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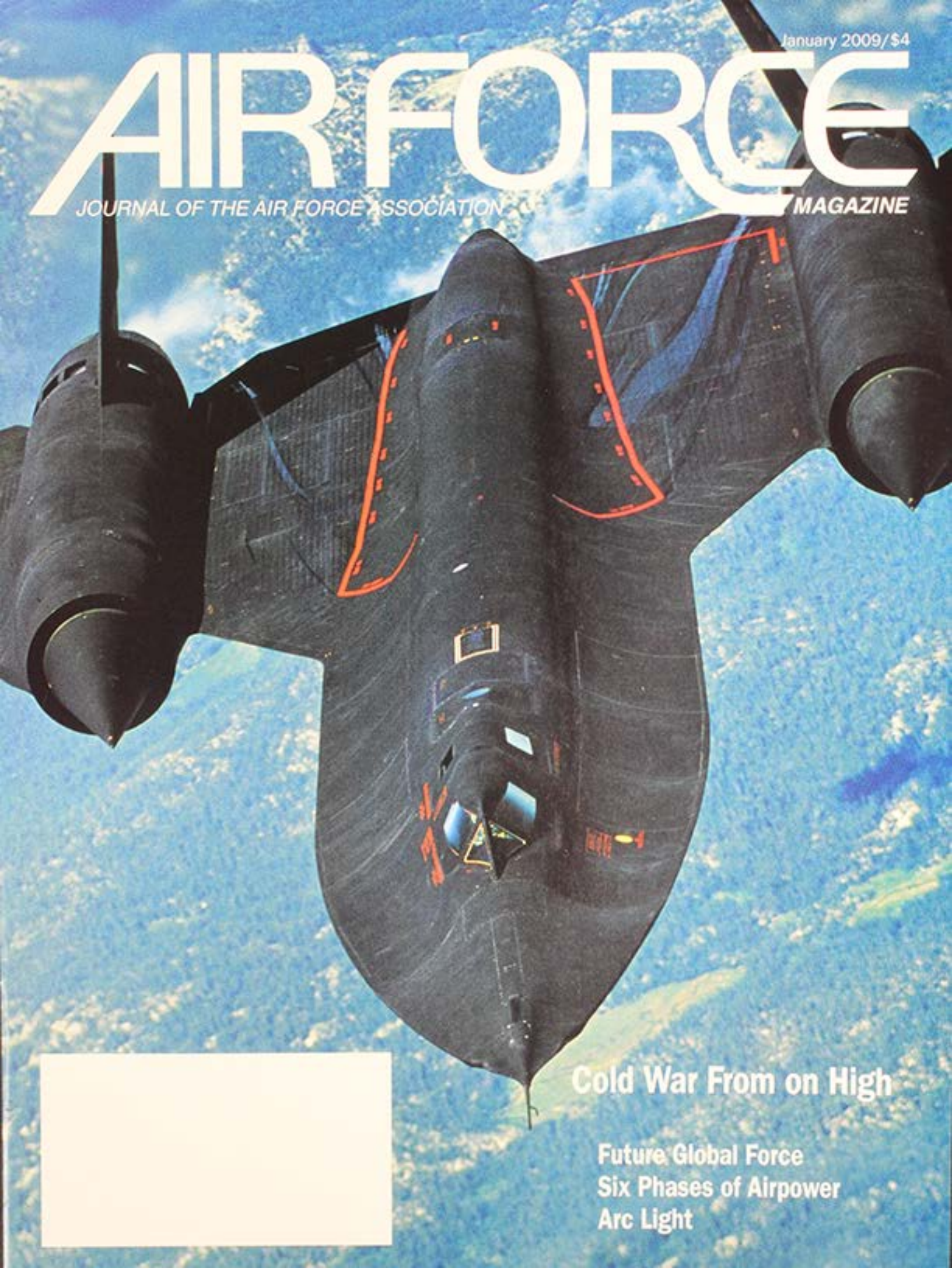

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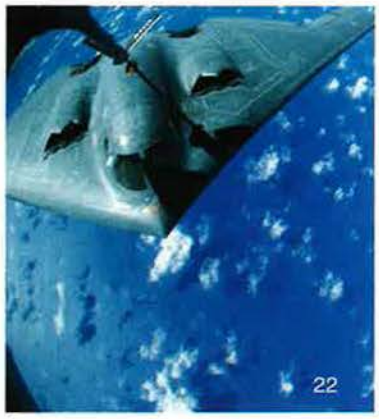

**About the cover:** An SR-71 Blackbird. Photo by Ted Carlson. See "Cold War From on High," p. 38.



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# Editorial

By **Robert S. Dudney,** Editor in Chief

# Obama's Nuclear Challenge

DETERRENCE—the practice of relying on doomsday weapons to prevent wars—has often been threatened by arms control advocates and other critics. Few, though, ever guessed deterrence might some day be undone by a simple lack of reliable weapons.

Indeed, the Air Force and Navy have in the past fielded 14,000 operational warheads and bombs. A vast nuclear industrial complex churned out 3,000 nuclear charges every year. Thousands of top engineers and physicists regularly produced new designs. Real-world tests advertised the credibility of these weapons.

Today, though, such powers are gone. USAF Gen. Kevin P. Chilton, head of US Strategic Command, told AFA's Global Warfare Symposium in Los Angeles that they are "many years in the rearview mirror." In a later speech, he said US policy is "leading toward nuclear disarmament."

The upshot, warned Adm. Michael G. Mullen, Chairman of the Joint Chiefs of Staff, is uncertainty that invites miscalculation by US foes. "Deterrence then becomes anything but," said Mullen.

For President-elect Barack Obama, set to enter office Jan. 20, this poses a contentious problem. In the Presidential campaign, Obama declared sharp opposition to building new nuclear weapons. However, he also vowed to maintain the US deterrent so long as other nations possessed nuclear arsenals.

The two pledges may be difficult to reconcile. The new commander in chief, as he surveys the nation's strategic nuclear situation, will find at least four serious threats to the deterrent.

- Dwindling numbers. The US warhead stockpile has undergone a steep decline. Under the so-called Moscow Treaty, signed in 2002, the US committed itself to keeping no more than 2,200 and perhaps as few as 1,700 deployed warheads and bombs. The US plans to achieve this goal in 2010, two years early. When it does, says Secretary of Defense Robert M. Gates, the stockpile will be 75 percent smaller than its Cold War version. Experts warn that the small size of the force would magnify the danger posed by any unexpected technical problem.

- Rising weapon age. US officials insist today's stockpile is safe and reliable. "The problem," says Gates, "is the long-term prognosis—which I would characterize as bleak." Today's warheads are old. In the US, no one has designed a totally new weapon since the 1980s. No one has built one since the early 1990s. No one has tested a weapon since 1992. US weapons were designed for a life of about 15 years, but they all have lasted at least 20 years. Now, sensitive parts are eroding. As nuclear material decays, the US database grows increasingly dated. At some point, confidence in their reliability wanes, and safety declines.

**The new commander in chief will find at least four serious threats to the deterrent.**

- Industrial decline. With weapon-making in the doldrums for 20 years, nuclear infrastructure—the capability to sustain nuclear weapons—has all but disappeared. Chilton, speaking to the *Wall Street Journal,* declared that the US "has no nuclear weapon production capacity" and can only "produce a handful of weapons in a laboratory." In a Sept. 15 speech, Sen. John L. Kyl (R-Ariz.) said the nuclear network's formerly robust laboratories and plants can refurbish, at best, only about 10 weapons per year and are, in some cases, "simply falling down from age." Kyl says this amounts to a national "emergency."

- Lost expertise. In the nuclear field, the US has suffered a serious brain drain, losing most of its veteran weapon designers. National labs and weapons manufacturing facilities have shed thousands of workers. Since the mid-1990s, the National Nuclear Security Administration has lost more than a quarter of its force. Half of its lab scientists exceed the age of 50. Chilton told Congress last spring, "The last nuclear design engineer to participate in the development and testing of a new nuclear weapon is scheduled to retire in the next five years."

While most official concern focuses on warheads, not launch vehicles, Gates also notes DOD has deactivated many of its best weapons—the Peacekeeper ICBM, half of the Minuteman ICBM force, many Ohio-class ballistic missile submarines. Today's B-52s, mainstays of the bomber force, date to the early 1960s.

The Pentagon's proposed solution is the so-called Reliable Replacement Warhead, the first new and comprehensive redesign of a nuclear weapon since the Cold War. It is intended to provide a modern, safer warhead for Navy missiles before the end of this decade.

The RRW would actually replace existing warheads, but introduce no new capabilities. It would offer the considerable benefit of reviving at least a critical portion of the weapons complex.

Congress, however, is not sold on the program, largely out of arms control concerns and anti-nuclear sentiment. In Chilton's view, lawmakers this fall effectively killed the RRW program, refusing to fund a continuing study of its manufacture.

Rep. Ellen O. Tauscher (D-Calif.), chairman of the House Armed Services subcommittee on strategic weapons, said the program was in a "holding pattern" until Obama's officials could review the matter. She said a planned Nuclear Posture Review, the first since 2002, will be expected to settle key questions about whether new warhead work is needed.

This approach overlooks a significant reality, noted by Gates in an Oct. 28 speech to the Carnegie Endowment for International Peace in Washington, D.C. He pointed out that of the seven declared nuclear powers in the world, all but one have ambitious programs of nuclear weapon modernization or sustainment. The single holdout: the United States.

Deterrence, a bleak and unloved aspect of modern geopolitics, never will be popular. Nuclear weapons are too dangerous, and the prospect of their use too ugly, for anyone to ever warmly embrace it. It has, however, been successful. It would be a mistake to abandon deterrence until we can replace it with something better.

Even worse would be to lose it through sheer neglect. That danger still seems remote. But it is getting closer. ■

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# Letters

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**Editorial: Hard Times**

I take exception to your statement in the editorial, "Hard Times," in the November issue *[p. 2]* of *Air Force* Magazine "that the expense of simply maintaining today's 1.4-million-strong US force has gotten wildly out of hand" is a flawed vision.

Set aside the fact that the nation faces a critical financial crisis, with failing banks and industries, in which it seems so much must be rescued to stop a cascading growth of unemployment feeding upon itself. I hear that the US military expenditures are the equivalent of all the rest of the world's expenditures on military forces combined. That sounds like being "wildly out of hand" on the face of it.

I will take you at your word that in 2008 military functions were 20 percent of federal outlays, and that Social Security, Medicare, and Medicaid made up 52 percent (including some other programs—this is a complicated number) of this year's outlays. However, you didn't include interest on the debt of 13 percent, which is increasing, so we have accounted for 65 percent of the budget, leaving 35 percent as "discretionary"—but not really. If, as you say, the military functions make up 20 percent of the total budget, then it makes up 57 percent of that 35 percent which might be called discretionary.

And 57 percent of federal discretionary funds is "wildly out of hand" to a nation that is not facing a threat to its survival.

Maj. Charles W. Hinton, USAF (Ret.)
Satellite Beach, Fla.

Your editorial of November, "Hard Times," is my starting point. It is true that "Pentagon spending didn't cause today's economic crisis," but I believe the Pentagon, unfortunately, will have to accept budget reductions, as well as all other departments until this recession has abated. We will be fortunate to escape with a major recession and not something resembling the 1930s. In the [Great] Depression, military retiree pay was reduced by a desperate Congress. If that had to be done this time, the outcry would be unbelievable.

America has been living beyond its means for many years. Our savings rate is zero, our credit card debt is astronomical, our monthly negative balance of payments to the rest of the world, especially China, is huge. In the current circumstances we cannot, and should not, continue to spend $10 billion a month in Iraq. This expenditure in Iraq is made while the Iraqi government is reluctant to approve a status of forces agreement that is necessary for our continued support to their fragile government. Hopefully, President-elect Obama will redeem his pledge to drastically reduce our forces in Iraq at the earliest opportunity. We can then make some additional forces available for Afghanistan, as the threat there steadily increases. However, Gen. David Petraeus has indicated we should consider opening a dialogue with moderate elements of the Taliban, as the general is of the opinion that the war there is not winnable, and should not be open-ended.

The bottom line of the current situation is that we have squandered equipment assets for the last five years in an unnecessary war in Iraq, and the country is not now in a position to afford replacements. We have also stretched our military personnel to a near breaking point.

Your editorial, pointing out that our recent past military expenditures are not that burdensome in comparison to past wars, is an apples and oranges analysis. During past wars we did not have the extensive, and very expensive, entitlement programs, which now consume more than 60 percent of the federal budget. The inescapable conclusion is that our military will suffer reduced spending for the foreseeable future

An observation: If we want to attempt some savings, let's look at all the con-

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**Publisher**
Michael M. Dunn

**Editor in Chief**
Robert S. Dudney

**Editorial** afmag@afa.org

**Editor**
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**Advertising** bturner@afa.org

**Director of Advertising**
William Turner
1501 Lee Highway
Arlington, Va. 22209-1198
Tel: 703/247-5820
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tracts the military enters into for studies, programs, and projects. In 1966, when I first came to Scott AFB, Ill., and headquarters of Military Airlift Command, we had twice as many aircraft, bases, and stations around the world, and twice the personnel we have today in AMC. But the headquarters was half the size it is today. At that time, I never heard of private contractor studies and programs of any kind. For many years now, most of the retired senior NCOs and officers I know have gone to work locally for one private contractor or another. I doubt if little or any of this work is necessary, other than to provide employment for military retirees. This make-work condition exists at all major headquarters of all services, and is particularly rampant in the Washington, D.C., area, hence the origin of the phrase "Beltway Bandits."

On another subject, the numerous military organizations, such as [the Military Officers Association of America], need to reduce their efforts in which they continually attempt to obtain additional benefits for active and retired military. Congress, out of the goodness of their hearts, in wartime, is susceptible to such efforts. But the country cannot afford them. An example of Congress' ill-advised largesse was Tricare for Life. This program came about when, because of the "dot-com surplus" in 1999, Congress asked, "What can we do with all these extra funds the Treasury is receiving?" "Let's take care of military retirees with a 'no cost to them' medical program." The program was passed and a year later the Treasury surplus had evaporated with the "dot-com bubble." However, Tricare for Life was in place, and like all other entitlement programs, it will be there forever.

I have noted that many healthy officers and NCOs, when it gets close to retirement time, seem to suddenly develop all kinds of aches and pains in order to justify some percentage of disability upon retirement. I have also noted—just an impression—that the Air Force seems to have more of this tendency, than the other services. It would be interesting if there were statistics available which compared retirement disability rates among the services, although I know Veterans Affairs is a player in this process. But so is each military service's medical staff.

Perhaps some of the items noted above could result in savings in these difficult times for our country and our military forces.

Col. Lee R. Pitzer,
USAF (Ret.)
O'Fallon, Ill.

**Left Out**

Your excellent photo story, "Warriors for the Spectrum" (October, p. 48), left out a significant Air Force contribution to electronic warfare. A contingent of Air Force electronic warfare oficers (EWOs) and a few pilots fly EA-6B Prowlers in joint USAF-Navy expeditionary squadrons deployed to forward operating locations for use in the Middle East, South Asia, and the Balkans. Home-based at NAS Whidby Island, near Oak Harbor, Wash., the blue-suiters have been a part of the Prowler EW community for several years. Each Prowler is crewed by three EWOs (ECMOs in the Navy) and one pilot. Though USAF crews are limited to land-based deployments, a few overly adventurous USAF types requested, and received, Prowler deployments to carrier-based squadrons and served a sea tour. There are more great pictures available from these folks.

Tom Menza
Colorado Springs, Colo.

**On Effects-Based Operations**

Reference your October 2008 editorial on effects-based operations, "Improvisation Won't Do It" *[p. 2]*: Before you get too concerned about EBO doctrine development and implementation, remember this old story from World War II. At the conclusion of an intelligence debrief, a group of captured German tank drivers and artillery officers had one question of their captors: "We know your doctrine. We studied your doctrine. Why don't you follow it?"

Patrick S. Sharp
Las Vegas

**Maxing Assets: F-22s and UAVs**

Anyone who has seen the F-22 do more than a flyby knows the F-22 is a difference maker. So we might as well buy enough to make a difference while we still have the opportunity. *[See "The Big Squeeze," November, p. 36.]*

The F-22's opponents are right in one respect—we won't have a combined-arms war with a near-peer for the foreseeable future. But that's because our ground forces are so small. Once terrain or urban settings limit ground mobility, our ground forces would be up to their armpits in alligators.

Airpower is the only thing that will keep us from being bullied by potential enemies who we wouldn't dare meet on the ground.

Ironically, USAF is its own worst enemy. Besides trying to buy things when it can't decide what it needs, USAF still regards its pilots like they're medieval knights. You don't need knighthood to fly a UAV—just 1,000 hours on a Game Boy. And if we are ever forced into a real war with the big boys, we'll want hundreds of UAVs of all types in the air 24/7, not 50. *[See "Air Force World: New UAV Pilot Training Launched," November, p. 22.]*

Paul J. Madden
Seatac, Wash.

**Fit for War**

USAF's way towards physical fitness (PF) is a sore subject. Not that fitness is not necessary, it is! Not that we don't need to be tested more often, we do! But how the Air Force administers the PF test is the problem. *[See "On the Minds of the Troops," November, p. 42.]*

There is too much emphasis on cardio running rather than real wartime fitness. No amount of running in shorts and sneakers will get you ready for the AOR and heavy body armor, etc. The abdominal testing measures around a bone mass and does NOT take height into account. This test was formulated in 1996 in the Netherlands; it's obsolete. Both the running and abdominal tests favor short-statured people who may not be up to the muscular rigors of carrying that body armor. BMI [body mass index] favors the "Pillsbury Doughboy" and not the muscular guy or lady who works out (muscle weighs more than fat). Furthermore, the PF test gives only 20 percent scoring to core strength tests for sit-ups and push-ups. Let's make this test fit a wartime readiness tasking.

1. It is more important to be muscularly fit when you are in the AOR. Three-mile walks with 10 to 20 pounds of equipment in a timed event will give you a cardio workout and build your musculature and muscle balance (try putting on that equipment without feeling like you're going to tip over).

2. Make the abdominal test more realistic by factoring in height and measuring the real waist where soft tissue, not bone tissue, is. BMI should be thrown out entirely.

3. Revamp the scoring system. More points for push-ups and sit-ups (40 to 50 percent maybe) and less points for cardio and especially reducing the abdominal scoring.

The studies are somewhat accurate regarding why we measure abdominal circumference, but again, they are 12 years old and counting, and developed in a country where men and women are probably much smaller framed than your typical American male or female. Cardio studies don't take into account the real damage one can do to one's joints, especially the knees, over the decades by performing a potentially debilitating high-impact exercise such as running. One doctor said, "What good is cardio, if you can't stand up?"

Make the test real. Make it representative of what really gets one ready for the AOR.

Lt. Col. Eric Johnson,
USAFR
Burlington, N.J.

**Airpower Classics**

I am writing in regard to the "Airpower Classics: F-86 Sabre" in the November issue *[p. 88]*.

The statement is made that "the F-86 suffered a high accident rate until pilots could routinely be given training of a caliber commensurate with the fighter's performance."

I had never heard this said about the F-86. Are you sure that the F-86 accident rate is not being confused with that of the North American F-100 Super Sabre? As a retired USAF fighter pilot who was also fortunate enough to fly military jet fighters (for pay) for another 20-plus years after retirement, I have almost 1,500 hours in the F-100 and 1,200 hours in the F-86. Actually my F-86 time is in the Mk 5 and 6 Sabre built by Canadair. At any rate, the F-86 is a real pussycat to fly. It has no adverse flight characteristics with the possible exception of "wing heaviness" or loss of positive aileron control above about .9 Mach. Of course, as soon as your speed is reduced, this characteristic goes away and thus is no real problem. The aircraft is very easy to land. I could check out anyone who has any jet experience in the F-86 in an afternoon, sending them off solo after good briefings and a supervised engine start.

On the other hand, the F-100 did have one of the worst early accident rates due to its unconventional slow speed or high AOA flight characteristics, namely adverse yaw and horizontal stabilizer authority, allowing extreme angles of attack at slow speeds. When the F-100 went supersonic, the center of pressure moved aft, which in effect made the aircraft nose heavy. To allow for supersonic maneuvering, this nose-heavy condition was overcome by much greater horizontal stabilizer (known as the slab) movement. This did in fact solve the supersonic maneuvering problem; however this same slab authority was available anytime including in the landing flare. An inexperienced pilot could inadvertently let his speed get too low on final approach and maybe not immediately recognize it since he could maintain his glide path with the available slab authority. So he could end up in a high AOA, high drag situation, and a high sink rate would be the result. At this point, more power would be required and with the J57's slow throttle response, the increased thrust needed could take too long to materialize. Thus you have the makings of a hard landing at best, and a crash at the worst. Now, if this weren't bad enough, in this high AOA condition is where the adverse yaw reared its ugly head. In this high AOA state, we're talking of airspeeds below the normal final approach airspeeds. If a wing started to drop and the pilot tried to pick up the wing with aileron, the aircraft would yaw into the down wing and roll opposite the applied aileron. The larger and quicker the aileron input, the more adverse yaw and opposite roll produced—the makings of a real disaster.

The solution was simple. Don't get slow on final, and at high AOA, don't use aileron to roll the airplane, but use rudder, which was very effective. But in those early days of the F-100, there was no F model (the two-seater), thus your first flight was solo. I think most guys transitioned from the T-33, F-86, or F-84 into "the Hun." This was a huge step and under the pressure of "getting behind the aircraft," many times the pilot would revert to his habit patterns from his earlier aircraft experience. Later on when the F-100F was available, the new-to-the-aircraft pilots would get several dual rides with an IP in the backseat to keep them out of trouble and get them off on the right foot.

Maj. Charlie Friend,
USAF (Ret.)
Alamogordo, N.M.

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# Washington Watch

By John A. Tirpak, Executive Editor

**Donley talks fighters; DOD voices skepticism; Continuing nuclear saga. ....**

## Reinventing a Requirement

The Air Force is reconsidering its numerical requirement for the F-22 Raptor—which has remained fixed at 381 aircraft for seven years—and will offer the Obama Administration a new number no later than the end of February, according to Air Force Secretary Michael B. Donley.

In a late November interview in Los Angeles, Donley said the Air Force is "re-looking the requirement issue." The service will have a new number ready "a month ahead of" a Congressional mandate that the President certify, by March 1, that further F-22 production is needed.

"We'll be prepared at the appropriate time to have that conversation," Donley said. Joint Chiefs of Staff Chairman Adm. Michael G. Mullen suggested in December that the new number could be 60 higher than the old limit of 183, bringing the fleet to 243 aircraft.

However, he said the F-22 requirement "is not the only issue in front of us, and ... we have many considerations to look at before settling on a recommendation for the incoming Administration."

Affecting the service's judgments about the new target buy for the F-22, Donley said, will be "what would we take [the money] from—some other Air Force capability"—as well as "opportunity cost" of deferring or deleting some other aspect of the Air Force program.

"So, just coming up with a number for the requirement is not an adequate answer ... in my view, and does not ... equal a recommendation," he said.

Donley acknowledged that the Air Force proposed cutting its fighter inventory as part of its 2010 budget, but said that the cuts did not assume more F-22s would be there to pick up the slack. The service is simply accepting greater risk.

"We have already had to confront the issue of bringing down force structure in order to support the existing modernization programs as they sit today in the department," Donley reported. "And now we have the F-22 question ... on top of that."

Word of the cuts emerged in October, when 2010 program objective memoranda, or POM documents, leaked showing that the Air Force proposed slashing more than 300 fighters from the inventory. The reductions included 137 F-15s, 177 F-16s, and nine A-10s, toward saving about $3.4 billion in operations costs, to be applied to other projects. If enacted, the moves would chop 18 percent off the fighter force structure.

The proposed cuts mean that the Air Force would only keep about 129 F-15Cs of the 178 it had planned to make into "Golden Eagles"—those youngest F-15s which have the fewest problems and which would get an upgraded radar and other enhancements. The service has said all along that the size of its Golden Eagle fleet would depend on getting 381 F-22s; fewer Raptors would mean a consequent increase in the number of Golden Eagles that would have to be retained. It's not clear how the math has changed, and service leaders have not identified any dramatic reduction in threat or rotational requirements for fighters.

"What we do across the Air Force," Donley said, "is look at all our mission areas, all the things we have to do. We have to make choices. We cannot do everything we want to do in all those mission areas, at the speed we would like to do it. We don't have the money. ... So we have to make choices."

Photo by David Dillman

*New numbers coming*

## View From the Pentagon

Donley spoke a few days after John J. Young Jr., the Pentagon's acquisition, technology, and logistics chief, approved spending only $50 million of $140 million that Congress provided to keep the F-22 in production.

The funds were meant to support long-lead money to buy 20 F-22s, but Young's action funded only four—an amount he said was sufficient to give the new Administration enough time to make an informed choice about its F-22 plans.

Leaders of the two committees that oversee appropriations thereafter sent Young a letter urging him to comply with Congress' stated intent to spend all the long-lead money for 20 F-22s. However, Young said the law providing long-lead money for F-22 production did not require spending all of it (see "Air Force World: OSD Releases Minimum Funding for More F-22s," p. 14).

Donley also said that to go beyond funding just four more Raptors "can be interpreted as taking away the flexibility of the incoming Administration to make this decision, as well."

In a discussion with defense reporters in November, Young went out of his way to offer comments damning the F-22, saying it has still not met key performance parameters, is proving far more costly to maintain than expected, is taking more maintenance man-hours than expected, and is turning in mission capable rates hovering at 62 percent.

The Air Force, however, has touted the airplane as exceeding expectations and demonstrating mature performance.

The service's official response to Young's charges was, "No comment."

The decision to continue with the F-22—or not, as Defense Secretary Robert M. Gates has said he believes the programmed 183 aircraft are enough—has to be viewed "holistically" within the context of the overall Air Force budget, Donley said.

"We can't look at these decisions as just one system. Would you like to have more F-22s? Sure. Would you like to have more C-17s? Sure. ... But this is all about balance. And when you do

balance, you end up sub-optimizing in individual areas to get the optimum use of resources as a whole. ... We have to make choices."

### Default Downsizing

The Air Force is going to have to be highly selective about which programs it commits to, because it wants to avoid planning for—and investing in—large production capabilities that then yield only a few operational systems, Donley said.

"We're modernization- and recapitalization-challenged," Donley said in the interview.

"We have produced small numbers of aircraft, in some cases, that end up being more niche capability than we had originally intended. ... We have to be very careful [not to] ... start down the path of developing capabilities that we think we're going to buy a lot of, but we decide later, after several iterations inside the department or with Congress, that we're only going to buy a few. That gets us way out of whack on our force structure, and that's where we are on bombers."

Donley noted that the B-2 program was originally facilitized, at great expense, to build more than 170 airplanes, but ended up producing only 21. Likewise, the F-22 program was conceived as yielding more than 700 airplanes, but the Bush Administration chose to halt the program at 183 aircraft.

He noted that "it does sometimes make sense to build a small niche capability" like the F-117 attack aircraft. In that example, he said, a small number were built as an "early generation" stealth system, "with some attributes that you would not necessarily want to carry forward—[and] a lot of experimental elements embedded in it."

The labor-intensive stealth features of the F-117 quickly gave way to cheaper, more producible and maintainable systems on the B-2, F-22, and F-35.

"We probably need to continue to do [niche programs]. But do them deliberately, and not accidentally default from something we meant to buy a lot of," Donley observed. He added that to promote an Advanced Concept Technology Demonstrator such as the Global Hawk to a full-up operational system does have some growing pains, but in the end, it's a better way to go about it "than a B-2 situation," where a large production and organic support capability was laid in and then not needed.

He sees a "tension" between niche platforms and large-run systems as they compete for procurement dollars. He also said the Air Force has had a challenging time meeting both short-term combat needs—where money is almost no object—and long-term requirements, and finding a balance between the two.

"We're making some 30- and 40-year investments where we have to be more careful, more deliberative, and we have to do more trade-off work. And I do think it is a challenge to be living in both of those worlds, where, on one hand, requirements and resources are less constrained and, on the other hand, they need to [be] and will be constrained."

Donley added that in unmanned aerial vehicles, he sees a continuing "variety" of systems being developed and fielded, rather than a standard machine that the Air Force configures for a particular mission.

"I don't see a convergence to a single aerodynamic or mission-focused combination of ... stuff. I see a lot of variety."

### The Nuclear Handle

Donley was brought in after Michael W. Wynne and then-Chief of Staff Gen. T. Michael Moseley were forced to resign last summer over two episodes that came to light of mishandled nuclear weapons and related components. His charter, with six months left of the Bush Administration, was to concentrate on turning the Air Force's nuclear culture around. Donley thinks that's largely been accomplished.

"I think we have most of it figured out," Donley said. "There are a few details that we still need to work. But I would say that the

USAF photo by SSgt. Christine Jones

*Donley says, "I see a lot of variety."*

big issues for the Air Force leadership have been determined and are reflected in the [nuclear] roadmap," which was released in November.

"I don't want to minimize the amount of work ahead of us, implementing that," he cautioned. Standing up the new Global Strike Command, just one of the plans in the roadmap, "is a couple of years' effort."

Still, "the big decisions have been made."

Does he think it was the right decision, back in 1992, to eliminate Strategic Air Command, especially since the main fix to the nuclear issue was creating a new SAC-like organization?

Donley replied that the various blue-ribbon and internal looks at the Air Force's nuclear enterprise all concluded "that there was no one big change that led to this loss of focus on the nuclear work. It was a series of changes, and areas receiving new emphasis, the blending of nuclear work with other work that had higher priority, and these sorts of incremental changes that really left us with less than the focus that we now understand we need. So I wouldn't hang it all on the SAC decision, by any stretch."

It's time for a new nuclear debate, Donley said, but unlike those of the 1970s and 1980s, which focused on delivery systems such as bombers or ICBMs, it should be about how to build and maintain a safe and credible inventory of nuclear warheads.

"I think we face some fundamental questions as a nation," Donley asserted. "This is not about how big the nuclear arsenal is," or whether it should be larger or smaller.

"We know we're going to have nuclear weapons in land, sea, and air configuration, and ... if we're going to do that for another 30, 40, 50 years, we need to start thinking seriously about how it's kept modern, safe, reliable, and secure over that period."

### The Tanker Menu

The new Administration will be presented with a "menu" of options on how to proceed with a new aerial tanker, "as opposed to a single-point recommendation," Donley said.

"There are ways to do this, and our efforts are focused right now on making sure that we have options in front of the new team" with regard to requirements, source selection strategy, and acquisition strategy.

Young has said that he favors a basic approach, possibly one based strictly on price, but Donley said, "I don't think it's the only one."

He said the Bush Administration is waiting to offer a preferred choice among the range of possibilities until it understands the new Administration's priorities, "where they're headed on budget issues, and so I think there's room for discussion. And there needs to be further discussion."

In the abortive tanker program, "we saw good examples" of how "sometimes our contractor partners and even our major command partners" and advocates inside the service "get focused on a particular system [or] specific program decision. We need to understand the whole Air Force, the holistic perspective of where we are." ■

# Air Force World

By **Michael Sirak,** Senior Editor, with **Marc Schanz,** Associate Editor

**Airman Dies in Iraq**

SSgt. Brian P. Hause, 29, of Stoystown, Pa., died Oct. 23 of noncombat-related medical causes while deployed to Joint Base Balad, Iraq, from the 20th Equipment Maintenance Squadron at Shaw AFB, S.C. He was serving as assistant noncommissioned officer-in-charge of Balad's 332nd Expeditionary Maintenance Squadron Phase Dock.

The Department of Defense did not release additional details of his death at the time since the incident was under investigation.

**Medal of Honor for Etchberger**

CMSgt. Richard L. Etchberger, who originally received an Air Force Cross posthumously for his heroic actions at Lima Site 85 in Laos during the Vietnam War, is now authorized to receive the Medal of Honor for that action, based on language included in the Fiscal 2009 defense authorization act.

The act, Public Law 110-417, that went into effect in October, waives the time limitations normally entailed with such awards. Etchberger kept North Vietnamese troops at bay with an M-16 as they overran a secret Air Force radar site atop one of the highest Laotian mountains on March 11, 1968. His actions enabled rescue for seven of the 19 Americans at the site, but he was mortally wounded as he boarded the rescue helicopter.

At the time, the White House declined to award Etchberger the MOH, believing the action would spotlight the presence of the clandestine facility in a supposedly neutral country. Rep. Earl


US Navy photo by Petty Officer 2nd Class Todd Frantom

## Donley Says Keep Nuclear Deterrent Credible

No matter how the new Administration may mold the size of the nation's nuclear deterrent, the political and military leadership must remain vigilant in ensuring that the nuclear mission is not neglected going forward, Air Force Secretary Michael B. Donley said in November.

"This mission is too important for the country that we should somehow allow it to degrade or decay through lack of attention," Donley stated Nov. 12 during a speech at the Center for Strategic and International Studies in Washington, D.C., on the Air Force's efforts to reinvigorate its nuclear enterprise.

As operators of the nation's nuclear-capable bombers and Minuteman III land-based ICBMs, Donley said the Air Force needs to focus "on being a good steward" of them regardless of their size and composition. But, should any changes occur, the Air Force would also need strong policy and programming guidance from the leadership to ensure the nuclear deterrent "remains credible," he said. And to be credible, he noted, the deterrent "must be operationally effective and flexible, safe and secure, and reliable."

Donley's speech came just two weeks after Defense Secretary Robert M. Gates warned that the long-term prognosis for the nuclear deterrent is "bleak," due to the lack of an approved new warhead design and an aging and diminishing nuclear workforce.

"Let me first say very clearly that our weapons are safe, reliable, and secure," Gates said in an Oct. 28 speech at the Carnegie Endowment for International Peace in Washington, D.C.

But looking ahead, there are serious challenges since the US is currently the only declared nuclear power that is neither modernizing its nuclear arsenal nor cultivating the capability to produce a new nuclear warhead, he said.

"To be blunt," Gates said, "there is absolutely no way we can maintain a credible deterrent and reduce the number of weapons in our stockpile without either resorting to testing our stockpile or pursuing a modernization program."

The US stopped nuclear weapons testing in 1992.

Pomeroy (D-N.D.) worked to secure the authorization for Etchberger, a native of Bismarck, N.D.

**CV-22s Deploy Overseas**

Four Air Force Special Operations Command CV-22 Osprey tilt-rotor aircraft assigned to the 1st Special Operations Wing at Hurlburt Field, Fla., took part in Operation Flintlock in November in Africa, marking the CV-22's first overseas deployment.

About 100 airmen from the 1st SOW and about 100 airmen from the 352nd Special Operations Group at RAF Mildenhall, Britain, accompanied the Ospreys to the US Africa Command-sponsored multinational counterterror exercise that ran Nov. 3-20 in Africa's Trans-Saharan region, AFSOC representatives said. The CV-22s departed Hurlburt Oct. 17.

Mali hosted the exercise, which included events such as joint medical and veterinary visits to rural communities. Activities also took place in other nations, including Senegal, according to AFRICOM. Don Arias, an AFSOC spokesman, said Flintlock would allow AFSOC to demonstrate the speed, range, and unique capabilities of the CV-22.

**McKinley Becomes Guard Chief**

Gen. Craig R. McKinley received his fourth star during a ceremony at the

12.07.2008

*An unidentified USAF sharpshooter keeps watch in the Doura neighborhood in Baghdad as US troops advance "outside the wire." Attached to Det. 3, 732nd Expeditionary Security Forces Squadron, he is one of 1,800 airmen operationally assigned to Army and Marine Corps units in Iraq. Air Force snipers, all expert marksmen, set up a lookout nest well in advance of US troop movements. They observe, expose, and, if necessary, neutralize threats.*

USAF photo by SrA. Larry E. Reid Jr.

***Lining Up To Help:*** *C-130s taxi at Nellis AFB, Nev., after a training mission. C-130s such as these provide intratheater airlift in Afghanistan, Iraq, and the Horn of Africa. The aircraft is capable of operating from rough strips and is the prime transport for air-dropping troops and equipment into hostile areas.*

Pentagon on Nov. 17 and took command of the National Guard Bureau from Army Lt. Gen. H. Steven Blum, who has been named to be the first Guard deputy commander of US Northern Command. McKinley became the first four-star general to head the NGB in its 372-year history and the first Air Force officer to lead the bureau since 2002.

"This elevation of the chief of the National Guard Bureau to four stars underscores the critical importance of the Guard to America's overall national defense," said Defense Secretary Robert M. Gates at the ceremony.

On the following day, the Bush Administration nominated Maj. Gen. Harry M. Wyatt III (Oklahoma adjutant general) to receive a third star and take over the Air National Guard, the post that McKinley held since 2006. The Senate confirmed Wyatt's nomination Dec. 9.

### Pilot Receives DFC

The Air Force has awarded a Distinguished Flying Cross to Maj. Daniel Clayton, an A-10 pilot with the 51st Fighter Wing at Osan AB, South Korea. Clayton received the award in October for his actions during a nighttime combat search and rescue operation in Afghanistan on May 30, 2007, when he served as airborne rescue mission commander.

He and his wingman, Capt. Ryan Hill, went to the aid of a downed Army CH-47 helicopter, coordinating the efforts of multiple assets, including

## Air Force Prepares for New Administration

The Air Force began conducting an internal review of its acquisition processes late last year and brought on the Center for Naval Analyses to examine them with a fresh set of outside eyes to help support a smooth transition to President-elect Barack Obama's Administration, which assumes power Jan. 20.

Speaking Nov. 12 to an audience at the Center for Strategic and International Studies in Washington, D.C., Air Force Secretary Michael B. Donley said the two reviews were meant to provide "actionable recommendations" by the end of 2008 on improving the service's acquisition functions, which have been under scrutiny of late, due to a string of successful industry protests that have stymied the progress of the KC-X aerial tanker and CSAR-X rescue helicopter recapitalization initiatives as well as the KC-135 depot maintenance program.

The goal, he said, was "to set the table" for the new Administration, providing it with "a menu of options [with] pros and cons understood" on how to move forward with these issues and others.

Donley noted that, several weeks before his speech, Air Force acquisition officials and he had "a good sit-down, face-to-face discussion" with Government Accountability Office legal representatives who review Air Force files when contract awards are protested.

"Without speaking for GAO, one of their senior folks sort of said, 'Your system is not broken,'" he noted. Donley also made the point that "the vast majority" of the Air Force's acquisition decisions "remains untainted" by protests.

The Office of the Secretary of Defense instituted a new policy at the end of September requiring a service to subject a major weapons acquisition program worth more than $1 billion to peer review.

The new process is meant to increase the level of confidence in the decisions that each service renders and thereby make it harder for losing bidders to win protests and derail these programs.

Among the first programs expected to face this peer scrutiny are KC-X and CSAR-X.

several other aircraft and more than a hundred troops. "Under our control, this combined force continuously engaged Taliban insurgents attempting to reach the crash site and attack friendly forces," explained Clayton, who is chief of standardization and evaluation with Osan's 51st Operations Group.

Tragically, there were no survivors, but Clayton continued to lead the mission as the ground forces moved in to recover the fallen comrades.

**Missile Warning Leaps Ahead**

Air Force space officials in November cleared HEO-1, the first of the two Space Based Infrared System sensor payloads on orbit, and its ground element for operational service after an extensive period of operational evaluations.

This milestone "represents many years of hard work by space operators, acquirers, and testers alike," said Col. Roger Teague, commander of the Space Based Infrared Systems Wing at Los Angeles AFB, Calif., Nov. 12.

HEO-1 resides in highly elliptical orbit on a classified intelligence satellite. It provides "an unprecedented infrared view of the battlefield" compared to the existing constellation of Defense Support Program early warning satellites, including "real-time data on missiles, aircraft, and other events," according to Air Force Space Command. US Strategic Command was expected to certify the operational readiness of HEO-1 before the end of 2008. AFSPC expects HEO-2 to begin operations early this year.

**F-16 Pilots Receive Mackay Trophy**

Four F-16 pilots from the 35th Fighter Wing at Misawa AB, Japan, received the 2007 Mackay Trophy for the Air Force's "most meritorious flight of the year."

These pilots—Col. Charles L. Moore, Lt. Col. Stephen C. Williams, Capt. Lawrence T. Sullivan, and Capt. Kristopher W. Struve—were recognized in a Nov. 3 ceremony by the Air Force and National Aeronautic Association for their expert airmanship in executing an 11-hour mission from Joint Base Balad, Iraq. They attacked high-value Taliban positions in the Tora Bora region of Afghanistan in August 2007.

Flying under the call sign Panther 11, their four-ship F-16CJ formation marked the first time that fighter aircraft stationed in Iraq were used for combat operations in Afghanistan. The prestigious Mackay Trophy dates back to 1912.

**F-35 Goes Supersonic**

AA-1, the first F-35A Lightning II test aircraft, achieved supersonic speed for the first time during a Nov. 13 flight over northern Texas, flying from Lockheed Martin's production facility in Fort Worth. The aircraft reached Mach 1.05—about 680 mph—at 30,000 feet in altitude while carrying the weight of a full mock internal weapons load.

"The F-35 transitioned from subsonic to supersonic just as our engineers and our computer modeling had predicted" and maintained its "precise handling qualities" at that high speed, said Jon Beesley, Lockheed Martin's chief F-35 test pilot.

Prior to that, AA-1 completed three weeks of flight testing at Edwards AFB, Calif., in October to validate the aircraft's ability to shut down and restart its engine in flight. This was AA-1's first visit to the California test site.

**Satellite Programs Shift**

The Office of the Secretary of Defense decided to delay the planned multibillion-dollar contract award for the Air Force's Transformational Satellite Communications System from December 2008 to an undetermined date, which could be late 2010, the Associated Press reported Oct. 24.

The Pentagon is intent on devising a less costly program to provide dismounted soldiers secure access to the US military's information-sharing networks. The news service said the plan may not survive the next Administration. Boeing and Lockheed Martin are competing for the satellite contract.

Meanwhile, AP reported Oct. 21 that Congressional intelligence appropriators killed the Broad Area Space-based Imagery Collection satellite system, or BASIC, by gutting about $1 billion earmarked for it in Fiscal 2009. Under BASIC, the Pentagon and Intelligence Community planned to procure and operate two commercial-based imagery satellites to fill a potential coverage gap early next decade.

**Missile Wing Fails Inspection**

The 341st Missile Wing at Malmstrom AFB, Mont., did not pass a combined nuclear surety inspection and operational readiness inspection held Oct. 26 to Nov. 10. Some 90 inspectors from Air Force Space Command and US Strategic Command found deficiencies in several areas. A repeat inspection was planned for within 90 days, and AFSPC officials said they were confident the wing would pass.

The discrepancies were limited and did not signal a major problem that would have necessitated a leadership change or mission stand-down, the officials said. Further, the inspections were much tougher than they have been in the past 15 years, since the Air Force is upping its standards as it

## Pentagon Weapons Czar Displeased With CSAR-X Progress

John J. Young Jr., undersecretary of defense for acquisition, technology, and logistics, said Oct. 30 that he was dissatisfied with the Air Force's handling of the Combat Search and Rescue Replacement Vehicle, or CSAR-X, program.

"I'm actually, to be honest with you, somewhat disappointed in that. I can tell you my leadership is approaching unhappy with that," he told reporters during a Pentagon briefing.

Young said he had been prepared to give his stamp of approval so that the Air Force could have awarded the contract for the $15 billion helicopter recapitalization program in November, but had to cancel those plans after the Air Force determined that it had not properly informed the industry bidders of a factor that it had added to its evaluation criteria.

As a result, the Air Force issued a notice Oct. 22, stating that it would be releasing an amendment to the CSAR-X solicitation to clarify the change, thereby underscoring its "commitment to a fair and transparent competition." USAF said there would be a "minor delay" in announcing the winning helicopter associated with the amendment, which was issued on Dec. 5.

Some press reports said the delay could extend into the spring or summer of 2009.

The Air Force chose Boeing's HH-47 in November 2006 to replace its HH-60G rescue helicopters, but the program has been in limbo since. After two successful rounds of legal protests by Lockheed Martin and Sikorsky, the Air Force reopened the contest to revised bids.

Even with the delay, the Air Force said it had "full confidence" in its process to determine the winning helicopter. Further, it said the amendment and corresponding delay were "not associated" with the Pentagon inspector general's audit of the CSAR-X requirements development process that was expected to be complete before the end of 2008.

USAF photo by SSgt. Nathan Gallahan

***To Save a Life:*** *An HH-60G combat search and rescue helicopter takes off from RAF Lakenheath, England, for a nontraditional but extremely urgent rescue mission Dec. 10. The Pave Hawk, assigned to the 56th Rescue Squadron, was headed to pick up an injured crewman aboard a cargo ship 500 miles west of Ireland. The sailor had suffered a serious head injury and required immediate medical evacuation.*

## OSD Releases Minimum Funding for More F-22s

After some delay that raised Congressional concern, the Office of the Secretary of Defense on Nov. 12 freed up some—but not all—of the funding that lawmakers provided in Fiscal 2009 to keep the F-22 production line flowing uninterruptedly until President-elect Barack Obama's Administration decides within the next few months whether to keep building the stealthy fighter aircraft or shutter the line.

John J. Young Jr., undersecretary of defense for acquisition, technology, and logistics, authorized the Air Force "to take steps to spend up to $50 million for advanced procurement associated with four F-22 aircraft" beyond the 183 aircraft already under contract, according to a news release by his office on that day. These four F-22s correspond to the four Raptors that OSD said it intended to request in the next war supplemental to replace F-16s lost since 9/11 in the War on Terror.

Young wrote, "In January, the next Administration can decide to obligate additional advanced procurement funds, up to the Congress-imposed $140 million ceiling, to support up to 20 F-22 aircraft." Based on industry input, Young said it was his understanding that advance procurement of four aircraft in November, coupled with additional advance procurement in January, "will bridge the F-22 line with little or no additional cost."

OSD did not request funds to buy more Raptors beyond 183 in the Pentagon's Fiscal 2009 budget request. However, the Fiscal 2009 defense authorization act includes $523 million added by Congress to procure materials and long-lead-time parts for an additional lot of 20 F-22s beyond 183. Or, those funds would be applied to closing the F-22 production line, if the new Administration opts to build no more.

The lawmakers stipulated that only $140 million of that amount could be used for advance procurement until the new Administration made the production decision. This amount would keep the line flowing without interruption until March and avoid potentially substantial restart costs if there was a production break.

reinvigorates its nuclear enterprise, they noted.

"You just witnessed [that] you can have hundreds of tasks performed perfectly; have thousands of people performing their jobs without any flaws; and yet one single event ... can affect the overall team score," Gen. Roger W. Burg, 20th Air Force commander, told the Malmstrom missileers.

### First "Southern Partner" Held

Air Forces Southern conducted the inaugural Operation Southern Partner, a series of focused subject-matter exchanges and partnership-building exercises with air forces in Latin America, from Oct. 26 to Nov. 7.

More than 70 US airmen flew aboard a C-17 transport down to South America to work alongside members of the air forces of Argentina, Chile, Paraguay, and Uruguay. Activities included discussions on base security with Chilean airmen, on aircraft maintenance with Argentinean airmen, and on medical disaster response with Argentinean and Uruguayan military medics. There were also air-drop exercises with Chilean search and rescue airmen and Uruguayan military personnel and more than 10 outreach and community relations projects.

AFSOUTH plans to hold Southern Partner periodically, with the next iteration planned for the spring.

### New Radar for F-15E

The Air Force awarded Boeing a $238 million contract on Oct. 30 for the sys-

## The War on Terrorism

### Operation Iraqi Freedom—Iraq

#### Casualties

By Dec. 10, a total of 4,211 Americans had died in Operation Iraqi Freedom. The total includes 4,200 troops and 11 Department of Defense civilians. Of these deaths, 3,397 were killed in action with the enemy while 814 died in noncombat incidents.

There have been 30,871 troops wounded in action during Operation Iraqi Freedom. This number includes 17,270 who were wounded and returned to duty within 72 hours and 13,601 who were unable to return to duty quickly.

#### Iraqi Pilots Graduate

The fledgling Iraqi Air Force celebrated a milestone Oct. 13 with the graduation of the first three pilots from its sole fixed-wing flight training school at Kirkuk Regional Air Base.

"These new pilots are the first the Iraqi Air Force has produced since the fall of Saddam Hussein," said Lt. Col. Nathan Brauner, commander of the 52nd Expeditionary Flying Training Squadron. This US unit is helping to train the Iraqis as part of US-led Coalition Air Force Transition Team efforts to re-establish the Iraqi air component.

The three Iraqis underwent four months of language instruction, followed by six months of officer training at Taji Base, and then 12 months at Kirkuk, flying Cessna 172S Skyhawk and Cessna 208B Caravan aircraft.

### Operation Enduring Freedom—Afghanistan

#### Casualties

By Dec. 10, a total of 624 Americans had died in Operation Enduring Freedom. The total includes 623 troops and one Department of Defense civilian. Of these deaths, 409 were killed in action with the enemy while 215 died in noncombat incidents.

There have been 2,605 troops wounded in action during OEF. This number includes 922 who were wounded and returned to duty within 72 hours and 1,683 who were unable to return to duty quickly.

#### US Ramps Up UAV Fight

The US military has established some new bases closer to the presumed action in Afghanistan specifically to get unmanned aerial vehicles on the scene more quickly.

Dyke D. Weatherington, the Department of Defense's deputy director for unmanned warfare, told *USA Today* in a Nov. 10 report that the Pentagon had identified areas where it would need a "sustained presence" and added, "Recently we set up a couple of additional bases closer to the Pakistan border that cut down those transit times."

And, in Afghanistan, military spokesman Col. Greg Julian told *USA Today* that additional bases were being established for drones and more troops. The Air Force operates both the MQ-1 Predator and MQ-9 Reaper UAVs in Afghanistan; the larger Reaper hunter-killer entered the arena in September 2007.

Although the UAV missions generally are flown via satellite communication links by pilots and sensor operators at Creech AFB, Nev., the Air Force must have pilots and sensor operators on hand in theater to handle launch and recovery and some of the spontaneous troops-in-contact action. The service also has UAV crew chiefs forward deployed to assist with launch and recovery and handle any maintenance issues.

tem development and demonstration phase of the F-15E radar modernization program. Under it, the Air Force will replace the APG-70 radars on all 223 of its F-15E Strike Eagle multirole fighters with a sophisticated new active electronically scanned array system supplied by Raytheon.

The new AESA radar, for which the Air Force had not yet announced a nomenclature, will improve the aircraft's ability to detect and track air and ground targets, including small-size ones, and offer an order-of-magnitude jump in reliability and reduced maintenance, according to both companies.

During SDD, Raytheon will build developmental and flight-test units, and Boeing will integrate the radar onto the F-15E. A production decision is expected in 2011, leading to the first AESA-equipped F-15E unit being declared ready for operations in Fiscal 2014, the companies said.

#### Expanded BMT Begins

The Air Force started its first expanded basic military training course Nov. 4 at Lackland AFB, Tex. The recruits in this course are the first to undergo 8.5 weeks of instruction as opposed to the 6.5-week training regimen that had been in place since the 1960s.

The decision to expand BMT was made in 2006. The extra two weeks will be used to enhance and reinforce expeditionary war skills training and incorporate additional instruction such as combat CPR so that the recruits are better prepared to meet the challenges they will face as part of the Air Force, service officials have said.

The Air Force anticipates that a total of 39,000 recruits will pass through BMT at Lackland in Fiscal 2009.

#### Fire Hits Minuteman Site

The Air Force divulged in late October that a fire broke out in a Minuteman III ICBM launch facility May 23, 2008, near F. E. Warren AFB, Wyo., causing about $1 million in damage. But the flames did not enter the launch tube or reach the missile, and at no time was there the risk of an unauthorized release of nuclear material, Air Force Space Command officials said.

The incident was not publicly disclosed until the release of the accident investigation board findings on Oct. 30. The fire occurred just two weeks before the Air Force's previous leadership was fired over shortcomings in nuclear stewardship after two highly publicized missteps involving nuclear and nuclear-related materials.

AFSPC said accident investigators found that a buildup of flammable hydrogen gas caused by a malfunctioning battery charger resulted in the fire in the unmanned facility, which is designated LF Alpha 06.

#### USAF Develops Cyber Roadmap

Air Force Space Command and Air Force Cyber Command (Provisional) announced Oct. 24 that they were creating a roadmap to establish the cyberspace mission within a new numbered air force, 24th AF, under AFSPC.

Earlier that month, the Air Force leadership announced the plan to stand up the new NAF, thereby nixing previous plans to form a cyber operations major command. "There won't be a

## Senior Staff Changes

**RETIREMENTS:** Gen. Bruce **Carlson,** Maj. Gen. Wendell L. **Griffin,** Lt. Gen. Henry A. **Obering III,** Brig. Gen. Mark H. **Owen,** Brig. Gen. Katherine E. **Roberts,** Brig. Gen. Mark E. **Stearns,** Lt. Gen. Stephen G. **Wood.**

**NOMINATIONS: To be Lieutenant General:** Loren M. **Reno,** Harry M. **Wyatt III. To be Brigadier General:** James K. **McLaughlin.**

**CHANGES:** Brig. Gen. Judith A. **Fedder,** from Cmdr., 76th Maintenance Wg., Oklahoma City ALC, AFMC, Tinker AFB, Okla., to Dir., Log., ACC, Langley AFB, Va. ... Maj. Gen. Patrick D. **Gillett Jr.,** from Dir., Log., ACC, Langley AFB, Va., to Cmdr., Oklahoma City ALC, AFMC, Tinker AFB, Okla. ... Maj. Gen. (sel.) Bradley A. **Heithold,** from Dir., Plans, Prgms., Rqmts., & Assessments, AFSOC, Hurlburt Field, Fla., to Cmdr., AF ISR Agency, Lackland AFB, Tex. ... Brig. Gen. Bruce A. **Litchfield,** from Dir., Log., PACAF, Hickam AFB, Hawaii, to Cmdr., 76th Maintenance Wg., Oklahoma City ALC, AFMC, Tinker AFB, Okla. ... Brig. Gen. Thomas J. **Trask,** from Cmdr., 23rd AF, AFSOC, Hurlburt Field, Fla., to Dir., Plans, Prgms., Rqmts., & Assessments, AFSOC, Hurlburt Field, Fla.

**SENIOR EXECUTIVE SERVICE CHANGES:** Jeffrey C. **Allen,** to Dep. Dir., Log., DCS, Log., Instl., & Mission Spt., USAF, Pentagon ... James J. **Brooks,** to Assoc. Dir., AF Quadrennial Defense Review, Office of the Vice C/S, USAF, Pentagon ... James G. **Clark,** to Dir., ISR Innovations & Unmanned Aerial Sys. Task Force, DCS, ISR, USAF, Pentagon ... Audrey Y. **Davis,** to Dep. Asst. Secy., Financial Ops., Office of the Asst. SECAF, Financial Mgmt. & Comptroller, USAF, Pentagon ... Todd A. **Fore,** to Dep. Dir., Force Mgmt. Policy, DCS, Manpower, Personnel, & Svcs., USAF, Pentagon ... Richard P. **Gustafson,** to Principal Dep. Dir., Defense Finance & Accounting Svc., Arlington, Va. ... Robert M. **Maxwell,** to Assoc. Dir., Strat. Planning, DCS, Strat. Plans & Prgms., USAF, Pentagon ... Troy **Meink,** to Dir., Signal Intel. Sys., Acq. & Ops., NRO, AFSPC, Chantilly, Va. ... Deline R. **Reardon,** to Chief, Weapon Sys. Readiness, Resource Integration Directorate, DCS, Log., Instl., & Mission Spt., USAF, Pentagon ... Teri G. **Spoutz,** to Dir., Budget Investment, Office of Asst. SECAF, Financial Mgmt. & Comptroller, Pentagon ... Steven J. **Zamparelli,** to Dir., Contracting, Warner Robins ALC, AFMC, Robins AFB, Ga. ■

huge difference in what was being presented originally—cyber being its own command—with what will be done under AFSPC's umbrella," said Gen. C. Robert Kehler, AFPSC commander, in a release.

Maj. Gen. William T. Lord, commander of AFCYBER (P), told the *Shreveport Times* Nov. 7 that 24th AF would comprise about 400 people, roughly the same number that had been planned for the AFCYBER major command headquarters. The location of 24th AF and any subordinate units had not been finalized as of mid-November, but work was already under way to establish the career fields, training, doctrine, and policy for cyber.

### GAO Calls for UAV Lead

In a Nov. 14 report, the Government Accountability Office recommended that the Department of Defense establish a "single entity accountable for integrating efforts" with unmanned aerial systems.

"DOD has not defined the roles, responsibilities, and relationships among the various UAS-related organizations," GAO analysts wrote after examining the activities of DOD's task force for unmanned aerial vehicles that was established in 2007 after the Office of the Secretary of Defense stopped the Air Force push to become executive agent for higher-flying UAVs.

The Congressional watchdog agency acknowledged the "several steps" that DOD has taken toward management and operational improvements. However, it asserted that the Defense Department's "approach lacks key elements of an overarching organizational framework needed to fully integrate efforts, sustain progress, and resolve long-standing challenges in acquiring and operating UAS in a joint environment."

### Bronze Star Medals Awarded

Lt. Col. Lynden Skinner, deputy commander of the 341st Security Forces Group at Malmstrom AFB, Mont., received a Bronze Star Medal Oct. 24 for his activities while deployed to Iraq as the Joint Defense Operations Center Air Force liaison officer to an Army artillery task force at Logistics Support Area Anaconda.

The Air Force also awarded Bronze Star Medals to: Capt. Carl Close at Fairchild AFB, Wash., for his work as an embedded training team senior fuels mentor to the Afghan National Army while deployed to Kandahar Air Base; MSgt. Krisah Herron at Incirlik AB, Turkey, who served as an explosive ordnance disposal team leader while deployed to Baghdad, Iraq; MSgt. Andrea Vigliotti (now a senior master sergeant at Air Force Personnel Center), for her actions in Baghdad as deputy of acquisition policy and evaluations at Joint Contracting Command-Iraq/Afghanistan; TSgt. James Thompson at Izmir AB, Turkey, who served as an anti-terrorism force protection specialist at Joint Base Balad, Iraq; TSgt. Robert Weston at Elmendorf AFB, Alaska, an explosive ordnance disposal specialist; and SSgt. Karen Wagner at Ramstein AB, Germany, for her work as a weapons intelligence team investigator supporting the Army.

### Predators Will Stay

The Air Force said in early November it currently has "no plans" to shift its fleet of MQ-1 Predator unmanned aerial vehicles to another service when the larger, more capable MQ-9 Reaper UAVs enter operations in greater numbers, as was claimed in press reports in October.

In fact, service officials said such claims "were inaccurate" and subsequently "retracted by the source." Instead, the Air Force said the Joint Staff and US Strategic Command are conducting a study to determine the overhead full-motion-video needs of combatant commanders. Results are expected early this year and will help shape the Air Force's future UAV force mix.

The Air Force's current plans are to operate MQ-1s through 2015. The service expected to have enough Predators in place to provide 31 simultaneous combat air patrols in Southwest Asia by the end of 2008, and is working toward the goal of 50 CAPs filled by Predators and Reapers early next decade.

### Aircraft Losses Near 70

The tally of Air Force aircraft lost to date supporting the Global War on Terror is 67, counting from Sept. 11, 2001 to mid-November 2008. This includes 24 manned platforms and 43 unmanned aerial vehicles, according to data provided by the Air Force.

Cumulatively, these destroyed platforms are known as contingency losses. The manned loss breakdown is: one A-10A, two B-1Bs, one B-2A, one C-5B, one C-130H, one F-15E, five F-16s, two HH-60Gs, two MC-130Hs, one MC-130P, six MH-53s, and one U-2. The unmanned losses are: 40 MQ/RQ-1 Predators, one MQ-9A Reaper, and two RQ-4A Global Hawks.

Seven of these airframes (one A-10A, one F-16, one MH-53, two MQ-1s, and two RQ-1s) were destroyed while in direct contact with the enemy (e.g., shot down, crashed while attacking). They are considered combat losses.

USAF photo

***Desert Operations:** A Malian soldier takes a defensive position as a USAF CV-22 takes off during Exercise Flintlock in November. Flintlock is part of the Trans-Sahara Counterterrorism Program, which was initiated by the US as a means to enhance regional security cooperation across the region. (See "Air Force World: CV-22s Deploy Overseas, p. 11.)*

**Reprieve for Housing Projects**

HP Communities, a limited liability company owned by Hunt Development Group of El Paso, Tex., and Pinnacle AMS Development of Seattle, took over the beleaguered American Eagle military housing privatization projects at four Air Force bases through a sale announced Nov. 4.

The Air Force said the deal, culminating almost two years' effort, consolidates the housing privatization projects for more than 2,600 housing units collectively at Hanscom AFB, Mass., Little Rock AFB, Ark., Moody AFB, Ga., and Patrick AFB, Fla., under a single umbrella and allows construction to restart at all locations. Management of these activities had attracted much Congressional criticism after work stoppages and cost spikes.

"Getting these projects back on track has been of utmost importance to the Air Force and will improve the quality of life for our airmen at these four installations," said Kathleen I. Ferguson, deputy assistant secretary of the Air Force for installations. Hunt has built more military family housing in the US than any other company.

**Pentagon IG Admits Error**

The Pentagon inspector general office in October rescinded a March 2008 report that had cited the possible compromise of classified information on the F-35 Lightning II stealth fighter at BAE Systems facilities or through the company's computer systems.

"After report issuance, we determined that we did not have sufficient appropriate evidence to support the report conclusion," wrote Paul Granetto, principal assistant inspector general for auditing, in an Oct. 23 release.

The IG had criticized the Defense Security Service back in March for "incomplete" oversight of BAE Systems, a principal industry partner to Lockheed Martin on the $300 billion F-35 program, which could have led to the company's intentional or unintentional release of sensitive data on the aircraft. BAE had steadfastly contested the findings.

**World War II Ace Dies**

Retired Air National Guard Maj. Gen. Francis R. Gerard, 84, who shot down eight German fighters during World War II and went on to command the New Jersey National Guard in the 1980s, died Nov. 1.

According to New Jersey's *The Leader* newspaper, Gerard joined the Army Air Corps in 1942 after graduating from high school the previous year. He flew the P-51 Mustang with the 503rd Fighter Squadron during World War II, destroying four of his eight credited German fighters in one 12-minute battle over Leipzig, Germany, Sept. 11, 1944.

After the war, Gerard left active duty, became an attorney, and joined the New Jersey Air National Guard. He served during the Berlin Airlift and Korean War, rising to major general in 1977. During his career, he commanded the 108th Tactical Fighter Wing, headed the New Jersey ANG, and served as the New Jersey adjutant general from 1982 until his retirement in 1989.

**WWII Airman's Remains Identified**

The remains of Army Air Forces SSgt. Martin F. Troy of Norwalk, Conn., missing since 1944, have been identified, the Department of Defense announced Nov. 3

Troy was part of the 10-member crew of a B-24H Liberator bomber that was shot down on June 30, 1944 and crashed into a swampy area near Nemesvita, Hungary, beside Lake Balaton, while on a mission to strike an oil refinery in Blechammer, Germany.

Human remains turned over by Hungarian citizens and additional evidence from crash site surveys and excavations in 2003, 2005, and 2007 led to his identification. Troy was the last of the three airmen who perished in the crash to be recovered and identified.

**USAF Seeks Energy Jointness**

Michael A. Aimone, USAF's acting deputy chief of staff for logistics, installations, and mission support, said Oct. 30 that the Air Force is adopting a new policy to make its ambitious efforts to conserve energy and leverage renewable and environmentally friendly power sources more "cooperative and joint" with the other services and Office of the Secretary of Defense.

For example, the service now seeks to partner with the Army and Navy

## Index to Advertisers

USAF photo by SSgt. Samuel Morse

***Making It Permanent:*** *A1C Joshua Toth smooths wet concrete at Bagram Airfield, Afghanistan. Toth is a heavy equipment operator with the 455th Expeditionary Civil Engineer Squadron. There are 25 active construction projects under way at Bagram.*

on a large solar photovoltaic project in California that the Air Force had originally planned for Edwards Air Force Base, Aimone said. A site other than Edwards may be chosen to host the solar farm.

The Air Force is also now incorporating the Army in its activities to establish small nuclear power reactors at some USAF installations, Aimone said, noting the Army's history going back to the 1950s of using nuclear power at its facilities.

### Duluth to Keep F-16s Longer

The Duluth *News Tribune* reported Nov. 12 that the Minnesota Air National Guard's 148th Fighter Wing will retain the F-16 flying mission through 2018, and possibly 2020, instead of the earlier announced phaseout date in 2013.

According to the newspaper, Deputy Defense Secretary Gordon England told Sen. Norm Coleman (R-Minn.) that the wing would receive F-16 Block 40 aircraft to replace its current Block 25s and keep the mission at the base longer. This puts the 148th FW in better position to await the new F-35 Lightning II stealth fighter, but England made no promises that the wing would get the F-35.

The Duluth-based Air Guard unit is on the list of potential F-35 beddown locations.

### AFRL Awards Engine Contracts

General Electric, Lockheed Martin, and Pratt & Whitney received contracts cumulatively worth hundreds of millions of dollars from the Air Force Research Laboratory in late October and early November to continue their work on radically improving the performance of turbine engines.

The companies were chosen to proceed into Phase II and Phase III of AFRL's Versatile Affordable Advanced Turbine Engines program, which hopes to achieve results by around 2017 that yield a 10-fold performance increase, compared to a state-of-the-art turbine powerplant in 2000.

VAATE-derived engines are envisioned to power future strike aircraft and missiles as well as sensor platforms and reusable space-access vehicles. ■

## News Notes

■ Gen. Bruce Carlson relinquished command of Air Force Materiel Command on Nov. 21 and planned to formally retire on Jan. 1, ending his 37-year career. He led AFMC since August 2005. Gen. Donald J. Hoffman replaced Carlson as head of AFMC.

■ The Air Staff's new Strategic Deterrence and Nuclear Integration Office (A10) stood up on Nov. 1. It will provide a singular focus on nuclear matters in the Air Force headquarters. Maj. Gen. C. Donald Alston was appointed Oct. 31 to lead the office.

■ The Air Force awarded pilot wings posthumously to 2nd Lt. Alec F. Littler during the Nov. 7 graduation ceremony of his training class at Sheppard AFB, Tex. Littler and his instructor pilot were killed last May in the crash of their T-38C trainer, an accident that USAF blamed on the IP.

■ Quick action by SSgt. Akeilee Murchison, SrA. Heather Libiszewski, A1C Mayra Colon-Santiago, and Amn. Martin Renzi saved about $52 million worth of aircraft parts from being lost in a Sept. 22 electrical fire at Joint Base Balad, Iraq, the Air Force said.

■ The Air Force Research Laboratory expects to launch Tactical Satellite-3 this month after announcing a delay in late October to fix an issue with the spacecraft's star tracker so that it will be able to position itself correctly once on orbit.

■ The first four Air Force pilots picked to fly the F-22 without previous fighter experience took a big step forward Nov. 1 by graduating from the inaugural F-22 basic course at Tyndall AFB, Fla.

■ The Air Force on Oct. 31 transferred the 314-acre Davis Global Communications Site, an annex of the former McClellan Air Force Base in Sacramento, Calif., to Yolo County for use as parkland. McClellan closed in 2001 as a result of BRAC 1995.

■ Air Force technicians at Warner Robins Air Logistics Center in Georgia have succeeded in figuring out the best way to remove and replace longeron support beams in several grounded F-15Cs, even though these beams were never intended to be removed when the aircraft were built, the Air Force announced Nov. 14.

■ Air Force and state of Florida representatives held a ceremony Oct. 22 at Cape Canaveral Air Force Station to mark the transfer of Space Launch Complex 36 to the state for commercial satellite launches under a license agreement.

■ The Air Force began the first-of-its-kind unmanned aircraft systems fundamentals course Nov. 21 at Randolph AFB, Tex. The course will teach 10 newly winged graduates of undergraduate pilot training how to operate unmanned aerial vehicles without first sending them to fly manned operational aircraft.

■ After 30 years of service, the Air Force's one and only Convair C-131 Total In-Flight Simulator made its final flight Nov. 7—a trip to Wright-Patterson AFB, Ohio, to be put on permanent display at the National Museum of the US Air Force.

■ The new 300-foot-wide, 15,000-foot-long main runway at Edwards AFB, Calif., home to the Air Force Flight Test Center, began operations Oct. 31. ■

# What senior leaders say about Air Force Magazine. . .

*"I've been reading Air Force Magazine for more than 35 years, and I've always found it to be informed and insightful. Even more important is the fact that it covers the United States Air Force as an integrated whole and not in little bits and pieces—a weapon system here, a personnel matter there—as is the case in most defense publications. In Air Force Magazine, you see the Air Force as a whole, as it should be seen."*

*Lt. Gen. David Deptula, Deputy Chief of Staff for ISR*

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***More USAF decision-makers read* AIR FORCE *Magazine. Period.***

# Issue Brief

By **Adam J. Hebert,** Executive Editor

# The Taiwan Problem, Alive and Kicking

*If "secessionist forces [cause] Taiwan's secession from China, or ... possibilities for a peaceful reunification [are] completely exhausted, the state shall employ non-peaceful means." —China's 2005 anti-secession law.*

Beijing could not be more blunt. China has a right—even an obligation—to use force against Taiwan if it takes steps toward independence. It's the law, says China's communist regime.

Washington has long wrestled with this attitude toward Taiwan, which China considers a breakaway province. The issue has grown in importance recently.

In October, the US approved the sale of $6.5 billion in new defensive weapons for Taiwan. Included in the package—which was first proposed eight years ago—are Patriot air defense missile batteries, Apache attack helicopters, Javelin anti-tank missiles, and parts for Taiwan's F-16 fighters.

The package did not include 66 F-16s, which Taiwan has sought in a separate request.

China responded by condemning the sale, banning port calls by US warships, and canceling military exchanges. "We demand the US change its ways," a Chinese general said in November. He claimed the exchanges would not resume until the US canceled the sale.

The US has its own law—the 1979 Taiwan Relations Act. When Washington in 1978 switched diplomatic recognition from the Republic of China (Taiwan) to mainland China, Congress responded with the act. It pledges that the US will supply Taiwan with weapons necessary to defend itself, and that America will "maintain the capacity" to resist threats to Taiwan.

According to a Congressional Research Service report, the US (1) did not explicitly state the sovereign status of Taiwan in Joint Communiques of 1972, 1979, and 1982, (2) "acknowledged" the "one China" position of both sides of the Taiwan Strait, (3) has not recognized mainland China's sovereignty over Taiwan, (4) has not recognized Taiwan as a sovereign country, and (5) has considered Taiwan's status as undetermined.

The act, however, implies that America will come to Taiwan's defense if the island is attacked. Many observers feel that the US would have no choice but to defend Taiwan from a Chinese armed assault.

The US has only one way to defend Taiwan: with a blend of airpower and sea power. Land-based fighters and bombers stationed at a handful of bases in the Western Pacific and carrier battle groups would bear the burden. USAF keeps a detachment of heavy bombers at Andersen AFB, Guam, at all times, and has fighters permanently assigned to bases in Japan and South Korea.

China prepares for this scenario. According to DOD's 2008 report on Chinese military power, the "near-term focus on preparing for contingencies in the Taiwan Strait, including the possibility of US intervention, is an important driver of [Chinese] modernization."

The bulk of China's advanced weapons are based within striking distance of Taiwan. China keeps 490 combat aircraft within unrefueled combat range of Taiwan. Hundreds more could easily be moved to local bases. China has roughly 1,100 ballistic missiles trained on the island.

The cross-strait balance of power already favors mainland China, and the imbalance is growing worse. For example, Beijing's forces add about 100 new missiles each year.


Staff map by Zaur Eylanbekov

China's military embraces anti-access strategies. Chinese ballistic missiles can hit every air base in Korea and Japan, and China also has numerous, highly accurate cruise missiles and advanced anti-ship missiles to threaten carrier battle groups.

A recent RAND analysis of China's anti-access strategies quotes a senior People's Liberation Army officer saying "concentrated and unexpected" attacks are the best way to strike enemy airfields.

US analysts are particularly concerned about the vulnerability of aircraft and buildings at Western Pacific bases. Aircraft parked in the open and many buildings are "soft" targets vulnerable to attack by ballistic missiles with submunition warheads.

Guam lies outside of China's missile radius. However, the US would encounter great difficulty operating from Guam alone, noted a recent RAND study. Defending F-22s, for example, might find themselves vastly outnumbered in action over the strait.

USAF's permanent bases may be vulnerable to attack, but their destruction at Chinese hands would be no sure thing. China would risk World War III if it blanketed an air base with ballistic missiles, killing scores of Americans and Japanese or South Korean citizens in the process. That is seen as a powerful deterrent.

The bases themselves may prove resilient. Even Chinese military analysts do not assume air bases hundreds of miles from the Chinese mainland are easy to take out.

Still, a small number of large bases make for inviting targets, and military officials have called for USAF to broaden its base structure in the Far East.

DOD's "lily pad" basing strategy calls for USAF to seek a wide range of bare bones facilities so that Air Force aircraft are not confined to existing garrisons.

To defend Taiwan, the US could conceivably fly from locations such as Palau, the Philippines, or Japan's Ishigaki island. Officials note that, in the wake of the Sept. 11, 2001 attacks, US forces quickly arranged to use bases in Kyrgyzstan and Uzbekistan for operations in Afghanistan.

China's military buildup creates risk. If China feels it could safely take Taiwan by force, a miscalculation could lead to a war that would be disastrous to all involved. ■

**More information: http://www.defenselink.mil/pubs/pdfs/China_Military_Report_08.pdf**

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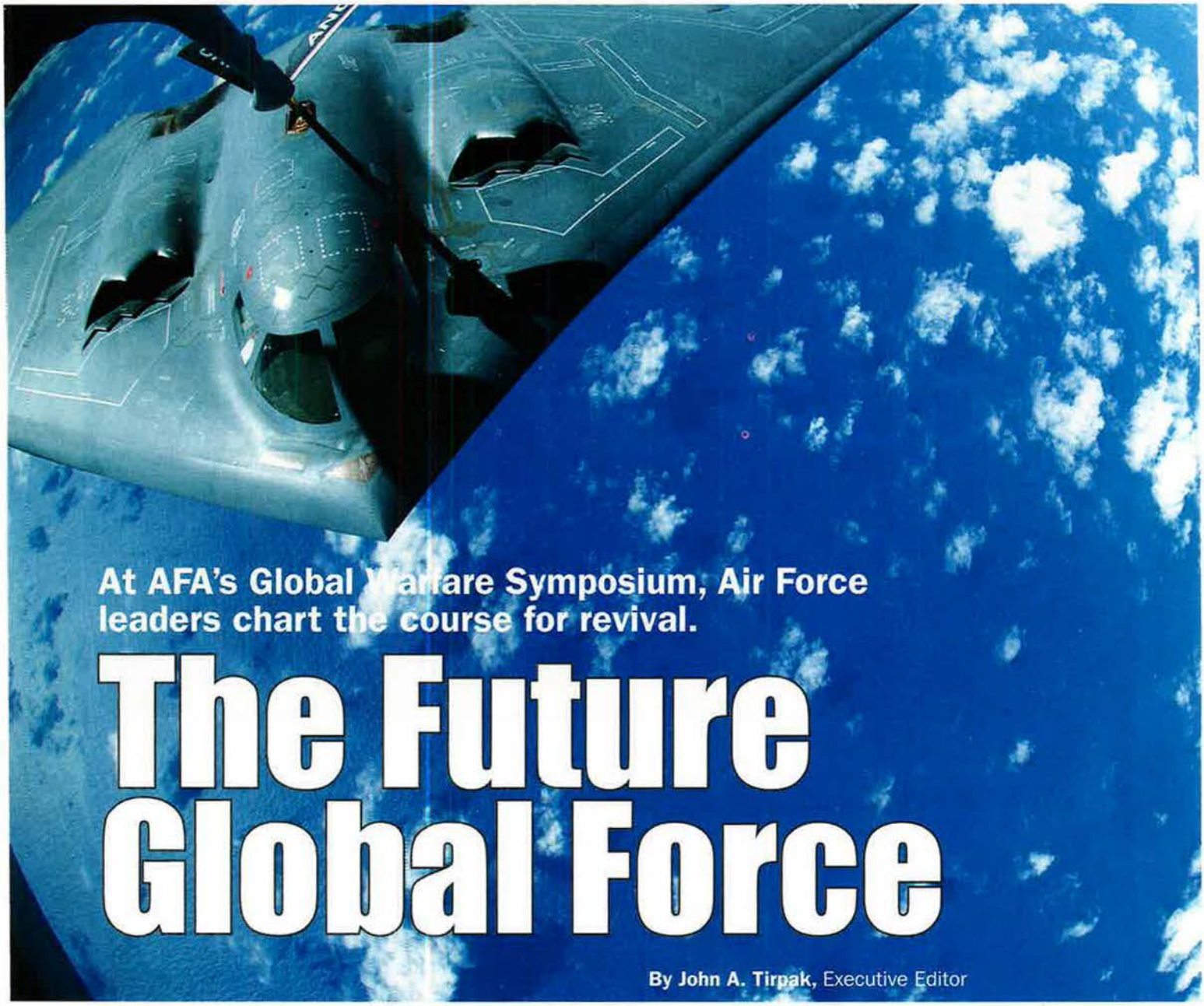


**At AFA's Global Warfare Symposium, Air Force leaders chart the course for revival.**

# The Future Global Force

By John A. Tirpak, Executive Editor

The modern Air Force packs an impressive array of world-spanning military capabilities—nuclear, space-based, cyber-borne, and even conventional. Yet, to keep them effective, USAF will have to rethink and restructure virtually all of them.

USAF, moreover, must do this at a time of high operations tempo and slack funding, and with no assurance of success.

That was the consensus of top officials at the Air Force Association's Global Warfare Symposium, held Nov. 20-21 in Los Angeles. The roster included senior officers and experts in the fields of space, strategic nuclear forces, cyber warfare, ISR, and Pacific regional requirements.

They offered their unique perspectives on how the service could or should cope with the needs of global operations.

## Fixing Military Space

Secretary of the Air Force Michael B. Donley fingered the space realm—systems, architecture, acquisition, operations—as a mission area in great need of an overhaul. As Donley put it, "We need to forge a new path."

He observed that the space industrial base is shrinking, dependence on space is rising, and new threats in space are multiplying.

Within the Air Force, Donley continued, space acquisition has a long way to go before attaining true efficiency or timeliness. Although satellites tend to work well once in orbit, they take far too long to develop and cost too much.

They are also increasingly vulnerable to nations with proven anti-satellite capabilities and a willingness to use them.

"We ... need to consider ways to harden and protect the end-to-end space architecture of ground stations, satellites, and command and control links against various types of threats," Donley said.

In one sense, that points to a need for better space situational awareness—the ability to locate, identify, and then characterize objects in orbit. This, in turn, will require unprecedented cooperation among all members of the space community, including those outside the defense space enterprise.

USAF photo by SrA. Brian Kimball

***Above: A B-2 takes on fuel over the Pacific Ocean. Right: The last Defense Support Program satellite heads into space atop a Delta IV evolved expendable launch vehicle.***

Attempts at knitting these disparate agencies' space efforts have been "inconsistent," Donley said.

"I am not convinced that we are tying these discussions together into a sufficiently robust interagency framework for developing a national space vision, strategy, and resourcing plan," he allowed.

The US should recognize its dependence on space and invest accordingly, according to Gen. Kevin P. Chilton, commander, US Strategic Command.

"I don't want to be holding my breath on every launch," he said, arguing that the nation should be willing to spend the money to ensure adequate backups in case of failure.

"We need robustness," Chilton asserted. "If you need four, why not build five?" The US military establishment is utterly dependent on space, he said, and without it, warfare would rapidly lapse into brute force battles like those seen in World War II.

Donley added that intense focus must be placed on "ways to streamline and strengthen interagency governance" of the space enterprise.

With the change of Administrations under way and a new Quadrennial Defense Review coming, "the time is ripe" to overhaul the national security space enterprise, Donley said. There are numerous "complex and overlapping structures for addressing [space] policy" in the executive branch and Congress, and these need to be rationalized.

## Mushrooming Cyber Issues

Chilton said there are some similarities between the emerging cyber mission and space operations. Like space, cyber is global, something "we use every day" and is a domain that "we defend, [and] prepare for attack from this domain."

He said cyber can be used to create combat effects, and "we need to demystify it." He added that the nation is as dependent on cyber as it is on space, and isn't moving quickly enough to organize its defense. "Are we in denial about that? Yes, we are."

The toughest job in cyber defense, he said, is to keep Web-based traffic moving even when fighting is going on. It won't be possible to just shut it all down in the middle of a fight. "We

USAF photo

USAF photo by Capt. Carrie Kessler

***L-r: Lt. Col. Tim Sands, Capt. Jon Smith, and Lt. Col. John Arnold monitor an electronic warfare simulation at Eglin AFB, Fla.***

have to operate it, and fight through" attempts to corrupt or disrupt it, Chilton said.

The Global Information Grid, he maintained, "is a weapon system, and deserves to be treated like one." Cyber defense should be in the hands of a combatant commander for that reason, and STRATCOM is the right place to do it, he said.

He also warned that enemies looking for "a chink in the armor" of the US have settled on cyber as an excellent place to make mischief, and "we don't have the luxury of time" to conduct a long debate over who's in charge of the domain or how to fight back.

USAF photo by A1C Kelly Timney

USAF photo by A1C Sharida Bishop

***Above: A nuclear weapons convoy moves between two groups of B-52 bombers at Minot AFB, N.D., during a nuclear surety inspection. Left, maintainers and inspectors verify the serial numbers of nuclear cruise missiles before they are loaded into a waiting B-52.***

Dr. Rebecca Grant, independent airpower analyst, Senior Fellow of the Lexington Institute, and Director of the Mitchell Institute for Airpower Studies, said cyber warfare will not develop along traditional lines.

Whereas combat power in air and space developed as outgrowths of existing military enterprises, and were shaped by the military early on, Grant noted that cyber is everywhere at once, and "90 percent or so of it is in private hands."

A big challenge will be to "clarify lines of control" and identify who has the main responsibility, said Grant, who at the symposium released the latest Mitchell Institute special report, "Rise of Cyber War."

The Department of Homeland Security "has taken on a pretty big role in cyberspace in the last couple of years," but for the defense establishment, US Strategic Command is the logical place to manage cyber defense, she said.

There have already been some noteworthy examples of state-sponsored cyber attacks—Russia made cyber attacks on Estonia in 2007, and against Georgia prior to actual armed conflict in 2008—but the rules of this new warfare have not yet been written. Is a cyber attack a true act of war, or just a crime? Cyber requires a new way to view the definition of "sovereignty," especially since attacks come through other, noninvolved combatants.

Cyber is definitely a domain. "We know this is a domain because we all use it," Grant said, but it remains an open question "where the edges" are. Defining the situation should be one of the first priorities of the new Obama Administration, which should be "straightening out what role we want our military services to play" in cyber, Grant said. However, she believes the services "ought to have a bigger lead ... than they do" in performing cyber defense.

## Strategic Forces Emphasis

Chilton, the US operational commander for all strategic nuclear forces, said that the time has come for the US to be thinking about a follow-on to the Minuteman ICBM system. By the time a replacement is developed, the US will have exhausted the service life extension possibilities of its remaining land-based missiles.

Chilton reiterated calls to maintain a healthy infrastructure to design, build,

and test nuclear warheads, but he expressed satisfaction with all the delivery systems for nuclear weapons now in active service.

Nuclear organization and posture has gotten priority attention from the Air Force in the past eight months. After top Air Force leaders were forced out last summer over mishandled nuclear materials, the service has been reinventing its nuclear enterprise.

Lt. Gen. Robert J. Elder, head of 8th Air Force, acknowledged that USAF's focus on the nuclear mission atrophied in the years since the Soviet Union and Strategic Air Command went out of business. However, the service is deadly earnest about restoring its credibility in the nuclear arena, and has the nuclear operational and security inspection results to prove it.

"We are definitely focused," Elder said, "not only on nuclear [operations] but nuclear deterrence. I think we've been able to recreate the same kind of enthusiasm for what we did during the Cold War that kind of drifted away from us ... over the last 15 years."

Elder explained that 8th Air Force, which is to be folded into the new Global Strike Command, has tightened its nuclear procedures, discontinuing the storage of inert and live nuclear weapons in the same facility. The B-52 wings at Barksdale AFB, La., and Minot, N.D., have survived a half-dozen nuclear operations inspections, some with no notice. While the grades are classified, Elder said the personnel involved were justifiably proud of their showing.

Training for the nuclear mission used to be secondary for bomber crews, but no more, Elder said. Bomber crews now report for duty having mastered nuclear skills first, and conventional skills second, and will thereafter maintain a "balance" of skills. The nuclear mission has been reintroduced to the weapons school, and Elder said he is pushing to have more study of deterrence in professional military education.

To maintain emphasis on the nuclear mission, a B-52 wing and a B-2 squadron will always be designated and in training for nuclear duty, although not on nuclear alert. That's because USAF doesn't see an urgent threat of attack on the bomber force, and the US isn't trying to send any other country the message "that we are on a hair trigger, ready to go attack," Elder explained.

The bomber force has been sized in recent years to answer mainly the conventional mission. To meet the needs of the renewed nuclear mission, an additional squadron of B-52s will be brought on line. This will allow annual rotations of one B-52 wing and one B-2 squadron in and out of immersion in nuclear training and exercises, though all bombers will be available for

## Reinventing Operations in a "Global Theater"

With 51 percent of the world's surface to monitor and dozens of countries with which to engage, Pacific Air Forces is definitely "global" and working to reinvent the Air Force posture in the Pacific, according to Lt. Gen. Loyd S. Utterback, commander of 13th Air Force.

Utterback noted substantial shifts of USAF hardware in the Pacific. He pointed out that three of the seven F-22 squadrons will be assigned to PACAF; two are already in place in Alaska and a third will arrive in Hawaii in 2011.

The command also has two C-17 squadrons—one each in Alaska and Hawaii—and has deployed C-130s throughout the region.

Block 40 F-16s in theater have been consolidated at Kunsan and Osan ABs, South Korea, while the older versions have moved up to Red Flag-Alaska to be "aggressor" aircraft. Along with A-10s also based in South Korea, USAF is ready to "fight tonight" on the peninsula "if the armistice fails," Utterback said, reminding the audience that "we are still at war in Korea, and we tend to forget that."

As they become available, "you're going to see, I hope, F-35s at both Kadena Air Base in Japan as well as Eielson Air Force Base" in Alaska, he added. These beddowns of first-line equipment will be supplemented with routine and unbroken chains of deployments of bombers and Global Hawk ISR aircraft to Guam. Andersen AFB, Guam, will be getting three Block 20 Global Hawks beginning in Fiscal 2010, he said.

The US will have to do more than simply push hardware out into the Pacific and conduct some bilateral exercises if it is to build security there, according to retired Army Lt. Gen. Edwin P. Smith, director of the Asia-Pacific Center for Security Studies. Smith painted a picture of the Pacific region illustrating its diversity of cultures and the need for the US to tailor its policies and strategies accordingly. The US cannot afford to be psychologically arrogant and assume that the things that motivate Americans to cooperate will work everywhere.

Against terrorism, Smith said, the US can be effective in the Pacific region if it addresses the "conditions that enable terrorism," such as poverty, ignorance, and a perception that the US is culturally disrespectful and tone-deaf. The US should help its allies and neighbors combat political and bureaucratic corruption, which undermines people's faith in their governments, and maintain long-term policies not affected by political "polarization" in Washington.

"There is no more important security challenge" than the lack of basic education in countries susceptible to terrorism, Smith said, and the US should do what it can to assist public education in countries where extremism sees opportunity.

The US should also be formulating strategies now to deal with a region where growing population and increasing poverty will ensure conflict over "life-essential resources" such as food and water, Smith warned. The US must prepare sustainable strategies, not those that ebb and flow with particular individuals.

He lauded the US willingness to offer immediate and substantial aid in natural disasters and said that, long-term, it does help burnish the American image and win access. He also expressed optimism that younger officers in the US military seem to inherently understand the need to be more culturally attuned in their dealings with other countries.

Besides defending the US, Utterback said PACAF is heavily engaged in many bilateral arrangements for training, and especially providing humanitarian relief in a seemingly endless string of natural disasters in the region.

Utterback said the Pacific region is "not at war today, but it's not a theater at peace." Tensions remain high, and the US is striving to remain engaged with other Pacific countries to keep the lines of dialogue open despite increasing competition for resources.

"We ... recognize that a stable and a predictable relationship with a growing China ... is vital," Utterback asserted. However, China's growing economic and military strength, and a willingness to open its "checkbook illustrate that she is seeking pre-eminence in the region and we have to pay attention."


USAF photo by SSgt. Bennie J. Davis III

***Gen. Kevin Chilton, commander of US Strategic Command.***

nuclear operations at need. They will rotate into conventional emphasis for training, or deploy forward for presence missions—such as in Guam—or to combat in Southwest Asia.

Many process changes have been put in place. Elder noted that nuclear skills had been relegated to being tested and exercised only in the flying parts of bomber wings, but now has been expanded to include the whole wing and the entire support and training apparatus.

"Perfection is our standard, and every part of this mission is being looked at in excruciating detail to ensure that we are in fact living up to the kind of standards that the American people expect us to live up to," he asserted.

Old regulations have been reconstituted and "all the things we had always done back in what we call the 'good old days' are now there." As for the process problems that got the Air Force in hot water, "we have all those in the bag," Elder said.

## Building Global Vigilance

After the nuclear mission, the area getting the most top-level attention from the Air Force's top leaders is the intelligence-surveillance-reconnaissance (ISR) mission.

Lt. Gen. David A. Deptula, deputy chief of staff for ISR, offered a "progress report" on how the ISR enterprise has been reorganized, and is now recast as not only supporting operations, but being an operational mission unto itself.

"We can affect enemy behavior" by maintaining persistent watch, Deptula said. The mere presence of Predators, Reapers, Global Hawks, and U-2s over the battlefield forces the enemy to hide and constrains his ability to do damage, Deptula said.

He noted that in the celebrated case of an attack that killed a major terrorist leader in 2006, "six minutes of F-16 time" had been preceded by "600 hours of Predator time." He asked rhetorically, "Who were the operators?" The realities of ISR today mean it's time for a "culture change" in the Air Force to redefine what "operations" means.

Deptula noted that the Air Force is considering creating a major command for ISR, the better to have it given proper resources and involved across all aspects of the service's portfolio. Fighters and bombers, he noted, are increasingly able to obtain vast amounts of data that can be sent to whoever needs it. The stealthy F-22, he noted, is "a flying sensor platform," which will provide enormous amounts of behind-enemy-lines information to the entire joint force. It must be recognized that ISR provides major effects on the battlefield, albeit "nonkinetic" ones, he said.

The ISR enterprise is knee-deep in developing new concepts of operations for unmanned aerial vehicles and ISR overall and creating an ISR roadmap. An ISR strategy is already completed, but is a "living document" that is modified constantly, Deptula said. Career tracks are being built that will again put ISR operators in the running for top service jobs, the better to grow the talent pool.

He also said that ISR missions are being integrated into the air tasking order that schedules combat sorties, toward the goal of making "every shooter a sensor and every sensor a shooter."

There's been a 520 percent increase in MQ-1 Predator combat air patrols in just four years, Deptula noted—well above goals specified in the last Quadrennial Defense Review—but the demand for unmanned ISR remains intense. The Air Force plans to eventually field 197 Predators, 352 MQ-9 Reapers, and 77 RQ-4 Global Hawks.

The Air Force would like to have single acquisition authority for the medium- and high-altitude UAVs, Deptula said, for the simple reason that separate programs, contracts, and product lines cost more money and add delays to a system screaming for ever-more ISR coverage.

"We can't afford multiple [unmanned aircraft system] program offices, independent training, logistics and maintenance operations," as well as multiple support facilities and procurement contracts, he said.

## Space Acquisition Solutions

Gen. C. Robert Kehler, head of Air Force Space Command, identified the command's multiplicity of customers, all with their own requirements, as the biggest problem in space acquisition.

Kehler said "requirements churn"—as each space platform is configured to accommodate many needs—invariably

***F-22s on the flight line at Andersen AFB, Guam.***

USAF photo by A1C Courtney Witt

USAF photo

*A Global Hawk unmanned aerial vehicle is readied for launch at Beale AFB, Calif.*

leads to delays and cost overruns. As programs get too expensive—and some are eliminated—the need to pile requirements on those programs still going forward only heightens the problem.

It's time to recognize that "one size does not fit all" in the space community, and that greater success will be found in narrowing the scope of some projects, Kehler asserted.

He noted that the long-term intelligence, surveillance, and reconnaissance needs of national policy decision-makers are often at direct odds with the more tactical requirements of forces in the day-to-day fight, which often involves fast-moving situations. Kehler argued that separate programs, individually tailored to the needs of each user, would be easier to design and manage, cost less, and get on orbit faster.

"We need to deploy space systems at the 'speed of need,'" and not at the sluggish pace of development by committee, Kehler asserted.

He quickly added that he doesn't oppose integration of products in the space architecture, but sees value in segregating "black" and "white" space systems. Acquisition problems, he said, will inevitably arise when "we continue to force" convergence of dissimilar requirements.

Kehler offered the Space Radar as an example of a noteworthy failure to harmonize strategic requirements with those of tactical operators "on one platform." The needs of either set of users could have been met with technology already on hand, Kehler said, but it proved too hard to meet them simultaneously.

He offered increased prototyping as a way to vet technologies before fully committing to them. Some think this too costly, but "you could decide to afford it if you need it enough."

Government needs to reinvent its relationship with industry, with more trust and accountability on both sides. That may require thinking back to an earlier, more cooperative time, Kehler said.

"I'm not sure what it was, but all of you say it used to be better," he added.

### An Industrial Perspective

In a panel discussion, industry space experts aired general agreement with Donley and Kehler, arguing for smaller, more focused satellite platforms that can be launched with greater frequency and improved in increments.

Greater stability in the government-industry space relationship—in funding, acquisition, and workforce—would improve the process and the product, according to Brian A. Arnold of Raytheon.

Industrial managers need to have a clear and consistent set of rules—long-term—so they can plan program development logically. Arnold also said the government should consider broadening its use of civil satellites to augment and complement its national assets.

Echoing those remarks was Craig R. Cooning of Boeing, who also pitched for "an enduring and sustainable space architecture," for both government military and civil space activities. If the space industrial base continues to shrink, we can't "attract the best and the brightest" to the field, and America will lose its space leadership, Cooning warned. Big projects are attractive to young engineers and scientists and serve as a recruiting tool.

"We need excitement for this industry in order to sustain" its space edge, he said.

At the same time, Cooning said it's important to recognize a paradigm shift from the space age to the information age, and that satellites should be tasked to do only those things best done by satellites. Moreover, there needs to be some willingness to accept risk. As things stand now, "we continue to require ... exquisite satellite capabilities on the first satellite system that comes out of the chute." He voiced his support for incremental developments: "shorter focus missions," and "responsive, low-cost access" to space.

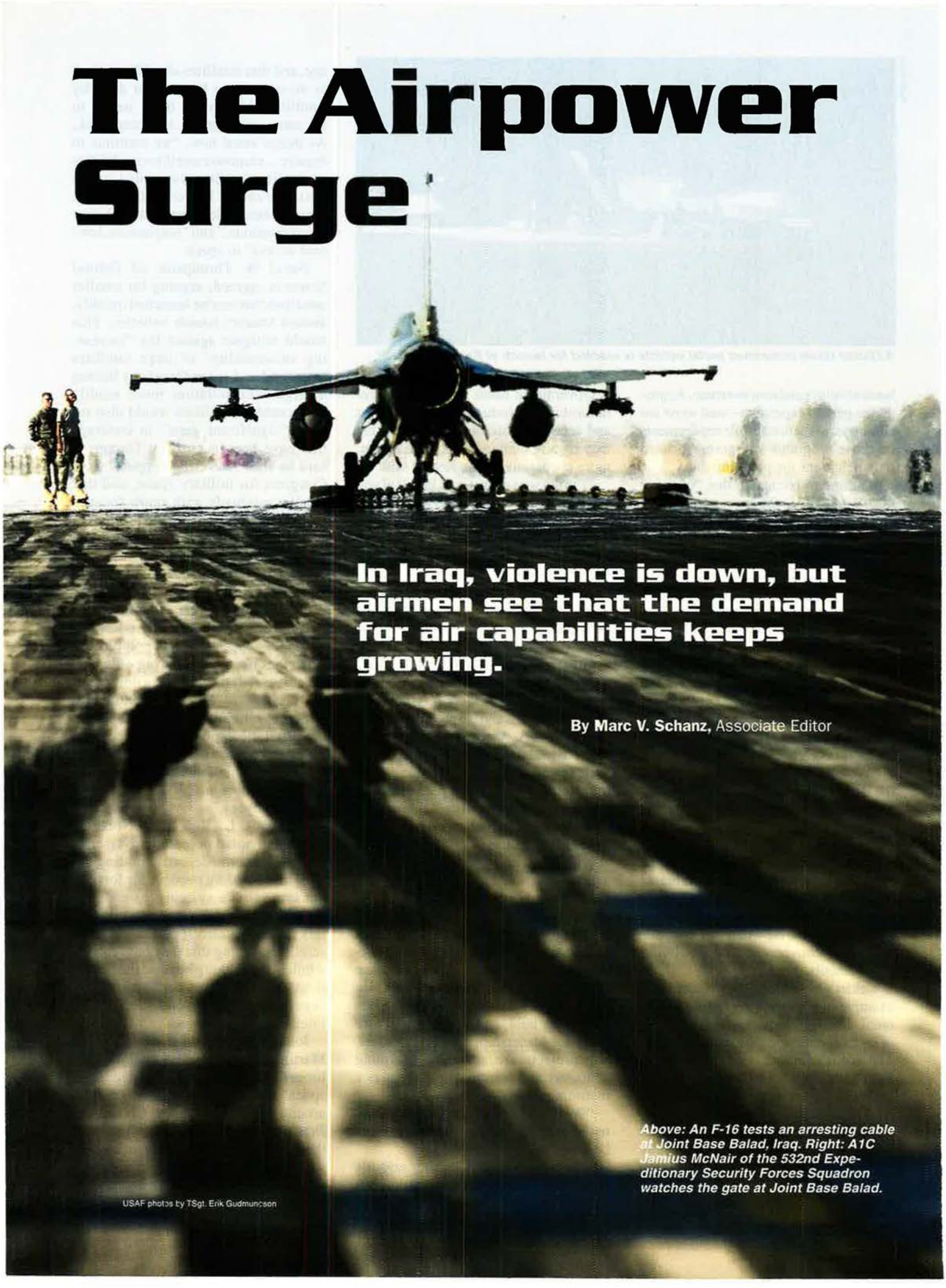
David W. Thompson, of Orbital Sciences, agreed, arguing for smaller satellites that can be launched quickly, aboard smaller launch vehicles. This would mitigate against the "increasing vulnerability" of large satellites to ground and space threats by having a larger constellation more readily replaceable. Smallsats would also reduce "significant gaps" in coverage that have been occurring. Thompson said he sees "wavering support" from Congress for military space, and that smaller payloads with more focused missions would be helpful in getting a rhythm going that Congress could get behind.

Michael C. Gass, of United Launch Alliance, said his company is focused on increasing launch reliability, and is keenly aware that it only takes one failure to upset the space applecart. There has been a long string of launch successes, but those streaks don't matter, Gass said. "We must continue to improve reliability." Like others on the panel, he expressed some concern that the space workforce is graying, but said, "I'm incredibly optimistic. ... We are getting more productivity out of our new employees."

Frederick L. Ricker of Northrop Grumman noted potential adversaries are "no longer necessarily putting energy into building massive air forces," but into missile systems instead, and the US should take steps to mitigate this threat. He also spoke up for large satellites, saying that they have, on the whole, lasted "long beyond the design lives" and "delivered performance and benefits that go beyond the original intents of their designs."

Joanne M. Maguire of Lockheed Martin said that the US today is "no longer" the "unquestioned leader in space" and faces direct challenges from around the world. India, China, and Japan are "acting decisively" to build their space capabilities, particularly with manned spaceflight. "Are we as a nation willing to ... let them pass us?" she asked. ■

# The Airpower Surge



**In Iraq, violence is down, but airmen see that the demand for air capabilities keeps growing.**

**By Marc V. Schanz,** Associate Editor

*Above: An F-16 tests an arresting cable at Joint Base Balad, Iraq. Right: A1C Jamius McNair of the 532nd Expeditionary Security Forces Squadron watches the gate at Joint Base Balad.*

USAF photos by TSgt. Erik Gudmundson

**Viewed** from a military helicopter at low level, Iraq just north of Baghdad appears almost peaceful. Fields are filled with crops irrigated by the nearby Tigris River. Cattle herds roam. Traffic on the roads is relatively light.

Squarely in the middle of this bucolic scene, however, one finds Joint Base Balad, the largest Air Force hub in Iraq and the focus of support activity for the Multinational Force-Iraq. Out by Balad's east entry control point, just over a bridge spanning an irrigation canal, a string of watchtowers and checkpoints line the road approaching the base. About 700 locals a day pass onto the facility for work, and all have to be checked and screened by the security forces.

"We keep an eye out for people who come up to the gate who might be injured, and make sure people are where they need to be," said SSgt. Joseph Howard, standing watch at the approach. When not helping manage the arrival of locals, Howard and his security forces teammates keep a steady eye on the farmlands and berms to either side of the entry point. Most days, things are fairly calm, Howard said.

The future and nature of the US combat mission in Iraq has been ceaselessly debated, but violence in Baghdad is down 90 percent from the worst months of 2006, according to US officials. It is down 80 percent across the entire country.

The number of American combat troops in Iraq has returned to pre-surge levels. Another 8,000 troops are scheduled to leave soon. But MNF-I officials report that several vital military and support missions will remain the work of the US and its allies. A reliable logistical infrastructure is needed to support Iraqi security forces, as are high-tech intelligence-surveillance-reconnaissance and armed close air support flights. This job falls mainly to US airpower forces.

### Wide-Ranging Demands

Operations in Iraq are taking on a new and less violent character. "I would say that 'weapons dropped' is probably not the best measure for how we're performing in this [counterinsurgency] environment," said Maj. Gen. David E. Clary, director of MNF-I's Air Component Coordination Element.

Clary said coalition efforts in the country demand a wide range of airpower assets—from tactical airlift for Iraqi forces and delegations, to aeromedical evacuation, to the seemingly insatiable need for ISR support.

Key to these efforts are the airmen and aircraft that make up the 332nd Air Expeditionary Wing at Balad, the most forward deployed wing now engaged in Operation Iraqi Freedom.

The base exists side by side with the town of Balad, predominantly Shiite, situated on the Tigris about 42 miles north of Baghdad. Balad lies on the edge of the Sunni Triangle—the homeland of former dictator Saddam Hussein and nexus of the Sunni-based insurgency against US forces.

Balad—once known as al-Bakr Air Base—boasts two 11,000-foot runways. Today, Joint Base Balad is the busiest of the Defense Department's many aerial port operations.

A melange of concrete, trailers, and faded outbuildings remains from the days when Balad was a training site for Saddam Hussein's air force. In June, the base's support functions were shifted from the Army to the Air Force, leaving USAF in charge of food service, lodging, vehicle operations, and base construction, defense, and upkeep. This is no small task—the Air Force is now responsible for more than 30,000 troops, contractors, and other personnel.

According to the Air Force, the base on an average month processes more than 950 transport aircraft, 12,000 tons of cargo, and 19,000 passengers. The wing is home to approximately 8,000 airmen performing a wide range of critical missions in the country, from

USAF photo by A1C Jason Epley

*An F-16 of the Oklahoma Air National Guard's 138th Fighter Wing shelters in a hardened bunker at Balad. USAF fighters in Iraq have largely shifted to the "armed overwatch" mission.*

combat search and rescue to tactical airlift, ISR, and close air support.

From a perch atop the base's main tower, one catches a glimpse of an F-16 fighter taxiing on its way to the far end of the runway. Here, Col. Michael A. Fantini, commander of the 332nd Expeditionary Operations Group, explains the daily operations tempo and various missions. Fantini oversees a large portfolio of assets at Balad—F-16s, C-130s, MQ-1 Predator and MQ-9 Reaper unmanned aerial vehicles, and HH-60 Pave Hawk rescue helicopters. "The big red wheel never stops turning," he said.

For one thing, the base hosts the largest group of CSAR helicopters deployed abroad since the Vietnam War, Fantini noted. On Balad's south ramp, the high-pitch sound of jet engines indicates another F-16 sortie is heading out for a morning "vulnerability period"—a standard mission over Iraq nowadays. In these "vuls," the F-16s will fly missions ranging from infrastructure protection to armed overwatch and protecting convoy operations.

## The CAS Surge

In November, F-16s stationed at the 332nd AEW flew approximately 40 close air support missions a day. But unlike their counterparts in Afghanistan, ordnance drops were a rarity. While bombs may be dropping in much smaller numbers than in the dark days of 2007, the pace of operations remains brisk due to one large demand—the need for overwatch.

Iraq is a large country, and even with 150,000 US troops in place, the demand for intelligence, and the ability to quickly act on it, has not diminished.

"The biggest difference is the lack of kinetics," said Lt. Col. Miles DeMayo, an F-16 pilot deployed from Shaw AFB, S.C., and commander of the 55th Expeditionary Fighter Squadron. "Whether it's counter-IED [improvised explosive device] missions [or] armed overwatch, ... we're the eye in the sky [but we also] have that rapid response capability" for when someone needs help fast.

Back in the summer of 2007, when the surge began squeezing enemy forces in Iraq, CAS strikes peaked with 303 drops against insurgents in July. Today, that number has dwindled to a handful.

Two days before a reporter's visit to Balad, an F-16 dropped GBU-38s onto enemy fighters hiding in a building near the town of Baqubah, where they were firing rocket-propelled grenades at coalition forces. It was the first such air strike that week.

"We track convoys, ISR stuff, [and] we make sure, if there's any threat behind or in front of convoys, we know

USAF photo by TSgt. Erik Gudmundson

*Heavily protected airmen of the 532nd Expeditionary Security Forces Squadron survey a construction site at the Balad base.*

what it is," said Capt. Adam Hafez, an F-16 pilot deployed to Balad with the 55th EFS.

In short, pilots spend much time making sure that ground commanders and coalition officials know where the bad guys are at all times. And "armed overwatch" means the aircraft can quickly deliver ordnance on an enemy's head, if that is required.

Keeping ready a fleet of fighters and weapons in the middle of a harsh desert brings inherent challenges. Aircraft are prone to malfunction in Iraq's extreme climate and dusty conditions.

"The dirt and sand get everywhere," said TSgt. Jason Fitts, an armaments crew member with the 55th Expeditionary Aircraft Maintenance Unit. "We [may not] fire a lot of rounds and drop a lot of bombs [these days, but] we still have to upload" munitions and still have to take them off and return the weapons to storage.

"We tear [munitions] down and build them up on a 180-day cycle," said Capt. Mark Ashman, a munitions flight commander deployed from the 23rd Wing at Moody AFB, Ga. "That constant vigilance we're maintaining is not going away."

Fitts said that, despite the sometimes halting process of loading, maintaining, and constantly checking for foreign object damage, airmen at Balad are taking a lot away from their time on the ramp. "Back home, we load practice bombs," he said. "Here, you actually see how it works, day in and day out."

Keeping a fighter's sensitive electronics in working order presents its own set of challenges in this harsh environment. Radios and targeting pods are indispensable tools for the pilots, mission planners, and commanders on the ground.

## Popular Predators

SrA. Jeffrey Haviland, an avionics specialist with the 55th EAMU, said his shop works a great deal with the components of the ARC-210 radios and the Sniper targeting pods, items that are critical to exchanges of information between the pilot in the cockpit and joint terminal attack controllers on the ground. Pilots say they could not fly effectively in Iraq without these tools.

"There will always be component failure with electronics," said Haviland, but they've been able to handle things. "We get on top of problems quickly."

The Air Force fighters at Balad are teamed up with the war's most sought-after aircraft—the MQ-1 Predators. These multimission UAVs were joined last summer by MQ-9 Reapers of the 46th Expeditionary Reconnaissance and Attack Squadron. Down the flight line from the fighter shelters, a Reaper, engine humming, was positioned for takeoff on a combat air patrol mission.

USAF now is flying over Iraq more CAPs than ever, said Maj. Tim Bolen, commander of the 46th ERAS, which is responsible for launch and recovery of Air Force UAVs over Iraq. There are more than 21 combat air patrols over Iraq as of November 2008, he said.

The Air Force's unmanned attack assets have been game changers in the skies over Iraq. The nearly constant surveillance of high-value targets and convoy routes—and the ability to strike targets at a moment's notice—has created unending demand for the aircraft in theater.

"What we need is more ISR," wrote Army Gen. Raymond T. Odierno in an article published just prior to his promotion to commander of MNF-I in September. Odierno has said that armed UAVs are a bonus, but that systems such as the Reaper should not be used primarily as attack platforms until the larger ISR shortfall ends.

Sometimes the aircraft are monitoring suspicious sites or tracking groups of terrorists seen digging in a road late at night. And they circle and watch.

"You go through checks, you watch them placing wire, placing IEDs, and then you see them putting something in, and then the adrenaline kicks in,"

***An MQ-9 Reaper of the 46th Expeditionary Reconnaissance and Attack Squadron touches down at Joint Base Balad.***

USAF photo by TSgt. Erik Gudmundson

USAF photo by TSgt. Erik Gudmundson

***Soldiers form up to board a C-17 from Charleston AFB, S.C.'s, 437th Airlift Wing at Joint Base Balad. The base has DOD's busiest aerial port operation.***

said Maj. Nathan Titus, the operations director for the 46th ERAS. "The whole process can go fast. You're up close and personal with these guys."

Titus, a former KC-10 pilot, points out that, for the UAV community, deployments are different. In Iraq, there is no shortage of targets or missions. Predator and Reaper crews, which include sensor operators and pilots who operate the vehicles from back in the United States, develop their own targets. "We come here to be the enabler to help the guys back home," Titus said.

The UAV crews at Balad perform the critical task of getting the aircraft aloft and back down on the ground, using a line-of-sight application that takes over flying from US-based pilots. At the Stateside ground stations, there is often a two-second delay from the satellite link. That is manageable for flying and launching weapons, but would prove devastating while landing.

Things don't always go right. The new UAVs are temperamental and don't have the benefit of a human being who can, with a head turn, see what is going on around the aircraft. Several have been lost due to landing mishaps, but crews have also managed to keep the Predators and Reapers out of the way of the many manned aircraft flying over Iraq.

"It's busy and we learn a lot from operations [here]," said A1C Alexandra Wright, a sensor operator with the 46th ERAS.

Airmen are quick to point out the other vital part of in-country airpower—tactical airlift.

Balad is home to the 777th Expeditionary Airlift Squadron, known to airmen as the Triple Seven. The "dirty south," as the mobility ramp is referred to, was home this fall to about nine C-130s from the 19th Airlift Wing, Little Rock AFB, Ark., and the 153rd Airlift Wing, Wyoming Air National Guard. The Wyoming Air Guard Hercs were flown by the active duty airmen of the 30th Airlift Squadron, which in 2006 became the first active duty associate unit.

The C-130s parked on Balad's ramp average a sortie per day across Iraq, performing duties from hub-and-spoke air/land missions to distinguished visitor airlift.

## Hub-and-Spoke System

The C-130s also fly "top cover" sorties. For these, crews install a pallet that accommodates four radio operators, making the airplane an analogue of a more traditional airborne battle management aircraft. The sortie provides communications relays for ground convoys and maintains connectivity if problems arise, such as after an IED explosion or breakdown, explained Lt. Col. Ken Kopp, the 777th EAS operations officer.

The hub-and-spoke system—set up at airfields from Basra in the south all the way up to Kirkuk and Mosul in the north—moves everything from detainees to vehicles and personnel across Iraq.

This is the kind of transport that was once performed by ground convoys. Since the inception of convoy reduction operations in early 2006, the 777th has taken the equivalent of 6,274 trucks (each lugging eight tons of supplies) and 5,457 buses (each with 40 passengers) off Iraq's dangerous roads, where they were vulnerable to sniper fire or attack from IEDs or car bombs.

"It's a lot different now than back in 2003 or 2004," Kopp added. "We do a lot of short hops as opposed to long drags."

Capt. Steve DeHaas, a veteran of several Iraq deployments and currently assigned to the 61st Airlift Squadron at Little Rock AFB, Ark., said there is one big advantage of flying airlift here: "There's not a lot of need for short fields in Iraq." In Afghanistan, tactical airlift teams often use short dirt strips for resupply.

Airdrops are relatively rare in Iraq, because it has decent airfield infrastructure, which allows mobility airmen to operate with relative ease inside the country—albeit with the constant danger of attack from the ground.

Balad was formerly Logistics Support Area Anaconda (on the Army's side) and Balad Air Base (for the Air Force). Just a few years ago, however, the troops called it "Mortaritaville."

That was when rocket and mortar attacks were the norm—until Air Force security forces initiated Operation Desert Safeside in 2005, which sought out and eliminated threats to the base through direct attacks and targeted raids.

Today, mortar attacks are a rarity at Balad. In October, the Air Force assumed responsibility for in-depth base defense and, with the stand up in July of the 332nd Expeditionary Security Forces Group, took over base defense from the Army.

The 332nd runs every aspect of Balad's defense, including the Joint Defense Operations Center, a new quick reaction force that hunts threats outside the wire, tower supervision, and manning the entry control points.

Lt. Col. Anthony Maisonet, commander of the 532nd Expeditionary Security Forces Squadron, noted that his airmen are regularly tasked to go "outside."

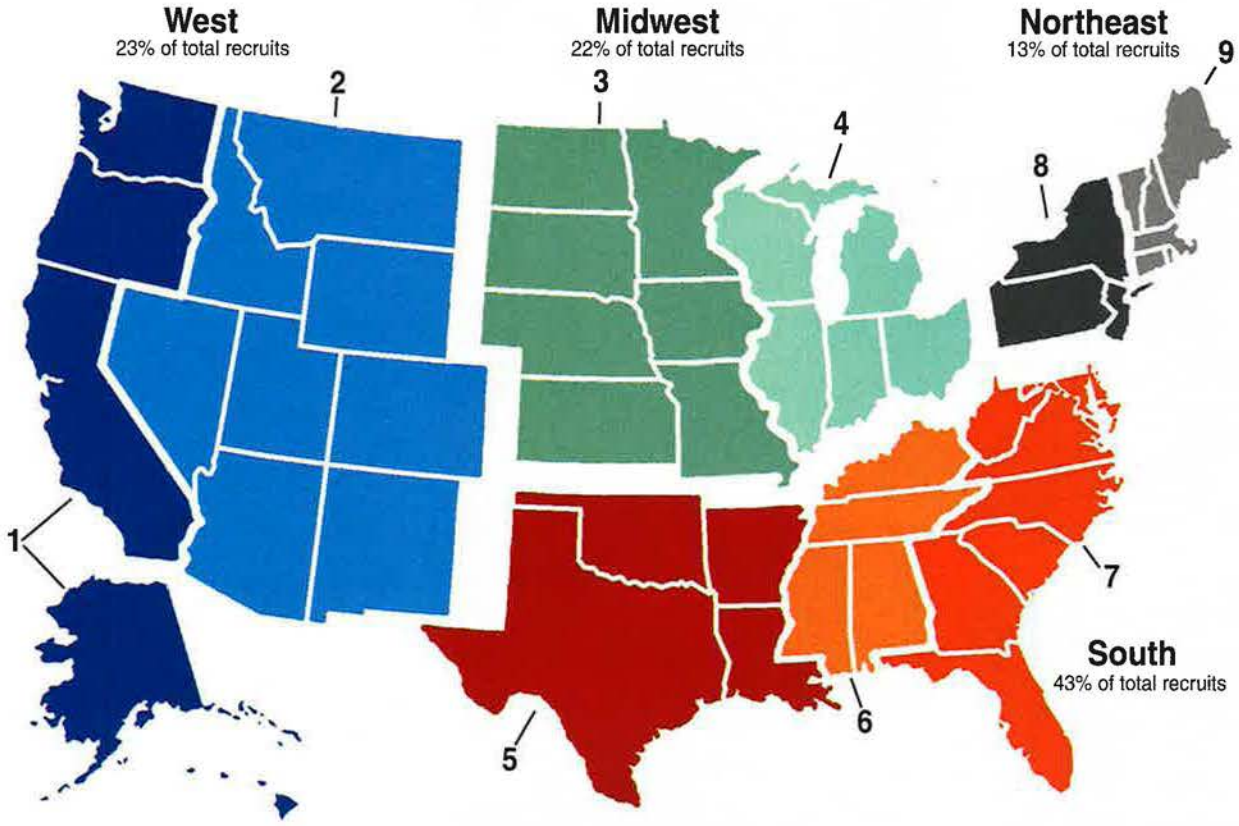
From countering indirect fire to working with local leaders in the nearby villages, security forces are now taking a proactive approach to defense of the base. "We have airmen protecting airmen now," Maisonet added. "Everyone feels that we're a part of something new, a special mission." ■

# Chart Page

By Tamar A. Mehuron and Heather Lewis

# Where US Troops Come From

The South's strong tradition of military service, long recognized by scholars, pays heavy dividends for today's US armed forces. A recent Heritage Foundation study found that the South, in 2007, accounted for 43 percent of new enlistees, though it had only about 36 percent of recruit-age US men (aged 18 to 24 years). If the South was overrepresented, however, the Northeast was underrepresented; it had some 18 percent of recruit-age men, but it provided less than 13 percent of recruits. The West and Midwest fall between these two extremes.




## Ratio of Enlisted Recruits To Recruit-Age Men

| | | | |
|---|---|---|---|
| 1. Pacific | 0.88 | 6. East South Central | 1.10 |
| 2. Mountain | 1.07 | 7. South Atlantic | 1.17 |
| 3. West North Central | 0.99 | 8. Middle Atlantic | 0.73 |
| 4. East North Central | 0.98 | 9. New England | 0.73 |
| 5. West South Central | 1.26 | | |

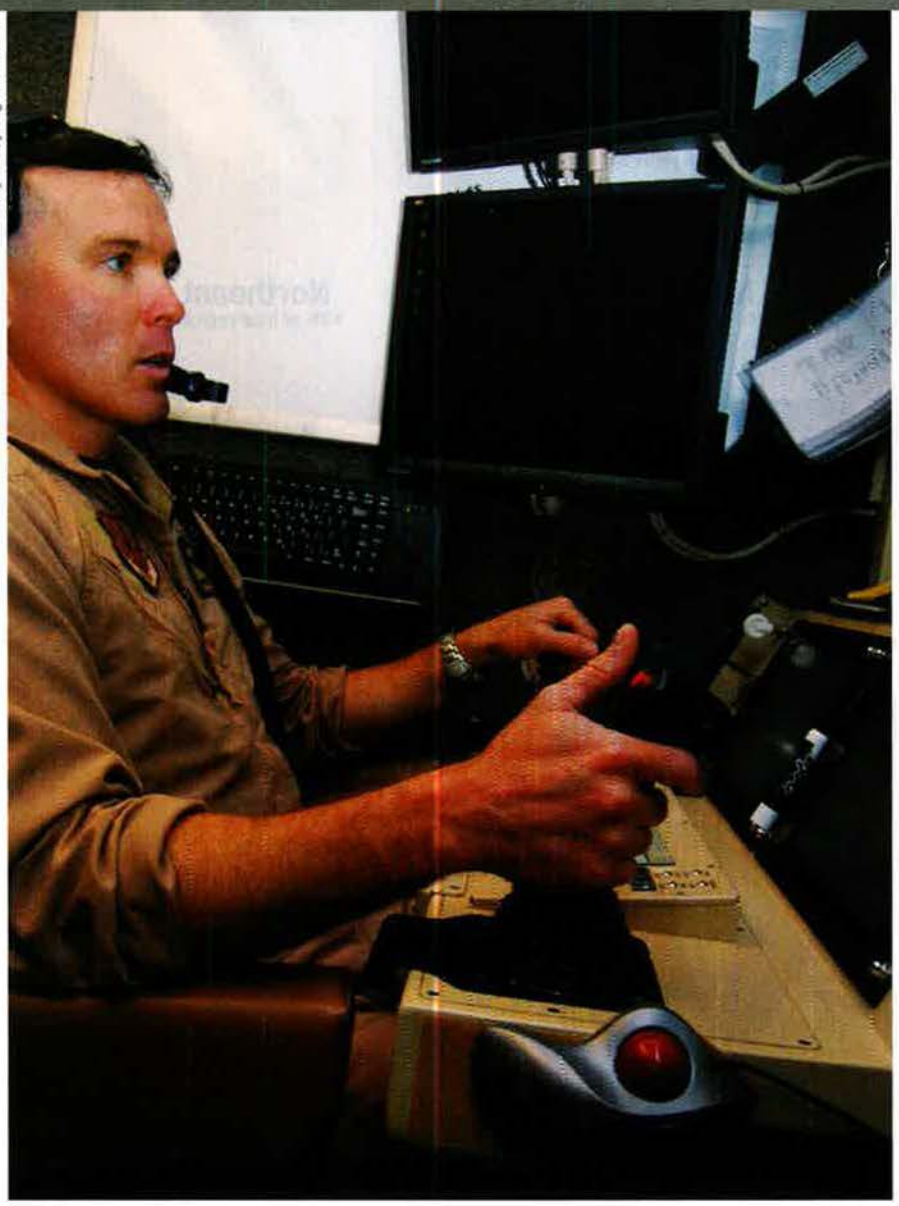
Ratios less than 1.0 indicate underrepresentation of recruits, and ratios more than 1.0 represent overrepresentation.

**Source: "Who Serves in the US Military? The Demographics of Enlisted Troops and Officers," p. 9, Shanea J. Watkins and James Sherk, The Heritage Foundation, Aug. 21, 2008. Posted at http://www.heritage.org/Research/NationalSecurity/upload/CDA_08-05.pdf.**

**There aren't enough of them. The Air Force is determined to do something about that.**

# UAV Pilots

By Anna Mulrine



DOD photo by SSgt. Don Branum

The soldiers of the US Army's 1st Battalion of the 506th Infantry Regiment, Ghazni, Afghanistan, keep a close eye on their stretch of a vital road linking Kabul and Kandahar. Earlier last year, they began coming across unusual roadside bombs.

The bombs contained 200 to 500 pounds of explosives, much more than any seen before. Moreover, insurgents had planted them in culverts running beneath the highway, where they were hard to see. The bombs proved to be devastating to trucks and the new Mine Resistant, Ambush Protected vehicle, or MRAP.

Yet, fortunately, US forces had a breakthrough against this threat. Air Force MQ-1 Predator unmanned reconnaissance aircraft and the airmen who were flying them helped break up the bomb teams and greatly reduce large-scale bomb attacks along the highway. With the help of full-motion video from the MQ-1s, the battalion (part of the 101st Airborne Division) needed only seven days to find and eliminate five Taliban cells attempting to plant these improvised explosive devices, or IEDs.

Moreover, Predator reconnaissance and strike capabilities helped the battalion strike and kill a team of IED planters sent from Pakistan to train Afghan recruits. At the site of one Predator strike, US troops discovered Pakistani currency and ID cards.

There is still a risk that such teams will return to plant bombs along the highway, which, intact, is a key symbol of progress in war-torn Afghanistan. As it stands now, while on patrol between bases, US troops get out of their vehicles to check every culvert along the highway. There are some 1,000 such culverts on this road, however, and keeping all of them clear in this manner is unrealistic.

For this reason, battalion officials would like to see more unmanned aerial vehicles, to help them determine patterns of activity along the highway. And that, demonstrated by one battalion on one front of the War on Terror, is an explanation for the US military's insatiable demand for UAVs.

The Air Force is launching a number of new measures to expand UAV capabilities in response to the ever-growing demand for Predator, MQ-9 Reaper, and other unmanned systems. In a series of firsts, freshly minted pilots are being sent directly to UAVs for their initial assignments, nonpilots are being trained as unmanned aircraft pilots, and UAV operators will soon have their own distinct career field.

By 2012, the Air Force plans to increase the ranks of UAV pilots and air operations staffers to a total of 1,100. That is up from just over 450 Predator and Reaper operators today—and 180 just a couple of years ago.

Such an increase, notes Brig. Gen. Lyn D. Sherlock, director of air operations for the Air Staff's directorate of operations, will make the size of the UAV pilot community second only to that of the F-16.

It is a change that has been long in coming. The Air Force "must promote a strong and healthy [UAV] community, not a 'leper colony' or an agency of expedience," said Gen. Norton A. Schwartz, Air Force Chief of Staff, in announcing the change in September.

The buildup is an acknowledgement that UAVs and the pilots who fly them are going to be in critical demand in the years to come.

Much of the drive for more pilots stems from the problems caused by rising violence in Afghanistan and the relatively small contingent of US troops on the ground there. Those factors have created what currently amounts to overwhelming demand, said Col. Trey Turner, commander of the 451st Air Expeditionary Group in southern Afghanistan.

Predator and Reaper are vitally important to ground commanders for their integrated sensor balls and ability to stream video in near-real time to troops fighting militant groups throughout the country.

The UAVs help search the rough, mountainous terrain for insurgents and provide armed overwatch for troops in battle.

Of their numbers, "we could certainly use more," said US Army Gen. David D. McKiernan, commander of all NATO forces in Afghanistan. "The border between Afghanistan and Pakistan runs 2,500 kilometers," more than 1,500 miles. "That's a huge area to maintain surveillance on."

### Beta Testing Begins

A multipronged approach will bolster the ranks of Predator and Reaper operators, Air Force officials say. "We want to go to a dedicated career field because we can see this as a force that we're going to need in the future," said Sherlock, "not only at the tactical, but at the operational and strategic [level]."

This realization has begun to affect the approach to the problem taken by the Air Force's senior leadership. Indeed, until recently, USAF was recruiting specialized pilots (trained to fly F-16s, for example) for three-year UAV assignments involving a permanent change of duty stations.

A key initiative announced this fall, however, will create a cadre of pilots to fly UAVs exclusively.

To do this, the Air Force will send 10 percent of its undergraduate pilots directly to UAV training. The first class began a four-week fundamentals course Nov. 21 at Randolph AFB, Tex., before moving to Creech AFB, Nev., for more instruction. Each year, roughly 100 brand-new pilots will head down the UAV track.

This month, the Air Force will also begin beta testing a class of 10 active duty officers (up through the rank of captain) from various technical and nontechnical fields, to see if it can teach them how to fly armed UAVs. In the past, the Air Force has used only rated officers for this purpose.

If it succeeds, the program will give these trainees the green light to operate Predators and Reapers in national airspace and in battlefield conditions.

There has been a great deal of interest in such programs. "We want to look at someone who can learn to operate an unmanned system and teach them how," said Sherlock. For that reason, the Air Force does not want beta testers "to even have a private pilot's license," she added. That's because the Air Force wants to gauge the extent to which it can train to a new skill set.

"In the beta test, we want to be able to show that we can take someone through an Air Force training program and teach him how to get air sense, and to fly in the United States as well as in a combat zone," she said. "We want to make sure that the test is good for someone who has little or no aviation experience right now."

Sherlock went on, "We found out that there are a lot of people interested." Through October, the Air Force had

***Left: Maj. John Chesser at the pilot's control station for an MQ-9 Reaper at Joint Base Balad, Iraq. Below: A Reaper on an Operation Enduring Freedom mission in Afghanistan.***

USAF photo

USAF photo by Val Gempis

*MSgt. Fred Roberts (foreground) and SSgt. Alex Bush (back) perform a check of an MQ-1 UAV system at March ARB, Calif.*

received more than 700 inquiries. The initial "call out" for nonpilot UAV operators went only to airmen, because they understand Air Force culture. Not all of the applicants fit the criteria for the program, which is being designed for candidates with three to five years of experience.

Candidates will be screened for many of the same skill sets that traditional pilots need, including motor skills and vision. Though the eyesight requirements won't be as stringent as they are for fighter pilots, color vision will still be important, said Sherlock.

Certain personality traits will also be vital, Sherlock added, among them decision-making capability under stress. After cutting the initial class of volunteers down to fewer than 40, the candidates will undergo physicals and then go through initial flight screening in Pueblo, Colo.

After a month, they too will go to Randolph Air Force Base and use simulators to learn instrument flying in the national airspace system. It is here the beta airmen will also learn about the UAV weapons, "and how that integrates into the fight," said Sherlock.

Only then will the nontraditional pilots begin their training at Creech. The process will begin again for another 10 candidates this spring.

Plans call for Schwartz to decide later this year whether the program to train nonpilots will be institutionalized.

To create more UAV pilots, the Reaper schoolhouse at Creech added a second training line this past summer.

## 120 Days Straight

"That was a great expansion for us," said Lt. Col. Christopher Gough, who directs the Reaper training program and leads the 42nd Attack Squadron. The schoolhouse has gone from training classes of seven or eight crews, to classes of 15 crews, "so we have effectively doubled the prior capacity. That has afforded us the opportunity to build what initially was a slow-to-mature system [because] we didn't have enough people trained in it."

The schoolhouse has also just entered into an agreement with a civilian contractor to take on academic work such as teaching engine and fuel system nuts-and-bolts. "We can focus our efforts on training and flying," Gough explained.

Lt. Col. Lawrence Spinetta, commander of the 11th Reconnaissance Squadron and head of Creech's MQ-1 schoolhouse, added, "Pilots are starting to realize that 'unmanned' is really a misnomer. There is a man in the loop every step of the way, including three men or women in the immediate crew."

The fact that UAV pilots fly drones while sitting in high-tech trailers that are sometimes in and around Las Vegas creates some stereotypes, said Turner, commander of the 451st in Afghanistan.

"People think they're smoking and joking in a casino somewhere," he said.

However, he noted, it is very difficult to offer the UAV operators time off, and there is no time to release the pilots to the professional military education courses that are normally required.

At a base in southern Afghanistan, UAV pilots work 12 hours on and 12 hours off for 120 days straight, said Turner. "They don't get days off the whole time they're out here."

That pace isn't likely to let up anytime soon. The Air Force will probably buy "more unmanned than

USAF photo by A1C Jonathan Snyder

*Airmen run a preflight inspection on an MQ-1 Predator UAV at Ali Base, Iraq. As the UAV fleet continues to grow, USAF will more than double its UAV pilot inventory.*

USAF photo by SSgt. Paul Villanueva II

***USAF Chief of Staff Gen. Norton Schwartz speaks about career field reorganization to airmen of the 447th Air Expeditionary Group at Sather AB, Iraq. In the past, all UAV pilots were reassigned from other aircraft.***

manned platforms next year," Spinetta said, bumping Predator flying hours to 14,000 per month. "There's no spin-up time."

In the past, trainees would "graduate from a formal training unit, then spend a few months getting more seasoned, and do a Red Flag. Here, there's none of that," Spinetta said. "They graduate and 60 days later, they walk out the door and fly their first combat mission."

Training for the crew therefore includes strict instructions on rules of engagement "and on when and how we employ ordnance," said Spinetta.

"We also get deep into who is able to provide that clearance authority, and how we coax that out of them," Gough said. What's more, the schoolhouse "works with guys on the ground to develop that awareness of friendly locations, and PID [positive identification], so that ... we're training with folks on the ground that mirror real-world scenarios."

"These are going to be warriors capable of operating in the airborne environment," said Sherlock. "So the expectation is that they will have the same skill sets and the same understanding of air battle operations, whether they're operating a UAV or an aircraft."

Sherlock noted, "All agree that, as we put them through training, as they engage in the fight, they will have the same culture and warrior skills" as traditional aviators.

The insurgents "have had the upper hand," he said, because "they can wear civilian clothes and they can attack us." The UAV, he said, "is leveraging technology, finding innovative ways to put the ball back in our court and seize the initiative. We can develop those patterns of life, determine who the bad guys are, and then get the clearance and go through the whole find, fix, track, target, attack cycle."

Manned weapons systems simply do not offer the same persistence. With a Reaper, "I don't have to go back and hit the tanker" and lose the uninterrupted view of the battlefield, Gough noted. The fact that this can be controlled from US soil is but one of the many cultural adjustments the airmen are making.

"The chance to directly contribute is something special," said Spinetta, who had been an F-15 pilot. Recalling an early Predator combat mission over Sadr City, Iraq, he said, "You can see the garbage in the streets, you can contribute to the mission, talk to folks on the ground."


AP photo by Musadq Sadeq

***US Army Gen. David McKiernan, NATO commander in Afghanistan, speaks at a press conference in Kabul. McKiernan wants more UAVs in the theater.***

"From the time I got my orders, it took me about a week to understand that this was going to be a game-changer, with a persistent stare and a persistent strike," said Gough, who was an F-16 pilot before he took over the Reaper schoolhouse in 2008. "I've seen the future," he said.

"The frustrating thing" about flying an F-16, he explained, is that the time in the air is limited. This is not a problem for long-flying UAVs. "Here, every day we're putting the hurt on the bad guys. It's relentless."

As training continues to ramp up to match the intense demand on the ground, the Air Force is slowly creating a culture of acceptance of and appreciation for UAV pilots, said Spinetta.

Unmanned aircraft represent "a significant cultural change," he said, "but I think the Air Force is really starting to embrace it." ■

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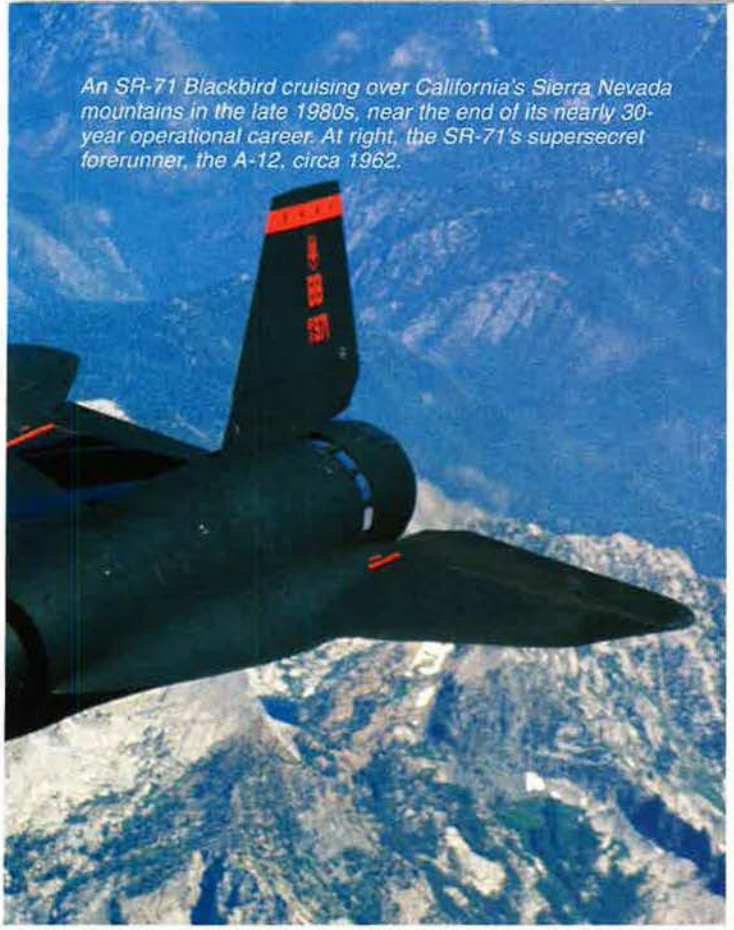
*Anna Mulrine, senior editor and defense correspondent for* US News & World Report *magazine, reports frequently from Iraq and Afghanistan. Her last article for* Air Force *Magazine, "Warheads on Foreheads," appeared in the October 2008 issue.*

Photo by Tom Carlson

Photo by Tom Carlson

Lockheed Martin photo

*As a potential solution to politically sensitive basing issues, the concept of operating U-2s from aircraft carriers was explored in Operation Blue Gull V. This U-2R landed on and flew from the aircraft carrier USS America in 1969. At right, a modern U-2S works in the pattern at Beale AFB, Calif.*



An SR-71 Blackbird cruising over California's Sierra Nevada mountains in the late 1980s, near the end of its nearly 30-year operational career. At right, the SR-71's supersecret forerunner, the A-12, circa 1962.

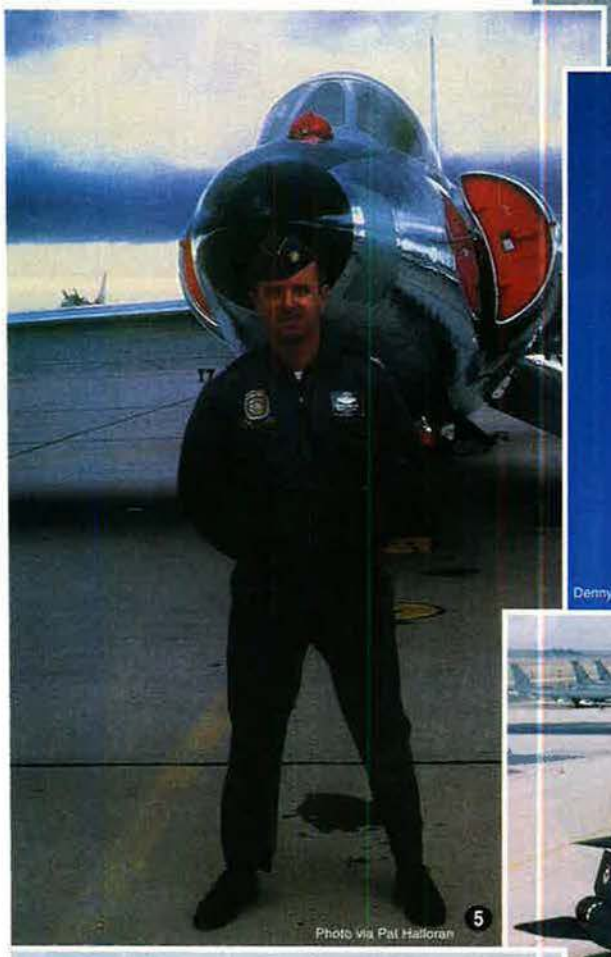
Lockheed Martin photo

# Cold War From on High

**The U-2 and SR-71 were two of the most famous and successful aircraft of all time.**

**Photos from the collection of Warren E. Thompson**

*The dangerous but essential business of strategic reconnaissance during the Cold War and beyond fell to two platforms: the U-2 and the SR-71. The CIA's 1953 request for an aircraft that could reach 70,000 feet and fly 1,700 miles led to the U-2. It first flew in 1955 and was operational the following year. Its cutting-edge status was short-lived, though: The 1960 shootdown of Francis Gary Powers in Russia compelled a solution that was not only high-flying, but fast enough to escape surface-to-air missiles. Eventually, this led to the triple-sonic SR-71.* ***|1|*** *The thirsty SR-71 needed to be refueled shortly after takeoff and just before entering and immediately after leaving enemy airspace. This one is pulling up to a tanker.* ***|2|*** *An early bare-metal U-2A, soon after USAF started flying the aircraft. Lockheed Martin built 48 of the U-2A models.*



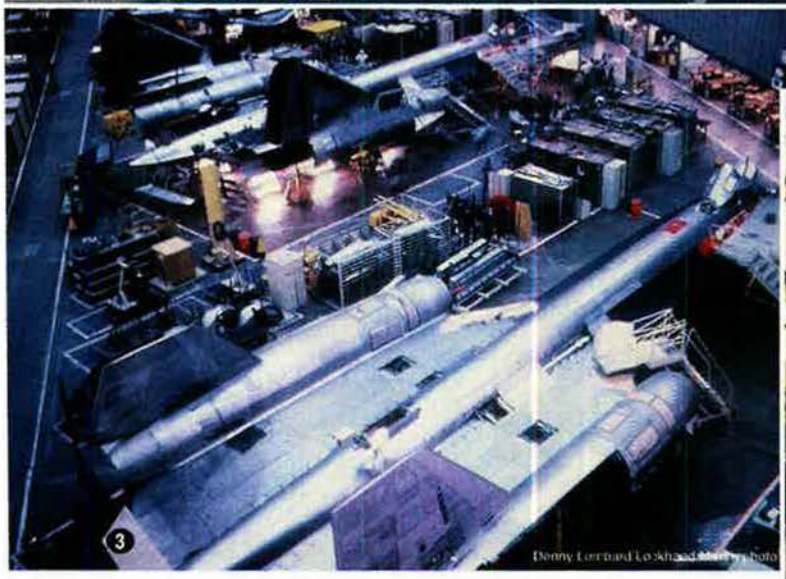


*Lockheed based the aircraft on the main fuselage of the F-104 fighter.* ***|3|*** *As USAF was phasing the SR-71 out, 11 of Beale's remaining aircraft pose for a family photo in 1989.* ***|4|*** *A Blackbird gets airborne. Its Pratt & Whitney J58-P4 engines could each produce 32,500 pounds of thrust, pushing the craft to record-breaking speeds.* ***|5|*** *The first public display of a U-2 at an air show, at Patrick AFB, Fla., in 1960. Maj. Pat Halloran stands in front of his airplane. He eventually logged 1,700 hours in the U-2 and 600 more in the SR-71.*

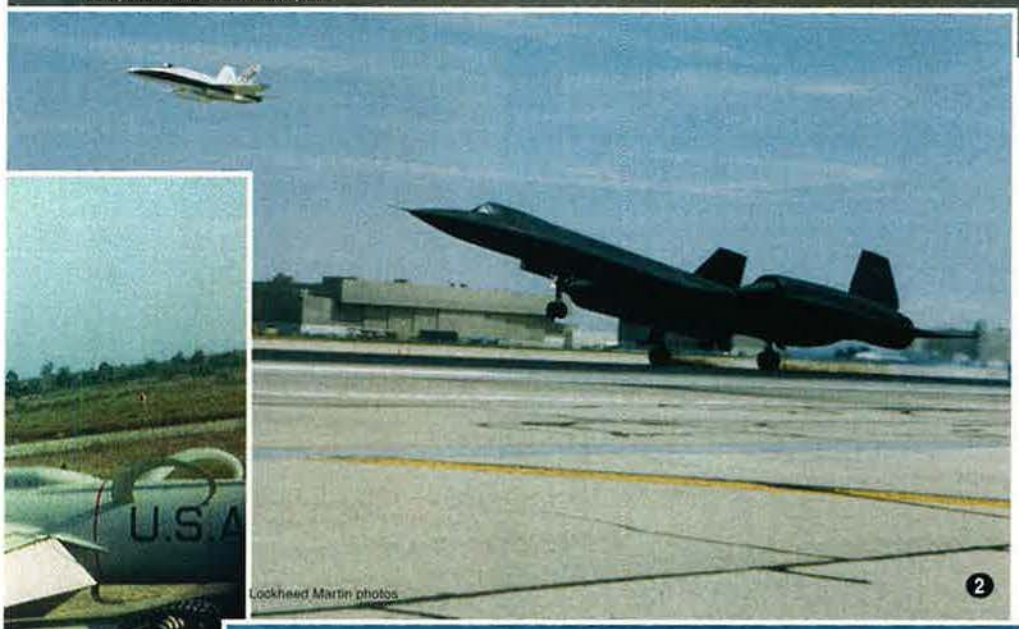

*|1|* *NASA flew the U-2 for high-altitude research at the edge of space, and also as a cover for more clandestine flights. This U-2 in NASA livery went to the Robins Air Force Base museum in Georgia shortly after this photo, circa 1989.* *|2|* *An SR-71A with Lockheed's "Skunk Works" logo on the tail. The company built both the U-2 and the SR-71, and has been closely associated with secret USAF projects. This aircraft today is at the Edwards AFB, Calif., Air Force Flight Test Center Museum.* *|3|* *Lockheed test pilot Robert Gilliland, shown here, made the first SR-71 flight in December 1964. He reached Mach 1.5 on the first sortie.* *|4|* *A Blackbird fuels up from a specially configured tanker loaded with JP-7 fuel. This fuel had a higher flash point than standard jet grades, so as to withstand the heat of sustained triple-sonic flight.* *|5|* *A U-2 lands after a long mission, circa 1965.*




*|1| A pair of U-2As, assigned to the Special Projects Branch, over Edwards during the early 1960s. The U-2 has received near-constant modification, and today's models feature interchangeable noses, depending on mission sensor requirements. |2| The SR-71 routinely operated above 70,000 feet. Its altitude, combined with its speed, foiled every one of the 4,000 attempts to shoot it down over its more than two-and-a-half decades in service. Over its life, the special white paint necessary for lettering and national markings was deleted because of its expense. Normal paint would burn off at high speeds. |3| The SR-71 production line in California. Lockheed built the Blackbird under the tightest security.*

*|4| An SR-71 is slowly towed down a main road to its final rest at Lackland AFB, Tex., in June 1990. |5| The U-2s were heavily tasked throughout the Vietnam War. This one is readied for a mission at Bien Hoa in December 1964, early on in the US involvement. Note the unusual antennae on the aircraft's spine behind the wing's trailing edge.*






***I1I*** *At the height of their career in the 1970s, two Blackbirds present a sinister silhouette on a foggy flight line. The SR-71 operated routinely overseas from Kadena AB, Japan, and from RAF Mildenhall, Britain, but was temporarily based overseas at many locations throughout Europe, the Far East, and Southwest Asia.* ***I2I*** *An SR-71 on a test flight mission with a NASA F/A-18 flying close chase.* ***I3I*** *In 1988, NASA obtained an ex-USAF TR-1A, a short-lived designation for a much-modified U-2 variant.* ***I4I*** *This SR-71 was the first flight test model, serial no. 64-17950.* ***I5I*** *The U-2R was a vast improvement over earlier versions. It was more than 33 percent larger than previous models, boasting a 6,000-mile ferry range and the ability to reach 75,000 feet altitude. This first production model of the U-2R made its first flight in August 1967.*

*|1|* *Before the USS* America *carrier trials, U-2 pilots practiced on an airfield marked off with carrier dimensions. Although the experiments were a success, the cost of keeping one carrier configured to allow U-2 operations was deemed too high.* *|2|* *An SR-71 at Kadena in 1969. Blackbirds supported air strikes by keeping close watch on targets in North Vietnam. A B-52 bomber is in the background.* *|3|* *A U-2 on descent at U Tapao AB, Thailand, in 1972, sharing the base with B-52s. U-2s supported the air war with pre- and post-strike target imagery.*






*|4|* *Test pilot Gilliland in the Blackbird. Gilliland had flown F-84s in Korea, and built many hours in the F-104. It was this latter experience that made him a natural for SR-71 test flight work.* *|5|* *Gilliland prepares to take off on a test flight of an SR-71.*

Photo via Carl Berger

1

Lockheed Martin photos

2

*|1| U-2s are crowd-pleasers when they can be spared for an air show. This one is on static display at Carswell AFB, Tex., in 1966. |2| Clarence "Kelly" Johnson, the engineering genius who led development of both the U-2 and the SR-71, poses with the U-2C. Johnson's Skunk Works at Lockheed came up with the F-104, the F-117 stealth fighter, and dozens of other secret projects. |3| The D-21 was an unmanned drone that could be launched from the back of an SR-71 to continue a mission even deeper into enemy territory. |4| The SR-71 ended its career in high style. On March 6, 1990, it flew its last USAF mission, from Palmdale, Calif., to Dulles Airport, outside Washington, D.C. During the flight, it set four speed records, which still stand. The aircraft is on display at the Smithsonian Institution's Dulles facility.*


Denny Lombard/Lockheed Martin photo

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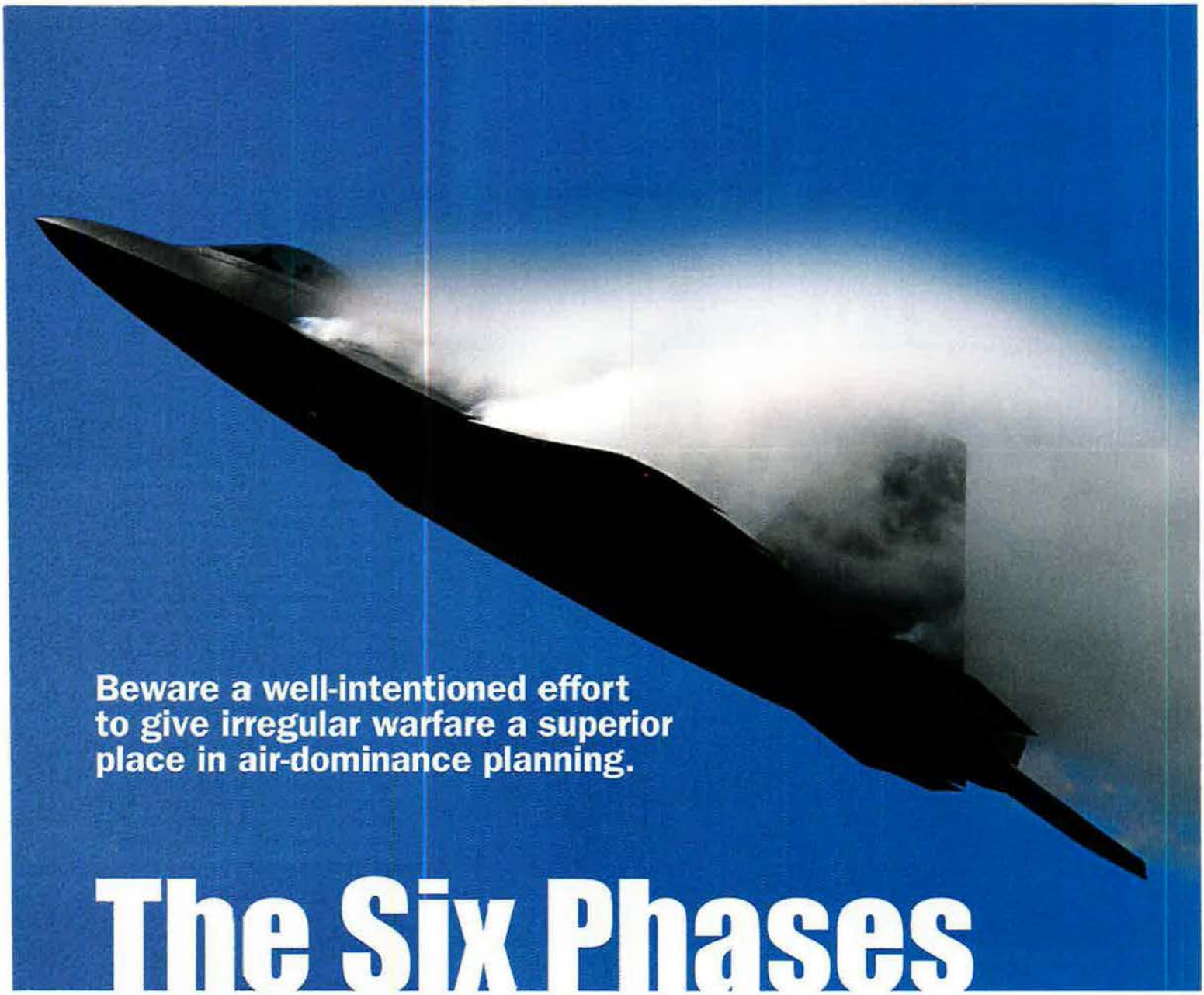
*|5| Some of Lockheed's Skunk Works employees get rare recognition in an undated group portrait with a U-2.* ■



**Beware a well-intentioned effort to give irregular warfare a superior place in air-dominance planning.**

# The Six Phases of Airpower

**By Rebecca Grant**

In recent years, the Pentagon has focused more and more heavily on irregular warfare and accorded it a far more prominent place in joint doctrine. The shift has forced to the surface the question of what constitutes the right air dominance force.

Today's force was structured primarily to mesh with an older concept of joint operations. This concept was based on four notional phases of combat—deter, seize the initiative, dominate, and stabilize. USAF and other services have always viewed Phase 3—"dominant maneuver"—as the critical point of a campaign.

Things have changed. For one thing, the doctrine writers have expanded the number of war phases from four to six. More importantly, doctrine now declares that irregular warfare in the latter two phases could require force commitments as great as or greater than those for dominant maneuver.

This marks a seismic shift in US thought—irregular war getting priority equal to dominant maneuver in force tasking.

It is time for rethinking what air dominance really means and how the Air Force should organize, train, and equip to provide it.

Newly revised Joint Publication 3-0 was where these phases were unveiled. A new one—Phase 0 shaping—opens and closes any combat episode. Phase 4 stability operations, while it already existed, underwent big changes.

Another new one, Phase 5, calls for "enabling civil authority"—a clear reaction to the US experience in Iraq.

## HOW AIRPOWER FITS

Air dominance turns out to be important to all the phases and critical in most of them. Here are some examples:

**Phase 0 Shaping.** Shaping means influencing the state of affairs in peacetime.

USAF photo by TSgt. Justin D. Pyle

**Phase 2 Seize Initiative.** Actions range from imposition of no-fly zones to limited strikes. Assuring access is key; airmen in the 1990s and early 2000s flew thousands of sorties to hold the initiative over Iraq. Demands on ISR collection increase, as does the need to prevent attacks on airpower bases.

**Phase 3 Dominate.** Air forces gain superiority with attacks on airfields, air defenses, and aircraft. They perform close air support and interdiction deep in the battlespace and also attack of strategic targets. ISR forces fulfill demands for overwatch and data on fixed, mobile, and high-value targets.

**Phase 4 Stabilize.** Surveillance and on-call fire support aircraft expand operating areas of land units. An ISR-focused F-16 circling over a ground patrol is on a Phase 4 mission. Combat patrols perform strafing and "presence" flights, plus direct support of troops.

**Phase 5 Enable Civil Authority.** Air forces provide armed overwatch, surveillance, and fire support. Building the capacity of the Iraqi air force is an air dominance mission in Phase 5, as is providing ISR to the Baghdad government.

As is readily apparent, the need for air dominance pops up everywhere in the new phases of war. In February 2008, doctrinal revisions beefed up the potential force commitments required for Phase 4 and Phase 5, where irregular war is most prominent.

## EARLY PHASES OF WAR

Given the size and strength of today's Air Force, what possible kinds of threats could emerge in Phase 0, 1, or 2? While many might say "none," that is not the case. Dangers already are lapping ominously at the edges of our air dominance.

Russia appears to be signaling a newfound willingness to challenge American air dominance at the low levels of shaping and deterrence—Phase 0 and Phase 1, respectively.

After a 15-year absence and in response to an order issued by then-President Vladimir Putin, Russia's Air Force began sending Tu-95 Bear bombers and Il-78 tankers on patrols in the Pacific, Atlantic, and near the Arctic Circle.

In other shaping and deterrence moves, Moscow talks of deploying its bombers closer to US soil. The newspaper *Izvestia* said Russia would respond to US missile defense systems in Poland and the Czech Republic by basing strategic bombers in Cuba.

It is hard to know how much importance to attach to this type of activity. However, it represents a distinct change in the environment, and one which shows how rapidly risk calculations even for Phase 0 and Phase 1 can fluctuate.

As a regional economic power, India aspires to exert influence "from Socotra to Sumatra," as the phrase goes. Scholar Ashley J. Tellis has pointed out that the task for India would involve focused

***Above: Condensation billows from the wings of a maneuvering F-22 Raptor as it performs at an air show in Point Mugu, Calif. Right: Marines help clear the city of Fallujah, Iraq, of insurgents and weapons caches in late 2004.***

USMC photo by SSgt. Jonathan C. Knauth

Commanders establish and maintain access to operational areas, ensuring forward presence, basing, freedom of navigation, and cooperation with allies. Exercises such as Cope India and Red Flag are part of it. So is defense of US airspace.

**Phase 1 Deter.** In this phase, a crisis is brewing. Deploying B-2 bombers to Guam creates a flexible deterrent option. So does the positioning of extra intelligence-surveillance-reconnaissance assets near a trouble spot. Today, the deployment of Global Hawk unmanned aerial vehicles would signal resolve.

USAF photo by SSgt. Aaron Allmon

*A B-1B takes on fuel from a KC-10 Extender on a mission over Afghanistan.*

modernization and development of more advanced capabilities to operate throughout its "extended neighborhood."

A changing international airpower equipment market has opened the door for new challenges to air sovereignty and to the need in Phase 2 to gain access and to seize the initiative. While the US has been fixated on irregular warfare, other nations have gone for air force capabilities at the high end.

Air Chief Marshal Fali Homi Major, Chief of Staff of the Indian Air Force, recently noted, "The air staff requirements for the fifth generation fighters have been made," and that this would take about a decade.

Elsewhere, Russia and China in the last two years have announced or elaborated major programs that include development of fifth generation fighters and superior models of fourth generation fighters such as the Su-30. They seek a much higher degree of air capability than they possess today.

What's more, there is a growing regional buildup of cruise and ballistic missiles. Appearance of these weapons in the wrong place at the wrong time could raise true challenges to American shaping in Phase 0, deterrence in Phase 1, and even gaining access and seizing the initiative in Phase 2.

Another potentially great challenge is a need to defend against short- and intermediate-range missiles targeted at cities or bases. Diversion of thousands of sorties from strategic targets or support of ground forces would be a major setback in campaign execution.

## MAJOR COMBAT PHASE

In its 2005 Quadrennial Defense Review, the Pentagon noted that "China has the greatest potential to compete militarily with the United States and field disruptive military technologies that could over time offset traditional US military advantages."

It might surprise many how much the world's most ancient state gives pride of place to air dominance concepts. China is an avid customer for air dominance technology in every form, from missiles to aircraft carriers.

Beijing does not much worry about global power projection, stability operations, or big land campaigns. China's battlespace is in and around China itself.

Chinese doctrine focuses on campaigns—a series of battles for local objectives. Rapid defeat of the enemy is the main objective and the preferred method is to inflict strategic and operational paralysis or even defeat the enemy with one strike.

The air battle is absolutely central to China's campaign plans. China experts note that People's Liberation Army writings emphasize the supreme need to gain air superiority. In short, China plans to avoid land war in favor of air, space, and cyber combat.

China is preparing to wage a vigorous, defensive battle in its own airspace. It has bought advanced fighters such as the Su-27 and is in the process of acquiring more. The Chinese force is a lethal combination of advanced fighters and highly effective long-range surface-to-air missiles and the surveillance and command and control needed to integrate them all.

China already has an air force formidable in numbers. The Pentagon estimates that China has a total of 2,250 fighters, with 1,000 more older types for training. By packing large numbers of these fighters into so-called "active


Photo via Piotr Butowski

*A Russian Su-35 is shown during a recent test flight. Some nations have invested in capabilities at the high end of air warfare.*

defense of coastal waters" guarded by advanced SAMs, China produces an environment that poses great operational problems.

If this is the near-peer battlespace, USAF air dominance will be put to a stern test. USAF must be certain it can prevent Red Air and missile defenses from creating a lockout in the Taiwan Strait, for example. F-22s will have to hunt and kill SAMs. Tankers and vulnerable ISR support-aircraft orbits will have to be placed well back from the battle area or defended by dedicated combat air patrols.

Russia is another player. Russian radar manufacturer Phazotron has in the works a powerful radar upgrade sufficient to challenge US technology in this area. The advanced Zhuk ASE radar might appear on the Flanker as early as 2010.

Radars that can outclass all but the F-22 in power and search volume present a severe challenge—especially if the radar appears on fighters laden with air-to-air missiles.

If advanced SAMs and any Red Air are in the area, the task of dealing with them would fall to the F-22. If the mission requires rapid closing speed, as with inbound cruise missiles, the F-22 is the right platform.

The basic message is that Russia, India, China, and others don't need to build or sell vast fleets to pose a threat to US air dominance. Given the requirements for global operations, low casualties, and irregular warfare, a threat could emerge if only half or a quarter of these programs come to fruition.

## IRREGULAR WAR PHASES

As recent events have made only too clear, it is no longer wise for planners to consider major combat only in planning for air dominance. They must also give strong consideration to the demands of Phase 4 and Phase 5, usually the scenes of irregular warfare.

The current cycle of the debate on irregular warfare is highly situation-specific. It dates back not much further than 2004, the year that US forces fought two major ground battles for the Iraqi city of Fallujah. Neither the war in Iraq nor the American military has been the same since.

On April 5, 2004, marines launched an operation intended, in part, to retaliate for the murder and mutilation of four American private contractors at the hands of insurgents.

Norwegian Air Force photo


*An Il-78 refuels a Tu-95 Bear bomber midflight. Russia appears to be signaling a newfound willingness to challenge US air dominance in some arenas.*

The marines fought well, but were withdrawn on May 1, 2004. There followed a period of intensive surveillance, reconnaissance, and preparation. In November, a force of marines with Iraqi troops attacked in a far more successful second offensive.

Fallujah I was important, in part, because it marked the beginning of a true insurgency, one that would stretch on and on, ultimately giving rise to the so-called US "surge" of 2007-08. From 2004 onward, there was little doubt that US forces and coalition partners were fighting often intense irregular warfare battles as they strove to meet the objectives of stabilization in Phase 4.

Irregular warfare in the Greater Middle East has sparked great airpower innovation. Faced with weak air opponents, most air platforms can play. Inventions like ROVER and precision airdrop get quick results.

Airpower experts have dealt with irregular warfare for a long time. From the famous British use of airpower in Iraq after World War I to the daily overwatch in Afghanistan today, examples abound. Some of the best came from the China-Burma-India Theater in World War II.

The expansion of today's joint doctrine to include irregular warfare opens up a key question: Should IW become co-equal with major combat operations in sizing the air dominance force?

Theories of irregular warfare have flourished in joint circles and among airmen in recent years. They are so popular, in fact, that there is a real question about whether the Air Force should concentrate mainly on air dominance for Phase 4 irregular warfare operations as the core of its future strategic plans.

Intellectual challenge aside, for airmen, the most crucial theory about irregular warfare is the assumption that it will be waged in permissive airspace.

For example, the air dominance environment determines to what extent C-17s can drop relief supplies or perform precision airdrops to resupply special operations forces and allies. The air dominance environment will affect the use of many ISR platforms and unmanned aerial vehicles. For all the dependence on Predator and Reaper, these platforms cannot operate in hostile airspace.

Irregular warfare can be tough on friendly air forces when the enemy has strong air defenses. In Vietnam, the US lost 2,448 fixed-wing aircraft of all types from all services. Helicopter losses were more than 5,500 of all types.

It would take only a few modern or advanced SAMs for a low-capability force to stymie full air operations in irregular warfare, including regular air transport and cargo. America's asymmetric advantages in irregular warfare lose their edge in the absence of air dominance.

Put another way, Phase 4 or Phase 5 can go back to Phase 3 in a flash.

## WAR IN REVERSE

What happens when irregular warfare suddenly isn't? The air defense environment has become a function of technology development and global arms sales.

USAF photo by SrA. Levi Riendeau

*Airmen from the 380th Expeditionary Aircraft Maintenance Squadron carefully back an RQ-4 Global Hawk UAV into a hangar after a mission in Southwest Asia.*

The latter variable can swing within a few short years.

The actions of Venezuelan President Hugo Chavez is one case in point. Venezuela has oil money to spend in the arms market and is doing so with purchases of Su-30s, other aircraft, and equipment such as tanks and rifles. A retired Russian general recently speculated that Venezuela could protect its oil fields with surface-to-air missiles.

"Needless to say, should S-300s be delivered to Venezuela, they would effectively strengthen its defense capability, and it would not be easy for its possible adversaries to punish the country by striking at its oil fields," said former Russian Air Force commander Gen. Anatoly Kornukov.

Kornukov figured 10 S-300 battalions with six launchers each "should be enough" to do the job.

Taken in isolation, the idea of SAMs blanketing the Venezuelan oil fields sounds far-fetched, as does the notion of Russian bombers setting up shop in Cuba.

The larger point, however, is that nations can change their capabilities in the air dominance sphere relatively quickly. New weapons can come into play almost overnight in irregular warfare.

Vietnam-era servicemen remember the impact of the SA-7 anti-aircraft missile. Beware, too, of hidden cultural snobbery in assuming that everyone is content to practice irregular warfare and hope for the asymmetric best.

In the final analysis, forces sized and equipped for irregular warfare run a real risk of being useless if a regional threat environment suddenly changes.

## TOWARD A BALANCED FORCE

The problem is not some sort of irreconcilable conflict between fifth generation fighters and low-tech counter-insurgency-type aircraft. The real issue is how to assess the risk of heavy investment in specialized irregular warfare capabilities at the expense of spending the marginal dollar on a balanced force capable of winning across the phases of war.

The key point in the risk assessment is the need to nail down what it takes to create the conditions for waging irregular warfare in the way that America must—with full air dominance.

Technology contributions for irregular warfare tend to cluster around modifications of existing systems or innovative upgrades to communications, networks, and weapons. Combat-urgent improvements in irregular warfare capabilities can be carried out in a relatively short period.

To be sure, there are some exceptions, but, for the most part, irregular warfare forces gain much from pre-existing air dominance.

There are exceptions. The difficulty in expanding the ISR force is one. The highly reliable Predator with its upgraded geo-location and weapons abilities came along recently. The US began war in Iraq with just nine Predators deployed. Only one Global Hawk—AV-3—was in flyable condition and it spent nearly all its time airborne.

It would have taken time to fill out this force structure regardless of whether irregular warfare or something else was the guiding light.

From an operational perspective, the supposed conflict between major combat operations and irregular warfare is a false one for airmen. Irregular warfare unquestionably has its own unique set of requirements. Yet for air and space operations, it is not hard to adapt a balanced force structure to accommodate them. The history of airpower in irregular warfare shows that there is remarkable utility to be gleaned from a balanced, conventional aircraft force.

Some may still plead the case that a "low-tech" or "right-tech" aircraft should be developed and fielded by the Air Force and sold to foreign partners. The main reasons cited are to reduce cost and provide tailored capability. Rarely contemplated is what those American or allied aircrews would do given the sudden introduction of even an SA-6 into the battlespace—much less those S-300s in Venezuela.

Technology time lines for high-end air dominance forces are measured in decades with billions of dollars of investment. Time is running out to make decisions about achieving a modernized force structure. That force may well have to be smaller, but it can hardly be equally or less advanced than today's.

The fact is, the US military has never had a long-term planning strategy with irregular warfare as its centerpiece. More to the point: If the Air Force loses its air dominance edge, one of the culprits may be a well-intentioned effort to give IW a superior spot in today's military planning. ■

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*Dr. Rebecca Grant is a Senior Fellow of the Lexington Institute and President of IRIS Independent Research. She has written extensively on airpower and serves as Director, Mitchell Institute, for AFA. Her most recent articles for* Air Force *Magazine were "Armed Overwatch" and "Losing Air Dominance," which appeared in the December 2008 issue.*

**The F-22 is a pain. The F-35 is a marvel. The tanker program is a mess. So is space. Any questions?**

# The John Young View

***John J. Young Jr.*** *has served since 2007 as undersecretary of defense for acquisition, technology, and logistics. In a Nov. 20, 2008 meeting with the Defense Writers Group in Washington, D.C., he offered a critical view of the Air Force's F-22 fighter and other programs. What follows are excerpts of his remarks.*

### Raptor Problems?

Congress has added money for advanced procurement to buy more [F-22] airplanes. And I don't think the debate's informed by all [the] facts. The recent mission capable data for Fiscal 2008 [show] F-22s had a mission capable rate somewhere in the 62 percent range. I think that's troubling.

Follow-on operation tests in 2007 raised operational suitability issues and noted that the airplane still does not meet most of its KPPs—key performance parameters. It meets some, but not all. The trend in those operational tests—there was an IOT&E, a follow-on test, I think in 2004, and a follow-on test in 2007—the trend is actually negative.

The maintenance-man-hours per flying hour have increased through those tests. The last one was a substantial increase. The airplane is proving very expensive to operate, not seeing the mission capable rates we expected. And it's complex to maintain.

### $8.3 Billion F-22 Bill

The Air Force had planned and expected to have kind of a two-tiered [F-22] structure, where some of the earlier jets were not fully capable jets—not to the Block 35 or increment 3.2 configuration, which provides important capabilities. I think something like 100 jets [were to] be lesser models. So one thing that's in the budget ... is to bring more of that fleet, most of that fleet, to a common, high-end, capable configuration, but the cost of that is $6.3 billion of R&D. This is in a platform we've already developed. We're going to spend six billion more of R&D to engineer the 3.2 upgrade for the software and the changes in the jet, and then about $2 billion to modify the jets. That's $8 billion more, and $8 billion I think needs to be spent in order to make sure the 183 airplanes we have will be highly capable fighters. Those discussions need to be had before I think you talk about buying more jets.

### "Discipline" Needed on F-22

That's really a requirements and a capability discussion that the Air Force and OSD have to have. There are lots of studies,

USAF photo by A1C Jonathan Snyder

*An F-22 takes on fuel from a KC-10 over Alaska.*


USAF photo by MSgt. Andy Dunaway

*A KC-10 moves into refueling position under a KC-135 during a mission over Afghanistan.*

... but I think people are executing a fair amount of discipline and just making sure the airplanes that we've already made a substantial investment [in] are capable, and I'm not so sure there still isn't more work to do there. ... The maintenance on the airplane is too high. They're struggling with some of the [low-observable maintenance] and other issues, and there's clearly work that needs to be done there to make that airplane both capable and affordable to operate.

### What Is the F-22 Requirement?

I don't know the exact state. ... There is an answer to that question. I am not ducking that. I just don't know the answer to that. I can tell you ... the deputy [Deputy Defense Secretary Gordon England] had the discussion with the Air Force about this. He said to Air Force, 'Do you or don't you require more F-22s?' And they couldn't answer that question. They said, 'We are reviewing this issue.' [It was] about two weeks ago [early November]. ... So the fact that they couldn't answer the question then, I think, is troubling. ... Gen. [Norton A.] Schwartz [USAF Chief of Staff] wasn't there. I don't want to talk about who was there. 'Air Force leadership'—whoever wanted to come to the meeting. Whoever the Air Force deemed appropriate to meet with the deputy. The deputy said, 'Where is the Air Force on this?' And the Air Force said, 'We are looking at this so that we can have a recommendation.' And the deputy said, 'Well, the transition team is going to show up shortly and you need to have a recommendation.' But the other thing to be clear: The building is filled with requirements that are not met, that aren't funded, that aren't addressed.

### F-35 Fighter Status

I think the [recent Defense Acquisition Board review] was a successful and productive discussion on the Joint Strike Fighter. I certainly didn't see anything in the DAB that would say we shouldn't approve it. I'm anxious for the program office in Lockheed to agree on the negotiated prices, but right now the good news is they seem to be on or below the pricing curve, which is really a positive curve for the program as a whole and for the warfighter and the taxpayer. I've asked them to give me a good sense of how those negotiations are going to come out, but I can see approving at least the [conventional takeoff and landing type, the Air Force variant].

### Tanker Priority

There's a very big vacuum right now because of the transition process, so people are sometimes filling it poorly, but ... the requirements will get settled, the new Administration will get in place, they'll be briefed on those requirements, then they'll make a decision about all the relative priorities they have, advised by the military's view of those priorities. I think one of those on the list will have to be tanker. What do we or don't we do about tanker, relative to all our other priorities?

### Tanker Requirements Scrub

Some set of [tanker] requirements have to be deemed to be mandatory, ... and then the rest ... can be things we're interested in, nice features; they can be whatever. We cannot have 800 tradable requirements again. ... Secretary [of Defense Robert M.] Gates has been very clear about this. The Air Force needs to think hard about getting down to a minimum set of requirements and features. Then, probably, ... we need to then evaluate whoever bids, as to whether they are technically acceptable or not, and then have a second round where we say, 'OK, you're technically acceptable;


USAF photo by SrA. Julius Delos Reyes

*An F-35 Lightning II test aircraft lands at Edwards AFB, Calif.*

USAF photo by MSgt. Kevin J. Gruenwald

*A USAF HH-60 hovers during a combat search and rescue training exercise.*

give me your best price,' and the best price is going to win because then I'll get the best deal for the taxpayer and I'll get my minimum set of requirements met. ... I can tell you for sure I think that is a path he and I and others will recommend to the new Administration.

### CSAR Aircraft Optional?

You start with the premise 'CSAR-X community' is in 'desperate need.' Well, we have a lot of assets that can be used in rescue missions with planning, so I don't necessarily just automatically rubber stamp the CSAR-X requirement. I don't know that that community has to have its own set of assets for the occasional rescue mission. We have new things coming on line like V-22s and other things that can be pressed into service. When we do our rescue mission we're going to do a come-as-you-are operation anyway, unless all the CSAR assets are pre-positioned for that.

### CSAR-X Program Problems

I can't deny that CSAR-X has a couple of the problems that were in [the tanker program], and I think they should have been caught sooner. It is to the credit of the team that they listened to. One team that banged the drum on this was the OSD independent team. They went in and said CSAR-X is not in a good position to be awarded right now. I just wish we'd all found that sooner, because we were marching up, as you know, to the potential for a November/December [2008] award. To postpone this in October is not optimal.

### USAF and Military Space

I think space is probably high on [the list of problem sectors]. ... I have expressed and I would continue to express concerns about the idea that you can put all space and all milestone decisions in the Air Force. That recommendation creates a complication where you have a person who is the undersecretary in the Air Force and is, therefore, somewhat ... a champion for the Air Force, also having to make hard decisions about the children in his family, i.e. the space programs. ... Where we had a space technology we wanted to develop, I found the persons who notionally would be in charge of space as the executive agent wanted to kill that technology program because they thought it threatened their multibillion-dollar space acquisition program. You can't have that kind of behavior in the enterprise. That's why you have to have purple oversight, detached oversight, and some neutral view of this, and that's why I believe space milestone decisions have got to stay with AT&L.

USAF photo by A1C Andrew Lee

*A Minuteman ICBM launch at Vandenberg AFB, Calif.*

### "Fixing" the Air Force

There are many things that are managed very well every day in the Air Force. But to the extent we've had ... problems, I, like you, have tried to look for the root cause in that. I can't tell you I have it exactly. ... I've had members of my team tell me there's still some of the practices and culture that evolved during Darleen Druyan's tenure. ... And I think we do have to keep working some elements of the Air Force culture. ... I do think there are lingering elements of culture that do have to be changed, and I think the combination of Air Force leadership and some of the OSD work on best practices, which has been well received by the Air Force, will not only help but I think will fix many of the issues there. ■

**A new wargame tells airmen what it will take to hold the line in the Far East.**

# PACAF's "Vision" Thing

USAF photo by MSgt. Kevin J. Gruenwald

**By Richard Halloran**

**Pacific** Air Forces has begun to forge a doctrine of AirSea Battle with the intent of deterring any Chinese, North Korean, or Russian military aggression in Asia and the Pacific. The doctrine is in its early stages of development, and initial findings are being drawn from a two-phase wargame called Pacific Vision, held in October.

Pacific Vision's first phase looked out to 2016, and was centered on Air Force operations. This wargame focused on the weapons, bases, and combat forces that PACAF already had on hand.

The second phase looked out to 2028 and included naval aviators and submariners from the US Navy as well as a contingent from Australia's armed forces. In this phase, officers taking part in the exercise brainstormed a series of alternate futures. Of particular interest was one scenario that the planners called "Dr. Strangelove's World."

Gen. Carrol H. Chandler, who commands PACAF from its headquarters at Hickam AFB, Hawaii, said, "Pacific Vision provided ... a foundational assessment of where we are and what we need in the Pacific."

Col. Martin Neubauer, the command's director of intelligence, added, "The easiest way to guarantee an undesirable future is to refuse to think about it." Neubauer ran the game.

In the first phase of the wargame in early October, the airmen concluded that US airpower would be sufficient to defeat a "near-peer competitor" in the Asia-Pacific region over the next seven years—provided the United States adopted a strategy of dispersal and made certain critical force investments.

For the "near-peer competitor" in Pacific Vision, read "China"—but Air Force officers cautioned that the main adversary in the Far East could be a resurgent Russia. In any case, the wargame was intended not only to test strategic plans but to help prevent any miscalculation of US power and intentions, a priority for American commanders in the region.

Chandler said in an interview that he asked his staff "to look at what we think we need to carry out our mission, particularly when we have finite resources."

The Air Force's internal results didn't mesh with the media's first take on this issue. In contrast to PACAF's assessment that it could realistically expect to defeat a serious foe through 2016, a contemporaneous RAND study, widely cited in the press, claimed that US airpower in the Pacific would be inadequate to thwart a Chinese attack on Taiwan in 2020.

Virtually all analysts believe a battle over Taiwan, the island claimed by China but informally allied with the US, is the most likely cause of hostilities between the US and China. RAND analysts took part in the Pacific Vision wargame, but PACAF officers said that the wargame and the RAND study were actually not connected. RAND's analysis also included

USAF photo by Ben Strasser

***Left: A B-52 deployed to Andersen AFB, Guam. Above: (l-r): Gen. Carrol Chandler, PACAF commander, Gen. Arthur Lichte, AMC commander, and Gen. Bruce Carlson, then AFMC commander, review notes before a meeting.***

future capabilities and a somewhat longer time horizon.

In Pacific Vision's first phase, a Red Team played the near-peer competitor and was instructed to "play dirty." This meant that these adversaries were to employ Chinese weapons, communications, and tactics to the fullest, with little consideration to training, maintenance capabilities, and political constraints.

Two Blue Teams, reflecting PACAF as it exists today and will be by 2016, were engaged. After two days, they were "reset" to run the game again with what they had learned. (In effect, that gave evaluators four sets of conclusions.)

PACAF's officers immediately determined that Washington should disperse its fighter, bomber, and tanker forces well before the start of hostilities. These assets, they said, should be redeployed on an arc ranging from Alaska in the north to Australia in the south, with intermediate bases in Japan, South Korea, Guam, and Southeast Asia. This, they said, would complicate and frustrate any adversary's targeting.

## Force Projection Needs

That, in turn, underscored the need for ready American access to bases for forward deployment, and for intensification of efforts to cultivate good political relationships with the nations along that arc.

Chandler said Pacific Vision "clearly drove home the importance of ensuring access to airfields around the Pacific Rim. You cannot 'surge' engagement, and we must ensure our ability to project airpower from forward bases in the region."

That means, among other things, strengthening relations with treaty allies in Japan, South Korea, the Philippines, Thailand, and Australia—each of which could impose political constraints to curtail US freedom to operate.

The same would be true of friendly nations, such as Singapore, with which the US lacks a defense treaty. Still other nations, like India and Indonesia, are already being cultivated by the US but are not yet ready to "sign on" as friends or military partners.

Vietnam presents an intriguing case. The nation was, of course, engaged in military hostilities with the US, in one form or another, from 1954 through 1975. Still, it harbors long-standing animosities toward China.

Touchiest of all is the case of Taiwan, situated just 100 miles off the coast of China. It is already the target of more than 1,000 Chinese missiles and is vulnerable to bomber attack, so relying on Taiwan as a potential base of operations does not make much strategic sense.

The Navy's aircraft carriers and submarines armed with cruise missiles would need to be dispersed like the land-based aircraft, but more needs to be done to integrate these vessels into war plans, said PACAF officers.

Pacific Vision emphasized the need to harden hangars, command posts, electrical plants, ammunition depots, and supply warehouses to withstand attack. This is particularly true on Guam, which is being built up as a critical forward base.

***Below: The carrier USS* Ronald Reagan *and two ships of its battle group cruise on a mission in the South Pacific.***

USN photo by Chief Mass Communication Specialist Spike Call


USAF photo by A1C Jonathan Stolfen

***An F-22 Raptor assigned to Elmendorf AFB, Alaska, takes on fuel from a KC-135 Stratotanker from the Alaskan Air National Guard's 168th Air Refueling Wing. Alaska-based forces are crucial to US power in the Pacific.***

Moreover, said PACAF planners, crews equipped and trained to repair damaged bases should be positioned to move quickly to wherever they are needed. Runways, for instance, would need to be repaired within hours. Because of long distances in the Pacific, more tankers are required to support combat operations than were needed in Europe to deter the Soviet Union.

The wargame also validated the advantages of the stealth technology that permits B-2 bombers and F-22 fighters to evade radar detection. "We are sure that we can shoot them before they can see us," said one officer.

Even so, the game also underscored the vulnerability of unprotected commercial communications channels on which the Air Force relies. China demonstrated its anti-satellite capability by knocking out an inactive satellite with a missile in 2007. Few expect China to hold back in the event of a shooting war.

Pacific Vision confirmed the need for greater numbers of Global Hawks, the large unmanned reconnaissance airplanes that can survey 40,000 square miles a day in all weather. The first of three Global Hawks to be based on Guam will arrive on the scene next year.

Officers also discovered that the US has lagged in cyber warfare, from jamming enemy radar to attacking computer networks, as well as protecting US radars and computers.

The 13th Air Force's air operations center at Hickam, which would coordinate an air war in Asia, has been up and running for two years but needs to improve controls over PACAF's dispersed forces.

In the second phase of Pacific Vision, the wargame's organizers asked the players to imagine the role of the US in the world 20 years hence. Scenarios included everything from the existence of a "Pax Americana" in which the United States dominated the political scene, to a return to the isolation of the 19th century with no alliances.

The future that got the most attention—the so-called Dr. Strangelove's World—was the least comfortable and perhaps most dangerous of the alternatives. It conjured up an America that was tired of war, having fought more or less continuously around the world since 1941 (World War II, Korea, Vietnam, Grenada, Lebanon, Panama, Persian Gulf, Somalia, Bosnia, Kosovo, Iraq, and Afghanistan). Its armed forces had long since been stretched to the breaking point, and the American people have been fatigued by repeated economic crises, political divisions, and the continuing War on Terror.

"That's not where we want to be," said Neubauer. He emphasized the need to have plans to cope with war fatigue. "It's a bit like thinking about retirement," he said. "All the surprises will be bad if you don't have a plan."

This second phase, in which about 80 people took part, included the participation of some 25 naval officers, a handful of marines, and a few special operations forces. Some Australians were assigned to a Green Team alongside the two Blue Teams. The Australians, who work hard to maintain their alliance with the US, "forced the Americans to articulate what most of us had taken for granted," Neubauer said. Americans had assumed that open ocean surveillance by aircraft would be a naval mission. The Australians didn't see that as obvioius, and pointed out that this is a Royal Australian Air Force mission for them.

That drove a discussion on "who does what and where" that forced everyone participating in the wargame to discuss the best ways to divide responsiblities in a joint operation.

When it was over, the PACAF staff set about drawing up its conclusions and fashioning a framework for AirSea Battle. When the final findings from Pacific Vision have been sorted out, Chandler will take recommendations to Adm. Timothy J. Keating, who heads US Pacific Command at nearby Camp Smith in Honolulu.

If proposed force structure, basing, or policy changes pass muster there, they will go to the Air Force Chief of Staff, Gen. Norton A. Schwartz, and the Chief of Naval Operations, Adm. Gary Roughead, for approval before eventually being submitted to the Joint Chiefs of Staff.

Parallel to that, PACAF plans to submit its proposals to Andrew Marshall, the influential director of the Office of Net Assessment who advises the Defense Secretary directly. The ONA shop helped to finance Pacific Vision, and sent officers to Hawaii to take part.

"Maintaining security and stability in the Pacific requires constant preparation for potential threats and crises," Chandler concluded. "That's what Pacific Vision was about." ■

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*Richard Halloran, formerly a* New York Times *foreign correspondent in Asia and military correspondent in Washington, D.C., is a freelance writer based in Honolulu. His most recent article for* Air Force *Magazine, "PACAF Between War and Peace," appeared in the August 2008 issue.*

# Verbatim

By John T. Correll, Contributing Editor

**Remembering Pearl Harbor**

"Roosevelt had become President on his public pledge not to go to war, so in order to start a war between the United States and Japan, it had to appear that Japan took the first shot. ... Even now, there are many people who think that our country's aggression caused unbearable suffering to the countries of Asia during the Greater East Asia War. But we need to realize that many Asian countries take a positive view of the Greater East Asia War. It is certainly a false accusation to say that our country was an aggressor nation."***—Gen. Toshio Tamogami, Japanese Air Force Chief of Staff, fired within hours of the appearance of these remarks in a Web site essay. Tamogami, unrepentant, stood by what he had written,*** **New York Times,** ***Nov. 1.***

**Funding for Flying Submarine**

"We are open to submissions from anywhere. DARPA has a budget of $3 billion."***—Jan Walker, spokeswoman for the Defense Advanced Research Projects Agency, on solicitation for designs for a "submersible aircraft" to carry eight persons 1,150 miles by air, 115 miles by sea, or 22 miles underwater in less than eight hours,*** **New York Daily News,** ***Oct. 24.***

**Where's Osama?**

"You have to ask what [al Qaeda leader Osama] bin Laden is actually doing these days besides hiding. ... While it would be very, very, very important to kill or capture bin Laden, there are numerous other leaders, ... so while we clearly have devoted considerable assets to finding and killing or capturing him, we have to recognize that even were we to do that, al Qaeda would by no means cease operations."***—Army Gen. David H. Petraeus, commander of US Central Command,*** **Army Times,** ***Oct. 27.***

**Game Changer**

"Even program leaders fully admit that F-35 unit costs have increased 38 percent to $77 million since the contract was awarded in 2001. But the attacks are way out of line, and highly misleading, when they compare JSF's performance on an apples-to-apples basis with legacy planes such as the A-10 and F-16. The F-35 is an extremely nontraditional program conceived on joint and coalition principles and requirements that neither existed nor were technologically feasible in the conception days of the F-16. Its prime operational requirement is to be able to go deep into a dense surface-to-air missile environment from any base. Combined with its stealth technologies, the F-35 becomes a game changer."**—Armed Forces Journal** ***on criticism of F-35 Joint Strike Fighter, October.***

**New Powell Doctrine**

"We have to do a lot more with respect to poverty alleviation and helping the needy people of the world, because when you help the poorest in the world, you start to move them up an economic and social ladder, and they're not going to be moving toward violence or terrorism of the kind that we worry about."***—Retired Army Gen. Colin L. Powell, former Chairman of the Joint Chiefs of Staff and former Secretary of State,*** **Philadelphia Inquirer,** ***Nov. 2.***

**Unmanned Flying**

"When you look at the requirements, we have to fly unmanned vehicles. That's hard stuff, because you want to fly a jet, but now, all of a sudden, your career path gets ventured into sitting behind a console. ... You may not like that, but I'm telling you that's a vital mission, and we are going there."***—Adm. Michael G. Mullen, Chairman of the Joint Chiefs of Staff, Air War College, Oct. 28.***

**Domains Yet To Appear**

"Though we recently recognized cyberspace as a warfighting domain along with the land, maritime, air, and space domains, who is to say that cyberspace is the fifth and final domain? Will there be a sixth? ... What will it look like? How will it change things? Will its nature be cognitive or physical? Will it be in the neural pathways of the mind, or in the space between molecules? Will we face a fight in a virtual world, or in the infinitesimal regions of 'nanospace'?"***—Air Force Chief of Staff Gen. Norton A. Schwartz, remarks to Scientific Advisory Board, Oct. 8.***

**Worse Than Economic Problems**

"What could be worse than credit markets collapsing just as baby boomers are about to retire? Well, here's something a lot worse: losing a million of those baby boomers and their kids in a nuclear attack. That danger has been with us since the dawn of the nuclear age, but it grew worse over the last eight years as the Bush Administration botched efforts to slow the spread of nuclear weapons. Because of its missteps in Iran, North Korea, Pakistan, and elsewhere, we are facing a more diverse and unpredictable nuclear danger than ever before."***—Loren B. Thompson, Lexington Institute issue brief, Oct. 28.***

**Industry Giants Always Win**

"The Obama Administration will begin by trying to kill Cold War legacy systems of marginal utility, but he will run into bipartisan opposition in Congress. Legislators love to praise our troops, but they vote to preserve defense contracts. Our soldiers have no lobbying clout comparable to that of defense industry giants. Budget advisors will fall back on cutting people and benefits, while an influential minority of political activists will be delighted to punish the military."***—Ralph Peters, foremost champion of "Boots on the Ground" (and a chronic critic of airpower),*** **USA Today,** ***Nov. 12.***

**Between Crime and War**

"When does a cyber attack on a bank change from being just a cybercriminal to being someone attacking the nation's banking system? Some would argue it doesn't matter, and it may not matter if you are inside the bank, but it matters if you are following US law in determining what action, what activity, you can take against it, if you can figure out who the attacker is."***—Maj. Gen. William T. Lord, commander, Air Force Cyberspace Command (Provisional), UPI, Nov. 4.***

**Impregnable**

"The air force has built up a solid barrier against any kind of strike, using up-to-date equipment as well as unique military tactics."***—Iran's Air Force chief, Brig. Gen. Ahmad Miqani, Xinhua news agency (China), Nov. 12.***

USAF photo via Lt. Col. George Allison

***Above: Andersen AFB, Guam, during the Arc Light era. Right: A B-52D from the 93rd Bombardment Wing drops a stream of 500-pound bombs.***

# Arc Light

## The B-52s fought their war in Vietnam without ever leaving SAC.

By John T. Correll

The centerpiece of the Arc Light memorial on Andersen AFB, Guam, is a B-52D bomber, painted in jungle camouflage and with markings from the Vietnam War. It is dedicated to the B-52 crew members who lost their lives in that war. Their names are engraved on a bronze plaque at the memorial.

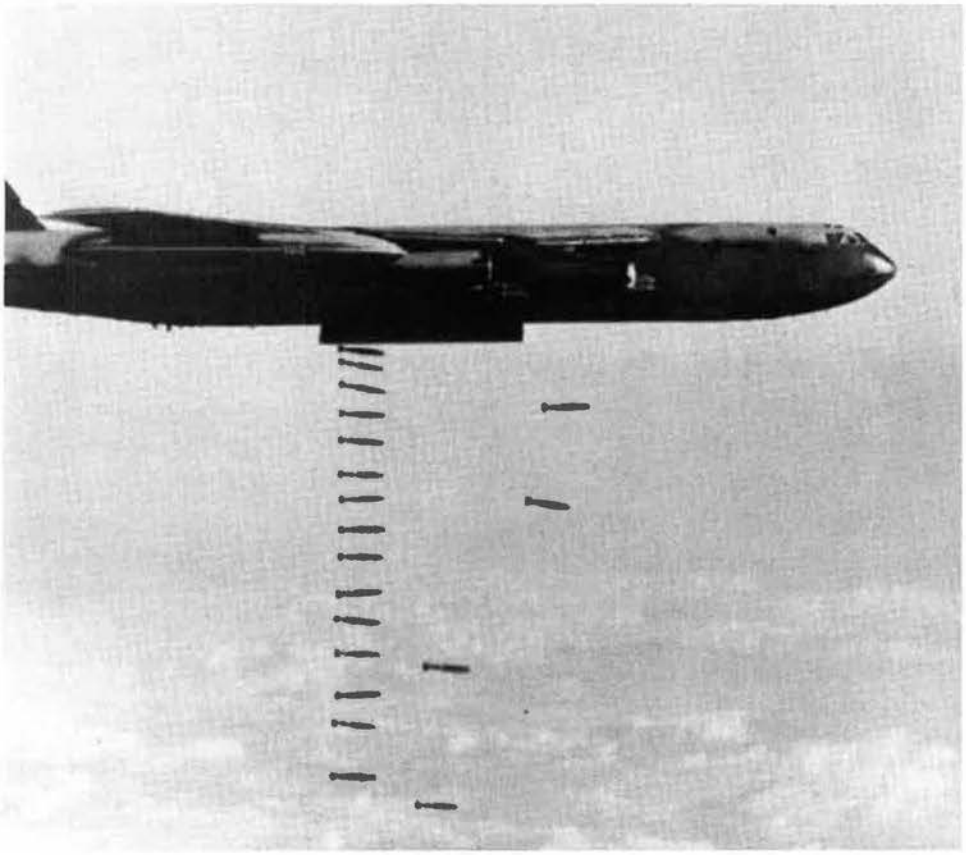
In a larger sense, the memorial recalls the long-running B-52 combat operation,

code-named Arc Light, that encompassed more than 126,000 sorties over Southeast Asia between 1965 and 1973. Andersen was Arc Light headquarters and the principal base, but B-52s also flew from two other bases—U Tapao in Thailand and Kadena on Okinawa.

The B-52s unquestionably brought the most lethal firepower of the war but much of the Arc Light employment, especially in the early years, was against minor targets in support of ground operations in South Vietnam. However, Arc Light culminated in Linebacker II, the 11-day bombing of North Vietnam in 1972 that led to the end of the war. It was an indication of how the US venture in Southeast Asia might have turned out had it been fought with a different strategy.

Arc Light was not part of the Vietnam air campaign run by 7th Air Force in Saigon. The Arc Light crews were drawn from the Strategic Air Command nuclear alert force and, wherever they were, they remained under control of SAC.

From beginning to end, Arc Light was executed by aircrews and ground crews from SAC bases in the United States on temporary duty rotations up to 179 days. Anything longer would have triggered a permanent change of station reassignment from their home wings. Some of them pulled half a dozen Arc Light tours or more, amounting to more than 1,000 days. They did not get credit for a Southeast Asia combat tour.



USAF photo

## Sledgehammers and Gnats

Nothing like Arc Light had been anticipated. The B-52, operational since 1955, was SAC's principal long-range, deep penetration nuclear bomber. It could deliver conventional ordnance, but SAC was not enthusiastic about that. In 1964, the Joint Chiefs of Staff directed that 30 B-52s be kept available for worldwide contingencies.

In February 1965, as the Vietnam War heated up, 30 B-52s deployed from the United States to Guam and KC-135 tankers were sent to Kadena to support them. The JCS recommended striking North Vietnam with B-52s, but that was ruled out as too provocative by the State Department and the White House. SAC wanted to bring them back home, but was not permitted to do so. They did not remain idle for long.

Gen. William C. Westmoreland, commander of Military Assistance Command Vietnam, persuaded the JCS to use these B-52s against Viet Cong base camps in South Vietnam. Earlier strikes by tactical aircraft had been unsuccessful, and the B-52s could put down an even pattern of bombs over a large area.

The first Arc Light mission was flown from Andersen on June 18, 1965 by B-52F crews on rotation from Carswell AFB, Tex., and Mather AFB, Calif. There were numerous last-minute changes, a complication that would become familiar in the years ahead. To calm White House fears of bombs hitting friendly troops or civilians, an Air Force brigadier general from Saigon was dispatched to the target area to keep watch in a C-123 command and control aircraft.

Everything went wrong on that first mission. The B-52s reached the refueling area seven minutes early because of tailwinds from a typhoon. The first aircraft to arrive was flying a circular holding pattern and collided with another aircraft just getting there. Both fell into the sea. The other B-52s completed the mission but the intended target, a Viet Cong battalion, was gone before the bombing started.

*Time* Magazine equated the Arc Light missions to "using a sledgehammer to kill gnats," but the commitment persisted. Operations were initially limited to South Vietnam as the Administration worried about escalation to "a wider war."

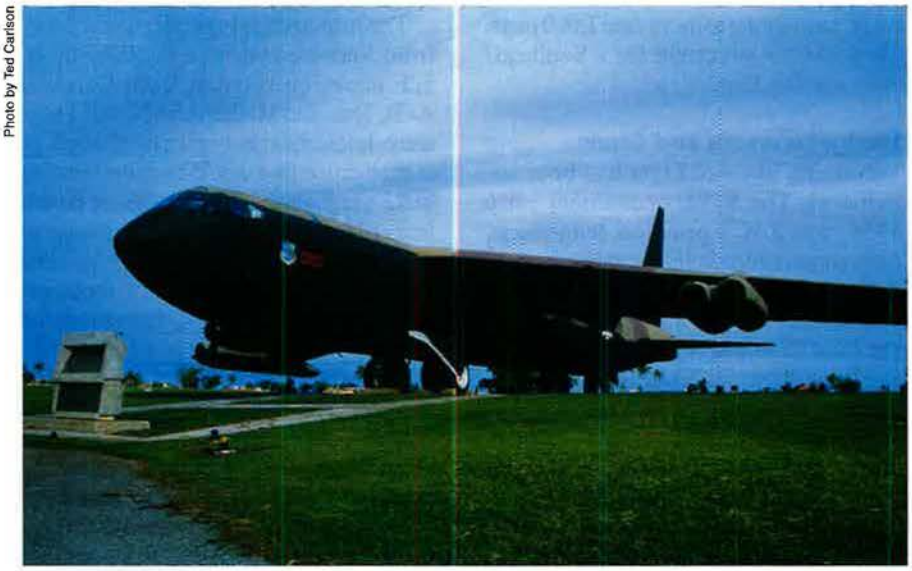
Command and control remained with SAC, but MACV could nominate targets. Westmoreland's method was to use B-52s as heavy artillery. He also liked their psychological effect on the enemy. The first indication the Viet Cong had that the B-52s were there was when the jungle erupted around them.

Gen. William W. Momyer, commander of 7th Air Force, was "appalled by the enormous tonnage of bombs the B-52s were dropping on the South Vietnamese jungle with little evidence of much physical effect on the enemy, however psychologically upsetting to enemy troops in the vicinity," said Air Force historian Wayne Thompson. However, Gen. Lucius D. Clay Jr., commander of Pacific Air Forces later in the war, acknowledged that the B-52s "gave ground forces the kind of fire support no other army has ever had."

In December 1965, Arc Light was expanded to include the Laotian panhandle, and the first strikes in North Vietnam, just over the border, were in April 1966. By the middle of 1967, the B-52s had established a sortie rate of 800 a month.

Airmen of the Vietnam era called Guam "The Rock." It is the largest island in the Marianas, a 32-mile-long column of basalt and limestone rising out of the Mariana Trench. Andersen, located at the north end of the island, was formerly

Photo by Ted Carlson



***This B-52 on display at Andersen AFB, Guam, serves as a memorial to Arc Light. The original "Old 100" was damaged and replaced with this one in 1983.***

North Field, built for B-29 missions against the Japanese home islands in World War II.

Before Arc Light, SAC had kept a small force of B-52s on Guam on "reflex alert." The first Arc Light missions were controlled by the existing organization at Andersen, but SAC soon formed provisional wings—and in the later phases of the war, provisional air divisions, at both Andersen and U Tapao—to which B-52 crews and support elements from US bases could be attached. Third Air Division, the longtime SAC headquarters on Guam, controlled all SAC operations in Southeast Asia until 8th Air Force relocated to Guam in April 1970 and took over.

Andersen has two parallel runways. The prevailing wind is such that virtually all takeoffs and landings are to the northeast. The runways end at Pati Point, where a cliff falls 500 feet to the sea. Throughout the Vietnam War, a Russian trawler lay off Pati Point, watching the takeoffs.

The Andersen runways are famous for the dip in the middle, which creates an uphill stretch toward the northern end. "On takeoff to the northeast, speed came up rather rapidly on the downslope but the upslope took a toll in speed so that it merely crept up towards liftoff numbers," said retired Lt. Col. Charles D. McManus, an Arc Light veteran who now lives on Guam.

From Andersen, it was 2,600 miles to Saigon. The round-trip mission lasted 12 to 14 hours. The B-52s flew in loose, three-ship formations to a refueling point north of the Philippine island of Luzon and refueled over the South China Sea. On return, they flew directly east across the Philippines to Guam.

A second Arc Light base was established in 1967 at the Thai Navy airfield at U Tapao on the Gulf of Siam. It was initially a shuttle bombing base. B-52s took off from Andersen, flew their missions, recovered and rearmed at U Tapao, flew another mission and returned to Andersen. In 1969, U Tapao was upgraded to a main operating base. U Tapao was closer to the targets; the missions were only one-third as long as those launched from Guam, and there was no need for aerial refueling.

## "Old 100"

When the American Tet counteroffensive got into full swing in February 1968, SAC also began staging Arc Light missions from Kadena.

In the earliest days, the first missions were flown by B-52Fs, which carried 27 bombs internally and 24 more on wing racks. B-52Ds took over in 1966 and became the signature bombers of Arc Light. They were older than the Fs, but with the high-density bombing or "Big Belly" upgrade, they could carry 84 bombs in the bomb bay and another 24 on pylons.

One D model nicknamed "Old 100"—serial number 55-0100—flew 5,000 combat hours. It was displayed at the Arc Light memorial until 1983, when corrosion from the salty air and damp climate of Guam forced its replacement with another B-52D. The replacement aircraft, painted with "Old 100" markings, was itself a veteran of numerous Arc Light sorties.

During the Arc Light maximum effort in 1972, B-52Gs joined the operation. They had longer range, but carried only 27 bombs. The newest of the B-52s, the H models, never flew in Arc Light.

When Arc Light began in 1965, the B-52s were painted for the strategic nuclear mission. The reflective anti-flash undersides of some of the B-52Fs were overpainted with black to reduce visibility at night. The B-52Ds introduced the characteristic look of Arc Light, with top surfaces painted jungle camouflage, tan, and two shades of green.

The standard strike formation for the Arc Light B-52s was the three-ship "cell." The attack could be either by a single cell or multiple cells, the combination being known as a "wave." Bombing altitudes were typically 25,000 to 30,000 feet. The targets were area boxes 1.2 miles long and .6 miles wide, which the B-52s could saturate with high explosives. By June 1967, Arc Light made extensive use of ground-directed radar bombing. Seven radar sites covered all of South Vietnam, eastern Cambodia, southern Laos, and the southern part of North Vietnam, and, from 200 miles away, guided the bombers precisely to the release point.

The enemy rarely grouped itself into mass formation, but when it did, the effectiveness of the B-52s was overwhelming. One such instance was the battle of Khe Sanh during the Tet Offensive of 1968.

Khe Sanh was a combat base situated 15 miles south of the Demilitarized Zone and occupied by 6,000 US Marines and South Vietnamese rangers. Land access was cut off when Khe Sanh was besieged by two North Vietnamese divisions with about 20,000 men. The base came to have a greater symbolic importance than its actual strategic value because of the priority accorded to it emphatically and publicly by the White House and MACV.

Air support kept Khe Sanh alive and eventually broke the siege. On an average day, 350 tactical fighters and 60 B-52s pounded the enemy, while airlifters delivered supplies and ammunition, landing under fire when necessary. Each cell of B-52s carpet-bombed a 1.2-mile strip, which created havoc among the besiegers. About 15,000 North Vietnamese and Viet Cong troops were killed, most of them by airpower. "The thing that broke their backs was basically the fire of the B-52s," Westmoreland said.

The Arc Light sortie rate increased to 1,800 in February 1968 and remained at that level for the rest of the year. In the spring of 1969, B-52s operating

under "special security and reporting procedures" bombed North Vietnamese and Viet Cong sanctuaries in Cambodia. Between March 18, 1969 and May 26, 1970, the B-52s flew 4,308 sorties in Cambodia.

Meanwhile, the policy of "Vietnamization" of the war steadily reduced US force levels and activity in Southeast Asia. In September 1970, U Tapao took over as the sole operating base for B-52 sorties. Missions were halted from Andersen and Kadena although Arc Light operations were still directed from the headquarters on Guam.

In late 1971, intelligence reported a big buildup of North Vietnamese forces just north of the DMZ and an increase of infiltration traffic on the Ho Chi Minh Trail. North Vietnam was preparing for what would be known as the "Easter Invasion" using massed forces. The US plan was to strike the new targets with B-52s before the enemy offensive began.

Operation Bullet Shot sent additional B-52s to the theater, raising the total in East Asia to 210, which was more than half of SAC's entire strategic bomber force. Of these, 155 were based at Andersen, forming the largest concentration of B-52s in history. It took five miles of ramp space to park them. A popular saying claimed that 30 airplanes had to be flying at any one time since there was not room enough for all of them on the base.

The number of support personnel in the 303rd Consolidated Aircraft Maintenance Wing (Provisional) at Andersen, eventually reached 5,000, of which 4,300 were on six-month temporary duty tours. A tent city was thrown up to house the maintenance and support troops. When Arc Light ended in 1973, many of them were on their third consecutive six-month tour to Guam.

The Easter Offensive began March 30 as the North Vietnamese Army crossed the DMZ with 40,000 troops and 400 armored vehicles. US tactical airpower, which by that time had been drawn down to half its peak size, returned and joined B-52s from U Tapao and Andersen in repelling the invasion. Henry A. Kissinger, the national security advisor, argued successfully against using the B-52s in North Vietnam lest they cause a "domestic outcry." As before, they were employed mostly in the South.

As at Khe Sanh, the massing of ground forces in the face of US airpower proved to be foolhardy, and the invasion was beaten back. However, when the United States suspended air attacks north of the 20th parallel, Hanoi began dragging its feet on peace talks. By early December, "Hanoi had in effect made a strategic decision to prolong the war, abort all negotiations, and at the last moment seek unconditional victory," Kissinger said. That set the stage for the biggest Arc Light mission of all.

Photo by Ted Carlson

***The battered B-52D tail section of the original "Old 100" was blown by a typhoon into the jungle.***

### The "Press On" Rules

Operation Linebacker II, which unfolded over the period Dec. 18-29, 1972, launched 729 B-52 sorties in 11 days from Guam and U Tapao against the heartland of North Vietnam, mainly Hanoi and Haiphong. It is often called the "Christmas bombing," but Christmas was the one day the B-52s did not fly.

The first day saw attacks by 129 B-52s, the biggest bomber attack force assembled since World War II. Of these, 87 were from Andersen; it took an hour and 43 minutes for them to taxi out and take off. The choreography of the massive launch—dubbed the "Elephant Walk"—was handled by "Charlie Tower," located between the approach ends of the runway and manned by experienced old hands who solved problems as they arose.

Since November, the B-52s had been operating under "Press On" rules, which meant that missions into North Vietnam would continue despite aircraft malfunctions or MiG threats. For Linebacker II, the Press On rules were tougher. "The loss of two engines en route or complete loss of the bombing computers, radar system, defensive gunnery, or ECM [electronic countermeasures] were not legitimate grounds for abort," said Brig. Gen. James R. McCarthy, who as a colonel in 1972 had commanded one of the two B-52 wings at Andersen. Ground crews sometimes stayed aboard the aircraft and continued maintenance on the way to North Vietnam.

Spare aircraft were preflighted and made ready. If necessary, a crew could transfer to the spare bomber, taking their mission materials and equipment with them. The exercise was known as a "bag drag."

Linebacker II is associated in popular memory almost exclusively with the B-52s. In fact, other aircraft flew almost half the Air Force sorties, which included combat air patrol, suppression of SAMs, electronic countermeasures, and various support missions. Nevertheless, the B-52s were clearly the power hitters and delivered the main message to the North Vietnamese.

They approached from the northwest, along the Red River Valley and Thud Ridge, and on the first night struck airfields and rail yards around Hanoi. Ninety-four percent of the attacking bombers put their ordnance on target.

The most serious trouble came on the third night, when six B-52s—of 99 launched—were shot down by SA-2 missiles. There was considerable opinion that the fault lay with tactics decided and directed by SAC headquarters, half a world away in Omaha. The bombers were repeatedly sent on the same approach routes, at the same altitudes, and at the same times of day.

A particularly questionable part of the order forbade maneuvering to evade SAMs or MiGs. There were two reasons given for this: concern about mid-

| Arc Light B-52 Organizations<br>P=Provisional | | |
|---|---|---|
| **Andersen AFB, Guam** | | |
| 1954-70 | 3rd Air Div | Hq for B-52 units at Andersen, U Tapao, and Kadena |
| 1970-75 | 8th Air Force | Replaced 3rd Air Div as hq for Arc Light |
| 1955-70 | 3960th Strategic Wg | SAC unit from pre-Vietnam period. Replaced by 43rd SW |
| 1966-70 | 4133rd Bomb Wg (P) | Formed to receive rotational crews, inactivated 1970 when 43rd SW formed |
| 1970-79 | 43rd Strategic Wg | Replaced 3960th SW when B-52 missions from Guam resumed in 1972, reported to 57th Air Div (P), continued as operating unit at Andersen until 1989 |
| 1972-73 | 57th Air Div (P) | Controlled both B-52 Arc Light wings on Guam |
| 1972-73 | 72nd Strategic Wg (P) | Reported to 57th AD (P) |
| 1972-73 | 303rd Consolidated Aircraft Maint Wg (P) | Reported to 57th AD (P) |
| **U Tapao RTNAF, Thailand** | | |
| 1966-70 | 4258th Strategic Wg | Reported to 3rd Air Div on Guam; in 1970, redesignated as 307th |
| 1970-74 | 307th Strategic Wg | For last part of war, reported to 17th AD (P) |
| 1972-74 | 17th Air Div (P) | Reported to 8th AF on Guam |
| 1972-74 | 310th Strategic Wg (P) | Reported to 17th AD (P) |
| 1972-74 | 340th Consolidated Aircraft Maint Wg (P) | Reported to 17th AD (P) |
| **Kadena AB, Okinawa** | | |
| 1965-70 | 4252nd Strategic Wg | |
| 1970-74 | 376th Strategic Wg | Replaced 4252nd SW; did not fly Arc Light combat missions |

air collisions among bombers or with other aircraft, and more important, the reduced risk of hitting civilian areas if the bombers stayed on planned course and in trail formation. In addition, a "post-target turn," a steep, 45-degree banked turn immediately after release of bombs, was directed. This was a standard SAC maneuver to help bombers get away from nuclear blast, which was not one of the threats they encountered over Hanoi.

"The inbound heading to the target and the post-target turn remained relatively unchanged for the first three days of Linebacker II," McCarthy said after the war. "This, in my opinion, caused the high B-52 losses sustained on the second and third days." After that, the rules changed. SAC delegated authority to select axes of attack and withdrawal routes to 8th Air Force on Guam. A smaller post-target turn was adopted. The B-52s could maneuver in self-defense. There were further losses—15 in all for the 11-day operation—but never again more than two a night.

## Final Mission: Cambodia

Linebacker II struck railroad yards, storage facilities, radio communications facilities, power plants and transformers, airfields, SAM sites, and bridges. North Vietnam lost 80 percent of its power production and its military infrastructure was severely battered. It was obvious that the B-52s could have wiped Hanoi and Haiphong off the map had that been their purpose. Instead, damage to civilian areas was limited.

The North Vietnamese understood that there would be more to come if they continued to slow roll the peace talks. Besides, they were running out of SAMs and they knew from the Russian trawler at Pati Point that they had made only a small dent in the B-52 force. They returned to the peace talks and a cease-fire was signed in Paris on Jan. 27, 1973. Kissinger, who had been reluctant to use the B-52s in the north, acknowledged that it had "speeded the end of the war" and most likely was "the only measure that would have done so."

B-52 missions in Vietnam stopped with the peace agreement, but Arc Light operations continued for a while in other parts of Southeast Asia. The final mission was in Cambodia on Aug. 15, 1973.

During the eight years and two months of Arc Light, the full power of the B-52s was seen only sporadically. The exceptions were employment against a massed enemy, as at Khe Sanh, and in the strategic operation of Linebacker II. The United States had already made its critical mistake in strategy before B-52s flew the first Arc Light mission. In April 1965, the air campaign against North Vietnam had been downgraded to a supporting action for the ground war in the South although the war was instigated, perpetuated, and sustained by the North. That barrier made victory impossible, but South Vietnam might have survived as a nation if Arc Light had continued.

"There seems to be no question that the B-52 bombing of Hanoi and the terrific casualties North Vietnamese military forces suffered from US air attacks in 1972 intimidated the North Vietnamese leadership," said Marshall L. Michel III in *The 11 Days of Christmas*. "Had Nixon remained in power and the United States kept a significant B-52 presence in Asia, it is at least questionable if the North Vietnamese would have again risked a conventional invasion of South Vietnam. It was only after the fall of Nixon that the fall of South Vietnam became inevitable." ■

*John T. Correll was editor in chief of* Air Force *Magazine for 18 years and is now a contributing editor. His most recent article, "Rendezvous With the* Rex," *appeared in the December 2008 issue.*

**Everyone, even Red the Uniform Tailor, has said his piece about how to fix USAF's blue suit.**

# In Search of the Perfect Uniform

By Peter Grier

On Oct. 31, 1991, Gen. Merrill A. McPeak, then Air Force Chief of Staff, unveiled a new service uniform to assembled photographers and reporters in the Pentagon's press briefing room. McPeak was wearing it.

The lanky ex-fighter pilot moved somewhat stiffly, and admitted he was no one's idea of a catwalk star, but he gamely tugged at the front of the three-button coat to show off its slim cut. He pointed out his new sleeve rank insignia, a two-inch silver braid embroidered with clouds and thunderbolts topped by three additional narrow braids. He raised his arms high in the air to show the garment's flexibility and ease of wear.

"It's much more comfortable," McPeak said. "The armholes are larger."

McPeak had ordered up the new uniform to give Air Force personnel a more military appearance. What he got was a firestorm of controversy.

Many in the Air Force disliked the new coat, which to critics offered not a more military look but a stripped-down, corporate appearance.

Nor did they approve of the silver piping on the lower sleeves worn by officers to display rank. It looked like an airline uniform, grumbled many in the service. It looked like a Navy uniform, said others.

"Instead of looking like soldiers in blue uniforms, we will all look like stewards from the Love Boat," wrote one critic in a 1991 letter to the *Air Force Times*.

The new "blues" lasted only three years. McPeak's successor, Gen. Ronald R. Fogleman, ditched it within a week of his taking office.

## Fix The Ones We Have

Since then, the Air Force has continued its search for a dress uniform that expresses the service's distinct identity. The latest effort—the "heritage coat"—is currently on hold.

The heritage coat was designed to partake of the service's history. Its design borrowed heavily from the belted, high-button jackets of the era of Gen. Henry H. "Hap" Arnold, the airpower pioneer and World War II leader of the Army Air Forces.

However, Gen. Norton A. Schwartz, the current Chief of Staff, decided in August to defer a decision on whether to proceed with the heritage coat effort begun by his predecessor, Gen. T. Michael Moseley. Instead, Schwartz wants the service to focus on rolling out the new airman battle uniform and improved physical training gear.

"The Chief of Staff said he'll take until [this] summer and then decide whether to proceed," said an Air Force spokesman. Schwartz, he added, "wants to fix the uniforms we currently have before we add new uniforms to the inventory."

Given the Air Force's relatively short history as a separate service, it should perhaps come as no surprise that it is still searching about for uniform elements to combine into a distinct look. The Navy, for its part, has had more than 200 years to figure out its uniform requirements. Since World War II, Navy uniform changes have primarily involved materials, as opposed to basic patterns.

For the Air Force, the color blue has been a constant, of course. But the question of how elaborate service uniforms should be has remained open to debate, with opinions veering back and forth over the decades.

McPeak considered the service dress to be too cluttered. He also regarded it as being, at heart, a blue version of the Army's uniform. When he became Chief in 1990, he was determined to give the Air Force a more distinctive look.

*Going back to the uniform known as "pinks and greens" (shown here on Gen. George Kenney) was considered, but ultimately rejected.*

The result was stripped-down, radical, and unloved—to put it mildly.

Designed by Red the Uniform Tailor, of Toms River, N.J.—and at a cost of $1.5 million—McPeak's uniform did away with outer patch pockets and a number of decorative buttons. It eliminated epaulets, emblems, name tags, and as many pin-on items as possible.

The coat was three-button, instead of the old four. Lapels were cut lower to provide what its designer described as a "more elegant fit." The fabric was a polyester-natural fiber blend, as opposed to the former polyester double-knit.

As Chief, McPeak wanted to shake up the Air Force's traditional way of doing things. He was known for his attention to detail, and the uniform reflected that.

A fitness enthusiast who mixed his own muesli-based breakfast each morning, McPeak made every effort to stay in shape and said that he expected everyone else who wore a blue uniform to do the same.

The new clothing "fits in with ... our image of a streamlined, trim, and tougher Air Force, with less doodads of all kinds," said McPeak at the uniform's Halloween day unveiling. "It's a return to basics."

Rows of "fruit salad" ribbons marking awards and decorations were discarded in favor of a minimalist "top three."

Then there were the sleeves—more specifically, the silver braids ringing the lower sleeves as indications of rank. Did the braid speak of "US Air Force" or "US Air?" Many in the service thought it was the latter.

"Guilty as charged," said McPeak, when asked by a reporter if the new coat looked just a little bit like an airline uniform. "We do look something like ... many airline pilots." However, that was not a bad thing, according to McPeak.

"We want a distinctive military look. We also want an airman's look," he said.

Airmen liked the new, more comfortable fabric, and the fit met with approval. In general, though, the stripped-down look got a thumbs-down response. Air Force personnel did not want to be asked the way to the business class lounge. Nor did they want to be confused with Navy officers.

## BDUs Are Better

Among the senior officers who were not fond of the new design was Fogleman, who was then the commander of Air Mobility Command at Scott AFB, Ill. He directed members of his command to wear the battle dress uniform, not service dress, as their day-to-day outfit.

Fogleman's opposition was so well-known that, after he was picked to succeed McPeak as the Air Force Chief of Staff, press reports openly debated whether he would wear the

*During the early 1960s, the dress blues (shown here on Gen. Curtis LeMay) bore a close resemblance to today's uniform.*

*Gen. Merrill McPeak, as USAF Chief of Staff, introduced a widely disliked "stripped down" dress uniform with Navy-style braids in 1991.*

McPeak uniform at his October 1994 change-of-command ceremony. Many thought that he would show up in his older, traditional blues.

Fogleman wore the McPeak-style uniform. Still, once in office, he quickly sent a message to Air Force personnel around the world, announcing uniform changes.

The "US" and traditional rank insignia were reinstated, bringing captain's bars and general's stars back to the shoulders. Ribbons, too, were back. Epaulets were reinstated.

Most importantly, the silver braid was unraveled. Old rank insignia were the new order of the day.

Fogleman billed the alterations as "midcourse corrections" which would enhance the uniform's acceptability, functionality, and appearance.

"Our goals are to make the necessary changes as soon as possible and eliminate the uniform as an issue," said Fogleman in his message to the field, alluding to the dislike McPeak's uniform had engendered.

In some ways, the recent move to postpone a decision on whether to institute the heritage coat may proceed from the same motives that drove Fogleman. Whatever the merits of the design, at the moment the Air Force does not need a new uniform to be an issue or source of controversy.

The service has plenty to do in regard to making sure the new ABU rollout goes smoothly, and that PT gear is upgraded in response to airmen complaints.

"Our airmen spend their hard-earned money on these uniforms, and we owe it to them to do the research, development, and quality assurance to guarantee every uniform item put on the shelf is right the first time," said CMSAF Rodney J. McKinley after the heritage coat was delayed.

The service is developing a lighter-weight ABU for hot weather climates, for instance. PT shorts are being lengthened by one inch for larger sizes, and one-half inch for smaller ones. PT gear is getting bigger pockets.

The Air Force is also looking at quieter fabrics for warm-up jackets and pants.

This is not a reshuffling of the deck chairs on the *Titanic:* On combat assignments, airmen can only wear ABUs or PT gear, noted service spokesman Capt. Michael Andrews.

"Depending on where you are, that 'swish-swish' sound isn't something you want to be making," he said.

Limited production of improved ABUs will begin in the summer of 2010, depending on funding and fabric availability, according to the Air Force. Deployed units will receive the first production models.

Boots have also been an issue. Air Force officials say ABU boots have led to complaints about blistering, contusions, sprains, swelling, and general pain.

The service has recently certified a second manufacturer for the boots,

USAF photo by SSgt. C. Todd Lopez

*An early version of the "heritage coat" (shown here on SMSgt. Dana Athnos and then-Brig. Gen. Robert Allardice) was styled after the uniform worn by airpower pioneer Billy Mitchell.*

USAF photo by TSgt. Matthew Lohr

*Here, Gen. Robert Kehler is seen in a heritage coat styled after the uniform worn by Gen. H. H. "Hap" Arnold. A recent uniform board considered over 900 proposed uniform initiatives.*

following an extensive wear test of their products conducted by Air Force Academy cadets.

It's doubly important to get boots right, considering their importance to an expeditionary Air Force, said Lt. Gen. Richard Y. Newton III, deputy chief of staff for manpower and personnel.

"We continue to strive to provide our airmen uniforms that are functional and practical," said Newton in August.

As for the heritage coat, Schwartz opted for delay following a gathering of senior leaders at Bolling Air Force Base in Washington, D.C., over the summer.

A wear test of the coat is proceeding apace, however, and the results were expected in by the end of 2008. Some 240 airmen participated, from a range of locations around the country.

"The heritage coat isn't dead. ... Air Force officials will review comments and present their findings to Schwartz, who will make a decision next summer," read a statement in an "Airman's Roll Call" issued the first week of September.

Airmen have long expressed a desire for a more military, less corporate look, and the heritage coat project was intended to respond to that desire.

"We want a service dress that clearly represents our pride as airmen and history as a service, and we want to make sure we get it right," said Maj. Gen. Floyd L. Carpenter, who was director of airman development and sustainment when the heritage coat design was unveiled in August 2007.

## Back to the Future?

The Air Force considered several prototypes for the heritage coat. One had a stand-up collar reminiscent of the era of airpower pioneer Billy Mitchell. Another had a belted coat and high lapel meant to evoke the time of Hap Arnold.

Designers considered different lapel styles and sizes, button placements, and many pocket iterations, as well as belted and unbelted styles. In the end, they based their final prototype on the Hap Arnold uniform model.

The official coat candidate that was announced in 2007 was a high-lapel, belted style with a relatively high neck opening, due to the four-button design, and scalloped-edge pocket flaps. Two different belt configurations were produced for wear testing.

At the time of the coat's introduction, Air Force officials noted that service personnel who wished for a more professionally tailored look than the standard issue would be able to obtain a custom-tailored coat from Brooks Brothers.

The Navy has a similar arrangement with the company.

"This new coat will help make our airmen look sharp, and it better personifies today's warrior ethos of an airman engaged in the war on terrorism," said Carpenter at the time.

Reception among Air Force personnel was mixed, if comments posted on Air Force Link are any guide. Some approved of the nod back to the service's past. Higher-ranking officers and retirees in particular seemed interested in the heritage look.

But others did not want to look like they had gone backward in time.

Critics generally disliked the vintage belt or the necktie on the women's version of the new uniform. And some questioned the wisdom of focusing any attention on clothing at a time when the nation is at war.

"Any time you introduce a new uniform, obviously there will be folks for and against it," said spokesman Andrews, who added that the feedback USAF has received shows airmen are supportive of the effort.

The Air Force does take the concerns of airmen into account in uniform design, say service officials. A recent "virtual uniform board" considered more than 900 proposed initiatives, which helped lead to the changes now being made to the ABUs and PT gear.

"The Air Force is committed to ensuring airmen have a fully functional uniform at the right time at the right cost," said Andrews.

This has been an odyssey of at least 17 years, however, and perhaps of 61 years. The search for the perfect uniform continues. ■

*Peter Grier, a Washington editor for the* Christian Science Monitor, *is a longtime defense correspondent and a contributing editor to* Air Force *Magazine. His most recent article, "On the Minds of the Troops," appeared in the November 2008 issue.*

**The Air Force and NRO have been hacking at this project for nearly 50 years now.**

# Ups and Downs of Space Radars

By Jeffrey T. Richelson

NRO photo

*Technicians work on a radar-imaging Lacrosse satellite.*

When David D. Bradburn entered the US Army Air Corps in 1946, his branch had only the faintest acquaintance with missiles and spacecraft. Bradburn could not have foreseen that, on Dec. 21, 1964, he would be at Vandenberg AFB, Calif., overseeing the launch of a highly specialized spy satellite—but he was.

Bradburn had flown fighters and had racked up 50 B-26 combat missions in the Korean War. In December 1960, however, he moved to the Air Force Office of Special Projects. Shortly afterward, he was selected to be program manager of a classified satellite program. Less than a year later, the Kennedy Administration created the National Reconnaissance Office, and Bradburn became part of it, and so did his program.

Bradburn's satellite was given the designation Quill. Quill was a radar imager, an early part of what was, and still is, an extraordinarily challenging US space radar effort. The program yielded a total of three models—two flightworthy spacecraft and a bench model for testing. It was the first of those two flying systems that was propelled into orbit that December.

The concept of space radar was simple: The satellite transmits powerful radar waves toward Earth. They bounce off the target and return to a receiver on the satellite, which captures an electronic image of the target.

Radar waves penetrate cloud cover, and do not rely on the visible light portion of the electromagnetic spectrum. For these reasons, radar imagers, unlike photographic spy satellites, can provide imagery of any target in any weather at any time.

To Bradburn and others in the Air Force, this looked to be a particularly promising technique for detecting nighttime Soviet military exercises and nuclear missile movements.

Like photoreconnaissance satellites, Quill returned images by ejecting a payload capsule, which was then snatched out of the air by a specially modified C-130. The Quill images did not have very high resolution, but analysts still could clearly identify cities, airfields, military formations, and industrial installations. In truth, its target area was highly restricted. It was allowed to "paint" targets only in Ohio, Illinois, Indiana, and Far West states—not the Soviet Union.


USAF photo

*Maj. Gen. David Bradburn, a space radar pioneer.*

Quill's operational life was not long—only about a month—but that was still longer than was the case for most of the new reconnaissance satellites. On Jan. 11, 1965, its mission ended and the satellite burned up in the atmosphere upon re-entry. That event marked not only the end of that particular satellite but also of the whole space radar program—for a while, anyway.

What killed Quill was fear that the existence of a US reconnaissance satellite that transmitted such signals would spur the Soviets to interfere with those satellites—and also threaten the NRO's passive photographic satellites.

Even so, that was not the end of the matter. The concept of space-based radar kept bobbing back to the surface. Bradburn, in fact, spent more than 20 years helping develop radar and satellite systems for the Air Force before finally retiring as a major general in 1976. (He died in October 2008.) The Air Force and National Reconnaissance Office, in turn, have been hard at work developing promising but difficult space radar systems. Work on classified programs continues to this day.

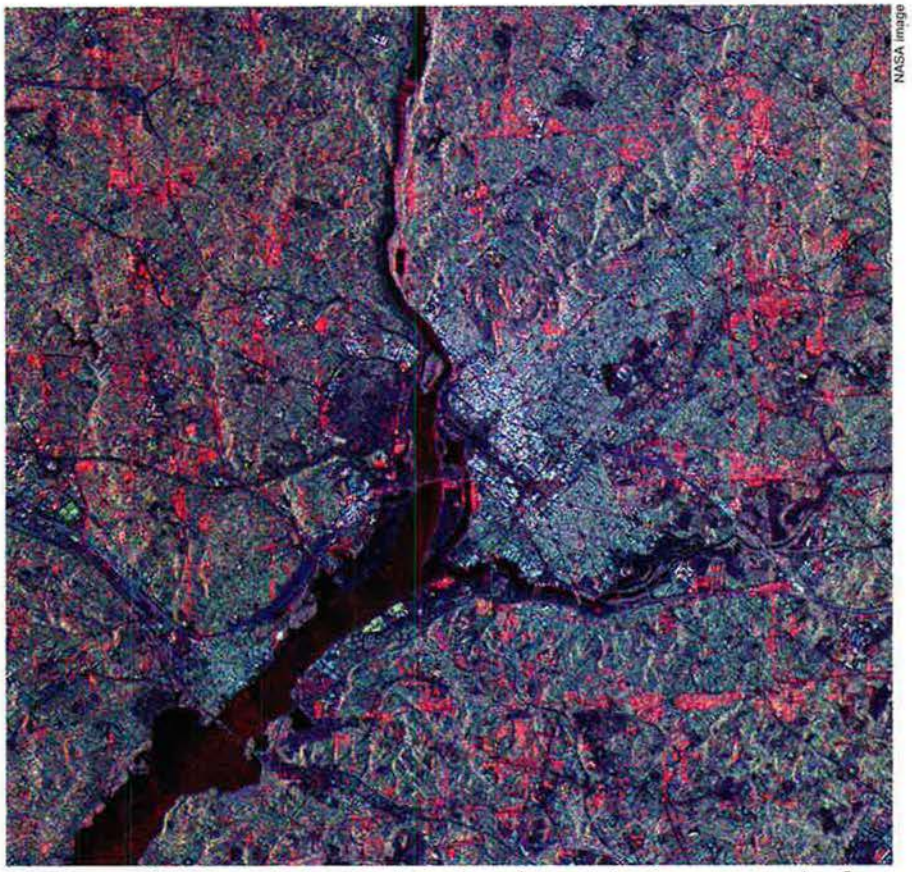
Soviet launches of radar-based ocean-reconnaissance satellites in the 1960s may have spurred the US to again consider developing a radar imaging system, specifically a side-looking, synthetic aperture radar, which allowed an image to be constructed from multiple reflections off a target.

On Jan. 20, 1970, the NRO hosted a meeting to discuss plans for testing a side-looking SAR. The Defense Intelligence Agency believed North Korea, with an abundance of ground targets, would be the best place on which to focus.

However, the National Photographic Interpretation Center had an alternative—Cuba. NPIC preferred the island because it had many and varied targets accessible to side-looking radar, the US had a large database of information about Cuban targets, and the US could test the radar's powers of "change detection" by obtaining around-the-clock, all-weather coverage.

Cuba was selected as the best test target for a new radar imaging system.

Later that year, NPIC hosted another meeting to discuss side-looking satellite radar imagery. There were two projects to be discussed—the QU [Quill] Follow-on SLR Project and the Advanced Strategic SLR System—both of which were being managed by the NRO. Officials believed that a Quill follow-on with 10-foot resolution would meet requirements for oceanic surveillance and indicators and warnings.


NASA image

***The Greater Washington, D.C., area shown in an image taken by a space radar. One of the benefits of space radar is that it can penetrate clouds.***

It was the NRO Advanced Strategic SLR System that was to be tested on Cuban targets.

## Looking At Cuba

In April 1971, under a program designated Senior Lance, U-2Rs equipped with side-looking radar began flying along the coast of Cuba to verify the value of radar imagery on targets in Cuba.

The declassified record is silent concerning the NRO's pursuit of radar imagery satellites during the remainder of the Nixon and Ford Administrations.

One problem that did not go away was the cloud cover over the Soviet Union and Eastern Europe. As one defense official of that era put it, "The weather in the Soviet Union is crappy all the time." Obtaining a satellite photo of a target could take years.

During his tenure as director of central intelligence in 1976-77, George H. W. Bush approved a radar satellite program designated Indigo, and assigned responsibility for the program to the Air Force Office of Special Projects.

Bush's successor as DCI, Adm. Stansfield Turner, recalls that during his tenure, the CIA proposed an alternative—adding a radar imaging capability to future KH-11 electro-optical satellites, the first of which was launched in December 1976.

Turner characterized the proposal as "an ingenious solution" to the problem of cloud cover, because "if a target were obscured temporarily, the satellite could switch quickly from optical pictures to radar ones and be sure of getting something." Turner recommended setting aside funds to procure radar-augmented KH-11s.

He also recalls that Defense Secretary Harold Brown "immediately saw the benefits of this combined optical-radar satellite" and agreed it should be developed by the CIA.

Turner was therefore confident that President Jimmy Carter would approve the program. But what "I did not foresee," Turner has written, "was the pressure that would beset Harold from below."

"Below" in this case meant the Defense Department and the Air Force, which convinced Brown to support


Sandia National Laboratory image

***A high resolution airborne synthetic aperture radar image of the Pentagon, Arlington, Va. In the 1970s, earlier airborne radar imagers gathered intelligence on targets in Cuba.***

a separate, Air Force-led, radar-only system.

When the two put their cases before Carter, "Harold deftly out-argued me, refuting the points on which we had agreed just hours before," Turner said. Brown said the CIA approach placed too many eggs in one basket—a failure in space or a launch failure would deprive the US of both sensors simultaneously.

Furthermore, two sensors on the same satellite couldn't be in two places at once. A radar-only satellite would mean that while a KH-11 photographed a target in China, a radar satellite might be thousands of miles away, imaging tank movements in Ukraine.

Carter sided with his Secretary of Defense, and the Air Force got to keep its radar satellite program—for a few years at least. But, by the middle of President Reagan's first term, it was apparent that Lacrosse, as Indigo had been renamed, had vast cost overruns and numerous developmental problems. Roughly $200 million was needed to keep Lacrosse alive in 1983.

This set up a showdown in the Congressional intelligence oversight committees. Edward P. Boland, the chairman of the House Permanent Select Committee on Intelligence, believed that the program's developmental problems were insurmountable.

Barry M. Goldwater, chairman of the Senate Select Committee on Intelligence, argued that U-2 and SR-71 spyplanes experienced similar cost overruns and developmental problems, but ultimately added a vital new dimension to US intelligence capabilities. Goldwater also pointed to the success of the 26th Tactical Reconnaissance Wing, which flew RF-4s out of Zweibrucken AB, Germany, and transmitted real-time radar imagery of targets along the German border.

Lacrosse's contribution to the nation's security, he argued, could be immense, was worth the cost, and "could work to prevent war."

## Enter the Onyx

Boland agreed to one year's funding, and Goldwater agreed that further cost overruns would result in the project's demise.

The first Lacrosse satellite was completed in October 1987, by which time the satellite's code name had been changed to Onyx.

Martin Marietta's James McAnally apparently played a key role in resuscitating the program. Named an NRO pioneer in 2004, the press release of his citation noted that he led "the development of a new satellite reconnaissance system capable of imagery essential for a wide range of operations," which "provided unique and critical intelligence information."

"When McAnally took over the program's management, it was experiencing serious financial and technical difficulties," another declassified NRO document stated. "In an effort to prevent imminent program cancellation, McAnally worked funding issues, and streamlined business management."

Onyx was ready to go in 1988, but its launch vehicle, the space shuttle, was not. The shuttle was still grounded after the 1986 *Challenger* disaster. After a successful shuttle mission in September 1988, NASA scheduled a Dec. 1 launch for *Atlantis* to deliver Onyx to orbit.

The launch site was to be Cape Canaveral, Fla., due to problems with the shuttle launch pad at Vandenberg AFB, Calif. But launching a reconnaissance satellite from the Cape posed one significant constraint. To avoid overflying populated areas on launch, the maximum inclination that could be attained was 57 degrees. With that inclination, radar coverage would stop 100 miles north of Moscow.

Therefore excluded from Onyx coverage would be the naval facilities around the Kola Peninsula, six ICBM sites, and the satellite launch facility at Plesetsk.

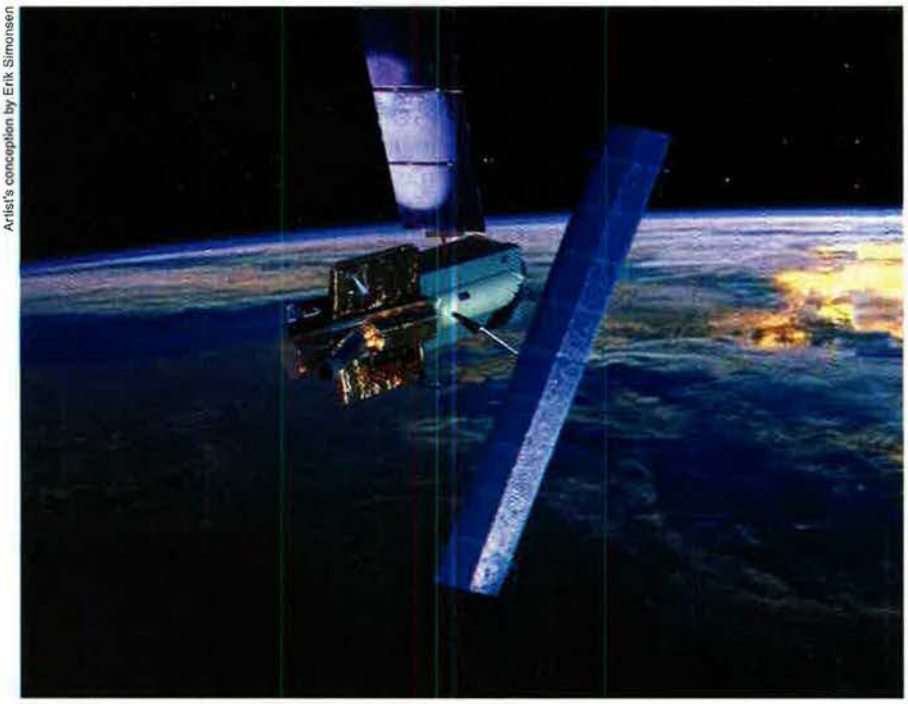
High-altitude wind caused NASA officials to postpone the Dec. 1 launch—the loss of the *Challenger* crew was still fresh in NASA's mind, and each Onyx was a several hundred million dollar investment.

The next day, at 9:30 a.m., two minutes before the launch window for the day closed, *Atlantis* lifted off. On the seventh orbit, the payload was released into space.

From a safe distance, *Atlantis* instructed the two solar panels attached to the central body of the satellite to unfold—and they failed to respond. Fortunately, a second set of radio commands freed the solar arrays. This Onyx bird was intended to be part of a five-satellite Cold War imagery constellation consisting of three KH-11 satellites and two radar imagery satellites.

Within five weeks, the first Onyx—also designated 3101 for the satellite program number (3100) and the mission number (one)—used its on-board rocket engines to reach its operational orbit. It then transmitted its digital imagery, with resolution in the five-to-10-foot range, to its ground station at White Sands, N.M.

The imagery helped monitor Soviet SS-20 missile movements, transportation of nuclear weapons, and other nighttime Soviet military activities. It also assisted in monitoring Iraqi tank movements during Operations Desert Shield and Desert Storm.



Artist's conception by Erik Simonsen

***An artist's conception of the notional joint NRO-Air Force Space Radar. The program's fate is unclear: In 2008, Congress cut off all funding.***

Before dawn on March 8, 1991, a Titan IV rocket blasted off from Vandenberg to place the second Onyx (3102) into a 68-degree orbit at 423 miles. Nearly two decades later, No. 3102 remains in orbit.

An image of the satellite obtained by a Russian space surveillance facility showed, in addition to the satellite's bus, solar panels and a 30-foot dish antenna.

In September 1996, it was reported that the two Onyx satellites were used for bomb damage assessments of two US attacks on Iraqi air defense installations. Specifically, the sensors provided images of the craters made by Navy Tomahawk Land Attack Missiles.

In 1997, the first Onyx spacecraft deorbited, burning up in the atmosphere. That October, a Titan IV blasted off from Vandenberg, carrying 3101's replacement, again into orbit with a 57-degree inclination.

According to a senior Pentagon official, the satellite was an upgraded version with improved "granularity"—resolution good enough to identify an armored vehicle and differentiate between a tank and an armored personnel carrier.

Replacing 3102 was next, and the fourth Onyx was launched on Aug. 17, 2000 from Vandenberg aboard a Titan IV-B. The 30,000-pound satellite was eventually maneuvered into 425-mile orbit, with an inclination of 68 degrees.

The NRO announced in a press release that it owned the payload launched that day, but did not reveal the satellite's name or mission. An unclassified shoulder patch the NRO distributed to employees to commemorate the launch was more revealing, however. The patch announced that "We Own the Night."

## Joint Development

The patch soon became the subject of an article in the *Washington Post*. The phrase "We Own the Night" of course indicated that the satellite was effective at night, when a visible-light imagery sensor would not be. In addition, four bird shapes, shown crossing the equator at inclinations corresponding to past Onyx launches, represented the four previous radar imagery satellites that had orbited.

The launch of the fifth Onyx spacecraft, reported to have two-to-three-foot resolution, took place April 29, 2005 from Cape Canaveral. Five days later, it was in its operational orbit of 445 miles.

That Onyx is reportedly the last of its line.

The nature—and even the fate—of a follow-on system is unclear. In September 1999, the NRO awarded a multibillion dollar contract to Boeing for the Future Imagery Architecture program. Boeing was to develop a follow-on to both the advanced KH-11 and Onyx satellites.

Eventually, due to technical difficulties and escalating costs, NRO pulled the plug on the electro-optical part of the project, but the radar imagery component survives.

By this time, the Air Force, NRO, and Defense Advanced Research Projects Agency had agreed to jointly develop a spacecraft with a synthetic aperture radar and moving target indicator capability. The objective of the system was to provide near-continuous surveillance between 65N and 65S latitudes, and the ability to track targets.

Boeing continued with its separate, NRO-funded, Onyx follow-on program.

Then, in 2005, DCI Porter Goss and Defense Secretary Donald H. Rumsfeld signed a memorandum of agreement stipulating that the joint NRO-Air Force Space Radar program would also serve as the radar imagery component of FIA.

That required Congressional committees to approve the ambitious effort—and the extraordinary cost of developing a system that would satisfy military requirements. This is something Congress has proved reluctant to do: Lawmakers ultimately deleted all funding for the joint program from the spending bill it passed on Sept. 24, 2008.

It now appears that the next descendant of Quill will be built by Boeing as first planned in 1999 and possibly funded solely by the NRO.

In October, when NRO Director Scott F. Large was asked if there would ever be a joint NRO-DOD radar imagery system, he said, "I certainly hope so."

But Large also indicated that NRO was proceeding on its own to develop a system to satisfy intelligence and military customers.

Developing these advanced radar imaging systems has never been easy, but for more than four decades DOD and the Intelligence Community have found it worth the effort and expense—up to a point. ■

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*Jeffrey T. Richelson is a senior fellow with the National Security Archive and the author of* Defusing Armageddon: Inside NEST, America's Secret Nuclear Bomb Squad. *His most recent article for* Air Force *Magazine, "A Rifle in Space," appeared in the June 2003 issue.*

# Keeper File

# Airpower's Magna Carta

*In summer 1917, London was rocked by German bomber attacks. The World War I British Cabinet appointed a committee—Prime Minister David Lloyd George and Gen. Jan C. Smuts—to find solutions. Smuts' report came in two parts. The first focused on homeland defense. The second (excerpted here) called for an independent air force, saying air actions "may become the principal operations of war, to which older forms of military and naval operations may become secondary and subordinate." Smuts said maintaining both a Royal Navy Air Service and a Royal Flying Corps caused dysfunction, and that the nation should create "one unified air service" out of the two existing services. The Cabinet accepted his report and passed the Air Force (Constitution) Act, leading to the creation, in April 1918, of the Royal Air Force. The Smuts Report today is viewed as a Magna Carta of airpower—and not only in Britain.*

**"Air Organization and the Direction of Aerial Operations"**

Gen. Jan Smuts
London
Aug. 17, 1917

**Find the full text on**
***Air Force* Magazine's Web site**
**www.airforce-magazine.com**
**"The Keeper File"**

We proceed to deal in this report with ... the air organization generally and the direction of air operations. For the considerations which will appear in the course of this report, we consider the early settlement of this matter of vital importance to the successful prosecution of the war. The three most important questions which press for an early answer are:

- Shall there be instituted a real air ministry responsible for all air organization and operations?
- Shall there be constituted a unified air service embracing both the present RNAS and RFC? And if this second question is answered in the affirmative, the third question arises:
- How shall the relations of the new air service to the Navy and the Army be determined so that the functions at present discharged for them by the RNAS and RFC respectively shall continue to be efficiently performed by the new air service? ...

Under the present constitution and powers of the air board, the real directors of war policy are the Navy and Army, and to the air board is really allotted the minor role of fulfilling their requirements according to their ideas of war policy. Essentially the air service is as subordinated to military and naval direction and conceptions of policy as the artillery is, and, as long as that state of affairs lasts, it is useless for the air board to embark on a policy of its own, which it could neither originate nor execute under present conditions.

The time is, however, rapidly approaching, when that subordination of the air board and the air service could no longer be justified. Essentially the position of an air service is quite different from that of the artillery arm. ... It [artillery] is a weapon, an instrument ancillary to a service, but could not be an independent service itself. The air service on the contrary can be used as an independent means of air operations. Nobody that witnessed the attack on London on 11th July could have any doubt on that point.

Unlike artillery, an air fleet can conduct extensive operations far from, and independently of, both Army and Navy. As far as can at present be foreseen, there is absolutely no limit to the scale of its future independent war use. And the day may not be far off when aerial operations with their devastation of enemy lands and destruction of industrial and populous centers on a vast scale may become the principal operations of war, to which the older forms of military and naval operations may become secondary and subordinate. ...

We must not only make unlimited use of mechanical genius and productive capacity of ourselves and our American allies. We must create the new directing organization—the new ministry and air staff which could properly handle this new instrument of offense, and equip it with the best brains at our disposal for the purpose. The task of planning the new air service organization and thinking out and preparing for schemes of aerial operations next summer must tax our experts to the utmost, and no time should be lost in setting the new ministry and staff going. Unless this is done, we shall not only lose the great advantages which the new form of warfare promises, but we shall end in chaos and confusion, as neither the Army nor Navy nor the air board in its present form could possibly cope with the vast developments involved in our new aircraft program.

Hitherto the creation of an air ministry and an air service has been looked upon as an idea to be kept in view but not realized during this war. Events have, however, moved so rapidly ... that the change will brook no further delay and will have to be carried through as soon as all the necessary arrangements for the purpose can be made.

There remains the question of the new air service and the absorption on the RNAS and RFC into it. Should the Navy and the Army retain their own special air service in addition to the air forces which will be controlled by the air ministry? This will make the confusion hopeless and render the solution of the air problem impossible. The maintenance of three air services is out of the question. ...

The proper and, indeed, only possible arrangement is to establish one unified air service, which will absorb both the existing services under arrangements which will fully safeguard the efficiency and secure the closest intimacy between the Army and the Navy and the portions of the air service allotted or seconded to them. ...

It is important for the winning of the war that we should not only secure air predominance, but secure it on a very large scale; and having secured it in this war we should make every effort and sacrifice to maintain it for the future. Air supremacy may in the long run become as important a factor in the defense of the empire as sea supremacy. ■

AIR FORCE ASSOCIATION'S 25TH ANNUAL

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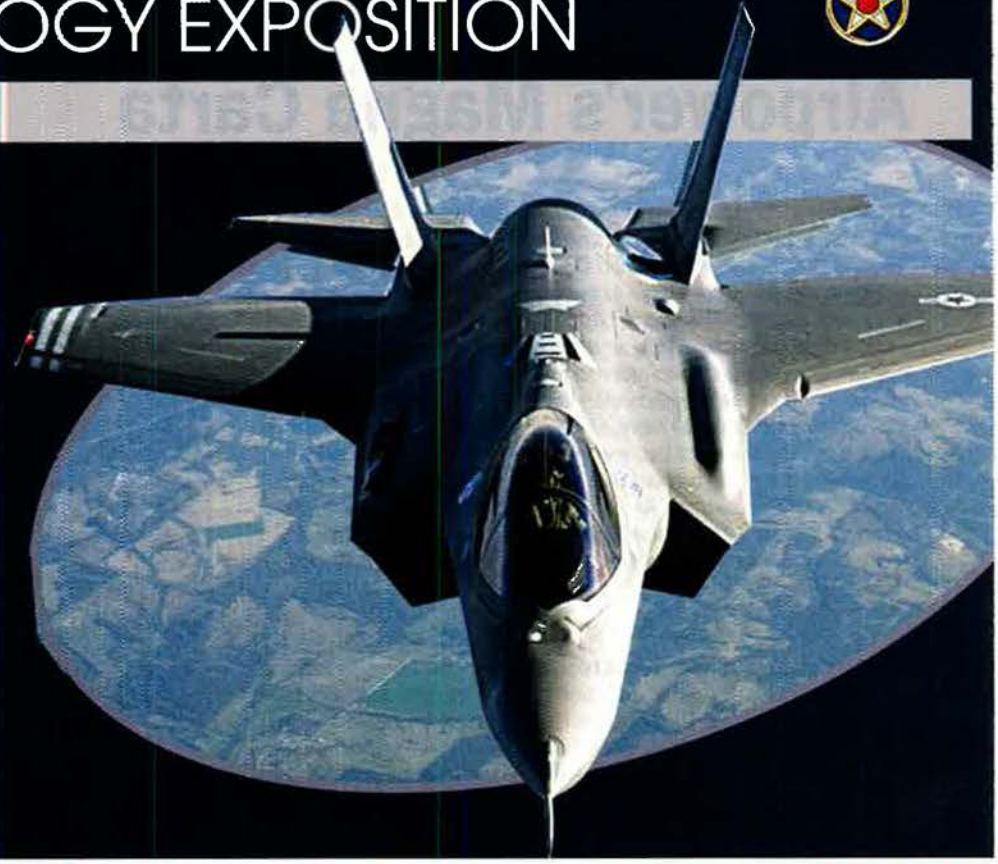

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# AFA National Report

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**By Frances McKenney,** Assistant Managing Editor

### Air Force Ball in Los Angeles

Brig. Gen. Susan J. Helms received the prestigious Gen. Thomas D. White Space Award at the Los Angeles Air Force Ball, hosted by the **Gen. B. A. Schriever Los Angeles Chapter** at the Beverly Hilton Hotel in November.

The ball, organized with the aid of the **General Doolittle Los Angeles Area Chapter** and the **Orange County/Gen. Curtis E. LeMay Chapter,** was held in conjunction with the Air Force Association's Global Warfare Symposium.

The award recognized Helms—who in 1993 became the first US military woman in space—as an outstanding contributor to the nation's progress in space. Helms in November was commander of the 45th Space Wing at Patrick AFB, Fla., and had been selected for assignment as US Strategic Command director of plans and policy.

Master of ceremonies Patrick Coulter, a Raytheon vice president, told the audience that Helms had directed space launches with a 100 percent success rate, placing "14 missions on target, including numerous shuttle flights and Department of Defense satellites." He said that under her leadership, a list of firsts took place, including launch of the Wideband Global satellite.

USAF photo by Lou Hernandez

*At the Los Angeles Ball, Brig. Gen. Susan Helms receives the space award named for a former USAF Chief of Staff, Gen. Thomas White. Presenting it are (l-r) Brian Arnold, Schriever Chapter board chairman; Lt. Gen. John Sheridan, commander of the Space and Missile Systems Center; and AFA Board Chairman Joe Sutter.*

### More Awards at LA

Also at the Los Angeles Ball, Brig. Gen. Susan K. Mashiko, vice commander of the Space and Missile Systems Center at Los Angeles Air Force Base, was named a Bernard A. Schriever Fellow. Mashiko received the honor in recognition of a 28-year career that has included directing the Evolved Expendable Launch Vehicle system program, serving as vice commander of the Air Armament Center, and more recently, commanding the Military Satellite Communications Systems Wing.

S. Sanford Schlitt, AFA vice chairman of the board for aerospace education, joined Far West Region President Wayne R. Kauffman and Schriever Chapter President Pam A. Levine in making the presentation to Mashiko.

Proceeds from the Los Angeles Air Force Ball help promote aerospace education through the chapter's Schriever Education Foundation. In 2008, the organization distributed some $34,000 for AFROTC units and USAF personnel, said Ronald D. Sugar, the general chairman of the ball. Sugar, who is Northrop Grumman's chairman and chief executive officer, told the audience that the chapter sponsors 84 Visions of Exploration classrooms. Visions is an educational program of AFA and *USA Today* newspaper to encourage the study of science, technology, engineering, and math.

### Alamo's Combat Breakfast

An Air Force explosive ordnance disposal technician recovering from wounds sustained in Iraq was among the honored guests at the **Alamo Chapter's** Combat Breakfast at Randolph AFB, Tex.

SSgt. Christopher Slaydon and 21 other wounded warriors attended the annual gathering held at the Enlisted Club on Nov. 3. Slaydon lost his sight and his left arm in October 2007 when an IED exploded as he cleared a convoy route in Kirkuk. At the time, he was on a joint mission with the US Army's 10th Mountain Division. He had been assigned to the 56th Civil Engineer Squadron, Luke AFB, Ariz., and was on his third deployment to Iraq. Slaydon and the other injured vets at the chapter breakfast are recovering at Brooke Army Medical Center at Ft. Sam Houston.

According to Air Force Print News, 300 guests attended the Combat Breakfast, which was part of San Antonio's annual weeklong series of events to salute the US military.

Alamo Chapter President Gary L. Copsey commented that the breakfast highlighted the "commitment and willingness of Americans to sacrifice for the nation."

### First Expeditionary Air Force

Shortly after Maj. Gen. Stephen T. Sargeant became commander of the Air Force Operational Test and Evaluation Center at Kirtland AFB, N.M., in July 2007, the president of the **Albuquerque Chapter** paid him a courtesy call.

Frederick J. Harsany said that during this visit, Sargeant suggested the chapter hold joint meetings with similar organizations and later offered even more direct help: Last summer, the two-star was guest speaker at an AFA-hosted joint luncheon with the local Military Coalition. More recently, Sargeant's

father-in-law, James R. Greenwood, was guest speaker for the chapter-hosted September meeting.

A retired Gates Learjet public relations executive and author of several books, Greenwood spoke about the first expeditionary operation by America's airmen: the March 1916 Punitive Expedition into Mexico. Triggered by Mexican guerrilla Pancho Villa's attack on Columbus, N.M., a week earlier, the expedition was led by Brig. Gen. John J. "Black Jack" Pershing. The 1st Aero Squadron—commanded by Capt. Benjamin D. Foulois—carried out aerial reconnaissance, photography, and courier missions for the operation.

Harsany said nearly 40 people attended the meeting, several of them members of an aviation history group. As a result, it was a knowledgeable audience that asked Greenwood follow-up questions. Harsany said they asked: How effective were the squadron's eight Jennys? How did the expedition handle the logistics of resupply? What lessons learned from this first "tactical air unit" were later applied to World War I operations?

Harsany videotaped the 45-minute presentation to add to the collection of the Albuquerque Aviation History Group.


***The Prescott/Goldwater Chapter's entry in a Veterans Day parade was a 1933 Buick. Embry-Riddle Aeronautical University cadet Steven Hamman, who is also a chapter member, rides in the rumble seat.***

**Jumbo Jubilee**

A medal ceremony organized last summer by the **Long Island Chapter** garnered so much publicity that a similar award presentation this fall brought forth three times as many recipients.

In October, the chapter's 19th Jubilee of Liberty medal ceremony honored more than a score of veterans from the World War II Normandy invasion. They received their honors from three of New York state's members of Congress: Rep. Tim Bishop (D), Rep. Steve J. Israel (D), and Rep. Carolyn McCarthy (D).

The Regional Council of Normandy, France, originally minted the Jubilee of Liberty Medal in 1994, for a 50th anniversary commemoration of the June 6, 1944 landing. Later, the French government asked that the medal be presented to US veterans of the Normandy landing who didn't attend the anniversary ceremony.

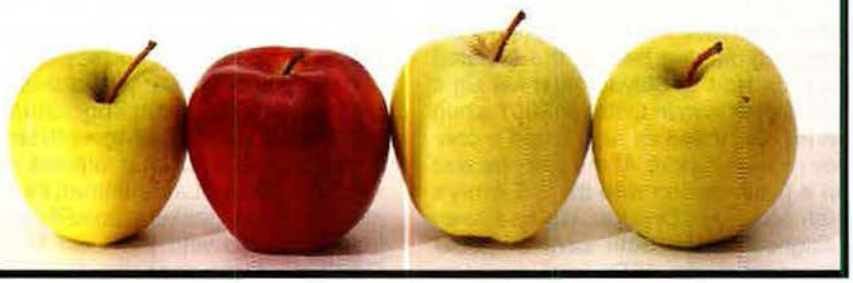
In the years since then, the Long Island Chapter has recognized several hundred Normandy vets. Last June's ceremony involved seven soldiers, who received honors from Bishop and news coverage from a local newspaper and cable TV station. As a result, reported Chapter Treasurer Fred DiFabio, 21 veterans stepped forward with documentation of their part in the Normandy campaign.

DiFabio said 250 guests turned out for the October presentations, held at the American Legion Post in Babylon, N.Y. The ceremony included the presentation of the colors by a local Civil Air Patrol squadron, remarks from the three Congressional representatives, and music by a choral music group from Long Island.

**More Chapter News**

■ With former USAF Chief of Staff Gen. Ronald R. Fogleman as guest speaker, an Air Force memorial was dedicated on Veterans Day at the New Hampshire State Veterans Cemetery in Boscawen, N.H. The **Brig. Gen.**





**Harrison R. Thyng Chapter** in New Hampshire had joined with two other associations to raise $150,000 for the memorial, a small-scale replica of the Air Force Memorial located near the Pentagon. New Hampshire's memorial features shorter versions of the three stainless steel spires; the tallest is 26 feet versus the original's 270-foot spire. Granite monoliths at the New Hampshire memorial are engraved with descriptions of the state's contributions to Air Force history. Just one example: Congressional Medal of Honor recipient Capt. Harl Pease Jr. and seven World War II and Korean War aces came from the Granite State.

■ In a Veterans Day ceremony at the Ocala/Marion County Veterans Memorial Park in Ocala, Fla., a Marine Corps color guard posted the colors, and local warbird aircraft flew overhead. Students and JROTC units from several high schools presented music and a parade of colors, and an honor guard from the sheriff's office rendered a 21-gun salute. Fifteen **Red Tail Memorial Chapter** members manned a display at the park, attracting attention from visitors. Chapter President Michael H. Emig said a dozen people were recruited as members, as well as two Community Partners.

■ A committee that included **Carl Vinson Memorial Chapter** representatives





worked for more than 12 years to raise funds for a POW/MIA memorial that was dedicated in October at the Museum of Aviation in Warner Robins, Ga. Retired Brig. Gen. James E. Sehorn was guest speaker for the ceremony. Sehorn was a POW in North Vietnam for more than five years, after having been shot down on his seventh mission. An audience of about 500 people attended the dedication of the 11-foot-tall six-sided granite memorial.

■ A retired German Air Force WSO was guest speaker for the November meeting of the **Columbus-Bakalar Chapter** in Columbus, Ind. Martin Baier, who retired as a lieutenant colonel in 2005, described his career as a weapons systems officer and his reconnaissance missions over Yugoslavia. He was stationed at Holloman AFB, N.M., from 1999 to 2002 as a liaison to USAF. In his remarks to the chapter, he described the German Air Force presence at USAF and US Navy installations. Today Baier lives in Indianapolis and is a consultant, reported Chapter Secretary John B. Pavone.

■ In Arizona, the **Prescott/Goldwater Chapter** took part in Prescott's annual Veterans Day Parade that this year drew 3,000 spectators, according to news accounts. The parade began at the Bob Stump Veterans Affairs Medical Center, where Chapter President Thomas Rowney prepared the chapter's entry: He tied AFA banners to the sides of a fire-engine-red 1933 Buick. Embry Riddle Aeronautical University cadets—and chapter members—Matthew Rhodes and Steven Hamman rode in the rumble seat of this ragtop coupe. Chapter VP James Turner, Chapter Secretary Adolphus Bledsoe Jr., and chapter members Paul Feirick and Gary Swigart escorted medical center patients, so they could watch the huge parade of some 60 floats and entries.

*The Genesee Valley Chapter had a good turnout for its Veterans Recognition Night in Rochester, N.Y. Among those in the front row are (l-r) Army veterans Mario Fabi and Henry Cudzilo and chapter member Thomas Callon, a Korean War veteran.*

■ **The Genesee Valley Chapter (N.Y.)** helped carry out a 22nd annual Veterans Recognition Night in Rochester in November. Chapter President Alfred E. Smith coordinated the event, held at Henry Wadsworth Longfellow Elementary School. The audience also included local representatives from organizations such as the Pearl Harbor Survivors Association and Jewish War Veterans. ■

**More photos at http://www.airforce-magazine.com, in "AFA National Report"**

*Maj. Gen. Stephen Sargeant (left), commander of the Air Force Operational Test and Evaluation Center, suggested author James Greenwood (center) as guest speaker for the Albuquerque Chapter. John Toohey, at right, is New Mexico state president.*

## Reunions

reunions@afa.org

**319th FIS.** May 7-9 in Nashville, IN. **Contact:** Jerry Henry, 2823 23rd St., Columbus, IN 47201 (812-314-0813) (retiredjerry@sbcglobal.net).

**444th FIS.** April 14-16 at the Sheraton North Charleston Hotel, Charleston, SC. **Contact:** Wallace Mitchell, 535 Mimosa Rd., Sumter, SC 29150 (803-469-3297).

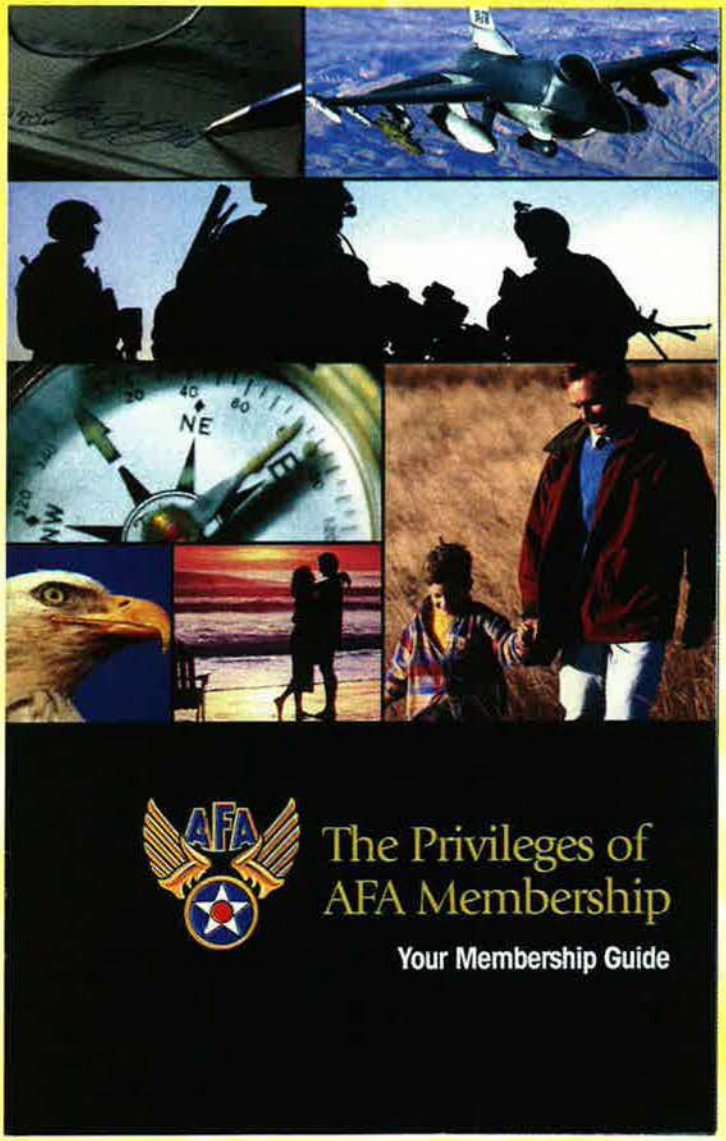
**494th BG** (WWII). June 18-22 at the Grand Plaza Hotel in Branson, MO. **Contacts:** Marshall Keller, 7412A Vassar Dr. East, West Bloomfield, MI 48322 (phone or fax: 248-626-3684) or Jerry Lindley, 780 Alexander Rd., Stephenville, TX 76401 (254-965-5990).

**Pilot Tng Class 54-G.** April 15-19, in Phoenix. **Contact:** John Schaefer (623-561-5000) (johntomoko3@cox.net). ■

E-mail unit reunion notices four months ahead of the event to reunions@afa.org, or mail notices to "Unit Reunions," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information. We reserve the right to condense notices.

**SPOTLIGHT ON . . .**

# "YOUR AFA MEMBERSHIP PRIVILEGES"

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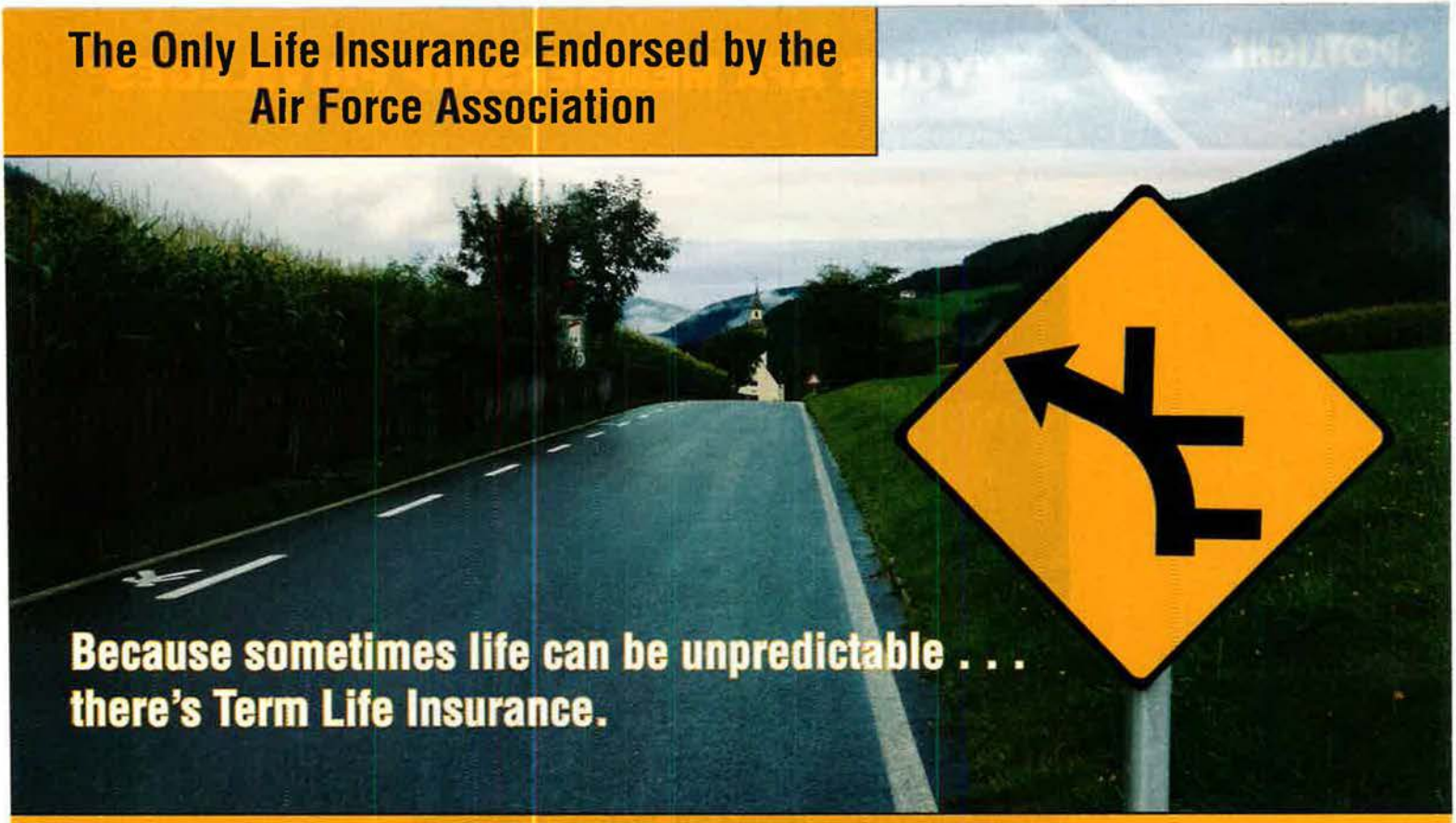


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# AFA Field Contacts

## Central East Region

### Region President

**Mason Botts**
10002 Rough Run Ct., Fairfax Station, VA 22039-2959 (703) 395-0885

### State Contact

**DELAWARE:** Richard B. Bundy, 39 Pin Oak Dr., Dover, DE 19904-2375 (302) 730-1459.
**DISTRICT OF COLUMBIA:** Kip Hansen, 251 18th St., Suite 1100, Arlington, VA 22202-3545 (703) 416-8000.
**MARYLAND:** Robert Roit, P.O. Box 263, Poolesville, MD 20837-0263 (301) 349-2262.
**VIRGINIA:** Jeff Platte, 109 Colonels Way, Williamsburg, VA 23185-5130 (757) 827-4729.
**WEST VIRGINIA:** John R. Pfalzgraf, 1906 Foley Ave., Parkersburg, WV 26104-2110 (304) 485-4105.

## Far West Region

### Region President

**Wayne R. Kauffman**
3601 N. Aviation Blvd., Ste. 3300, Manhattan Beach, CA 90266-3753 (310) 643-9303

### State Contact

**CALIFORNIA:** Martin Ledwitz, 8609 E. Worthington Dr., San Gabriel, CA 91775-2646 (626) 302-9538.
**HAWAII:** Jean Fontenot, 144 21st St., Honolulu, HI 96818-4621 (808) 449-3943.

## Florida Region

### Region President

**John T. Brock**
622 West Palm Valley Dr., Oviedo, FL 32765-9215 (321) 383-2906

### State Contact

**FLORIDA:** John T. Brock, 622 West Palm Valley Dr., Oviedo, FL 32765-9215 (321) 383-2906.

## Great Lakes Region

### Region President

**Ronald E. Thompson**
2569 Indian Wells Trail, Xenia, OH 45385-9373 (937) 376-3068

### State Contact

**INDIANA:** William Grider, 4660 Wexmoor Dr., Kokomo, IN 46902-9597 (765) 455-1971.
**KENTUCKY:** Jonathan G. Rosa, 1101 Grade Ln., Louisville, KY 40219-2678 (502) 413-4773.
**MICHIGAN:** Bruce Medaugh, 317 Garfield Ave., Battle Creek, MI 49017-3752 (269) 969-3447.
**OHIO:** John McCance, 2406 Hillsdale Dr., Beavercreek, OH 45431-5671 (937) 429-4272.

## Midwest Region

### Region President

**Frank J. Gustine**
998 Northwood Dr., Galesburg, IL 61401-8471 (309) 343-7349

### State Contact

**ILLINOIS:** Jesse Wayland, 2116 58th St., Monmouth, IL 61462-8530 (309) 734-3230.
**IOWA:** Chuck McDonald, 905 58th St., West Des Moines, IA 50266-6308 (515) 964-1398.
**KANSAS:** Gregg Moser, 617 W 5th St., Holton, KS 66436-1406 (785) 364-2446.
**MISSOURI:** Patricia J. Snyder, 14611 Eby St., Overland Park, KS 66221-2214 (913) 685-3592.
**NEBRASKA:** Michael Cook, 3204 Rahn Blvd., Bellevue, NE 68123-2640 (402) 232-8044.

## New England Region

### Region President

**Ronald Adams**
5A Old Colony Dr., Westford, MA 01886-1074 (781) 861-4703

### State Contact

**CONNECTICUT:** Daniel R. Scace, 38 Walnut Hill Rd., East Lyme, CT 06333-1023 (860) 443-0640.
**MAINE:** Ronald Adams, 5A Old Colony Dr., Westford, MA 01886-1074 (781) 262-5403.
**MASSACHUSETTS:** John Hasson, 23 Leland Dr., Northborough, MA 01532-1958 (603) 884-3063.
**NEW HAMPSHIRE:** Kevin Grady, 140 Hackett Hill Rd., Hooksett, NH 03106-2524 (603) 268-0942.
**RHODE ISLAND:** Bob Wilkinson, 85 Washington St., Plainville, MA 02762-2127 (508) 243-5211.
**VERMONT:** Gregory A. Fick, 789 Vermont National Guard Rd., Colchester, VT 05446-3099 (802) 338-3179.

## North Central Region

### Region President

**Ronald W. Mielke**
4833 Sunflower Trail, Sioux Falls, SD 57108-2877 (605) 335-8448

### State Contact

**MINNESOTA:** Glenn Shull, 7098 Red Cedar Cove, Excelsior, MN 55331-7796 (952) 831-5235.
**MONTANA:** Matthew C. Leardini, P.O. Box 424, Ulm, MT 59485-0424 (406) 781-4917.
**NORTH DAKOTA:** James Simons, 1712 13th St., NW, Minot, ND 58701 (701) 839-6669.
**SOUTH DAKOTA:** Richard Gustaf, 25741 Packard Ln., Renner, SD 57055-6521 (605) 336-1160.
**WISCONSIN:** Victor Johnson, 6535 Northwestern Ave., Racine, WI 54306-1343 (262) 886-9077.

## Northeast Region

### Region President

**Robert W. Nunamann**
73 Phillips Rd., Branchville, NJ 07826-4123 (973) 948-3711

### State Contact

**NEW JERSEY:** Norman Mathews, 193 Taft Ave., Hamilton, NJ 08610-1913 (609) 838-0354.
**NEW YORK:** Alphonse Parise, 33 Fox Blvd., Massapequa, NY 11758-7248 (516) 798-2587.
**PENNSYLVANIA:** Bob Rutledge, 2131 Sunshine Ave., Johnstown, PA 15905-1615 (724) 235-4609.

## Northwest Region

### Region President

**I. Fred Rosenfelder**
15715 SE 171st Pl., Renton, WA 98058-8659 (206) 662-7752

### State Contact

**ALASKA:** Butch Stein, P.O. Box 81688, Fairbanks, AK 99708-1688 (907) 388-6049.
**IDAHO:** Roger Fogleman, P.O. Box 1213, Mountain Home, ID 83647 (208) 599-4013.
**OREGON:** Mary J. Mayer, 2520 NE 58th Ave., Portland, OR 97213-4004 (310) 897-1902.
**WASHINGTON:** Rick Sine, 5743 Old Woods Ln., Bainbridge Island, WA 98110-2031 (206) 855-1300.

## Rocky Mountain Region

### Region President

**Joan Sell**
10252 Antler Creek Dr., Falcon, CO 80831 (719) 540-2335

### State Contact

**COLORADO:** Gayle White, 905 Shadow Mountain Dr., Monument, CO 80132-8828 (719) 574-0200.
**UTAH:** Kit Workman, 2067 W 470 N, West Point, UT 84015-8194 (801) 402-8200.
**WYOMING:** Irene Johnigan, 503 Notre Dame Ct., Cheyenne, WY 82009-2608 (307) 632-9465.

## South Central Region

### Region President

**Mark J. Dierlam**
7737 Lakeridge Lp., Montgomery, AL 36117-7423 (334) 271-2849

### State Contact

**ALABAMA:** Thomas Gwaltney, 401 Wiltshire Dr., Montgomery, AL 36117-6070 (334) 277-0671.
**ARKANSAS:** Jerry Reichenbach, 501 Brewer St., Jacksonville, AR 72076-4172 (501) 982-9077.
**LOUISIANA:** Paul LaFlame, 5412 Sage Dr., Bossier City, LA 71112-4931 (318) 742-4626.
**MISSISSIPPI:** Roy Gibbens, 5220 16th Ave., Meridian, MS 39305-1655 (601) 482-4412.
**TENNESSEE:** Alfred M. Coffman, 1602 Staffwood Rd., Knoxville, TN 37922-4285 (865) 693-5744.

## Southeast Region

### Region President

**Don Michels**
1000 Elmhurst Ct., Lawrenceville, GA 30043-2655 (770) 513-0612

### State Contact

**GEORGIA:** Will Newson, 460 Copper Creek Cir., Pooler, GA 31322-4013 (912) 220-9515.
**NORTH CAROLINA:** David Klinkicht, 514 Shelley Dr., Goldsboro, NC 27534-3252 (919) 751-2890.
**SOUTH CAROLINA:** Rodgers K. Greenawalt, 2420 Clematis Trail, Sumter, SC 29150-2312 (803) 469-4945.

## Southwest Region

### Region President

**James I. Wheeler**
5069 E. North Regency Cir., Tucson, AZ 85711-3000 (520) 790-5899

### State Contact

**ARIZONA:** Harry Bailey, 5126 W. Las Palmaritas Dr., Glendale, AZ 85302-6218 (623) 846-7483.
**NEVADA:** Matthew Black, 3612 Fledgling Dr., North Las Vegas, NV 89084-2482 (702) 395-3936.
**NEW MEXICO:** John Toohey, 1521 Soplo Rd., SE, Albuquerque, NM 87123-4424 (505) 294-4129.

## Texoma Region

### Region President

**Terry Cox**
1118 Briar Creek Rd., Enid, OK 73703-2835 (580) 234-8724

### State Contact

**OKLAHOMA:** James Jacobs, P.O. Box 6101, Enid, OK 73702-6101 (580) 541-5150.
**TEXAS:** Dave Dietsch, 4708 El Salvador Ct., Arlington, TX 76017-2621 (817) 475-7280.

## Special Assistant Europe

### Special Assistant

**Vacant**

## Special Assistant Pacific

### Special Assistant

**Gary L. McClain**
Komazawa Garden House D-3091-2-33 Komazawa Setagaya-ku, Tokyo 154-0012, Japan 81-3-3405-1512

**For information on the Air Force Association, see www.afa.org**

# Airpower Classics

**Artwork by Zaur Eylanbekov**

# PBY Catalina

The US Navy PBY Catalina was by far the most-produced and most-important flying boat or seaplane in history. It provided stellar service throughout World War II in many roles, flying in all US armed services and in the fleets of many nations. USAAF's version was known as the OA-10A. Consolidated Aircraft Co. designers gave it a rugged structure and a high-wing configuration that allowed it to operate in rough seas. The PBY-5A amphibian, introduced in 1939, was even more versatile than its predecessors.

The PB in the acronym PBY denoted "patrol bomber," while the final letter, Y, signified its builder, Consolidated, in naval parlance. The Catalina was all metal, except for a few fabric-covered areas, and so was far cleaner in design than previous Navy patrol airplanes. It had a semicantilever, strut-braced, pylon-mounted wing, and retractable wing-tip floats. Amazingly successful in its original roles as a long-range patrol bomber, the Catalina also excelled in anti-submarine warfare, air-sea rescue, landing assault forces, mine-laying, reconnaissance, convoy escort, and transport work.

The Catalina's long range brought it into prominence in many historic actions, including the sighting of the German battleship *Bismarck,* the sighting of the Imperial Japanese fleet in 1942 at Midway, its torpedo attacks against that fleet, and suppression of German U-boats with constant surveillance and attack. The Cat's most highly regarded achievements were its "Dumbo" air-sea rescue efforts, when it would descend to the sea to scoop up downed airmen, even under intense hostile fire.

*—Walter J. Boyne*

**This aircraft:** United States Navy PBY-5A Catalina—*Bureau No. 48318*—as it looked in late 1944 when assigned to VPB-63 in Port Lyautey, French Morocco.

*The ocean was its landing strip.*

### In Brief

Designed by Consolidated ★ built by Consolidated, Boeing, Canadian-Vickers, others ★ first flight May 19, 1936 ★ crew of eight ★ two Pratt & Whitney R-1830 engines ★ number built 4,051 ★ **Specific to PBY-5A:** max speed 179 mph ★ cruise speed 125 mph ★ max range 2,545 mi ★ armament, three .30 cal machine guns, two .50 cal machine guns ★ max load, 4,000 lb of bombs, depth charges, mines, torpedoes ★ weight (max) 35,300 lb ★ span 104 ft ★ length 63 ft 10 in ★ height 20 ft 2 in.

### Famous Fliers

**Medal of Honor:** Nathan Gordon. **Victoria Cross:** John Cruickshank (RAF), David Hornell (RCAF). **Notables:** Knefler McGinnis, Leonard B. Smith, Howard Ady, Thomas Moorer, L. J. Birchall, Adrian Marks, Jacques Cousteau, Philippe Cousteau.

### Interesting Facts

Built in at least 25 variants ★ served in some 30 air forces ★ used engine exhaust as de-icing mechanism—a first ★ named by the RAF ★ mounted first US air action of World War II (helping attack a Japanese midget sub at Pearl Harbor) ★ flew first round-the-world flight by seaplane ★ nicknamed Cat, Black Cat, Canso, Nomad, Pig Boat, P-Boat.

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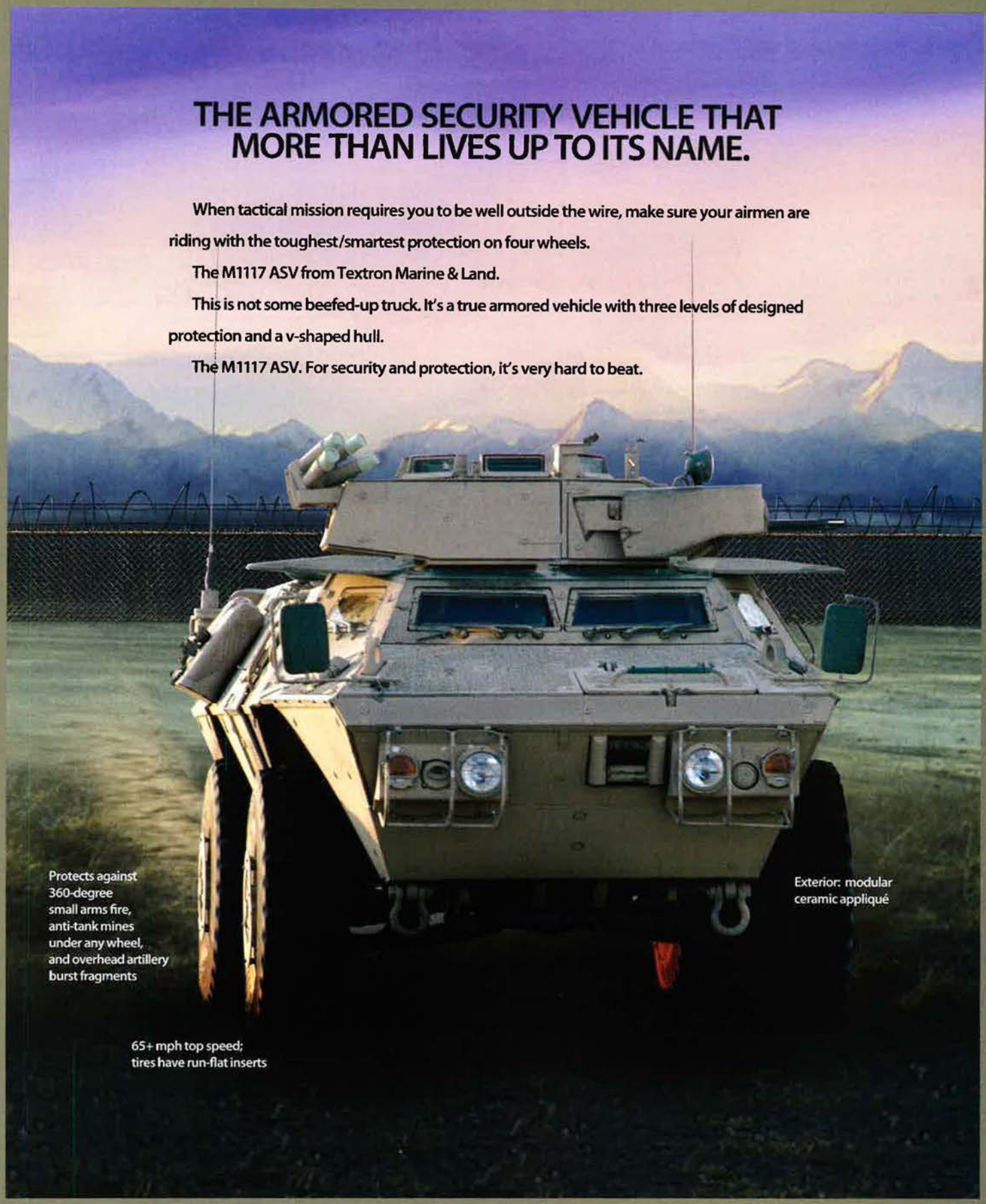
The M1117 ASV from Textron Marine & Land.

This is not some beefed-up truck. It's a true armored vehicle with three levels of designed protection and a v-shaped hull.

The M1117 ASV. For security and protection, it's very hard to beat.



Protects against 360-degree small arms fire, anti-tank mines under any wheel, and overhead artillery burst fragments

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Exterior: modular ceramic appliqué

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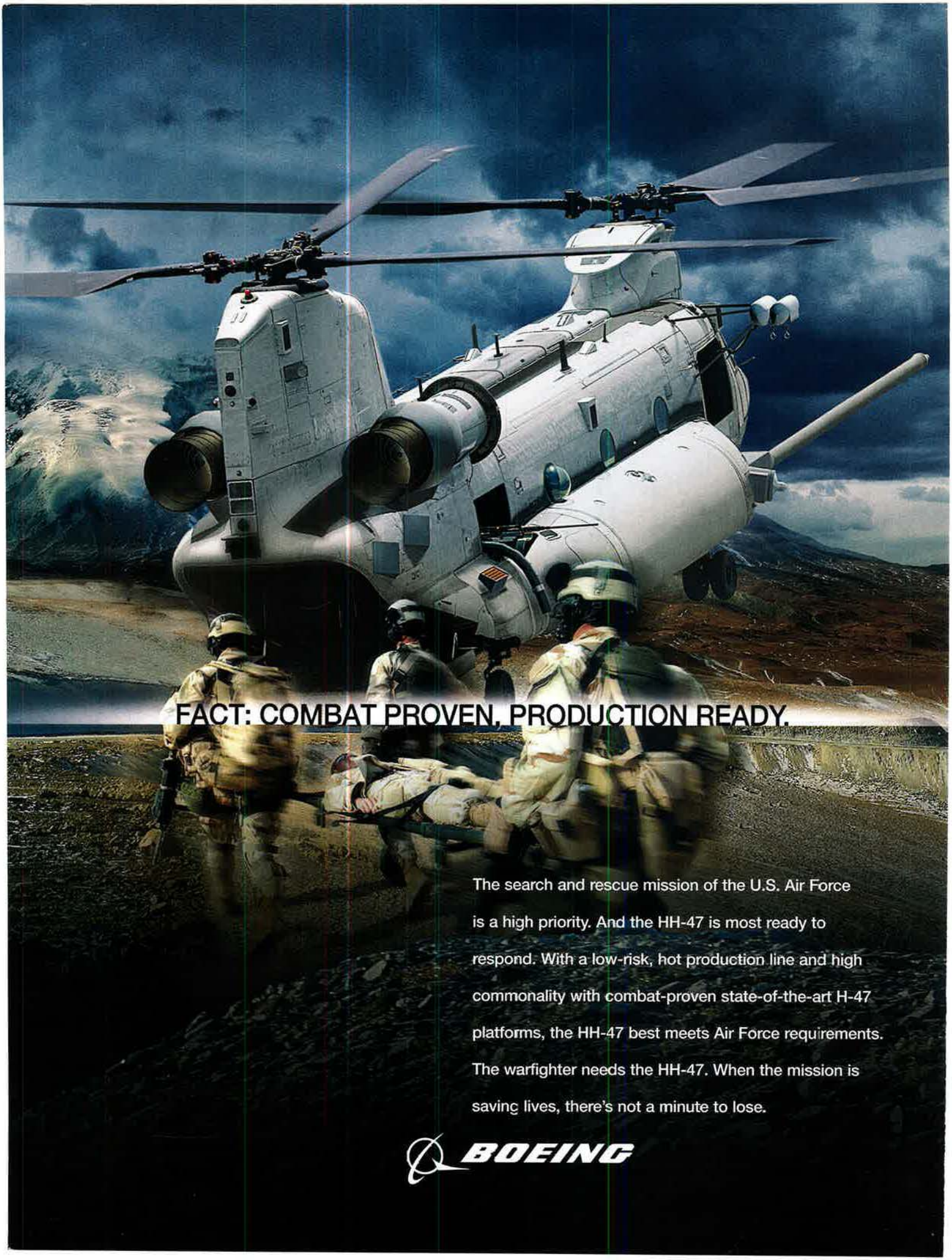
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