

*Air Force Association's Air, Space & Cyber Conference*

# AIR FORCE

MAGAZINE





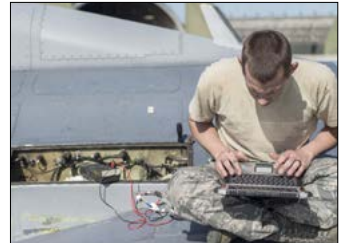
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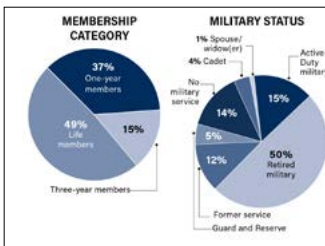
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SrA. Leeann LeClair works on an F-16 for Operation Inherent Resolve. See "Heat From the Desert." Photo: MSgt. Benjamin Wilson.

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# Air Force Association's Top Issues—2018

"Provide for the common defense"—these five words from the Preamble to the Constitution highlight the priority our nation places on defending its security and citizens. In today's global environment of armed conflict, terror, intimidation and instability, aerospace power has emerged as the most frequently used military capability to meet the dynamic and deadly threats arrayed against the United States. The Air Force possesses the unique capability to bring all aspects of aerospace power to bear by deterring and, if necessary, defeating potential adversaries.

Since its founding, our Air Force has been called to action for the Berlin Airlift and the Korean and Vietnam Wars. It stood its ground in the Cold War against the massive forces of the Soviet Union. It responded to the brutality of Saddam Hussein in dramatic fashion during Desert Storm, the world's most successful air campaign. It responded again in Bosnia and Kosovo to end genocide and war crimes. All this time, the Air Force performed missions around the globe but at the same time remained deployed in the Middle East. After the devastating attacks of September 11, 2001, our Air Force not only patrolled the skies of the United States, but increased its presence in the Middle East. Meanwhile, it led the charge around the globe in combating terror, including the defeat of Saddam Hussein and the world's fourth largest army in 2003. However, as worldwide missions increased, the size of the Air Force declined by 30 percent in personnel and 37 percent in aircraft.

Forged against this backdrop of deterrence, readiness, and engagement, the Air Force has been in continuous combat operations for 27 years with a steadily smaller force, which has taken a severe toll on both weapon systems and, most importantly, Airmen and their families. Despite being a much-needed first-responder around the globe, it now operates the smallest, oldest and least ready force in its history. The Air Force is dangerously short of pilots, maintainers, space operators, cyber specialists and personnel in other critical specialties. Only 50 percent of its units are deemed "ready" for assigned missions. Some aircraft in its vital tanker, bomber, and ISR (Intelligence, Surveillance, and Reconnaissance) fleets are over 50 years old and will continue in service for decades more. It operates fighter aircraft over 30 years old. While technological advances and modernization have helped these aging weapon systems to keep pace, our adversaries are rapidly closing the gap, risking our current air and space superiority.

The reality is that our Air Force is too small for the missions that our nation requires. It is forced to operate with budgets that are too constrained for its force structure and too uncertain to allow modernization at the pace required. The Budget Control Act of 2011 and sequestration have placed our Air Force in a perilous position. These budget caps have forced the Air Force to make trade-offs between readiness and

modernization when both are critically required. Our national security strategy depends on our Air Force to respond globally, rapidly and, when necessary, with dominant lethal force. The resources provided by Congress to enable this required capability are not sufficient. As a result, American security is at risk while global instability dangerously increases.

The Air Force Association's mission is to promote a dominant United States Air Force and a strong national defense, and to honor Airmen and our Air Force Heritage.

Therefore, the Air Force Association supports the following actions:

## 1. REBUILD COMBAT READINESS IN AIR, SPACE AND CYBERSPACE

a. Complete budgets by the beginning of the Fiscal Year (FY). The Air Force needs stable and predictable funding—at adequate funding levels. Continuing Resolutions (CRs) degrade readiness. A consistent yearly budget allows the Air Force to make long-term plans and effectively manage its programs.

b. End the Budget Control Act's (BCA's) debilitating restrictions which continue to erode readiness each year.

c. Grow the Total Force to 70 fighter squadrons—Tomorrow's threats require that the Air Force grow in order to carry out all of its assigned missions.

d. Divest aging air and space platforms and excess infrastructure—Free up needed fiscal resources.

e. Consolidate Space Operations Command and Control into a single, joint command-and-control center. Space is a contested environment. Operating the nation's space assets is vital to the Air Force's mission to win in Air, Space and Cyberspace. As a nation we do not go to War without Space Assets' integral role in the joint fight kill chain. The operation of our nation's Space Assets is critical to our security.

## 2. FORCE STRUCTURE

a. Size force structure to meet global requirements by increasing active duty strength to 350,000 personnel, the Air National Guard to 120,000, and the Reserve to 69,500. The Air Force is the smallest in its history and does not have the manpower to execute all of its current missions.

b. Increase pilot retention bonuses to \$60,000 to stem the loss of pilots. The AF pilot shortage has grown more acute because of the continuous operations tempo, training restrictions and squadron additional duties, coupled with enticements from airline hiring and higher airline salaries. The current shortage has grown to 1,555 pilots including a critical deficit of 1,300 fighter pilots.

c. Increase the number of maintainers; provide adequate funding for spare parts. Because of the shortage of 3,400 maintainers and an insufficient supply of parts, the Air Force has unprecedented low mission capable (MC) rates.

d. Invest in continued joint partnerships between Airmen and our nation's cyber business leaders to defend the growing cyber battlefield and defeat today's cyber terrorists.

e. Invest in continued joint partnerships between Airmen and our nation's space launch business leaders to reduce the cost of space systems and reduce the time to field those systems.

f. Increase recruitment and retention of highly skilled support personnel and implement Selective Bonuses for depleted career fields—such as cyber security, security forces, maintainers and medical personnel. It is "cheaper to retain than retrain."

### 3. RECAPITALIZATION / MODERNIZATION

a. Recapitalize the Air Force's air and space systems to ensure continued core mission capabilities.

b. Fund the Air Force's top 3 acquisition programs to allow them to stay on schedule and on budget in order to deliver aircraft to the warfighters in a timely manner, while mitigating costs to the taxpayers.

1. F-35A Joint Strike Fighter – A fifth generation fighter that is survivable against today's defenses. The Air Force needs to purchase 100 aircraft per year to keep up with future demands and decrease unit costs.

2. KC-46A Pegasus Tanker – Replace costly 50-year-old aircraft that are at the end of their service lives. The current program is only a down payment on the 500 total new tankers that are required.

3. B-21 Raider Bomber – Procure 174 B-21 bombers. The current long-range strike force averages 40 years in age and 87% of today's bomber fleet predates stealth technology.

c. Support the T-X program to replace the T-38 trainer; a new trainer is key to meeting the needed increase in pilot production the AF requires and provides a platform more aligned with fifth generation aircraft.

d. Continue sustainment and modernization of the airlift fleet that provides global reach.

e. Recapitalize the aging Joint Surveillance Target Attack Radar System (JSTARS) fleet.

f. Maintain Combat Search and Rescue (CSAR) capabilities and update the CSAR fleet to meet the increasing requirements for time-critical long-range personnel recovery.

g. Develop the Long Range Standoff Weapon (LRSO) with nuclear capability.

h. Support necessary Intelligence, Surveillance, and Reconnaissance (ISR) platforms to meet future threats.

i. Maintain Close Air Support (CAS) capabilities.

j. Support full funding for the Ground Based Strategic Deterrent (GBSD) to replace the increasingly expensive Minuteman III intercontinental ballistic missile system (ICBM), which is approaching 40 years old.

k. Continue development of robust space launch capabilities, taking advantage of cost-reducing measures in the commercial space industry.

l. Support the Air Force's OA-X Light Attack aircraft demonstration and similar programs that generate faster development and acquisition cycles.

m. Work with Congress and industry to institute defense industrial base policies that ensure a robust defense industrial base capable of meeting Air Force acquisition/procurement requirements.

n. Support replacement helicopters for the UH-1N fleet at the earliest opportunity for missile force security and VIP movements.

### 4. INVEST IN TECHNOLOGY

a. Increase the Air Force Science & Technology (S&T) account by 4%. While the Air Force increased Research, Development, Test & Evaluation (RDT&E) by 20 percent, most of that increase went toward latter stage development, mostly for emerging weapons systems testing. Early stage research and applied research remained at roughly the same levels, and basic research increasing only slightly.

b. Preserve our technological edge by investing in new technologies. Near-peer competitors are catching up to our capabilities.

c. Develop hypersonic technologies aggressively and leverage those technologies to more fully integrate operations in the air and space environments.

### 5. SUPPORT AIRMEN AND THEIR FAMILIES; CARE FOR RETIREES & VETERANS

a. Support and fund TRICARE to provide proper care for all military families. Healthcare is a readiness issue.

1. Protect TRICARE for Life (TFL): It is a national obligation to retirees, earned long ago. TFL is costing less, not more. Negative changes are perceived as a breach of faith.

2. Tie Tricare fees to the Cost of Living Allowance (COLA) vice the DOD proposed Health Index.

b. Extend the Special Survivor Indemnity Allowance (SSIA) with incremental increases to the monthly amount to assist affected survivors. Current law requires a dollar-for-dollar reduction in SBP payment for any DIC paid to surviving spouses of service members who died of service-connected causes. The SBP paid to a surviving spouse is stopped, even though SBP premiums are refunded (pro-rated) in a lump sum. Affected survivors may lose most or all their SBP, an insurance paid into by the veteran to support the surviving spouse after death.

c. Tie Military Pay raises to the Employment Cost Index (ECI). Military pay raises have fallen below private sector rates for the past four years.

d. Oppose proposed cuts that would eliminate the Individual Unemployability (IU) benefit once a veteran becomes eligible for Social Security. IU helps those veterans who have service-connected disabilities and are not able to work. Many veterans on IU have not been able to work for many years and therefore have inadequate Social Security Benefits. Because the IU program also raises the veteran's disability rating to 100%, other benefits including dental insurance for the veteran and medical insurance for their dependents would also be lost.

e. Maintain Commissary access and support for authorized Air Force members, veterans, and families.

“THE REALITY IS THAT WE ARE TOO SMALL FOR WHAT THE NATION EXPECTS OF US.”

—Dr. Heather Wilson, Secretary of the Air Force, June 6, 2017

# Security on the Brink



An F-15E Strike Eagle assigned to the 332nd Air Expeditionary Wing takes off in Southwest Asia, July 7. The 332nd AEW flies missions throughout the region for Operation Inherent Resolve, to combat the threat of ISIS and bring stability to the region. Photo: SrA. Damon Kasberg

By Brian W. Everstine, Pentagon Editor

## Top Air Force and DOD leaders warn that the nation's defense apparatus is imperiled by congressional inaction.

The US military is in a readiness crisis—one brought on by Congress. The military readiness crisis not only threatens the nation's safety and ability of the Defense Department to deter and defeat adversaries, it endangers the stability of the country itself.

That stark warning was the message of top Pentagon and USAF officials at AFA's 2017 Air, Space & Cyber Conference. The strong language to the attendees gathered at National Harbor, Md., on the outskirts of the nation's capital, came from the Secretary of Defense on down and was clearly directed at Capitol Hill.

"If we don't get budgetary predictability, if we don't remove the defense caps, then we're questioning whether or not America has the ability to survive," Defense Secretary James N. Mattis said in the conference's keynote address. "It's that simple. And I think that right now, we have got to move with the Congress, and the congressional leaders are calling for this, toward passing the president's budget, toward lifting and removing the defense caps, in the current increasingly severe security situation, so that we maintain our competitive edge."

Mattis spoke as Congress inched closer to a long-term continuing resolution (CR), to follow a three-month stopgap bill signed into law in September. This CR is one that Air Force leaders have opposed because it limits acquisition of new programs and freezes funds for readiness, including flying hours and purchases of weapons.

"Nothing has done more damage to the readiness of our

armed forces than the continuing resolutions that stop us from taking initiative, than the lack of budgetary predictability, which means our industries will not change what they are doing, because they don't know whether they are going to be able to get the funding next year to keep an effort going," Mattis said. "And you can't ask companies to take survivor risk without some kind of reassurance."

Military leaders have repeatedly called on Congress to avoid long-term continuing resolutions, citing the lack of new-start acquisition programs and a limitation on growing the force's ranks. The September conference, however, included language previously unheard in congressional testimony and think tank speeches.

Capitol Hill has lost its "managerial integrity" over the budget and is hamstringing the Pentagon's ability to focus on "critical warfighting capabilities," Mattis said. This is impeding new-start acquisition programs in space and cyberspace, along with future needs in global strike, close air support, global intelligence, global mobility, global surveillance, and global command and control, Mattis said.

### "WE DON'T GOT THIS"

The Air Force is already too small for what the nation is asking of it, including fighting two air wars in the Middle East along with maintaining an effective nuclear deterrence, Air Force Chief of Staff Gen. David L. Goldfein said at ASC. And that is on top of "tough, tough, budget issues," he said.

Air Force Secretary Heather Wilson, during her first speech



at an AFA conference, illustrated this issue, relating what she learned during a recent visit to the Middle East. At Al Udeid AB, Qatar, Wilson and Goldfein spoke with B-52 crews that were flying daily missions for Operation Inherent Resolve and Operation Freedom's Sentinel over Iraq and Afghanistan.

The crews were deployed from Minot AFB, N.D., and once they returned from their deployment, they would have 10 days to prepare for a nuclear surety inspection. They had not trained for the nuclear mission in four months.

"When I looked at the commander of that aircraft and I said, 'Wow, do you think you can do that?' he said, with confidence, 'We got this ma'am; we got this.'"

That confidence exhibited by the aircrew needs to be backed up by action in Washington to ensure that the Air Force, and broader military, is ready.

"It is not fair for this nation to ask our commanders to keep saying, 'We got this,' right up to the point of failure because we don't got this," Wilson said. "And that has to change. Our crews are not getting the time they need for the training in contested environments and for the high-end fights, and the nuclear deterrence missions that we're going to be testing them on. Our training and exercises have to continue to challenge our men and women across the range of operations, which means we have to get larger in order for them to be ready for that fight."

The lack of training and capacity, however, does not limit what actions the Air Force will take when called upon.

"Americans need to understand low readiness for a crisis doesn't mean we won't go; we will go," Wilson said. "What it means is that fewer will come back. We have an obligation as a nation to make sure that our airmen are ready when the nation calls."

This shortfall can explicitly be seen in the fight in the Middle East. The Air Force itself has dropped 54,000 precision guided munitions against ISIS since 2014. These weapons are not being replenished as quickly as needed, and the military can only use more expensive precision weapons because "the world will not tolerate imprecise weapons," Wilson said.

Because of the inability to have a long-term budget, the Defense Department is not able to give industry "certainty on the amount" the Pentagon is going to buy, and in turn ramp up production, Wilson told reporters at ASC.

Another shortfall is in the cockpits of the aircraft. The service projects a shortage of about 1,500 pilots and needs stable funding to keep aircraft flying and pilots training. The military cannot compete with the airlines in salaries, but can appeal to the sense of service and the importance of flying for national security.

Currently, the priority for flying hours is in US Central Command and for aircraft forward deployed to the Pacific.

"WE HAVE AN OBLIGATION AS A NATION TO MAKE SURE THAT OUR AIRMEN ARE READY WHEN THE NATION CALLS."

—Secretary of the Air Force Heather Wilson



Secretary of Defense James Mattis addresses the Air Force Association's Air, Space & Cyber Conference on Sept. 20 at National Harbor, Md.

Photo: Mike Tsukamoto/Staff

Air Force-wide, recovering from this shortfall will take years.

"Not only does readiness go way down, but everybody picks up their phone and calls that recruiter who's been pestering them from American Airlines or Delta," Wilson told reporters.

## NONSTOP OPERATIONS

The Air Force has been flying combat operations nonstop for the past 26 years. This has built up a cost to the service's personnel and equipment, and "that demand for airpower is not going to abate any time in the near future," she said.

That constant demand of the unrelenting operations tempo has crowded out money needed for modernization at the same time that the wars have worn out the Air Force's equipment itself. Deferred modernization has created a "bow wave" of looming priorities rising up over the next 10 years. The service is trying to invest in the B-21 bomber, continued production of the F-35, the KC-46A tanker, the next generation T-X trainer, new satellites, the Combat Rescue Helicopter, and the Ground-Based Strategic Deterrent—all at approximately the same time.

While it is a "testament to the quality of their design" that the average Air Force aircraft is 28 years old, Wilson said, potential enemies have been modernizing. New Air Force equipment, purchased efficiently with stable funding, is needed to "increase the lethality of the force that we lead."

The US does not have a "God-given right to victory on the battlefield," Mattis said. Victory needs capability and commitment, along with training and recruiting the right people "if we're going to maintain the ability to fight and win, because we never want to come in second."

Congress has passed 31 continuing resolutions over nine of the past 10 years, so the Air Force has constantly been restricted on starting new programs, hindered in funding innovation, and by extension, forced to allow potential adversaries to chip away at the US military's advantages.

"It means we lose the flexibility to enhance readiness and lethality," Wilson said. "Little by little, over 31 continuing resolutions, our adversaries outpace us."

"Our potential adversaries have not been waiting around," she continued. "They've been studying us. They're innovating and modernizing faster than we are, putting at risk our technological advantage in air and space. Air and space superiority are not America's birthright. We earned it the hard way and we are not going to give it up without a fight."



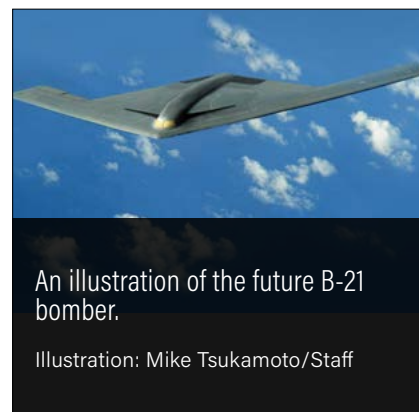
The Air Force wants to see if a new JSTARS can add to its capabilities.

Photo: TSgt. Bradly Schneider/ANG

By John A. Tirpak, Editorial Director

# May You Live in Interesting Times

## USAF's long list of critical modernization programs face disparate challenges.



An illustration of the future B-21 bomber.

Illustration: Mike Tsukamoto/Staff

The Air Force's slate of long-postponed, must-get new hardware is threatened by competing Pentagon priorities, Capitol Hill inaction, and second-guessing by the service itself.

Top service leaders at AFA's Air, Space & Cyber Conference 2017 in September explained how external factors and internal reevaluations are driving them to recast their modernization plans.

### JSTARS RECAPITALIZATION

One surprise arose regarding the plan to replace the E-8C, an Air Force-Army ground target tracking aircraft. USAF may be going back to the drawing board.

Secretary of the Air Force Heather Wilson said in a press conference that "we are going ahead with source selections," but added that "we are not meeting combatant commander

requirements," and USAF wants to see if the mission could be performed "in a different way."

There are a "lot more sources of information" in the battlespace that aren't being collected and aggregated that could improve the picture JSTARS provides, she said.

The following week, Wilson said she expected results from the second look in October. She said she's rethinking the program because the JSTARS Recap would merely recreate an existing capability, suggesting that adding aggregation capability might be part of a JSTARS 2.0.

Candidates have been narrowed to Boeing, Lockheed Martin, and Northrop Grumman. They are offering business jets of various sizes to host the JSTARS radar and processing systems and stations.

During an ASC17 panel on "Big

Wing" intelligence, surveillance, and reconnaissance, Deputy Chief of Staff for ISR Lt. Gen. VeraLinn "Dash" Jamieson said USAF is rethinking the JSTARS role because of both the evolving threat and changing ways to perform the mission.

"Adversary capabilities ... have come online in the last couple of years" demanding a fresh look at JSTARS, she said.

Jamieson told *Air Force Magazine* there are new, automated ways to collect and fuse data from a variety of platforms with sensors—as well as from "publicly available information" such as social media—that could prove useful for the ground moving target indicator and command and control missions while minimizing US "vulnerabilities."

### T-X ADVANCED TRAINER

The T-X advanced trainer program,

meanwhile, has become a bit of question mark for completely different reasons: Congress' inability to pass a budget threatens the program.

The competition has been run, and the Air Force is nearly ready to choose a winner.

However, under a Continuing Resolution (CR)—which was the state of affairs at the time of the AFA conference—funding is frozen at the previous year's spending levels, and new starts are prohibited.

Top uniformed USAF acquisition chief Lt. Gen. Arnold Bunch said source selection has always been planned for the end of calendar 2017 or early 2018, but USAF won't rush the choice in order to beat a CR deadline of early December. The program is "event driven, not calendar driven," he insisted, adding it is possible USAF could choose a winner and hold off awarding a contract until Congress passes a budget.

Doing so would tell both the winner and losers whether they should keep their T-X team together or release their engineers to work on other projects.

### B-52 RE-ENGINEING

Secretary Wilson said "we know we're going to have to re-engine" the B-52 bomber if the service is going to keep it in the inventory for the long term, but new engines are still in competition with other priorities.

USAF is struggling with budget tradeoffs, but Wilson said, "We're starting to get into the window" where a re-engineing decision will have to be made.

Boeing, which made the B-52—the last one was delivered in 1962—and engine makers have said fitting the bomber with modern power plants would decrease fuel use 30 percent, increase range or loiter 40 percent, and drastically cut maintenance requirements. Bunch said the Air Force has looked at leasing as a way to afford the engines.

### F-35 STRIKE FIGHTER

The F-35 fighter should be through with development in the next few months, Vice Adm. Mathias Winter, program executive officer, reported in a panel discussion on acquisition program affordability. He thinks operational test and evaluation will begin nearly on time—early in 2018—and he expects prices will go lower. However,



SrA. Jovie Abaya (left) and SrA. Bradley Hardee train on a B-52 engine. The bombers will soon need re-engineing, service leaders acknowledged.  
Photo: SrA. Mozer Da Cunha



Air Combat Command's Gen. Mike Holmes said that budget pressures will keep the F-35 buy at 60 per year.  
Photo: Michael McCool

Winter said the biggest challenge for the program will be sustainment costs, and right now they're "too high."

Jeff Babione, Lockheed Martin's F-35 program manager, said he expects F-35 prices to eventually reach a level "comparable to those of the F-16."

Air Combat Command chief Gen. James "Mike" Holmes told *Air Force Magazine* the service simply can't afford to buy F-35s at the desired rate of 100 a year. In fact, even 80 a year—USAF's target for 2022—is a goal that's been given up. With all the budget pressures, 60 F-35s per year is probably going to be the buy rate "for the foreseeable future," Holmes said.

### B-21 BOMBER

The Air Force's very secret Northrop Grumman B-21 stealth bomber has passed its preliminary design review,

and drawings are "being released" to vendors to start fabrication, Air Force Rapid Capabilities Office chief Randall Walden said during an acquisition panel. He thinks the aircraft is making good progress and will come in on or below cost expectations.

Walden said the program so far is meeting its goals: to "hold any target on the planet at risk"—able to penetrate any air defense system now anticipated—and deliver "at least" 100 airplanes "on time, on cost, with the best value."

To quicken its delivery, Walden said, the B-21 is based on "mature technologies" and will "leverage those lessons learned" from the B-2, F-22, and F-35 programs.

"Our biggest activity right now is putting out drawings to build the bomber," he said.



USAF's three current bombers practice a flyover. A Bomber Vector will chart the evolution of the bomber fleet.

Photo: courtesy Sagar Pathak



A KC-46 tanker refuels a C-17. The new Pegasus' ability to meet its end-of-2017 deadlines is in doubt.

Photo: courtesy Boeing

The next task is to “get on with the first builds of the structure.”

He said programmatically, the B-21 is “doing quite well,” having “plagiarized” the structure and culture of Lockheed Martin’s “Skunk Works” model. The B-21 is being built by a small team with clear direction, avoidance of requirements changes, and management that “doesn’t get in the way.”

Air Force Global Strike Command chief Gen. Robin Rand, in a press conference, reiterated “at least” 100 B-21s should be bought to meet regional commander needs because of the demands on the bomber fleet. The final number doesn’t have to be set now, he said, and will be re-evaluated when the aircraft is in production. A “deep dive” is underway on the B-2 program to capture lessons learned and make the B-21 as problem-free and cost-effective as possible, Rand reported.

The Air Force is working on a Bomber “Vector,” a term it prefers to “Roadmap,” to lay out the planned introduction of the B-21 and the schedule USAF will use to eventually divest its older aircraft.

Rand said the plan is coming close to completion, but he has previously said he doesn’t think the B-21 will be “additive” to the fleet—given constraints on funding and manpower. Counting its B-1, B-2, and B-52 aircraft, the Air Force today has 157 bombers.

Rather than calling for a minimum of 100 B-21s, USAF ought to be requesting 174, said retired Lt. Gen.

David Deptula, dean of AFA’s Mitchell Institute for Aerospace Studies.

Chairing a panel on “The Evolution of Stealth,” Deptula said the Air Force must conserve its heaviest hitters and add to their numbers. “What we really need is 120 combat-coded B-21s,” which translates to a fleet of 174 of the jets to accommodate test, maintenance, training, depot work, and some for attrition, he said.

Deptula specifically noted that the 20-airplane B-2 fleet—only about 14 of them available for combat at any given time—is the only system on hand that can penetrate heavy air defenses and attack “hardened, deeply buried” targets with the Massive Ordnance Penetrator weapon. Countries like Iran and North Korea have hidden their nuclear development enterprises in such hardened underground facilities.

#### KC-46 TANKER

The Air Force and prime contractor Boeing have a disagreement about the ability to meet KC-46 delivery requirements, tanker program executive officer Brig. Gen. Donna Shipton reported. While Boeing insists it can meet its end-of-2017 deadlines, USAF believes the real date will be closer to “spring,” and in a later press telecon with reporters, said that was June 2018.

Shipton also reported three outstanding KC-46 issues. She expected two of them to be “closed” in October. One has more serious repercussions.

One of the simpler problem to fix is an uncommanded boom extension after disconnect from the receiver aircraft.

The other is to guarantee that high-frequency radios—which use the wings as an antenna—don’t broadcast while air refueling is underway, because the wings could arc and ignite the fuel.

A tougher problem to solve is a lack of warning if the refueling boom makes contact with a receiving aircraft away from the fuel receptacle. If a boom were to scrape the front of a stealth aircraft, that could damage the aircraft’s low observable finishes—and thus jeopardize its ability to perform its mission. This has never happened—only A-10s, C-17s, and F-16s have thus far tanked behind a KC-46 in test—but Shipton didn’t know when the problem might be resolved.

#### GBSD

The Air Force recently chose Boeing and Northrop Grumman as the finalists in the Ground-Based Strategic Deterrent program to replace the Minuteman III intercontinental ballistic missile. Program director Col. Heath Collins said that after exhaustive study, it looks like USAF will be able to make use of existing silos and launch facilities.

The existing silos are “plenty big enough” to accommodate any missile design being contemplated, he told *Air Force Magazine*. Although they’d have to be modernized, the concrete structures are sound.

# Eyes to the Future

## The Chief's three focus areas will help define what USAF needs for future effectiveness.

By Amy McCullough, News Editor

Future warfare is going to look much different from warfare today, and the Air Force must be positioned to respond. To address the nation's future needs, Air Force Chief of Staff Gen. David Goldfein is prioritizing three focus areas: revitalizing squadrons, strengthening joint leaders and teams, and improving multidomain command and control.

Goldfein likes to say the squadron is the “heart and soul” of the Air Force, and after years of cutting manpower while simultaneously adding on responsibilities, it's time for a refresh. More importantly, it's time for the Air Force to get out of “the business of legislating common sense” and start empowering airmen to think for themselves, he said at AFA's Air, Space & Cyber Conference Sept. 19. “Some of the most important work we're doing is to push decision authority back down where it belongs,” said Goldfein.

This will be key because the future fight will be “trans-regional,” said Goldfein, and it's likely to be contested, which means squadron commanders—and airmen at all levels—must be able to make decisions when temporarily cut off from higher headquarters.

Goldfein said USAF needs to decide whether it should think about the fight like a “game of checkers,” which is linear in nature, or as “chess masters” where it is “simultaneously ... providing pressure from the north and south and east and west and from below the surface to the highest of the outer reaches of space.”

That's where his three focus areas tie together. The effort to revitalize the squadrons looks to create the best possible airmen, and those airmen must be capable of operating in a multidomain command and control environment. The US Air Force must be able to create a common operational picture that provides real-time information to combatant commanders so they can create military effects that will allow the United States to stay ahead of its adversaries.

“All of that has to come together with airmen that understand their sister services and contribute the best that they can to their sister services in order to win the future fight, which is going to be fast, violent, and over,” said Maj. Gen. Brian M. Killough, who leads the Chief's second focus area initiative, building joint leaders and teams.

### STRONGER SQUADRONS

Brig. Gen. Stephen L. Davis, special assistant to the Chief of Staff of the Air Force for squadron revitalization, said his team was given two to three months last year to come up with a plan that dug deeper than the “symptoms” and attempted to figure out “the macro-level issues across the Air Force.”

To do this his team needed data—a lot of them. They



Gen. David Goldfein, Chief of Staff of the Air Force, speaks at AFA's Air, Space & Cyber Conference on Sept. 19.  
Photo: Mike Tsukamoto/Staff

started poring through Air Force climate surveys, retention surveys, and inspector general reports to see what was working at the squadron level and what wasn't. From there they built a survey of about 20 questions and sent it to 80,000 airmen, “from general officer to airmen, civilians, Air National Guard, and Air Force Reserve.”

Armed with all that data, Davis and his team set out to talk to airmen. They conducted more than 3,800 interviews, of which about 2,000 were hour-long, one-on-one interviews. The team also created a crowd-sourcing website so airmen located at the bases they didn't visit had an opportunity to chime in. (See “Revitalizing the Squadron,” October/November 2017.)

The survey team “got tens of thousands of hits on that site. We got thousands of votes [on ideas presented on the site] and several hundred different ideas,” said Davis.

The team now is back at the Pentagon reviewing all that information and building its initial recommendations. They will be presented to Goldfein in November.

“Decision authority is nothing short of a warfighting imperative,” said Goldfein, who noted that he wants his squadron commanders to feel “empowered” to “take appropriate risks.” That's why he directed the Air Force inspector general to start rewarding commanders for making a “prudent, reasonable decision to change course,” especially if that decision “increased the lethality and the readiness ... to accomplish their mission.”

“We're not going to ding them, we're going to celebrate it,” Goldfein said.

He also directed Davis not to wait to push out solutions until he has a chance to see the report. So the service is already taking a look at all Air Force instructions (AFIs) to

weed out the ones that just don't make sense or that waste airmen's time. It's also in the process of creating a centralized course for commanders and superintendents at Air University, similar to the one already in place for first sergeants.

## JOINT LEADERS FOR JOINT TEAMS

The Chief's challenge to Killough was "to make the Air Force better."

"He thinks from his time on the Joint Staff that we can present even more capability to the joint force and the Department of Defense," said Killough. "We do that by making our airmen better from the very beginning. We hope to build stronger teams with our joint partners and our allied partners going forward."

Airmen need to learn to branch out beyond their stove-piped specialty, so a mechanic not only understands all the nuts and bolts of an aircraft but also what a space control squadron contributes.

Killough said his team started by figuring out how to best train airmen at the very beginning of their careers and ensure they learn to speak the same language as their joint partners. Then the service needs to make sure airmen are gaining the right experience to contribute to the joint team and just as importantly that they are being rewarded for that experience.

Along those lines, the Air Force must figure out how it should present forces to combatant commanders. The Air Expeditionary Force construct was created in the late 1990s in the middle of Operation Northern Watch—the no-fly zone over Iraq following the aftermath of the 1991 Gulf War. After nearly two decades, Goldfein said, it's "time for us to upgrade."

In the meantime, starting on Oct. 1, the Air Force was to deploy airmen in teams of at least three. "We don't want airmen going by themselves downrange into something that could be a significant emotional event by themselves," said Killough. "We know we deploy better, work better, and are more effective as teams."

Goldfein also wants to build a core headquarters capability in the Air Force that can lead a joint task force. Killough said 9th Air Force has been designated an "instructor pilot demo" to lead the "pathfinder effort for this JTF capability."

Killough said his team is putting together a "flight plan" detailing what they have learned so far and their initial recommendations. That plan will be presented to Goldfein in December.

## C2 COMPLEXITY

Of all the focus areas, improving multidomain command and control is the most complex. Operations in the information age will be quick and require the Air Force to simultaneously master and utilize multiple domains. The effort is being led by Brig. Gen. B. Chance Saltzman, Air Staff director of current operations.

His team organized around three lines. "The first is operational concepts," said Saltzman. "Think command relationships, authorities. This is where it starts to bridge

"TIME FOR US TO  
UPGRADE."

—USAF Chief of Staff Gen. David Goldfein



SrA. Corey Robison works on a laptop at Misawa AB, Japan. He was troubleshooting fuel flow indication to ensure all the wires were functioning properly.

Photo: SrA. Brittany Chase

with the other two focus areas. We're going to have to train our commanders at much lower levels to be able to execute these authorities," he said.

Force presentation and joint arrangements all affect command and control, said Saltzman, who noted that the three focus groups are "inextricably linked together."

The second line of interest is technology. During his speech, Goldfein repeatedly asked, "Does it connect? Good. Does it share? Even better." This at the heart of the multidomain command and control concentration and gives some insight into the direction USAF seeks to move.

Saltzman said there are aspects of technology—such as artificial intelligence, machine learning, machine-to-human interface, and automation—the service is not quite ready to take advantage of. Its process for bringing this technology online is simply too slow. But that's not just an Air Force problem. The service is going to have to work with DOD and Congress to change some authorities and speed up the acquisition process.

Still he said there is already technology available that will solve the problems the team has come up with so far. "Our challenge is how do we roll them into our business?" asked Saltzman.

One way is to go after smaller, more modular capabilities and avoid larger acquisition programs that naturally take longer to "work through the wickets," said Saltzman.

As a way to get after the "quick wins," the Air Force is standing up a "developmental operational environment" at Nellis AFB, Nev., where it can "experiment with new technologies and software in particular," he said. The initial focus will be on virtualized data sets and how USAF can leverage what industry already has learned with cloud-based data structures and the test, design, and development process.

The focus areas will not go away when the teams present their reports by the end of the year: Goldfein has made it clear that this is a four-year project. The service will try to find quick wins where it can, but revitalizing the service is a long-term endeavor.

"The Air Force is fully embracing this opportunity to become more innovative," said Killough. "Airmen are very, very intelligent and they are watching and if you don't follow-up they will know you are just talking."



# HEAT

## From the

# DESERT

**From a network of bases across the Middle East, the Air Force battles ISIS, al Qaeda, and the Taliban.**

An F-15E Strike Eagle fires flares during Operation Inherent Resolve June 21, 2017.  
Photo: SSgt. Trevor McBride

The Air Force runs two ongoing air wars. One is Operation Inherent Resolve against ISIS in Syria and Iraq; the other is Operation Freedom's Sentinel, targeting al Qaeda, the Taliban, and other terrorists in Afghanistan and elsewhere. The efforts are launched from a constellation of bases scattered throughout the Middle East, ranging from massive flight lines in allied countries to small, dusty airstrips close to the front lines.

By Brian W. Everstine, Pentagon Editor

Air assets, including the most modern stealth fighters, massive lumbering B-52 bombers, and the full range of intelligence, surveillance, and reconnaissance gatherers, take off from around the region, kept aloft by KC-135s and KC-10s deployed to regional air bases that are integral to ongoing wars.



A C-130H from the North Carolina Air National Guard on the tarmac at dawn during a dust storm in Southwest Asia in May.  
Photo: SSgt. Alejandro Armendariz/ANG



An RC-135 Rivet Joint ISR aircraft moves away after taking on fuel from a KC-135 during OIR.  
Photo: SSgt. Michael Battles

The 380th Air Expeditionary Wing at Al Dhafra AB, United Arab Emirates, is a keystone of these operations. The wing's approximately 3,000 airmen are at a base that for years was referred to only as an "undisclosed location." Al Dhafra is a rare air base where "every one of our five core missions" are handled, then-Wing Commander Brig. Gen. Charles S. Corcoran said in an interview with *Air Force Magazine* in May.

The wing is host to about one-fourth of the Air Force's entire KC-10 fleet, flying constantly for Operation Inherent Resolve in Iraq and Syria. U-2 Dragon Lady spyplanes and RQ-4 Global Hawks gather intelligence, splitting their time between OIR and Afghanistan. Al Dhafra is the only base in US Central Command that supports both these airframes. Four E-3 Sentry airborne warning and control system aircraft control the battlespace daily.



Airmen at Davis-Monthan AFB, Ariz., load equipment onto a C-5M Super Galaxy in preparation for a deployment to Turkey for OIR.  
Photo: SrA. Betty Chevalier





SrA. Babatunde Olatinwo repairs a worn panel on an F-15E in Southwest Asia.  
Photo: SrA. Damon Kasberg



Security forces airmen guard a U-2 Dragon Lady spyplane in Southwest Asia.  
Photo: SrA. Tyler Woodward

Meanwhile, a contingent of F-22s rule the skies over Iraq and Syria from the base along with F-15E Strike Eagles, Corcoran said.

Supporting these diverse aircraft brings a “huge sense of pride” to the thousands of airmen at the base. “They buy into the ‘why,’” Corcoran said. “They’ll do anything for you. [They are] proud of what they are doing.”

Farther north along the Persian Gulf is the Air Force’s biggest base in the region, the sprawling Al Udeid Air Base near Doha, Qatar, where all regional airpower is controlled in the base’s state-of-the-art combined air and space operations center (CAOC). The tightly secured complex controls both air wars and all the airlift and air refueling.

“When you look at being expeditionary, there’s really nobody else who does this business the way we do,” said



A B-52 maneuvers into place under a KC-10 for refueling over Southwest Asia.

Photo: SSgt. Marjorie Bowlden



A security forces airman stands guard during an OIR cargo mission in Baghdad.  
Photo: SSgt. Michael Battles



Lt. Col. Ben Rudolphi conducts a preflight munitions check on an A-10 at Incirlik AB, Turkey.  
Photo: SrA. Ramon Adelan



SSgt. Helen Daniel launches an RQ-11 Raven at Al Udeid Air Base in Qatar.  
Photo: TSgt. Amy Lovgren



A missile (red circle) plummets toward an ISIS tank hidden under debris during a coalition strike near Palmyra, Syria, in February.  
Illustration: *Air Force Magazine* from DOD video.

Brig. Gen. John B. Williams, the director of mobility forces at the CAOC, in a recent interview with *Air Force Magazine*.

The Al Udeid flight line has dozens of KC-135s from all components across the Air Force, lining up to take off to keep combat and ISR aircraft aloft in two air wars. Air Force C-17s and C-130s work with the massive aerial port at the base to keep the wars supplied. This includes flying to small, austere locations inside Iraq and Syria to keep frontline forces ready in the fight against ISIS.

"There are dynamic requirements that pop up out of nowhere," said Lt. Col Aaron Lane, the operations officer for the 8th Expeditionary Air Mobility Squadron at Al Udeid. "We jump into action to provide that as quickly as we can." For the most part, this has included bullets and other small-arms ammunition for US-backed fighters, although there's



Maintainers perform final preflight procedures for an MQ-9 Reaper before takeoff on a combat flight for OIR.  
Photo: SrA. Damon Kasberg



TSgt. Joseph Benoit tests the functionality of a weapons rack on an F-16.  
Photo: MSgt. Benjamin Wilson



Maintainers run preflight checks on a KC-135 at Al Udeid before a flight for OIR.  
Photo: SSgt. Michael Battles



A maintainer preps an A-10 at Incirlik.  
Photo: SrA. Ramon Adelan



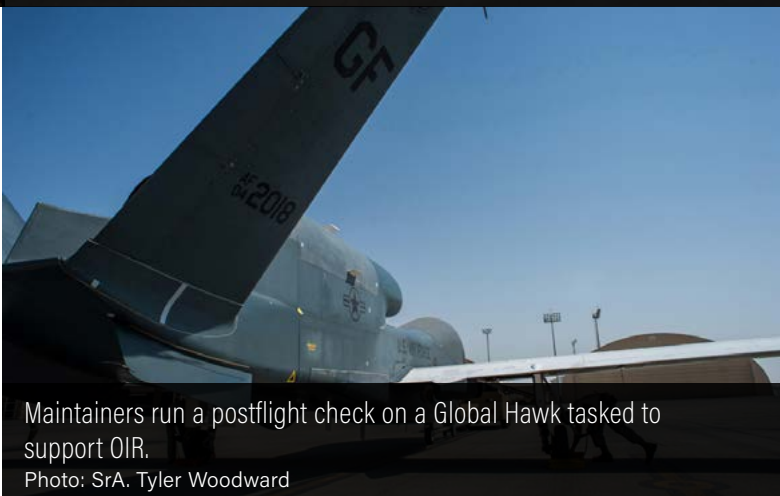
An airman prepares the tail section of a GBU-54 Laser Joint Direct Attack Munition at Incirlik.  
Photo: A1C Devin Rumbaugh

also been a need for blood, food, and other humanitarian supplies.

In addition to mobility assets, Al Udeid's flight line has E-8C JSTARS aircraft flying constantly to track ISIS fighters in the region and B-52 Stratofortress bombers to destroy them. The B-52s first deployed to the base in spring 2016 and have been an integral part of a large increase in air strikes since they've arrived in theater. As of July 31, US and coalition aircraft had conducted 27,726 air strikes on ISIS targets in Iraq and Syria, a pace well ahead of 2016's overall total of 30,743.

B-52s have also been a large part of air strikes in Afghanistan, complementing the USAF F-16s that are deployed to Bagram Airfield there.

Stratofortresses are tasked with flying to Afghanistan



Maintainers run a postflight check on a Global Hawk tasked to support OIR.  
Photo: SrA. Tyler Woodward



A crew chief performs a preflight walk around a C-17 at Al Udeid in June.  
Photo: A1C Devin Rumbaugh



SSgt. Stephens Doherty (left), and SrA. Nathaniel Awrey reassemble the GAU-8/A rotary cannon on an A-10 at Incirlik.  
Photo: A1C Devin Rumbaugh



An airman checks the engine of a C-17 at Al Udeid.  
Photo: TSgt. Amy Lovgren



A munitions technician loads a B-52 in Southwest Asia.  
Photo: SSgt. Trevor McBride

on average about once per week, Maj. Gen. James B. Hecker, the commander of NATO Air Command-Afghanistan and the 9th Air and Space Expeditionary Task Force-Afghanistan, told *Air Force Magazine* in Kabul recently. This pace is expected to increase as the US surges troops to Afghanistan again this year.

Throughout US Central Command, there are about 20,000 US and international airmen deployed to the region. Over three years, those airmen have contributed to more than 94,000 bombs dropped against ISIS targets, former Air Forces Central Command Commander Lt. Gen. Jeffrey L. Harrigian wrote in a letter to airmen before leaving the post in August. These airmen and aircraft have worked to “pummel ISIS into a remnant of its former self, unable to focus because of a daily forecast of punishing airpower.”



A sensor operator helps control an MQ-1B Predator in Southwest Asia.  
Photo: SrA. Damon Kasberg



An F-16 from the 36th Fighter Squadron, Osan AB, South Korea, flies with US Marine Corps and Republic of Korea Air Force (far right) aircraft in August. The technological advantage of the US is eroding, speakers at AFA's Air, Space & Cyber Conference said.

Photo: SSgt. Alex Fox Echols III

By Wilson Brissett, Senior Editor

# Race for Speed

## USAF is preparing to win future wars by evolving faster than any adversary can keep up.

The US military's next adversary is waiting just over the horizon. That adversary is not North Korea or Russia or China, or any other nation by name. For top Air Force leaders speaking at AFA's 2017 Air, Space & Cyber Conference, the greatest threat the nation faces in the near future is a concept: speed.

"I'm very concerned that our nation has lost the ability to go fast," said US Strategic Command boss Gen. John E. Hyten. And it's not just Hyten who is worried. Chief of Staff Gen. David L. Goldfein has placed speed alongside ideas like "multidomain," "multicomponent," and "transregional" as one of the defining concepts of the war of the future. But what does going faster mean?

Goldfein, Hyten, and others made it clear the Air Force needs more speed in areas like combat decision-making, acquisition, space operations, and software development. And the need is being driven by adversaries who

are already moving faster in many of these areas. If the Air Force doesn't get speed right—and fast!—it will find itself in 2030 fighting yesterday's wars, with unhappy results, the generals said.

For a long time, the US has enjoyed astounding capability advantages on the battlefield. At least since Desert Storm, when the US goes to war, it has done so with "the most dominant conventional force in the history of the planet," Hyten said. That dominance comes in large part, Goldfein said, because "we have had a luxury for the last 16 years of controlling the rheostat of time that is actually unparalleled in the history of warfare."

Goldfein said that the US has been able to begin operations on its own terms and within its own timing. Further, US technological superiority has been so automatic the military can announce its battle plans six months ahead of time—as it did in the recapture of Mosul from ISIS—"and there's



Gen. John Hyten, head of US Strategic Command, speaking at the conference at National Harbor, Md.

Photo: Mike Tsukamoto/Staff

nothing the adversary can do to stop us," he said.

That unprecedented technological advantage is already dissipating. There is widespread concern that, in many ways, China, Russia, transnational terrorist organizations, and even shadowy programmers and hackers may be able to outmaneuver the United States.

Goldfein warned that the Air Force will need to be on the forward edge of making the US military faster as its technological leg up fades. "We as a service are going to have to ... be more agile, more adaptive, more responsive as we look at the future of warfare," he said. A good place to start focusing is acquisition.

World War II was a war of attrition, and Goldfein said the US military acquisition process was built to fit that need. In B-24 production, the driving requirements were getting the right



A Russian A-50 Mainstay airborne early warning and control aircraft on the tarmac in Syria in September. Russia and China are striving to outpace the US military.

Photo: Ministry of Defense of the Russian Federation

capability in the platform and getting the right number of aircraft built. Ultimately, Air Force Plant 4 in Fort Worth, Texas, was producing a bomber every hour at its peak, he said. “It was about things,” and making more of them, at the end of the day.

Now, platforms and their inventories are not the core focus, Goldfein insisted. “We’re transitioning from wars of attrition to wars of cognition,” and this change “forces us to ask different questions of industry.”

Wars of the future will be defined by decision-making speed and based on how—and how much—data is gathered, analyzed, and shared. Goldfein said that in this type of war, the service needs to ask industry partners, “Does it connect? Good. Does it share? Even better.”

### DANGER: GOING TOO SLOW

The imperative for speed is critical even now at STRATCOM, Hyten made clear. “We have adversaries now, and we [see] proof in those adversaries that they’re going faster than we are,” he said. China and Russia are going faster than the US “in nuclear modernization, faster than we are in ... hypersonic deployed weapons, ... faster than us in space, faster than us in building counterspace capabilities to deny space, faster than us in cyber.”

Since World War II, the US has owned



SrA. Ian Dudley photographs an unarmed ICBM during a test in August. The original ICBM system was developed quickly, but replacing it will take another 12 years.

Photo: SrA. Ian Dudley

the competition in speed of fielding new requirements because “we’ve always been able to leverage the industrial base” for military purposes, Hyten said. But because of creeping bureaucracy, exploding requirements, and a risk-averse culture, the Department of Defense is now “slow, expensive,” Hyten said. “That’s the way it is.”

In the early 1960s, then-Brig. Gen. Samuel C. Phillips was able to develop the nation’s first Minuteman intercontinental ballistic missile system, including 800 missiles and launch facilities, in five years at a cost of \$17 billion in today’s dollars. By comparison, the current ICBM replacement

program, the Ground-Based Strategic Deterrent, or GBSD, is not expected to reach initial operational capability for another 12 years. GBSD won’t reach full operational capability until 2035, and it has been estimated that it could cost as much as \$84 billion to produce 450 missiles, Hyten said.

Phillips was able to build the Minuteman I system quickly and cheaply, Hyten said, because “he had simple requirements” that did not change over time, because he had a budget every year instead of a string of continuing resolutions, and because Phillips understood how to take “smart risk.”

Perhaps the most important factor enabling the Minuteman I achievement, said Hyten, is that Phillips was given the authority and responsibility to execute that program.

Hyten is clearly tired of DOD hand-holding acquisition program managers. He wants the Air Force to

“I’M VERY CONCERNED THAT OUR NATION HAS LOST THE ABILITY TO GO FAST.”

—Gen. John Hyten, commander, US Strategic Command



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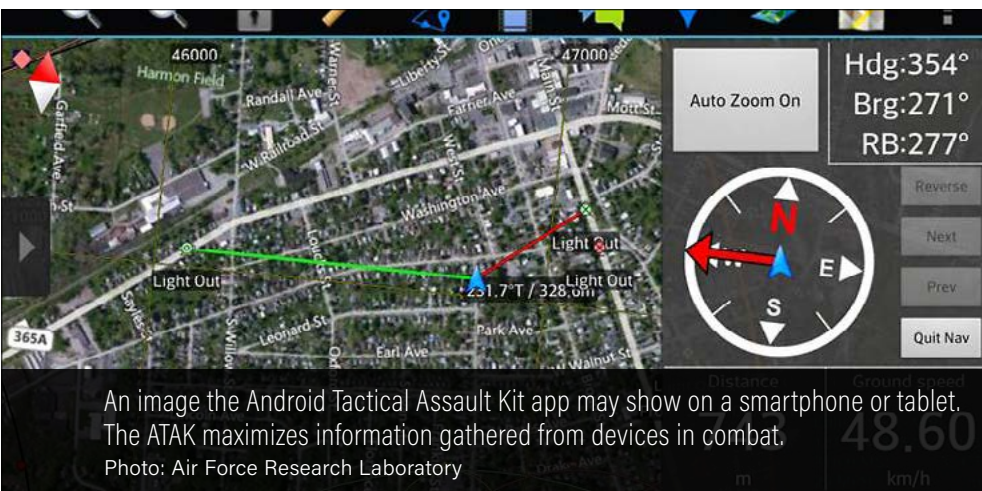
The X-37B Orbital Test Vehicle is moved after completing mission 4 in May. USAF accelerated space launching capabilities this year.

Photo: Michael Martin



Secretary of the Air Force Heather Wilson and USAF Chief of Staff Gen. David Goldfein (standing, right) are briefed on the DIUx program at Al Udeid AB, Qatar.

Photo: SSgt. Desiree Economides



An image the Android Tactical Assault Kit app may show on a smartphone or tablet. The ATAK maximizes information gathered from devices in combat.

Photo: Air Force Research Laboratory

pick the right people and send them off to deliver the best product in collaboration with industry partners. “Industry has the ability to go as fast as we want them to go,” Hyten insisted. “If we give them good contracts, good incentives, they will go fast.”

One area where the Air Force is already leveraging commercial partnerships to go faster is space operations, Brig. Gen. Wayne R. Monteith, commander of the 45th Space Wing at Patrick AFB., Fla., said. “We have launched more than Russia, and we have launched more than China” this year, Monteith declared.

“We’ve taken our capability to launch quickly from 72 hours last year, to now I can shoot twice in 24 hours,” Monteith said. The 45th SW has also landed seven SpaceX Falcon 9 first-stage boosters this calendar year. As the fiscal year ended, Monteith said the 45th SW had “launched 21 space missions,” representing “over one-quarter of all space missions in the world.”

The speed of SpaceX’s launch op-

erations are a big part of this new efficiency. The company “has forced us to become better at what we do,” Monteith said. “We are adopting commercial business practices; we are becoming more efficient, more effective, more affordable.” In concert with SpaceX, the 45th SW has been able to “reduce the cost of a single launch for them by over 50 percent.”

“SpaceX does not launch on schedule,” he said. “SpaceX launches on readiness.” As the Air Force’s partnership with the company grows, Monteith expects that “they will help us get to 48 launches a year” in the near future.

### SPREADING THE SPEED

Goldfein hopes USAF’s accelerating space-launch capabilities will be replicated in other areas as well. The Air Force Research Laboratory is working with special operations forces on a data management interface called Android Tactical Assault Kit (ATAK). The service wanted to maximize the data it was pulling from devices carried in combat.

“Rather than going and building a system to pull that in,” Goldfein said, “we actually went to a commercial company and they built an algorithm” that saved a lot of time. Now, ATAK can map personnel on the battlefield who are using a radio, which to Goldfein means that “we have now a common operational picture.”

Another key area is cyber operations, where development of new capabilities must be faster than traditional acquisition models allow.

The service recently tasked a Defense Innovation Unit Experimental (DIUx) team to work with the Combined Air and Space Operations Center (CAOC) at Al Udeid AB, Qatar. The “coders sat down right next to our operators and started actually working design of new software immediately,” Goldfein said. This kind of speed could change the way the Air Force operates in the CAOC.

“In the wars of attrition, we would go out to industry and we would do a request for proposal,” Goldfein said. “We would get competition and then two years later we would maybe, maybe, start looking at an IT solution.” For wars of cognition, that process is simply too slow, Goldfein said. “In today’s and tomorrow’s warfare, we’ve got to be able to own and manipulate the code real time.”

This processing speed will enable the multidomain wars that are becoming familiar. In the wars of tomorrow—and more and more in the wars of today as well—“combined arms is about simultaneous activity from all domains that operate together,” requiring decision-making speed an adversary cannot match, Goldfein said. Simply put, “we have got to think about speed,” he said.



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The 45th Space Wing supported United Launch Alliance's launch of NASA's Tracking and Data Relay Satellite-M (TDRS-M) Aug. 18 from Space Launch Complex-41 Cape Canaveral AFS, Fla. The addition of TDRS-M to the Space Network provides the ability to support space communication for an additional 15 years.

Photo: United Launch Alliance

# A Hard Look at Science and Technology

**For the next year, USAF and AFRL are going to step back, collaborate, and listen.**

In one of the most specific announcements at AFA's Air, Space & Cyber Conference, Secretary of the Air Force Heather Wilson said the service would be kickstarting a year-long effort to review its science and technology (S&T) strategy.

"The Air Force must reinvigorate its focus on basic and applied research to ensure the long-term domination of air and space," Wilson said. "We must also reevaluate how we manage our research enterprise and spend research dollars in ways that advance air and space superiority for the long term."

The review will see USAF "step back" from today's realities and "project [forward] ... to see what kind of Air Force we might have at that time," Wilson said, emphasizing future needs must be attended to now.

"Our adversaries are advancing rapidly," Wilson said. "We

By Gideon Grudo, Digital Platforms Editor



Secretary of the Air Force Heather Wilson speaks at the Air Force Association's Air, Space & Cyber Conference on Sept. 18.

Photo: Mike Tsukamoto/Staff

need to update our research priorities, but validation of research areas isn't enough. We need to rethink the way in which we manage our path-breaking research."

Wilson continued, "Near the end of World War II, [Gen. Henry H. "Hap" Arnold] realized that the future of US national security depended on our military supremacy and that supremacy depended on scientific research and development."

## GETTING TO KNOW THE UNKNOWN UNKNOWN

Over the next year, airmen from the Air Force Research Laboratory—which is leading the endeavor—are going to travel to almost a dozen research centers as part of the S&T review. The goal is to create a new science and technology strategy, and to stay on top.

But the Air Force is not sure where it's going, yet.

The visits are part of an attempt to open up communication and potential collaboration with academia and industrial partners that “historically do not” cooperate or work with DOD, AFRL Commander Maj. Gen. William T. Cooley told reporters at the conference. Looking both domestically and internationally, AFRL will identify 10 academic or enterprise hubs, whether by pedigree or geographical proximity to its research targets. It will make a “significant effort” to build those relationships and engage those research agencies, he added.

While Cooley did not identify specific areas of S&T AFRL will be focusing on, he said the four major domains for research will be “space, air, cyber, and multidomain C2 [command and control].” With these broad strokes, AFRL hopes to reach researchers who've never considered what their work could do for the service.

“They may not know or be as familiar” with USAF and what it does or what needs doing within its organization. For example, AFRL will share what USAF's challenges are, “the types of missions” it's concerned with, and ask what such agents of innovation might be able to offer.

“It's really hitting the entire ecosystem of S&T,” said Morley Stone, AFRL's chief technology officer, adding, “It's not just academia.” As the agency is determining where to go, small businesses or lesser known laboratories will get a look as well.

Stone added that—like the rest of the Department of Defense—AFRL is aware of an “undeniable fact”: S&T is receiving a smaller share of the budget than before, and “given that, how do we keep reaching out to traditional and nontraditional” partners and engage in applied research?

Stone went on to call the effort “an international research endeavor,” to which Cooley added USAF has a “large number” of “smaller dollar” grants already spanning the globe's universities.

## NOT JUST ANOTHER MILITARY STUDY

On top of asking the world what AFRL can do to innovate its mission sets, the laboratory will seek on its own—and from the outside—creative solutions to the way it approaches science and technology research in the first place.

“The last piece of this is looking at potential changes—things that we can do within our organizations to ensure we're as innovative as we can be, but also that we're ready to adopt new technologies,” Cooley said. “We intend to understand that through the lens of other organizations.”

Citing what he called the “influential” 2010 study *Air Force Technology Horizons 2010-2030*, Stone said, “The key difference” with this effort is “really digging into ‘How do we change our portfolio in response to what we learn?’” or what Stone called an “execution function” to the project.

“The real metric is ‘What's changed?’” Cooley added. The service needs to avoid a problem from the past, in which AFRL conducted past studies but then placed them “on the shelf.” In addition to this study, “I'm going to be looking for measurable results,” Cooley asserted, and having the Air Force Secretary's attention on the endeavor will certainly help drive the change.

“We need to update our research priorities, but validation of research areas isn't enough. We need to rethink the way in which we manage our path-breaking research,” Wilson said. “Hap Arnold's vision for this Air Force still rings true. The United States will develop technologies to secure air dominance. We will underwrite our nation's military supremacy.”



SrA. William Pryor (left) and SrA. Mehmet Yasdiman study their computer monitors during a mission aboard an E-8C JSTARS aircraft based at Al Udeid AB, Qatar, July 27.

Photo: TSgt. Bradly Schneider/ANG

## AFRL “WILL NOT BE ALONE”

Cooley didn't add much about the upcoming research, saying, “We don't know what we don't know.”

While AFRL is going to lead the effort, USAF's Scientific Advisory (SAB) will lead a parallel effort, and input will even come from a National Academy of Sciences workshop, whose details are still working.

In 2018, SAB is going to undertake two major studies, one of them specifically tied to the S&T strategy review, the board announced on Sept. 21, a day after ASC17 ended.

This main study will deliver an “independent, expert perspective on the critical air, space, and cyber technology development needed in the 2030-and-beyond environment and propose policies, processes, and mechanisms that enable more rapid, affordable, and effective transitions of capability that provide distinctive advantages into the hands of the war-fighter,” reads a service news release.

The second study—echoing one of AFRL's own broad priorities in its S&T review—will focus on “technologies for enabling resilient command and control,” researching “current capabilities and limitations” in C2, and possible means to improve current systems for the service.

“We present the most challenging technology issues the service faces to the best and brightest in specific science fields,” said Werner J. A. Dahm, SAB chairman, about 2018's goals.

Altogether, the various approaches USAF is taking with this S&T review will work to keep the country ahead of its adversaries in the scientific realm, now and decades into the future.

“I view this through a much broader security lens,” Cooley said. “This is about our United States Air Force and how we're going to ensure we maintain our technological edge.”

This hopeful introspection, eagerness to change from within, and the world innovation tour are examples that set this S&T project apart from other studies. Collectively, the hope is to integrate more agents of change into the Air Force S&T efforts.



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A full-size fiberglass model of its entry in the Air Force's T-X advanced trainer competition dominated Boeing's booth complex.



**AIR  
SPACE  
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CONFERENCE

**The Technology Exposition  
looked to the future.**

By John A. Tirpak, Editorial Director

Photos by Mike Tsukamoto, Photo Editor

AFA's 2017 Air, Space & Cyber Conference was the best-attended yet, beating last year's attendance figures by more than 1,000 people and boasting many more exhibitors, as well.



With real estate on combat aircraft hardpoints growing increasingly precious, Northrop Grumman showed the Open Pod, an open-system architecture, reconfigurable system of sensors. The first version will include infrared search and track and targeting devices.



Visitors could "fly" the T-100 trainer candidate for the T-X competition on a simulator at the Leonardo DRS booth.



Kawasaki's C-2 transport in a cutaway model carried a load of earthmovers for a notional humanitarian relief operation.



Modular payloads for Northrop Grumman's Global Hawk surveillance aircraft were shown in these full-scale models of the Optical Bar Camera (left) and MS-177 multispectral sensor.



Elbit Systems of America displayed some of the configurations of its helmet-mounted display products.



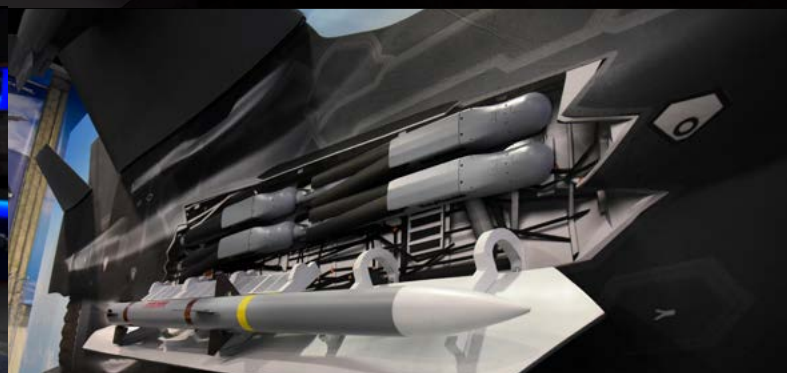
A sampling of aircraft powered by Pratt & Whitney engines were featured in large models at the company's booth, which also showed engine models in cutaway.



Leonardo DRS' T-100 model, its T-X entry, was painted in the colors of the 332nd Fighter Group, the World War II "Red Tails" of the Tuskegee Airmen. If the company wins the T-X contract, aircraft would be assembled at Moton Field, Ala., where the Tuskegee Airmen trained.



Orbital ATK's Advanced Anti-Radiation Guided Missile (AARGM) AGM-88E. A week after the AFA conference, the company won a sizable contract for the radar-killing missile.



Raytheon packed a model of the F-35 fighter with its AIM-120 AMRAAM radar-guided dogfight missile and a hefty load of Small Diameter Bomb IIs.



Legion Pod is Lockheed Martin's offering in the hunt to provide a multifunction sensor for combat aircraft.



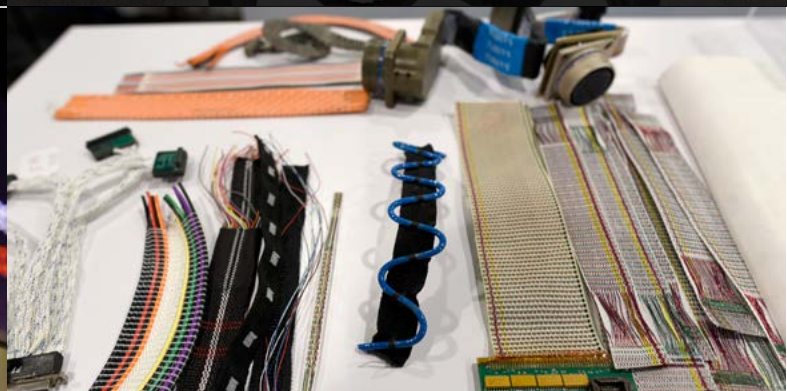
The ACES 5 is UTC Aerospace System's latest generation of the combat aircraft ejection seat.



Charles Buynak of the Air Force Research Laboratory demonstrates a snake-like robot that can inspect parts of an airplane where tech crews can't go.



AFROTC Cadet Cristian Alfonso of the University of Puerto Rico tries a BAE System Striker II helmet-mounted display system.



Woven Electronics laid out a variety of its specialized cable harnesses and connectors used for military and commercial applications.



This General Atomics MQ-9 Reaper model carries an MS-110 multispectral recce pod made by UTC Aerospace Systems.





A DARPA project, the vertical takeoff XV-24A LightningStrike, was presented in model form by maker Aurora Flight Sciences. It would escort CV-22 Ospreys into combat.



Saab is offering its JAS-39C Gripen to air forces and contractors looking for a high-performing, low-cost Aggressor platform.



This full-size "Gremlin" by General Atomics Aeronautical Systems is one proposal for a class of remotely piloted aircraft cheap enough to be sacrificed if necessary.



A generic fighter aircraft wing bears (from top) Lockheed Martin's Sniper targeting pod, Paragon guided bomb, and the LRASM and the JASSM stealth anti-ship/land-attack missiles.



For the ground-bound, the Polaris DAGOR is built to provide mobility for special forces.



A warning to hobbyists and an ad for anti-drone devices marked the entrance of the Tech Expo.



Kongsberg's Joint Strike Missile is a joint venture of Norway and Raytheon, for attacking ships at long distance.



Northrop Grumman models illustrated its proposal for shrinking JSTARS to fit on a Gulfstream 550.



Viper-E from MBDA Missile Systems is a precision guided standoff weapon with both GPS and laser guidance.



Microsoft's patrol vehicle concept that controls drones and has surveillance systems that can read license plates, among many other tricks.



An active electronically scanned array radar needs a new radome. At its booth, General Dynamics showed off this one for an F-16.

# AFA CHAPTER NEWS



From left: Cape Fear Chapter President John Lasley; special guests from Laney High School retired Col. T. Harrison Smith, cadet Arthur Sawyer and cadet Jonathan White; and AFA President Larry Spencer.

Photo via John Lasley

## CAPE FEAR CHAPTER

The **Cape Fear Chapter** in North Carolina welcomed AFA's president, retired Gen. Larry Spencer, to its quarterly meeting in early September.

He delivered inspiring remarks to a full house—over 50 guests—including cadets from AFJROTC Unit NC-802, E. A. Laney High School, of Wilmington, N.C.

Spencer described how AFA members are on the front lines for building a strong Air Force. He mentioned personally contacting thousands of former AFA members to learn why they did not continue their membership and what is needed to bring them back.

He encouraged chapter members to reach out to the

community and share the AFA story. Spencer reminded the chapter that this story includes The Mitchell Institute for Aerospace Studies and the AFA STEM programs CyberPatriot and StellarXplorers. Communities are hungry for programs on these subjects, Spencer said, because they excite our youth in K-12 grades about cybersecurity, spacecraft and payload development and operation, and STEM subject areas.

Spencer closed his remarks by telling the audience about two key lessons: His grandfather taught him, "It is OK to fail, but it is not OK to have never tried."

Second, he faced challenges in his Air Force career but was steadfast in believing that his success was up to him.

—John Lasley



Maxine Rauch, author Dan Hampton, and Susan Loricchio (l-r).

Photo via Susan Loricchio

## IRON GATE CHAPTER

Northeast Region President Maxine Rauch, Susan Loricchio, and Carol Nelson represented the **Iron Gate Chapter**

of New York at a recent book signing.

The Cradle of Aviation Museum on Long Island hosted author—and retired USAF lieutenant colonel—Dan Hampton for a signing of his latest book, *The Flight: Charles Lindbergh's Daring and Immortal 1927 Transatlantic Crossing*.

Hampton was an F-16 pilot before retiring in 2006 and wrote about the Wild Weasel role in Desert Storm in *Air Force Magazine's* July 1991 edition.

—Susan Loricchio

## UTAH AFA

Jointly sponsored by **Utah AFA/Aerospace Education Foundation** and the Air Force Sustainment Center, the 37th annual Utah Focus on

Defense took place in Ogden, Utah, this summer.

The theme, "Sustaining the Nuclear Triad," brought nearly 400 military, contractor, and civic leaders to the forum to discuss where and how the military should pursue upgrading the nuclear enterprise.

VIP guests included USAF Vice Chief of Staff Gen. Stephen Wilson; Air Force Global Strike Command's Gen. Robin Rand; Vice Adm. Charles Richard, deputy commander of US Strategic Command; and Utah Gov. Gary Herbert. Representatives from Boeing, Lockheed Martin, and Northrop Grumman provided the defense industry perspective.

—Robert George

## The Air Force Association's 12 Founders

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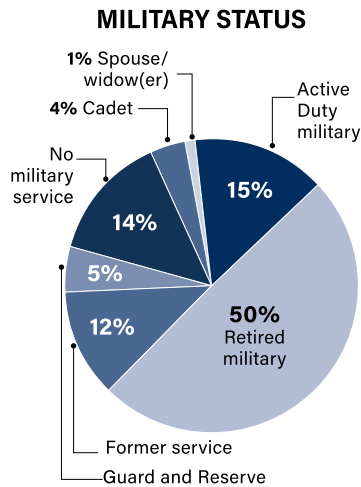
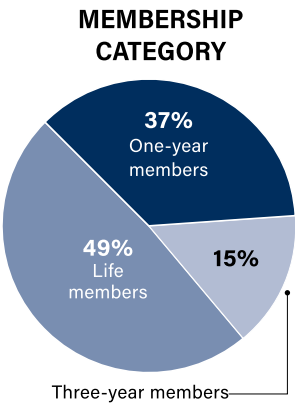
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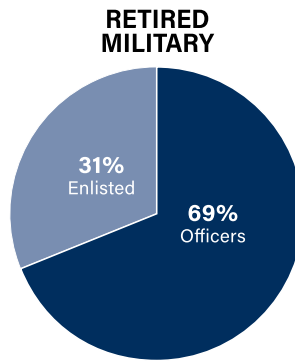
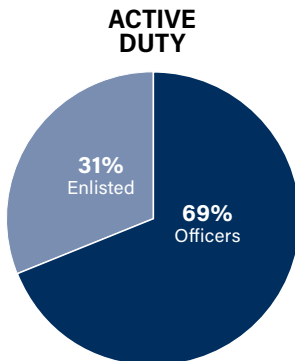
JOHN HAY WHITNEY  
New York

## Profiles of AFA Membership

As of June 2017. Total 90,970. Numbers are rounded.



### OF AFA'S SERVICE MEMBERS WHO LIST THEIR RANK:



## AFA Membership Statistics

1946	51,243	32	1982	179,149	7,381
1947	104,750	55	1983	198,563	13,763
1948	56,464	68	1984	218,512	18,012
1949	43,801	70	1985	228,621	23,234
1950	38,948	79	1986	232,722	27,985
1951	34,393	81	1987	237,279	30,099
1952	30,716	356	1988	219,195	32,234
1953	30,392	431	1989	204,309	34,182
1954	34,486	435	1990	199,851	35,952
1955	40,812	442	1991	194,312	37,561
1956	46,250	446	1992	191,588	37,869
1957	51,328	453	1993	181,624	38,604
1958	48,026	456	1994	175,122	39,593
1959	50,538	458	1995	170,881	39,286
1960	54,923	464	1996	161,384	39,896
1961	60,506	466	1997	157,862	41,179
1962	64,336	485	1998	152,330	41,673
1963	78,034	488	1999	148,534	42,237
1964	80,295	504	2000	147,336	42,434
1965	82,464	514	2001	143,407	42,865
1966	85,013	523	2002	141,117	43,389
1967	88,995	548	2003	137,035	42,730
1968	97,959	583	2004	133,812	42,767
1969	104,886	604	2005	131,481	43,094
1970	104,878	636	2006	127,749	43,266
1971	97,639	674	2007	125,076	43,256
1972	109,776	765	2008	123,304	43,557
1973	114,894	804	2009	120,507	43,782
1974	128,995	837	2010	117,480	43,954
1975	139,168	898	2011	111,479	44,182
1976	148,202	975	2012	106,780	43,686
1977	155,850	1,281	2013	102,540	43,851
1978	148,711	1,541	2014	96,017	43,720
1979	147,136	1,869	2015	92,829	43,936
1980	156,394	2,477	2016	93,379	44,074
1981	170,240	3,515	2017	90,970	44,083

# AFA Awards

## DONALD W. STEELE SR. MEMORIAL AWARD

Air Force Association unit of the year

Year	Award Recipient(s)	Year	Award Recipient(s)
1953	San Francisco Chapter	1985	Cape Canaveral Chapter (Fla.)
1954	Santa Monica Area Chapter (Calif.)	1986	Charles A. Lindbergh Chapter (Conn.)
1955	San Fernando Valley Chapter (Calif.)	1987	Carl Vinson Memorial Chapter (Ga.)
1956	Utah State AFA	1988	Gen. David C. Jones Chapter (N.D.)
1957	H. H. Arnold Chapter (N.Y.)	1989	Thomas B. McGuire Jr. Chapter (N.J.)
1958	San Diego Chapter	1990	Gen. E. W. Rawlings Chapter (Minn.)
1959	Cleveland Chapter	1991	Paul Revere Chapter (Mass.)
1960	San Diego Chapter	1992	Central Florida Chapter and Langley Chapter (Va.)
1961	Chico Chapter (Calif.)	1993	Green Valley Chapter (Ariz.)
1962	Fort Worth Chapter (Texas)	1994	Langley Chapter (Va.)
1963	Colin P. Kelly Chapter (N.Y.)	1995	Baton Rouge Chapter (La.)
1964	Utah State AFA	1996	Montgomery Chapter (Ala.)
1965	Idaho State AFA	1997	Central Florida Chapter
1966	New York State AFA	1998	Ark-La-Tex Chapter (La.)
1967	Utah State AFA	1999	Hurlburt Chapter (Fla.)
1968	Utah State AFA	2000	Wright Memorial Chapter (Ohio)
1969	(No presentation)	2001	Lance P. Sijan Chapter (Colo.)
1970	Georgia State AFA	2002	Eglin Chapter (Fla.)
1971	Middle Georgia Chapter	2003	Hurlburt Chapter (Fla.)
1972	Utah State AFA	2004	Carl Vinson Memorial Chapter (Ga.)
1973	Langley Chapter (Va.)	2005	Central Florida Chapter
1974	Texas State AFA	2006	Enid Chapter (Okla.)
1975	Alamo Chapter (Texas) and San Bernardino Area Chapter (Calif.)	2007	Central Oklahoma (Gerrity) Chapter
1976	Scott Memorial Chapter (Ill.)	2008	Lance P. Sijan Chapter (Colo.)
1977	Thomas B. McGuire Jr. Chapter (N.J.)	2009	Paul Revere Chapter (Mass.)
1978	Thomas B. McGuire Jr. Chapter (N.J.)	2010	C. Farinha Gold Rush Chapter (Calif.)
1979	Brig. Gen. Robert F. Travis Chapter (Calif.)	2011	Lance P. Sijan Chapter (Colo.)
1980	Central Oklahoma (Gerrity) Chapter	2012	Hurlburt Chapter (Fla.)
1981	Alamo Chapter (Texas)	2013	Paul Revere Chapter (Mass.)
1982	Chicagoland-O'Hare Chapter (Ill.)	2014	D. W. Steele Sr. Memorial Chapter (Va.)
1983	Charles A. Lindbergh Chapter (Conn.)	2015	Lance P. Sijan Chapter (Colo.)
1984	Scott Memorial Chapter (Ill.) and Colorado Springs/Lance Sijan Chapter (Colo.)	2016	Paul Revere Chapter (Mass.)
		2017	Enid Chapter (Okla.)

## JOHN R. ALISON AWARD

AFA's highest honor for industrial leadership.

Year	Award Recipient(s)	Year	Award Recipient(s)
1992	Norman R. Augustine, Chairman, Martin Marietta	2004	Thomas J. Cassidy Jr., Pres. and CEO, General Atomics Aeronautical Systems
1993	Daniel M. Tellep, Chm. and CEO, Lockheed	2005	Richard Branson, Chm., Virgin Atlantic Airways and Virgin Galactic
1994	Kent Kresa, CEO, Northrop Grumman	2006	Ronald D. Sugar, Chm. and CEO, Northrop Grumman
1995	C. Michael Armstrong, Chm. and CEO, Hughes Aircraft	2007	Boeing and Lockheed Martin
1996	Harry Stonecipher, Pres. and CEO, McDonnell Douglas	2008	Bell Boeing CV-22 Team, Bell Helicopter Textron, and Boeing
1997	Dennis J. Picard, Chm. and CEO, Raytheon	2009	General Atomics Aeronautical Systems Inc.
1998	Philip M. Condit, Chm. and CEO, Boeing	2010	Raytheon
1999	Sam B. Williams, Chm. and CEO, Williams International	2011	United Launch Alliance
2000	Simon Ramo and Dean E. Wooldridge, missile pioneers	2012	Boeing
2001	George David, Chm. and CEO, United Technologies	2013	X-51A WaveRider Program, Boeing, Aerojet Rocketdyne, and Air Force Research Laboratory
2002	Sydney Gillibrand, Chm., AMEC; and Jerry Morgensen, Pres. and CEO, Hensel Phelps Construction	2014	C-17 Globemaster III, Boeing
2003	Joint Direct Attack Munition Industry Team, Boeing	2015	F-22 Raptor, Lockheed Martin
		2016	SpaceX
		2017	Northrop Grumman

## AFA MEMBER OF THE YEAR AWARD

Year	Award Recipient(s)	Year	Award Recipient(s)
1953	Julian B. Rosenthal (N.Y.)	1985	George H. Chhabott (Del.) and Hugh L. Enyart (Ill.)
1954	George A. Anderl (Ill.)	1986	John P. E. Kruse (N.J.)
1955	Arthur C. Storz (Neb.)	1987	Jack K. Westbrook (Tenn.)
1956	Thos. F. Stack (Calif.)	1988	Charles G. Durazo (Va.)
1957	George D. Hardy (Md.)	1989	Oliver R. Crawford (Texas)
1958	Jack B. Gross (Pa.)	1990	Cecil H. Hopper (Ohio)
1959	Carl J. Long (Pa.)	1991	George M. Douglas (Colo.)
1960	O. Donald Olson (Colo.)	1992	Jack C. Price (Utah)
1961	Robert P. Stewart (Utah)	1993	Lt. Col. James G. Clark (D.C.)
1962	(No presentation)	1994	William A. Lafferty (Ariz.)
1963	N. W. DeBerardinis (La.) and Joe L. Shosid (Texas)	1995	William N. Webb (Okla.)
1964	Maxwell A. Kriendler (N.Y.)	1996	Tommy G. Harrison (Fla.)
1965	Milton Caniff (N.Y.)	1997	James M. McCoy (Neb.)
1966	William W. Spruance (Del.)	1998	Ivan L. McKinney (La.)
1967	Sam E. Keith Jr. (Texas)	1999	Jack H. Steed (Ga.)
1968	Marjorie O. Hunt (Mich.)	2000	Mary Anne Thompson (Va.)
1969	(No presentation)	2001	Charles H. Church Jr. (Kan.)
1970	Lester C. Curl (Fla.)	2002	Thomas J. Kemp (Texas)
1971	Paul W. Gaillard (Neb.)	2003	W. Ron Goerges (Ohio)
1972	J. Raymond Bell (N.Y.) and Martin H. Harris (Fla.)	2004	Doyle E. Larson (Minn.)
1973	Joe Higgins (Calif.)	2005	Charles A. Nelson (S.D.)
1974	Howard T. Markey (D.C.)	2006	Craig E. Allen (Utah)
1975	Martin M. Ostrow (Calif.)	2007	William D. Croom Jr. (Texas)
1976	Victor R. Kregel (Texas)	2008	John J. Politi (Texas)
1977	Edward A. Stearn (Calif.)	2009	David R. Cummock (Fla.)
1978	William J. Demas (N.J.)	2010	L. Boyd Anderson (Utah)
1979	Alexander C. Field Jr. (Ill.)	2011	Steven R. Lundgren (Alaska)
1980	David C. Noerr (Calif.)	2012	S. Sanford Schlitt (Fla.)
1981	Daniel F. Callahan (Fla.)	2013	Tim Brock (Fla.)
1982	Thomas W. Anthony (Md.)	2014	James W. Simons (N.D.)
1983	Richard H. Becker (Ill.)	2015	James R. Lauducci (Va.)
1984	Earl D. Clark Jr. (Kan.)	2016	David T. Buckwalter (Texas)
		2017	James T. Hannam (Va.)

State names refer to recipient's home state at the time of the award.

## AFA CHAIRMAN'S AEROSPACE

### EDUCATION ACHIEVEMENT AWARD

For long-term commitment to aerospace education, making a significant impact nationwide.

Year	Award Recipient(s)	Year	Award Recipient(s)
2009	ExxonMobil Foundation	2014	Department of Defense STARBASE Program
2010	USA Today	2015	Northrop Grumman Foundation
2011	The National Science Foundation	2016	Harry Talbot
2012	The Military Channel	2017	Analytical Graphics, Inc.
2013	The Civil Air Patrol Aerospace Education Program		

## GOLD LIFE MEMBER CARD

Awarded to members whose AFA record, production, and accomplishment on a national level have been outstanding over a period of years.

Name	Year	Card No.	Name	Year	Card No.
Gill Robb Wilson	1957	1	Sam E. Keith Jr.	1990	12
Jimmy Doolittle	1959	2	Edward A. Stearn	1992	13
Arthur C. Storz Sr.	1961	3	Dorothy L. Flanagan	1994	14
Julian B. Rosenthal	1962	4	John O. Gray	1996	15
Jack B. Gross	1964	5	Jack C. Price	1997	16
George D. Hardy	1965	6	Nathan H. Mazer	2002	17
Jess Larson	1967	7	John R. Alison	2004	18
Robert W. Smart	1968	8	Donald J. Harlin	2009	19
Martin M. Ostrow	1973	9	James M. McCoy	2013	20
James H. Straubel	1980	10	George M. Douglas	2014	21
Martin H. Harris	1988	11	John A. Shaud	2016	22

# AFA Awards (cont.)

## H. H. ARNOLD AWARD

Named for the World War II leader of the Army Air Forces, the H. H. Arnold Award has been presented annually in recognition of the most outstanding contributions in the field of aerospace activity. Since 1986, it has been AFA's highest honor to a member of the armed forces in the field of national defense.

Year	Award Recipient(s)	Year	Award Recipient(s)
1948	W. Stuart Symington, Secretary of the Air Force	1982	Gen. Lew Allen Jr., USAF (Ret.), former Chief of Staff
1949	Maj. Gen. William H. Tunner and the men of the Berlin Airlift	1983	Ronald W. Reagan, President of the United States
1950	Airmen of the United Nations in the Far East	1984	The President's Commission on Strategic Forces (Scowcroft Commission)
1951	Gen. Curtis E. LeMay and the personnel of Strategic Air Command	1985	Gen. Bernard W. Rogers, USA, SACEUR
1952	Sen. Lyndon B. Johnson and Sen. Joseph C. O'Mahoney	1986	Gen. Charles A. Gabriel, USAF (Ret.), former Chief of Staff
1953	Gen. Hoyt S. Vandenberg, USAF (Ret.), former Chief of Staff	1987	Adm. William J. Crowe Jr., USN, Chm., Joint Chiefs of Staff
1954	John Foster Dulles, Secretary of State	1988	Men and women of the Ground-Launched Cruise Missile team
1955	Gen. Nathan F. Twining, Chief of Staff, USAF	1989	Gen. Larry D. Welch, Chief of Staff, USAF
1956	Sen. W. Stuart Symington	1990	Gen. John T. Chain, CINC, SAC
1957	Edward P. Curtis, special assistant to the President	1991	Lt. Gen. Charles A. Horner, Cmdr., CENTCOM Air Forces and 9th Air Force
1958	Maj. Gen. Bernard A. Schriever, Cmdr., Ballistic Missile Div., ARDC	1992	Gen. Colin L. Powell, USA, Chm., Joint Chiefs of Staff
1959	Gen. Thomas S. Power, CINC, SAC	1993	Gen. Merrill A. McPeak, Chief of Staff, USAF
1960	Gen. Thomas D. White, Chief of Staff, USAF	1994	Gen. John Michael Loh, Cmdr., Air Combat Command
1961	Lyle S. Garlock, Assistant SECAF	1995	World War II Army Air Forces veterans
1962	A. C. Dickieson and John R. Pierce, Bell Telephone Laboratories	1996	Gen. Ronald R. Fogleman, Chief of Staff, USAF
1963	The 363rd Tactical Recon. Wing and the 4080th Strategic Wing	1997	Men and women of the United States Air Force
1964	Gen. Curtis E. LeMay, Chief of Staff, USAF	1998	Gen. Richard E. Hawley, Cmdr., ACC
1965	The 2nd Air Division, PACAF	1999	Lt. Gen. Michael C. Short, Cmdr., Allied Air Forces Southern Europe
1966	The 8th, 12th, 355th, 366th, and 388th Tactical Fighter Wings and the 432nd and 460th TRWs	2000	Gen. Michael E. Ryan, Chief of Staff, USAF
1967	Gen. William W. Momyer, Cmdr., 7th Air Force, PACAF	2001	Gen. Joseph W. Ralston, CINC, EUCOM
1968	Col. Frank Borman, USAF; Capt. James Lovell, USN; and Lt. Col. William Anders, USAF, Apollo 8 crew	2002	Gen. Richard B. Myers, USAF, Chm., Joint Chiefs of Staff
1969	(No presentation)	2003	Lt. Gen. T. Michael Moseley, Cmdr., air component, CENTCOM, and 9th Air Force
1970	Apollo 11 team (J. L. Atwood; Lt. Gen. S. C. Phillips, USAF; and astronauts Neil Armstrong and USAF Cols. Buzz Aldrin and Michael Collins)	2004	Gen. John P. Jumper, Chief of Staff, USAF
1971	John S. Foster Jr., Dir. of Defense Research and Engineering	2005	Gen. Gregory S. Martin, USAF (Ret.), former Cmdr., AFMC
1972	Air units of the allied forces in Southeast Asia (Air Force, Navy, Army, Marine Corps, and the Vietnamese Air Force)	2006	Gen. Lance W. Lord, USAF (Ret.), former Cmdr., AFSPC
1973	Gen. John D. Ryan, USAF (Ret.), former Chief of Staff	2007	Gen. Ronald E. Keys, Cmdr., ACC
1974	Gen. George S. Brown, USAF, Chm., Joint Chiefs of Staff	2008	Gen. Bruce Carlson, Cmdr., AFMC
1975	James R. Schlesinger, Secretary of Defense	2009	Gen. John D. W. Corley, Cmdr., ACC
1976	Sen. Barry M. Goldwater	2010	Lt. Gen. David A. Deptula, USAF Deputy Chief of Staff, ISR
1977	Sen. Howard W. Cannon	2011	Gen. Duncan J. McNabb, Cmdr., TRANSCOM
1978	Gen. Alexander M. Haig Jr., USA, Supreme Allied Commander, Europe	2012	Gen. Norton A. Schwartz, USAF (Ret.), former Chief of Staff
1979	Sen. John C. Stennis	2013	Gen. Douglas M. Fraser, USAF (Ret.), former Cmdr., SOUTHCOM
1980	Gen. Richard H. Ellis, USAF, CINC, SAC	2014	Gen. C. Robert Kehler, USAF (Ret.), former Cmdr., STRATCOM
1981	Gen. David C. Jones, USAF, Chm., Joint Chiefs of Staff	2015	Gen. Janet C. Wolfenbarger, USAF (Ret.), former Cmdr., AFMC
		2016	Gen. Mark A. Welsh III, USAF (Ret.), former Chief of Staff
		2017	Lt. Gen. Christopher C. Bogdan, USAF (Ret.), former PEO, F-35 Prgm

## W. STUART SYMINGTON AWARD

AFA's highest honor to a civilian in the field of national security, the award is named for the first Secretary of the Air Force.

Year	Award Recipient(s)	Year	Award Recipient(s)
1986	Caspar W. Weinberger, Secretary of Defense	2002	Rep. James V. Hansen (R-Utah)
1987	Edward C. Aldridge Jr., Secretary of the Air Force	2003	James G. Roche, SECAF
1988	George P. Schultz, Secretary of State	2004	Peter B. Teets, Undersecretary of the Air Force
1989	Ronald W. Reagan, former President of the United States	2005	Rep. Duncan Hunter (R-Calif.)
1990	John J. Welch, Asst. SECAF (Acquisition)	2007	Michael W. Wynne, SECAF
1991	George Bush, President of the United States	2008	Gen. Barry R. McCaffrey, USA (Ret.)
1992	Donald B. Rice, SECAF	2009	Sen. Orrin G. Hatch (R-Utah)
1993	Sen. John McCain (R-Ariz.)	2010	John J. Hamre, Center for Strategic & International Studies
1994	Rep. Ike Skelton (D-Mo.)	2011	Rep. C. W. "Bill" Young (R-Fla.)
1995	Sheila E. Widnall, SECAF	2012	Gen. James L. Jones, USMC (Ret.)
1996	Sen. Ted Stevens (R-Alaska)	2013	Michael B. Donley, SECAF
1997	William Perry, former SECDEF	2014	Ashton B. Carter, former Deputy SECDEF
1998	Rep. Saxby Chambliss (R-Ga.) and Rep. Norman D. Dicks (D-Wash.)	2015	William A. LaPlante, Asst. SECAF (Acquisition)
1999	F. Whitten Peters, SECAF	2016	Jamie M. Morin, Director, Cost Assessment & Prgm Evaluation
2000	Rep. Floyd Spence (R-S.C.)	2017	Lisa S. Disbrow, Undersecretary of the Air Force
2001	Sen. Michael Enzi (R-Wyo.) and Rep. Cliff Stearns (R-Fla.)		

## AFA LIFETIME ACHIEVEMENT AWARD

The award recognizes a lifetime of work in the advancement of aerospace.

Year	Award Recipient(s)
2003	Maj. Gen. John R. Alison, USAF (Ret.); Sen. John H. Glenn Jr.; Maj. Gen. Jeanne M. Holm, USAF (Ret.); Col. Charles E. McGee, USAF (Ret.); Gen. Bernard A. Schriever, USAF (Ret.)
2004	Gen. Russell E. Dougherty, USAF (Ret.); Florene Miller Watson
2005	Sen. Daniel K. Inouye; William J. Perry; Patty Wagstaff
2007	CMSAF Paul W. Airey, USAF (Ret.)
2008	Col. George E. Day, USAF (Ret.); Gen. David C. Jones, USAF (Ret.); Harold Brown
2009	Doolittle Raiders; Tuskegee Airmen; James R. Schlesinger
2010	Col. Walter J. Boyne, USAF (Ret.); Andrew W. Marshall; Gen. Lawrence A. Skantze, USAF (Ret.); Women Airforce Service Pilots
2011	Natalie W. Crawford; Lt. Gen. Thomas P. Stafford, USAF (Ret.); Gen. Larry D. Welch, USAF (Ret.); Heavy Bombardment Crews of WWII; Commando Sabre Operation—Call Sign Misty
2012	Gen. James P. McCarthy, USAF (Ret.); Vietnam War POWs; Berlin Airlift Aircrews; Korean War Airmen; Fighter Pilots of World War II
2013	Maj. Gen. Joe H. Engle, USAF (Ret.); US Rep. Sam Johnson; The Arlington Committee of the Air Force Officers' Wives' Club—"The Arlington Ladies"
2014	Brig. Gen. James A. McDivitt, USAF (Ret.); Civil Air Patrol—World War II veterans; American Fighter Aces
2015	R. A. "Bob" Hoover; Eugene F. "Gene" Kranz; Gen. Michael V. Hayden, USAF (Ret.)
2016	Maj. Gen. Claude M. Bolton Jr., USAF (Ret.); Lt. Col. John T. Correll, USAF (Ret.); Gen. Charles A. Horner, USAF (Ret.); Lt. Gen. James M. Keck, USAF (Ret.); Gen. Richard B. Myers, USAF (Ret.)
2017	Gen. Ronald R. Fogleman, USAF (Ret.); Col. Clarence E. "Bud" Anderson, USAF (Ret.); Elinor Otto; Lafayette Escadrille Memorial Foundation

## DOTTIE FLANAGAN STAFF AWARD OF THE YEAR

A donation from the late Jack B. Gross, national director emeritus, enables quarterly and staff member of the year awards.

Year	Award Recipient(s)	Year	Award Recipient(s)	Year	Award Recipient(s)
1992	Doreatha Major	2001	Katie Doyle	2010	Bridget Wagner
1993	Jancy Bell	2002	Jeneathia Wright	2011	Merri Shaffer
1994	Gilbert Burgess	2003	Jim Brown	2012	Caitie Craumer
1995	David Huynh	2004	Pearlie Draughn	2013	Pamela Braithwaite
1996	Sherry Coombs	2005	Ursula Smith	2014	Bridget Dongu
1997	Katherine DuGarm	2006	Susan Rubel	2015	Nathaniel Davis
1998	Suzann Chapman	2007	Ed Cook	2016	Amanda L. Grandel
1999	Frances McKenney	2008	Michael Davis		
2000	Ed Cook	2009	Chris Saik		

### Aerospace Awards

#### AWARDS AND RECIPIENTS

##### **David C. Schilling Award**

Most outstanding contribution in the field of flight  
492nd Fighter Squadron, RAF Lakenheath, UK

##### **Theodore von Karman Award**

Most outstanding contribution in the field of science and engineering  
Capt. Eric Robinson, JB Pearl Harbor-Hickam, Hawaii

##### **Gill Robb Wilson Award**

Most outstanding contribution in the field of arts and letters  
1st Combat Camera Squadron, JB Charleston, S.C.

##### **Hoyt S. Vandenberg Award**

Most outstanding contribution in the field of aerospace education  
Lt. Gen. Steven Kwast, Maxwell AFB, Ala.

##### **Thomas P. Gerrity Award**

Most outstanding contribution in the field of systems and logistics  
Lt. Col. Michael Boswell, Eglin AFB, Fla.

##### **General Billy Mitchell Award for C4 Excellence**

C4 professional who most enhanced the US Air Force's warfighting capability  
Capt. Larry Stevens Jr., JB Pearl Harbor-Hickam, Hawaii

##### **Lieutenant General Claire Lee Chennault Award**

For outstanding aerial warfare tactician(s) from ACC, PACAF, USAFE, ANG and AFRC

Lt. Col. Richard Meziere Jr., Gowen Field, Idaho

##### **General Larry D. Welch Award-Officer**

Most significant impact by an individual on the overall operations, safety, security, and effectiveness of the Air Force nuclear mission  
Col. Scott Jones, Hill AFB, Utah

##### **General Larry D. Welch Award-Enlisted**

Most significant impact by an individual on the overall operations, safety, security, and effectiveness of the Air Force nuclear mission  
SMSgt. Morgan Ard, Aviano AB, Italy

##### **General Larry D. Welch Award-Civilian**

Most significant impact by an individual on the overall operations, safety, security, and effectiveness of the Air Force nuclear mission  
David Phillips, Malmstrom AFB, Mont.

##### **General George C. Kenney Award**

Most significant contribution by an individual or team in the area of lessons learned  
USAFCENT Air Advisor Assessment Team, Shaw AFB, S.C.

##### **Joan Orr Spouse of the Year Award**

For civilian spouses of military members for their significant contributions to the United States Air Force  
Alicia Barnett, US Air Forces in Europe, Ramstein AB, Germany

##### **Chief Master Sergeant of the Air Force Thomas N. Barnes Award**

Most outstanding aircraft crew chief in the United States Air Force  
TSgt. Nathan Tierney, 51st Maintenance Squadron, Osan AB, South Korea

### Professional, Civilian, Education, Management, and Environmental Awards

#### AWARDS AND RECIPIENTS

##### **AFMC Management Award - Executive Division**

Hugh Foskey, Supply Chain Management Group, Robins AFB, Ga.

##### **AFMC Management Award - Middle Division\***

April West, 422nd Supply Chain Management, Tinker AFB, Okla.

##### **AFMC Management Award- Junior Division\***

Capt. Kathryn Kenan, Air Force Installation and Support Center, Ramstein AB, Germany

##### **USAFA Cadet of the Year**

Cadet Benjamin Hook, Colorado Springs, Colo.

##### **AFROTC Cadet of the Year**

Cadet Alexander Jones, Detachment 805, Texas A&M, Texas

##### **CAP Aerospace Education Cadet of the Year**

C/Capt. Casey Owen, Eau Claire Composite Squadron, Wis.

##### **Chaplain Corps Award**

Capt. Brian Musselman, JB Elmendorf-Richardson, Alaska

##### **Paul W. Myers Award for Physicians**

Maj. Matthew Brock, JBSA-Lackland, Texas

##### **Juanita Redmond Award for Nursing**

1st Lt. Owen Caron, Keesler AFB, Miss.

##### **Stuart R. Reichart Award for Lawyers**

Col. Roger Drew, JB Andrews, Md.

##### **Verne Orr Award for Effective Utilization of Human Resources**

18th Wing, Kadena AB, Japan

##### **Civilian Senior Manager of the Year**

William Stewart Jr., 86th Airlift Wing, Ramstein AB, Germany

##### **Civilian Program Manager of the Year\***

Marsha Gonzales, HQ AFPC, Randolph AFB, Texas

##### **Civilian Program Specialist of the Year\***

Jared Kleiman, 48th Logistics Readiness Squadron, Ramstein AB, Germany

##### **Civilian Wage Employee of the Year\***

Timothy Cowsert, 509th Maintenance Squadron, Whiteman AFB, Mo.

##### **Gen. Edwin W. Rawlings Award - Management\***

Christian De La Rosa, 502nd Civil Engineering Squadron, JBSA-Lackland, Texas

\* presented at recipient's location

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## Citations of Honor

### RECIPIENTS AND ACHIEVEMENTS

Information Exploitation Squadron, Wright-Patterson AFB, Ohio  
The Information Exploitation Squadron's four operationally diverse missions made significant contributions to national defense, striking deep into the enemy's strategic and tactical centers of gravity. Its timely signals intelligence, open source, and translation capabilities addressed top Chief of Staff and combatant command priorities. The squadron's products armed tactical warfighters and national-level policy-makers with actionable adversary intelligence, which resulted in optimized targeting, collection, and exploitation strategies throughout three combatant commands.

75th Aircraft Maintenance Unit, Moody AFB, Ga.  
The 75th Aircraft Maintenance Squadron accomplished 22 phases with a stellar 92 percent pass rate, ensuring 100 percent of air tasking orders were met in support of Operation Inherent Resolve. Additionally, the unit supported allied ground forces for Operations Talon Anvil and Tidal Wave II, destroying 389 trucks, halting \$40 million per month revenue stream, and enabling air support that liberated 25 percent of Islamic State of Iraq and Levant-held territory.

17th Special Tactics Squadron, Fort Benning, Ga.  
The 17th Special Tactics Squadron was consistently deployed for a combined total of 4,015 days, providing synergistic effects to ground force commanders in Afghanistan. The 17th led multiple medical evacuations, combat resupplies, close air support missions, and hostage rescues. They provided valuable training to partner units including Army Rangers and combat Air Force fighter units.

## Air Force Awards

### AWARDS AND RECIPIENTS

#### General Larry O. Spencer Innovation Award - Individual

MSgt. Andrew Kehl, Spangdahlem AB, Germany

#### General Larry O. Spencer Innovation Award - Team

Logistics Information Technology Innovation Team, The Pentagon, Va.

#### International Affairs Excellence Award

Officer - Lt. Col. Geoffrey Brasse; Enlisted - MSgt. Manuel Chavez;  
Senior Civilian - Marvin Mens; Junior Civilian - Jose Mandujano

## Air Reserve Component Awards

### AIR NATIONAL GUARD AWARDS AND RECIPIENTS

#### Earl T. Ricks Award

Outstanding ANG airmanship  
Maj. John Hourigan, 123rd Operations Support Squadron Kentucky ANG

#### CMSgt. Dick Red Award

Best ANG maintainer  
SMSgt. John Wardrip, 123rd Munitions Group, Kentucky ANG

#### Outstanding ANG Unit

Best ANG unit airmanship  
128th Air Refueling Wing, Wisconsin ANG

#### George W. Bush Award - Enlisted

MSgt. Jason Sanderson, 123rd Contingency Response Wing, Kentucky ANG

## Crew and Team Awards

### AWARDS AND RECIPIENTS

#### Lt. Gen. Howard W. Leaf Award

Best test team  
31st Test and Evaluation Squadron, Edwards AFB, Calif.

#### Lt. Gen. William H. Tunner Award

Best airlift crew  
Crew of Arson 56, RAF Mildenhall, UK

#### Brig. Gen. Ross G. Hoyt Award

Best air refueling crew  
Crew of Jakal 11, Kadena AB, Japan

#### Gen. John P. Jumper Award

Best remotely piloted aircraft crew in USAF  
Pilot: Maj. Brad Delloiacono; Sensor Operator: MSgt. JaMacus Joseph;  
Mission Intelligence Coordinator: Capt. Caroline Ojerio-Lannigan

#### Gen. Curtis E. LeMay Award

Best bomber aircrew  
Crew of Grim 13, Barksdale AFB, La.

#### Gen. Thomas S. Power Award

Best missile combat crew  
321st Missile Squadron, F. E. Warren AFB, Wyo.

#### Gen. Jerome F. O'Malley

Best reconnaissance crew  
Crew of Python 72, 55th Wing, Offutt AFB, Neb.

#### Best Space Operations Crew

ECHO "Executioners" Crew, Vandenberg AFB, Calif.

#### Airborne Battle Management Crew

Crew Four, Robins AFB, Ga.

#### BAVA Humanitarian Mission of the Year Award

Most outstanding humanitarian mission  
Crew of Reach 184, 6th Airlift Squadron, JB McGuire-Dix-Lakehurst, N.J.

## AIR FORCE RESERVE COMMAND AWARDS AND RECIPIENTS

#### President's Award for AFRC

Best AFRC flying unit or individual of the year  
Crew of Glide 68, 302nd Operations Group, Peterson AFB, Colo.

#### AFRC Unit Award

Best AFRC wing of the year  
914th Airlift Wing, Niagara Falls ARS, N.Y.

## Outstanding State Organization

Florida

President Bill Yucuis

### Outstanding Chapters by Size

#### Small Chapter

##### **Cochise Chapter, Ariz.**

President Stuart Carter

#### Medium Chapter

##### **Delaware Galaxy Chapter, Del.**

President John Murphy

#### Large Chapter

##### **Northern Utah Chapter, Utah**

President Randy Tymofichuk

#### Extra Large Chapter

##### **Lance P Sijan Chapter, Colo.**

President Kristen Christy

### Aerospace Education Excellence Award

Presented for excellence in aerospace education programming. To qualify, a chapter must have received the Aerospace Education Achievement Award this year.

#### Extra Large Chapter

##### **Ak-Sar-Ben Chapter, Neb.**

President Chris Canada

### Aerospace Education Achievement Award

Presented to chapters for outstanding achievement in aerospace education programming.

#### Montgomery Chapter, Ala.

President Patrick Albrecht

#### Martin H. Harris Chapter, Fla.

President Gary Lehmann

#### Tennessee Valley Chapter, Ala.

President Rick Driesbach

#### Wright Memorial Chapter, Ohio

President Ken Curell

#### Lincoln Chapter, Neb.

President Richard Holdcroft

#### Ak-Sar-Ben Chapter, Neb.

President Chris Canada

#### Lance P Sijan Chapter, Colo.

President Kristen Christy

#### Mel Harmon Chapter, Colo.

President Margaret Eichman

#### Paul Revere Chapter, Mass.

President Jamie Thurber

#### Northern Utah Chapter, Utah

President Randy Tymofichuk

#### Ute Rocky Mountain Chapter, Utah

President Catherine Barker

#### D.W. Steele Chapter, Va.

President Michelle Ryan

#### Danville Chapter, Va.

President Gerald Hovatter

#### Richmond Chapter, Va.

President Harper S. Alford

#### Langley Chapter, Va.

President Buster Douglas

#### Blue Ridge Chapter, N.C.

President William D. Duncan

#### Gen. Charles A Gabriel Chapter, Va.

President Joe Burke

#### David C. Jones Chapter, N.D.

President Jim Simons

### Unit Exceptional Service Awards

#### Airmen and Family Programs

##### **Paul Revere Chapter, Mass.**

President Jamie Thurber

#### Best Single Program

##### **Richmond Chapter, Va.**

President Harper S. Alford

#### Roanoke Chapter, Va.

President Scott Van Cleef

#### Communiations

##### **Mel Harmon Chapter, Colo.**

President Margaret Eichman

#### Community Partners

##### **Enid Chapter, Okla.**

President Dan Ohnesorge

#### Community Relations

##### **Hurlburt Chapter, Fla.**

President James Connors

#### Overall Programming

##### **Paul Revere Chapter, Mass.**

President Jamie Thurber

#### Veterans Affairs

##### **Ak-Sar-Ben Chapter, Neb.**

President Chris Canada

### Jack Gross Award

Presented to the chapter in each size category with the highest number of new members as a percentage of chapter size at the beginning of the membership year. A minimum of 10 is required.

#### Small Chapter

##### **Altus Chapter, Okla.**

President Roderick Hill

#### Medium Chapter

##### **Enid Chapter, Okla.**

President Dan Ohnesorge

#### Large Chapter

##### **Northeast Texas Chapter, Texas**

President Vance Clarke

#### Extra Large Chapter

##### **Gen. E. W. Rawlings Chapter, Minn.**

President Daniel Murphy

#### Chapter Size Larger Than 1,100

##### **Frank Luke Chapter, Ariz.**

President Edward Logan

### Arthur C. Storz Sr. Membership Award

Presented to the AFA chapter producing the highest number of new members during the 12-month period ending June 30, 2017, as a percentage of total chapter membership as of July 1, 2016. This award is based on both the quantity of new members as well as sustained new member recruitment. A chapter must be chartered for at least three years to qualify.

#### Altus Chapter, Okla.

President Roderick Hill

## Community Partner Membership Awards

### GOLD AWARD

Presented to chapters whose Community Partners represent at least six percent of overall chapter membership, with a minimum number of Community Partners. The minimum number is determined by chapter size.

Montgomery Chapter, Ala.	Gen. David C. Jones Chapter, N.D.
Tennessee Valley Chapter, Ala.	Northeast Texas Chapter, Texas
Swamp Fox Chapter, S.C.	Meridian Chapter, Miss.
Mel Harmon Chapter, Colo.	Fairbanks Midnight Sun Chapter, Alaska
Cheyenne Cowboy Chapter, Wyo.	Enid Chapter, Okla.
Golden Triangle Chapter, Miss.	Happy Hooligan Chapter, N.D.
Altus Chapter, Okla.	Col. H. M. Bud West Chapter, Fla.
Fort Wayne Chapter, Ind.	

### ACHIEVEMENT AWARD

Presented in the field to chapters whose Community Partners represent at least three percent of overall chapter membership, with a minimum number of Community Partners. The minimum number is determined by chapter size.

Paul Revere Chapter, Mass.	McChord Field Chapter, Wash.
Shooting Star Chapter, N.J.	Eglin Chapter, Fla.
David D. Terry Jr. Chapter, Ark.	Hurlburt Chapter, Fla.

## Special Recognition Awards

### SUSTAINED NEW MEMBER RECRUITMENT

These chapters have attained the quarterly new member recruitment goal for three consecutive quarters, extending from October 2016 to June 2017.

Gen. Charles A. Horner Chapter, Iowa	Lawrence D. Bell Museum, Ind.
Inland Empire Chapter, Wash.	Fort Wayne Chapter, Ind.
Northern Utah Chapter, Utah	Paul Revere Chapter, Mass.
Ute Rocky Mountain Chapter, Utah	Gen. E. W. Rawlings Chapter, Minn.
Cheyenne Cowboy Chapter, Wyo.	Golden Triangle Chapter, Miss.
Tennessee Valley Chapter, Ala.	Gen. David C. Jones Chapter, N.D.
Northern Texas Chapter, Texas	Happy Hooligan Chapter, N.D.
Ramstein Chapter, Germany	Steel Valley Chapter, Ohio
Keystone Chapter, Japan	Altus Chapter, Okla.
Frank Luke Chapter, Ariz.	Enid Chapter, Okla.
Mel Harmon Chapter, Colo.	

### STATE GROWTH

This state realized a growth in total membership from June 2016 to June 2017.

Alabama

### CHAPTER GROWTH

These chapters have realized a growth in total membership from June 2016 to June 2017.

Aggieland Chapter, Texas	Golden Triangle Chapter, Miss.
Altoona Chapter, Pa.	Montgomery Chapter, Ala.
Cape Fear Chapter, N.C.	Northeast Iowa Chapter, Iowa
Everett R. Cook Chapter, Tenn.	Northeast Texas Chapter, Texas
Gen. Bruce K. Holloway Chapter, Tenn.	Prescott/Goldwater Chapter, Ariz.
Gen. Charles A. Gabriel Chapter, Va.	Roanoke Chapter, Va.
Gen. Charles A. Horner Chapter, Iowa	Shooting Star Chapter, N.J.
Gen. David C. Jones Chapter, N.D.	Steel Valley Chapter, Ohio

### REGION GROWTH

These regions have realized a growth in total membership from June 2016 to June 2017.

Central East	New England	Southeast
Florida	Northeast	Southwest
Great Lakes	Pacific	Texoma
Midwest	South Central	

## Chairman's Citation

MARK CHAPMAN	BOB GEORGE
BILL YUCUIS	LACY BIZIOS
TOM KOOGLER	MARK TARPLEY
PAUL LYONS	GARY COPSEY
RUSSELL KLATT	RICK HAMER

## Individual Awards by Region

### **Medal of Merit**

Dallas Kennedy  
Nikki Barry  
Regina Giles  
David Hartley  
Kennard Wiggins

### **Exceptional Service Award**

Mark Douglas  
Harper Alford  
Bill Oldham

### **Medal of Merit**

Dustin Lawrence

### **Medal of Merit**

Eddie Arroyo  
Thom Guthrie  
Clifford Palmer  
Dennis Krebs  
Colleen Smith

### **Exceptional Service Award**

Susan Ault-Davis  
Christina English  
Michael Farrell

### **Medal of Merit**

Ronald Axley  
Breck Woodard

### **Exceptional Service Award**

Bill Day

### **Medal of Merit**

Rick Holdcroft  
Thomas O'Shea  
Harley Thornton  
Jerry Thorius  
Paul Bekebrede

### **Exceptional Service Award**

Chris Canada

### **Medal of Merit**

Samuel Barnes

### **Exceptional Service Award**

Mike Therrien  
Ruthie Barnes

### **Medal of Merit**

William Wages  
Juan Vergara  
Marcus Gray  
Julia Eszlinger Jensen  
Bruce Roberts

### **Exceptional Service Award**

Randy Schwinler

### **Medal of Merit**

Raymond Donnelly  
Steve Latus  
Patrick Replogie

### **Exceptional Service Award**

William Fosina  
Ron Campbell

### **Medal of Merit**

Bill Houth  
Patricia Swan  
Shawn Swidecki

### **Exceptional Service Award**

Scott Fox  
Kirk Schmierer

### **Medal of Merit**

Betty McCoy  
Michael Manning  
Lee Alford  
Scott Patton  
Robert Harmon

### **Exceptional Service Award**

George Krym  
Jack Royster

### **Medal of Merit**

Larry Wells  
Linda Sturgeon  
Jackie Trotter

### **Exceptional Service Award**

Richard Devereaux

### **Medal of Merit**

Wally Saeger  
Roberta Oates  
Judith Logan  
Terry Sullivan  
Alan Berg

### **Exceptional Service Award**

Stu Carter  
Ed Logan

### **Medal of Merit**

Lori Earl  
Tom Peterson  
Paul Hendricks  
Nicole Owens  
Mitzi Morrison  
Steve Barnes  
Joe Sommers

### **Exceptional Service Award**

Sonya Yelbert  
Danny Ohnesorge  
Trey Johnson  
George Pankonin

## CyberPatriot Coach and Mentor

### **MENTOR OF THE YEAR**

#### **Rob Karas**

*Battlefield High School  
Haymarket, Va.*

### **COACH OF THE YEAR**

#### **Mandy Galante**

*Red Bank Regional High School  
Little Silver, N.J.*

## Chapter Retention Award

### **OVERALL RETENTION AWARD**

#### **Small Chapter**

**Gen. H. H. Arnold Memorial Chapter,  
Tenn.**

*President Claude Morse*

#### **Medium Chapter**

**Brig. Gen. Frederick W. Castle  
Chapter, N.J.**

*President George Filer*

#### **Large Chapter**

**Tennessee Valley Chapter, Ala.**

*President Frederick Driesbach*

#### **Extra Large Chapter**

**Austin Chapter, Texas**

*President Norman King*

#### **Chapter Size Larger Than 1,100**

**Gen. Charles A. Gabriel Chapter,  
Va.**

*President Joe Burke*

### **FIRST YEAR RETENTION AWARD**

#### **Small Chapter**

**Newport Blue & Gold Chapter, R.I.**

*President Paul Theriot*

#### **Medium Chapter**

**York-Lancaster Chapter, Pa.**

*President Edwin Hurston*

#### **Large Chapter**

**Tennessee Valley Chapter, Ala.**

*President Frederick Driesbach*

#### **Extra Large Chapter**

**Hawaii Chapter, Hawaii**

*President John Murphy*

#### **Chapter Size Larger Than 1,100**

**Wright Memorial Chapter, Ohio**

*President Kenneth Curell*



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# AFA Chairmen of the Board and National Presidents



**Jimmy Doolittle**  
President, 1946-47  
Chairman, 1947-49



**Edward P. Curtis**  
Chairman, 1946-47



**Thomas G. Lanphier Jr.**  
President, 1947-48  
Chairman, 1951-52



**C. R. Smith**  
President, 1948-49  
Chairman, 1949-50



**Robert S. Johnson**  
President, 1949-51



**Carl A. Spaatz**  
Chairman, 1950-51



**Harold C. Stuart**  
President, 1951-52  
Chairman, 1952-53



**Arthur F. Kelly**  
President, 1952-53  
Chairman, 1953-54



**George C. Kenney**  
President, 1953-54  
Chairman, 1954-55



**John R. Alison**  
President, 1954-55  
Chairman, 1955-56



**Gill Robb Wilson**  
President, 1955-56  
Chairman, 1956-57



**John P. Henebry**  
President, 1956-57  
Chairman, 1957-58



**Peter J. Schenk**  
President, 1957-59



**James M. Trail**  
Chairman, 1958-59



**Howard T. Markey**  
President, 1959-60  
Chairman, 1960-61



**Julian B. Rosenthal**  
Chairman, 1959-60



**Thos. F. Stack**  
President, 1960-61  
Chairman, 1961-62



**Joe Foss**  
President, 1961-62  
Chairman, 1962-63



**John B. Montgomery**  
President, 1962-63



**W. Randolph Lovelace II**  
President, 1963-64  
Chairman, 1964-65



**Jack B. Gross**  
Chairman, 1963-64



**Jess Larson**  
President, 1964-67  
Chairman, 1967-71



**Robert W. Smart**  
President, 1967-69



**George D. Hardy**  
President, 1969-71  
Chairman, 1966-67  
Chairman, 1971-72



**Martin M. Ostrow**  
President, 1971-73  
Chairman, 1973-75



**Joe L. Shosid**  
President, 1973-75  
Chairman, 1972-73  
Chairman, 1975-76



**George M. Douglas**  
President, 1975-77  
Chairman, 1977-79



**Gerald V. Hasler**  
President, 1977-79  
Chairman, 1976-77



**Victor R. Kregel**  
President, 1979-81  
Chairman, 1981-82



**Daniel F. Callahan**  
Chairman, 1979-81



**John G. Brosky**  
President, 1981-82  
Chairman, 1982-84



**David L. Blankenship**  
President, 1982-84  
Chairman, 1984-85



**Edward A. Stearn**  
Chairman, 1985-86



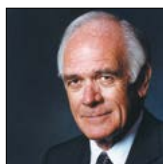
**Martin H. Harris**  
President, 1984-86  
Chairman, 1986-88



**Sam E. Keith Jr.**  
President, 1986-88  
Chairman, 1988-90



**Jack C. Price**  
President, 1988-90  
Chairman, 1990-92



**Oliver R. Crawford**  
President, 1990-92  
Chairman, 1992-94



**James M. McCoy**  
President, 1992-94  
Chairman, 1994-96



**Gene Smith**  
President, 1994-96  
Chairman, 1996-98



**Doyle E. Larson**  
President, 1996-98  
Chairman, 1998-2000



**Thomas J. McKee**  
President, 1998-2000  
Chairman, 2000-02



**John J. Politi**  
President, 2000-02  
Chairman, 2002-04



**Stephen P. Condon**  
President, 2002-04  
Chairman, 2004-06



**Robert E. Largent**  
President, 2004-06<sup>a</sup>  
Chairman, 2006-08<sup>b</sup>



**Joseph E. Sutter**  
Chairman, 2008-10



**S. Sanford Schlitt**  
Chairman, 2010-12



**George K. Muellner**  
Chairman, 2012-14



**Scott P. Van Cleef**  
Chairman, 2014-16



**F. Whitten Peters**  
Chairman, 2016-

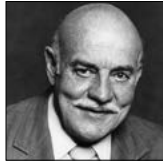
<sup>a</sup> The office of National President, an elected position, was disestablished in 2006.

<sup>b</sup> AFA's Chairman of the Board also serves as Chairman of both AFA affiliates, the AFA Veteran Benefits Association and the Air Force Memorial Foundation.

# AFA Executive Directors/Presidents/CEOs



**Willis S. Fitch**  
Executive Director  
1946-47



**James H. Straubel**  
Executive Director  
1948-80



**Russell E. Dougherty**  
Executive Director  
1980-86



**David L. Gray**  
Executive Director  
1986-87



**John O. Gray**  
Acting Executive Director  
1987-88, 1989-90



**Charles L. Donnelly Jr.**  
Executive Director  
1988-89



**Monroe W. Hatch Jr.**  
Executive Director  
1990-95



**John A. Shaud**  
Executive Director  
1995-2002



**Donald L. Peterson**  
Executive Director  
2002-06<sup>6</sup>  
President-CEO  
2006-07



**Michael M. Dunn**  
President-CEO  
2007-12



**Craig R. McKinley**  
President  
2012-15



**Mark A. Barrett**  
Acting President  
2015



**Larry O. Spencer**  
President  
2015-

<sup>6</sup> The position of Executive Director was replaced in 2006 by President-CEO. In 2012, the position was redesignated President.

## VICE CHAIRMEN FOR FIELD OPERATIONS

Joseph E. Sutter	2006-08
James R. Lauducci	2008-10
Justin M. Faiferlick	2010-12
Scott P. Van Cleef	2012-14
David A. Dietsch	2014-16
F. Gavin MacAloon	2016-

## VICE CHAIRMEN FOR AEROSPACE EDUCATION

L. Boyd Anderson	2006-07
S. Sanford Schlitt	2007-10
George K. Muellner	2010-12
Jerry E. White	2012-15
Richard B. Bundy	2015-

## NATIONAL SECRETARIES

Sol A. Rosenblatt	1946-47
Julian B. Rosenthal	1947-59
George D. Hardy	1959-66
Joseph L. Hodges	1966-68
Glenn D. Mishler	1968-70
Nathan H. Mazer	1970-72
Martin H. Harris	1972-76
Jack C. Price	1976-79
Earl D. Clark Jr.	1979-82
Sherman W. Wilkins	1982-85
A. A. "Bud" West	1985-87
Thomas J. McKee	1987-90
Thomas W. Henderson	1990-91
Mary Ann Seibel	1991-94
Mary Anne Thompson	1994-97
William D. Croom Jr.	1997-2000
Daniel C. Hendrickson	2000-03
Thomas J. Kemp	2003-06
Judy K. Church	2006-09
Joan Sell	2009-11
Edward W. Garland	2011-14
Marvin L. Tooman	2014-15
John T. Brock	2015-17

## NATIONAL TREASURERS

W. Deering Howe	1946-47
G. Warfield Hobbs	1947-49
Benjamin Brinton	1949-52
George H. Haddock	1952-53
Samuel M. Hecht	1953-57
Jack B. Gross	1957-62
Paul S. Zuckerman	1962-66
Jack B. Gross	1966-81
George H. Chabbott	1981-87
William N. Webb	1987-95
Charles H. Church Jr.	1995-2000
Charles A. Nelson	2000-05
Steven R. Lundgren	2005-10
Leonard R. Vernamonti	2010-14
Nora Ruebrook	2014-16
Charles L. Martin Jr.	2016
Steven R. Lundgren	2016-

# AFA's Regions, States, and Chapters

These figures indicate the number of affiliated members as of June 2017. Listed below the name of each region is the region president.

## CENTRAL EAST REGION 10,807

Tyler Johnson	
<b>Delaware</b>	<b>396</b>
Brig. Gen. Bill Spruance	105
Delaware Galaxy	291
<b>District of Columbia</b>	<b>366</b>
Nation's Capital	366
<b>Maryland</b>	<b>1,935</b>
Baltimore*	685
Central Maryland	416
Thomas W. Anthony	834
<b>Virginia</b>	<b>7,928</b>
Danville	37
Donald W. Steele Sr. Memorial	3,365
Gen. Charles A. Gabriel	1,321
Langley	1,795
Leigh Wade	86
Northern Shenandoah Valley	252
Richmond	497
Roanoke	280
Tidewater	295
<b>West Virginia</b>	<b>182</b>
Chuck Yeager	182

## FAR WEST REGION 8,016

Wayne R. Kauffman	
<b>California</b>	<b>7,329</b>
Bob Hope	511
Brig. Gen. Robert F. Travis	480
C. Farinha Gold Rush	944
David J. Price/Beale	285
Fresno*	422
Gen. B. A. Schriever Los Angeles	686
General Doolittle Los Angeles Area*	788
Golden Gate*	421
High Desert	138
Orange County/Gen. Curtis E. LeMay	487
Palm Springs	308
Robert H. Goddard	370
San Diego	644
Stan Hryn Monterey Bay	146
Tennessee Ernie Ford	418
William J. "Pete" Knight	281
<b>Hawaii</b>	<b>687</b>
Hawaii*	687

## FLORIDA REGION 7,662

William A. Yucuis	
<b>Florida</b>	<b>7,662</b>
Brig. Gen. James R. McCarthy	274
Cape Canaveral	811
Central Florida	1,011
Col. H. M. "Bud" West	202
Eglin	974
Falcon	462
Florida Highlands	249
Florida West Coast	266
Gold Coast	513
Hurlburt	718
Miami-Homestead	332
Red Tail Memorial	456
Tyndall	304
Waterman-Twinning	1,090

## GREAT LAKES REGION 6,001

Paul A. Lyons	
<b>Indiana</b>	<b>1,099</b>
Central Indiana	355
Fort Wayne	159
Grissom Memorial	161
Lawrence D. Bell Museum	169
P-47 Memorial Chapter	122
Southern Indiana	133
<b>Kentucky</b>	<b>621</b>
Gen. Russell E. Dougherty	373

Lexington	248
<b>Michigan</b>	<b>1,256</b>
Battle Creek	69
Lake Superior Northland	111
Lloyd R. Leavitt Jr.	263
Mount Clemens	813
<b>Ohio</b>	<b>3,025</b>
Capt. Eddie Rickenbacker Memorial*	469
Frank P. Lahm	330
Gen. Joseph W. Ralston	273
North Coast*	170
Steel Valley	113
Wright Memorial*	1,670

## MIDWEST REGION 5,569

Russell A. Klatt	
<b>Illinois</b>	<b>2,109</b>
Chicagoland-O'Hare	974
Scott Memorial	1,135
<b>Iowa</b>	<b>465</b>
Fort Dodge	31
Gen. Charles A. Horner	186
Northeast Iowa	193
Richard D. Kisling	55

## KANSAS 508

Lt. Erwin R. Bleckley	339
Maj. Gen. Edward R. Fry	169

## MISSOURI 1,354

Harry S. Truman	469
Spirit of St. Louis	486
Whiteman	399

## NEBRASKA 1,133

Ak-Sar-Ben	928
Lincoln	205

## NEW ENGLAND REGION 2,914

Kevin M. Grady	
<b>Connecticut</b>	<b>579</b>
Flying Yankees/Gen. George C. Kenney	350
Lindbergh/Sikorsky	229
<b>Massachusetts</b>	<b>1,379</b>
Minuteman	218
Otis	204
Paul Revere	701
Pioneer Valley	256

## NEW HAMPSHIRE 604

Brig. Gen. Harrison R. Thyng	604
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## RHODE ISLAND 183

Metro Rhode Island	145
Newport Blue & Gold	38

## VERMONT 169

Green Mountain	169
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## NORTH CENTRAL REGION 2,652

Ronald W. Mielke	
<b>Minnesota</b>	<b>883</b>
Gen. E. W. Rawlings	739
Richard I. Bong	144

## MONTANA 314

Big Sky	231
Bozeman	83

## NORTH DAKOTA 342

Gen. David C. Jones	175
Happy Hooligan	87
Red River Valley	80

## SOUTH DAKOTA 357

Dacotah	172
Rushmore	185

## WISCONSIN 756

Billy Mitchell	756
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## NORTHEAST REGION 5,361

Maxine Rauch	
<b>New Jersey</b>	<b>1,272</b>

Brig. Gen. Frederick W. Castle	244
Hangar One	158
Highpoint	65
Mercer County	106
Sal Capriglione	227
Shooting Star	195
Thomas B. McGuire Jr.	277

## NEW YORK 1,994

Albany-Hudson Valley*	329
Finger Lakes	257
Gen. Carl A. Spaatz	138
Genesee Valley	176
Iron Gate	235
L. D. Bell-Niagara Frontier	269
Long Island	498
Pride of the Adirondacks	92

## PENNSYLVANIA 2,095

Altoona	110
Joe Walker-Mon Valley	214
Lehigh Valley	150
Liberty Bell	496
Lt. Col. B. D. "Buzz" Wagner	99
Mifflin County*	90
Olmsted	248
Pocono Northeast	167
Total Force	291
York-Lancaster	230

## NORTHWEST REGION 4,068

William Striegel	
<b>Alaska</b>	<b>547</b>
Edward J. Monaghan	410
Fairbanks Midnight Sun	137

## IDAHO 414

Snake River Valley	414
--------------------	-----

## OREGON 732

Bill Harris	198
Columbia Gorge*	534

## WASHINGTON 2,375

Greater Seattle	755
Inland Empire	639
McChord Field	981

## ROCKY MOUNTAIN REGION 4,840

Robert E. George	
<b>Colorado</b>	<b>3,502</b>
Gen. Robert E. Huyser	113
Lance P. Sijan	1,947
Mel Harmon	148
Mile High	1,294

## UTAH 1,034

Northern Utah	365
Salt Lake City	381
Ute-Rocky Mountain	288

## WYOMING 304

Cheyenne Cowboy	304
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## SOUTH CENTRAL REGION 6,137

Russell V. Lewey	
<b>Alabama</b>	<b>2,133</b>
Birmingham	295
Montgomery	1,126
South Alabama	171
Tennessee Valley	541

## ARKANSAS 783

David D. Terry Jr.	465
Lewis E. Lyle	318

## LOUISIANA 897

Ark-La-Tex	491
Maj. Gen. Oris B. Johnson	406

## MISSISSIPPI 808

Golden Triangle	263
John C. Stennis	368
Meridian	177

## TENNESSEE 1,516

Everett R. Cook	353
Gen. Bruce K. Holloway	652
H. H. Arnold Memorial	116
Maj. Gen. Dan F. Callahan	395

## SOUTHEAST REGION 6,427

Rodgers K. Greenawalt	
<b>Georgia</b>	<b>2,678</b>
Carl Vinson Memorial	854
Dobbins	1,340
Savannah	306
South Georgia	178

## NORTH CAROLINA 2,159

Blue Ridge	417
Cape Fear	247
Kitty Hawk	62
Pope	524
Scott Berkeley	289
Tarheel	620

## SOUTH CAROLINA 1,590

Charleston	505
Columbia Palmetto	355
Strom Thurmond	353
Swamp Fox	377

## SOUTHWEST REGION 5,971

John A. Toohey	
<b>Arizona</b>	<b>3,204</b>
Cochise	112
Frank Luke	1,742
Prescott/Goldwater	330
Tucson	1,020

## NEVADA 1,444

Thunderbird	1,444
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## NEW MEXICO 1,323

Albuquerque	954
Fran Parker	257
Llano Estacado	112

## TEXOMA REGION 10,964

Gary L. Copsy	
<b>Oklahoma</b>	<b>1,759</b>
Altus	187
Central Oklahoma (Gerrity)	1,034
Enid	214
Tulsa	324

## TEXAS 9,205

Abilene	321
Aggie/land	165
Alamo	3,370
Austin	1,037
Concho	279
Del Rio	124
Denton	474
Fort Worth	1,269
Gen. Charles L. Donnelly Jr.	196
Northeast Texas	388
San Jacinto	839
Seidel-AFA Dallas	743

## OVERSEAS CHAPTERS

### US Air Forces in Europe

Charlemagne: Geilenkirchen, Germany	
Dolomiti: Aviano AB, Italy	
Ramstein: Ramstein AB, Germany	
Spangdahlem: Spangdahlem AB, Germany	
United Kingdom: RAF Lakenheath, UK	
<b>Pacific Air Forces</b>	
Keystone: Kadena AB, Japan	
MIG Alley: Osan AB, South Korea	
Tokyo: Tokyo, Japan	

### \*These chapters were chartered before Dec. 31, 1948, and are considered original charter chapters.

Ohio's North Coast Chapter was formerly the Cleveland Chapter; Oregon's Columbia Gorge Chapter was formerly the Portland Chapter.





# AIR FORCE ASSOCIATION AIR WARFARE SYMPOSIUM

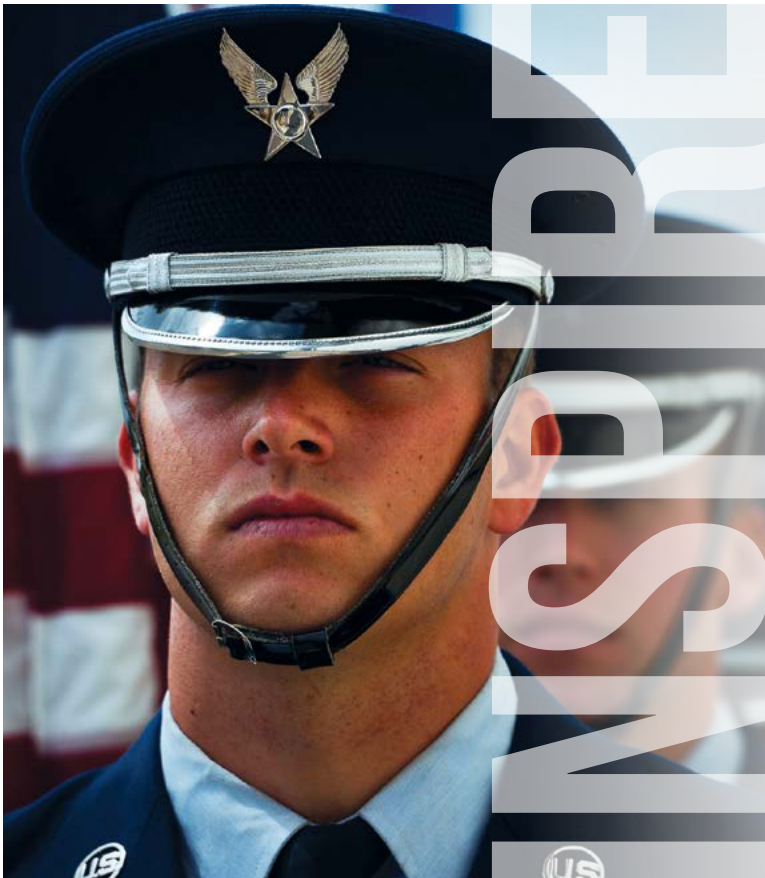
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**FOR MORE INFORMATION CONTACT:**

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*Promoting Air Force Airpower*



# Namesakes



USAF KC-135R Stratotankers, 186th ARW, taxi on Key Field in 2014.

Photo: TSgt. Richard Smith

## KEY FIELD ANGB



ALGENE EARL KEY



FREDERICK MAURICE KEY



Fred Key does an in-flight repair on the engine of the Curtiss Robin.

Photo: Meridian Regional Airport

# KEY

## Flight of Ole Miss

Today, Key Field, Miss., can't be considered a famous Air Force base. Yet for a brief period it was in fact at the center of the aviation universe. For 39,214 minutes, to be exact.

At 12:32 p.m. on June 4, 1935, a Curtiss Robin flown by Algene and Frederick Key took off from Meridian City Airport. The brothers remained aloft until landing at the same spot at 6:06 p.m. on July 1. Their 27-day flight crushed the world endurance record and made global headlines.

The airport was instantly renamed Key Field in honor of the town's world-famous citizens.

In 1935, Depression-minded town leaders proposed closing that town's airport. Faced with unemployment, the brothers acted to save the day with a pure publicity stunt: They would break the world flight endurance record of 23 days and thereby bring glory to Meridian.

The brothers borrowed a Robin J-1 Deluxe, which they named Ole Miss, and modified it. They built a catwalk to allow in-flight engine service. They added a big new fuel tank, sliding top hatch for in-flight deliveries, and advanced VHF radio outfit.

Air-to-air refueling was still new and dangerous, but the brothers and a local mechanic, A. D. Hunter, invented a spill-

free system, featuring a valve that would prevent fuel from flowing unless a probe was firmly inserted into the receiving tank.

The "Flying Keys" took off and for 27 days flew Ole Miss in circles above Meridian. Several times a day, the crew of another plane would lower food and supplies via rope and ship fuel via a long tube. They survived storms and even an onboard fire.

They stayed aloft 653 hours and 34 minutes. Their estimated ground track was 52,320 miles. When they finally landed, the Keys were greeted by 35,000 wildly cheering spectators. The idea of closing the airport was forgotten.

Both Al and Fred served as heavy bomber pilots in World War II. Fred flew 100 missions and logged 500 combat hours in the Pacific. Al had 200 combat hours in the Pacific and a like number in Europe. Fred came home in 1945 to run the family flying school. Al retired from USAF in 1960. He then became mayor of Meridian.

The Keys' valve system was adopted by the Army Air Corps; somewhat modified, it remains in use. Ole Miss is on display at the National Air and Space Museum, its record still unbroken by a conventional aircraft. It was finally bested in 1973 by the spaceflight of Skylab II, which lasted for 28 days.

In World War II, the Air Corps began using Key Field for flight training. Later years saw the establishment of Key Field Air National Guard Base, co-located with Meridian Regional Airport. It is the home of the 186th Air Refueling Wing, a KC-135 tanker unit of the Mississippi Air National Guard.

## ALGENE EARL KEY

**Born:** Feb. 8, 1905, Kemper County, Miss.

**Died:** July 17, 1976, Meridian, Miss.

**Education:** Mississippi A&M College; Nicholas-Beazley Flying School

**Service:** Air National Guard, US Army Air Forces, USAF

**Occupation:** US military officer, businessman, politician

**Main Era:** World War II

**Years Active:** 1939-60

**Combat:** Pacific Theater, European Theater

**Final Grade:** Colonel

**Honors:** Distinguished Service Cross, Distinguished Flying Cross, Bronze Star Medal (7)

## FREDERICK MAURICE KEY

**Born:** April 28, 1909, Kemper County, Miss.

**Died:** Sept. 15, 1971, Meridian, Miss.

**Education:** Nicholas-Beazley Flying School

**Service:** Air National Guard, US Army Air Forces

**Occupation:** US military officer, businessman

**Main Era:** World War II

**Years Active:** 1939-45

**Combat:** Pacific Theater

**Final Grade:** Major

**Honors:** Distinguished Flying Cross

## KEY FIELD AIR NATIONAL GUARD BASE

**State:** Mississippi

**Nearest City:** Meridian

**Area:** 1.6 sq mi / 1,000 acres

**Status:** Open, operational

**Opened:** (Meridian Municipal Arprt.) November 1930

**Renamed:** (Key Field) July 1, 1935

**Renamed:** (Key Field Army Airfield) 1941

**Renamed:** (Key Field ANGB) Sept. 18, 1947

**Current Owner:** Air National Guard

**Former Owner:** Third Air Force

**Home Of:** 186th Air Refueling Wing