportunity for growth is," said Skoch.

ALL ARE WELCOME

As for the middle school teams, CyberPatriot officials have adjusted their software so younger competitors don't face as challenging a problem set as the high school age participants. "It drives their scores up," said Skoch. "It's not that they're not bright, but they haven't had the opportunity to learn as much about leadership and creative problem-solving."

Any school can field a CyberPatriot team. This includes charter high schools, home schools, scout troops, and Boys or Girls Clubs. The teams do not have to have special computer or STEM classes to be able to compete on an equal basis. Each

team needs a coach, usually a teacher or volunteer. The coaches need no special technical background. CyberPatriot provides all cyber teaching materials, and there isn't a skill prerequisite for the program. Any student who wants to learn about cyber defense can join. If a team needs help with computer basics they can ask the program office to steer them to a mentor, usually a local computer or engineering professional with the necessary skills.

Teams have two to six members. Five compete, with one serving as an alternate. The CyberPatriot competition year begins in October. Early rounds take place online, with teams playing from their own classrooms or computer labs. They download virtual representations of computer operating systems that conceal worms, viruses, or other flaws. Then they race against time to find the bugs while trying to keep the useful parts of the operating systems, such as email, up and running.

In essence they play the role of information technology professionals trying to defend their networks against hacker attacks.

State and then regional rounds of competition narrow the field. Eventually the 12 top Open Division teams, 13 top JROTC or CAP teams, and three middle school teams earn an expense-paid trip to the CyberPatriot National Finals in March at the Gaylord National Resort, outside Washington, D.C., in National Harbor, Md.

Many of the participating students have never been to the nation's capital so the trip alone is a treat. Winners get more, including a total for the high school divisions of some \$50,000 in scholarships from presenting sponsor the Northrop Grumman Foundation.

But competition is not all CyberPatriot offers. This year it is moving to expand its educational efforts into different areas: elementary school-level cyber safety modules and summer camp curricula for vacation time cyber learning.

The elementary initiative has been under development for some time. It intends to help develop personal cybersecurity awareness in preteens while getting them excited about STEM disciplines in a gentle manner. CyberPatriot will provide elementary schools with three learning modules, according to Skoch. The first is a bilingual K-3 module focusing on cyber safety. It is now getting a final shakedown in a Los Angeles school.

"It teaches basic principles, like what a password is, why it's important, and why you don't want to share it with everybody," said Skoch.

The second and third modules will reach fourth- to sixth-graders. The modules will include games, with a teacher's manual and some instruction. "The overarching purpose of the program is to keep students safe online," said Skoch. "CyberPatriot will provide this at no cost to schools." Rollout of these two modules is scheduled for this year.

The summer camp cyber outreach has been a logical extension. Camp is not just for sports and outdoor activities any more, and many summer camp specialties abound, from tuba camp to stained-glass camp to many variations of robotics and math camps.

CyberPatriot helped conduct three week-long pilot camps last summer: two in Texas and one in Northern Virginia. The total curricula ran 20 hours, with the first 16 devoted to education about cybersecurity and the last four allotted to a mini-CyberPatriot competition for campers. About 250 kids participated. "They were enormously successful," said Skoch of the pilot camps.

This summer CyberPatriot will debut some 20 camps in several states, including Texas and Hawaii. Along with elementary school programs, it is all part of the move to evolve from a national high school cyber defense competition into a national youth cyber education program.

"Two years ago I'd have said we're trying to break through. Now we're getting invited to STEM conferences," said Skoch. "We're getting the calls now. We are unaware of any peer competitor."

CyberPatriot is still relatively young, as educational initiatives go. But its founders say it is already having a real-world impact on the educational choices and job opportunities of its alumni.

In 2014 CyberPatriot for the first time surveyed students who have participated in past competitions to find out what they are doing now. CyberPatriot alumni still enrolled in high school are an ambitious bunch: Ninety-five percent said they intend to pursue a college degree of some kind. By way of comparison, about 66 percent of high school seniors who graduated in 2013 subsequently entered a higher education program, according to the Bureau of Labor Statistics. "This shows that CyberPatriot alumni are being drawn to higher education at a higher rate than their peers," said Skoch.

They are also tech-oriented. Fully 80 percent of the current high schoolers who want to attend college said they plan to study a STEM topic.

In addition, the choices made by CyberPatriot past participants already in colleges or universities might be even

Photo by Jose Andres Ruiz



Last year's team from Sisler High School in Winnipeg, Manitoba, Canada, compete in the Cyber Crime Scene Challenge. L-r: Jarren Mercado, Arran Retzlaff, Devyn Hrechkosy, and Ajit Matharoo. A team from the school made it to the National Finals again this month.

more indicative of the program's impact. CyberPatriot is now old enough to have a significant number of such graduates, and according to the 2014 survey, they are also drawn to technical fields in disproportionate numbers. Ninety percent of alumni who are enrolled in higher education or who have already graduated with a degree enrolled in STEM fields.

AND IT'S FUN, TOO

It is possible that students drawn to a cyber defense competition in high school might be naturally STEM-oriented and would have majored in math or science in college regardless of CyberPatriot. But the survey asked alumni now in college whether CyberPatriot made a difference in the type of classes they eventually took. Eighty-seven percent said it did. "We're impacting their choices in education," said Skoch.

Part of the reason seems to be that participants find CyberPatriot entertaining, according to the survey. Participants in the 2013 season, polled after the close of competition, generally said they had little knowledge of cybersecurity basics until they signed up for the CyberPatriot competition. Most were glad they did so—51 percent found CyberPatriot "very engaging." Eighty-two percent said it was either fun or the most fun of all their extracurricular activities.

Keeping it fun takes hard work. Social media and the way teenagers interact with electronic devices is changing so fast that CyberPatriot will have to continue to innovate to keep up with the times.

"One of the things I've sought to do is keep things fresh, make it so good we keep drawing the interest we have," said Skoch. For instance, CyberPatriot IV added to the National Finals a forensics competition, accounting for 10 percent of a team's final score. This involves teams analyzing a physical cyber crime scene in an attempt to discover digital evidence and piece together what happened. Skoch said he'd like to broaden that aspect of the contest, perhaps introducing it in earlier rounds.

CyberPatriot is also considering enriching its mobile computing challenges. In the last finals, participants had to harden an iPad against intrusion. Given the explosion in use of mobile devices, there are many ways this might be expanded in a manner that would seem directly useful to students' lives.

For sponsors, Facebook signed up as a CyberPatriot partner in 2014, joining presenting sponsor Northrop Grumman, along with Cisco Systems, Symantec, Microsoft, Riverside Research, Splunk, URS, Leidos, and AT&T, as a private sector supporter.

Government backing comes from the Department of Homeland Security and the Department of Defense. Educational institutions that have signed on include the Massachusetts Institute of Technology's Lincoln Labs, Embry-Riddle Aeronautical University, and the University of Maryland University College.

"We hear a lot of talk about public-private partnerships. I can't think of a program that exemplifies that more than ours," said Skoch. ★

Peter Grier, a Washington, D.C., editor for the Christian Science Monitor, is a longtime contributor to Air Force Magazine. His most recent article, "Kittinger," appeared in August 2014.

On Aug. 9, 2008, eight Su-30MKI strike fighters, two Il-78 tankers, and two Il-76 airlifters from the Indian Air Force (IAF) landed at Nellis AFB, Nev., to begin India's first-ever participation in USAF's renowned Red Flag air warfare training exercise.

The intent was to demonstrate the IAF's ability to project a combat-capable force halfway around the globe, to sustain and support such a presence, to operate alongside other air forces and integrate effectively with them, and to exchange best practices with USAF and other exercise participants.

By all accounts, the experience was a resounding success. The IAF brought a mix of seasoned and novice pilots, flew more than 350 day and night sorties, and rode a steep learning curve throughout the two-week exercise. Although its aircraft were not wired to tap into the US Link 16 communications network, they flowed seamlessly into the Blue Force's daily game plan in every other respect.

After the exercise ended, the desire for more USAF-IAF interaction was well-expressed from an American perspective by a Blue Force planner, Capt. Marcus Wilson. He said the IAF was a "world-class air force with great aircraft and great leadership. ... We would like to have IAF here as a regular participant."

Most Americans remain under the mistaken impression the IAF is a remote Third World air force flying antiquated Soviet-

era MiGs. In fact, India operates the world's fourth-largest air arm with more than 1,300 aircraft at some 60 bases nationwide. It also is one of the world's oldest continuously functioning air services, with roots going back to Oct. 8, 1932, when it was established by Great Britain's Royal Air Force as an auxiliary of the Indian Empire during the time of the British Raj.

Until the early 1990s, the IAF was little more than a support entity for the Indian Army. As such, it had a purely tactical orientation and operated almost entirely in the shadow of its bigger army brother when it came to its budget share and bureaucratic clout. Today, in contrast, the IAF has acquired independent strategic missions, including first and foremost, nuclear deterrence and retaliation. It also operates first-rate equipment and is determined to build its global reach and status.

The Indian Air Force's recent emergence as a full-spectrum air heavyweight has been distinguished by fielding not just fourth generation multirole fighters but also force-extending tankers, an airborne early warning and control system capability, intra-theater airlifters, remotely piloted aircraft, and the beginnings of a military space surveillance capability.

This impressive achievement has naturally paralleled the growing disposition of India's foreign policy establishment to develop a capability for projecting Indian power, presence, and influence beyond the Indian subcontinent. In that regard, a



India's Air Force Evolves

By Benjamin S. Lambeth

Photo by Sagar Pathak

former commander of the IAF's Western Air Command, retired Air Marshal V. K. Bhatia, wrote in 2009 in *SP's Aviation* of the service's "growing aspirations to transform itself from a mere sub-continental tactical force to an intercontinental strategic aerospace power in conformity with other leading air forces in the world."

Indeed, the flight plan the IAF has followed unwaveringly since the late 1990s has shown remarkable parallels to USAF's transformation after the Vietnam War. Today, the service has more in common with USAF than with most other air forces in overall size, reach, composition, breadth of missions, and ability to achieve tactical and strategic effects. Its principal operating forte, according to its then-Chief of Air Staff, Air Chief Marshal S. P. Tyagi, in 2006, is its ability "to conduct a swift and decisive offensive campaign."

TRAINED TO THE HIGHEST STANDARDS

The IAF is mainly a fighter force, with the Soviet-designed and indigenously produced Su-30MKI its current pride. This aircraft is not a stock Russian product but a hybrid built expressly to IAF requirements and incorporating both indigenous and Western technology, including Israel's Litening targeting pod. It is backstopped by three variants of modernized MiG fighters and Jaguars and Mirage 2000s fielded in multisquadron strength.

The IAF is a combat organization in which fighter pilots have traditionally dominated the service's leadership. This comes as no surprise, considering that its ratio of fighter pilots to others is substantially higher than USAF's, due to the small size of the IAF's tanker and transport inventory, its fairly small helicopter community, and its lack of a long-range bomber force.

Among the service's predominant cultural traits are a deeply ingrained can-do attitude, a well-educated and technically literate officer corps, an ability to absorb and operate high-technology equipment quickly, and aircrews trained increasingly to the highest Western standards. These characteristics were directly imparted to the IAF by its RAF progenitor years ago and are well-captured in the service's proud motto, "Touch the sky with glory."

The IAF differs notably from USAF in its composition and command and control arrangements. Its main operating entities—Western Air Command, Eastern Air Command, Central

Air Command, Southern Air Command, and Southwestern Air Command—are regional rather than functional in focus and are not just force-provider organizations but also combat entities with full execution authority. When it comes to the allocation and apportionment of IAF aircraft in joint operations, Air Headquarters in New Delhi remains the ultimate locus of decision making. However, because of the country's large size, the daily operational control of those assets is delegated to the IAF's five regional commands, whose commanders see to the tasking of all air assets within their respective geographic areas of responsibility.

As for its doctrine and concepts of operations, the IAF now stands at the forefront of modern airpower thinking, with its leaders increasingly confident that any major conflict involving India will be air-led and that India's chances for success in any such confrontation will depend heavily on what the IAF can contribute to the joint fight.

IAF fighter pilots log an average of 180 to 200 flight hours a year in a variety of air-to-air and surface attack mission profiles. Continuation training at the squadron level focuses mainly on air defense, aerial combat, and airfield attack, with less emphasis placed on defense suppression and counter land missions. The IAF's long-classic practice of low-level ingress to targets and manual bombing with unguided munitions has increasingly given way to medium-altitude tactics and the delivery of precision guided weapons from standoff ranges. That said, the IAF still remains only in the early stages of its precision revolution and is now about where USAF stood at the time of Operation Desert Storm in 1991, when fewer than 10 percent of its munitions delivered in combat were precision guided.

Recent years have also seen an IAF trend toward the periodic conduct of large-force employment exercises at the squadron level involving multiple tanker hookups and often the inclusion of airlifters, helicopters, and special operations forces.

As for its force structure, the IAF is unusually diversified. It operates seven types of fighters, six types of helicopters, four types of airlifters, and three types of trainers, as well as tankers, new AWACS platforms, and a variety of remote piloted aircraft. Some of its fighters and mobility aircraft have been retained well beyond their planned service life. Because of this virtual

Over time, the IAF has become increasingly like USAF.



An Indian Air Force Il-78 refuels an IAF Su-30MKI Flanker while flying in formation with two USAF F-15s during preparations at Mountain Home AFB, Idaho, for a Red Flag mission in 2008.

menagerie of different aircraft types—26 in all from four nations of origin—the IAF faces a uniquely complex force management challenge and a maintenance nightmare. This requires an uncommonly agile logistics approach.

Advanced weapons training and tactics development and validation are conducted by the IAF's Tactics and Air Combat Development Establishment (TACDE) at Air Force Station Gwalior located not far south of New Delhi. This elite training facility—begun in 1971—and the more recently created air warfare center in the United Arab Emirates—established in 2000—are the only true foreign counterparts to USAF's Air Warfare Center at Nellis or the Naval Strike and Air Warfare Center at NAS Fallon, Nev.

TACDE has long maintained air combat maneuvering instrumentation to support its periodic large-force training activities by providing real-time readouts of essential flight information on each participating fighter to facilitate the most accurate mission debriefings. It also is now seeking to acquire its own fully instrumented range complex for use as a site for future IAF-sponsored exercises comparable to Red Flag.

High-profile international training exchanges have become especially important to the IAF. The service had opened itself to the outside world in 2003 when it invited a detachment of French air force Mirage 2000 fighters to Gwalior to take part in a novel air-to-air training exercise called Garuda. During the 12-day event, IAF pilots did not fare well in simulated beyond visual range combat and learned some important lessons about modern aerial warfare. It was only after that sobering experience that the IAF fighter community began to move decisively beyond its old-school insistence that "the only good kill

is a gun kill" and to appreciate the tactical value of cross-training with Western air forces. This required reassessing what their former Soviet suppliers had long said about the capabilities of Soviet aircraft and weapons.

A year later, the IAF hosted Exercise Cope India 2004 at Gwalior, involving six participating F-15Cs from USAF's 19th Fighter Squadron at Elmendorf AFB, Alaska. That event offered the IAF's fighter community its first opportunity to interact closely with American airmen in a training environment since an exercise in 1963 brought a small detachment of F-100s to India.

The IAF's pilots had learned much about modern aerial combat in the short time since their unexpected comeuppance at the hands of the French in 2003. Thanks to determined efforts to master and further refine their resultant learning, they gave their USAF visitors a surprising wake-up call regarding India's creative and effective use of mostly Soviet-designed fighters.

According to subsequent accounts by USAF participants, the IAF pilots who flew in Cope India 2004 showed impressive flexibility and tactical innovation. In marked contrast to the highly scripted and predictable tactics under close ground control that the Soviets would most likely have employed in any NATO-Warsaw Pact showdown in Central Europe, the Indians varied their aircraft mixes, altitudes, and formations and never reinforced failure by repeating tactical moves the F-15 pilots had easily countered.

The USAF visitors faced "superior numbers [but also] an IAF pilot who was very proficient in his aircraft and smart on tactics," commented the leader of the F-15 contingent, Col. Greg Neubeck, after the exercise ended. "What we've seen in the last two weeks is the IAF can stand

toe-to-toe with the best air force in the world," he said. "I pity the pilot who has to face the IAF and chances [that] day to underestimate him, because he won't be going home."

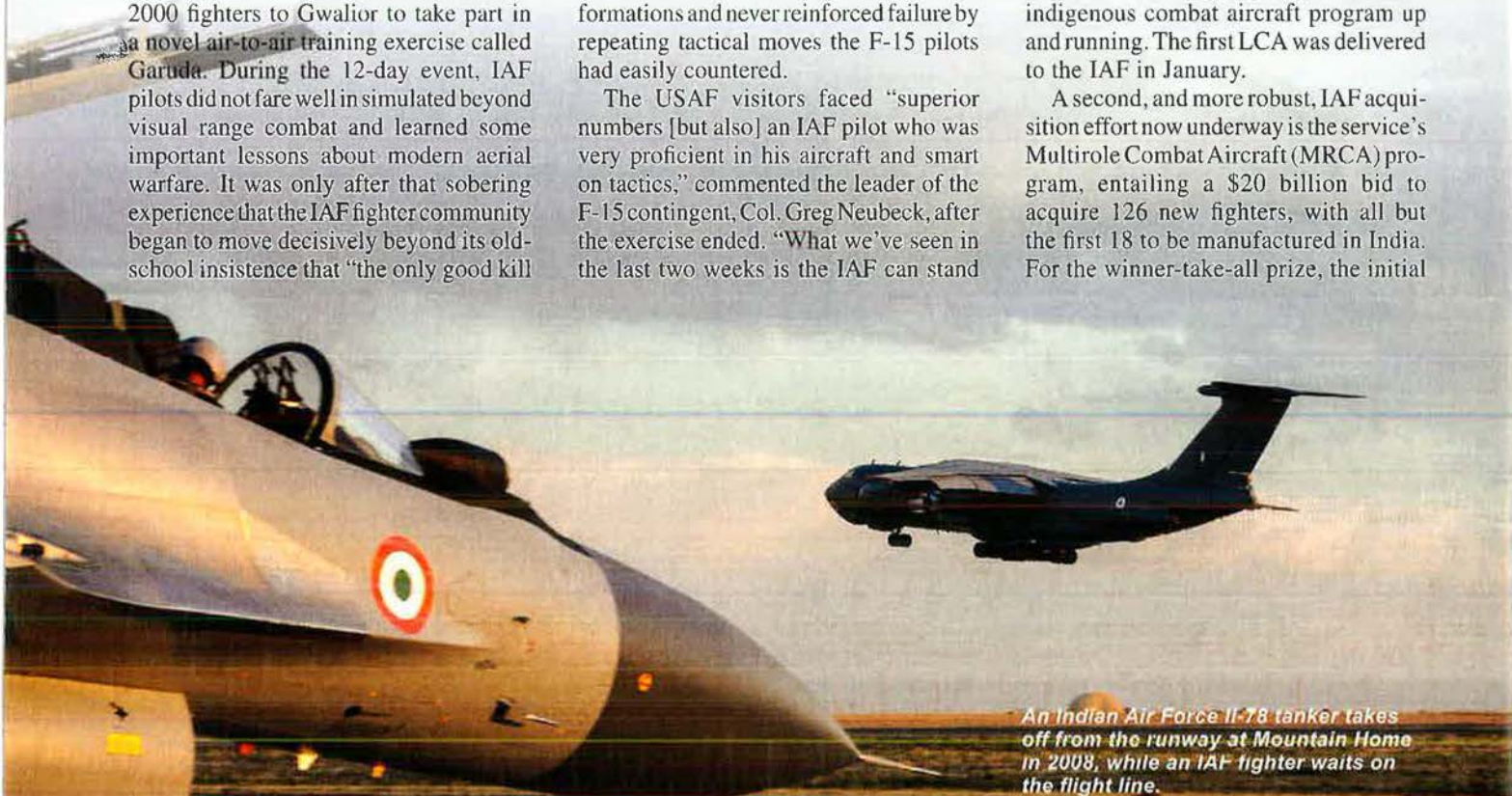
INVESTING IN AIRCRAFT

The IAF is now pursuing three major combat aircraft acquisition programs. The first, India's indigenous Light Combat Aircraft is intended to replace the service's aging MiG-21s with a domestically designed successor.



The LCA has been pushed hard by the Indian government and even more aggressively by India's aviation industry with its own vested interests. Both of those powerful domestic backers have shown a consuming urge to get a credible indigenous combat aircraft program up and running. The first LCA was delivered to the IAF in January.

A second, and more robust, IAF acquisition effort now underway is the service's Multirole Combat Aircraft (MRCA) program, entailing a \$20 billion bid to acquire 126 new fighters, with all but the first 18 to be manufactured in India. For the winner-take-all prize, the initial



An Indian Air Force Il-78 tanker takes off from the runway at Mountain Home in 2008, while an IAF fighter waits on the flight line.



USAF photo by Jet Fabara

Photo by Sagar Pathak

competition pitted six foreign contenders against each other: the Lockheed Martin F-16IN, Boeing F/A-18E/F, Eurofighter Typhoon, Dassault Rafale, SAAB JAS-39 Gripen, and a still-developmental MiG-35 derivative of the MiG-29 the IAF had long operated.

To the surprise of many who followed this competition, only the Typhoon and Rafale survived the initial downselect to become semifinalists. In January 2012, India announced Rafale was its MRCA choice.

That unexpected dark-horse choice suggested the fighter pilots who dominate the IAF almost surely got their way in wishing for the most modern of the six contenders, even though the French air force and navy have been slow to acquire their own Rafales—and even though no foreign country had adopted the aircraft before India chose it.

The selection further attested that cost was not the driving concern, given that the likely price of the Rafale is widely assessed as the highest among the contenders.

French willingness to release sensitive technology, including the aircraft's main

mission computer source codes, could have also played a role in the decision. Such a tech transfer would have been proscribed from being shared abroad by US export controls.

Finally, the IAF had long been satisfied with its French-developed Mirage 2000s, and if nothing else, a decision to acquire the Rafale would make for a familiar supplier arrangement.

The two involved governments are still in protracted contract negotiations, so it

Clockwise from top left: A USAF F-15 and an IAF Mirage 2000 fly together over the Himalayas during Cope India 2004. India's new jet fighter will also be French-developed. An IAF sergeant stands atop an Su-30MKI Flanker during flight preparations at Mountain Home. A Boeing C-17 for India arrives at Edwards AFB, Calif., for testing in 2013. India is on track to become the world's second-largest C-17 user, trailing only the US.

USAF Capt. Pete Felser is briefed on Su-30K operations by U. Rakhura, an IAF wing commander, during Cope India '04. It was the first dissimilar air combat training exercise between the two nations in more than 40 years.



USAF photo by TSgt. Keith Brown



Two IAF Mirage 2000s lead a formation of USAF F-15s and IAF Su-30Ks over India during Cope India '04. Plans for future Cope India and Red Flag exercises are in the works.

remains unclear when the MRCA effort will finally succeed in putting rubber on the ramp at IAF bases.

The third and last ongoing IAF force modernization initiative is the planned acquisition of a Fifth Generation Fighter Aircraft once its MRCA buy nears completion.

India signed an agreement with Russia in 2007 to co-develop an indigenous version of the Sukhoi T-50, a Russian stealth fighter said to be comparable to USAF's F-22. This aircraft made its long-awaited maiden flight on Jan. 29, 2010. Sukhoi describes it as incorporating very low observability, high maneuverability, an active electronically scanned array radar, and supercruise.

So far, although Russia and India have each pledged more than \$5 billion to the joint FGFA project, state-owned Hindustan Aeronautics Limited (HAL) has played no part whatsoever in the T-50's development. This raises questions about HAL's co-development role, as the aircraft's main design features appear to be set by Sukhoi.

Another concern regarding the program's long-term viability is whether HAL will have the engineering and industrial know-how to contribute effectively in a cutting-edge fifth generation program, in light of its continuing developmental difficulties with the far simpler LCA.

There remains a chance this fifth generation program could prove a bridge too far for India's aerospace industry. Similarly, should the Russians themselves fail to deliver the T-50 as expected, the IAF could well be forced to develop eleventh-hour fallback options to acquire its fifth generation capability.

In decades past, India's relations with the US were distant and strained because

of Washington's close ties with Pakistan going back to the earliest years of the Cold War. The American inclination to favor Pakistan geopolitically created a natural disincentive against cooperative bilateral ties with India, as did the predominant American view for many years of India being half of the annoying "India-Pakistan problem." American coolness drove New Delhi toward Moscow, which became the main purveyor of the IAF's Cold War combat aircraft.

IMPROVING RELATIONSHIPS

Today, the US and India live in a fundamentally different world of increasingly shared security concerns. These include a robust and expansionist China showing regional hegemonic ambitions in South Asia, an ever more unstable Pakistan, and radical Islamist extremism and its associated threats of global terrorism presenting both current and long-term threats to both countries.

In this new setting, mutual understanding and a mutual willingness to seek a more cooperative relationship have improved US-India relations substantially. So has New Delhi's recent softening of its long-standing insistence on strict nonalignment, which has in turn progressively yielded to closer interactions with the West.

In light of these considerations, USAF chose wisely in 2010 when it opted to make India the 14th country to be included in its periodic bilateral Opera-

tor Engagement Talks. These recurrent discussions have continued in a collegial spirit ever since, most recently in a three-day operator-to-operator exchange hosted last December at Pacific Air Forces' headquarters in Hawaii, with the IAF delegation headed by the service's vice chief and with topics including plans for future Cope India exercises and the IAF's prospective return to Nellis for a second Red Flag, in 2016.

The case for closer USAF interaction with the IAF is compelling for at least three reasons.

First, the IAF serves the world's largest democracy and its fastest-growing economy after China's. It also has more in common with USAF than with most other air forces around the world.

Second, although India chose in the end not to go with either proffered US candidate as its final MRCA choice, the IAF has increasingly acquired other American aircraft, including a recent purchase of six C-130Js. Beyond that, with 10 C-17s now delivered or on order and with an option to buy six more, the IAF would become the world's second largest C-17 user. It could yet become a satisfied user of other US aircraft and associated systems in years to come.

Finally, as a result of its increasingly shared regional security concerns with the US, New Delhi has an abiding common interest with Washington in achieving a satisfactory solution to continuing political and strategic challenges in Afghanistan and Pakistan.

To be sure, it would be premature to suggest that today's improved US-India relationship portends anything like a more formal security partnership between the two countries anytime soon. Short of that, however, continued bilateral ties between USAF and the IAF make ample sense on multiple grounds and are well worth pursuing in any case, since the IAF has finally emerged as a world-class air force in the service of a vibrant democracy that has every likelihood of being a constructive participant in today's and tomorrow's global security environment. ✪

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When US aircraft struck the Xom Bang ammunition depot, 35 miles inside North Vietnam, on March 2, 1965, the White House denied there had been any change in policy on the war.

In truth, it was a major policy change—and one the Administration sought to conceal from the public. It was also the beginning of Operation Rolling Thunder, the sustained US air campaign against North Vietnam.

The operation would last for another three years and eight months. During that time, the Air Force and the Navy would fly more than 350,000 combat sorties over North Vietnam, losing hundreds of airmen and aircraft. It finally ended in 1968 when President Lyndon B. Johnson stopped the bombing of North Vietnam in hopes of reaching a negotiated settlement.

Rolling Thunder went down in history as a failure, regarded by some as an instance of airpower promising more than it could deliver. Closer examination shows the performance of Air Force and Navy airmen in Rolling Thunder was consistently strong and often outstanding.

The problem was the strategy, objectives, and rules of execution, which were established by political leaders in Washington. The main flaws were apparent from the start, but professional military advice was discounted by the White House and Secretary of Defense Robert S. McNamara.

It is accurate to conclude that Rolling Thunder did not achieve its objectives—but essential to remember what the objectives were. North Vietnam was fighting a war. The United States was sending signals. Top US decision-makers did not intend for the air campaign to achieve a military victory. Their plan was to convince North Vietnam to stop its aggression and bargain for terms. Within the first six months of Rolling Thunder, the key decisions affecting the outcome of the war were already in place.

LBJ IN A BIND

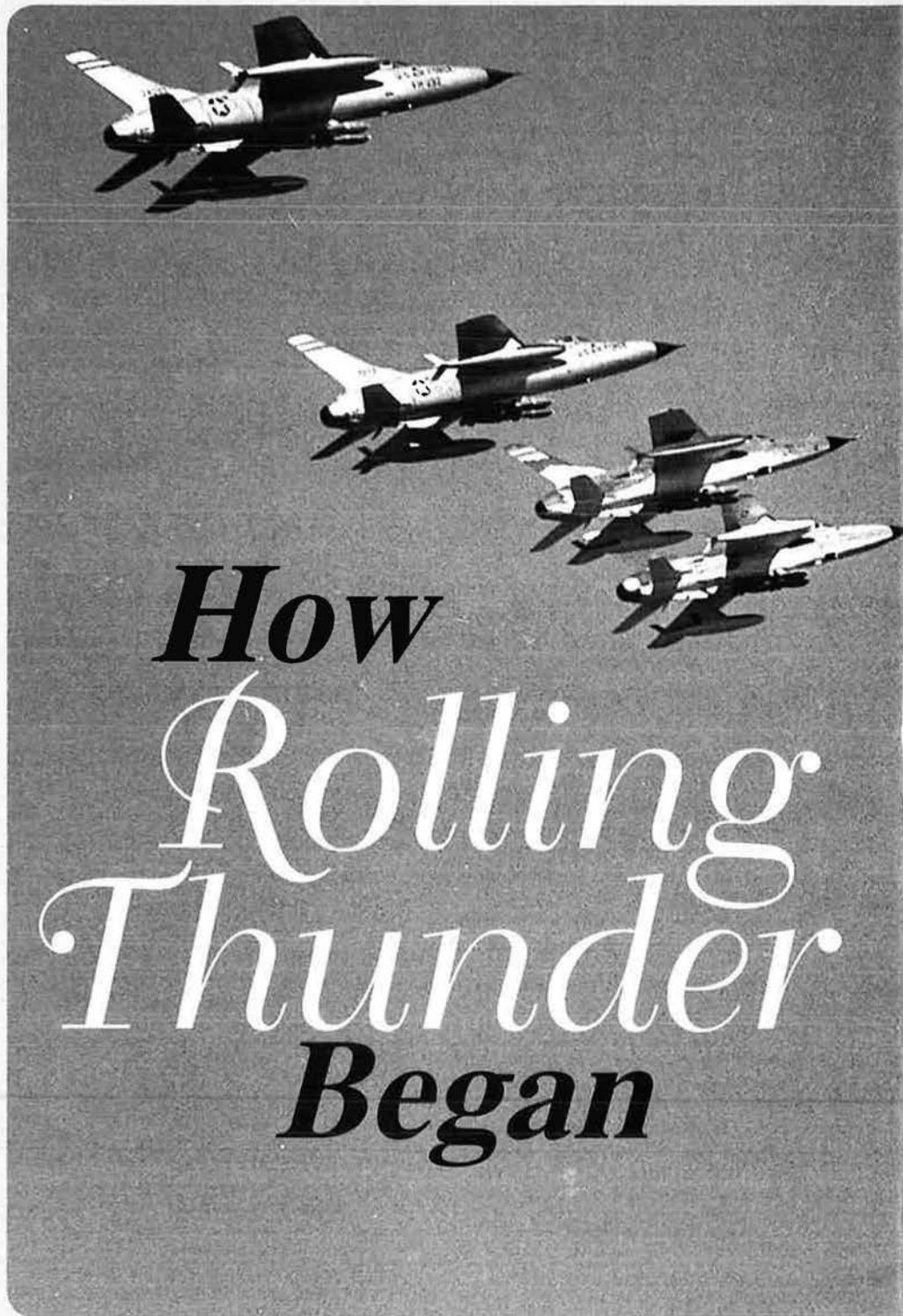
As 1965 began, the situation in Vietnam was deteriorating. The South Vietnamese government was losing the war and was on the verge of collapse, with rival factions in Saigon battling each other for control.

On Jan. 27, Johnson was told by McNamara and McGeorge Bundy, the

presidential assistant for national security, that the United States had reached “a fork in the road.” They said he could either use US military power to force a change or “deploy all our resources along a track of negotiation, aimed at salvaging what little can be preserved.”

or ten thousand miles away from home to do what Asian boys ought to be doing for themselves,” Johnson said.

At the same time, he desperately did not want to be known as the President who “lost” Vietnam in the way the Truman Administration was accused of



How Rolling Thunder Began

LBJ was in a bind. In the 1964 Presidential campaign, he had depicted the Republican challenger, Barry M. Goldwater, as a dangerous warmonger. “We are not about to send American boys nine

“losing” China. He sought to balance his commitments so that foreign affairs did not upset support and funding for his “Great Society” social programs at home.

“Johnson assumed that in war, as in the Senate, everyone knew the rules of the game, what kind of agreement would be reasonable, and that eventually an agreement would be reached,” said historian Doris Kearns Goodwin, who was on LBJ’s staff at the White

win said. “So, faced with a situation he could not control and an adversary who was unwilling to bargain, Johnson would force him to bargain.”

A Viet Cong attack on Pleiku Feb. 7, killing nine Americans and destroying several US aircraft, provided the trig-

“As an example of what was to become an unfortunate pattern throughout the war, the civilian decision-makers selected the weakest attack options available; that is, the combination of targets selected and amount of force employed that would have the least impact on the enemy,” said Adm. U. S. Grant Sharp, commander of US Pacific Command.

Fifty years ago this month, the US air campaign against North Vietnam got off to a “measured and limited” start.

By John T. Correll



A KC-135 refuels an F-105 on the way to targets in North Vietnam. The F-105 was the Air Force's main strike aircraft in Rolling Thunder, deployed first in temporary rotational squadrons and then in permanent wings at Korat and Takhli air bases in Thailand.

USAF Photo

House and who later helped him write his memoirs.

“Johnson’s adversary in Vietnam—unlike nearly all of his opponents at home—was unwilling to bargain,” Good-

ger. Air Force and Navy fighters, along with the South Vietnamese air force, conducted reprisal attacks, code-named Flaming Dart, against installations in North Vietnam from Feb. 7 to 11.

GRADUAL ESCALATION

More air strikes in North Vietnam were a foregone conclusion. The only question was what form the operations would take.

The Joint Chiefs of Staff argued for a dramatic and forceful application of military power. They drew up a list of 94 key targets in North Vietnam and proposed bombing all of them within 20 days. However, the JCS were not part of LBJ’s inner circle, where policy was formulated.

The President wanted the support of the military leaders but he was not interested in their advice except on technical matters. Open dissent from the Joint Chiefs would have been a problem. Realizing that, LBJ kept them in line with appeals to their loyalty and program concessions important to their services.

Gen. Curtis E. LeMay, the Air Force Chief, had been the strongest voice for a serious air operation, but LeMay was gone. Gen. J. P. McConnell succeeded him Feb. 1, 1965. “With LeMay’s replacement by McConnell, a Secretary McNamara selection, the transition of the Joint Chiefs of Staff from a body of warriors to one of officers attuned to the complexities of the nuclear age and willing to defer to civilian authority was complete,” said an official JCS history of the Vietnam War published in 2012.

The first team on war policy consisted of civilian officials at the Pentagon, the State Department, and in the White House. They urged a step-by-step program, limited in scope and intensity, that could be cranked up or down, depending on how North Vietnam responded.

Gradual escalation meshed with what LBJ himself wanted to do. According to Goodwin, Johnson held a “fundamental premise” that the Soviet Union and China had entered into secret treaties with North Vietnam. He never knew which targets, if bombed, might “set off the provisions of those secret treaties,” he said. Thus, Goodwin said, “Johnson lived in constant fear of

triggering some imaginary provision of some imaginary treaty.”

The formal decision to launch Rolling Thunder was handed down in a presidential directive Feb. 13, which said, “We will execute a program of measured and limited air action” against selected military targets in North Vietnam.

The beginning of Rolling Thunder was postponed several times for various reasons. In the meantime, the State Department published a white paper Feb. 27 stating that the war in Vietnam was “not a spontaneous and local rebellion.” It was an armed attack on a neighboring state “inspired, directed, supplied, and controlled by the Communist regime in Hanoi.”

The first Rolling Thunder target to be struck, Xom Bang, was carefully chosen. It was important enough but not

the first Air Force POW of the Vietnam War and would spend just shy of eight years in North Vietnamese captivity.

The last wave of the attack consisted of B-57 light bombers, which arrived as the F-105s were finishing up.

The strike destroyed or damaged almost 80 percent of the target area, but six US aircraft were lost to the guns. Five of the pilots were recovered. It was a hard price for meager results, and there would be no more strikes for more than a week.

Sharp said that this level of operation was “completely insignificant” and that “the North Vietnamese probably didn’t even know the planes were there.” US Ambassador to South Vietnam Maxwell D. Taylor said that leaders in Hanoi were unlikely to be impressed and guessed that “Rolling Thunder in their eyes has been a few isolated thunderclaps.”

frame,” Sharp said. Eventually, target approval would be given in two-week packages.

The principal advocates of a vigorous Rolling Thunder effort were Sharp and Air Force Chief McConnell. Army leaders did not agree. Gen. Harold K. Johnson, the Army Chief of Staff, held that the war would be won or lost on the ground in South Vietnam and urged the deployment of a large ground force. He declared as “fictional” the notion that the United States must avoid a land war in Asia.

Gen. William C. Westmoreland, head of Military Assistance Command Vietnam (MACV) described Rolling Thunder as “pie in the sky.” MACV was supposedly a joint service command, but under Westmoreland it was basically operated by and for the Army.



too important. It could deliver a message without being overly provocative.

THUNDER FAINTLY HEARD

More than 100 US aircraft took part in the attack on Xom Bang March 2. The base was well-defended by anti-aircraft guns, so first in were flak suppression F-100s. Next came the main strike force of F-105s, led by the noted fighter ace Lt. Col. Robinson Risner, who saw one of the F-100s go down in flames. The pilot, Lt. Hayden J. Lockhart, became

Lt. Gen. Joseph H. Moore, commander of the 2nd Air Division in Saigon, said, “I was never allowed in the early days to send a single airplane North [without being] told how many bombs I would have on it, how many airplanes were in the flight, and what time it would be over the target.”

Later in March, Washington “eliminated the requirement that we strike only on a specifically designated day and left the precise timing to field commanders within a one-week time

The 2nd Air Division commander was MACV deputy for air operations but the air deputy was not part of the MACV staff structure.

MACV was a subunified command reporting to Pacific Command, where Sharp restricted Westmoreland’s authority over airpower. Westmoreland ran the war in the south but Sharp exercised direct control of Rolling Thunder through his component commanders in Pacific Air Forces and the Pacific Fleet.

On March 8, US Marines deployed to Da Nang, ostensibly to protect the Air Force installation there, but it began the introduction of ground combat forces into Vietnam.

A CHANGE IN STRATEGY

It did not take the Administration long to give up on Rolling Thunder. "After a month of bombing with no response from the North Vietnamese, optimism began to wane," said the Pentagon Papers, a classified reappraisal by the Department of Defense that was leaked to the *New York Times* in 1971.

In National Security Action Memorandum 328, LBJ approved a "change of mission for all Marine battalions deployed to Vietnam to permit their more active use" but ordered that the decision be kept secret to avoid "pre-

Lest he be misunderstood, McNamara said that "I do not want one plane dropping bombs on North Vietnam if it can be used advantageously for combat in South Vietnam." In Sharp's estimation, "this fateful decision contributed to our ultimate loss of South Vietnam as much as any other single action we took during our involvement."

The main mission of airpower against North Vietnam had been switched to interdiction. "I had made the point many times that air attacks on lines of communication have never been able to stop infiltration, only hinder it," Sharp said. "The primary objective of using airpower should not be to try to stop infiltration but rather to destroy the sources of the materials being infiltrated."

Assistant Secretary of Defense John T. McNaughton, the principal civilian war planner in the Department of Defense, explained US purposes in South Vietnam in a remarkable memo. Seventy percent of the objective, he said, was

Tennessee Valley Authority project that had provided navigation, flood control, and electricity to the rural United States in the 1930s. He invited Hanoi to join the effort in "peaceful cooperation." Hanoi ignored him.

In May, pressed by student protests and liberal Democrats, LBJ ordered a week-long bombing halt in hopes, he said, that "it might trigger a sequence of events leading Hanoi either to negotiate or to reduce its support of the insurgency." Hanoi ignored that, too, as well as the six subsequent LBJ bombing halts.

During the spring of 1965, Rolling Thunder gradually expanded to 10 or 12 missions per week. However, by June, only 24 of the 94 targets on the JCS list had been struck. The accusation persists that the air campaign was against a North Vietnamese industrial base that did not exist. In fact, only eight of the targets on the list were industrial. Twelve targets were lines of communication nodes; nine were airfields; 53 were military installations and ports; and 12 were road and rail routes.



L-r: Fighter ace Lt. Col. Robinson Risner led the first Rolling Thunder mission against the ammunition depot at Xom Bang; President Johnson did not want to be known for having "lost" Vietnam; Secretary of Defense Robert McNamara—wearing a set of aircraft carrier launch crewman's "Mickey Mouse" headgear—on the USS Independence. Flaws with the Rolling Thunder strategy were apparent from the start, but McNamara and the White House ignored advice from military professionals.

"to avoid a humiliating US defeat (to our reputation as a guarantor)." Another 20 percent was "to keep SVN (and then adjacent) territory from Chinese hands." Only 10 percent was "to permit the people of SVN to enjoy a better, freer way of life."

The Army presence in Vietnam rose steadily. The White House press office said, "There has been no

change in the mission of United States ground combat units in Vietnam." The Pentagon Papers, on the other hand, noted that, "by the summer of 1965, bombing NVN had been relegated to a secondary role in US military strategy for dealing with the war."

THE RITES OF SPRING

In April, still seeing the war as a variation on Texas politics, LBJ proposed a "billion dollar American development" in the Mekong River basin, akin to the

"The final decision on what targets were to be authorized, the number of sorties allowed, and in many instances even the tactics to be used by our pilots was made at a Tuesday luncheon in the White House attended by the President, the Secretary of State, the Secretary of Defense, Presidential Assistant Walt Rostow, and the Presidential Press Secretary—first Bill Moyers, later George Christian," Sharp said. "The significant point is that no professional military man, not even the Chairman of the JCS, was present at these luncheons until late in 1967."

Air Force fighters from bases in Thailand and South Vietnam flew about the same number of early Rolling Thunder missions as Navy aircraft from carriers offshore did. The Air Force, whose F-105s carried more ordnance than the Navy A-4s, delivered more of the bombs. The South Vietnamese air force flew 13 percent of the missions over the north in the spring of 1965.

Through late June, the Air Force had lost 24 aircraft over North Vietnam, the

mature publicity." Even internally, the Administration insisted that "these movements and changes should be understood as being gradual and wholly consistent with existing policy."

At a conference in Honolulu April 20, McNamara announced a fundamental change of strategy. "Emphasis from then on would be on the ground war in the south," Sharp said. "Targets in the south took precedence over those in the north, and sorties would be diverted to fill the requirement."



Gen. John McConnell (l), USAF Chief of Staff, is greeted by Gen. William Westmoreland, commander of MACV, at Tan Son Nhut Air Base in South Vietnam. McConnell argued the case for airpower, but did not have the same influence as his famous predecessor, Gen. Curtis LeMay.

Navy 26. All but three of them were shot down by anti-aircraft guns. MiG interceptors and surface-to-air missiles were not yet the big problems they would become.

SPINNING THE STORY

The Johnson Administration, fearful of political repercussions, repeatedly misled the public about the deepening US involvement in Vietnam. In his memoirs, McNamara elaborated on what motivated LBJ to “refuse to take the American people into his confidence.”

“Some point to his innate secretiveness, but the answer is far more complex,” McNamara said. “Two factors in particular influenced him. One was his obsession with securing Congress’s approval and financing of his Great Society agenda; he wanted nothing to divert attention and resources from his cherished domestic reforms. The other was his strong fear of hard-line pressure (from conservatives in both parties) for greater—and far riskier—military action that might trigger responses, especially nuclear, by China and/or the Soviet Union. The President coped with his dilemma by obscuring it—an unwise and ultimately self-defeating course.”

Once the infusion of US ground forces into Vietnam began, it was hard to stop. Westmoreland kept raising the requirement. In July 1965, he said he would need 175,000 troops by the end of the year—up from 82,000 in June—and another 100,000 in 1966. McNamara supported Westmoreland’s request and proposed mobilization of reservists and the National Guard.

At a press conference two weeks later, the President said he had agreed to sending more troops, but he depicted the buildup and the role as different than it actually was. The increase, he said, was from 75,000 to 125,000 and that “it is not essential to order reserve units into service.”

In response to a question about American forces carrying out offensive operations, he said the new deployment decision “does not imply any change in policy whatever. It does not imply any change of objective.” The *New York Times* took comfort the next day in an editorial that praised LBJ’s decision to maintain a “severely limited operation on the part of the United States.”

In *Dereliction of Duty*, published to wide acclaim in 1997, Army Maj. H. R. McMaster excoriated the Joint Chiefs of Staff as “five silent men” who did not dispute Johnson’s misrepresentations about force levels, cost, purpose, and conduct of the war. In response to questions from Congress, they did not disclose their reservations or actual estimates of requirements. (McMaster is still in the Army and is currently a three-star general.)

THREE MORE YEARS

LBJ finally called an end to Rolling Thunder in 1968 after the newspapers discovered that Westmoreland had asked for 207,000 more troops in addition to the 500,000 he already had, plus another 17

fighter squadrons. The President ordered a partial halt to the bombing of North Vietnam in March 1968 and a complete stop on Nov. 1.

In the three intervening years, more targets had been approved and the strikes went farther north, but always with restrictions and limitations. In 1966, McNamara said that US “objectives are not to overthrow the Communist government of China or the Communist government of North Vietnam. They are limited to the destruction of the insurrection and aggression directed by North Vietnam against the political institutions of South Vietnam. This is a very, very limited political objective.”

Nevertheless, the Pentagon Papers, written between 1967 and 1968 at the behest of McNamara by political functionaries on his staff, said that “the vaunted boosters of airpower would once again be proven wrong” in Rolling Thunder, “in which we relearned the negative lessons of previous wars on the ineffectiveness of strategic bombing.”

No doubt some of the expectations for airpower were excessive, but that was not the reason why Rolling Thunder failed. Gradual escalation allowed the North Vietnamese to adjust to the attacks, improve their defenses, and find countermeasures. The air strikes were micromanaged from Washington.

“I spent 10 hours a day worrying about all this, picking the targets one by one, making sure we didn’t go over the limits,” Johnson said. He would not allow bombing of the most critical targets. The rules of engagement for US aircraft were elaborate and restrictive. The objectives were an illusion.

“In Rolling Thunder, the Johnson Administration devised an air campaign that did a lot of bombing in a way calculated not to threaten the enemy regime’s survival,” Air Force historian Wayne Thompson said in *To Hanoi and Back*. “President Johnson repeatedly assured the Communist rulers of North Vietnam that his forces would not hurt them, and he clearly meant it. Government buildings in downtown Hanoi were never targeted.”

It was LBJ’s intention that Rolling Thunder send signals to North Vietnam and it certainly did that. Unfortunately, the message that got through was that the United States was not serious in its commitment and that all Hanoi had to do was wait out the operation. ❁

John T. Correll was editor in chief of Air Force Magazine for 18 years and is now a contributor. His most recent article, “Twenty-seven Minutes Over Ploesti” appeared in the February issue.

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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 fifth profile in AFA's second group of Emerging Leaders.

Emily C. Shay

Home State: Massachusetts.

Chapter: Paul Revere.

AFA Offices: Chapter secretary; formerly VP, Race Programs.

Occupation: Air Force civilian program manager.

Education: B.S., Northeastern University; M.S., Tufts University.



Q&A

What have you learned on AFA's Membership Committee? My goal on that committee is to be able to provide insight on the wants and needs of [the younger] demographic. ... I think the e-membership is great. It speaks to a lot of different needs that people have. I think that people are concerned about the environment, so with e-membership there's less paper [without a printed] magazine. Also you have your iPad with you all the time, so it makes AFA more accessible to people.

What new ideas do you have for AFA? Adding more networking events at the chapter level. ... A way to bring value to AFA members would be through things like educational opportunities and networking events and leadership opportunities.

How did you first learn about AFA? From my supervisor at the time. His name is Paul Zauner. He asked me to come on board and direct a race that we do. It's a big fund-raiser for our chapter. I've been directing that race for three years now.



At the 2014 Veterans Day 10K and 5K run, race organizer Emily Shay clutches her cellphone and a shotgun envelope full of awards. The Paul Revere Chapter sponsors the race, held at the Bedford, Mass., Veterans Affairs facility. Shay reports the event has raised \$30,000 in the last three years.

Try, Try Again: A Science Project Launches into Space

When the SpaceX company's rocket launched on Jan. 10, the **Northeast Texas Chapter** was as pleased—and relieved—as the International Space Station astronauts and the rocket company's founder, Elon Musk.

Along with supplies for the astronauts, the capsule contained a science experiment created by students from Rockwall, Texas. The Northeast Texas Chapter had arranged for a \$5,000 donation toward the goal of more than \$20,000 needed to send the project into space.

The successful launch came a little over two months after the first one ended with the rocket exploding just after liftoff from NASA's Wallops Island facility in Virginia.

That Oct. 28 mishap destroyed not only the Orbital Sciences Corp. launcher and its cargo of supplies for the ISS but also 18 science projects by student groups, including one from Rockwall.

Three days afterward, however, the Rockwall team members learned that they could reassemble their experiment and get onto Musk's SpaceX-5, scheduled for a mid-December launch from Cape Canaveral AFS, Fla. The students met the new deadline and, as they had for the first launch attempt, faced round after round of rescheduled dates that pushed the liftoff into mid-January.

Several Rockwall schools actually started a year ago to send a science project into space through the Student Spaceflight Experiments Program. Now freshmen at Rockwall High School, Will Brown, Ryan Figert, Brooks Helmer, Chase Howerton, James Matthews, and Harrison Smith were eighth-graders when they earned a spot for their experiment. It is called "How Microgravity Affects Yeast Cell Division and How it Relates to Human Cancer Cells." The team then had to raise the funds to secure their space launch.

The AFA chapter donation honored Chapter Community Partner Nancy Murray's father, retired Lt. Col. John J. Murray, a strong supporter of the chapter before his passing in 2012. According to Chapter Communications VP Vance M. Clarke, the donation had put the student's fund-raising effort "over the top."



Rockwall, Texas, students Brooks Helmer, Luke Cox, Ryan Figert, James Matthews, and Will Brown (l-r) discuss their science experiment that launched into space—after numerous delays and even a headline-making rocket explosion. The Northeast Texas Chapter contributed funds to their project.

Photo by Ron Baselt, Dallas Morning News

LA Ball

Gen. John Hyten, head of Air Force Space Command, speaks to the audience after receiving the Thomas D. White Space Award at the Los Angeles Air Force Ball, sponsored by the Gen. B. A. Schriever Los Angeles Chapter in November. On stage (l-r): AFA Board Chairman Scott Van Cleef, Schriever Chapter Board Chairman Tav Taverney, and Chapter President Ed Peura. Below: Space and Missile Systems Center's command chief CMSgt. Craig Hall elicits smiles from the Los Angeles AFB Honor Guard, l-r: 2nd Lt. Nathan Olivarez, SrA. Corey Franzke, 2nd Lt. Arun Das, and 1st Lt. Justin Shimasaki. The airmen presented the colors at the ball. Below right: Dave Deptula, dean of the Mitchell Institute, Hyten, his wife, Laura, Pat Greaves, and SMC Commander Lt. Gen. Sam Greaves.



USAF photos by Sarah Corrice



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Photo by Vic Johnson



In Wisconsin, CAP members honored local Congressional Gold Medal recipients. Billy Mitchell Chapter president Vic Johnson attended the ceremony. World War II CAP veteran Winifred Alexy stands fifth from the left (in maroon jacket), with another medal recipient, Bill Bruring, in CAP uniform, to her left.

CAP Gold in Wisconsin

In a Capitol Hill ceremony on Dec. 10, World War II-era Civil Air Patrol representatives accepted a Congressional Gold Medal—recognition for CAP’s wartime role in protecting the US against German U-boat attacks.

In the outskirts of Milwaukee two days later, **Billy Mitchell Chapter** President Victor L. Johnson Jr. attended a presentation ceremony for local CAP recipients.

Winifred Alexy and Bill Bruring were the two World War II CAP veterans able to accept their awards in person at the evening reception. Several relatives of other eligible CAP volunteers

received the medal on behalf of a family member.

The *Milwaukee Journal Sentinel* reported that Alexy became a CAP cadet at age 18 and served in her hometown of Duluth, Minn. Bruring, also 18 at the start of the war, joined CAP but soon left for Army service and later for Navy service in Korea. He is still in CAP and as part of this medal ceremony was promoted to lieutenant colonel.

The ceremony took place at a senior living center where Alexy lives. “Winnie must be a private person,” commented Johnson, “as a couple [of residents] did not know she was in World War II and a CAP member.”



Ned Hance pins an AFA CAP Outstanding Squadron Cadet of the Year medal onto Jerry Jaipersad’s uniform. Hance is from Florida’s Waterman-Twining Chapter.

Congress approved a Congressional Gold Medal for CAP last May. Living CAP World War II veterans and family representatives of those who have died receive replicas of it. AFA honored CAP with a Lifetime Achievement Award at its convention last fall.

Stepping Up to the Task

Waterman-Twining Chapter President Edward H. Hance presented an AFA Civil Air Patrol Outstanding Squadron Cadet of the Year Award at a banquet in Florida.

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Tuskegee Airman Leo Gray addresses the Miami-Homestead Chapter.

Cadet Jerry Jaipersad received the medal and AFA Citation at a mid-December annual awards event in Brandon.

Keith Barry, commander of the General Chuck Yeager Cadet Squadron in Brandon, explains why in an email:

"With nearly all of the squadron's cadet officers graduating from high school ... and moving on to either military service or attending college out of the local area, Cadet Senior Master Sergeant Jaipersad stepped into the leadership role of both first sergeant and the ranking cadet in the squadron.

"He has displayed excellence, performing tasks normally reserved for the cadet commander, in addition to his own responsibilities as first sergeant."

During this event, Hance, too, received recognition: a CAP Certificate of Appreciation from Barry.

A Tuskegee Airman's Tales

Tuskegee Airman Leo R. Gray spoke to the **Miami-Homestead Chapter's** luncheon meeting in October, recounting anecdotes from World War II, when he was among America's first black military airmen.

Gray, an AFA Life Member of Florida's **Gold Coast Chapter**, entitled his presentation to the Miami AFA audience "Home Free." Chapter President Rodrigo Huete said that Gray spoke about difficulties he encountered as an African-American in the military.

At age 18, Gray went to single-engine training at Tuskegee AAF, Ala., in 1943. He flew 15 combat missions as a P-51 Mustang pilot over Europe, serving with the 100th Fighter Squadron, 332nd Fighter Group.

After leaving Active Duty in 1946, he earned two college degrees and began a 30-year career with the US Department

of Agriculture. He retired as a Reserve lieutenant colonel in 1984.

The Total Force

The **Gen. Charles A. Horner Chapter** convened its "first-ever expert panel" for its November meeting in Iowa—and that was only Part One.

Chapter President Harley Thornton said chapter members representing the Total Force made up the gathering's roster of speakers: Lt. Col. Ryan D. Hollman, commander of AFROTC Det. 250 at Iowa State University; retired Maj. Gen. Gregory J. Schwab, who had been ANG assistant to the commander of Air Combat Command; and retired Maj. Gen. Linda S. Hemminger, a Reservist, who was mobilization assistant to the Air Force deputy surgeon general.

Thornton said the panel focused on "people topics": organization of forces, command structure, duty status, and promotion processes.

Hollman, who brought three cadets with him to the meeting, said the speakers covered similarities and differences in the three components—an area his students often overlook because they focus on their immediate goal of Active Duty service.

On the green with 1976 US Open champion Jerry Pate (center), at the Eglin Chapter's golf tournament in Florida, are (l-r): Mike Kostelnik, chapter Aerospace Education Foundation chairman; Curt Long, Emerald Coast Military Affairs Council chairman; Paul Hsu, a scholarship sponsor; and Bob Patterson, Florida Region past president. This 42nd annual Doolittle Scholarship Open, in November, netted some \$18,000 for the chapter foundation.



Photo by Eddie McAllister

In fact, the discussions prompted the cadets to ask about retirement from Active Duty versus from the reserves, Hollman said.

Thornton explained that the meeting concentrated on personnel topics because a follow-on appearance by this expert panel is scheduled for this month. They'll discuss the missions carried out by the three sectors of USAF's Total Force.

James E. Smith, 1923-2015

Retired Col. James E. Smith, an AFA national director emeritus, died Jan. 25. He was 91 and a resident of Princeton, N.C.

Better known as "Red," he once told AFA's membership department that if they addressed his mail to James E. Smith, the post office at Princeton wouldn't know who it was for.

Colonel Smith was born in Boaz, Ala., and had served as a pilot from World War II through the Vietnam War years. His assignments included five years on the Joint Staff and participation in the Berlin Airlift.

In his civilian career, Colonel Smith taught business management at community colleges and served as Princeton town manager.

Reunions reunions@afa.org

C-141A/B crew members and squadron, Travis AFB. June 20 at Pippo Ranch, Vacaville, CA. **Contact:** Jack Pledger (520-705-0658).

F-86 Sabre Pilots Assn. April 26-28 at the Gold Coast Hotel/Casino in Las Vegas. **Contact:** J. R. Alley, PO Box 34423, Las Vegas, NV 89133 (702-363-9880) (alleyoop3@cox.net).

Bien Hoa AB, Vietnam, all units. June 11-13 at the Clarion Hotel in Branson, MO. **Contact:** Tim Pierce (864-654-7510) (tap6869nam@gmail.com).

Saigon Mission Assn., including all who served in or supported the Vietnam War.

May 1-2 in Dayton, OH. **Contact:** Hal Segerson (731-614-2134) (hsege1@charter.net).

Udorn RTAB, Thailand, veterans. July 9-13 at the Best Western Plus Cutting Horse Inn and Suites, in Weatherford, TX. **Contact:** Jerry and Thim Long, 118 Mariah Dr., Weatherford, TX 76087 (817-594-4623) (jclhydsr71bafb@gmail.com).

Having a Reunion?

Email reunion notices four months ahead of time to reunions@afa.org, or mail notices to "Reunions," *Air Force Magazine*, 1501 Lee Highway, Arlington, VA 22209-1198. We reserve the right to condense notices.

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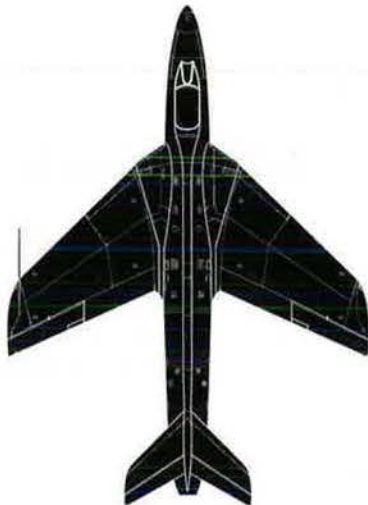
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Hunter



The sleek transonic Hunter was a mainstay of frontline RAF operations in the 1950s and 1960s. The Hawker Siddeley fighter-and-attack aircraft was highly popular abroad, too, serving in 21 non-British air arms. It began life as the RAF's premier fighter. Then, as it was phased out of that role in the 1960s, it began a second career as the RAF's main ground-attack aircraft.

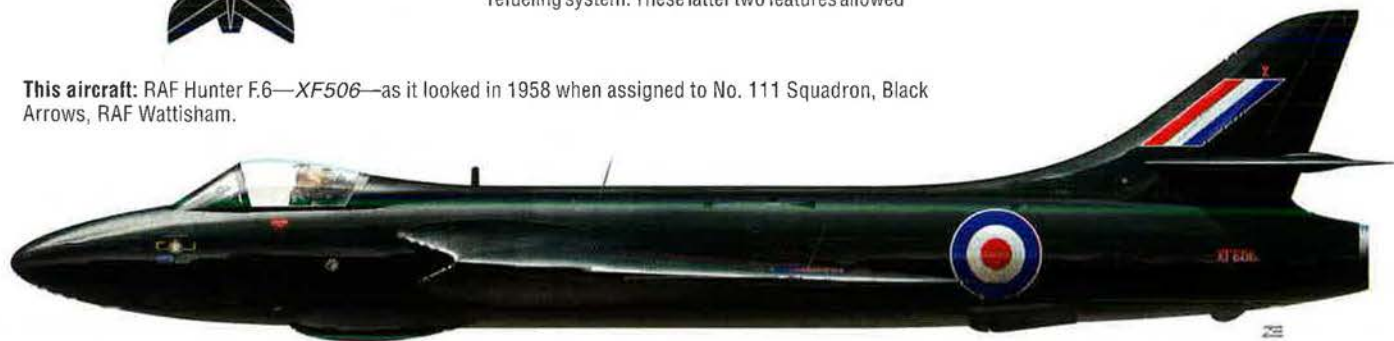
The Hunter was a conventional all-metal type, with a leading edge wing sweep of 35 degrees. Though the aircraft had a long teething period—many problems had to be fixed—the eventual fighter proved easy to fly. It was RAF's first high-speed jet aircraft equipped with radar and fully powered flight controls. All of its 30 mm guns were carried in one detachable gun pack. It had a pressurized refueling system. These latter two features allowed

ground crews to turn the aircraft in seven minutes. Hunter began its second act as the FGA.9 attack aircraft in 1960, a move whose physical changes, however, compromised its speed.

The Hunter gained perhaps its greatest fame as the demonstration aircraft of the Black Arrows, the RAF's first aerobatic team, and the Blue Diamonds, its successor. More importantly, however, the Hunter proved able in combat, first in Britain's 1956 Suez invasion and later in RAF operations in Indonesia. Iraqi Hunters fought in both the 1967 and 1973 Mideast wars. Kenya, Rhodesia, and Somalia all used Hunters in local wars. And India's Hunters flew against China in 1962 and Pakistan twice (in 1965 and 1971).

—Robert S. Dudley with Walter J. Boyne

This aircraft: RAF Hunter F.6—XF506—as it looked in 1958 when assigned to No. 111 Squadron, Black Arrows, RAF Wattisham.



In Brief

Designed, built by Hawker Siddeley ★ first flight July 20, 1951 ★ number built 1,972 ★ crew of one to two ★ **Specific to Hunter F.6:** one Rolls Royce Avon 207 turbojet engine ★ armament four AIM-9 Sidewinders, four 30 mm cannons ★ munitions load up to 7,400 lb of bombs, rockets, missiles, including AGM-65 Maverick ★ max speed 715 mph ★ cruise speed 500 mph ★ max range 445 mi ★ weight (loaded) 24,600 lb ★ span 33 ft 8 in ★ length 45 ft 11 in ★ height 13 ft 2 in ★ service ceiling 50,000 ft.

Famous Fliers

Record setter: Neville Duke (world speed record, 1953). **RAF notables:** John Tumilty (killed in 1956 six-jet accident), Roger Topp (leader, Black Arrows), Brian Mercer (leader, Blue Diamonds), Alan Pollock (flew Hunter under top span of Tower Bridge, April 5, 1969). **Other notables:** King Hussein bin Talal of Jordan; Saiful Azam (Pakistani pilot, flying Jordanian and Iraqi Hunters, downed two Israeli fighters in 1967 War). **Test pilots:** Duncan Simpson, John Sowrey.

Interesting Facts

Set world speed record (1953) of 727.63 mph ★ flown by two RAF demonstration teams—Black Arrows and Blue Diamonds ★ served in RAF and Royal Navy ★ suffered major mishap (1956) when six Hunters ran out of fuel and crashed ★ sported under-cockpit blisters nicknamed "Sabrinas," after voluptuous starlet ★ ordered by, but withheld from, Castro's Cuba ★ used by aero teams of Belgium, India, Jordan, Singapore, Sweden, Switzerland ★ flown by Jordan against Syrian tanks in 1970 Black September war ★ bombed palace of Chile's president Salvador Allende in 1973 coup ★ exported to 21 nations, including nine Arab states ★ featured in films "The Sound Barrier" (1952), "High Flight" (1957), and "Machuca" (2004) ★ flown in more than 25 major variants.



The Hawker prototype aircraft.



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