October 2008/$4

# AIR FORCE

JOURNAL OF THE AIR FORCE ASSOCIATION MAGAZINE

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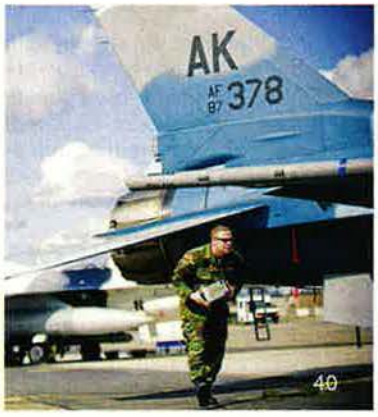
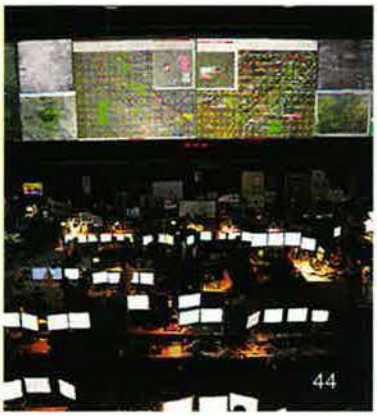
October 2008, Vol. 91, No. 10

# AIR FORCE MAGAZINE

JOURNAL OF THE AIR FORCE ASSOCIATION



**About the cover:** A C-17A Globemaster III. Photo by Greg L. Davis. See "Airlift on Thin Ice," p. 32.



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# Editorial

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

# Improvisation Won't Do It

In recent decades, the US military hasn't had many large, classical force-on-force clashes. American power frequently has been employed against specific target sets to produce a certain and preplanned effect, not to deal death and destruction.

These "effects-based operations" have attempted to combine military might with other forms of US power—economic, political, diplomatic—to push enemy behavior to desired end states. Up-front planning needs were huge. Still, many believe EBO now has been proved from the Gulf to the Balkans and Afghanistan.

That view, however, has never cut much ice with land power advocates, who seem to regard EBO as, among other things, some kind of airpower cult. Retired USMC Lt. Gen. Paul K. Van Riper, speaking to *Inside the Pentagon,* described it as "utter nonsense."

Recently, Marine Corps Gen. James N. Mattis, head of US Joint Forces Command, slammed EBO as being too complex and vague. He wants the military to return to "time-honored principles and terminology ... tested in the crucible of battle and ... well-grounded in the theory and nature of war," as he put it in an Aug. 14 memo.

Mattis, a well-regarded infantry officer, penned his memo with the specific goal of banishing EBO from joint affairs. As he said in a companion paper, "Effective immediately, USJFCOM will no longer use, sponsor, or export" any EBO terms or concepts.

He claims EBO assumes unachievable predictability and requires unattainable knowledge. As he observed in an earlier speech, "I will sum up in three words what I have learned about fighting over the last 30 years: improvise, improvise, improvise.'

For USAF, this is a big deal. EBO-type thinking entered joint doctrine a few years ago and has supporters in all services. Even so, it was USAF's brainchild and is a good fit with airpower's attributes of speed, range, precision, and flexibility. Failure to continue EBO doctrine development could inhibit full USAF contributions to the joint force.

How do airmen respond to the Mattis action? The first thing to be said is that, to them, the effects-based approach to war no longer is a mere "theory," as the critics often claim.

They note that the power of EBO was demonstrated in at least three US operations—Desert Storm in 1991, Allied Force in 1999, and the opening phase of Enduring Freedom in 2001.

In the Gulf War, for example, attacks on the electricity grid produced the "effect" of shutting down the Iraqi air defenses but took far less time and effort than destroying each radar, SAM battery, and anti-aircraft gun. In the Air War Over Serbia, preplanned strikes at high-value targets forced the Belgrade regime to capitulate.

**If land power advocates have their way, this will be the end of "effects-based operations."**

The effects-based approach, airmen maintain, dovetails with the American way of war—reducing risk to our forces while maximizing the risk to the enemy's. In the Gulf, they say, the decimation of Iraq's forces from the air likely saved the lives of thousands of soldiers and marines.

Airmen believe use of an effects-based approach in Iraq could have helped prevent a debacle by identifying the desired outcome up front and forcing the system to contemplate the resources needed. The commander, Army Gen. Tommy Franks, planned only for the major combat phase, failing to take up the possibility of a bloody aftermath.

It is interesting, say airmen, that the concept has seeped down to the lowest level of ground units in Iraq and Afghanistan where young officers embrace it. They say it helps them focus on goals and make wise decisions in a confusing war.

According to airmen, Mattis' guidance ignores strategic art. It seeks to make "commander's intent" the touchstone of efforts to design, plan, and execute an operation, leading to a tactical result. The EBO method, based on extensive sources of information and analysis, is superior, they add.

"General Mattis would apparently prefer to form his 'commander's intent' in the same strategic vacuum still plaguing our efforts in Iraq," noted retired USAF Maj. Gen. Charles D. Link, a keen observer of joint matters, in a recent response.

Land force critics plainly have a hard time understanding the concept. (In Mattis' paper, variations of the word "confusion" appear nine times.) This appears especially true in maneuver forces—infantry and armor units that aspire to "close with and destroy the enemy force" in close combat. USAF Lt. Gen. David A. Deptula, a key architect, argues EBO is a "fairly simple" thing. He concedes, however, that some have distorted it and made it more complex than need be.

No one presents EBO as a magic-bullet solution for all US military challenges. Over all, the effects-based approach to war, say airmen, should be regarded as one of a number of approaches to campaign design. They point out that large-scale, "traditional" destruction of enemy forces would be an "effect" all its own.

Make no mistake, however: Mattis' words carry weight. His decisions will affect joint training, doctrine, and professional military education. One who expects it is Van Riper, who says "the debate is over, and effects-based operations or EBO is dead."

In an interview with *Inside the Pentagon,* retired Air Force Lt. Gen. Thomas G. McInerney predicted problems.

McInerney claimed that the policy shift will bring "numerous adverse consequences," one of which is an "attritional approach" to war that will "place many American military personnel, both short-term and long-term, at much greater risk."

We believe that, given the stakes and strong feelings involved, now would be a good time for Adm. Michael G. Mullen, the Chairman of the Joint Chiefs of Staff, to step in and suggest a widening of discussion. Indeed, an organization such as Joint Forces Command, rather than closing off debate, should be encouraging a wider variety of perspectives on how to enhance joint operations.

On such matters, no service or individual has a monopoly on wisdom. Improvisation does not exactly inspire confidence. A big question is whether all parties understand that. ■

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# Letters

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### Failure Is an Option

Regarding the editorial and letters in the August issue, I'm trying hard to keep the buzzwords straight, so let me see if I've gotten all this correct *["Editorial: Failure Is an Option," p. 2, and "Letters: Bad Medicine," p. 4]:* Secretary of Defense Robert M. Gates is hammering the services for having "next-war-itis." For years, generals have been criticized for planning based on the last war. Secretary Gates apparently wants to plan for only the one we're in now.

Does anyone see the idiocy of all three of these concepts? It is too late to "plan" for the war we're fighting now. We will fight it with the equipment we now have because of the way DOD buys weapons systems—anything not fielded today is unlikely to be delivered in less than 10 to 15 years. Up until early August, no one considered Russia a likely threat, because they were now "civilized" and were going to become good capitalists and enter NATO and the World Trade Organization. Oops. That was before Russia's attack on Georgia.

Are we such a shallow society that we are completely unable to realize that the next war might be against any country—irrespective of its GDP or "intent"? A number of wars in the past started by a chain of events that, had they developed only slightly differently, would certainly not have resulted in war. If history is any predictor, we must be ready to fight the next war, either against a large industrialized force such as China and Russia, or against a non-country-backed army of religious zealots, or a small localized country or group of countries that pull us into a fight.

If we don't plan—seriously plan—for all these possibilities, we will once again enter a war completely unprepared. That could be especially damaging if the "next" one results in a terrorist group using nuclear weapons against the continental US.

It is even likely that while we continue to fight the War on Terror for the next 100 years, we will also have to fight a few traditional wars with or without nuclear weapons.

Let's stop management by buzzwords and try rational thought instead.

Jim Vint
Nipomo, Calif.

The declining age and power of Air Force equipment, at a time when we have significant breakthroughs in aviation and ground-air technology, is incomprehensible. We are headed toward wasting new capabilities, and putting the United States into significant jeopardy.

Your [editorial] in the August issue of *Air Force* Magazine covered the subject clearly. However, I would like to add that the Secretary of Defense had better take his "next-war-itis" comment and look around. We are surrounded by nations big and small that would like to do us in. He should be able to see that our future for many years to come will depend on our military ability to make and win war. If that is "next-war-itis," then I hope we develop a strong case of it.

Each generation of Americans for

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the foreseeable (or maybe not foreseeable) future carries a threat of war. Whether we survive or not will depend on our ability to be ready year in and year out to wage whatever kind of war is needed. That means airpower must be continually at its best.

The Secretary of Defense can call it what he wants. I call it being deadly prudent in a troubled world. I sincerely doubt Secretary Gates' qualifications to be Secretary of Defense.

Maj. Gen. Jack K. Gamble,
USAF (Ret.)
Tacoma, Wash.

I enjoyed your [editorial] "Failure *Is* an Option." Yes, it would be hard for me as a former airman to think that we as a military service could ever fail, but indeed we have. In some ways you highlight success when others considered it somewhat of a failure and, in my mind, left out some historically most important air arm victories.

The first is the Vietnam War, Linebacker I. You correctly mention Linebacker II as a success in its overall strategy of getting the peace accords signed, but it did not come without significant failure. Indeed, I believe the real Air Force success was Linebacker I (flown several months before Linebacker II), where we achieved the unthinkable use of strategic air strikes into the heart of North Vietnam, and for the first time struck real targets with great might. Each mission had 18 B-52s loaded with up to 125 (500-pound) bombs apiece, hitting five key target areas in the North at different times, and we did not lose a single B-52 aircraft. (One was hit by a SAM-2 but returned out of Da Nang miraculously surviving the North Vietnam raids with a quick patch job on the blast damage.)

The Linebacker I successful strikes include Hanoi and Haiphong, and were calculated to bring the Communists back to the peace table and get on with the release of the POWs, which they did at first, but unfortunately they began to stall again, requiring Linebacker II. Linebacker II was an overall political success, but if you were in Strategic Air Command's shoes, [it was] a great air disaster when the seemingly invincible B-52s, using Cold War SAM tactics and EW systems, were compromised by all too many exploitable tactical air patterns and were defeated by our old enemy, using newly trained Soviet advisors updating their old SAM-2 tactics and finding a great vulnerability in our tactics, which they successfully exploited. The result was the seemingly impossible downing of some 13 B-52s and aircrew, the first loss of B-52s to enemy air defenses in the history of the command.

Lt. Col. Sid Howard,
USAF (Ret.)
Midwest City, Okla.

Regarding Robert S. Dudney's editorial "Failure *Is* an Option" on p. 2 of the August issue:

While Mr. Dudney makes some pertinent points in his article, he unfortunately undermines at least one of the bases of his historical arguments with inaccurate information. Under the heading "Lacking in

modern aircraft and weapons," he states: "Then there was USAAF in the first year of the Pacific War. For strike, it had mostly obsolete B-10 bombers. Tactical forces were based on old P-26 and P-35 fighters."

In fact, according to Wikipedia, "No US Army B-10B participated in any combat during World War II." The only extensive action seen by the B-10 was with the Netherlands East Indies Army Air Force. As to the P-26 and the P-35, both saw very limited service during the invasion of the Philippines, the former as part of the tiny Philippine Army Air Corps, not the USAAC. That was also the P-35's only combat action in American colors. Thus, all three of the admittedly obsolete types to which Mr. Dudney referred saw only minimal service very early in the war—two of them with foreign air forces.

So, what USAAF aircraft types did predominate in combat against the Japanese from December 1941 to December 1942? As for fighters, it was the Curtis P-40, supplemented by the equally obsolescent (but by no means obsolete) Bell P-39, both of which performed yeoman service until more modern types became available. (Before the end of that year, the much superior Lockheed P-38 had entered combat in the Pacific.) The main US Army Air Forces bombers to see action during the first year of the Pacific War were the B-17, the B-25, and the B-26, all of which, with continual technical improvements, remained effective front-line aircraft until the end of the war.

My point is that USAAF did not fight the Japanese primarily with "obsolete" aircraft types in 1942, and most of them were in fact remarkably successful, especially in the hands of well-trained and dedicated American pilots and aircrews.

Steve Blake
Mission Viejo, Calif.

**A Force Remade by War**

I think you'll find that the B-52H, tail #61-1021, depicted on p. 25 in the August 2008 issue *["A Force Remade by War"],* is from the 319th Bombardment Wing, circa 1982. The 319th transitioned to B-52G in 1983, and lost the BUFFs in December 1986, as we transitioned to the new B-1B, so the photo could not be dated 1987.

MSgt. Stephen Perez,
USAF (Ret.)
Abilene, Tex.

**To Come: A Sigint Global Hawk**

I am writing in an attempt to point out an error in the August issue of *Air Force* Magazine. The article "PACAF Between War and Peace" *[p. 30]* contained incorrect verbiage about the capabilities of Global Hawk. The article states, "Global Hawk is packed with sensors designed to detect everything from mobile nuclear launchers to pirates at sea." The statement is incorrect in that the current operational GH models have an Imint capability only. There is no Sigint capability currently installed and operational. The later block models have a planned Sigint capability. The statement "packed with sensors" should be corrected. The U-2 is still the only high-altitude air breathing platform that can perform the mission planned for GH.

MSgt. Kevin Smith,
USAF (Ret.)
Limassol, Cyprus

**2008 Space Almanac**

Regarding the "US Manned Spaceflights" chart on p. 44 of the August 2008 issue *["Space Almanac"],* it would have been appropriate for your editorial staff to have footnoted the chart with the fact that each of the manned flights with seven persons indicated for 1986 and 2003 represents the lost *Challenger* and *Columbia* shuttle missions, respectively.

The total of 784 represents those who launched aboard spaceflights, but unfortunately, only 770 returned safely.

Lt. Col. T. C. Schultz,
USAF
US Embassy
Pretoria, South Africa

**If Only**

Twenty years ago, we missed an opportunity that might have precluded today's KC-X selection conundrum *["Travail of the Tanker," August, p. 54].*

As an initial cadre Air Force KC-10A follow-on test and evaluation (FOT&E) pilot in the early 1980s, I observed firsthand the jumbo jet tanker's tremendous air refueling, cargo hauling, and operational readiness capabilities. Fun to fly, the 60 Extenders rolling off Douglas Aircraft Co. (DAC) Long Beach, Calif., production line added some serious chops to the USAF aerial refueling support for an ever-thirsty global jet fuel demand.

The 1986 Mackay Trophy awarded to the crew of Gold 11 for their determined effort saving another KC-10A and its marine fighters—all running on a wing and a prayer—highlighted early on the new tanker's flexibility and reliability, especially during adverse operating conditions. Sporting an advanced fly-by-wire boom, a built-in hose reel drogue system, and a receiver receptacle, the Extender could/can do it all.

Around the time USAF accepted delivery of the last KC-10A in 1988, the McDonnell Douglas folks were tooling up their Southern California DAC facility for an MD-11 production run; the new aircraft represented a next generation evolution of the venerable DC-10. Although it was a superbly advanced "three-holer," the MD-11 sales appeal dried up in the face of a next-next generation rush toward two-engine jumbo jets.

Too bad. A batch of big, bad, beautiful KC-11 tankers would be real handy right about now.

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

Unfortunately, your article "Travail of the Tanker" pretty well summed up the mess that has been made of the attempt to replace KC-135s. However, since the article was printed, the mess may have taken on an even further dimension in that the Air Force is now attempting to make a revised decision based largely on the contractor's original inputs, but amended on a shortened timeline. It also appears

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that the basic requirement is changed in the new competition to accept or view favorably Northrop Grumman's larger plane concept. This Administration also wants to award the contract before they leave office. Stand by for further fireworks.

I find it amazing in all of this that other than the female contracting official who originally tried to hand the job to Boeing in return for a corporate position, no one else seems to have been jailed, fired, demoted, or negatively identified. Surely the team that awarded Northrop Grumman the contract, which the GAO just denied, did a much less than sterling job even by its own rules.

One major sticking point is the requirement that foreign proposals

cannot be degraded in favor of a US only or prime award. [It] will remain in this competition, and others, unless Congress changes the rules or DOD ignores them. This came in years ago in order to keep NATO and others happy, but it is patently unfair. No other friendly nation builds or contributes to its military strength in the manner or size that the US does. US defense contracts such as this tanker deal are paid for 100 percent by the US taxpayer. We should therefore give a priority to awards which reward the US industrial base and spread the taxpayer funded benefits and multiplier effect throughout the US economy.

Awards to foreign firms should only be made as offsets on small awards (not tankers, aircraft carriers, etc., which are major items and big money awards) or in cases where the other nation(s) provide funding as part of the system cost or those nations are going to buy a designated share of the production line on the contract. I don't think France or NATO has volunteered to come up with one euro to support building the new tanker or buy any number of them once produced.

In the F-35 contract, various countries have bought in and paid for a share in the contract and development work. Some Army missile developments have pre-established percentages, which countries provide contract funding for and which includes buying similar percentages of final systems and sharing potential future profits. It appears DOD has no one standard way to allow foreign countries to buy into joint productions. The emerging tanker result is one example of a format which shouldn't work. We should not be awarding a major development contract to a potential winner who will pass a large percentage of the work and money on to a foreign country, which will not have any stake in funding the project or buying any of the final products.

Thanks to bureaucrats and Congress, we may once more be our own worst enemy.

Bill Barry
Huntsville, Ala.

**Heinkel 111, not 177**

Just a note to make a correction in a great magazine. The airplane being shot down in the photo art on p. 63 *["How the Luftwaffe Lost the Battle of Britain, August]* is a Heinkel "111" not a "177." The He 111 had the rounded wings and tail, while the 177 had square wings and tail platforms and was a larger aircraft. The He 111 also had the distinctive curve at the wing roots.

Roy P. Gibbens
Meridian, Miss.

**White Knuckles**

I just received the August issue of *Air Force* Magazine, and when I saw the article "White Knuckles To the Azores" *[p. 68]* I had to read that article right away. I was stationed at Lajes Field from May 1951 through 1952. The base was still very much in the stage it was in during World War II.

However, many changes were begun during my time there. I was in Air Installations and had a lot to do with base development and upkeep. As far as I was concerned, I would have loved to have had my whole enlistment there. My rank was airman first class, and my duties were land surveying and construction drafting. Every time I come across an article on the Azores, especially Lajes Field, I have to read it. This brought back some great memories.

James L. Robinson
Redmond, Wash.

I enjoyed reading the account of Gold 11. As a former member of the 911th AREFS and KC-10 pilot, I was fortunate enough to serve, and fly, with Col. Marc Felman, MSgt. Lester Bouler, and MSgt. Patrick Kennedy. All of them were exacting professionals, and there could not have been better crew members on Gold 11 that fateful day in 1986.

The Gold 11 mission was legend among KC-10 crews, and for good reason. To have the story published in *Air Force* Magazine gives all tanker pilots well deserved redemption from a "tanker pilot" stigma. If it had not been for the SAC KC-10 and KC-135 crews being the best trained, dedicated, and resourceful crews in the world, that day would have most certainly ended in disaster. The quick thinking and remarkable resourcefulness of the tanker crews will, I'm sure, keep those marine A-4 pilots singing the praises of USAF tanker crews.

Of course, there is always a fine line between hero and criminal. Part of the legend I always heard was that the commander in chief of Strategic Air Command wanted then Captain Felman court martialed for "bending" regulations in the Gold 11 mission. That was until the Commandant of the Marine Corps called CINCSAC to thank the tanker crews for saving his pilots. He supposedly told the CINC not to hang the men, but to give them a medal.

Thank heaven common sense prevailed. Otherwise, many crew members, including myself, would not have had the honor to serve with these true warrior "crew dogs."

Maj. Paul Hahn,
USAFR
Vance AFB, Okla.

**Bad Medicine Indeed**

Regarding the letter from Richard Thomas about the June editorial, "Bad Medicine," in the August 2008 issue *["Letters: Bad Medicine," p. 4]:* No threat from China and Russia in the short term? Hogwash. Like most Western powers, we are no longer useful as a foreign investor to China.

Even if we were, the powers that be in China have absolutely no understanding nor respect for ownership and propriety for their own people, let alone to the foreign investors of those 300,000 factories.

At this time, we are a customer of China, nothing more, and as long as we still have the wealth to buy, we are off the table from this bully-to-be. That sucking sound you hear is not offshore drilling. It is the rapidly depleting paper assets of the West going to China and China's wealthier customer, the Middle East.

[As for] Russia, the Georgia incursion should give reason for Mr. Thomas to pause. In addition to Georgia, Russia has held hostage other former Soviet states and is poised, as the chief gas supplier to Europe, to muddy the thinking of the otherwise impotent Western European democracies. The Russians don't need indigenous science and technology systems—they'll buy it on the open market from energy-hungry Europe under the pressure of a harsh winter. Russia, it seems, is looking to return to its pre-breakup world status, and our preparations for war against terrorism will not protect us from its expansionist desires.

Though we can still outproduce the Russian economy, can we outproduce them when they hold the weak democracies to the west captive? We've recently learned that Europe is as loyal to us as their energy supplier will enable.

Both nations have recently shown us what international peer pressure will do to them: absolutely nothing. Clearly, world opinion has never presented them an obstacle. When they pick their next fight, we will be tested far more than the test under way in Iraq (which, contrary to Congressional review, we are winning). Mr. Thomas, the threat is not illusory at all. It is real and the best investment for our taxpayers is to

preserve a little preventive sting in the budget behind the electronic warfare used so effectively against terrorism. As long as the totality of our arsenal is in unmanned electronic firepower taking all their instructions from vulnerable orbiters in the crosshairs of the Russian and Chinese military, a cadre of independent Air Force jockeys may be the only prudent taxpayer investment.

By the way, Mr. Thomas, as a taxpayer, I still like the Navy and their subs, too. If I can get them faster than Mach 2 and to be stealthy while over land, I would like to fund a few more of them. Right now, the F-22 is actually a bargain.

David A. Buslinger
Elon, N.C.

**Lady Be Good**

On p. 5 of the March 2008 issue, in the "Letters" section (in the rightmost column), a letter from retired Lt. Col. John Bessette states that of the missing crew members from the B-24D *Lady Be Good* "eventually all were found and identified." Based on the Web page from the National Museum of the US Air Force, this statement is not correct. SSgt. Vernon Moore, an assistant radio operator and gunner, has never been found.

Also, in the September USAF photochart, on p. 87 under "Other," Brig. Gen. Keith L. Thurgood, commander, AAFES at Dallas, is an Army general, not Air Force.

Lt. Col. Ed Sienkiewicz,
USAF (Ret.)
Bonaire, Ga.

**Another Billy Mitchell?**

Most people today recognize that General Billy Mitchell was right on. The Navy has done a complete turnaround, by making the carrier task force the centerpiece of its force structure. The Army still has not learned that without control of the airspace above the battlefield they had better not put any boots on the ground. Many overlook the fact that Japan was brought to its knees by two B-29s that obviated the necessity of putting boots on the ground of mainland Japan. Since World War II, I have often asked, "Who are we not listening to today?"

Another person overlooked was Robin Olds. I just learned in *Air Force* Magazine that, during WWII, he could do more damage to the actual target with 70 P-51s than a 1,000 plane raid by heavy bombers. The Navy has proved him right on that one with their A-6s, A-7s, and now the great F-18, not to mention our great A-10s.

After reading John A. Tirpak's "Washington Watch: Wynne Goes On Record" *[August, p. 8],* I believe we now have another Mitchell in the canned USAF Secretary Michael Wynne. In my view, he is right on all counts. Defense Secretary Gates has vindicated Wynne by halting the drawdown of USAF [personnel] strength. Now if he will just see the light on the F-22, C-17s, an American-built tanker, synthetic fuel, etc. We send [Wynne] packing at our peril. As your editorial says, "Failure *Is* an Option," and we ain't gonna like losing.

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# Washington Watch

By John A. Tirpak, Executive Editor

**Rejecting fighter pilots?; Lingering image; Things in the black ....**

### That Missing Link

The Air Force clashed with Secretary of Defense Robert M. Gates and his predecessor, Donald H. Rumsfeld, for many reasons, but one source of difficulty may have been that there weren't many airmen around to offer USAF's perspective, reports former Secretary of the Air Force Michael W. Wynne.

Wynne, in a wide-ranging interview in the weeks after he resigned under pressure from Gates, said, "We have a serious lack of Air Force influence in the Joint Staff and in the Secretariat."

"If you go back and look at the people who were in the Joint Staff and the people directly advising the Secretary, you'll find that it was very heavily Navy with a pretty good dose of Army [and] very heavily marines," Wynne observed.

The former Air Force leader continued, "Airmen were, I thought, a pretty secondary issue, to the point where I think [DOD leaders] were actually rejecting fighter pilots, out of hand, for any offices."

Why did he think that was the case? Because, Wynne said, of a perception that airmen weren't "broad enough" in their military experience and expertise. "It's just starting to change, and hopefully it will continue to go that way, where people are beginning to ask for airmen in the Joint Staff," Wynne said.

### Sources of Negativity

In the interview, Wynne speculated that Gates may have formed a negative image of the Air Force's handling of unmanned aerial vehicles earlier in his career, and this may have colored his attitudes toward the service when Gates became Defense Secretary.

When Gates was head of the CIA in the early 1990s, Wynne said, "he was a promoter of the Predator" UAV, but, at that time, "Air Force leadership was not eager to have unmanned vehicles" and some senior officers seemed to be campaigning against them. "He left the government, [and] that was the 'photograph' he took with him," Wynne added.

When Gates became Defense Secretary, he evidently was unaware that the Air Force in the meantime had completely turned around on UAVs and that Wynne, particularly, was actively promoting both the vehicles and broad-based connections that would make their products widely available to US users.

Wynne noted, "When he went over to Iraq, the first thing [ground commanders] said was, 'We need more Predators.' He came back and the Air Force said, 'We don't have more Predators.' His 'photograph' from [his earlier experience] was instantly confirmed. He decided the Air Force was ... not a fan of unmanned vehicles."

However, it was Wynne himself who had sold the ground commanders on connecting surface troops and UAVs. When the ground force saw what a powerful capability this was, it became "a demanding customer" with an "insatiable" appetite for UAV-based intelligence, and it insisted on "instant satisfaction." Wynne surmised that this was the genesis of Gates' comments, offered at Maxwell AFB, Ala., that it had been like "pulling teeth" to get more UAV coverage from the Air Force.

USAF photo

*Gates used to be a promoter of the Predator.*

Wynne continued, "One of the interesting things is, he didn't beat up the Army, which had almost a thousand Shadows [a type of UAV]. He beat up the Air Force, which had about 100 Predators. And the Army didn't say they had 600 of the Shadows back in the United States" doing essentially nothing.

Wynne said an experiment had proved that the Shadow, like the Predator, could be operated and controlled remotely from the US. The Army, however, believes that UAVs should be tethered to individual units, rather than made available to whomever needs them. This means that, when a ground unit rotates home, the UAVs come with it and are not available generally in the theater.

"The Army said, 'We don't want to give those up, because we don't want these to become theater assets,'" and Gates, said Wynne, "didn't hear any of that." Wynne said he didn't know whether or not Gates was aware of the availability and non-use of the Army's Stateside Shadows. "All I know is, it doesn't come through in his speeches. There's no 'pulling teeth' to get Shadows to theater."

Wynne repeatedly asked the Army to provide a for-instance case—that is, a concrete example of its forces requesting Predator coverage and being turned down by the Air Force. He got no response, he said. "I said, 'All I want to know is, if you had a mission that you wanted to do, and you asked the Air Force for overhead coverage, ... where did we fail?'"

Wynne noted that the Air Force and the Army now have "a very big difference" in how they view UAVs. "We would like to take the battalion assets and turn them into theater assets. They would like to take the theater assets and turn them into battalion assets."

### Laboring in Obscurity

Wynne maintained that the Air Force doesn't get well-deserved credit for huge advances in close air support response times. The ground forces, he said, can pretty much "point to a building, and it will come down. ... We can almost dial destruction."

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Army Gen. David H. Petraeus, now US Central Command chief, wrote a new counterinsurgency doctrine a couple of years ago in which "he basically dismissed airpower as a counterinsurgency tool," Wynne noted.

During the surge in Iraq, however, "the number of air strikes went up 400 percent," said Wynne. "The amount of ordnance dropped went up 1,000 percent. Now, what happened?"

The answer, said Wynne, was that Petraeus used airpower because of the high level of confidence "in the ... precise nature of the air strike, and the calculation of collateral damage that you can now do on your laptop."

Little note was taken of the big role airpower had in the success of the surge.

"I don't think the Air Force tells its story as well as it could [or] should," Wynne asserted.

The Air Force also pushed for a capability called Angel Fire, in which C-12 aircraft could use radar to locate improvised explosive devices buried in the ground. At first, Wynne said, the Army refused to mark the detected objects because "they were terrified of [a] false alarm rate." But eventually, they became enamored of the program, and when USAF couldn't supply the capability fast enough, the Army was allowed to take it over.

### Dearth of Sparring Partners

According to Wynne, the Air Force is experiencing an odd problem. He noted that, in Stateside joint force exercises, USAF's capabilities are deliberately blunted because, otherwise, there wouldn't be much for ground forces to do. Soldiers in such training exercises "don't get to fight to the last man."

The airpower difference is replicated in real operations. "We reduced seven divisions of the Revolutionary Guard in a sandstorm," Wynne said, referring to the massive destruction of Iraqi armor by air in 2003 while US ground forces were halted by the weather. Global Hawk UAVs targeted the vehicles through and provided strike coordinates to aircraft flying above the billowing sand.

Wynne said the Air Force is having a hard time showing what its F-22 can do in realistic combat exercises. The problem has nothing to do with the fighter's capabilities. The problem is that no other fighter force wants to participate.

"People don't want to fly against it," he said. Scarcely a moment after the radio call comes that the fight is on, the adversary aircraft get another message: "You're dead." As Wynne wryly noted, "What fun is that?"

As a result, USAF has had to argue for the F-22 using "virtual" experience, which is less compelling than real force-on-force experience.

Wynne said he sees the F-22 as "*the* ISR platform on the battlefield," able to designate targets for Army, Navy, or Marine Corps airplanes. "I see the F-22 as being able to provide them the sweeping look at the terrain that you can't get [from other types of platforms] because it's going to be a lot closer," said Wynne.

Wynne believes the Raptor will be used for other unique purposes. He sees the F-22 in the role of managing wolf packs of unmanned fighters, which could multiply the weapons at the disposal of a single F-22.

"Two F-22s and four high-speed UAVs. The high-speed UAVs, by the way, could actually be modified F-16s ... [acting as] weapons carriers for the F-22." The F-16s could be made more cheaply because they would not need individual radars capable of seeing "deep."

### Operating in the Black

The Air Force's considerable investment in classified technologies doesn't undercut its case to modernize its combat aircraft fleet, Wynne said. His remarks also suggest that more than just a new secret bomber is in the works.

"In the world where that [classified] budget lives, there is a very good, solid set of people that are knowledgeable about what we're doing to minimize the risk and what we're doing in the world of pushing stealth, ... technologies, and ... the future."

Northrop Grumman artist's conception

***High tech, black budget concepts.***

He noted the general surprise on Capitol Hill and in aviation circles when the service said it was reasonable to commit to fielding a new bomber by 2018. Given the long development times for most systems, the target date seemed wildly optimistic.

Wynne explained that "we were saying, quite openly, that we are in fact maturing technologies that will allow us to minimize the risk" and have the new bomber ready to go in 2018. The strategy was an effort to "synergize" the secret and open budgets "to make sure that the technologies that we were developing there were, in fact, available."

He noted that it is taking "a lot of trips for people to go up range" to the Air Force's remote classified testing area to show that such technologies "are actually coming along and ... real."

Air Force officials have suggested that the service is working on classified, small-scale demonstrators or operational prototypes of extremely stealthy air vehicles, and Wynne seemed to confirm this when asked if the service should be pursuing a sixth generation fighter follow-on to the F-22. He also suggested that hypersonics, long deferred for combat aircraft because the technology is not yet ready, needs to be a consideration in the next generation of aircraft.

"I would say what we need to do now is to take the concepts that we are doing in the [black] world to develop a next generation recce and strike [aircraft] and see if there's any chance that we can scale it up. Right now ... probably, because of the nature of the beast and the nature of the concepts of stealth, multiple mach is probably not an issue."

He continued, however, "if it's true that we have some maturity in the stealth curve, ... we probably need to go back and examine the speed element. We need to think about multiple mach. ... Is it truly controllable?

"People tell me, well, just develop a Mach 7 missile; don't worry about the Mach 7 airplane. ... No, you've got to do both."

He said a high-speed reconnaissance aircraft is necessary because of uncertainty about whether satellites will be available when needed.

"You've got to allow for failure up there and get somebody in the cockpit."

Wynne declined to more narrowly characterize the nature of USAF's portfolio of classified aircraft. However, he suggested that strides are being made in three areas of high interest.

"I can only tell you that ... post Vietnam ... in the '80s, when we found ourselves faced with integrated air defenses, ... people came up with the concepts of stealth, speed, and precision, to try to minimize the time on target, maximize the survivability, and minimize the duration" of acquiring the target.

"We are still nurturing those three aspects. I don't think it's time to stop." ■

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# Air Force World

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

### F-15 Crash Kills Pilot

Lt. Col. Thomas Bouley, commander of 65th Aggressor Squadron at Nellis AFB, Nev., died July 30 when the two-seat F-15D he was flying crashed at the Nevada Test and Training Range.

Bouley had been participating in a Red Flag air combat training exercise. He had served for 20 years and amassed 4,500 flying hours in the F-15, T-38, and Royal Air Force F-3.

The second pilot, a Royal Air Force exchange officer assigned to USAF's 64th AGRS, survived but was hospitalized. The Air Force said it would not release his identity until the conclusion of its accident investigation.

### Predator Fleet Hits 400,000 Hours

The Air Force's MQ-1 Predator unmanned aerial vehicle force surged past 400,000 flight hours during an Aug. 18 mission over Southwest Asia.

While it took 12 years for the Predator fleet to amass the first 250,000 flight hours—a feat accomplished in June 2007—it required only 14 months to accumulate the next 150,000 combat flight hours since then, Air Force officials said.

Predators are flying about 14,000 hours a month, according to Col. Christopher Coombs, commander of the 703rd Aeronautical Systems Group at Wright-Patterson AFB, Ohio, where Aeronautical Systems Center procures the MQ-1. Since 1998, it has brought in 165 Predators to meet ever-increasing demand.

### ISR Aircraft Surge to Wars

Congress in August approved DOD's request to reprogram $1.2 billion this year for intelligence-surveillance-reconnaissance purposes. The money will be used to rapidly bolster overhead ISR in Afghanistan and Iraq.

The reprogramming recommendation came from the ISR task force that Defense Secretary Robert M. Gates established to ensure that the Pentagon was doing everything possible to support the forces in combat.

Some of the money will be used to purchase 21 Beechcraft C-12 manned turboprop aircraft with advanced surveillance sensors. It will also go toward procuring additional Air Force MQ-1 Predator and MQ-9 Reaper UAVs and Hunter, Raven, ScanEagle, and Shadow UAVs used by the other services, Pentagon spokesman Bryan Whitman said Aug. 7.

Gates approved another task force recommendation for a follow-on package in Fiscal 2009 to sustain the extra assets, procure 30 additional C-12s, and pay for additional intelligence analysts.

### Bomb Wing Passes Inspection

The 5th Bomb Wing at Minot AFB, N.D., passed a mid-August nuclear surety inspection held to assess its ability to conduct its nuclear mission. The inspection was a retest of the B-52H unit, which had come up short in a previous evaluation.

"I can tell you the 5th Bomb Wing performed in an exceptional manner during this reinspection," Brig. Gen. Joseph Reynes Jr., ACC inspector general, said Aug. 15.

Thirty-five inspectors from ACC and the Defense Threat Reduction Agency, plus observers from US Strategic Command and the Air Force Inspection Agency, scrutinized the wing.

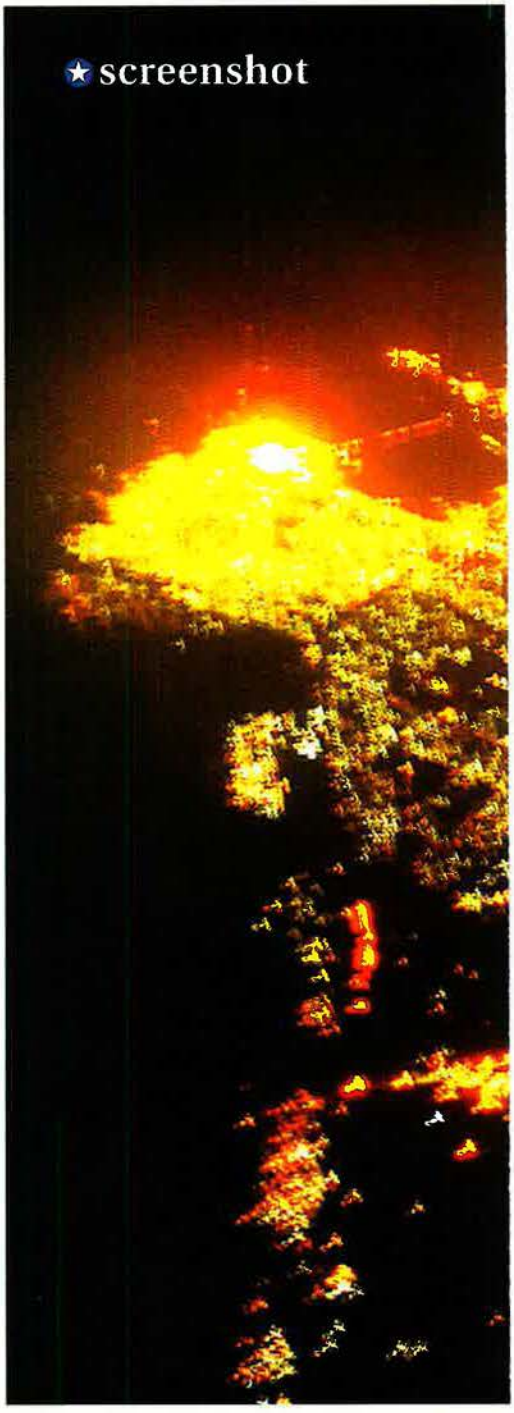
The unit had been under the microscope since its role in a Bent Spear incident in August 2007. In that event, the Air Force conducted an unauthorized transfer of six live nuclear cruise missiles from Minot to Barksdale AFB, La.

### CSAR-X Decision On for Fall

Air Force officials, as of mid-August, still anticipated that the service would announce a winning entry this fall for the Combat Search and Rescue Replacement Vehicle program.

"We have got warfighters out there that need this capability and they need it soon, and so we are working hard on the acquisition side to make that happen," Maj. Gen. David S. Gray, director of global reach programs in the Office of the Assistant Secretary of the Air Force for Acquisition, told reporters Aug. 19.

Boeing, Lockheed Martin, and Sikorsky are competing for the rights to build up to 141 new helicopters to




USAF photo by SSgt. Aaron Allmon II

replace aging HH-60G Pave Hawks under work estimated to be worth up to $15 billion.

The Air Force wants the first squadron in the field no later than September 2014.

**Osprey Deployment Nears**

Air Force Special Operations Command anticipated sending the first of its CV-22 Osprey tilt-rotor aircraft into Southwest as a by late September or early this month on their first combat deployment, Brig. Gen. Bradley A. Heithold, the command's requirements chief, said in an Aug. 11 interview.

"We are finding out that it is a transformational weapon system, ... so we are in a hurry to get it into the fight," he said. Heithold said the 8th Special Operations Squadron at Hurlburt Field, Fla., had five CV-22s with six full crews, as of August, with more assets and personnel coming.

Congress has been receptive to US Special Operations Command and Air Force requests to accelerate delivery of the CV-22 fleet. With additional funding provided in the Fiscal 2008 war supplemental, AFSOC now anticipates the delivery of the 50th airframe by Fiscal 2015 instead of Fiscal 2017 to complete the current program of record.

**Holloman Gets UAV Training**

Air Combat Command announced

**09.03.2008**

***With the nighttime lights of an Iraqi urban landscape glowing below, an Air Force F-16 multirole fighter aircraft takes on fuel from a KC-135 Stratotanker. The tanker is assigned to the 763rd Expeditionary Refueling Squadron. The F-16 is part of the 332nd Air Expeditionary Wing, based at Joint Base Balad. The 332nd is the most forward-deployed USAF wing in the Iraq War.***

USAF photo by SrA. Julianne Showalter

***The New Boss:** A CV-22 Osprey (foreground) and an MH-53 Pave Low cross the coastline near Hurlburt Field, Fla. Air Force Special Operations Command planned to send the first of its Osprey tilt-rotors to Southwest Asia this fall.*

## AFSOC Sets Sights on AC-27J Gunship

In what appears to be a significant departure from previously announced intentions, Air Force Special Operations Command now eyes the AC-27J, a weaponized version of the C-27J transport, as its next gunship and wants to field it starting early next decade.

AFSOC chose this path after an analysis of alternatives completed earlier this year, Brig. Gen. Bradley A. Heithold, AFSOC's director of plans, programs, requirements, and assessments, said in an Aug. 11 interview. Heithold said the command now sees the AC-27J as the solution to fulfill the requirements for the notional AC-XX concept meant to replace the Air Force's aging and extensively used AC-130 gunships.

"The analysis of alternatives has pointed us to the C-27 as the most appropriate aircraft to use for this," he said. AFSOC has 17 AC-130U Spooky and eight AC-130H Spectre gunships in service. They need new avionics and many of them require new centerline wing boxes; thus there is urgency in getting a new platform on the ramp.

The AC-27J, now dubbed the "Stinger" as an homage to the Vietnam-era AC-119K gunship, will be a multimission platform, equipped with full-motion video cameras and capable of covert infiltration-exfiltration as well as armed support from above, Heithold said.

In prior years, AFSOC officials said the command was interested in a future gunship capability that would represent a radical improvement over the AC-130s and was examining synergies with the Air Force's next generation bomber that is eyed for service around 2018. Therefore it was not inclined to pursue nearer term options. But for now, Heithold said acquiring the AC-27J is seen as the path ahead.

The Air Force has programmed funds in its Fiscal 2010 program objective memorandum for the new gunships. The proposed program of record calls for nine aircraft, with the first to be purchased in Fiscal 2011, but efforts are under way to expand that number to 16 and accelerate their delivery, Heithold said.

Aug. 18 that it intends to establish a formal training unit for its MQ-1 and MQ-9 unmanned aerial vehicles at Holloman AFB, N.M. Currently the service has only one FTU—at Creech AFB, Nev.—for these much-in-demand UAVs.

Pending successful completion of the environmental impact review, ACC said it would like to start training operations at the New Mexico facility next year. The new mission would be implemented in two phases. First, ACC would create an MQ-1 FTU squadron, with about 17 Predator UAVs and some 300 airmen, including students, as early as January 2009; second, it would form another MQ-1 squadron, an MQ-9 Reaper squadron, and the FTU wing staff later in 2009.

All told, the addition would bring another 750 personnel and 28 Predators and 10 Reapers to the base.

### B-1B Uses Sniper in Combat

A B-1B bomber deployed to Southwest Asia from the 34th Bomb Squadron at Ellsworth AFB, S.D., used a Sniper targeting pod over Afghanistan on Aug.

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4 to strike enemy combatants with a 500-pound Joint Direct Attack Munition, marking the first time that the B-1B employed a weapon in combat with the help of the Lockheed Martin-built pod.

Equipping B-1Bs with the Sniper was the top priority of the combined forces air component commander in Southwest Asia. The pod's features allow the bomber's aircrew to detect and identify targets from standoff distances; designate targets for laser guided bombs; generate targeting coordinates for Global Positioning System guided weapons, such as the JDAM; share live, streaming video images with joint terminal attack controllers; and quickly assess battle damage.

### Missing World War II Pilot Identified

The remains of 2nd Lt. Howard C. Enoch Jr., an Army Air Forces pilot from Marion, Ky., missing since World War II, have been identified, the Pentagon announced Aug. 13.

Enoch went missing on March 19, 1945 when his P-51D fighter crashed while engaging enemy aircraft about 20 miles east of Leipzig, near the village of Doberschuetz, Germany.

In 2004, a DOD team surveyed a possible P-51 crash site near Doberschuetz and found aircraft wreckage. Two years later, another DOD team excavated the site and recovered aircraft wreckage and human remains that forensic analysis proved to be those of Enoch.

### USAF Signs Energy Deals

Air Force officials signed four memoranda of understanding with the governor of New Mexico July 24 to pursue renewable energy projects that would yield up to 245 megawatts of power in the state for use at Cannon, Holloman, and Kirtland Air Force Bases.

New Mexico state agencies and the cities of Alamogordo, Albuquerque, and Clovis will work with the Air Force on new clean energy projects, the service said. The agreements deal with: USAF's intention to purchase green power in the state; a solar power initiative for Holloman; the creation of a plant to utilize New Mexico's abundant dairy waste; and a wind power project.

These agreements are the first of their kind between the service and a state. The Air Force is already the largest purchaser of renewable energy in the federal government.

### Longer Reserve Tours Cleared

More than 1,600 Air Force Reservists were expected to receive a waiver to stay on active duty after Sept. 30, Air Force Reserve Command said in August. As of early August, AFRC headquarters said it had received more than 2,200 requests from Reservists wishing to stay.

Reserve airmen through the rank of colonel received permission under legislation enacted in Fiscal 2005 to serve up to 1,095 man-days of the previous 1,460 days in a rolling four-year calendar. But a waiver is required to serve for more than 1,095 days within that period.

### Airmen Receive Bronze Star Medals

The Air Force on July 25 awarded Bronze Star Medals for meritorious service to Maj. Patrick O'Rourke and SSgt. Jose Cervantes for their actions while deployed from Davis-Monthan AFB, Ariz., to Afghanistan from May 2006 to May 2007. O'Rourke, a combat rescue officer, and Cervantes, a pararescueman, both faced hostile fire during recovery operations for personnel aboard a CH-47 helicopter that crashed.

Maj. Chris Hermann and Maj. Joe Wildman, both from RAF Mildenhall, Britain, received Bronze Star Medals on July 30 and Aug. 1, respectively, for their activities in Iraq.

## New Air Force Leadership Debates Personnel Plans

The Air Force's two new leaders say they intend to assign more airmen to priority mission areas such as nuclear operations, ISR, and perhaps aircraft maintenance.

USAF will be able to do this with additional forces that become available as a result of decisions to keep active duty end strength at 330,000, said Gen. Norton A. Schwartz, USAF Chief of Staff, and Michael B. Donley, Acting Secretary of the Air Force.

Schwartz and Donley spoke to reporters at an Aug. 12 press briefing.

"I can tell you that we are going to put [them] where we need them most," said Schwartz. He said these decisions were "yet to be finalized." But "the bottom line," he added, was that the issue "certainly has the Secretary's and my personal attention."

Donley emphasized that the additional manpower was "a pretty important change" for the service, which was scheduled to draw down to about 316,000 by Fiscal 2009 based on plans drafted several years ago, but later judged to be overtaken by events.

"The main thing for us," Donley continued, "is not just the number, but obviously the mix, in terms of what new missions need to be covered and new requirements need to be covered in that [330,000]."

As of May, active duty end strength stood around 324,000 as the drawdown was still in effect. But in June, Secretary of Defense Robert M. Gates put the brakes on the reductions, shortly after the purge of the service's then-leadership, Gen. T. Michael Moseley and Michael W. Wynne, over what Gates claimed were shortcomings in the Air Force's stewardship of nuclear weapons.

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USAF photo

***Family airloom:** On the left is Capt. David A. Deptula II, an F-15 pilot of the 67th FS, Kadena AB, Japan. The other guy is Captain Deptula's father, Lt. Gen. David A. Deptula, deputy chief of staff for ISR and also an F-15 pilot. Father and son were snapped just before they engaged in a Sept. 4 air combat exercise. The general himself is a former member of the 67th, one of the pilots who introduced the F-15C in 1979. In fact, the younger Deptula's F-15—tail #78-548—is one of the very jets flown by his dad nearly 30 years ago.*

And on Aug. 14, four airmen from the 819th RED HORSE at Malmstrom AFB, Mont., received Bronze Star Medals for their actions while deployed to Southwest Asia. They are: Capt. Glenn Cameron, Capt. Josh Aldred, CMSgt. Gary Stuckenschmidt, and MSgt. Todd Pedersor.

### Minuteman Squadron Closes

The Air Force inactivated the 564th Missile Squadron at Malmstrom AFB, Mont., on Aug. 16, about three weeks after the unit's 50th and final Minuteman III ICBM was pulled from its silo.

These actions capped an effort begun in June 2007 to divest Malmstrom of 50 of its Minuteman IIIs under a policy established in the 2005 Quadrennial Defense Review to reduce the Minuteman fleet from 500 to 450. The squadron's launch and missile alert facilities will be in caretaker status in case the US decides at some future point to increase the size of the ICBM fleet.

The reduction leaves Malmstrom's 341st Missile Wing with three ICBM operations squadrons and a total of 150 missiles, like the 90th MW at F. E. Warren AFB, Wyo., and the 91st MW at Minot AFB, N.D.

### Elmendorf F-22 Force Grows

The 525th Fighter Squadron at Elmendorf AFB, Alaska, is on track to get all of its F-22 Raptor fighters by November, Lt. Col. Orlando Sanchez, the unit's director of operations, said in an interview July 25. Like the Air Force's other F-22 operational squadrons, the 525th will have a complement of 20 Raptors.

As of late July, the unit had 11 aircraft on the ramp at Elmendorf, with about two a month arriving from Lockheed Martin's assembly plant, he said. The squadron anticipates having all of its pilots in place by mid-2009.

The unit planned to participate in a Combat Archer air-to-air training exercise in August at Tyndall AFB, Fla., and is expected to take part in this month's installment of the Red Flag-Alaska air combat training exercise, Sanchez said. The 525th FS is the second F-22 unit behind the 90th FS to stand up at Elmendorf.

### First of 18 B-52Hs Retired

The Air Force on July 24 sent the first of the 18 B-52H bombers that it intends to phase out of service to Davis-Monthan AFB, Ariz., for placement in recallable storage. This aircraft, built in 1961 and assigned to the 2nd Bomb Wing at Barksdale AFB, La., was the first H model to be decommissioned.

Air Combat Command planned to fly one of the selected B-52Hs every two weeks to Davis-Monthan, alternating between aircraft assigned to Barksdale and to the 5th BW at Minot AFB, N.D., the Air Force's other B-52 unit.

The drawdown will leave the Air Force with 76 B-52Hs. "It's not like the aircraft are all rusted or corroded; it's just that the selected 18 are not as airworthy as the first 76," said Lt. Col. Bill Stahl, deputy commander of the 5th Maintenance Group.

USAF photo by SSgt. Shawn Weismiller

***Rescue Flight:** A crew member hands water to passengers on a C-17 during an Aug. 31 emergency evacuation flight from New Orleans, which was threatened by Hurricane Gustav. US Transportation Command at Scott AFB, Ill., coordinated the evacuation of some 16,000 residents before the storm made landfall with 110 mph winds.*

## The War on Terrorism

### Operation Iraqi Freedom—Iraq

#### Casualties

By Sept. 15, a total of 4,158 Americans had died in Operation Iraqi Freedom. The total includes 4,147 troops and 11 Department of Defense civilians. Of these deaths, 3,377 were killed in action with the enemy while 781 died in noncombat incidents.

There have been 30,634 troops wounded in action during Operation Iraqi Freedom. This number includes 17,121 who were wounded and returned to duty within 72 hours and 13,513 who were unable to return to duty quickly.

#### Reaper Drops First Bomb In Iraq

An MQ-9 Reaper unmanned aerial vehicle dropped a 500-pound laser guided bomb against an enemy target in Iraq on Aug. 16, marking the platform's first weapon engagement in Iraq since its introduction there in July.

Air Force officials said the Reaper strike destroyed a vehicle-borne improvised explosive device that was discovered during an overwatch mission over southeast Iraq. "This was a great example of the Reaper's unique capabilities," said Lt. Col. Micah Morgan, commander of the 46th Expeditionary Reconnaissance and Attack Squadron at Joint Base Balad. "We searched for, found, fixed, targeted, and destroyed a target with just one aircraft."

Reapers began flying combat sorties in Iraq out of Balad on July 18, joining the MQ-1 Predator in patrolling the skies to aid coalition forces.

#### Balad C-130 Unit Marks Passenger Milestone

The 777th Expeditionary Airlift Squadron at Joint Base Balad marked a milestone on Aug. 5 when one of its C-130s airlifted the unit's 200,000th passenger during a sortie from Ali Base to Balad.

Lt. Col. Chris Cantu, the unit's commander, was the navigator for the flight. He and the other crew members presented Army Spc. Steven Nix, the passenger of note, with a flag, squadron coin, and certificate to commemorate the milestone.

Members of the 777th EAS, deployed from Little Rock AFB, Ark., were nearing the end of a two-month rotation to Balad when they reached the milestone.

### Operation Enduring Freedom—Afghanistan

#### Casualties

By Sept. 15, a total of 587 Americans had died in Operation Enduring Freedom. The total includes 586 troops and one Department of Defense civilian. Of these deaths, 375 were killed in action with the enemy while 212 died in noncombat incidents.

There have been 2,443 troops wounded in action during Operation Enduring Freedom. This number includes 882 who were wounded and returned to duty within 72 hours and 1,561 who were unable to return to duty quickly.

#### Insurgent Attack on Major US Installation Foiled

A group of Taliban militants on Aug. 18 assaulted Forward Operating Base Salerno near the Afghan border with Pakistan, but failed to penetrate the base, which is the second largest US military installation in the country.

The militants launched waves of attacks on Salerno, located in Khost, just before midnight on Aug. 18, firing mortars and rockets at the base while suicide bombers attempted to gain entry near the base's airfield. Coalition forces observed the attackers about 1,000 yards outside the perimeter and opened up with small-arms fire and requested air support, which came quickly.

An Afghan commando unit surrounded the suicide team approaching the airfield and engaged in a fierce firefight. Six suicide bombers were killed in the fight or blew themselves up, according to NATO accounts. Coalition fighter aircraft and helicopters helped chase the attackers in retreat, while ground troops gave chase.

A day earlier, a suicide bomber detonated a car bomb killing 10 civilians and wounding 13 just outside the base's gates.

With the 76-aircraft fleet, ACC plans to activate a second operational B-52 bomber squadron at Minot.

#### USAF Leases Launch Complex

The Air Force agreed in August to grant the state of Florida access to Space Launch Complex 36 at Cape Canaveral AFS, Fla., for use as a commercial launch site to place commercial satellites into orbit. The agreement, which is subject to completion of an environmental impact evaluation, calls for an initial term of five years.

Gen. C. Robert Kehler, Air Force Space Command commander, said in an Aug. 7 release that he supported the proposal, noting that it "encourages, facilitates, and harnesses entrepreneurial space achievement." Florida officials said the deal boosts the state's efforts to create a commercial launch zone on the East Coast and attract and sustain national and international aerospace business in Florida.

The Air Force used the complex for launching Atlas rockets from 1961 to 2004; thereafter, it deactivated it.

#### Hill Gets Research Park

The Air Force on Aug. 13 signed a development agreement with a private developer Sunset Ridge Development Partners for a $1.5 billion aerospace research park called Falcon Hill on the grounds of Hill AFB, Utah.

Sunset Ridge will finance, build, and manage eight million square feet of office space, including supporting restaurants and two hotels, on 550 acres of land on the west side of the base under a 50-year lease.

Developers expect the park to attract thousands of aerospace industry jobs to the area. In return, Hill will receive up to 1.6 million square feet of free office space to use for Air Force projects. Construction will begin this year, with completion of the initial phase anticipated in 2010.

#### Warren Grove Resumes Ops

New Jersey Gov. Jon S. Corzine authorized the New Jersey Air National Guard's 177th Fighter Wing to resume "limited" flying operations on the Warren Grove Gunnery Range, starting Oct. 1. The wing had been prohibited from using the range since a May 2007 fire ignited by a flare dropped by one of its F-16s during target practice. The fire caused widespread damage to the surrounding area, including residential areas.

In an Aug. 15 release from the governor's office, Corzine restricted range use initially to the 177th FW, so the unit can verify new safety procedures. Following that validation, use of the range would be opened to other units on Nov. 1. However, Corzine said,

## Senior Staff Changes

**RETIREMENTS:** Maj. Gen. Jeffrey R. **Riemer,** Brig. Gen. Francis M. **Bruno,** Brig. Gen. Donald **Lustig,** Brig. Gen. Joseph F. **Mudd Jr.**

**NOMINATION: To be General:** Craig R. **McKinley.**

**CHANGES:** Brig. Gen. Gregory L. **Brundidge,** from Dir., Comm., ACC, Langley AFB, Va., to DCS, Comm. & Info. Sys., Multinational Force-Iraq, CENTCOM, Baghdad, Iraq ... Maj. Gen. Randal D. **Fullhart,** from Vice Cmdr., AFCYBER (Provisional), Barksdale AFB, La., to Dir., Global Reach Prgms., Office of the Asst. SECAF for Acq., Pentagon ... Brig. Gen. Steven J. **Spano,** from DCS, Comm. & Info. Sys., Multinational Force-Iraq, CENTCOM, Baghdad, Iraq, to Dir., Comm., ACC, Langley AFB, Va.

**SENIOR EXECUTIVE SERVICE RETIREMENTS:** Robert L. **Buhrkuhl,** Karen-Sue **Dunn,** Frances A. **Duntz,** Jon S. **Ogg,** Richard R. **Severson,** Eric L. **Stephens.**

**SES CHANGES:** Thomas R. **Berard,** to Exec. Dir., AF Flight Test Ctr., AFMC, Edwards AFB, Calif. ... Kevin W. **Billings,** to Acting Asst. SECAF for Instl., Env., & Log., OSAF, Pentagon ... David C. **Bond,** to Dir., Engineering & Technical Mgmt., AFMC, Wright-Patterson AFB, Ohio ... Cheri L. **Cannon,** to Dep. Gen. Counsel, Fiscal, Ethics, & Administrative Law, OSAF, Pentagon ... Steven A. **Cantrell,** to Dep. Dir., Global Maritime & Air Intel. Integration, Office of the Dir. of Natl. Intel., Washington, D.C. ... Daniel L. **Deforest,** to Dir., Materials Tech., AF Technical Applications Ctr., AF ISR Agency, Patrick AFB, Fla. ... Sheila M. **Earle,** to Exec. Dir., AFPC, Randolph AFB, Tex. ... Rose **Gault,** to Dep. Asst. Secy., Strat. Diversity Integration, Office of the Asst. SECAF, Manpower & Reserve Affairs, Pentagon ... Clyde R. **Hobby,** to Dep. Dir., Log., CENTCOM, MacDill AFB, Fla. ... Mark H. **Johnson,** to Exec. Dir., Jt. Info. Ops. Warfare Cmd., STRATCOM, Lackland AFB, Tex. ... Margaret **Leclaire,** to Dir., Acq., TRANSCOM, Scott AFB, Ill. ... Richard W. **Lombardi,** to Exec. Dir., ESC, AFMC, Hanscom AFB, Mass. ... Ronald A. **Mason,** to Dir., 653rd Electronic Sys. Wg., AFMC, Hanscom AFB, Mass. ... D. Mark **Peterson,** to Dir., Center for Financial Mgmt., SOCOM, MacDill AFB, Fla. ... James N. **Stewart,** to Asst. Vice Cmdr., AFRC, Robins AFB, Ga. ... David **Tillotson III,** to Dep. Chief Management Official, OSAF, Pentagon ... David E. **Walker,** to Assoc. Dir., AF Prgms., Dep. C/S, Strat. Plans & Prgms., USAF, Pentagon. ▪

"The resumption of operations will be predicated on the thorough education of all units" on the new rules.

### Re-engined C-5 Test Ends

Lockheed Martin announced Aug. 18 that it had "successfully completed" developmental flight testing of the three C-5 test aircraft that underwent performance upgrades and received new engines under the C-5 Reliability Enhancement and Re-engining Program. Next up for these aircraft is operational testing by the Air Force, slated to begin in the third quarter of 2009.

George Shultz, vice president for C-5 modernization at Lockheed, said the three aircraft "performed great throughout the test program, demonstrating consistent and reliable performance."

The Air Force plans to install the new engines and reliability upgrades on its 47 remaining C-5Bs and two C-5Cs by around the middle of next decade. These aircraft are also getting revamped cockpits under the C-5 Avionics Modernization Program. The service's 59 remaining C-5As will receive only the AMP upgrade. Already 43 C-5s in the 111-aircraft fleet have the AMP mods.

Lockheed Martin photo


***Another Milestone:*** *An F-22 from Edwards AFB, Calif., receives synthetic fuel from a KC-135 during an Aug. 28 test of alternative jet engine fuel. The tanker was from March ARB, Calif. It is the first time an Air Force aircraft refueled in midair using an alternative jet engine fuel.*

USAF photo by SSgt. Aaron Allmon II

***40,000 and Counting:*** *In Southwest Asia, TSgt. Bo Sullivan—a flight engineer—prepares for takeoff in an E-8 Joint STARS for a mission over Iraq. This flight on Sept. 2 marked 40,000 combat hours for the airmen assigned to the 7th Expeditionary Air Command and Control Squadron. The unit deployed from the 116th Air Control Wing, Robins AFB, Ga.*

### USAF Assigns ANG C-27s

The Air Force in July and August formally assigned the new C-27 transport aircraft that it plans to field next decade to the North Dakota Air National Guard's 119th Wing and the Ohio ANG's 179th Airlift Wing, according to lawmakers and press reports.

North Dakota's Congressional delegation—Sen. Kent Conrad (D), Sen. Byron L. Dorgan (D), and Rep. Earl Pomeroy (D)—welcomed the news regarding the 119th Wing in a joint release on July 29, calling it a "strong statement" by the Air Force that the unit will "keep playing a central role in military operations around the world." The wing currently flies C-21 VIP shuttle aircraft, in addition to their new unmanned aerial vehicle mission, and will continue to fly C-21s until the C-27s arrive.

The 179th AW is expected to get its C-27s around 2012, according to an Aug. 2 report in the *News Journal* of Mansfield, Ohio. The wing will lose its eight C-130 transports in 2010 under BRAC 2005, but will operate the C-21s until its C-27s arrive, the newspaper reported.

### Spooky Gun Swap Canceled

Air Force Special Operations Command has abandoned a project to put two 30 mm Bushmaster guns on each of its 17 AC-130U Spooky gunships in place of the platforms' current 25 mm Gatling gun and 40 mm Bofors cannon.

Brig. Gen. Bradley A. Heithold, AFSOC's director of plans, programs, requirements, and assessments, said Aug. 11 the effort was canceled due to problems with the Bushmaster's accuracy "at the altitude we were employing it" in tests. There were also schedule considerations that drove the decision, he said.

### Georgia Mission Launched

An Air Force C-17 transport aircraft spearheaded the US military's humanitarian relief mission to the Republic of Georgia by flying in 16 pallets of supplies, including medicine, clothing, sleeping bags, cots, and other essential items from Ramstein AB, Germany, to Tbilisi Airport on Aug. 14.

President George W. Bush on Aug. 13 directed the US military to commence a "vigorous" humanitarian relief mission for the people of Georgia in the wake of Russia's military incursion there earlier in the month. As of Aug. 19, C-17s and C-130s, along with a US Navy C-9, had delivered more than 200 short tons of relief supplies, according to US European Command.

### T-38C Gets New Wing Levers

The Air Force announced in August plans to replace the same type of wing lever in all of its T-38 Talon trainer aircraft that was identified as the cause of a Talon crash at Columbus AFB, Miss., on April 23. The crash killed the two pilots.

Gen. Stephen R. Lorenz, commander of Air Education and Training Command, said Aug. 11 the service would install new, stronger levers in the T-38s as soon as they are manufactured and available. The April crash involving the broken lever—identified as a part of the right aileron—is the first known instance of this part failing.

But since there is the "very small chance" that the part may fail again, the

### In Wake of Upheaval, Air Force Rethinks Cyber Plans

The Air Force in August placed its plans to establish a major command to oversee its cyberspace activities on hold to reassess the situation and give the new service leadership time to plot the best path forward. Service officials said at the time that the Air Force was not abandoning plans to establish a lead command. However, the planned Oct. 1 start of Air Force Cyber Command's initial operations was deferred.

The Air Force said in a statement Aug. 13 that it remained committed "to providing full-spectrum cyber capabilities to include global command and control, electronic warfare, and network defense." The pause, it said, would "allow ample time for a comprehensive assessment of all AFCYBER requirements and to synchronize the AFCYBER mission with other key Air Force initiatives."

During a Pentagon press briefing on the previous day, Acting Air Force Secretary Michael B. Donley said AFCYBER will go forward. "The issue," he said, "is in what context and what form and in what national framework." He continued, "This is not just Air Force. It has to fit with [US] Strategic Command, has to fit with the broader national security community."

As word spread of the cyber pause, concern grew in the states and communities across the nation vying to host AFCYBER's permanent headquarters, which the Air Force planned to announced in the fall of 2009. For example, Sen. Mary Landrieu (D-La.), in whose state resides AFCYBER Provisional at Barksdale Air Force Base, cited the Russian military incursion into Georgia on Aug. 8 and the accompanying Internet attacks as "a stark reminder that the threat of cyber terrorism and warfare is very real."

In an Aug. 13 statement, she said, "These attacks in Georgia should put the new Air Force leadership on notice that the time for the US to act on a strong cyber defense command is now, and any transitional delay must be extremely limited."

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Photo courtesy of Department of Defense.

USAF photo by A1C Jason Epley

***Mount Up:** Airmen at Joint Base Balad, Iraq, climb into a Mine-Resistant Ambush-Protected vehicle. From this staging area, their convoy went "outside the wire" to a forward operating base. These kinds of aggressive security patrols are now the norm for expeditionary forces.*

Air Force made the decision to replace them, Lorenz said. In the interim, T-38 flying operations will continue since AETC deemed the risk acceptable after consulting with subject matter experts, he said.

### RAF To Get Rivet Joints

The Air Force will convert three KC-135R tanker aircraft starting in Fiscal 2010 to RC-135 Rivet Joint signals intelligence platforms for the British Royal Air Force, an Air Mobility Command spokeswoman confirmed in early August.

The RAF will use the Rivet Joints to replace its Nimrods which have passed the end of their service lives. Making them available to the British "will be a significant step to relieve stress in this vital mission area, improve interoperability, and improve overall warfighting capability in our coalition operations," she said.

To make up for the three fewer tankers, the Air Force will temporarily allow a higher utilization rate on remaining KC-135Rs, assign more crews, and adopt some "efficiencies" in the KC-135R schoolhouse.

### NYANG Unit Starts Mission

Members of the New York Air National Guard's 174th Fighter Wing are now embarking on the transition to a new mission—operating the MQ-9 Reaper unmanned aerial vehicle—after arriving home in August from their final overseas deployment while flying F-16 fighters.

The Syracuse-based wing will be the first ANG unit to operate the MQ-9—courtesy of BRAC 2005, which strips the wing of its F-16s and ends its 61 years of flying fighters, and the Air Force's Total Force game plan. Although the transition is commencing this fall, unit members are not expected to actually begin training on the MQ-9s until 2010 and to receive their own MQ-9s in 2011.

### Engine Makers Settle Dispute

The Justice Department announced Aug. 1 that Pratt & Whitney and its subcontractor PCC Airfoils LLC had agreed to pay more than $52 million to settle allegations of selling defective jet engine parts for F-15 and F-16 fighters.

DOJ's investigation found that the two companies "knowingly sold defective turbine blade replacements" designed by P&W and cast by PCC between 1994 and 2003. This defect was identified by the Air Force as the cause of the June 2003 crash of an F-16 from Luke AFB, Ariz. ■

## News Notes

■ The National Board of the Civil Air Patrol elected CAP Maj. Gen. Amy S. Courter in August to be national commander. She will serve both as a member of the Board of Governors and National Board and will lead CAP's volunteer force of some 56,000.

■ Ecuador's Foreign Ministry formally notified the United States in July of its decision not to renew the lease that allows US Southern Command to use Eloy Alfaro Air Base in Manta, Ecuador, as a forward operating location for counternarcotics surveillance aircraft.

■ The Air Force successfully launched a Minuteman III ICBM on Aug. 13 from Vandenberg AFB, Calif., to the Kwajalein Atoll in the Marshall Islands. This was a routine test to ensure the Minuteman fleet's continued reliability and accuracy.

■ The American College of Emergency Physicians on Aug. 1 recognized Maj. James Eadie as a "hero of emergency medicine." He is vice chair of emergency medicine, medical director, and flight commander at Wilford Hall Medical Center in Texas.

■ An instructor pilot's failure to execute proper emergency procedures caused the fatal crash of a T-38C trainer aircraft on May 1 at Sheppard AFB, Tex., the Air Force said Aug. 6. The crash claimed his life and the life of a student pilot.

■ Lockheed Martin announced Aug. 5 that it has handed over control of HEO-1, the first on-orbit Space Based Infrared System sensor payload, to the Air Force. The service is expected to commence formal operations with it before the end of the year for detecting ballistic missile launches.

■ An eight-alarm fire on Aug. 16 destroyed 167 uninhabited housing units and damaged another 11 on the grounds of Travis AFB, Calif. The fire lasted about 12 hours and raged over more than 12 acres before firefighters brought it under control, base officials said.

■ The Montana Air National Guard's 120th Fighter Wing in August received the first of the 18 F-15s slated to replace its F-16s under changes mandated under BRAC 2005. The F-15s are coming from the Missouri ANG and from Eglin AFB, Fla.

■ The 410th Flight Test Squadron at Plant 42 in Palmdale, Calif., was inactivated on Aug. 1. It was the unit responsible since 1980 for flight-testing the F-117A stealth fighter, which USAF retired in April.

■ Eielson AFB, Alaska, is one of several Air Force locations under consideration to host a coal-to-liquid-fuel conversion facility, service officials divulged in July. The facility would cost between $3.5 billion and $6 billion to build and produce up to 40,000 barrels per day, depending on its size. ■

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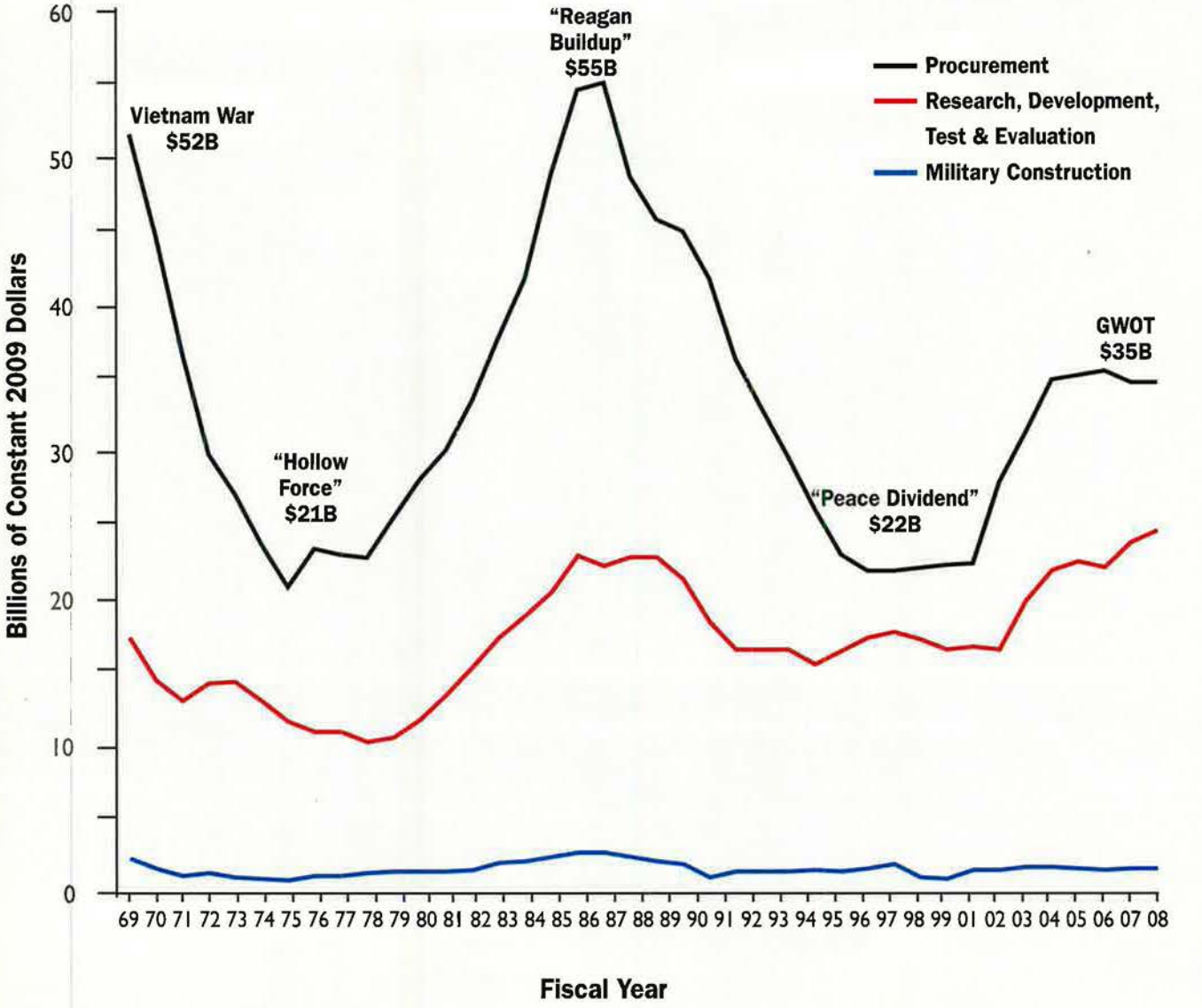
# Chart Page

By Tamar A. Mehuron and Heather Lewis

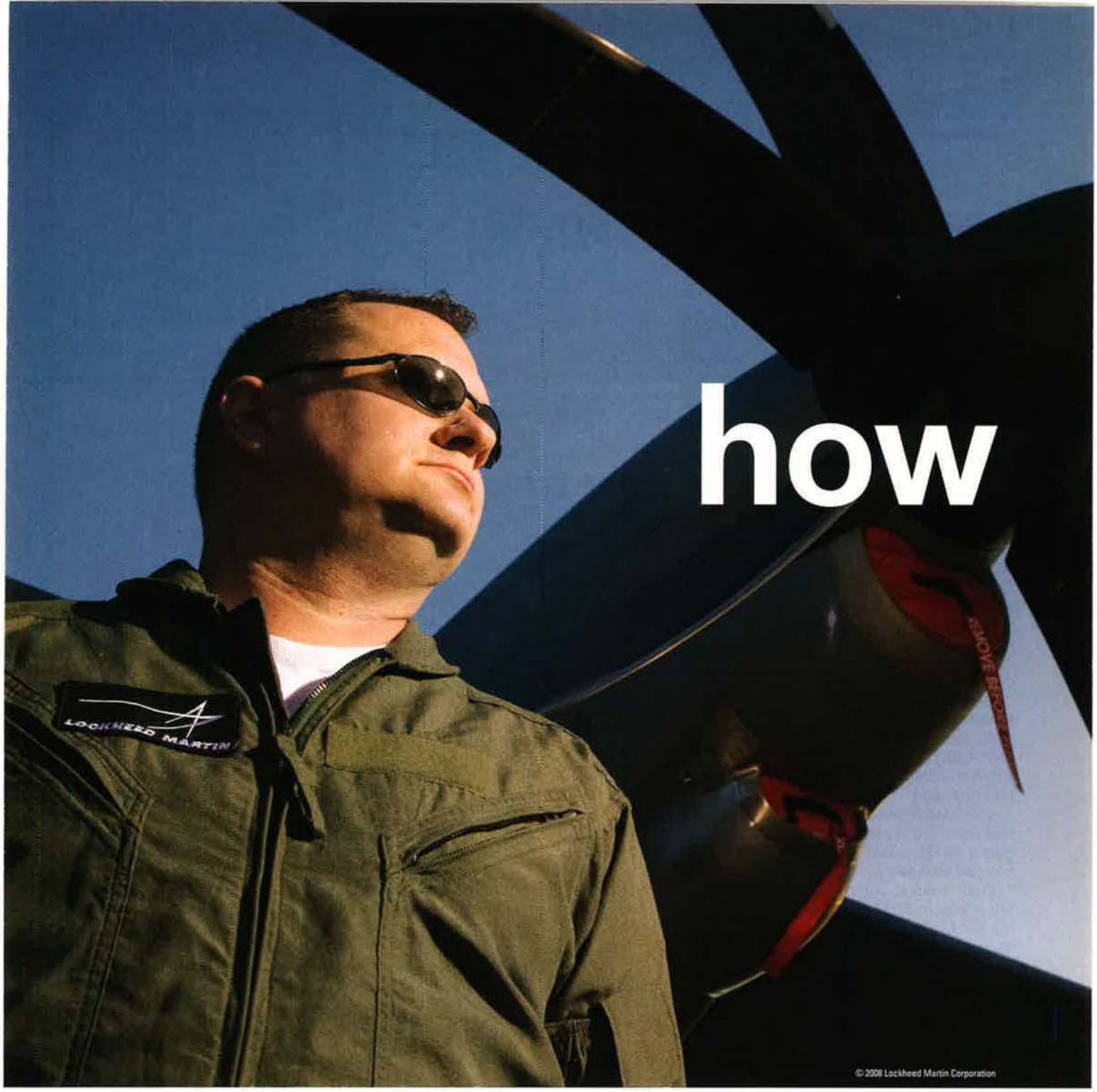
# Forty Years of Air Force Investment

"Anemic" is the word that best describes Washington's investment in today's wartime Air Force. Investment comprises three main accounts—weapon procurement, RDT&E, and military construction. The problem is procurement, as seen here. In the wake of the Vietnam War, weapon buying sagged. However, it rebounded strongly in the Cold War face-off of the Reagan years. Then, in the 1990s, investment again plummeted. However, the "bounce" of the Global War on Terror has been feeble. While high Air Force optempo is wearing out aircraft, there is little money to replace them, which is the reason the USAF fleet is the smallest, oldest, and most problem-prone in service history.

## Forty Years of Air Force Investment




**Source:** "National Defense Budget Estimates for FY 2009," March 2008, Department of Defense, Washington, D.C. Data from Table 6-24, p. 197-201.

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# Issue Brief

By Adam J. Hebert, Executive Editor

# The Joint Base Dispute

You probably have never heard of Joint Base McGuire-Dix-Lakehurst, but you will. It's coming to New Jersey.

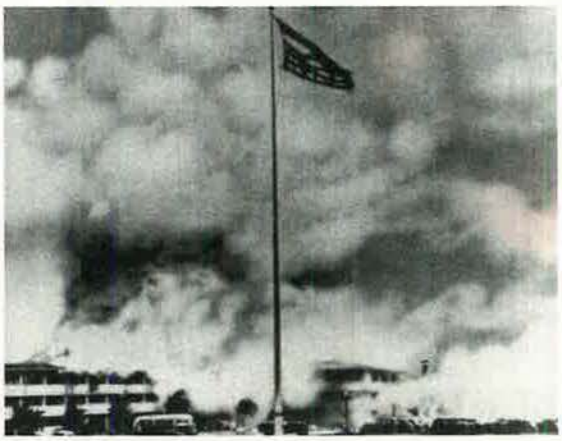
Joint Base Pearl Harbor-Hickam, a name that casts underfoot decades of military heritage, will soon be in Hawaii.

What about Joint Base Charleston-Naval Weapons Station Charleston, a name that can be said to lack felicity? Expect it in South Carolina.

The 2005 Base Realignment and Closure (BRAC) act ordered these and similar basing structures. The goal: greater efficiency.

The Defense Department is well along in merging 26 domestic Air Force, Army, Navy, and Marine Corps installations to form 12 joint mega-bases. Plans called for the submittal this fall of signed "integration" plans for the first five joint bases. The entire process must be completed by 2011.

Negotiations have been tough. For the Air Force, the stakes are high. Joint bases, should they be improperly set up, may damage USAF's combat power, morale, and retention.



*Hickam on Dec. 7, 1941. Lots of history.*

Joint basing is the norm at war, and the push is not limited to domestic installations. In Iraq, Balad Air Base was recently renamed Joint Base Balad and merged with the Army's Logistics Support Area Anaconda.

Gen. John P. Jumper, the then-Air Force Chief of Staff, observed in 2005 that "we will not only train as we fight, we will live as we fight." Jumper fingered a key goal—joint basing must not lower standards or damage combat capability.

Of the 12 conglomerations, the Air Force will lead six. These will be the joint installations dominated by Andrews AFB, Md., Charleston AFB, S.C., Elmendorf AFB, Alaska, Lackland AFB, Tex., Langley AFB, Va., and McGuire AFB, N.J.

The Navy will lead four—most notably, those encompassing Hickam AFB, Hawaii, and Andersen AFB, Guam. The first will be absorbed by Pear Harbor, the second will be placed under Navy administration of JB Naval Base Guam-Andersen.

The Army will lead two joint bases, including JB Lewis-McChord, which includes Washington's McChord Air Force Base.

The plan is to find efficiency in bases that sometimes share a long fence line. Separate medical, child care, grounds maintenance, public affairs, safety, housing, dining, and finance departments don't necessarily make sense.

In all, there are 49 support functions that the military services have identified as potential sources of efficiency.

The potential for trouble creeps in because bases have different missions, property standards, and cultures.

"I did not think giving Hickam to the Navy made sense. I don't think giving Andersen to the Navy makes sense," former Air Force Secretary Michael W. Wynne said in July. "The Air Force has a very different concept of operations ... in managing its bases."

Airmen often go directly into combat from home stations, which are not "just some place we deploy from," said Gen. T. Michael Moseley, then Chief of Staff, in March. USAF must "ensure we can still conduct our missions."

The Air Force does not use bases as garrisons, like the Army. Bases such as Charleston and Andersen are essentially combat platforms, where aircraft fly missions directly to the war zone.

The Air Force will continue to run the airfields at its joint bases, and keep training resources in place. For example, when McChord is absorbed into Ft. Lewis, the airfield will be run by the airlift wing commander "on behalf of" the joint base commander.

Also critical is preservation of USAF's combat support capability. Security forces, RED HORSE construction units, fuels specialists, and other deploying units are integrated with installation support units at Air Force bases.

The health of the force is a concern. USAF has a mature, highly skilled, retention-driven force of airmen. The Army has a young, recruitment-based force of soldiers. The services can—and do—treat their troops differently. There is lingering concern that joint basing will create "lowest common denominator" facilities standards, driving out airmen with families, the kind USAF needs to retain.

Ownership has been contentious. Plans call for the lead service at a joint base to assume ownership of the land and the money used to support it. For example, Hickam's real estate and installation funding would be handed over to the Navy.

Air Force officials last year called this a bad idea, but have since been somewhat mollified on this point.

Yet to be determined is whether the Navy and Army will meet USAF funding requirements when budgets get tight.

"Our operational commanders should define the requirements necessary to execute the mission and manage the funds to meet their needs," William C. Anderson, Air Force installations chief, told Congress Anderson resigned in August, after Wynne and Moseley were deposed, saying the leadership changes limited his ability to take care of airmen.

Perhaps beaten into submission, USAF in recent weeks has taken on a more conciliatory tone. "I wouldn't characterize [final negotiations] as disagreements," said one senior official. The Air Force is "confident joint basing will be very successful."

Organizational structures, joint base MOAs, and agreements on how much money to transfer are being negotiated. The first five joint bases are supposed to go "live" in January. Then, we will begin to see the effect of the joint basing plan. ■

**More information: http://www2.hickam.af.mil/shared/media/document/AFD-070507-111.pdf**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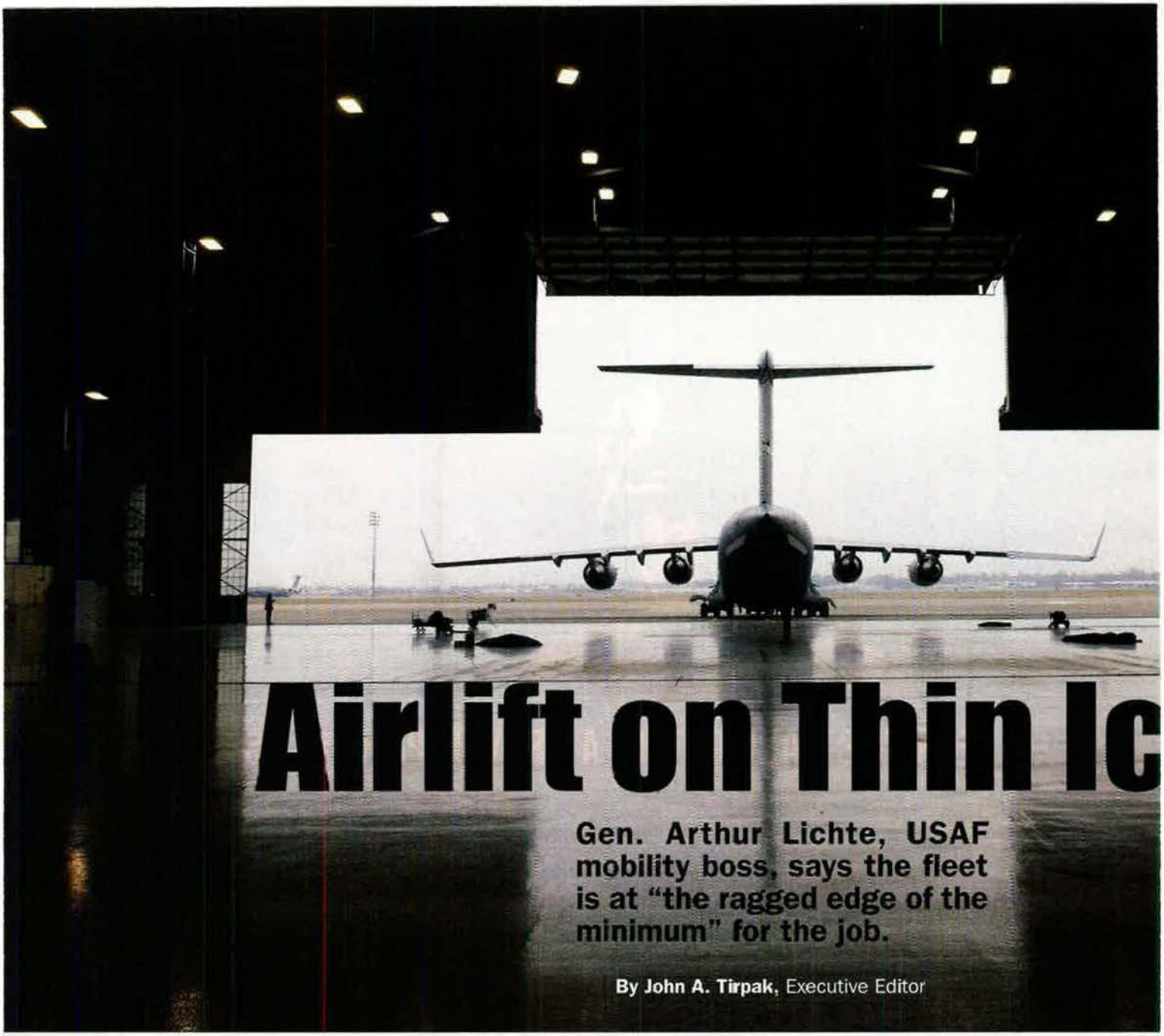


# Airlift on Thin Ic

**Gen. Arthur Lichte, USAF mobility boss, says the fleet is at "the ragged edge of the minimum" for the job.**

By John A. Tirpak, Executive Editor

For years, the Air Force's airlifter fleet has felt the strain of relentless operational demands. That pressure has begun eating away at future capabilities of USAF's transports. The service has launched studies of how best to remedy the problem, but what's really needed is a long-term commitment to maintain something more than the bare minimum of air mobility forces.

That's the word from Gen. Arthur J. Lichte, head of Air Mobility Command, as he sizes up the effect on the transports of seven years of nonstop warfare.

Lichte notes that most AMC aircraft have been flying at rates well above planned usage levels for some time. Although the command is maintaining the pace and meeting wartime demands, there's a price to be paid: Aircraft service lives are being consumed faster than expected. They'll either have to be somehow rested in order to get them to last out their predicted service lives, or they'll have to be replaced sooner than is now programmed or funded.

The situation is symptomatic of what happens when the fleet is held at "the ragged edge of the minimum" required to do the job, Lichte said.

Acknowledging that there's always a major mobility study either just completed or just getting under way, Lichte said they all tend to recommend a fleet of airlifters within a particular numerical range. Within that range, buying fewer airlifters entails high risk of not being able to perform all required missions. Buying more lowers that risk.

"We always come up with a requirement," he observed, "and then we immediately drop to the minimum of the requirement."

He went on, "Everyone says, 'OK, if the minimum is good enough, we should go to the minimum.'" but, when world events suddenly turn up the demand for mobility forces, decision-makers say, " 'Gee, maybe we better do another study,' as opposed to ... saying, 'Gee, if we had gone to the high side of the envelope, maybe we would have had it covered.' "

Here is a prime case in point: USAF is "burning up" its fleet of C-17s, AMC's

USAF photo by Abner Guzman

*A C-17 outside a hangar at McChord AFB, Wash. The Air Force has been flying its C-17s so heavily that they may wear out eight years earlier than planned.*

youngest and most versatile heavy airlifter, Lichte said. The Air Force planned to fly the C-17 "a thousand hours per year ... for 30 years," he noted. However, in recent years, usage rates have shot up to between 1,500 and 1,800 hours per aircraft per year.

"We know we're going so fast that ... instead of a 30-year life, it's only going to be a 25-year life, or 22," Lichte said.

In its unfunded requirements list sent to Congress earlier this year, the Air Force requested additional C-17s to make up for some of the excessive flight hours consumed during Operation Iraqi Freedom and Operation Enduring Freedom. That request recognized not only the C-17's heavy usage but also the fact that the earliest models are already 15 years old.

"We are halfway through its lifespan," Lichte noted. Additional aircraft would help AMC manage the fleet such that the C-17s can collectively age gracefully and predictably, and remain in service as long as they have to.

### A Never-Ending Debate

To relieve the overuse issue, Lichte said, some C-17s might be shifted to the Guard and Reserve. Although the reserve component is flying at a higher than normal operating tempo, it still flies somewhat less often than does the active force.

"If we want to slow down the use of the airplanes," Lichte said, "we'd think about putting them in the Guard and Reserve."

The C-17 is not the only aircraft being overused, though. According to AMC charts, the C-130 fleet has already flown past 112 percent of its planned life expectancy. The C-5B is at 147 percent, the KC-10 at 156 percent, and the KC-135 tanker fleet at 184 percent.

The adequacy of airlift issue isn't being ignored, but it tends to be debated over and over again. That's partly because new missions for air mobility routinely present themselves and raise the question of how much is enough.

Air Force airlifters have in recent years been the high-visibility face of the US in humanitarian relief to victims of natural disasters worldwide. Airlift made it possible to open a northern front in the Iraq War of 2003. In August, C-17s were called on to quickly repatriate Georgian troops serving in Iraq when their country was attacked by Russia. The C-17s then provided supplies to the embattled capital of Tbilisi, in a mission not unlike that of the Berlin Airlift.

The C-17 is in production, and Congress has signaled that, for now at least, it wants to keep the line open. New C-130Js are being bought, though slowly. A major C-5 upgrade is in test. A new small tactical airlifter, the C-27J, has begun.

(However, a new tanker program, although authorized and funded, was suddenly aborted in September, due to contracting issues.) Still, aircraft programs don't yield operational capability overnight, and the nation has to stick with it, Lichte asserted.

"All of our modernization programs are going to take a long time, ... involving long-term commitments of resources and long-term public support," he observed.

Two big mobility studies have affected the size of USAF's airlift fleet in recent years. The first was the Mobility Requirements Study 2005—completed in 2000—which stated how much airlift was needed to carry out national strategy

USAF photo by SSgt. Jacob N. Bailey

*Paratroopers of the 82nd Airborne Division jump from a C-130 at Ft. Bragg, N.C. The War on Terror has required Air Force mobility aircraft to continuously transport and resupply ground troops.*

USAF photo by SrA. Julianne Showalter

*Airmen bring a Stryker aboard a C-5 for transport from Joint Base Balad, Iraq. USAF recently approved parallel upgrade programs for the C-5A and C-5B fleets.*

at that time. It stated a minimum airlift requirement of 54.5 million ton miles a day of capability, comprising both Air Force and commercial carriers. That was about 15 percent higher than what AMC could then provide. Moreover, it didn't address the needs of special operations forces or set a course for tactical airlift.

Its shortcomings aside, the MRS-05, as it was known, was rendered immediately obsolete on 9/11. In the seven-year Global War on Terror that followed, airlift usage shot up, and special operations forces and tactical airlift became hugely important.

Then, in 2005, a Mobility Capabilities Study was undertaken. It didn't assess how much lift was needed in the way the MRS-05 did, but rather how much was on hand, and what could be done with it. The document was folded into the 2005 Quadrennial Defense Review, and as a stand-alone document, it was classified. Defense officials have suggested that this was done because, if no minimum requirements for lift were made public, no one could be accused of failing to meet them.

The QDR report contained a summary of the MCS, saying that existing airlift assets were sufficient through 2013. In strategic lift, it stated a range of 292 to 383 aircraft as appropriate.

Earlier this year, when deciding whether to keep a C-5 upgrade program alive, the Joint Requirements Oversight Council said that the Air Force must have 33.95 million ton miles a day of airlift capability in its own fleet, to be supplemented by commercial carriers. In July, among written answers to Congress for his confirmation to be the new head of US Transportation Command, Gen. Duncan J. McNabb said he does not "currently perceive there to be a shortage of intertheater airlift."

## The Numbers Game

Now, there are two major studies of air mobility currently under way. The bigger one, called the Mobility Capabilities Requirements Study, is being done by the Pentagon's program analysis and evaluation shop, in partnership with US Transportation Command. Its charter is to "identify alternatives in mobility capabilities (including intertheater fleet mix) and requirements to support the defense strategy." It's supposed to be finished next spring.

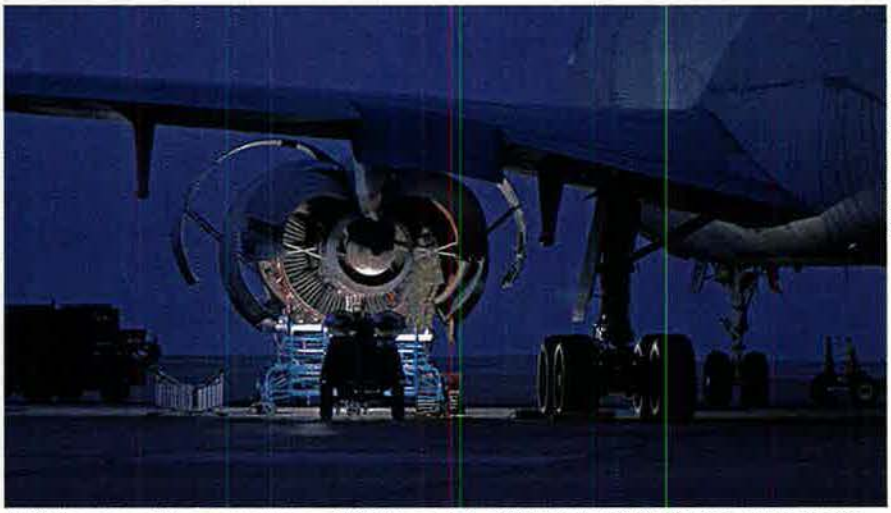
Lichte noted that the MCRS will project requirements out through 2016. It will take into account whether the Air Force needs more airlift to accommodate the Army and Marine Corps, which are growing by a combined 92,000 troops. However, the study won't be able to determine what will be needed to move the Army's new Future Combat Systems, because the size and number of FCS vehicles remains unsettled.

The second study, being conducted by the Institute for Defense Analyses, has a shorter fuse. Congress directed this study, to be done by Jan. 10, 2009, to look at the trade-offs between buying more C-17s and fixing up the C-5 Galaxy fleet. As part of the analysis, alternatives such as heavier reliance on commercial lift, the cost of stopping and restarting the C-17 line, likely aircraft service life, and the prospect of using tankers to haul cargo are all to be looked at.

In April, the Government Accountability Office reviewed a draft of the study and found that it "lacks sufficient detail" to be of much use to lawmakers, and said it didn't answer the questions it was intended to. The GAO suggested that Pentagon acquisition, technology, and logistics chief John J. Young Jr. be instructed to ensure the study is more "robust" and provides the needed data.

For about two years, Air Force leaders have been sticking to a figure of about 300 strategic airlifters overall as being a suitable number for the missions the service will have to perform.

Although there were only 180 C-17s on order when the MRS-05 was finished, the Air Force has had 25 airplanes added to the program by Congress since then.



USAF photo by MSgt. Lance Cheung

*Maintenance airmen work on a KC-10 engine at Travis AFB, Calif. The Extender is the Air Force's "new" tanker, but is 25 years old.*

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USAF photo by SrA. Brian Ferguson

***A KC-135 out of MacDill AFB, Fla., maneuvers on a runway as a C-5 Galaxy (background) takes off. The KC-135 and C-5 are among the Air Force's oldest aircraft.***

Ten were added in Fiscal Year 2007. In the Fiscal Year 2008 supplemental budget, 15 were added, bringing USAF up to a total of 205; the contract was being negotiated in August. The additional buy will keep the airlifter in production until August of 2010. In Fiscal 2009 defense budget bill discussions, the House Armed Services Committee approved a further 15, but this wasn't matched in the Senate version. The issue was one to be resolved in the House-Senate budget conference.

Lichte believes the level of 205 C-17s is "in the right ballpark" of the number AMC needs.

"We understand that 205 is the program of record, and we're managing to that," Lichte said. That number assumes, however, that there will be success in updating the C-5 Galaxy.

Two parallel upgrades are being done on the C-5. One is called the Avionics Modernization Program, which adds new displays and electronics to the aircraft, toward improving reliability. By mid-August, 42 C-5As had received the AMP.

The second is the Reliability Enhancement and Re-engining Program, or RERP, which adds new engines and makes other structural changes meant to improve the C-5's departure reliability, which has never been great and which has declined in recent years. The C-5's mission capable rate, a key indicator of a system's health, has been hovering around 50 percent for the last year.

Three C-5 aircraft were modified with the RERP: two C-5Bs and one C-5A. Flight testing of the three aircraft wrapped up in August, to be followed by operational testing. All the answers on whether the C-5 upgrade does what it's supposed to—provide a 75 percent on-time departure rate—should be in hand by early 2010.

### C-5Ms Make the Grade

In the fall of 2007, the C-5 RERP project was declared to be a Nunn-McCurdy breach, meaning it had increased in cost more than 25 percent above budget. In February, the Pentagon saved the program by certifying that it is critical, but to cut costs, it eliminated doing the upgrade on the oldest C-5A airplanes (except for the one already modified). Only 51 C-5B/Cs in total will get the RERP, which will bring them to what's now called C-5M Super Galaxy configuration.

By law, the Air Force can't retire any C-5As until RERP operational test and evaluation is finished.

Lichte said Air Force evaluators are "very impressed" with the C-5Ms in flight test.

"They haven't had any problems with the engines or the avionics stuff. If anything goes wrong, it's usually with some of the old legacy business, but even that has been performing very, very well."

He is confident the C-5M will prove out.

"I've got my fingers crossed; I think this is going to work," he said.

If it does, the Air Force will likely ask Congress to let it start retiring some of the nonupgraded C-5As. In April, Gen. Norton A. Schwartz, then head of TRANSCOM and now Chief of Staff, told the HASC that if more than 205 C-17s are acquired, it should ramp down in Galaxys.

"If you build above 205 C-17s, it means taking capacity out elsewhere, which probably means C-5As," Schwartz told the House panel. Schwartz has long maintained that to buy too much "organic" airlift capability would be detrimental, since it would reduce the amount of work available for commercial carriers, on which AMC depends heavily. Reduced work might cause participants in the Civil Reserve Air Fleet, or CRAF, to exit the program, robbing the Air Force of an economical augment to its airlift portfolio.

"The CRAF right now is doing very, very well," Lichte reported. "We're providing them with a lot of business, and so they are very happy with that." CRAF participants carry the majority of passengers that travel back and forth from their home bases to deployments in Iraq and Afghanistan, while AMC carries most of the cargo.

However, with the airline and air freight industries suffering from high fuel costs and dropping demand, Lichte said AMC will be watching the market closely for signs that the CRAF could be in peril. In the near term, he doesn't see a problem.

"Even if we decide ... that we're not doing Iraq and Afghanistan anymore, it's going to take us another couple of years to get everybody ... and ... all the equipment back home," Lichte predicted. "It's not going to happen overnight."

Should the passenger-carrying business fall precipitously, Lichte said there will still be a "business case" for companies to be in the freight-flying enterprise. However, if there is a steep drop in Defense Department passenger traffic due to a pullback from Southwest Asia, "they are going to have to find other markets," Lichte acknowledged.

A huge factor in the mobility equation will be the new KC-X tanker. In February, the Air Force selected the Northrop Grumman KC-30 to replace the oldest USAF tankers, the KC-135Es. The Eisenhower-vintage KC-135Es have become so frail, Lichte said, that it is no longer economical to fly them, and the last E models in the fleet are either already being retired or are grounded pending retirement.

"It's not like we really chose to do that," Lichte said, but the engine struts

## The Labors of Hercules

The Air Force laid out a new master plan for its C-130 fleet in late August, under which it would build an inventory of 132 cargo-dedicated C-130Js (not including 40 more for special mission functions), retire all its oldest E models by 2015, and extend the service lives of 221 H models another 20 years.

The E models, which date to the 1960s, are suffering heavily from structural fatigue and parts obsolescence, and must be retired, according to Maj. Gen. David S. Gray, USAF's director of global reach programs. The E model made headlines in recent years when it was discovered that cracks were developing in the type's center wing boxes—the key structural component—and the afflicted aircraft had to be grounded. Gray said the E models that don't have the cracks will soldier on without either a structural fix or the Avionics Modernization Program. The last of 89 E models now in the inventory will retire from active and Air Guard squadrons in 2015.

Savings from forgoing the upgrades and retiring the maintenance-intensive E models would be applied to buying more C-130Js, and USAF will seek approval for a new multityear contract, Gray said. He declined to say how many C-130Js the Air Force wants to buy annually, but Lockheed Martin has previously provided the service with quotes on up to 24 per year. The service has taken delivery of 51 cargo-version C-130Js so far (plus 17 weather and electronic combat models), meaning it wants another 81 of the transports, or just over three years' production at a multiyear rate.

The Pentagon has blessed a plan to upgrade 221 C-130Hs with both the AMP and center wing box replacement, which Gray said they will ultimately need. The Air Force hopes to perform 24 of the double upgrades per year; 47 have been done already. Although there's no funding yet for 47 further Air Mobility Command H models to be upgraded (82 noncargo, special mission aircraft, such as gunships, are also not funded), he said USAF will seek money in fiscal 2010 for those as well.

When the Hs have been modified, "what you're going to have is an aircraft that has the structural ability and the avionics necessary to allow this aircraft to continue to operate worldwide for the next 20 years," Gray asserted.

*—John A. Tirpak and Marc V. Schanz*

on the E models—a critical item and costly to replace—are no longer considered airworthy.

"Every time we put an E model into depot, we found more and more problems. It was getting more expensive" to fix them. Ultimately, Lichte decided, "we just can't do this any longer."

Because Congress has mandated that the E models be kept in condition capable of being returned to flight—at least until new-build tankers start arriving in service—USAF is being forced to spend money to keep them that way. Lichte was unable to say how much this costs, but noted that it is money that could be better spent on new airplanes. Even when Congress releases the last aircraft to be put in the boneyard at Davis-Monthan AFB, Ariz., it has insisted they be kept in "Type 1000 storage," which means they will be mothballed rather than scrapped. To return these aircraft to flight status would cost a minimum of $14 million apiece, to replace the engine struts alone.

Since the KC-135Es are no longer flying, AMC has decided to increase the rate at which it flies the KC-135Rs, which received a structural modification in the 1990s that made them "younger" than the E models, and gave them newer engines. Additional flight crews will be added, and E model technicians will be put to work on the Rs. However, AMC said that the Rs cannot keep up the pace indefinitely. They will have to be relieved by the new tanker, and soon.

Unfortunately, the new tanker program can't seem to get off the ground. Congress and the Pentagon agree that the need is urgent to replace the KC-135Es, and Congress has appropriated money to get the project moving. However, soon after the Air Force awarded the KC-X to Northrop Grumman, Boeing protested, saying it hadn't been treated fairly in the competition. (See "The Tanker Endgame?" June, p. 30, and "Travail of the Tanker," August, p. 54.) The GAO, which adjudicates such protests, agreed, finding "significant errors" in USAF's evaluation of the two competing bids. It recommended the competition be rerun.

Defense Secretary Robert M. Gates appointed Young to take over the tanker source selection, and to fix the identified mistakes without voiding the rest of the enormous data already obtained in the competition. However, citing "mistakes and missteps along the way," as well as a "highly charged" political environment, Gates terminated the KC-X competition on Sept. 10. He said it wasn't possible to fix the contract's problems by the end of 2008, and left it to the incoming Congress and Administration to "craft a new acquisition strategy."

Gates, in a statement for the press, said that in reaching his decision he concluded that "the current KC-135 fleet can be adequately maintained to

Photo by Bryan Williams Jones

***Technicians at Hill AFB, Utah, work on a disassembled C-130 Hercules. The head of Air Mobility Command wants to retire USAF's older C-130Es, many of which are grounded.***

Photo by Greg L. Davis

*This C-17 from the 58th Airlift Squadron, shown on the flight line at Altus AFB, Okla., is one of only 205 planned aircraft. That may be enough—if the C-5 can be successfully upgraded.*

satisfy Air Force missions for the near future." He said extra money would be requested in the Fiscal Year 2010-15 budgets to keep the KC-135 "at high mission capable rates." Gates added that he'd recommend that funding for the KC-X be continued, but suggested that Fiscal 2009 money would be diverted to other programs.

"It is my judgment that in the time remaining to us, we can no longer complete a competition that would be viewed as fair and objective," Gates asserted.

The tanker has been the Air Force's No. 1, most critical modernization priority for several years, and Lichte said, "I honestly do not care which tanker is the one we are given. We just need to get on with it."

Further delay in bringing on the new airplane poses a grave challenge, Lichte said. He noted that, although the KC-135R—and much of the airlift fleet—is spending less time in depot, that's due to the efficiency of the depot system. Actually, more faults are being found, and the list of old items needing ever-increasing inspections, repair, or replacement is growing long, he said.

"I am very confident that our KC-135s are good for the near term," Lichte asserted. "But for every year that we [delay introducing a new tanker], it's going to pop out on the far side." He said that if the new tankers don't arrive starting within three years, "we may be pushing out into 2050-something" with the KC-135R. "And at [that] point, we'll be flying 100-year-old airplanes." Given that AMC's older types are showing so many age-related faults, such as corrosion, bad wiring, and failure of "life of the airplane" parts never expected to serve more than two decades, Lichte doubts the fleet can hold out so long.

## Modernize, and Quickly

His nightmare scenario is that the entire KC-135 fleet is grounded by a fleetwide defect, leaving the 59 KC-10s alone to perform the entire tanking mission.

"If something catastrophic happens," Lichte said, "we would press the KC-10 into full-blown operation. But keep in mind, the KC-10 is 25 years old, now, too. ... It's no longer a teenager."

The KC-10 was always intended to be a "bridge" to the new tanker, and there were ambitious plans to modernize it with new avionics and other enhancements. However, "whoops, we didn't do it," Lichte explained. "We didn't have the money. And so now, we are in a program to try to modernize it as quickly as possible, at least on the avionics," so it will be compliant with international air traffic management rules and able to fly in the "sweet airspace" of the most efficient routes and altitudes.

Besides giving the Air Force a more reliable tanker, Lichte said a new machine will expand USAF's tanker capabilities. It will have defensive systems, allowing it to get closer to the battle than its predecessors. Combat aircraft won't have to fly as far or as long to refuel, keeping them near or over the target longer. Simultaneous ability to refuel with either a boom or a drogue means USAF won't have to turn away anyone who needs gas in a hurry, Lichte said. A new tanker's network-centric capabilities would give managers back at AMC headquarters at Scott AFB, Ill., the ability to position its aircraft, worldwide, as if they were on a huge chessboard, knowing at a click what each one is carrying, how much fuel it has, and where it can divert to if needed.

Being a 50-year leap ahead in capability over the KC-135, a new tanker would offer capabilities "we haven't even thought of yet," Lichte said.

In tactical airlift, Lichte said he thinks USAF will continue to buy C-130Js.

"We want a cargo delivery fleet of 132 C-130Js," and to perform the AMP on as many older C-130Hs that are deemed capable of remaining in economical service, Lichte said. The service initially wanted to AMP 519 C-130Es and Hs, but after another Nunn-McCurdy breach, the program was descoped to include only 221 H models.

Lichte wants to get rid of the C-130Es, which are fragile and many of which are grounded because of cracked wing boxes. The C-17 and C-130 will continue to share the job of performing in-theater, tactical airlift, abetted to some degree by the new, smaller C-27J, on which the Air Force is partnered with the Army. There's a business case for the C-27J, he said, for those times when "you're not moving a lot, but it's critical that you move a little bit, over a relatively short distance."

A new capability has drawn into high relief the question of whether the Army really needs to be involved in the airborne resupply mission, Lichte said. That capability is the Joint Precision Air-Drop System, or JPADS. Using a GPS-aided navigation system not unlike that used on bombs, a JPADS-equipped, 2,000-pound pallet can be precisely parachuted to within a few feet of any coordinates. In one test, Lichte said, two pallets were dropped to the same coordinates, and the second actually landed on top of the first.

For now, JPADS is in its infancy and it's too soon to wonder whether it can take over the mission of an actual aircraft, such as the C-27J.

"Right now, it's a nice capability and it really enhances what we're doing," Lichte noted. "But I think the more ... the Army and marines realize that we can do this, ... then we'll have to start questioning ... why do you need a helicopter to take three boxes and something up there? Why couldn't we just precision-airdrop it and put it right at the guy's doorstep?" ■

# Verbatim

By John T. Correll, Contributing Editor

**Creeping Militarization**

"In the campaign against terrorist networks and other extremists, we know that direct military force will continue to have a role. But over the long term, we cannot kill or capture our way to victory. What the Pentagon calls 'kinetic' operations should be subordinate to measures to promote participation in government, economic programs to spur development, and efforts to address the grievances that often lie at the heart of insurgencies and among the discontented from which the terrorists recruit."***—Secretary of Defense Robert M. Gates, warning of "creeping militarization" in US foreign policy, speech to US Global Leadership Campaign, July 15.***

**Their Own Air Force**

"I don't see any reduction in the need for combat aviation; in fact, it's increasing. ... Commanders and soldiers want Army aviation—it's such a combat multiplier, ... [and they're] asking for more right now."***—Army Vice Chief of Staff Gen. Richard A. Cody,*** **Defense Daily,** ***Aug. 1.***

**Nonaligned, It Says Here**

"The big powers are going down. They have come to the end of their power, and the world is on the verge of entering a new, promising era."***—Iranian President Mahmoud Ahmadinejad in keynote speech to 120-nation Nonaligned Movement conference, which endorsed Iran's nuclear program, Associated Press, July 29.***

**The Pentagon's Assumption**

"Today, the Pentagon doesn't have a coherent plan for how it will sustain global air dominance over the next 30 years without a sufficient number of F-22s because it has convinced itself that unconventional warfare is the wave of the future. In other words, it doesn't think US air dominance will be challenged. Not surprisingly, some potential adversaries like Russia see this as an invitation to begin competing again for command of the skies."***—Loren B. Thompson, Lexington Institute, July 16.***

**Job Advantage**

"I've hired a lot of people, and typically the military guys are better educated. You have [retired] lieutenant colonels who have Ph.D.s, and have spent 20 years in the military doing their jobs. Then you have a GS-15 with a master's degree and who doesn't have as much experience. Who do you pick?"***—Unidentified Defense Department "senior executive" on why retired military officers often beat out career civil servants for defense top jobs,*** **Federal Times,** ***July 28.***

**Deadly Stare**

"Today we are in an environment where we may not need the large number or persistence of manned aircraft. We can put unmanned aircraft—Predator, Reaper, and other assets—overhead for long endurance periods. We call that persistent stare. And with the Reaper, armed with Hellfire and 500-pound precision weapons, we'll be able to have a deadly stare if needed."***—Lt. Gen. Gary L. North, commander of US air forces in Southwest Asia, Agence France-Presse, Aug. 4.***

**Two Is Enough**

"Right now I'm fighting two wars and I don't need a third one."***—Adm. Michael G. Mullen, Chairman of the Joint Chiefs of Staff, on consequences of potential conflict with Iran, "Fox News Sunday," July 20.***

**TSA and the Troops**

"Law enforcement officers can go through with just a note from the sheriff, and here we have military guys who just got back from serving their country in Iraq. It stunned me [that] they are having to take off their lace-up boots. It's ludicrous."***—Rep. John Mica (R-Fla.), leading a push to change Transportation Security Administration treatment of military personnel returning home from war zones,*** **Washington Times,** ***July 24.***

**Roots of an Attitude**

"Anti-American feeling was entrenched before Iraq. Even in Britain, where there is a deep and pervasive affection for the US (and far more anxious talk about the fraying of the 'special relationship' between the two countries than you ever hear in the US), the grumbling undercurrents were getting louder through the 1990s. That mood—far stronger in continental Europe—drew new energy from the fall of the Soviet Union, which left the US as the sole superpower, and freed Europe from its dependence on American protection against the threat to the east."***—Bronwen Maddox,*** **Times of London** ***chief foreign commentator,*** **Wall Street Journal,** ***July 21.***

**Tell It Now**

"Getting these oral histories now is important, because once [the veterans] are gone, their stories are gone forever."***—Steve Hollingshead, Department of Veterans Affairs, calling on veterans to participate in VA's Veterans History Project, Air Force Print News, Aug. 1.***

**Doesn't Work**

"Military might against al Qaeda and other terrorist groups isn't working—and no wonder. After studying the record of 648 terrorist groups between 1968 and 2006, we've found that military force has rarely been effective in defeating this enemy. Indeed, the US reliance on military force—especially conventional military forces—has often been counterproductive."***—Seth G. Jones and Martin C. Libicki, RAND, "Stop the 'War' on Terror,"*** **Christian Science Monitor,** ***Aug. 6.***

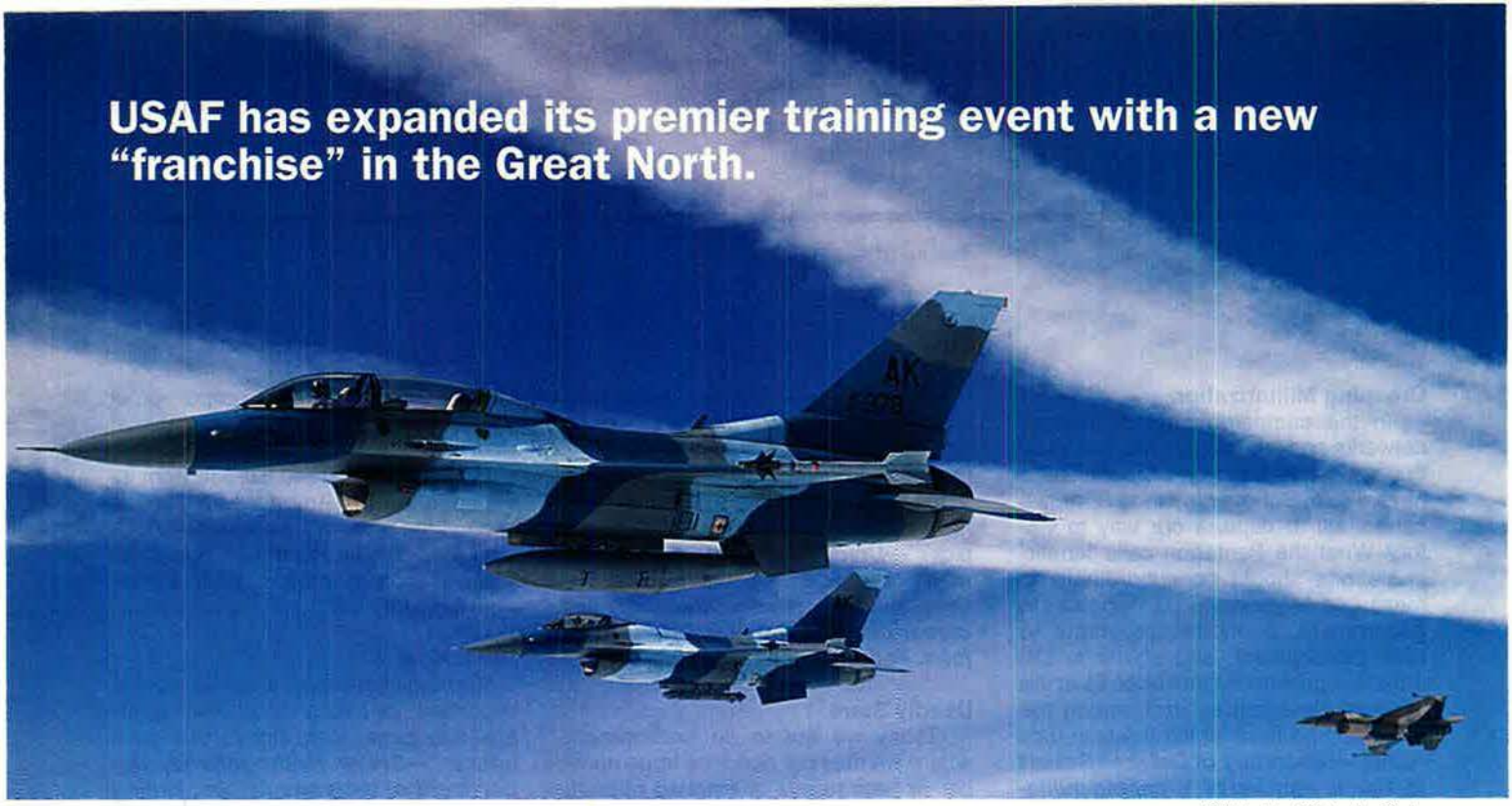
**Top Objective of Strategy**

"For the foreseeable future, winning the Long War against violent extremist movements will be the central objective of the US."***—New National Defense Strategy, released to the public by the Department of Defense, July 31.***

**Five Percent**

"We need to reach a consensus between the President, the Congress, and the American taxpayer over what adequate force levels cost, over spending plans that offer at least five years of continuity for core programs, and over the strategy and force posture we will actually fund. ... The end result may cost closer to five percent of our GDP than the four percent or less we have paid in recent years and now plan to pay in the future."***—Anthony H. Cordesman, Center for Strategic and International Studies,*** **Washington Times,** ***Aug. 10.***

**USAF has expanded its premier training event with a new "franchise" in the Great North.**



USAF photo by A1C Jonathan Snyder

# Red Flag Over Alaska

By Marc V. Schanz, Associate Editor

The back door of the C-17 hadn't been open more than a few minutes when the loadmasters shrugged and hit the switch to close up. Their planned airdrop, they were told, was an abort.

The weather was not cooperating. Worse, surface-to-air missile sites in the area had not yet been suppressed by Blue Air. So, it was time to get out of Dodge. The C-17 lurched and wove around a bit while the jolts of the egress from the drop zone rattled the brains of crew members. Then it was gone.

This could have been a combat mission over some far-distant drop zone. The sounds were the same. The actions were the same. Yet this "mission" was unfolding in Red Flag-Alaska, playing out over America's vast Pacific Alaskan Range Complex.


USAF photo by A1C Jonathan Steffen

The combat airdrop is just a snapshot of RF-A, the newest franchise in a successful air combat training program.

The Air Force's combat and mobility forces use Red Flag to master operations in realistic, high-stress situations. "It pays off when you have to go to war," said Lt. Col. Andy Hird, a veteran C-17 pilot who flew the transport on this particular mid-June mission. Hird is head of operations for the 517th Airlift Squadron, Elmendorf AFB, Alaska.

As if to emphasize that point, Hird recalled an incident from the 1990s, when he began flying these kinds of missions over the Balkans. He noted that the first time he ever talked to an E-3 AWACS aircrew member was when he was already en route to a combat zone. That was not an ideal situation, Hird noted.

Thanks to the Red Flag training missions, future aircrews won't have the same experience.

The new regime is an offshoot of USAF's former Cope Thunder exercise, established in 1976. It was elevated to Red Flag status in 2006 by the then Chief of Staff, Gen. T. Michael Moseley. The service's leaders saw an opportunity to enhance the Cope Thunder training in the wide open spaces of the American north, and it has turned out to be a profitable step.

### Links With Nellis

Not long ago, USAF's two main Alaska sites, Elmendorf Air Force Base and Eielson Air Force Base, could together handle some 600 Cope Thunder participants. Now, nearly twice that number are operating from Eielson alone, said Capt. Ronald K. Strobach, the senior team chief for RF-A at the 353rd Combat Training Squadron at Eielson—the host of the exercise.

Air Force leaders make a conscious link between the two components of Red Flag—the part in Alaska and the original part at Nellis AFB, Nev. They want to make sure that those training in Alaska don't replicate events in Nevada, and vice versa. Though much looks the same, the training regimes are different.

The guidance is for RF-A actions to be "comparable and complementary but not identical," said Brig. Gen. Mark W. Graper, commander of the 354th Fighter Wing at Eielson.

True to the Red Flag template, Eielson is the home of its very own aggressor squadron—the 18th AGRS—which flies F-16s adorned with the iconic Flanker-style paint schemes. The aggressors put participants through the aerial wringer over the course of the two-week event, held up to four times a year.

Red Flag was born from the Air Force's frustrations in Vietnam, after which it was determined that most pilots shot down were rookies with fewer than 10 combat missions under their belts. Red Flag gives junior aircrews the fog and friction of those critical first sorties in a controlled environment.

"Some of the things ... we strive to replicate [are] those first eight to 10 combat sorties," said Graper. The intensity and demands of the exercise are also the same. The difference is in the details.

The 18th Aggressor Squadron will eventually boast 24 fighters. Moreover, the Air Force is in the midst of a long-term buildup of infrastructure and capabilities for RF-A, though bad weather limits work to about five months out of the year. An estimated $57 million is allocated for range and infrastructure improvements over the next three to five years. The funding will be used to build new targets, upgrade current ones, and expand other facilities used on the range.

Those with firsthand experience at RF-A say the long trek north is worth it. The participants get to fit together,

Photo by Andre Benschop/Aeropromotion

***Left top: Three F-16 aggressors in the skies above Eielson AFB, Alaska. Left: Amn. Brad Ivey, a crew chief with the 354th Aircraft Maintenance Squadron, removes chaff from an 18th Aggressor Squadron F-16 during Red Flag-Alaska. Above: Both the pilot and the radar intercept officer in this German Tornado crane their necks to watch a B-1B taking off from Eielson during RF-A.***

USAF photo by A1C Jonathan Snyder

***A KC-10 Extender gasses up an F-22 26,000 feet above Eielson during Red Flag-Alaska.***

over US territory, all the pieces of an air operation before they do it in enemy airspace.

"Here, we're brought in on the air side, where we're learning how things work [together]," said TSgt. Nathan Hoffman, RF-A's joint terminal attack controller coordinator. He called the experience "a side of operations we don't normally see."

Added Graper, "I think it's a pretty accurate representation of how we prosecute an air campaign."

One realistic touch: working with allies. Foreign air force participants in June's RF-A 08-3 included airmen from the German Air Force, which sent 16 Tornado fighters to the exercise. The Japanese Air Self-Defense Force deployed several surface-to-air missile teams and ground control elements to Eielson, while JASDF F-15Js and an E-767 command and control aircraft deployed to Elmendorf. South Korea deployed a C-130 to Elmendorf to participate in airlift operations.

RF-A planners focus on tactical training—getting participants in the air, mixing it up and throwing curveballs. This keeps all the participants busy, said Maj. David Michaud, 18th AGRS assistant director of operations.

"We are flying 10 Red Air aircraft on any given day," he said. "If I fly, and I die every day, I'm doing my job because I'm training [Blue Forces]."

Using sites arrayed across the ranges, aggressors got shot down then flew back over the point to simulate regeneration from low altitude before re-entering the fight. Sometimes the aggressors were augmented by other forces, including allied participants (Japanese F-15Js, for example, have performed Red Air functions in the past over Alaska), while ground crews replicated a host of other threats.

The ranges, while not as sophisticated as those found at Nellis, host many relevant sites. There are simulated airfields, control facilities, bases, and surface-to-air threats arrayed across the ranges and live fire areas.

## Open Skies

Some 400 targets are spread out over the space, and the 353rd's targeting shop stays busy setting them up as everything from anti-aircraft artillery to rail switchyards. The new franchise's main asset is its backyard—the range complex known to fliers as "The Park." The sheer space of the place was the primary reason for bringing a Red Flag to Alaska in the first place. The main section of the ranges could cover the entire state of Florida, with room to spare.

"This is a fantastic training space ... that we cannot get at home," said Lt. Col. Oliver Eckstein, commander of the German Air Force contingent flying from Eielson.

German airmen had been flying in Alaska for a few weeks before the official start of the exercise. With demands ranging from participation in NATO response forces to flying reconnaissance over Afghanistan, Germany's need to train both aircrews and personnel for large deployed operations is crucial, Eckstein said.

"This is about as close to an operational detachment as you can get," he added.

The advantage is large. The Nellis ranges feature 12,000 square miles of airspace over mostly desert terrain which, while fully developed with threats and infrastructure, gives a distinct desert training experience. Over Alaska, however, participants have access to more than 64,000 square miles of airspace over Alaskan wilderness, with widely varied topography. The space is so vast that different weather systems converge from the north and south sides—creating yet another training hurdle for planners and crews to manage.

Lt. Col. John Koss, deployed from the 7th Bomb Wing at Dyess AFB, Tex., was the deployed forces commander for RF-A 08-3, the boss of the White Air forces. Koss made sure all the Red and Blue elements got where they needed to be, and early in the exercise he already had his hands full.

Koss gave a bird's eye view of what was unfolding in the distance as a pair of B-1Bs rumbled off the flight line. The large-force exercise was set to go for the first hour as soon as the "war call" was made, followed by the close air support exercise.

Based on the weather, and what "MiG One," the Red Air boss, said, Koss would decide if it would be a "high war" (above the clouds), a "low war," or a mix of the two. Five minutes before 10 a.m., the call was made and the airmen sprang into action.

The Eielson auditorium for the morning mission brief was full as the day's mission commander—Capt. Dan King from the 9th Bomb Squadron at Dyess—gave a quick introduction and turned the podium over to the briefers. They reviewed the weather, strike packages, the air-to-air package, and intelligence.

SSgt. Steven Lewis, an intelligence briefer from the 55th Fighter Squadron, Shaw AFB, S.C., told pilots that "Aleskyan" forces had invaded a friendly allied country and a full-scale conflict was now under way, with coalition forces responding.

Intelligence suggested that targets were fortified with SA-6 and SA-11 batteries in strategic locations, with ground forces concentrated near the SA-11s to better protect them from air attack. Critical infrastructure had been protected with SA-8s and assorted anti-aircraft artillery emplacements.

Those flying in the south "might get some harassment from Flanker bases in the area," Lewis cautioned. The Red fighters should engage slightly past

USAF photo by SSgt. Joshua Strang

***Four pilots from the 64th Aggressor Squadron, Nellis AFB, Nev., step to their aircraft on the flight line at Eielson during Red Flag-Alaska exercises.***

the "MIZZI line"—a sort of bull's eye airspace reference point for all Blue Forces that separates certain aspects of the fight.

"Engage and acquire your targets autonomously and watch for possible airborne jamming of your radars," Lewis said. Soon, the aggressor pilots left to prepare for takeoff.

The diversity of pilots and operators in the room was indicative of the Red Flag enterprise's shift over the years. It has evolved from being a mass air-to-air battle over the Nevada desert to a close simulation of an actual expeditionary war, featuring not only aerial combat but air-to-ground operations, airlift, and so on.

"It used to be two big walls of airplanes coming together and mixing it up," Koss said of Red Flags from days past. After the Gulf War, the Air Force began to work on integrating air-to-air with air-to-ground assets as well—throwing elements such as air defense suppression and ground-based controllers into the mix.

A short Humvee ride from Eielson, joint terminal attack controllers were on the ranges lining up targets for participants.

Hoffman said that by the end of the exercise, his teams planned to have conducted convoy operations, roadblocks, simulated infrastructure attacks, and a host of other scenarios from a different perspective.

"This is a way for JTACs to get beyond their comfort zone," Hoffman said, noting most of the controllers are used to working in an Army environment. It's also a push up. ... You're managing a lot of different assets and doing it the same way you'd do in a war."

From the participation of multiple services and allied forces to the dispersion of aircraft and personnel across two geographically separated locations, the goal was to create the feel of an expeditionary combat environment.

## Masses of Aircraft

It felt like expeditionary combat, said Capt. Alison Shore, an E-3 mission crew member from Kadena Air Base on the Japanese island of Okinawa. Shore's unit was working alongside an E-767 crew from Japan to deconflict the masses of aircraft. On any given day, some 60 to 90 aircraft would be involved in the fray.

"At Kadena, you're doing four to eight F-15s at a time," she said. "Here it's totally different. It's the only real replications of what you'd see in combat."

For those on the ground, the response was similar.

First Lt. Josephine Beacham—the tanker task force maintenance officer in charge—made sure RF-A's tankers were in the right spaces at the right times. Tankers from MacDill AFB, Fla., Grand Forks AFB, N.D., and Kadena were all in the mix.

Handling all of these aircraft wasn't always easy. Beacham said one of the tankers had a fuel cell problem, forcing it to abort a takeoff. "Mission capable rates will fluctuate, especially in an exercise like this," she said. "You don't know when the jet will break."

For that reason, RF-A effectively puts maintainers through the paces, she said, because the deployed perspective is better here than any home station training. "The lieutenants, the sergeants, ... this is a great chance for us to perform missions," said Beacham. "Here we can make mistakes that we can't afford in the desert."

In Alaska, events are not as technically sophisticated as those found in Nevada, but the flexibility of the exercise allows commanders and planners a wide range of options.

The Germans "have been here a couple weeks training, and that's advantageous because if you fly to Alaska you want to get your money's worth," Graper said. " 'Arrive early, stay late,' is our mantra, and it's because we have the range space and the airspace to accommodate that."

Another difference: dispersion of forces across two big bases, Eielson and Elmendorf. Face-to-face debriefing after a day of flying isn't available. The upside, though, is that situation is very realistic. Pilots and maintainers will likely be asked to fight in a similar environment, within a network of dispersed operations centers and airfields.

Just over 40 minutes out of Elmendorf, 1st Lt. Joe Aubert—a C-17 pilot deployed from Hickam AFB, Hawaii—refreshed the plan for his flight with Hird, the mission's pilot. The airlifter was to fly under escort by A-10s and F-16CJs, hold back as the fighters attack ground targets, and then proceed to the drop zone.

Suddenly a siren wailed over the din of the engines and a calm computerized voice informed the crew that a missile launch had been detected. There was a flurry of activity, as Aubert dodged behind the aircraft's cockpit bulkhead and pulled several pins out near the top. These were the safeties for the aircraft's flares and countermeasures. The simulated countermeasures were launched as a precaution and the aircraft accelerated.

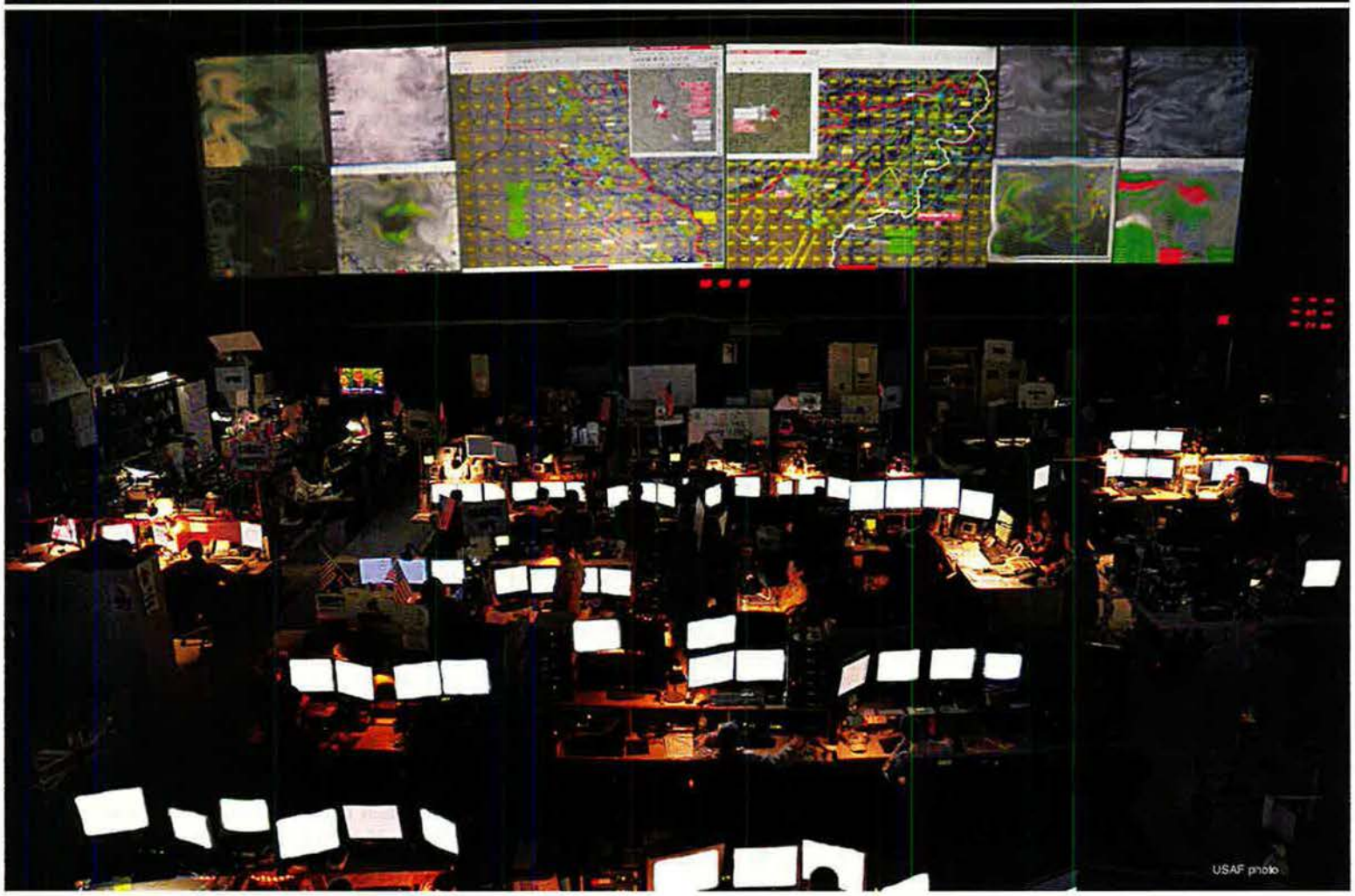
A few minutes later, Hird gave the all-clear.

The scenario, and many like it, played out many times during the course of RF-A's missions. By the end of exercise 08-3, all 103 participating aircraft had flown a total of 1,222 sorties and racked up 2,548 hours over the Alaska ranges. About 995 short tons of cargo were delivered and 279,000 pounds of munitions were dropped.

Everyone appeared to think the gain was worth the effort. ■

# Warheads on Foreheads

By Anna Mulrine



USAF photo

**The USAF-led combined air and space operations center is helping craft an "airman's view" of counterinsurgency warfare.**

The facility is located somewhere in the Persian Gulf region. Within the confines of US Central Command's combined air and space operations center (CAOC), scores of flat screen monitors project a stream of images that have been beamed back to Earth from aircraft patrolling in the skies above Iraq and Afghanistan.

Airmen here most closely watch the videos of US and allied forces under enemy fire. Such videos depict "troops in contact"—TICs, for short.

It is a TIC, in fact, that on this day occupies the attention of Lt. Gen. Gary L. North, the commander of US Air Forces Central and combined air forces in the Middle East. "The ground commander has said that we have troops in contact," said North, commenting as the video images flash across the monitors. He added, "We need [airpower] overhead, right now."

This is a common declaration within the CAOC, which is housed in a nondescript dun-colored building squirreled away on a remote base in a Mideast state that does not wish to be identified. There, scores of analysts pore over real-time intelligence from US and NATO sources, trying to piece together facts into an accurate view of reality "out there."

The CAOC has many missions, and this is among the most important. Troops that find themselves under fire in Iraq will see air support in 10 minutes, on average. In Afghanistan, the average elapsed time is 12 minutes. Times are

*In CAOCs such as the one pictured at left in an undisclosed location, analysts pore over real-time data provided by US and NATO manned and unmanned intelligence resources.*

down from 15 and 20 minutes, respectively, last year.

At a bank of computer terminals, in the high-ceilinged, low-light room, the Air Force coordinates air strikes, disseminates incoming intelligence, and orchestrates the delivery of a massive and steady stream of supplies for troops on the ground.

The CAOC is responsible for an area that sprawls across roughly 4,000 miles—about the distance between Anchorage, Alaska, and Key West, Fla. It is here that the Air Force is working hard to develop an "airman's view" of counterinsurgency. This view is based on precision attack and intelligence, both of which depend heavily on unmanned aerial vehicles.

UAVs—Predators, Global Hawks, Reapers, and more—deliver what CAOC denizens refer to as "persistent stare."

Attacks on the insurgents—officers call it "putting warheads on foreheads"—are now a major focus of the Air Force and a prime mission for armed Predator and Reaper unmanned aircraft.

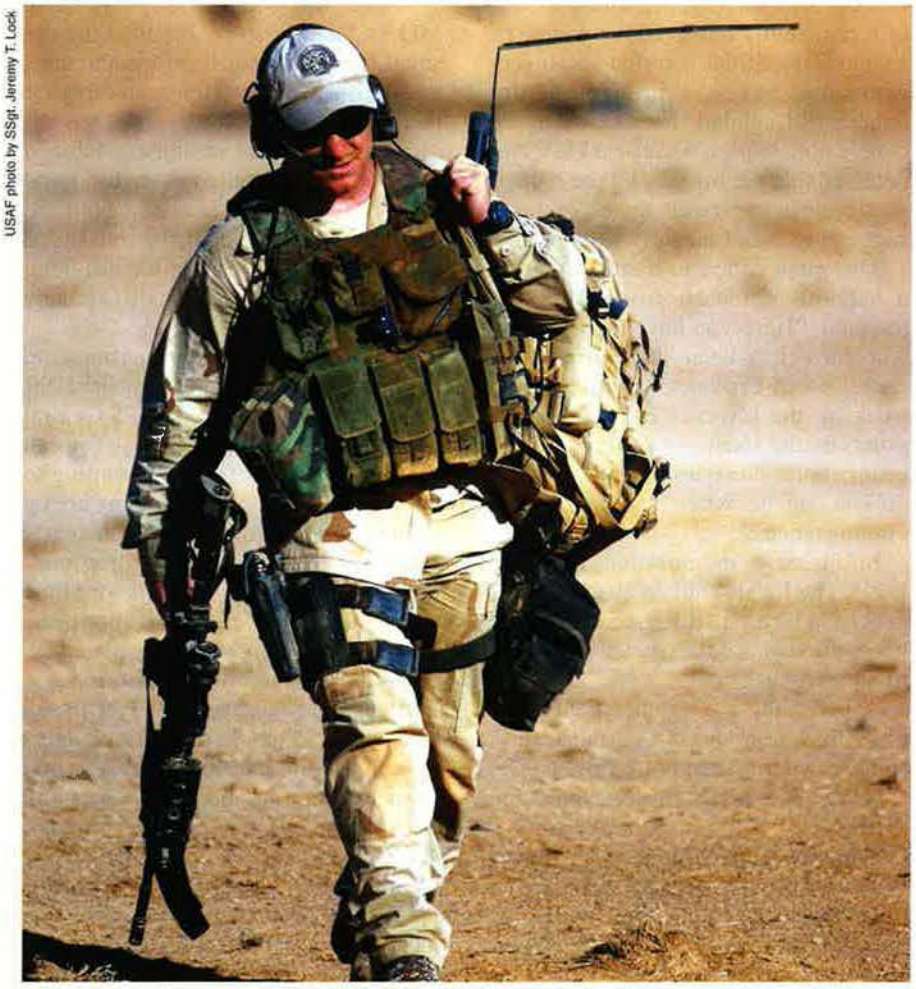
"What we're doing in a counterinsurgency war is looking for individuals and small groups," said Lt. Col. Walt Manwill, chief of combat operations here. "To do that, we have to find them, and make sure they are who we think they are."

The center painstakingly plans its combat strikes, calculating the size of bomb fragments and distances they travel from the strike sites. To do this, they use detailed maps and video footage, calculating the potential for human casualties as well as property damage. Here, analysts wear 3-D glasses to read maps that help them calculate the precise heights of palm trees and the walls of compounds, to help determine potential collateral damage.

USAF photo by MSgt. Andy Dunaway

*Six JDAMs released from a B-1B on March 10 take out an al Qaeda torture compound and prison in Zenbaraniyah, Iraq. The CAOC makes these operations possible.*

USAF photo by SSgt. Jeremy T. Lock



*A combat controller returns to his teammates after a firing exercise for Operation Enduring Freedom.*

## Stepping Up To the Task

Air Force personnel continuously look for ways to be more accurate. In Iraq, insurgents would shoot mortars and quickly make their getaways in cars moving at 50 to 70 miles per hour, so bombs were missing their targets.

"We decided that we've got to have a weapon that can hit something moving pretty fast," said North. "We were tired of dropping a weapon that [fell] short." In just eight months, the Air Force developed a new type of bomb, the laser and satellite guided Joint Direct Attack Munition, and put it into the field in Iraq.

Some recent advances in the counterinsurgency war are decidedly low tech. Until recently, for example, the Air Force's smallest bomb weighed 500 pounds and carried some 190 pounds of explosives. The Air Force

USAF photo by MSgt. Andy Dunaway

***A-10 Thunderbolts, such as this one over the Afghanistan countryside, are heavy-hitting force protectors for ground personnel.***

began pouring concrete into the nose of the bomb, leaving less than 30 pounds of explosives, mainly in the tail. That shortens the range of flying bomb fragments by as much as one-third, reducing the chances of injuring bystanders.

The Air Force is also using longer bomb fuses. Delaying an explosion by just a few milliseconds can mean that the bomb gets buried deeper into the ground before exploding, buffering its force.

"We know how far the frag pattern goes on every weapon," said Col. Gary L. Crowder, commander of the Air Force's 609th Air and Space Operations Center. "We know how far they go if I blow it up in the air, or 10 feet underground."

This spring, the air and space operations center oversaw use of a modified bomb with a delayed fuse dropped into the middle of a two-lane road "with houses on either side," said Crowder. After the bomb exploded, "there was no damage to the houses. ... That's the type of thing that gives commanders more choices, without the risk of collateral damage."

One of the innovations early in the war came from a staff sergeant who screwed a piece of wood onto a Predator frame and wrapped it with wire to make an antenna so his AC-130 gunship could receive the Predator's video feed. "So when his gunship shows up, he knows, 'This is a mosque,' and 'These are bad guys,'" said Crowder.

North added, "The absolute worst thing that could ever happen is to injure a noncombatant, or to kill a friendly in a fratricide."

North points to the killing in 2006 of al Qaeda leader Abu Musab al-Zarqawi in Iraq as the "perfect" example of how the CAOC's operations and intelligence sides come together. The tracking of Zarqawi took the military months, spent working to "piece together the intelligence to know exactly where he was in a building, in a date palm grove, to put two 500-pound bombs right on him," said North.

### "That's the A-10"

The promise and the problems associated with the air war were on display at the CAOC recently.

As grainy intelligence video rolled, officers silently observed the course of an Iraqi flatbed truck carrying passengers who were, they said, insurgents from outside of Baghdad. They reached this conclusion, in part, because a UAV had detected that the big gun on the flatbed was emitting infrared traces of heat, suggesting it had recently been fired.

The truck rolled to a stop. Nearby, a handful of locals strolled through the area. "Here you have three people who have just been shooting Americans," noted Crowder, pointing at the truck on the screen. "But there"—he points at the locals—"you have innocent people. The question now is, how do you engage, when, and under what circumstances?"

In this case, the question answered itself. The locals walked away to what proved to be a safe distance. The insurgents piled out of the truck and headed to a nearby tree line.

"There they are, giving themselves high fives for shooting Americans," said Crowder. "Aaand"—a brief pause, followed by a bright flash—"that's the A-10."

The powerful ground attack fighter is nowhere visible on the screen, but its effect is evident. The insurgents vanish in a burst of light, as does their flatbed truck.

Today, North added, the focus is on identifying and disrupting the terrorist networks. The Air Force's ability here "is getting better every day." To explain things, North resorted to a basketball analogy. "Sometimes we're playing zone defense, and sometimes we're playing man-to-man," North said. The latter approach is particularly helpful when US forces "know exactly who we want to get out of the network, because if you take that single person out, the entire network will fold."

Increasingly, the Air Force is turning to the MQ-9 Reaper UAV to help keep the insurgent heads down as the US troop surge tapers off and ground troops begin to head home. The Reaper has been flying in Afghanistan for just over a year, and in Iraq only since July.

While the MQ-1 Predator has a ceiling of about 25,000 feet, carries two laser guided Hellfire missiles, and can travel 135 miles per hour, the Reaper can fly twice as high, almost twice as fast, and carry eight times more weaponry, including two 500-pound GBU-12 laser guided bombs. It also has a range of more than 3,600 miles, compared to the Predator's 450 miles.

"We're not going to buy any more MQ-1s, or Predators, because they're small, they have finite legs for endurance, and the only weapons they can carry are the Hellfire," said North.

These UAVs are in highest demand over Iraq and Afghanistan, for good reason. They are effective in both the reconnaissance and strike missions. They can remain on station for long periods and track individuals for many hours at a time.

USAF, in just a bit more than one year, has more than doubled the number of ISR platforms it operates in the US Central Command area of operations. "You can see right here," North said, pointing to the monitors. "That's how many are up right now. They allow us to persistently sit over an area of interest, develop intelligence for future operations, or allow us to get a [positive identification]," he added. "Our intelligence fuses all the way down to that point of execution."

It was more than a year ago, North said, that AFCENT challenged its planners to increase the intelligence take while using the same number of airplanes—in other words, do it better and smarter. The CAOC has since doubled its intake of full-motion video.

"If I give you a screen shot out of the movie 'Godfather,' can you tell me what it's about?" Crowder asks rhetorically.

"But if I show you the movie, you can. It's a huge difference."

Other intel is also pouring in. On the high-flying U-2 spyplanes, for example, USAF has added two and sometimes three data-collection pods. This "just sucks up all of these signals—including bad guys talking on their radios," said Crowder.

He went on, "If you have a convoy driving up the road, and the Taliban is talking on the radios, that information goes up to the U-2s and back to the United States where we have interpreters listening to the information full-time, and translating it in real time."

The information then goes back to the U-2 via satellite, which then conveys the data back to the guys on the ground. It's sometimes possible to geo-locate the signal, making it relatively easy for aircraft to find and attack enemy positions.

The trick is "taking intelligence and then focusing it like a power hose to whoever needs it at that time," Crowder said.

The Air Force has exponentially increased the number of Predator combat air patrols flown each day to meet the ever-expanding demand. Still, fielding enough qualified UAV pilots is an ongoing challenge. "Every time we graduate a couple of classes, ... every time we think we're getting to a reasonable manning level where people could get some time off, they say, 'Look here's another CAP,' and we go right back to being undermanned again," said Col. Trey Turner, commander of the 451st Expeditionary Group. Turner added that he has pilots who work 12 hours on, and 12 hours off for 120 days on a seven-days-a-week basis.

Currently the Air Force recruits pilots to fly Predators and Reapers for a three-year permanent change of station assignment.

"The problem with this is that you have a crew for three years, at the same time you're trying to grow capability," he said. "So every three years we're losing guys back to their normal weapons system. That's been one of the real challenges."

Turner went on to say that, for some pilots, "it's possible that they may not ever go back to their F-16s." The pilot's expectation, however, was that he would put in a UAV tour then go back to his previous aircraft. "That's a tough fix," he added, "a leadership challenge."

Manning is vital, Turner said, for defeating the counterinsurgency because the Predator and Reaper provide "a true asymmetric [weapon] that the enemy cannot defeat. There's nothing they can do to defeat the fact that we're watching them 24 hours a day, seven days a week."

USAF photo by SrA. Julianne Showalter

***An MQ-9 Reaper takes off on a mission from Joint Base Balad, Iraq. The unmanned aircraft can carry precision weapons, including two 500-pound laser guided bombs.***

## Armed and Watching

Among the 50 or so troops analyzing intelligence on the floor of the operations center, one finds a military lawyer on hand around the clock. If there is a question about the legality of a strike, particularly when it endangers civilians, a lawyer will interpret and explain the Law of Armed Conflict, the international treaties that prohibit the intentional targeting of noncombatants and require militaries to minimize risks to civilians.

"The guys on the ground are always concerned about somebody second-guessing them when they're getting shot at," said Col. Bill Carranza, the chief JAG officer within the CAOC. "My job is to give them options."

In counterinsurgency wars, the line between civilians and insurgents gets blurry, since insurgents and noncombatants live side by side. As a result, said Manwill, the chief of combat operations, rules-of-engagement questions abound. Having someone standing by to consult on legal issues, he added, gives commanders a useful check on their options.

One of the little-known CAOC missions is tracking and identifying every aircraft that flies over Iraq and Afghanistan, including commercial airline traffic.

"If they're not squawking the right code, we don't know who they are. If we don't, we will intercept them," said Crowder.

This is particularly important in Afghanistan, where the sale of overflight rights to commercial aircraft companies has turned into one of the country's largest sources of legal income. (The largest illegal source is sale of opium.)

In Iraq, concern centers more on a possible 9/11-style aviation attack; the worry is that a terrorist will crash an airplane into the US Embassy in Baghdad, devastating the Green Zone, or into one of the major mosques. "We watch that very carefully," said Crowder.

Crowder pointed out that, in 90 percent of the missions flown, USAF fighters and bombers do not drop a bomb or otherwise commit an act of force against an adversary. What they provide is "armed overwatch"—in other words, they furnish direct links to ground commanders to allow them to "see" what's going on around them.

For some time, every fighter has possessed a sophisticated downlink that passes full-motion video from its targeting pod to receivers on the ground and in the air. This past summer, the same kind of pod and downlink was installed on every bomber in the theater.

"I'm always tweaking the system," said North. "We're not doing things today the way we did a month ago," he added. "I'm changing things every day."

And there is little room for error. As Crowder said, "The mission is so complex and so different from anything the Air Force has ever done." ■

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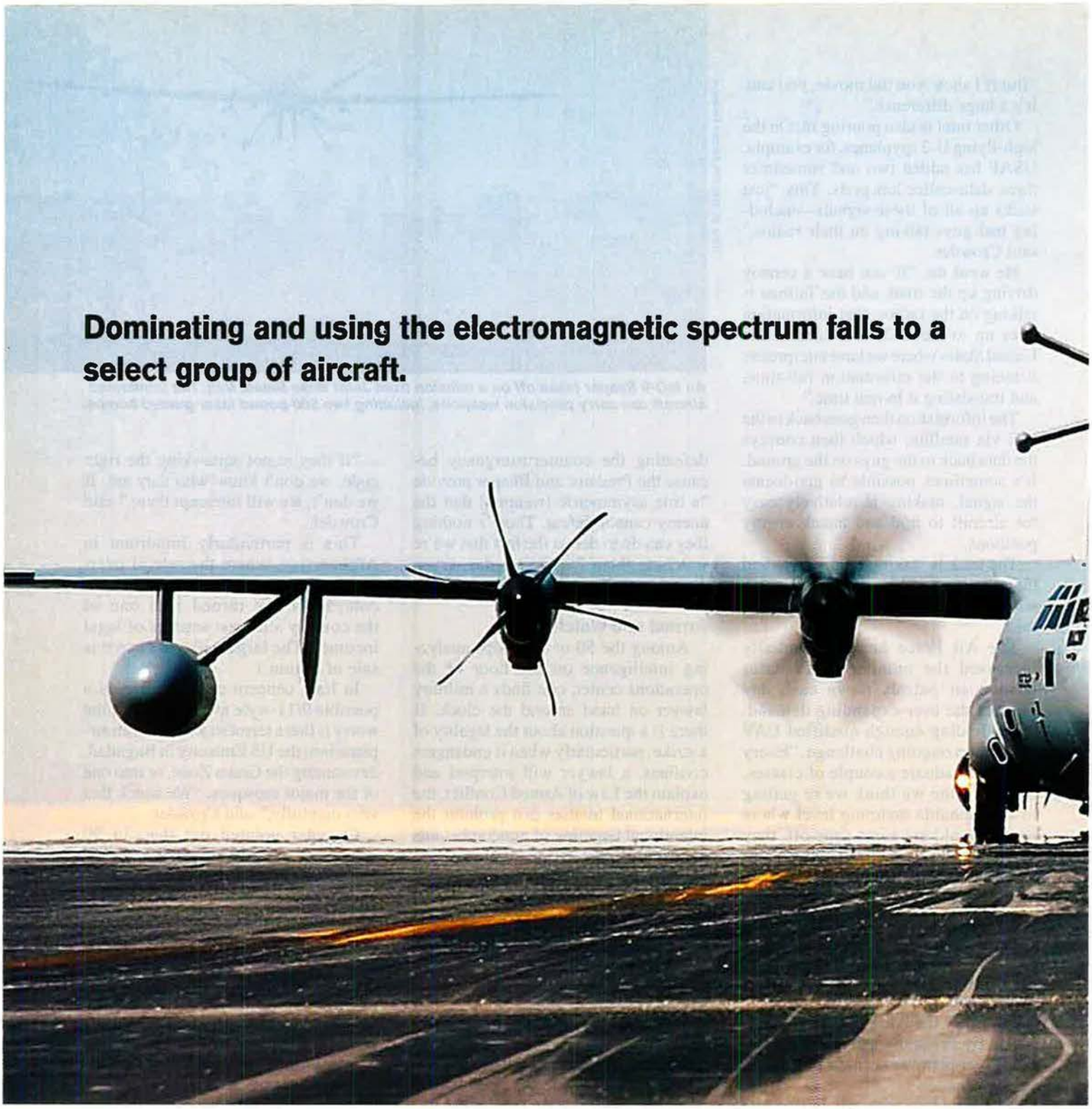
*Anna Mulrine, senior editor and defense correspondent for* US News & World Report *magazine, reports frequently from Iraq and Afghanistan. This is her first article for* Air Force *Magazine.*

**Dominating and using the electromagnetic spectrum falls to a select group of aircraft.**



# Warriors for t

*A Pennsylvania Air National Guard EC-130J Commando Solo readies for takeoff at a base in Southwest Asia. These flying TV and radio stations conduct information warfare operations, getting out the coalition message to local populations. The J models are among the newest in the electronic warfare inventory.*

# he Spectrum

**Photography by Jim Hazeltine**

USAF photo by SSgt. Tia Schroeder

*Electronic warfare is a broad discipline ranging from eavesdropping on communications to blinding an enemy's sensors. It is performed by a wide array of distinctive aircraft and dedicated specialists.*

*|1| EC-130H Compass Call aircraft, such as this one from Davis-Monthan AFB, Ariz., conduct jamming missions against enemy surface-to-air missiles and early warning radars. |2| Capt. C. J. Zaworski and SSgt. Jeremy Martin perform preflight checks in their RC-135W Rivet Joint. |3| An RC-135S Cobra Ball aircraft. Note the black wing, meant to reduce sunglare when the aircraft observes ballistic missile launches from afar. Note, too, the large round camera ports above the starboard cheek blister.*






*|4| An OC-135 aircraft, which makes overflights of countries signatory to the Open Skies treaty. |5| The RC-135W Rivet Joint is a signals intelligence platform distinguished by its long nose and bulbous "cheeks."*



***I1I*** *An EC-130J Commando Solo prepares to land after another mission in Southwest Asia.* ***I2I*** *SSgt. Jeremiah Curtain, an engine technician, reviews paperwork on an RC-135W Rivet Joint (in background). The "RJ" fleet is one of the most frequently updated and modified aircraft in USAF.* ***I3I*** *The E-4B National Airborne Operations Center in flight. The E-4B provides a flying command post for the President, Secretary of Defense, and Joint Chiefs of Staff in a national emergency, and carries a sophisticated suite of secure communications.* ***I4I*** *A crew chief at Offutt AFB, Neb., marshals a TC-135S, the trainer for the Cobra Ball.*

*|1|* *An E-3 Sentry of the 552nd Air Control Wing at Tinker AFB, Okla., takes off for a Red Flag mission at Nellis AFB, Nev.* *|2|* *An E-3 on final approach at Nellis after a Joint Expeditionary Force Experiment in April. Originally distinguished by its "flying saucer" radome, the E-3 now also sports cheek and chin radomes and bristles with additional antennas. It can track targets hundreds of miles away.* *|3|* *An RC-135U Combat Sent aircraft, with its unique chin radome. Beyond signals and communications intelligence, its mission is mysterious.* *|4|* *The RC-135V flown by the commander of the 55th Wing at Offutt, headquarters of the Rivet Joint fleet.* *|5|* *Lt. Col. Rody Janzen, Lt. Col. John Kratt, and Capt. Joey Laws (l-r), discuss an RC-135W preflight.*


Photo by Richard VanderMeulen

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5

Photo by Richard VanderMeulen

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*I1I The E-8C Joint STARS of the 116th Air Control Wing at Robins AFB, Ga., returns to Nellis after a JEFX exercise in early 2008. The E-8 carries a radar "canoe" under its forward half. It scans battlefields, providing moving target indications and other useful intelligence to commanders.* ***I2I*** *Capt. Keith Eveland preflights an RC-135 at Offutt.* ***I3I*** *L-r: pilot and copilot Capt. Jason Corbett and 1st Lt. Daniel Therrien and navigators Maj. Alex Bruzzano and Capt. Mike Forte on an RC-135.* ***I4I*** *A Cobra Ball is tracked by a Litening Advanced Targeting pod aboard an F-16, and displayed on the fighter's multifunction display.* ***I5I*** *One of only two Combat Sent aircraft, with its unique wingtips, tail, and nose fairings, banks away on another cloak-and-dagger mission.* ■

**It takes that many to make a modest reduction in fleet age. Getting there will be a neat trick.**

# Needed: 200 New Ai

**When** the Air Force's new leadership nominees sat at the witness table during their confirmation hearing this summer, the health of the force was foremost on the minds of many members of the Senate Armed Services Committee.

Lawmakers circled through questions for Gen. Norton A. Schwartz, the Chief of Staff nominee, and Michael B. Donley, the presumptive Air Force Secretary, that covered the waterfront from nuclear security to the increased reliance on unmanned aerial vehicles.

But the Senators returned several times to the issues most vexing to the operational Air Force. The one big question appeared to be the one without an immediate solution, short of pouring billions more dollars annually into the Air Force's budget.

"What is your solution ... to get rid of this aging aircraft problem?" asked Sen. James M. Inhofe (R-Okla.)

The Air Force's aircraft have been flying, on average, for 24 years, representing the oldest fleet in the service's 61-year history. Some aerial refueling tankers, in particular, date back to the 1950s, posing serious operational and maintenance challenges to an Air Force at war. The effect is real: USAF has seen its breakdown rates and its cost per flying hour each increase by about 17 percent since 9/11.

There is no quick fix in sight.

In order to merely sustain the fleet's average age, the Air Force would have to buy about 160 aircraft a year—roughly 50 more than the service typically purchases each year, said Schwartz, who was confirmed 10 days later to be the Air Force's 19th Chief of Staff.

To drive down that average age, Schwartz said, the Air Force would have to find room in its procurement accounts for a mind-bending 200 new aircraft every year.

But finding the modernization and recapitalization money needed for its fleet of tactical airlifters, bombers, search and rescue helicopters, tankers, and fighters is "going to be a neat trick," said Donley.

The standing force is wearing out and being replaced at a rate the service considers too slow. Meanwhile,

# craft a Year

By Megan Scully

Photo by Bryan William Jones

*A-10 attack aircraft go through repair, maintenance, and refurbishment at the Ogden Air Logistics Center, Hill AFB, Utah.*

nonstop wartime operations continue to grind down many segments of the force, with war supplemental funds never quite compensating for the accelerating wear and tear.

## Seeking Resources

Further compounding the Air Force's readiness problem was a personnel gamble that turned out to be a bust. USAF had hoped to use manpower savings to help pay for modernization, but the savings never materialized and the Air Force had to win approval to build its end strength back up.

Recognizing the strains of constant deployments, Defense Secretary Robert M. Gates recently announced that he would halt the Air Force's plan to cut the size of its force from 360,000 to 316,000 personnel. The force will stand, at least for the near term, at an end strength of about 330,000 personnel.

In sum, it was too few people who were too busy. They were operating too small an equipment force that was too old. Not exactly a recipe for improving readiness.

"We need more resources," said Donley in a measured understatement. But USAF is also dealing with what is known in Washington as a "resource constrained environment," and Donley (whose confirmation was held up in the Senate at press time) fully understands that.

"I have been in this town for 30 years and we always live in a resource constrained environment," he continued. "We have to make these trade-offs, and we are not always able to choose and implement the most effective acquisition profile for every program at the same time."

It is of course true that every aircraft the Air Force owns is aging from the day it rolls off the assembly line. But what is particularly troublesome is that the service has spent the last 17 years on a wartime footing and is now seeing age-related problems accelerating.

"Literally since 1991, since Desert Storm," Adm. Michael G. Mullen, Chairman of the Joint Chiefs of Staff, told reporters in June, the Air Force has been "pressed very hard in terms of aviation requirements."

"Part of the discussion that's been taking place," Mullen added, "has been how long the Air Force has been flying these airplanes."

Over the last several years, operational demands on the force have increased as the number of daily missions flown in Iraq and Afghanistan has grown steadily since the initial lull after the early days of the wars.

Perhaps that rising demand is felt nowhere as much as in the airlift community charged with transporting cargo and people through the war zones and around the world.

Indeed, the Air Force broke its record for the largest amount of cargo moved in a single day when it transported 3.92 million pounds of cargo this Feb. 29, according to Combined Forces Air Component Commander statistics provided by US Air Forces Central.

In March, the service moved 82.7 million pounds of cargo and nearly 120,000 passengers—setting two more records for War on Terror airlift operations.

Every month, the Air Force estimates that its airlift operations take between 9,000 and 10,000 people and at least 3,500 vehicles off the dangerous roads of Iraq. Improvised explosive device attacks are now down sharply, but the roads have been peppered with roadside bombs and other threats.

"We're putting them in C-130s and C-17s," then Air Force Chief of Staff Gen. T. Michael Moseley told reporters in February. "So, if you can take 3,500 [vehicles] and 9,000 people, at the low end, a month off the road, then that's some good work."

But airlift isn't the only area where the Air Force has seen an uptick in operations. Air strikes, for instance,

USAF photo by TSgt. Jeffrey Allen

***Airmen from the 447th Air Expeditionary Group place explosive charges on the wings of a C-130 that crash-landed in Iraq. It was a total loss.***

increased significantly between 2006 and 2007.

According to AFCENT, the total number of close air support and precision strike sorties flown by the US military and coalition members in Operation Iraqi Freedom and Operation Enduring Freedom jumped from 26,195 in 2006 to 33,519 just one year later.

Those figures, which are not broken out to include only USAF missions, are continuing on pace so far this year. By Aug. 4, AFCENT had counted 21,343 precision strike and close air support sorties.

A letup in Air Force effort is unlikely regardless of how many US ground forces stay in Iraq. Gen. John D. W. Corley, chief of Air Combat Command, told reporters earlier this year that he expects the military to leverage its combat advantage in the air well into the future.

"I can envision where we may return to a posture where there's fewer, if you will, forces on the ground and will continue to take advantage of that asymmetric advantage that you get from air," Corley said in March.

That could mean airpower via "unmanned aerial systems that possess both intel, surveillance, and reconnaissance capabilities, plus striking, or ... manned platforms in concert with some that are on the ground," he added.

As air operations have increased, there appears to be a corresponding effect on operational costs and failure rates since the outset of operations in Afghanistan and Iraq.

Indeed, between 2001 and 2007, failures on Air Force aircraft—as indicated by the "break rate," or failure per 100 sorties—have risen by 17 percent, according to the Air Force. (The maintenance community has clearly been pulling its weight, however—maintenance man-hours have remained fairly constant since 2002.)

### Issues of Priority

During that same period, overall operating cost per flying hour, adjusted for inflation, has risen by approximately the same 17 percent.

The issue, then, becomes one of prioritization of resources across the fleet. Without the extra $20 billion annually the Air Force has said repeatedly that it so desperately needs, where does the force spend its limited dollars?

"We have said that it's the [next generation] tanker first," Schwartz said. "That is the appropriate first priority, but I think we have to look across the fleet and dialogue with you, make sure each of the members of the committee appreciates the risks and the opportunities, and then gain consensus on a program for recapitalizing that fleet."

The heavy reliance on the force's ancient tanker fleet is clearly a concern to the Air Force leadership. Between 2006 and 2007, AFCENT saw coalition tanker sorties jump 24 percent from 12,787 to 15,875.

By Aug. 4, AFCENT already had counted 10,408 tanker sorties this year.

There has been a similar increase in the amount of fuel offloaded, which has grown from 740 million pounds in 2004 to 946 million pounds last year.

Although those figures include missions flown by allies and other services, the Air Force shoulders the lion's share of that load in airframes that date back decades.

"We're driving '57 tankers into combat today," said Maj. Gen. Loren M. Reno, commander of Oklahoma City Air Logistics Center, in June. "Our aircraft are old and we need to replace them."

During the confirmation hearing in July, Sen. John W. Warner (R-Va.),

USAF photo by MSgt. Ruby Zarzyczny

***SSgt. Kevin Brown, SSgt. Joseph Dodson, and SSgt. Jamie Sherwood (l-r) install a replacement engine on a KC-10 Extender.***

USAF photo by SSgt. Bennie J. Davis III

*A KC-135R is in line for a maintenance overhaul at the Oklahoma City Air Logistics Center, Tinker AFB, Okla. USAF will have to keep waiting for its replacement tanker.*

second-ranking member on the Senate Armed Services Committee, likewise expressed concerns about the age and operational stress on the tanker fleet.

"We're asking an awful lot of those young aviators to, night and day in any place in the world, roll them out, take them down that runway, take them off, hope and pray to come back with a good, safe landing," Warner said.

The Air Force, however, will have to keep waiting for its overdue new tankers.

In February, the service awarded a $35 billion deal to Northrop Grumman and EADS, the European parent company of Airbus, to build 179 KC-X tankers.

### Infinite Obstacles

But Boeing Co., the losing bidder, successfully protested the award with the Government Accountability Office, sparking a 100-day review. GAO ultimately found that Boeing would have had a "substantial chance" of winning the contract but for several Air Force errors, prompting Defense Secretary Robert M. Gates to reopen the competition.

Senior Pentagon officials had said they hoped the new competition would be wrapped up by the end of the year. But Gates on Sept. 10 terminated the competition, saying the politically sensitive program should be left to the new Administration.

Despite the bureaucratic and administrative hurdles the Pentagon must endure to award a new contract, the sense of urgency on buying new tankers is not lost on Congress, the Pentagon, or the Air Force's new set of leaders.

civil engineers, intelligence, transportation personnel, and security forces. In those fields, he said, so-called "dwell rates"—or the time spent at home—often are significantly less than the time spent deployed.

"So, is it stressing on our people? Yes, it is," Corley said. "Has the reduction in terms of overall number of people hurt? Yes, it has."

In addition to deploying troops for its more traditional missions, the Air Force is also sending roughly 6,000 airmen overseas at any given time to assist with traditional ground-force taskings. These "in lieu of" missions, which the Air Force is picking up so that the heavily deployed Army and Marine Corps can concentrate on ground combat operations, include convoy support and prison guard duty.

USAF photo by A1C Kenny Holston

*The propeller blades for a C-130 Hercules have been wheeled onto the flight line at Ramstein AB, Germany, ready to be installed.*

"The Air Force needs a new tanker; the joint warfighters need a new tanker," Donley told the Senators. "This is a critical capability that facilitates the projection of US influence around the globe."

The Air Force is still meeting its wartime requirements, but the job becomes increasingly difficult over time. Service leaders frequently refer to Air Force readiness as being maintained on the backs of its airmen.

Corley in March told reporters that USAF's most stressed career fields are

Gates, who has been harshly critical of the Air Force in many areas, recently praised Air Force personnel for their contributions to the war in Southwest Asia.

"Put simply, without the Air Force's contribution in the skies and in many cases on the ground, America's war effort would simply grind to a halt," Gates said July 24 at Lackland AFB, Tex. "Every soldier and marine in Iraq and Afghanistan is profoundly grateful to have you overhead watching out for them." ■

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*Megan Scully is the defense reporter for* National Journal's CongressDaily *in Washington, D.C., and a contributor to* National Journal *and* Government Executive. *Her most recent article for* Air Force *Magazine, "AFSO21 Progress Report," appeared in the July issue.*

Russia's lunge into Georgia was an attempt to gain regional leverage.

# Moscow's Pipeline Pressure Points

By Adam J. Hebert, Executive Editor


**The Adversaries in Brief**

| | Georgia | Russia |
|---|---|---|
| Population | 4.6 million | 140.7 million |
| Area (sq miles) | 27 million | 6,600 million |
| Regular troops | 18,000 | 1 million |
| Real GDP | $21 billion | $2,100 billion |
| GDP per capita | $4,700 | $14,700 |
| Oil prod. (bbl/day) | 2,000 | 10 million |
| Oil reserves (bbl) | 35 million | 60,000 million |

### Time Line of the Georgian-Russian War

**Aug. 7.** Georgian forces and separatists battle in South Ossetia.
**Aug. 7/Aug. 8.** Georgian troops reinforce South Ossetia.
**Aug. 8.** Russian President Dmitriy Medvedev vows to punish Georgia.
**Aug. 8-Aug. 10.** Russian troops and warplanes strike Georgia.
**Aug. 9.** President Bush backs Georgia's "territorial integrity."
**Aug. 10.** USAF airlifts a Georgian brigade of nearly 2,000 troops home from Iraq.
**Aug. 12.** Russia and Georgia agree to a cease-fire; Russian forces remain on Georgian territory.
**Aug. 13.** USAF begins humanitarian airlift flights to Georgia.
**Aug. 26.** Russia recognizes independence of breakaway areas.
**Aug. 27.** US and six allies condemn Moscow, call for full Russian withdrawal of forces.
**Sept. 5.** USS *Mount Whitney* begins unloading relief supplies at Georgian port of Poti, still partially occupied by Russian forces.

**Russia** on Aug. 8 struck tiny Georgia with an air and ground invasion. The assault was ostensibly to protect autonomous pro-Russian lands of South Ossetia and Abkhazia in the wake of fighting between South Ossetian and national Georgian forces.

It was an epic mismatch (see "The Adversaries in Brief," p. 58). Russia overwhelmed Georgian forces in the territories, moved into other parts of Georgia, and attacked garrisons, airfields, and ports. Russian warplanes bombed Georgian cities. They tried—but failed—to bomb a key pipeline.

The Baku-Tbilisi-Ceyhan oil line runs from Baku on the Caspian Sea, through Azerbaijan and Georgia, and on to a Turkish port on the Mediterranean. It is the only functioning oil line between Central Asia and the West that is free of Russian control.

As can be seen, it offers a fragile economic link between former Soviet Central Asia and the West. The attack is widely regarded as an attempt by Russia to intimidate its smaller, West-leaning neighbors and reassert its dominance and control—or at least hold hostage—Central Asian energy supplies. ■



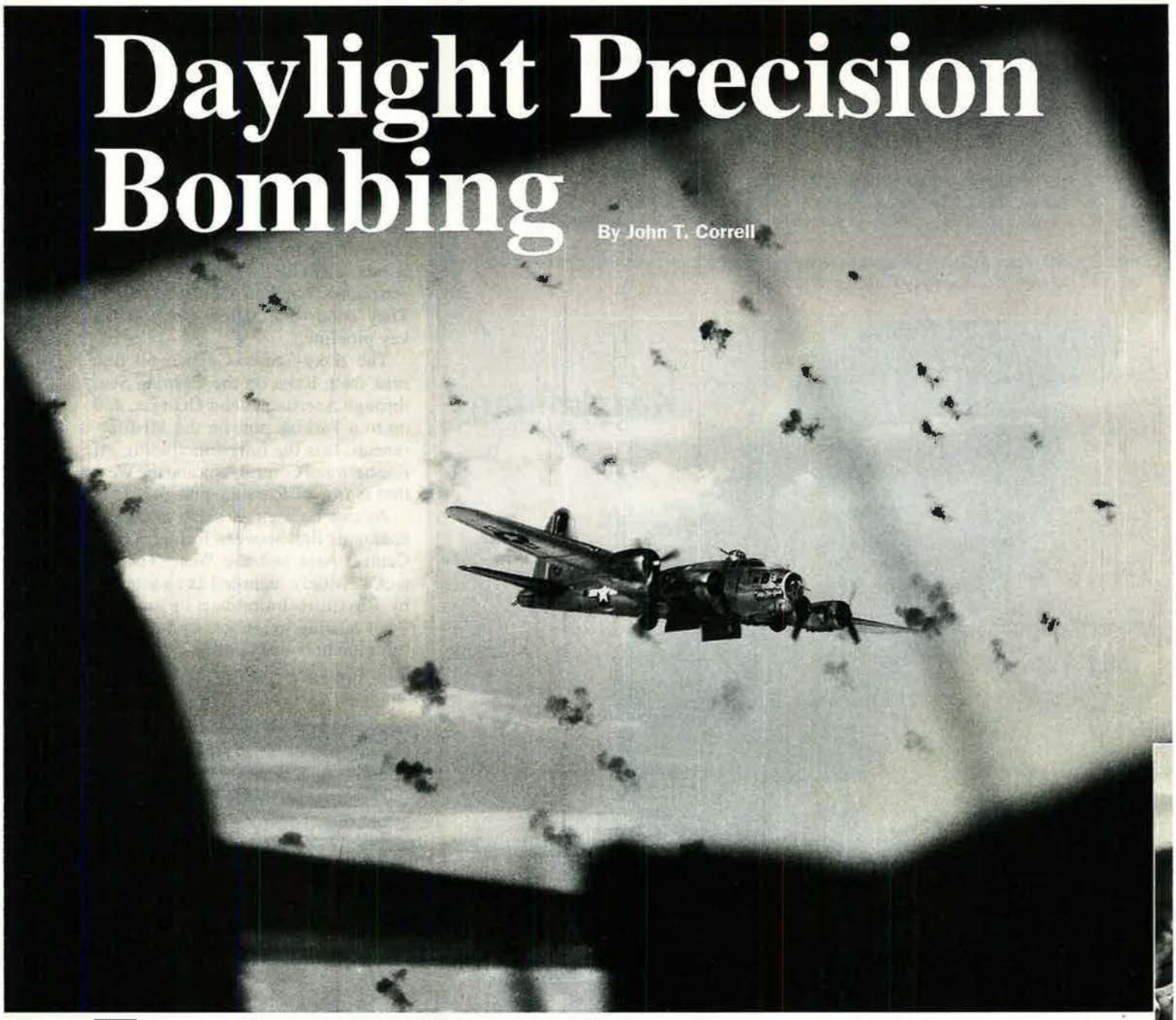

AP photo by Darko Bandic

***Russian troops take aim at Georgian troops on the outskirts of Gori, an area northwest of the Georgian capital Tbilisi, on Aug. 14.***

**A basic belief of the Army Air Forces was severely tested in the skies over Germany and Japan.**

# Daylight Precision Bombing

By John T. Correll



In the aviation enthusiasm of the 1930s, it was popular to claim that Air Corps bombardiers could drop a bomb into a pickle barrel from high altitude. In 1940, Theodore H. Barth, president of Carl L. Norden Inc., said that "we do not regard a 15-foot square ... as being a very difficult target to hit from an altitude of 30,000 feet," provided the bombardier was using that company's new M-4 bombsight connected to an autopilot.

That was stretching it considerably. In everyday practice in 1940, the average score for an Air Corps bombardier was a circular error of 400 feet, and that was from the relatively forgiving altitude of 15,000 feet instead of 30,000.

Nobody knows for sure where the "pickle barrel" imagery began. The term may have been coined by Norden's Barth, who was among its most energetic popularizers. Norden was not alone in spreading the legend. Some Air Force bombardiers spoke proudly of tossing bombs into a 100-foot circle from four miles up.

The pickle barrel story, often told and widely believed, served to reinforce the theory of daylight precision bombing, developed in the 1930s at the Air Corps Tactical School at Maxwell Field, Ala. The theory rejected the previously prevailing strategy of bombing broad areas, more or less indiscriminately, and focused on specific targets of military significance. As a side benefit, precision bombing would avoid civilian casualties and limit collateral damage.

The Army Air Forces was the lone champion of daylight precision bomb-

ing. The Navy—for whom the Norden bombsight was originally developed—gave up on it in favor of dive bombing. The British, finding that they could not hit precision targets, relied on area bombing at night. Daylight precision bombing was conducted by various kinds of aircraft in World War II, but the real test of it was the long-range strategic bombing missions in Europe and Asia of AAF B-17s, B-24s, and B-29s.

The first experimental bombsights appeared in 1910, but early bombing techniques were rudimentary. Bombing in World War I was at times spectacular—as when Zeppelin airships and Gotha biplanes dropped bombs on London—but it was of little strategic importance. A US Air Service pamphlet in 1918 spoke of bombs hitting "in the vicinity" of the target.

Precision bombing did not come into its own until the 1930s, with the availability of high-quality bombsights from Norden and Sperry and the introduction of faster, longer-ranging bombers. The best Air Corps bombardiers achieved considerable success in good weather and against clearly marked targets, which were typically huge bull's-eye circles painted on the ground.

Strategic bombardment was not yet an Air Corps mission. Development of long-range bombers had to be justified on the basis of coastal defense. However, the Tactical School theorists did not bother with such pretense. They saw strategic bombardment as the future of warfare. The special mission of the air arm, they said, was to attack the "enemy national structure," especially the "industrial web," which was vulnerable to the air arm but not to either of the other arms.

### Committed to Precision

Daylight precision bombing became Air Force doctrine, inseparable from the push to obtain four-engine B-17 bombers in appreciable numbers. In 1940, Maj. Gen. Henry H. "Hap" Arnold, Chief of the Air Corps, declared, "The Air Corps is committed to a strategy of high-altitude precision bombing of military objectives."

The Air Corps regarded the bomber as its principal weapon. Furthermore—on the basis of very thin evidence—the Air Corps concluded that new bombers such as the B-17 and the B-24 flew too high and too fast for pursuit aircraft to catch them and that bombers could operate over enemy territory without fighter escort.

In 1941, the AAF plan to implement Rainbow 5, the basic Army-Navy war plan, was drafted by four officers who had been daylight precision ringleaders at the Tactical School: Lt. Col. Harold L. George, Lt. Col. Kenneth N. Walker, Maj. Haywood S. Hansell Jr., and Maj. Laurence S. Kuter. Air War Plans Division Plan No. 1 (AWPD-1) was straight out of the Maxwell playbook. It prescribed an emphasis on precision bombing against the German national infrastructure, industry—especially the aircraft industry—and the Luftwaffe.

The planners were not misled by pickle barrel assumptions. According to data from training and practice bombing, a heavy bomber at 20,000 feet had a 1.2 percent probability of hitting a 100-foot-square target. About 220 bombers would be required for 90 percent probability of destroying the target. AWPD-1 forecast a need for 251 combat groups to carry out the plan.

Bombing was a complicated proposition. Where the bomb hit was a function of the direction and speed of the airplane at the moment of release, the aerodynamics of the projectile, and the wind and atmospheric conditions while the bomb was in flight.

The bombardier looked through the telescope of the bombsight to find the target somewhere ahead, then made adjustments to compensate for the effects of wind drift and the speed of the airplane. He then fixed the target in the crosshairs, and flew the airplane to the automatically calculated release point by the link from his bombsight to the autopilot.

Historian Stephen L. McFarland has explained the geometry of it, using the example of a B-17 flying at 160 mph at 23,000 feet and dropping a 600-pound bomb. The bomb was released at a distance, measured on the ground, of 8,875 feet from the target. It was in flight for 38 seconds. If the speed calculated for the airplane was off by two mph and the altitude wrong by 25 feet, that made a difference of 115 feet in where the bomb would land.

The limited yield of the bombs added to the problem. A 500-pound bomb, standard for precision missions after 1943, had a lethal radius of only 60 to 90 feet. It dug a crater just two feet deep and nine feet wide. With bombing accuracy measured in hundreds of feet, it took a great many bombs to get the job done.

Such high ratios of ordnance expended to results achieved were not unusual in war, nor were they unique to AAF bombers in World War II. The Army fired 10,000 rounds of small-arms ammunition for each enemy soldier wounded and 50,000 rounds for each enemy killed. It took the Germans an average of 16,000 88 mm flak shells to bring down a single Allied heavy bomber.

***Left, a B-17 encounters flak on a raid over Ludwigshafen in 1944. Here, Brig. Gen. Ira Eaker speaks with members of the media after the first World War II heavy bomber mission over Europe.***

Daylight precision bombing got off to a rocky start. When Eighth Air Force was set up in England in 1942, its methods were at odds with those of the Royal Air Force. Air Chief Marshal Arthur T. Harris, chief of Bomber Command, was the foremost advocate of "city busting," the night area bombing campaign that targeted the German population centers and workforce. He was supported in this by Prime Minister Winston Churchill and a national policy of "dehousing" the Germans.

Churchill wanted the Americans to join the British bombing program rather than instigate a different one of their own. He was prepared to put pressure on President Roosevelt to order the AAF to change its strategy but was talked out of it at the Casablanca Conference in January 1943 by Maj. Gen. Ira C. Eaker, commander of Eighth Air Force. Eaker's key point was the value of keeping the Germans under attack both day and night.

***Above, a refinery at Ploesti burns as B-24s continue the air assault on Aug. 1, 1943. At left, a Liberator on the same day skirts a towering column of smoke.***

Eaker had other problems as well. He could not mount large bomber operations because his aircraft and aircrews were diverted to operations in North Africa and the creation of Fifteenth Air Force in Italy in 1943. More than half of his remaining resources were assigned to attacking German submarine pens—a high priority for the British—even though bombing had little effect on these hardened facilities.

Bombing accuracy was terrible. The average circular error in 1943 was 1,200 feet, meaning that only 16 percent of the bombs fell within 1,000 feet of the aiming point. "Rather than dropping bombs into pickle barrels, Eighth Air Force bombardiers were having trouble hitting the broad side of a barn," said historian McFarland.

The prewar prediction that fighters could not intercept bombers was wrong. The Luftwaffe and ground defenses took a heavy toll on bombers if they ventured without fighter escort deep into hostile territory. As the loss rate spiked to eight percent in early 1943, crews calculated their chances of surviving a 25-mission combat tour. On the Ploesti, Romania, mission in August 1943, losses were 30 percent and against Schweinfurt in October, 28 percent.

## The Turning Point

Nobody tackled the accuracy and casualty problems with more initiative than Col. Curtis E. LeMay, commander of the 305th Bomb Group at Grafton-Underwood, Britain. He identified the best bombardiers, made them "lead bombardiers" for the formation, and had all of the aircraft drop their bombs when the lead bombardier did. LeMay also devised a staggered "combat box" formation, which gave the B-17 guns maximum fields of fire for mutual defensive support.

After Schweinfurt, the B-17s did not again fly deep into Germany until long-range P-38 and P-51 fighters were available to escort them. The best of the fighters by far was the P-51, which could escort bombers to their most distant targets. After 1943, all of the fighters, including the older P-47s, took advantage of disposable fuel tanks to extend their range.

Eaker did not have much in the way of strategic bombing results to show for his first two years. However, he said, "When our Eighth Air Force had but 200 bombers operating out of England in 1943, there were more than a million Germans standing at the anti-aircraft and fighter defenses on the West Wall to defend against them. And another million Germans were fire wardens or engaged in bomb damage repair."

The turning point came in early 1944. By then, Eaker had gone on to be commander in chief of Allied Air Forces in the Mediterranean. Maj. Gen. Jimmy Doolittle replaced him as commander

of Eighth Air Force. Several things had changed.

Finally, there were enough bombers to put together large formations. Joint efforts by Eighth and Fifteenth Air Forces put up a 750-bomber mission in January and a 1,000-bomber mission in February. AAF fighters coursed deep into Germany, and in a matter of months, they had virtually destroyed the Luftwaffe. When the D-Day invasion landed in June, the Germans were able to launch less than 100 sorties in defense of Normandy.

With fighter escorts and suppression of enemy air defenses, the aircrew loss rate declined in 1944 and 1945. For the bomber offensive as a whole, Eighth Air Force lost 4,182 aircraft from a total of 273,841 attacking, a rate of 1.5 percent. RAF's Bomber Command aircraft loss rate for the same period was 2.5 percent. The 250,000 aircrew members who flew bomber missions in Eighth Air Force in World War II sustained 58,000 casualties—18,000 killed, 6,500 wounded, and 33,500 missing.

AAF bombing accuracy improved. By 1945, Eighth Air Force was operating at much lower altitudes and was putting up to 60 percent of its bombs within 1,000 feet of the aiming point, almost four times better than in the dark days of 1943. Radar bombing, adopted from the British, was an alternative when conditions did not permit visual delivery, but it was not a precision technique in any true sense of the word.

RAF Bomber Command continued its night area bombing. From 1942 on, 56 percent of its sorties were against cities. On some occasions, notably the bombing of Dresden in 1945, the AAF joined the British in bombing cities, but overall, less than four percent of US bombs in Europe were aimed at civilians. The main targets for the AAF were marshaling yards (27.4 percent of the bomb tonnage dropped), airfields (11.6 percent), oil installations (9.5 percent), and military installations (8.8 percent).

The *US Strategic Bombing Survey* found that "Allied airpower was decisive in the war in Western Europe." That conclusion is sometimes challenged, but the bombing had reduced German rail traffic, aviation fuel production, steel production, and other aspects of the wartime infrastructure by 50 to 90 percent. Millions of people were occupied in repairing the damage and replacing the goods destroyed by bombing. Nazi Armaments Minister Albert Speer said that the bombing created a "third front" and that "without this great drain on our manpower, logistics, and weapons, we might well have knocked Russia out of the war before your invasion of France."

***RAF Lancasters—such as this one on a bombing raid over Hamburg—were primarily used as nighttime bombers, but also excelled at daylight precision bombing.***

In the Pacific, the question of daylight precision bombing centered on the last part of the war when the Japanese home islands came within range of the newest and biggest bomber, the B-29. All of the B-29s were assigned to Twentieth Air Force, with Arnold retaining command personally as the agent of the Joint Chiefs of Staff.

### Jet Stream Boosts

The B-29 was rushed into operation in June 1944 with XX Bomber Command. The headquarters was in India and the B-29s could reach southern Japan from forward bases in China. LeMay was brought from Europe to head XX Bomber Command.

With the US capture of the Marianas (Saipan, Tinian, and Guam), the B-29s obtained bases from which they could reach almost any target in Japan. XXI Bomber Command was established there, with Hansell, the AWPD-1 planner, now a brigadier general and the most fervent of the daylight precision bombing advocates, in command.

Over Japan, the B-29s encountered the jet stream, fierce winds above 25,000 feet that added as much as 250 mph to an aircraft's speed relative to the ground. The jet stream pushed the bombers over the target too fast for the Norden bombsight to compensate. Flying against the jet stream, the speed relative to the ground was so slow that the airplanes were sitting ducks.

Daylight precision bombing faltered, especially on the missions from the Marianas. The weather permitted only four days a month of visual bombing. The long distances and high altitudes consumed so much fuel that the bomb loads were relatively small. There were frequent aborts and ditchings as Twentieth Air Force worked the kinks out of the new bomber under combat conditions.

Arnold and the AAF were under tremendous pressure to produce strategic results and help bring the war in the Pacific to an end. Hansell stuck doggedly to daylight precision bombing, although repeated efforts against such targets as the Nakajima-Musashino aircraft plant near Tokyo were unsuccessful.

Meanwhile, the clamor was building in Washington to switch to incendiary area bombing. The Office of Scientific Research and Development had developed the highly effective M-69 incendiary bomb, to which the Japanese style of construction was starkly vulnerable. Japanese industry, including cottage industries making military parts and equipment, was so integrated with populated areas that it was difficult to draw the line between them.

The Japanese regarded surrender as dishonorable and fought to the last in battle after battle. The possibility loomed that an invasion of the Japanese home islands would be necessary. Plans projected a landing force of 1.8 million US troops and anticipated massive casualties. The US was no longer as

## The Mystique of the Norden Bombsight

Other companies made bombsights, but the famous name was Norden. Carl L. Norden was a Dutch engineer who immigrated to the United States in 1904 and worked for Sperry Gyroscope before going into business for himself. He lived in the United States for 43 years but never became a citizen.

Norden began his contract work with the US Navy in 1918. He liked the Navy better than the Air Corps, which he considered too flamboyant. He preferred the Navy as a customer, even though the Navy moved away from high-altitude horizontal bombing in the 1930s and took the bombsights out of most of its airplanes in the 1940s. (For no better reason than service parochialism, the Navy held on to its Norden bombsights, which it was not going to use, even though the AAF had a critical need for them.)

Some commanders were said to have required a "bombardier's oath" from their young men. Wording of the oath varied from report to report, but all included the vow to protect the secrecy of the Norden bombsight "if need be, with my life itself."

Actually, the secret had been blown, several times over. A Norden employee sold drawings to the Germans in 1938. The Russians stole a bombsight in 1940 but could not figure it out. They gave it to their (then) allies, the Germans. The Germans soon had plenty of samples of their own from the wreckage of US bombers shot down. In 1944, the US gave the Russians 100 lend-lease patrol aircraft—complete with Norden bombsights and a training package—in return for allowing US shuttle bombers to land in Soviet-controlled territory.

reluctant as it once had been to bomb enemy cities.

LeMay, who was the more aggressive commander and who had gotten better results with the B-29s in India and China, replaced Hansell at XXI Bomber Command in January 1945. XX Bomber Command was phased out and its aircraft and crews were transferred to the Marianas.

It had become apparent, LeMay said, that "we weren't going to be able to defeat Japan using high-altitude precision bombing before the scheduled invasion was to begin."

Acting on his own initiative, LeMay ordered a massive low-level night mission against Tokyo with incendiary bombs March 9. Three wings of bombers would attack from the altitudes of 4,000 to 9,200 feet. The aircraft were stripped of excess weight, including most of the guns. Flying lower and less heavily laden, the B-29s carried more than twice as many bombs as before. The strike force found landfall by radar and bombed with intervalometers set to space the bombs 50 feet apart. About a fourth of Tokyo was destroyed and some 84,000 people were killed. It was supposedly while touring the firebombed area that Emperor Hirohito came to the conclusion that the war had to end as soon as possible.

LeMay continued to order precision attacks and to use high explosive bombs when targets and weather were suitable, but the emphasis had shifted to incendiary bombing at night. It systematically laid waste to Japan's large industrial cities and by July, had reduced overall Japanese industrial output to some 60 percent from the 1944 level.

LeMay and Arnold believed that the incendiary bombing would eventually bring on a Japanese surrender. Gen. George C. Marshall, the Army Chief of Staff, and President Truman were not convinced. The Japanese military hardliners were prepared to accept enormous casualties and destruction and had assembled a force of 2.3 million troops in the home islands to throw back an invasion. Truman decided to use the atomic bomb.

### Infrastructure Devastation

Both at Hiroshima Aug. 6 and at Nagasaki Aug. 9, the atomic bombs were delivered by daylight high-altitude precision drop, using the Norden bombsight. Maj. Thomas W. Ferebee, bombardier on the B-29 *Enola Gay,* picked up the aiming point in Hiroshima, the Aioi Bridge, 12 miles out. The bomb, dropped from 30,700 feet, detonated in an airburst 800 feet (measured on the ground) from the bridge. The bombardier for Nagasaki was Capt. Kermit K. Beahan on the B-29 *Bockscar.* The bombing altitude was 31,000 feet and the explosion was 1,500 feet from the aiming point, the Mitsubishi Steel and Arms Works.

The hardliners wanted to hold out, but Emperor Hirohito broadcast his rescript of surrender Aug. 15, bringing World War II to a close.

Postwar analysis found that accuracy had been about the same in Europe and Asia for day visual and radar precision bombing. Eighth Air Force in Great Britain put 31.8 percent of its bombs within 1,000 feet of the aim point from an average altitude of 21,000 feet. Fifteenth Air Force in Italy averaged 30.78 percent of its bombs within 1,000 feet from 20,500 feet. In the Asia and the Pacific, Twentieth Air Force—45.5 percent of whose sorties were daylight precision despite the emphasis on area bombing in the last months of the war—put 31 percent of its bombs within 1,000 feet of the aim point, although the bombing altitudes were on average 4,500 feet lower than for Eighth Air Force.

Critics of various persuasions have challenged the value of the strategic bombing. However, postwar occupation authorities found that both the German and Japanese economies and their national infrastructures had been devastated to the point that they barely functioned. Industries that had supported the war were in shambles. That level of destruction and disruption was the result of Allied land, sea, and air action—and airpower had hardly been the least of it.

After the war, "pickle barrel" claims passed out of fashion even though nostalgic bombardiers and the popular press kept the notion alive for years. Despite the advent of nuclear weapons, the quest for precision delivery of bombs continued. The first Strategic Air Command Bombing Competition was held in 1948 at Castle AFB, Calif., with visual and radar releases from 25,000 feet. SAC continued to develop radar bombing techniques and used them effectively in its Arc Light missions in Vietnam.

Precision guided munitions first gained fame in the Vietnam War, but it was in the Gulf War and other conflicts of the 1990s that the Air Force finally achieved pickle barrel accuracy, placing bombs within 10 feet of the aim point. The use of the Global Positioning System and satellite data for aiming had made the issue of day vs. night irrelevant. ■

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

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**Germany's shrieking Ju 87 dive bomber lingered in the mind as a truly dreaded air weapon.**

# The Stuka Terror

By Rebecca Grant

"**Simultaneously**, like some birds of prey, they fall upon their victim and release their load of bombs upon the target. ... Everything becomes blended together; along with the howling sirens of the Stukas in their dives, the bombs whistle and crack and burst."

The time was May 1940. The diarist was one Sergeant Pruemers who, as part of Germany's 1st Panzer Division, was at that moment buttoned down and waiting to strike westward across the Meuse River and into the heart of France.

The German air attack went like clockwork. Luftwaffe historian Williamson Murray, describing the event that unfolded on that day, wrote, "Continuous Stuka attacks on French reservists holding the line had a devastating effect." France's infantrymen, according to a French general who witnessed the scene, "cowered in their trenches, dazed by the crash of bombs and the shriek of dive bombers."

The bridgehead across the Meuse was secure by nightfall. German tanks crossed the next day. The blitzkrieg into France was on.

This was not the Stuka's first successful operation in World War II. Nor would it be the last.

The Junkers Ju 87 Stuka dive bomber lingers in the mind as one of the icons of Nazi Germany's military machine. "Stuka" was the diminutive of Sturzkampfflugzeug, German for "diving combat aircraft." It was unique. Although its time of dominance lasted only four years—the period 1939-43—its low-altitude attacks were witnessed by millions.

From train sidings in Poland to the beaches of Dunkirk, from the head of Rommel's columns in North Africa to the vast steppes of Soviet Russia, the Stuka rained down terror on enemy soldiers, sailors, airmen, and civilians alike. This left a deep impression that has persisted to this day.

The Stuka was the war's pre-eminent dive bomber. It scored hits on targets ranging from artillery to aircraft carriers. Its deadly cluster munitions tore through troop concentrations herded together by the lightning-fast drives of the Panzer infantry and tanks. Stukas sank ships from the English Channel to the Black Sea. On the Eastern Front, the German aircraft's 37 mm cannon ripped up Soviet armor at a prodigious rate.

The Stuka was probably the most terrifying warplane of the war. For all that, though, it was not a quest for terror that lay at the root of its design; it was technical ingenuity.

In Hitler's stealthy rearmament effort in the 1930s, the German Air Ministry had no choice but to commit to bomber types that could be put into production

Photos from the collection of John Weal

*Two Ju 87 Stukas during the fateful summer of 1940.*

relatively quickly. A precision dive bomber fit the bill, and Junkers had one—a prototype called the K 47. This mono-wing attack airplane boasted a diving envelope ranging from zero to 90 degrees. Due to treaty restrictions, the Junkers K 47 was assembled in Sweden.

In the period 1931-34, the Junkers design team members experimented with K 47 configurations. Early trials demonstrated that a dive bomber could be very precise—but the aircraft gave up a lot to get that precision. The design trades would earn the Stuka its reputation, but also sow the seeds of its undoing.

A Stuka prototype—powered, strangely enough, by a Rolls Royce engine—began flight tests in September 1935 and was almost canceled in 1936. It was saved by the timely intervention of World War I German ace Ernst Udet, who pressed for its continued development. Udet was heading up the Technical Office. Though he was no great shakes of an administrator, he saw great potential in the dive bomber for precision attack.

By this point, the Stuka prototype was outperforming its competition. One of the most remarkable features of the Stuka was its automatic dive bombing system. Pilots set a predetermined release altitude for their bombs. As they peeled off from formation and pitched over into their dives, the system engaged as soon as the dive brakes extended.

Stuka pilots dove at close to 90 degrees and adjusted position with aileron control while watching target indicator lines painted on the canopy. At release height, the contact altimeter triggered a cockpit light and the pilot would release the bombs. This release would re-engage the elevator trim tab, bringing the tail down and pulling the Stuka out of its dive. Aircrews experienced about six Gs at the dive's completion.

### That Howl Overhead

The Stuka soon had reached a service ceiling of 26,000 feet and a range of more than 370 miles.

The attack aircraft sported two wing-mounted machine guns along with a third gun installed in the rear cockpit. Typically, the early Stukas carried either one 500-pound-class bomb or one 250-pound bomb on the centerline bomb crutch and two 50-pound bombs on each wing. Often, these smaller bombs were filled with cluster-type munitions.

Later Stuka models were equipped with a 37 mm cannon for low-altitude attacks on tanks on the Eastern Front. Another variant, the Ju 87R, had underwing fuel tanks to extend its range so that it could reach out and strike Allied ships at sea.

How did the Stuka create its trademark—that terrifying howl? It was purposely designed into the aircraft. When the Stuka went into its dive, a powerful rush of air would push through a specially built siren, activating the blood-curdling scream. The idea was to maximize the panic on the ground below, and it worked.

It wasn't long before the Stuka made its combat debut. A handful of Ju 87 variants saw action in the Spanish Civil War in the late 1930s as part of the Kondor Legion. However, it was not until Sept. 1, 1939 that the world got unforgettable exposure to the Third Reich's extraordinary dive bomber. On that day, no fewer than nine Stuka groups comprising more than 330 aircraft struck Poland with devastating surprise dawn attacks.

In the beginning, Stukas tried and failed to prevent Poland's forces from blowing a bridge over the Vistula. After that failure, though, the Stukas racked up success after success. Attacks against encircled Polish forces and on Poland's cities stunned the world.

Above all, it was the fine-tuned coordination of Stuka air attacks with ground maneuver that impressed. The Luftwaffe had learned the value of coordination with the ground forces during operations in Spain.

"By the time war engulfed Europe, this German close air support system set the standard for its time," wrote historian John Schlight. Chief architect of this air-ground coordination system was Gen. Wolfram F. von Richthofen, a cousin of Manfred, the famed Red Baron of World War I. Richthofen had seen much action in Spain as a combat commander and staff officer for the Kondor Legion. He took command of the force in May 1939 and led them into action against Poland.

Next on the list for the Stukas was the invasion of Norway. Airborne paratroops relied on it as true flying artillery. Stukas also claimed Norwegian, British, and French warships in the few short weeks of the northern campaign.

Then came Case Yellow—Germany's conquest of France.

On May 10, 1940, Hitler launched his attack westward in Europe. German Army Group B attacked Belgium in the Ardennes to draw in the Allies, while Army Group A crossed through Luxembourg and southern Belgium. Their plan was to drive in a wedge, cross the Meuse, then sweep through open country to encircle and roll up Allied forces. "All depended on gaining the open country on the other side, where speedy maneuver would bring total victory," wrote historian Matthew Cooper.

The Stuka attacks were a big part of this effort to gain speed. German infantry began to cross the Meuse on the afternoon of May 13, 1940. The Stuka barrage watched by Pruemers was part of a coordinated air-ground offensive against the sparse defensive positions on the other side. On the Meuse, the Stukas pummeled French artillery and infantry, while the German infantry performed an astonishing river crossing.

According to historian Murray, Panzer commander Lt. Gen. Heinz Guderian carefully devised a plan with Fliegerkorps II commander Lt. Gen. Bruno Loerzer. They organized Luftwaffe support to come in waves while their infantry made the crossing. Luftwaffe fighters kept the French Armee de l'Air and forward RAF at bay.

*The Ju 87R, pictured here in the Norwegian campaign, was equipped with underwing fuel tanks to extend its range—all the better to terrorize shipping lanes.*

Richthofen's tight coordination of air and ground operations paid off. More than 1,500 German aircraft were used in continuous offensives. Stukas attacked, rearmed, and attacked again. According to one source, Stuka pilots flew up to nine sorties per day during the drive across and beyond the Meuse.

The noise of the low-altitude dives ensured that everyone knew what the Stukas were doing. Tactics called for loitering then diving in succession, making the attack aircraft highly visible and fearsome. Stukas worked just ahead of ground units. Some found a French tank regiment under the command of Col. Charles de Gaulle, who was trying to organize a counterattack on May 17, and repeatedly attacked the unit.

Luftwaffe fighters succeeded in keeping the airspace clear for the relatively slow Stukas. "The enemy fighters appeared less and less, so that the Stukas could fly without fighter cover and could themselves hunt freely," recorded one German officer, Lt. Dieter Peltz. "Sometimes it was sheer target practice."

Ten days later, retreating Allied Forces were falling back on the last remaining open Channel port—Dunkirk. Stuka attacks shattered Dunkirk's port facilities, then terrorized Allied ships attempting to rescue the remains of the force from the beaches. One British merchant captain wrote of how the concussion from Stuka bombs roiled the waters as they attempted to load evacuees. Stukas sank several ships during the evacuation and unleashed cluster munitions on troops jammed together. Since the Stuka dove and released at low altitude, the shrieking dive bomber and its effects were easy for all to see.

The Stukas were not the most plentiful of Germany's light and medium bombing force, rarely numbering more than 300 or 400 aircraft for any campaign. Other Luftwaffe medium bombers did as much or more damage, but the Stuka was the prime platform for precision and terror.

## Failure Over Britain

The effectiveness came with a price. Nearly 30 percent of the dive bomber force was destroyed in operations in May and June 1940. Often the Stukas were dispatched with a covering force of fighters, but the RAF quickly learned to pick off the Stukas first. Ground anti-aircraft fire also took its toll.

The Stukas were a key part of Nazi Germany's plan to knock out the RAF fighter force for an invasion of England, but the slow-flying Stukas suffered when they tried to step out of the battlefield support role and move up to a more strategic task.

Reichsmarshall Hermann Goering wanted especially to use the Stuka's pinpoint accuracy against RAF radar stations and masts called the Chain Home system. It had proved nearly impossible to take down.

By Aug. 13, the Battle of Britain was raging at its peak. The biggest Stuka success of this campaign came late that day.

At around 5 p.m., a hundred Me 109s flew ahead of 80 Stukas. The bombers decimated the airfield at Detling, in Kent, hitting workshops, mess halls, and more than 20 aircraft on the ground. Yet, no RAF fighters were destroyed in the raid, and the British were about to get rich revenge on the Stukas.

As flying pinpoint bombers, the Stuka needed undefended airspace to operate. When the slow and highly vulnerable Stukas met fighters, it was all over. The top speed of the early Stukas was around 190 mph, compared with a 336 mph for the Hawker Hurricane and 408 mph for the Supermarine Spitfire.

On Aug. 18, British ace Flight Lt. Frank R. Carey led nine Hawker Hurricane fighters head on into a large formation of Stukas attempting to attack the radar station at Poling on the southeast coast of England.

"I fired at one ahead of me—it stood straight up on its nose with flames coming out of it," said Carey. The British destroyed 16 Ju 87Bs in that attack alone. Carey went on to bag 25 kills and become the RAF's second highest-scoring Hurricane ace.

Despite Goering's ambitions, the Stuka did not play a significant role in the Battle of Britain after August. Without air superiority, the audacious dive bombing never got going. Fifty-nine of the dive bombers were lost to enemy action from July through September 1940.

The Luftwaffe soon gave up on attempts at precision and switched to night bombing of London and other cities.

Conditions were soon more favorable for the Stuka in the East. Free to operate without facing enemy fighters, the Stuka was a major part of Hitler's punishment attacks on Yugoslavia in the spring of 1941. Raids on Belgrade etched the screaming bomber deeper into the European psyche.

Ruth Mitchell, sister of Brig. Gen. William Mitchell, was a photographer on assignment in Belgrade in April 1941.

## The Ultimate Stuka Pilot

In the beginning, Hans-Ulrich Rudel was just another Stuka pilot, flying his first missions as the invasion of Russia began on June 22, 1941. He soon became special. Part of an elite unit, Rudel learned fast and distinguished himself in September 1941 when he sank the Soviet battleship *Marat* near Leningrad harbor using a specially designed 2,000-pound bomb.

On another occasion, he hit more than 70 landing craft in the water. Rudel would go on to fly 2,350 missions, most in the Stuka. Official Luftwaffe records credited him with destroying more than 1,000 ground vehicles, including a mind-boggling 519 tanks.

"Think about that number. It's nearly three entire tank divisions. Wiped out by one man," noted one commentator.

The score for the Luftwaffe's No. 2 tank killer? Sixty tanks.

Rudel and the Stuka were the perfect match. He was a phenomenon who relished flying on the deck. His scores mounted when Ju 87Gs were delivered to the Russian front in numbers in 1943. Rudel's style was to fire a single 37 mm round into the vulnerable rear turret area of the T34 with the aplomb of an assassin.

His toughness was the stuff of legend. Rudel was shot down many times but repeatedly evaded capture. After being hit in the thigh in November 1944, he flew with his leg in a cast. Late in the war, he also flew the FW 190 and was credited with 11 aerial victories.

Rudel's luck almost ran out in February 1945. He was again hit, this time in the foot, and crash-landed within German lines. A doctor stopped the bleeding but Rudel's leg was amputated below the knee.

He was fitted with an artificial leg and resumed flying in late March 1945.

Under the sympathetic guidance of the Nazi propaganda machine, Rudel became a popular hero and was lauded as the "Eagle of the Eastern Front." By the end of the war, he was the most decorated German combatant of any discipline—land, sea, or air.

Rudel flew his final sortie on May 8, 1945, the day the war in Europe ended. A mixed flight of Stukas and FW 190s escaped by air to the American lines to surrender, avoiding the Soviets, who had put a price on his head.

He was also a Nazi to the core. He fled to Argentina in 1948, but soon returned to start a business career in Germany. The success of Rudel's memoir *Stuka Pilot* extended his reputation and stands out as a firsthand technical account of the Stuka in low-altitude ground attack. Rudel died in Bavaria in 1982.

She later wrote about the Stuka and her experience in the bombings in her 1943 book *The Serbs Choose War.*

As many as 74 Stukas took part in first wave of the bombing of Belgrade. Mitchell hid under the stairs of her house. Explosions followed and then "with a weird smooth sound, like the tearing of silk, the neighboring houses started to collapse," she later wrote.

Then came the second wave. "Again the bombs were falling, thick and fast, and on and on," wrote Mitchell. "Now far, then near, the Stukas shrieked." Bombing went on for two days.

Soon after that, the Stukas helped knock the British out of Crete. The RAF had only a few fighters to oppose the aerial onslaught and paratroop landings. A Stuka unit under the command of veteran pilot Col. Oskar Dinort sank three cruisers and eight destroyers and damaged 13 other British ships in the week following the seizure of Crete's airfield.

Next the Stuka—along with the cream of the German Army—moved on Russia.

### Barbarossa

Operation Barbarossa began on June 22, 1941. The Luftwaffe destroyed 1,200 aircraft, most on the ground, in a mere eight hours.

Against land armies left with no air cover, the Stuka excelled. The Germans had just 424 Stukas out of a total of over 4,000 aircraft, but again their terror outstripped their numbers. (The overall production run for the Stuka was small by World War II standards at just 5,752 aircraft.)

On the Eastern Front, the Stuka would earn a new battlefield reputation.

At first, the Stukas reveled in the lack of Soviet air opposition. Soviet soldiers called it "the screecher."

Stuka pilots helped bring Germany's 66 divisions to within 25 miles of Moscow. When winter set in, however, things changed dramatically. "Engines no longer start, everything is frozen stiff, no hydraulic apparatus functions; to rely on any technical instrument is suicide," wrote a young Stuka pilot Hans-Ulrich Rudel, a standout Stuka tactician.

By 1942, the Soviet Air Force was recovering, and dive bombing at nearly a 90 degree angle was turning just as suicidal as flying with frozen instruments.

As a result, the Stuka now went through a major change in tactics that turned it into a tank killer. The Stuka was rigged with removable 37 mm cannon mounted under the wings. Instead of dive bombing, the Stuka came in at treetop height to blast Soviet T34 tanks. These sniper-style tactics paid off handsomely for the Germans. The modified Stuka took on a new designation, the Ju 87G-1.

Veteran Stuka pilots would tally armor kills numbering in the thousands. German pilots on the Eastern Front racked up massive kills in the Stuka because of their skill and the plentiful targets—but also because they had no chance of going home, a fact that undoubtedly led the pilots to take more chances.

On the deck, the gun pods added weight to its already sluggish performance. By 1944, it took standouts such as Rudel, who was soon to be known as the Stuka ace, to compensate for the Stuka's by now well-known limitations. Other fighter aircraft, such as as an armored variant of the FW 190, took on more of the close support role. Some Stuka units shifted to night operations.

The Stuka reign of terror was over, but the gull-wing bomber stayed in action until the bitter end as the Allied militaries slowly but relentlessly rolled back the Germans to bring World War II to an end. ■

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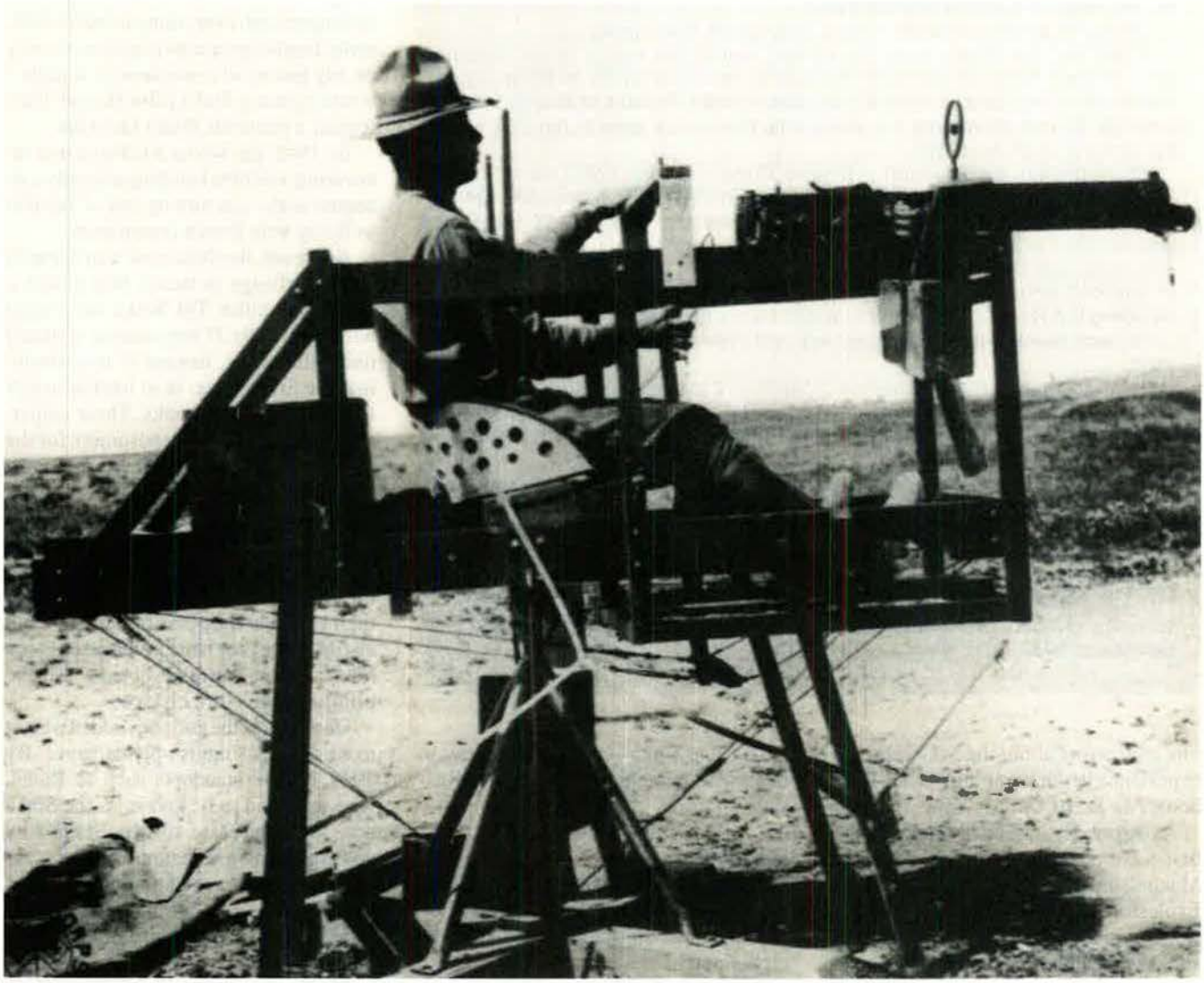
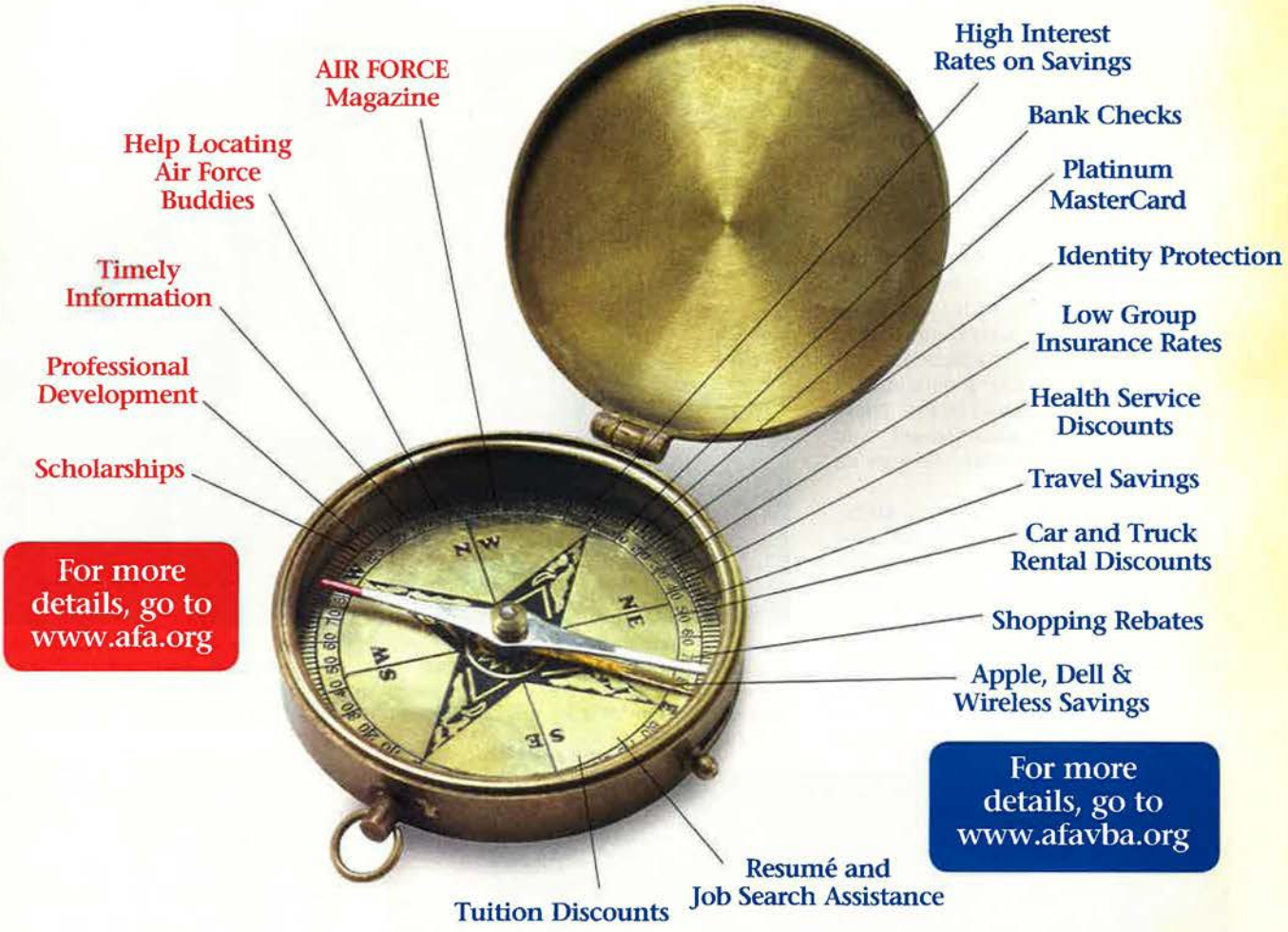
*Rebecca Grant is one of the nation's foremost airpower analysts, with nearly 20 years of experience in Washington, D.C. In the early 1990s, Grant worked in the operations group of the Chief of Staff of the Air Force, for the Secretary of the Air Force, and for RAND Corp. In 1995, she founded IRIS Independent Research and served as its president. Grant since 1996 has written extensively for* Air Force *Magazine. Grant is the first director of the General Billy Mitchell Institute for Airpower Studies, the public policy and research arm of the Air Force Association. Grant's latest article for* Air Force *Magazine, "The All-Seeing Air Force," appeared in September.*

# World War I "Simulator"



*A rocking device (such as that pictured here) was used to train aerial gunners during World War I. Flying real airplanes to teach the fine points of aiming and firing a machine gun while traveling through the air was too expensive and too dangerous—for both aircraft and airmen. In another creative "simulation," a shotgun was mounted on a turret, and gunner trainees fired at clay pigeons. Ground training for aerial gunners focused on quickly assembling, mounting, firing, clearing the inevitable jams, and disassembling the guns.*

# Where You Go For...

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# AFA National Report

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**By Frances McKenney,** Assistant Managing Editor

### Picnicking With the Senator

US Sen. Kent Conrad (D-N.D.) attended the **Red River Valley Chapter's** summer picnic in August at Grand Forks AFB, N.D.

More than 250 airmen, Air Force civilians, AFAers, and local community leaders turned out to hear Conrad's remarks and to honor several award recipients from Grand Forks.

"I see a bright future for this base and this community," said Conrad, who is chairman of the Senate Budget Committee. "It is all due to the outstanding military men and women of this base, community leaders who are active in their support of the base, as well as strong leadership."

Conrad joined SMSgt. Daniel J. Becker, the chapter president, in recognizing the 906th Air Refueling Squadron, which flew 800 combat sorties in Operation Iraqi Freedom and Operation Enduring Freedom at a 98 percent mission effectiveness rate. The unit had been selected for the AFA national-level David C. Schilling Award and was to receive it formally at the Air Force Association National Convention in September, but many of the squadron's airmen attended the picnic to enjoy the early recognition from local supporters.

*Air Force civilian William Rone (second from right) receives the Gen. Lewis Brereton Award at the Florida State Convention. Presenting the award are (l-r) Sandy Schlitt, AFA Vice Chairman of the Board for Aerospace Education; Tim Brock, Florida state president; and Joe Sutter, then AFA Vice Chairman of the Board for Field Operations.*

USAF photo by SrA. Tiffany Colburn

*SMSgt. Daniel Becker, president of the Red River Valley Chapter, and Sen. Kent Conrad (right) confer at the chapter's picnic and awards ceremony. Conrad was the guest of honor at this event.*

At the picnic, Conrad and Becker made a formal presentation of an AFA 2008 Spouse Scholarship to Angela Bell, who is earning a doctorate in education. Bell is one of eight winners of the $2,500 AFA national scholarships. Her husband is Chapter Vice President Maj. Anthony W. Bell, from the 319th Air Refueling Wing's judge advocate general office.

Becker said afterward that the chapter landed Conrad as their VIP picnic guest through the efforts of John D. Hanson, a chapter VP and a member of two veterans affairs committees. Hanson keeps in regular contact with the state's representatives, Becker explained. "He has them on speed dial." Through Hanson's connections, the chapter was able to invite Conrad and schedule its Monday afternoon picnic to take place during the Senator's visit to the base.

### Cyber Symposium

The **Paul Revere Chapter** co-hosted

the Air Force Cyberspace Symposium in Marlborough, Mass., in June, with the vice chairman of the Joint Chiefs of Staff as a headline speaker.

Marine Corps Gen. James E. Cartwright spoke about the need for individual services to work more closely, so critical information reaches the joint warfighter. "We fight joint, we fight as a coalition, we fight as a government, not as services," he said. He went on to praise the Air Force and other services for organizing and training cyber forces "in such a way that they can present those forces to combatant commanders."

Air Force senior leaders who spoke at the symposium included Lt. Gen. Robert J. Elder Jr., 8th Air Force commander, and Maj. Gen. William T. Lord, head of Air Force Cyberspace Command (Provisional).

Elder also leads US Strategic Command's air component headquarters, with responsibilities encompassing cyberspace operations and the security of USAF's global computer enterprise network. He told the audience, "If you are not a cyber operator, you are going to fail," and if the systems are not prepared to handle cyber attacks, "you will not be successful as a military operator."

Lord spoke about the reason for standing up a cyber command and its focus on Air Force networks.

Electronics System Center, at Hanscom AFB, Mass., and AFCYBER (Provisional) co-sponsored the symposium with the Revere Chapter, led by Angela M. Dupont.

It was the second one that has focused on USAF's offensive and defensive cyberspace capabilities; the first was held in November 2007.

USAF photo by Kemberly Groue

*Capt. Michael Zink (in brown T-shirt), VP of the John C. Stennis Chapter, checks the plans for marking the blacktop at an Ocean Springs, Miss., elementary school playground. His volunteers for this project came from nearby Keesler Air Force Base.*

### California Convention

"Edwards Air Force Base is where it all comes together," said Maj. Gen. David J. Eichhorn, commander of the Air Force Flight Test Center.

As keynote speaker for the California State Convention military awards gala, he was describing the center's mission and achievements, but he could just as well have been talking about representatives from the state's 19 chapters gathering together, hosted by the **William J. "Pete" Knight Chapter.**

After Eichhorn delivered his update on Edwards, he received the first award for the evening: California AFA Person of the Year. Joseph E. Sutter, then AFA Vice Chairman of the Board for Field Operations; Michael J. Peters, Far West Region president; and Martin W. Ledwitz, California state president, presented the award.

Other military awards went to SrA. Kali D. Kappes, as Airman of the Year, and TSgt. Jeanna L. Irby, named NCO of the Year.

The president of the host chapter, Randolph H. Kelly, reported that about 150 guests attended this black-tie event.

At an awards dinner held the night before at the base's Club Muroc, AFA members took home association honors: Frank D. Walterscheid of the **Maj. Gen. Charles I. Bennett Jr. Chapter** was named Member of the Year, and Richard C. Taubinger from the **C. Farinha Gold Rush Chapter** got the Golden Bear Award. Other awardees included: Nancy Driscoll of the **Bob Hope Chapter,** Lee Greer of the C. Farinha Chapter, Arthur F. Trost of the **Golden Gate Chapter,** and Kelly.

Brig. Gen. James R. Hogue was the guest speaker for this AFA awards dinner. He spoke to the audience about his role as director of the joint Flight Test Center-NASA Dryden space shuttle recovery team.


USAF photo by Rick Berry

*Lt. Gen. Robert Elder Jr., 8th Air Force commander, addresses the Air Force's second annual Cyberspace Symposium, cohosted by the Paul Revere Chapter and Electronic Systems Center in June.*

### Community Service

After being flooded out by Hurricane Katrina in 2005, the **John C. Stennis Chapter** at Keesler AFB, Miss., got back on its feet only five months ago. It continued its "recovery" in August with a community service project in nearby

Ocean Springs, a city that suffered severe hurricane damage.

Capt. Michael P. Zink, chapter VP, led a crew of volunteers in renovating a playground section at Pecan Park Elementary School. They designed the layout and painted white lines on an asphalt area that the school calls a "combo court." Now, the students can play basketball, volleyball, and tennis on this all-in-one blacktop.

The chapter donated more than $200 for the paint and supplies needed for the project.

Zink rounded up the volunteers from the 332nd Training Squadron, where he is the metrology training flight commander. Zink said his volunteers "were excited about doing this project," showing up to start work at 6 a.m. on one of their days off.

The volunteers were: MSgt. Michael Babbitt, TSgt. Joel Desjardin, TSgt. Jesse Goodwin, MSgt. Chad Heilman, and TSgt. James Malone, all instructors with the unit. Also pitching in: Petty Officer 1st Class Youssef Saab from the Center for Naval Aviation Technical Training Unit.

Their efforts were publicized on Keesler's Web site and in its base newspaper and earned a colorful, big thank you—illustrated with photos—on Pecan Park Elementary School's home page.

**In the Texoma Region**

The **Central Oklahoma (Gerrity) Chapter** hosted the Texoma Region conference in Oklahoma City in July, attended by more than 100 people.

Host Chapter President James F. Diehl reported that the highlights were presentations by luncheon guest speaker Maj. Gen. Loren M. Reno and dinner guest speaker retired Col. Charles B. DeBellevue.

Reno, who commands Oklahoma Air Logistics Center, spoke about the service's role in the War on Terror.

DeBellevue is the leading USAF ace from the Vietnam War, with six aerial victories. He spoke about one of his combat missions and about how the Air Force's core values related to his sorties over North Vietnam.

AFA officials who attended the convention included Buster Horlen, Edward W. Garland, and James R. Lauducci, who are AFA national directors.

Among the other convention activities were a golf tournament to raise funds for aerospace education activities and a tour of a 17-acre botanical garden and tropical conservatory located in the middle of Oklahoma City.

**More Chapter News**

■ At the Florida State Convention, hosted by the **Cape Canaveral Chapter** at Cocoa Beach in July, the spotlight was on the state's Teacher of the Year and the outstanding Air Force civilian. Leo F. Murphy—who would later be selected as AFA's National Aerospace Teacher of the Year—received the state-level award for his work in the Okaloosa County School District, establishing an aviation- and aerospace education-oriented program. Florida State President John Timothy Brock wrote: "Due directly to his efforts, last year, 13 of his seniors were accepted to Embry Riddle Aeronautical University." Also at the state convention, William S. Rone received the General Lewis H. Brereton Award as the civilian who made an outstanding contribution to airpower. Rone is director of financial management at Air Force Special Operations Command. He has 36 years of federal service.

■ Two local residents took top awards at the annual Georgia State Convention held at Warner Robins in August. Indeed, retired SMSgt. Antoine Jackson—named State Teacher of the Year—and Thomas Byrd—awarded Outstanding AFJROTC Cadet of the Year—even hailed from the same school: Warner Robins High School. AFA's Joe Sutter presented the awards, along with State President Greg Bricker. The **Carl Vinson Memorial Chapter** hosted the state convention.

■ In Anchorage, Alaska, the **Edward J. Monaghan Chapter** had a high-profile position at an Association of the US Army luncheon in August: President Kara G. Moriarty sat at the head table. The chapter also sponsored two tables of junior enlisted personnel and had arranged for the entertainment, the Alaska Brass from the US Air Force Band of the Pacific. At the luncheon, where Sen. Ted Steven (R-Alaska) was guest speaker, several junior enlisted from different services were given memberships in military associations. A1C Jose Camacho from the 3rd Wing and A1C Tiffany Olivares from the 19th Fighter Squadron received AFA memberships. They both come from Elmendorf Air Force Base. Chapter Secretary-Treasurer Jenny Skeen also attended the luncheon.

■ In the Vietnam War, he was a Green Beret. In August, he was the guest speaker for the **Columbus-Bakalar Chapter (Ind.).** Bob Culp enlisted in the Army right after high school and served two tours in Vietnam, first in the Quang Ngai area (1965-66) and then in the Tam Ky area (1968-69). He earned

more than a dozen military medals. His remarks to the chapter meeting in Columbus, Ind., covered his Army service—which resulted in a 40 percent disability rating—and how he completed his education with an MBA and went on to a successful civilian career. ■





## Reunions

reunions@afa.org

**63rd TCW (MATS),** Donaldson AFB, SC (1953-63). November. **Contact:** Shirley Holmquist (864-226-6869) (keshi@charter. net).

**435th Aerial Port Sq,** Rhein Main AB, Germany. Oct. 31-Nov 3 in San Antonio. **Contact:** Paul Erlewein (210-653-7708) (paulerlewein@webtv.net).

**612th TFS,** Torrejon AB, Spain (1973-77). May 8-10, 2009 at the Opryland Hotel in Nashville, TN. **Contact:** Skip Beasley, 208 Vantage Way, Franklin, TN 37067 (615-591-9112) (crisben@aol.com). ■

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.

## Air Force Association/AFA Veteran Benefits Association Air Force Memorial Foundation Consolidated Statement of Financial Position

**Dec. 31, 2007**

| | |
|---|---|
| **Assets** | |
| **Cash and Investments** | |
| Cash and Cash Equivalents | $2,053,958 |
| Marketable Securities: | |
| Debt Securities | 7,389,679 |
| Equity Securities | 14,303,083 |
| Total Marketable Securities | 21,692,762 |
| Total Cash and Investments | 23,746,720 |
| **Accounts Receivable** | |
| Trade, Net of Allowance for Doubtful Accounts of $4,029 | 1,127,565 |
| Pledges Receivable | 2,036,250 |
| Premium Refunds | 520,030 |
| Accrued Interest | 297,744 |
| Other | 14,159 |
| Total Acount Receivable | 3,995,748 |
| **Prepaid Expenses** | 200,477 |
| **Inventory** | 98,288 |
| **Property and Equipment** | |
| Land | 929,491 |
| Building and Improvements | 20,066,419 |
| Furniture and Equipment | 1,466,829 |
| | 22,462,739 |
| Less Accumulated Depreciation | (8,696,655) |
| Total Property and Equipment | 13,766,084 |
| **Prepaid Pension Cost** | 5,215,443 |
| **Other Assets** | 1,678,839 |
| **Total Assets** | $48,701,599 |

| | |
|---|---|
| **Liabilities and Net Assets** | |
| **Liabilities** | |
| Accounts Payable | $1,879,868 |
| Premium Refund Payable | 276,551 |
| Accrued Expenses | 478,342 |
| Deferred Revenue: | |
| Membership Dues | 863,784 |
| Magazine Subscriptions | 84,639 |
| Other | 29,407 |
| Total Deferred Revenue | 977,830 |
| Note Payable | 6,155,000 |
| Total Liabilities | 9,767,591 |
| **Commitments** | |
| **Net Assets** | |
| Unrestricted | 36,062,290 |
| Temporarily Restricted | 2,147,123 |
| Permanently Restricted | 724,595 |
| Total Net Assets | 38,934,008 |
| **Total Liabilities and Net Assets** | $48,701,599 |

**Treasurer's Note:** The Air Force Memorial Foundation was organized to raise money and build a memorial to those who serve and have served in the US Air Force. That memorial was constructed on a Pentagon Reservation site and dedicated in October 2006. On April 13, 2007, the Air Force Memorial Foundation voluntarily transferred all interest in the memorial, free and clear of all encumbrances, to the Secretary of Defense to have and hold forever. The gift and transfer was made in conformance with 10 US Code, Section 2608. By a decree from the Foundation's Board of Trustees effective April 13, 2007, the day-to-day governance of the organization was transferred to the Air Force Association with the stipulation that the Foundation continues as an independent tax-exempt entity. While AFA, VBA, and the Memorial Foundation operate as separate entities, the financial reporting is required to be consolidated since they share a common Board of Directors. The consolidated format is in accordance with SOP 93, *Reporting of Related Entities by Not for Profit Organization.* Single-year financial statements are presented since 2007 is the first year of the newly formed AFA, VBA, and Air Force Memorial Foundation.

## Air Force Association/AFA Veteran Benefits Association Air Force Memorial Foundation Consolidated Statement of Activities

**Year Ended Dec. 31, 2007**

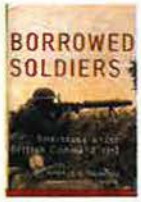
| | Unrestricted | Temporarily Restricted | Permanently Restricted | Total |
|---|---|---|---|---|
| **Revenue** | | | | |
| Contributions | $305,584 | | | $305,584 |
| Calendar | 694,441 | | $165,356 | 859,797 |
| General | 368,318 | $105,333 | | 473,651 |
| Air Force Memorial Foundation | 271,699 | | | 271,699 |
| Lapel Pin | 205,272 | | | 205,272 |
| Mailing Labels | 106,346 | | | 106,346 |
| Visions | 45,000 | | | 45,000 |
| Central Florida Gala | 25,786 | | | 25,786 |
| Los Angeles Ball | 22,604 | | | 22,604 |
| Total Contributions | 2,045,050 | 105,333 | 165,356 | 2,315,739 |
| Investment Earnings | 1,649,603 | | | 1,649,603 |
| Aerospace Technology Expo & Conference | 3,317,675 | 12,250 | | 3,329,925 |
| Membership Dues | 2,442,087 | | | 2,442,087 |
| Member Group Insurance Programs | 1,753,948 | | | 1,753,948 |
| Magazine | 1,639,181 | | | 1,639,181 |
| Building Operations | 952,503 | | | 952,503 |
| Royalties | 937,404 | | | 937,404 |
| Symposia | 472,974 | | | 472,974 |
| Industrial Associates | 92,786 | | | 92,786 |
| Other | 108,555 | | | 108,555 |
| Net Assets Released From Restrictions | 1,386,427 | (1,373,427) | (13,000) | |
| Total Revenue and Support | 16,798,193 | (1,255,844) | 152,356 | 15,694,705 |
| **Expenses** | | | | |
| Program Services: | | | | |
| Membership | 3,303,597 | | | 3,303,597 |
| Member Group Insurance Programs | 755,393 | | | 755,393 |
| Professional Development | 1,780,623 | | | 1,780,623 |
| Magazine | 3,993,602 | | | 3,993,602 |
| Aerospace Technology Expo & Conference | 539,658 | | | 539,658 |
| Aerospace Education | 903,862 | | | 903,862 |
| Field Operations and Communications | 760,450 | | | 760,450 |
| Calendar | 180,583 | | | 180,583 |
| Lapel Pin | 113,070 | | | 113,070 |
| Industrial Associates | 80,460 | | | 80,460 |
| Baker Institute | 38,259 | | | 38,259 |
| Air Force Memorial | 757,703 | | | 757,703 |
| Total Program Services Expenses | 13,207,260 | | | 13,207,260 |
| Supporting Services: | | | | |
| Building Operations | 858,612 | | | 858,612 |
| General and Administrative | 2,048,487 | | | 2,048,487 |
| Total Supporting Services Expenses | 2,907,099 | | | 2,907,099 |
| Fundraising Expenses | 172,734 | | | 172,734 |
| Total Expenses | 16,287,093 | | | 16,287,093 |
| **Change in Net Assets Before Other Items** | 511,100 | (1,255,844) | 9,499 | (735,245) |
| Cumulative Effect of Change in Accounting Principle-FAS 158 | (434,215) | | | (434,215) |
| Transfer of Memorial to Dept. of Defense | (33,088,304) | | | (33,088,304) |
| Capital Additions: Life Memberships Granted, Net | 355,521 | | | 355,521 |
| Unrealized Loss on Marketable Securities | (400,595) | | | (400,595) |
| **Change in Net Assets** | (33,056,493) | (1,255,844) | 152,356 | (34,159,981) |
| **Net Assets - Beginning of Year** | 69,118,783 | 3,402,967 | 572,239 | 73,093,989 |
| **Net Assets - End of Year** | $36,062,290 | $2,147,123 | $724,595 | $38,934,008 |

# Books

**Compiled by Chequita Wood,** Media Research Editor

***The 14th Fighter Group in World War II.*** John W. Lambert. Schiffer Publishing, Atglen, PA (610-593-1777). 165 pages. $45.00.

***Borrowed Soldiers: Americans Under British Command, 1918.*** Mitchell A. Yockelson. University of Oklahoma Press, Norman, OK (800-627-7377). 308 pages. $29.95.




***Milestones of Aviation.*** John T. Greenwood, ed., with Von Hardesty. Universe Publishing, New York (800-733-3000). 320 pages. $60.00.

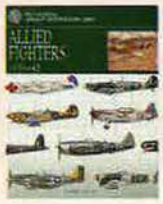


***15 Stars: Eisenhower, MacArthur, Marshall: Three Generals Who Saved the American Century.*** Stanley Weintraub. NAL Caliber Trade, New York (800-631-8571). 541 pages. $15.00.

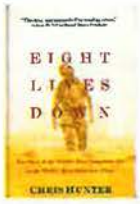

***Chief of Staff, Vol. II: The Principal Officers Behind History's Great Commanders, World War II to Korea and Vietnam.*** Maj. Gen. David T. Zabecki, AUS (Ret.), ed. Naval Institute Press, Annapolis, MD (800-233-8764). 243 pages. $37.95.


***Our War Stories III.*** Marvin Harper. Infinity Publishing, West Conshohocken, PA (877-289-2665). 352 pages. $18.95.

***Allied Fighters 1939-45: The Essential Aircraft Identification Guide.*** Chris Chant. Zenith Press, Minneapolis (800-766-2388). 192 pages. $19.95.




***Eight Lives Down: The Story of the World's Most Dangerous Job in the World's Most Dangerous Place.*** Chris Hunter. Delacorte Press, New York (800-733-3000). 351 pages. $26.00.




***Retribution: The Battle for Japan, 1944-45.*** Max Hastings. Knopf, New York (800-733-3000). 615 pages. $35.00.



***American Bomber Crewman 1941-45.*** Gregory Fremont-Barnes. Osprey Publishing, New York (866-620-6941). 64 pages. $18.95.


***F-14 Tomcat Units of Operation Enduring Freedom.*** Tony Holmes. Osprey Publishing, New York (866-620-6941). 96 pages. $22.95.

***Through Blue Skies to Hell: America's "Bloody 100th" in the Air War Over Germany.*** Edward M. Sion. Casemate, Drexel Hill, PA (610-853-9131). 220 pages. $32.95.

***Bill Mauldin: A Life Up Front.*** Todd DePastino. W. W. Norton, New York (800-233-4830). 370 pages. $27.95.

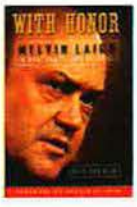

***Firefight: Inside the Battle to Save the Pentagon on 9/11.*** Patrick Creed and Rick Newman. Random House, New York (800-793-2665). 486 pages. $27.00.


***War Wings: Films of the First Air War.*** Phillip W. Stewart. FMS Press, Crestview, FL (850-420-1970). 218 pages. $24.95.



***Bluenoser Tales: 352nd Fighter Group War Stories.*** Robert H. Powell, ed. United Writers Press, Tucker, GA (866-857-4678). 373 pages. $55.00.


***The Guadalcanal Air War: Col. Jefferson DeBlanc's Story.*** Jefferson J. DeBlanc. Pelican Publishing, Gretna, LA (800-843-1724). 240 pages. $24.95.




***With Honor: Melvin Laird in War, Peace, and Politics.*** Dale Van Atta. The University of Wisconsin Press, Madison, WI (800-621-2736). 641 pages. $35.00.

# Keeper File

# LeMay and the "Airpower Battle"

*It was midway through the Eisenhower era, and Strategic Air Command was entering its second decade. Late 1956 was the moment chosen by Gen. Curtis E. LeMay, the famed SAC commander, to spell out his concept of SAC's purpose in life. He did so in a 2,700-word statement for a House committee, which published it along with other papers. The statement makes clear LeMay had a vision of SAC being so obviously powerful that it would be perceived by any and all enemies to be unbeatable and so deter them from any aggressive action. He described what he called "the airpower battle" as something new—global in scope, dependent totally on forces in being, and more important than any struggle on land or at sea. LeMay led SAC from 1948 through 1957, the longest tenure of any US military commander in nearly a century. When he left, SAC had grown to a force of 224,000 airmen, nearly 2,000 heavy bombers, and some 800 tankers.*

**"Strategic Air Command and World Peace"**

Gen. Curtis E. LeMay, USAF
From "Soviet Total War"
House Un-American Activities Committee
Washington, D.C.
Sept. 23, 1956

**Find the full text on the Air Force Association's Web site airforce-magazine.com "The Keeper File"**

In previous history, wars were generally protracted and long-range undertakings. Nations and their leaders recognized this from the outset. The decision for victory or defeat was the culmination of a long series of actions and reactions, spread out in time. ... "Protracted war" passed with the advent of the nuclear age. If we are to be successful in preventing war today, we must recognize the radically changed dimension in today's warfare—the dimension of time. Today, decisive force is already in existence, compressed in nuclear weapons stockpiles. It can be applied across the length and breadth of an enemy nation in a few hours, or in a few days at the most, by long-range jet bombers. ...

Our only significant strength is our strength in being. Our military strength is produced by our people and by our industry. It reposes in our various services. But every military man, soldier, sailor, or airman, agrees on one thing. As long as there are airplanes and air weapons, the successful conduct of any military operation hinges upon the possession of air superiority. Strength on the ground or on the sea can only prevail, or for that matter survive, if the air above it is friendly. I think we all agree that we can neither engage nor win unless we have air superiority.

Our first job therefore is to win the airpower battle. The airpower battle is a global battle. It is not a localized battle, and it cannot be won locally. Airpower, especially strategic airpower, is flexible. It can strike at long range or at short range; it can strike at a single target from many base areas, or at many targets from a single-base area. It can take off from widely dispersed bases and mass over a target system 5,000 miles distant. ... When I speak of air strength I am not speaking only of airplanes. I am speaking of airfields, fuel supplies, depots, stockpiles of aircraft parts, weapons and weapons stockpiles, control and communications centers, highly trained and skilled manpower—and airplanes. These constitute airpower. These are the things which must be destroyed if the airpower battle is to be won. The airpower battle is a battle we cannot lose, because its loss is defeat. Like any battle, the airpower battle is part of war. It is the decisive battle in modern war—the initial battle and the one whose outcome will clearly determine who wins. The decisive phase of the airpower battle is won or lost before the shooting war starts. This brings us again to the conclusion that the Cold War in which the United States is now engaged could already be a part of World War III. And I repeat, the result of the struggle for airpower supremacy will determine who wins and who loses. More importantly, as long as we win the airpower battle during peacetime, we will be successful in deterring war and preserving peace. ...

Our national policy is one of deterrence. Our national leaders recently made some very clear statements about that policy. We must deter aggression. We deter by making it clear that we have strength, and that its application will cost the enemy more than he could possibly gain by attacking us. Our assumption is, of course, that those who make decisions in the Soviet bloc are not without reason—that they are not deliberately bent upon suicide. If they are reasonable men, and we have cause to believe that they are not only reasonable, but practical, they will not start a shooting war when there is any serious doubt that they can win it. They will not start a shooting war, regardless of their definition of victory, as long as it is clear to them that no matter how they go about it, it will cost them more than they can possibly gain.

Assuming the Soviets are guided by reason, even by selfish reason, they will not initiate [any move to a phase] during which strength is overtly applied. ... The reason is obvious—they have not won the struggle for airpower ascendancy. We have the strength to deter them. Today, we have the ability to win the airpower battle. So today, we are achieving our national aim—we are preventing shooting war by possessing enough superiority that we are clearly ahead in the current Cold War.

The important thing to remember is that if we do, in fact, possess the power to deter, it is only because we clearly possess the strength to win—the strength to win the airpower battle and, through it, the war. ■

AFA's

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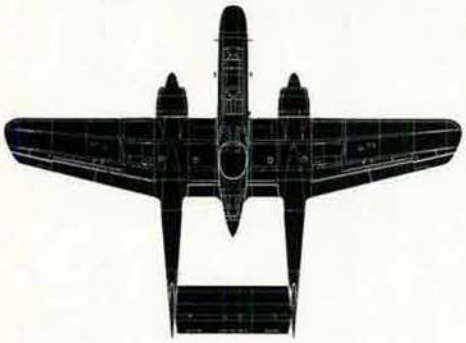
# Airpower Classics

**Artwork by Zaur Eylanbekov**

# P-61 Black Widow



The first aircraft designed specifically as a radar-equipped night fighter, the Army Air Forces P-61 Black Widow had a brief but distinguished World War II career. The Northrop aircraft was slow getting into combat, delayed by an overly ambitious design and John Northrop's preoccupation with his flying wing projects. The first P-61s did not enter service until mid-1944. They served well, but, by then, targets in all theaters were hard to find.

In November 1940, Northrop proposed a very large, two-engine fighter with a twin boom layout, sufficient to carry a required heavy early radar, powerful armament, and fuel for extended loitering time. The design was preferred to Douglas' offer of a modified A-26 Invader, and two prototypes were ordered in January 1941. Testing of the initial production run revealed that the top turret caused such violent buffeting that it had to be removed after the 37th P-61A. Eventually, however, the program smoothed out. The key to the P-61's success was the Western Electric SCR-720 airborne intercept radar.

The P-61 was the largest and heaviest USAAF fighter in World War II, but it was reliable and actually pleasant to fly. Its purpose also changed. Originally intended to shoot down night bombers, the Black Widow was soon employed as a night intruder, ranging far behind enemy lines. Other missions included reconnaissance, night ground attack, and test work on ramjet missiles and ejection seats. Eventually, it was used to equip all USAAF night fighter units.

*—Walter J. Boyne*

**This aircraft:** P-61B #42-39533—*Markey*—as it appeared in summer 1945 when assigned to the 417th Night Fighter Squadron in France.


### In Brief

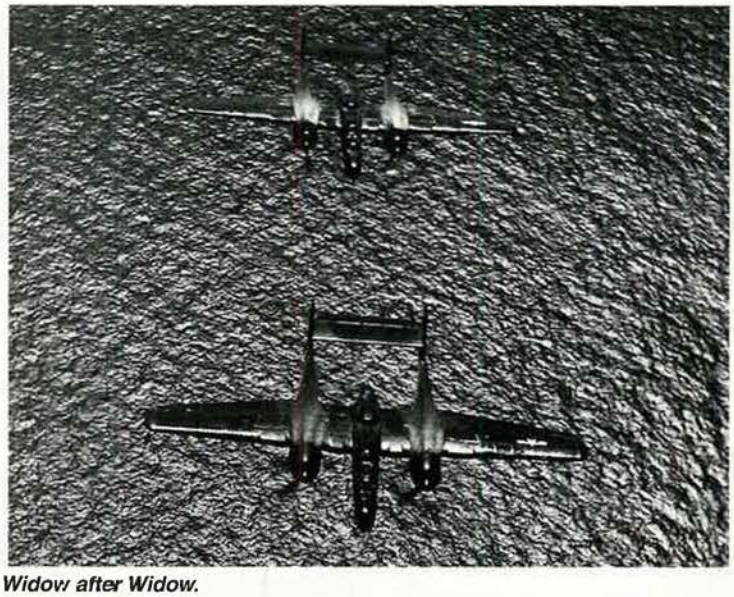
Designed, built by Northrop ★ first flight May 26, 1942 ★ crew of three—pilot, radar operator, gunner ★ two Pratt & Whitney R-2800-65 radial engines ★ number built 742 ★ **Specific to P-61B:** max speed 366 mph ★ cruise speed 275 mph ★ max range 1,200 mi ★ armament, four 20 mm cannon, four .50 cal guns in top turret ★ bomb load, four 1,600-lb bombs ★ weight (max) 29,700 lb ★ span 66 ft ★ length 49 ft 7 in ★ height 14 ft 8 in.

### Famous Fliers

**Aces:** Crews of Carroll Smith (pilot) and Philip Porter (radar operator); Paul Smith (p) and Robert Tierney (r/o); Herman Ernst (p) and Edward Kopsel (r/o); Eugene Axtell (p); Robert Graham (r/o).
**Notables:** Charles Lindbergh, Oris B. Johnson, Leonard Hall.

### Interesting Facts

Shot down 18 V-1 "buzz bombs" in Europe ★ rejected by British in favor of de Havilland Mosquito ★ directed by ground-based radar ★ introduced night vision binoculars ★ featured cannon fired by pilot ★ modified to become F-15 Reporter ★ one civilian P-61 and one F-15 Reporter were modified as air tankers; both crashed. ★ used in thunderstorm research ★ chosen as featured aircraft in a planned, but canceled, Howard Hughes film ★ used by Marine Corps as trainer aircraft.



***Widow after Widow.***

# ABE: THE PERFECT F-16 BORESIGHT SOLUTION.

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*ABE is the perfect solution for sensor and system alignment on F-16 Fighting Falcons .*

For instance, current flight tests of the next-generation F-35 Lightning II Joint Strike Fighter are carried out with sensors and systems aligned by ABE. And, the Air Force has ordered ABE systems for its C-130 gunships, C-17 Globemaster III transports, and C-130 AMP aircraft.

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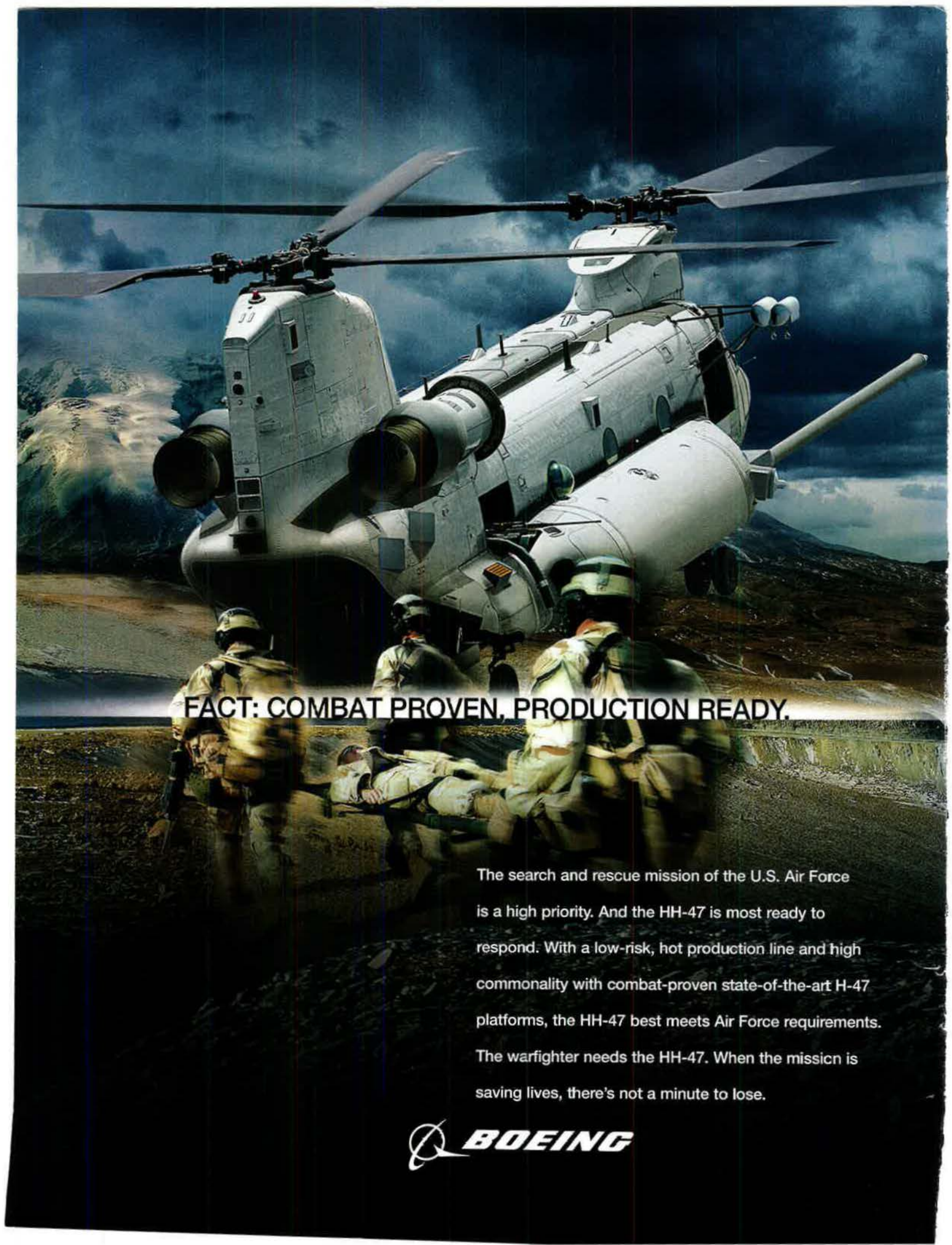
FACT: COMBAT PROVEN. PRODUCTION READY.
The search and rescue mission of the U.S. Air Force is a high priority. And the HH-47 is most ready to respond. With a low-risk, hot production line and high commonality with combat-proven state-of-the-art H-47 platforms, the HH-47 best meets Air Force requirements. The warfighter needs the HH-47. When the missicn is saving lives, there's not a minute to lose.
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