April 2007/$4

AIR FORCE MAGAZINE

JOURNAL OF THE AIR FORCE ASSOCIATION

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April 2007, Vol. 90, No. 4

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About the cover: A C-17 prepares to be refueled by a KC-135 tanker. See "For the Air Force, the Bill Comes Due," p. 28. Staff photo by Zaur Eylanbekov.

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Editorial

By Robert S. Dudney, Editor in Chief

A Better UAV Flight Plan

THE Air Force may be the official keeper of airpower, but aviation is respected by all of the armed services. The Navy defines itself in terms of carriers. The Marine Corps has fighters. The Army flies attack helicopters. All have support fleets.

USAF seeks no monopoly, having long ago accepted that the other services need organic air assets to carry out their assigned combat missions.

At times, though, USAF has had to push back. Federal law (Title 10, US Code) specifies that the Air Force—and it only—shall be "organized, trained, and equipped" for "prompt and sustained offensive and defensive air operations." Now, USAF faces a push-back moment, with its top officer leading the charge.

At issue are unmanned aerial vehicles, the robotic aircraft which have played starring roles in Afghanistan and Iraq.

UAVs have demonstrated great intelligence-surveillance-reconnaissance (ISR) power—tracking insurgents, foiling roadside bombs, and flying route reconnaissance. Each service has deployed hundreds as a cheap way of expanding battlespace awareness.

This sudden, unplanned, and chaotic rise of the UAV has sparked discord between the Air Force, on one hand, and Army, Navy, and Marine Corps on the other. The basic question: Which service, if any, should control UAV policy and guide UAV operations?

To that question, Gen. T. Michael Moseley, USAF Chief of Staff, has a blunt answer: The Air Force should be in charge. It is, the Chief maintains, the service "organized, trained and equipped" to conduct joint warfare "from the air."

Moseley made his pitch in a March 5 memo to Deputy Secretary of Defense Gordon England, members of the Joint Chiefs of Staff, and combatant commanders. He called for making USAF the executive agent for medium- and high-altitude UAVs, defined as higher than 3,500 feet above ground level. The move would allow USAF to shape requirements and guide development.

It was a bold step, but one the Air Force had to take because of two critical problems with the developing UAV situation.

First, other services keep their UAVs "tethered" to their individual units. UAVs in direct support of land or naval forces are controlled by local commanders. This limits distribution of ISR data and restricts highest and best use of each UAV. It leads to skies crowded with up to 1,000 UAVs, creating hazards. Airmen believe air assets are best controlled by a centralized air commander, as is the case with USAF's Predator and Global Hawk UAVs.

No one wants to deny ground or naval forces the power to see threats or targets. The real goal is to get the most out of each UAV for the joint force.

Second, the decentralized, unsynchronized approach to UAVs is inefficient, in both time and money. With so many institutions at work, there is inevitable duplication of effort and unfocused development of air and associated ground equipment, uplinks, and downlinks, often with no compatibility. Under this Lone Ranger approach, there are no standards for logistics, training, or ground stations. Operators using the same frequencies jam each other. Imposing discipline on air systems is supposed to be the Air Force's job.

With USAF as executive agent, said Moseley, the US would gain many benefits, from better distribution of intelligence to lower costs, from more participation of allies to a better grip on "ballooning" UAV bandwidth use.

In truth, no other service can match USAF's credentials. It suffered a slow start in UAVs, but now has established itself as a leader. Moseley pointed out that the Air Force has "max surged" all available UAVs forward to the Mideast. It has come up with innovative ways to share data from its sensors.

This year's Air Force budget earmarked $2.3 billion to hasten acquisition of Predators. USAF's 2008-13 budget plan seeks $13 billion to buy 241 UAVs for 12 new Predator squadrons.

Clearly, more than the future of UAVs is on the line. Also at stake is the fate of USAF's push to become the prime organization for operational ISR within the joint community, as it is for air combat and air mobility.

Already, most ISR data comes from USAF space satellites and manned aircraft such as the U-2, E-8 Joint STARS, E-3 AWACS, and RC-135 Rivet Joint, as well as Global Hawks and Predators. A growing UAV fleet would deepen and extend this capability. In his memo, Moseley said he planned to present a "comprehensive" plan to improve ISR capabilities.

Lt. Gen. David A. Deptula, deputy chief of staff for ISR, recently laid out a multifaceted blueprint for overhauling the service's ISR functions with operations in mind.

Moseley argues, "A joint theater ISR strategy, with the [top theater airman] controlling all medium- and high-altitude theater ISR assets, will better meet the ISR needs of the joint force commander."

This is the Air Force's second bite at the UAV apple. Pentagon officials in 2005 turned down a similar USAF bid for executive agency, largely because of objections from other services.

This effort, too, is sure to draw fire—particularly from the Army. In the past, it has sought a free hand to operate UAVs up to 10,000 feet. Service plans call for spending billions of dollars for thousands of UAVs over the next decade.

"They're out building their own air force," charges one bemused Air Force officer. "They're planning to buy more medium-altitude UAVs than the United States Air Force is buying."

No one wants to deny ground or naval forces the power to see threats or targets in the battlespace. The real goal is to get the most out of each UAV for the joint force. That's not happening today.

We think that Moseley has come up with an excellent way to improve the system. We further think that, if the Pentagon takes an honest look at things, it will come to the same conclusion. After all, UAVs are aircraft. Why not get guidance from the world's foremost practitioner of airpower? ■

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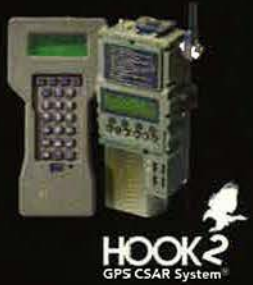

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Letters

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Ghost Dance

My compliments on your excellent editorial, "Ghost Dance at the Apocalypse," February 2007 *[p. 2],* which objectively addressed the Kissinger/Schultz/Perry/Nunn call for US leadership in creating a "world free of nuclear weapons."

Ultimately, their proposal rests on the assumption that all the US has to do is "set an example" and all other nations will follow along. This is highly doubtful in any case, but especially so when it comes to unstable nations run by irresponsible "leaders." Unstable countries and their leaders pursue nuclear weapons because it serves their reckless ambitions and their narrow interests, as they see them. For them, nuclear weapons facilitate regional dominance, enhance their power and prestige, and, most importantly, immunize them from the threat of US or other great power intervention, providing a cloak for coercion or aggression. Under some circumstances that seem "right" to them, they might even use these weapons. A situation that could stimulate that use would be one in which the United States had disarmed or even removed our ICBM and SLBM forces from the prudent alert posture they now maintain. A second situation would be one where the United States questions or doubts the means by which we dissuade WMD proliferation, deter violence, and defend ourselves ("self-deterrence").

Hopefully the compelling points made in the Defense Science Board report you reference will receive high-level attention within the DOD, DOE, and the Congress.

Maj. Gen. Tim McMahon,
USAF (Ret.)
Colorado Springs, Colo.

My view is that the reason nuclear, in particular, deterrence works is that it puts the leadership in mortal danger. Almost nothing else does as good a job as that. Combine your observations with the Congressional statement of purpose in Title 22 USC Section 2551 that includes "reduction and control of armaments looking toward ultimate *world* disarmament" (emphasis mine) and the graph on p. 10 *["The Chart Page: Entitlement Nation"]* could have been predicted in 1961 when the US arms control and disarmament agency was created.

Richard D. Spalding
Orlando, Fla.

Bombers Over Korea

I appreciated the pictures of B-26s displayed in the article "Bombers Over Korea" in your February issue *[p. 58].* I completed a tour in Korea flying my 50th mission in a B-26 of the 95th Bomb Squadron, 17th Bomb Wing, out of K-9 at Pusan about a week before the end of hostilities. At that time, the other two B-26 squadrons at K-9 were the 34th and 37th. There were also (I think) three squadrons of B-26s at Kunsan (K-8) which (again, I think, but am uncertain of) were assigned to the 3rd Bomb Wing. One of these (and I'm sure of this!) was the 13th or "Grim Reaper" Squadron.

Although you did not make a point of it in your article, it is apparent from the pictures that there were multiple configurations of B–26s. At K-9 we had hard nosed aircraft with four 50s in the nose, others with six, still others with eight. And there were also variations among the glass nosed planes, all of which used the Norden bombsight, but many of which carried Shoran sets in the compartment aft of the bomb bay. As to defensive guns, we had aircraft with no turrets (all Shoran equipped birds), others with an upper turret, others with a lower turret, still others (not many) with both.

A similar lack of standardization existed in the cockpits. All of the basic controls and instruments were pretty much in the same positions, but auxiliary items like gun controls, radios, and

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landing lights, were located in positions that sometimes seemed to lack serious thought about their placement. Following mission briefings, while I checked the bomb load, fuzing, and bombsight, my normally assigned pilot, Gary Wiersma, made it a practice to go sit in the cockpit of our assigned aircraft for a half-hour to familiarize himself with control item locations perhaps unique to that particular bird.

R.K. Markel
Corona, Calif.

I have ordered several copies of the [February issue] for the surviving four of our original 11 ex-B-29 Korean War combat crew mates, as a number of the B-29 photographs are 19th Bomb Group ships. We flew our combat tour in the second *No Sweat.* The original *No Sweat*—of the 28th Bomb Squadron—as pictured in your February 2007 issue, had been destroyed on the ground at an airfield in South Korea after having made an emergency landing there with battle damage incurred over North Korea in 1951. While there under repair, an F-51 Mustang fighter lost control on takeoff and crashed into and destroyed her. Our six-month combat tour (25 combat missions with 22 other formation training, search, and test hop flights for a total 47) was primarily in *No Sweat II* aircraft No. 44-70134 of the 93rd Bomb

Squadron, 19th Bomb Group.

Bud Farrell
Tucson, Ariz.

Tanker Voices

"The 90-Year Tanker Saga," February 2007 *[p. 78],* contains some misleading comments concerning the crash of the KB-50 at Takhli, Thailand, in October 1964. The aircraft did not crash on takeoff, the wings did not snap off, and the entire crew was not killed.

As a new first lieutenant navigator in the KB-50J, I was at Takhli in October 1964 and then went to Saigon on Oct. 5, 1964. I flew my last mission in the KB-50J on Oct. 10, 1964, so it was shortly after that that the aircraft crashed at Takhli.

As I recall the accident, the aircraft had departed Takhli for a combat refueling mission along the Thailand/Laos border. During climb out, the crew experienced a massive engine failure and fire. Normal emergency procedures failed to extinquish the fire, so the crew initiated a descent and return to Takhli. While returning to Takhli, the crew experienced a second engine failure and fire, which they were unable to extinquish. The aircraft was placed on autopilot and the crew bailed out at approximately 6,000 feet altitude. All crew members landed within one mile and were rescued shortly thereafter. The aircraft continued on autopilot and overflew Takhli in a normal attitude. Several squadron members witnessed the aircraft streaming fire and flying directly over the airbase. The aircraft struck the ground in a wing-level position but, unfortunately, in a small Thai village. Several Thai civilians were killed.

About two or three months prior to that accident, a KB-50 returning home to Yokota AB, Japan, from a refueling mission near Misawa AB, Japan, had two violent engine failures that resulted in fires that the crew was unable to extinguish with normal emergency procedures. The crew attempted to "blow out" the fires by diving the aircraft at a relatively higher speed. The tail section broke off causing the aircraft to pitch forward, the wing tips to break off just inboard of the jet engines, and the aircraft to impact a ridgeline in an "upside-down" position. Three crew members successfully bailed out and the rest were killed. Investigation of recovered aircraft parts revealed that severe corrosion caused the tail section to leave the aircraft.

The second accident in Thailand did result in the immediate grounding of all KB-50s and subsequent clearance for one-time flights to the boneyard in Tucson, Ariz.

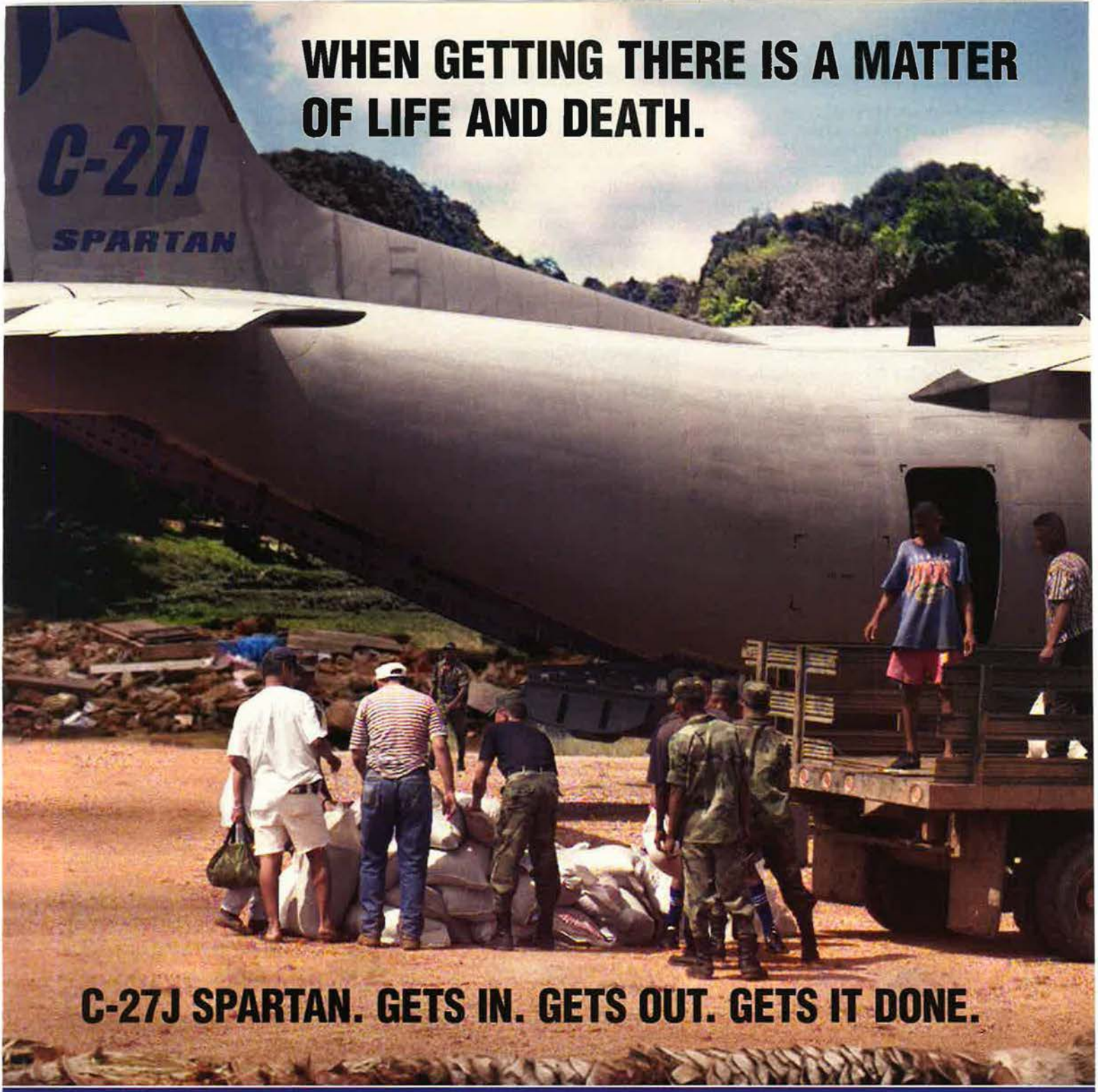
Lt. Col. Mel Marvel,
USAF (Ret.)
Sacramento, Calif.

The unrelenting demands for refueling support, coupled with the growing cost of maintaining an aging tanker fleet that is in the twilight of its service life, dictates modernization begin now. I'm an old tanker driver who retired from the Air Force nearly 20 years ago. When I retired, the KC-135 re-engining program had been under way for nearly seven years and still wasn't complete. And that doesn't count the many prior years it took to recognize the need, select, and fund a re-engine program. We can't afford to take as long acquiring and fielding a replacement for the KC-135 as the re-engining program took.

In the article, the author stated there were no tanker wings in SAC until 1988. SAC history shows there were at least five provisional air refueling wings dating back to the mid-50s. Permanent air refueling wings came into existence starting in 1964 with the 301st AREFW, Lockbourne AFB, Ohio; in 1970, the 305th AREFW, Grissom AFB, Ind.; in 1973, the 384th AREFW, McConnell AFB, Kan.; in 1982, the 22nd AREFW, March AFB, Calif.; in 1983 the 19th AREFW, Robins AFB, Ga.; in 1984, the 340th AREFW, Altus AFB, Okla.; in addition to several air refueling squadrons and groups that evolved into wings prior to 1988.

Lt. Col. Robert W. Burke,
USAF (Ret.)
Fort Worth, Tex.

Mr. Meilinger's article is a good survey of the USAF air refueling story, and is unique in its mention of Alexander de



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Seversky's role at the saga's very beginning. For that alone it is very useful.

However, as the historian for the Tactical Tanker Association I would like to correct his depiction of the Air Force's fighter aircraft refueling story. That tale begins in the late 1940s as the Air Force planned for the Cold War. It gained probe-and-drogue equipment and expertise from Britain's Flight Refueling Ltd. and installed it on a few B-29s. SAC had acquired several fighter escort wings and needed this capability to enable them to perform their mission. The Korean War pushed the Air Force dramatically into the fighter refueling role, and several experiments were tried in-theater to extend combat radius and endurance over the target area. SAC deployed at least two of its fighter wings TDY to Japan in 1952, using its KB-29s (incidentally, fighters never used the looped-hose system). The way was open for fighter air refueling on a large scale.

The legendary tactical air general, Otto P. Weyland, was commander of Far East Air Forces at the time and quickly realized the enormous potential that fighter air refueling had. By the time he came to Tactical Air Command as its commander in [1954], he and the Air Staff were engaged in doctrinal discussions on what came to be known as the Composite Air Strike Force (CASF). This concept would enable TAC fighter and reconnaissance units to remain PCS in the US, instead of all be stationed in overseas theaters, and deploy as necessary to calm incipient crises or to bring to the fight, if necessary, tactical airpower quickly and effectively. This was especially important as tactical aircraft gained the use of nuclear weapons. Thus an entirely new tool was given to the President to cope with world crises.

Meanwhile SAC got out of the fighter escort business and ceded to TAC many of its KB-29s in two configurations, probe-and-drogue (good for the F-84G) and the flying boom (good for the F-84F). Using the KB-29s the Air Force began to get six refueling squadrons, one each in the Pacific and Europe and four in the continental US. However, with the century-series fighters entering the inventory, a better tanker was needed, and SAC's surplus B-50 bombers were chosen. KB-50s with three refueling positions entered the inventory in 1956, and by 1958 all of them had been upgraded to KB-50J status with two J47 jet engines added under the wings. Thus TAC and the theater air forces had the refuelers they needed to cope with world war and any lesser crisis that might come along.

It was just in time. TAC had been practicing the CASF concept, and in 1958 it deployed two CASFs almost at the same time. Using air refueling and that other vital component of the rapid-deployment concept, airlift, TAC responded to the Lebanese crisis of July 1958 with a package of F-100s and reconnaissance aircraft sent to Turkey. Just two months later, TAC sent another CASF to the Western Pacific to cope with communist Chinese belligerence in the Taiwan Strait. For this heroic effort, that CASF was awarded the 1958 Mackay Trophy, an honor the refueling units made possible. TAC CASFs continued to be sent to crisis areas real and potential as directed by the President from then until the mid-1960s (Berlin, Cuba, Saudi Arabia, and Tonkin Gulf are just examples), and it all worked splendidly.

However, everyone knew that the KB-50 was just an interim solution. General LeMay as vice chief of staff in 1959 directed that SAC would become

single manager of AF air refueling, and that the KC-135 was the aircraft to perform both strategic and tactical missions. SAC KC-135 units began training for the fighter refueling mission in 1961, and by early 1965 took it over. The whole process was planned in advance, the TAC and European-based squadrons phasing out beginning in 1963. The Pacific squadron, the 421st, was indeed grounded in 1964, as Mr. Meilinger states, but there were two accidents, not one, that spelled the earlier-than-planned end of the KB-50. One, off Japan in August 1964, killed seven and injured three on board, and another in Thailand in October killed 15 Thai villagers while all the aircrew escaped, only one being injured. The KB-50s were immediately grounded, but were eventually flown back to the US and their "retirement" to Davis-Monthan [AFB, Ariz.]. The KB-50 story is in fact summarized very well in your magazine ("Twilight of a Gallant Warrior," April 1965).

The CASF concept went into hibernation with the huge commitments of tactical airpower we had to make in Southeast Asia. It could have been well used in the many non-SEA crises we had in that period. However, it surfaced again in the late 1980s and 1990s. Now the Air Force has evolved it into what is now known as the Air and Space Expeditionary Force concept, and makes the motto "Global Reach-Global Power" not just a slogan.

As you can see, it all began with us!

Lt. Col. John F. Bessette,
USAF (Ret.)
Springfield, Va.

An Operator's Perspective

I found the article in the February 2007 issue, "Lavelle, Nixon, and the White House Tapes" *[p. 86],* about General Lavelle's treatment very interesting. At the time, I was an AC-130 pilot by night and 16th Special Operations Squadron historian by day. There is at least one factual error in the article. While I can't dispute whether any AC-130s took battle damage on Jan. 17, 1972 (p. 87), I can attest there was no loss of life that day. We did lose two aircraft in late March. One was struck by an SA-2 with all hands lost. The other was hit with AAA and thanks to the Jolly Greens, all crew members were rescued.

As the actual threat at the time was clearly building, we naturally welcomed the air strikes up north. During one mission over the Plain of Jars in February 1972, my aircraft was momentarily unescorted when a MiG was launched to intercept us. We received a warning and took evasive actions. Our escorts quickly left their tankers to chase the bandit, but the MiG got across the border into North Vietnam before the F-4s could engage.

Col. Charlie Seifert,
USAF (Ret.)
Fairfax, Va.

Entitlement Nation?

["The Chart Page: Entitlement Nation," February, p. 10] was only partly revealing. In the first place, charting expenditures as a percent of GDP fails to disclose the absolute amounts, where Defense Department budgets are not exactly niggardly. Worse, though, is your implication that the proportionate growth of entitlements over defense is an unfavorable national priority. I might ask: What good is the strongest military in the world, with a budget greater than the rest of the world combined, if a large portion of the people who support that military are destitute, without medical care, unemployed, "and the like" (to use your words)? By now, no thinking person would seriously consider reducing our defense capability, and we can easily afford both defense and entitlements with a more rational tax policy such as we had in the 1940s, 1950s, and 1960s when defense was the greater portion of the two.

Howard F. Sosbee
Scotts Valley, Calif.

"The Chart Page," by Tamar Mehuron, "Entitlement Nation," in your February issue is misleading. It should have the entitlement line broken into two categories: earnings and benefits. An entitlement is defined in Webster's as "a right granted by law or contract (especially a right to benefits)." In the case of Medicaid and welfare/aid payments, society (read government) has decided to give this right to those who have a nonexistent or low income and those who, because of low income status or no insurance, cannot pay for medical care. Conversely, Social Security and Medicare, as with military or civil service retirement, are entitlements earned through payment into a system or service to the country. Most DOD retirees will drink from all three of these entitlement troughs because they earned that right. By separating the entitlement categories, we would see that earned entitlements take a big bite out of the GDP because the baby boomers are cashing in (based on involuntary payments into Social Security and Medicare) during their retirement years. In truth, the paltry defense budgets we see today are a reflection of the popular belief that our nation is not really threatened, in the sense that WWII was a threat. We should not be too concerned about the entitlement portion of the graph. It will diminish because Social Security and Medicare cuts are coming soon, especially for those of us who don't really need the money we paid in.

Lt. Col. Jim Beach,
USAF (Ret.)
Georgetown, Tex.

I realize Mehuron used a DOD/OMB chart that compared Defense Department spending to Payments to Individuals as a percentage of GDP to show Payments to Individuals rising much faster than Defense Department spending. However, as I thought about Payments to Individuals and how it was defined, it became apparent that population was a key variable/driver and not a constant. In fact, according to the GPO Economic Report of the President: 2005 Report Spreadsheet Tables, the US population went from 132 million in 1940 to 294 million in 2004. This equates to 1.2 percent population growth per year over the 64-year period. This omission was quite significant, I believe.

Brian D. Berry
Bellbrook, Ohio

■ *Mr. Sosbee missed the point of "The Chart Page." It did not intend to show gross dollar amounts but rather—as it clearly stated—US "commitment to" or "emphasis on" various government efforts over a long period. For that purpose, percent of GDP is a perfectly valid measure. Colonel Beach offers a useful idea, though the law does not differentiate. Mr. Berry has a point. However, one must take into account not only a larger US population but also a much larger GDP.* —THE EDITORS

Band-Aid Action

[Regarding the statement, "Medicare-eligible military retirees, as well as other Medicare patients, were spared possible tightening of access to physicians when Congress, in December, rescinded a provision of law that would have frozen doctor reimbursements at 2006 rates" in "Action in Congress: Medicare Doctor Rates," February, p. 29]: The action actually froze the rates at the 2005 level since the same provision was rescinded a year earlier. I would call this "Band-Aid" action by Congress. Why doesn't Congress rescind this provision once and for all? If the provision ever takes effect, many more doctors will drop out of Medicare and Tricare. The article went on to state "Medicare physician rates instead rose by 5.1 percent for 2007." The rates did not rise by 5.1 percent, but would have dropped 5.1 percent. If the provision had not been rescinded, existing rates paid to doctors would have been reduced by 5.1 percent.

Lt. Col. Howard K. Smith,
USAF (Ret.)
Lexington, Va.

Washington Watch

By John A. Tirpak, Executive Editor

The 20/$20 Billion Get Well Plan; Murtha's Concerns; The Mobility Jumble ....

USAF Readiness: Going, Going....

The Air Force can no longer say it is on the edge of a readiness crisis. It is now actually in one, and nothing short of huge budget boosts over many years can pull it out, say top Air Force officials.

USAF's Fiscal 2008 budget, sent to Congress in February, contains a modest spending increase. However, most of it is taken up by higher costs of fuel, pay, and health care. It does not begin to bring the service out of its current funk.

A senior service official, speaking on background, said returning USAF to a healthy condition will take budget increases of $20 billion a year for 20 years.

All readiness indicators are worrisome. In Air Force "stoplight" charts—where green is good, yellow is a caution, and red is bad—assessments are sliding more and more toward the red zone. In 2004, 68 percent of USAF units were counted as "ready." That number was bad enough, but, in 2005, it fell down to 63 percent. Last year, the figure was 56 percent.

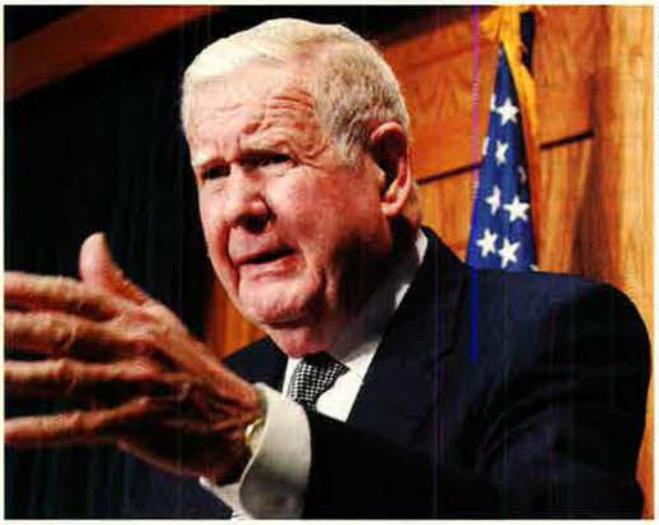
The number of units judged to be in the "red" rose from 15 percent in 2004 to 20 percent in 2006.

This year, despite some gains in readiness accounts, flying hours will be cut 10 percent—as they are projected to be each year for the next few years—and pilots will have to depend more on simulation training. Depot maintenance is only funded at 77 percent of the needed levels. Infrastructure, one of the classic bill-payers, is now on a replacement schedule of about 275 years.

Readiness problems stem principally from the vagaries of flying decrepit aircraft. For years, recapitalization funds have been diverted to pay for operations in Afghanistan and Iraq. Before that, equipment replacement was simply deferred.

"We really have a crisis in modernization," USAF budget director Maj. Gen. Frank R. Faykes told reporters at the release of the 2008 budget request.

Modernization has been kicked down the road for many years. Now, a significant portion of the fleet is grounded or restricted due to age problems, but help still isn't on the way.



AP photo by Dennis Cook

Murtha to Air Force: Tell us what you need.

Lockheed Martin photo by Tom Harvey

Lightning production will be like molasses.

For instance, USAF needs to procure roughly 110 F-35 fighters each year to offset planned F-16 retirements, but it can afford to buy only 48 per year. At that rate, it will still be buying F-35s in the 2050s—and still not have bought out its planned inventory.

Tankers are USAF's No. 1 priority, but budget plans show that it will buy only 14 a year. That will require that the youngest KC-135Rs of today will still have to fly missions 30 years from now. They will be nearly 80 years old.

"This budget forces us to accept significant risk," warned the service official, and, without a substantial boost, it sets the stage for USAF becoming "a smaller and less capable force."

He added that it is "unnecessary and unreasonable" to ask the service to accept this decay. The nation could spend more on defense, he suggested, given the currently low percentage of national wealth devoted to that purpose. (See "The Chart Page," February, p. 10.)

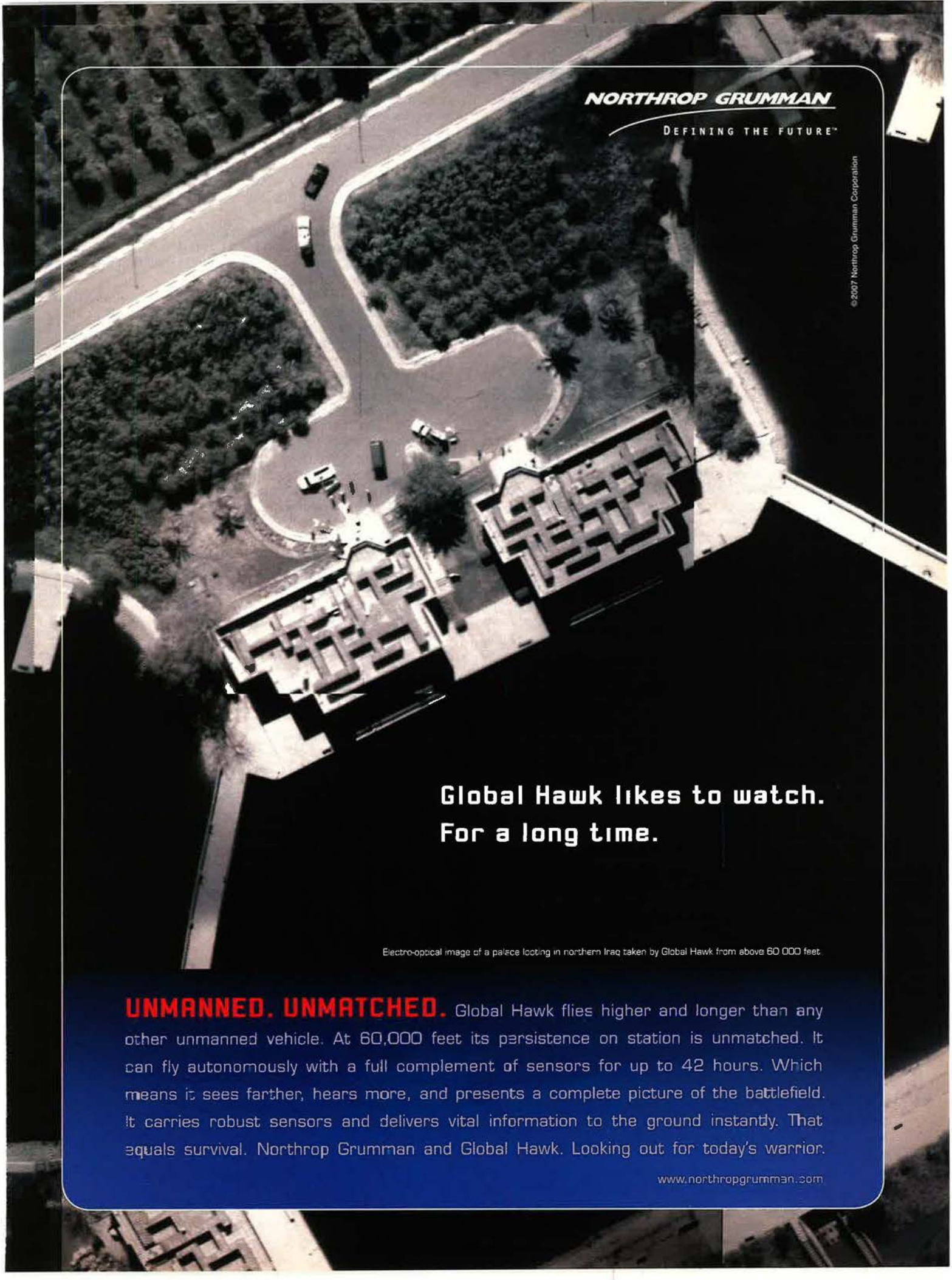
Murtha Demands, "Give Us a Number"

In an unusual twist in budget politics, a Capitol Hill defense baron has expressed growing impatience with the Air Force over its seeming reluctance to ask for what it needs.

Rep. John P. Murtha (D-Pa.), chairman of the House Appropriations defense subcommittee, used a Feb. 12 hearing to signal his belief that the Air Force should stop negotiating with itself and just declare its requirements. Evidently, he is not the only lawmaker thinking along those lines.

At the hearing, Murtha put the issue to Michael W. Wynne, the Secretary of the Air Force, and Gen. T. Michael Moseley, Chief of Staff. He told the two that he's baffled as to why the Air Force continues to cut its end strength.

"Reducing the size of the Air Force ... worries me," Murtha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said. "You're getting to the point where you're very, very on the edge here."

Wynne said that, as the Air Force's budget was being prepared, he had judged it to be "a stretch" for the Air Force to ask for "a huge plus-up in our budget," so he didn't ask.

To this, Murtha answered, "You're endangering the future."

Murtha said he wants to accelerate replacement of the Air Force's old KC-135 tankers and F-16 fighters. "When I see what's happening worldwide, I think you need to really be concerned about the future readiness of the Air Force," Murtha said. "Quit making the changes and give us a number so that we can buy what you need."

Congress suggests the Air Force might have to keep additional airmen in line with planned expansion of the Army and Marine Corps. USAF leaders resisted doing so because they were counting on savings from personnel reductions to help finance modernization.

A few days before the hearing, Wynne acknowledged a need to adjust Air Force end strength, but he said USAF would not try to amend its 2008 budget submission. "We're willing to live with it," Wynne said, because "this is a very poor time to approach the Congress" for a huge increase.

When Wynne and Moseley went before Murtha's panel, numerous members expressed exasperation with them for not requesting more of the equipment the Air Force needs.

Wynne and Moseley promised a major reassessment of Air Force modernization and readiness spending this summer.

Those Slippery Mobility Plans

It was supposed to be nailed down. After an excruciating, years-long mobility planning campaign—with multiple requirements studies, capabilities reviews, analyses of alternatives, and so forth—the Air Force last year announced its decision: It would make do with only 187 C-17s, fix up its 111 C-5As and Bs, buy some new C-130J theater airlifters, and replace its tanker fleet as quickly as possible.

That, however, was then, and this is now. In just the last few months, the mobility plan has gone back into the meat grinder and has come out with major revisions.

The biggest item to come into question is the $12 billion C-5 upgrade program, which had two parts: the Avionics Modernization Program (AMP) and Reliability Enhancement and Re-engining Program (RERP). At the Air Force Association's Air Warfare Symposium in February, service leaders acknowledged that the C-5 upgrade program is over budget and that A-model renovation may not be worth the candle.

"The facts are coming out," Secretary of the Air Force Michael Wynne told a news conference. He predicted that the C-5 upgrade "will undoubtedly become a Nunn-McCurdy report," a reference to the law demanding special explanations and justifications if a major program's unit cost jumps more than 15 percent.

"Once that happens," Wynne explained, "the program then is subject to restructure and reanalysis and perhaps even a redefinition." Offering no specifics, Wynne said that the scale of the overrun is "staggering."

Last year, USAF decided upgrading the C-5 fleet would be more cost-effective than buying more C-17s. Loath to let a strong program die, however, Congress added 10 C-17s to USAF's buying plan, bringing the total to 190 and extending the production line more than a year. (See "Aerospace World: Boeing Gets Reprieve for C-17," November 2006, p. 14.)

Moseley says that the C-5A, even with the AMP and the RERP, will be mission-ready only about 60 percent of the time—far less than the 75 percent the Air Force was going for—and will only be good for a maximum of 25 years. That's already inside the planning cycle for its replacement, he said.

"The real question is, do you want to spend that RERP money on a C-5A? Is it not a more interesting question to get the C-5Bs as reliable as you possibly can ... and then look at what you could do with the $5 billion" earmarked for C-5A engines?

Those options include some combination of buying more C-17s, cargo-capable tankers, more C-130Js, or the still-undefined Joint Cargo Aircraft, a small transport to be bought in conjunction with the Army, Moseley said.

Wynne said Congress' add of 10 unrequested C-17s "bridges us" to allow a thorough review of the airlift situation. However, the situation will "put some pressure on us in the '09 budget, because that's when we think it's going to be probably a critical time" to make some definitive moves, Wynne said.

Tanker Program Lifts Off

The Air Force in late January launched its high-priority, "winner take all," $40 billion KC-X tanker replacement program, releasing a final request for proposals on the project.

The service then heaved a huge sigh of relief a week later,

USN photo by Chief Petty Officer Eric A. Clement

When the meat grinder stops, USAF may need more C-17s.

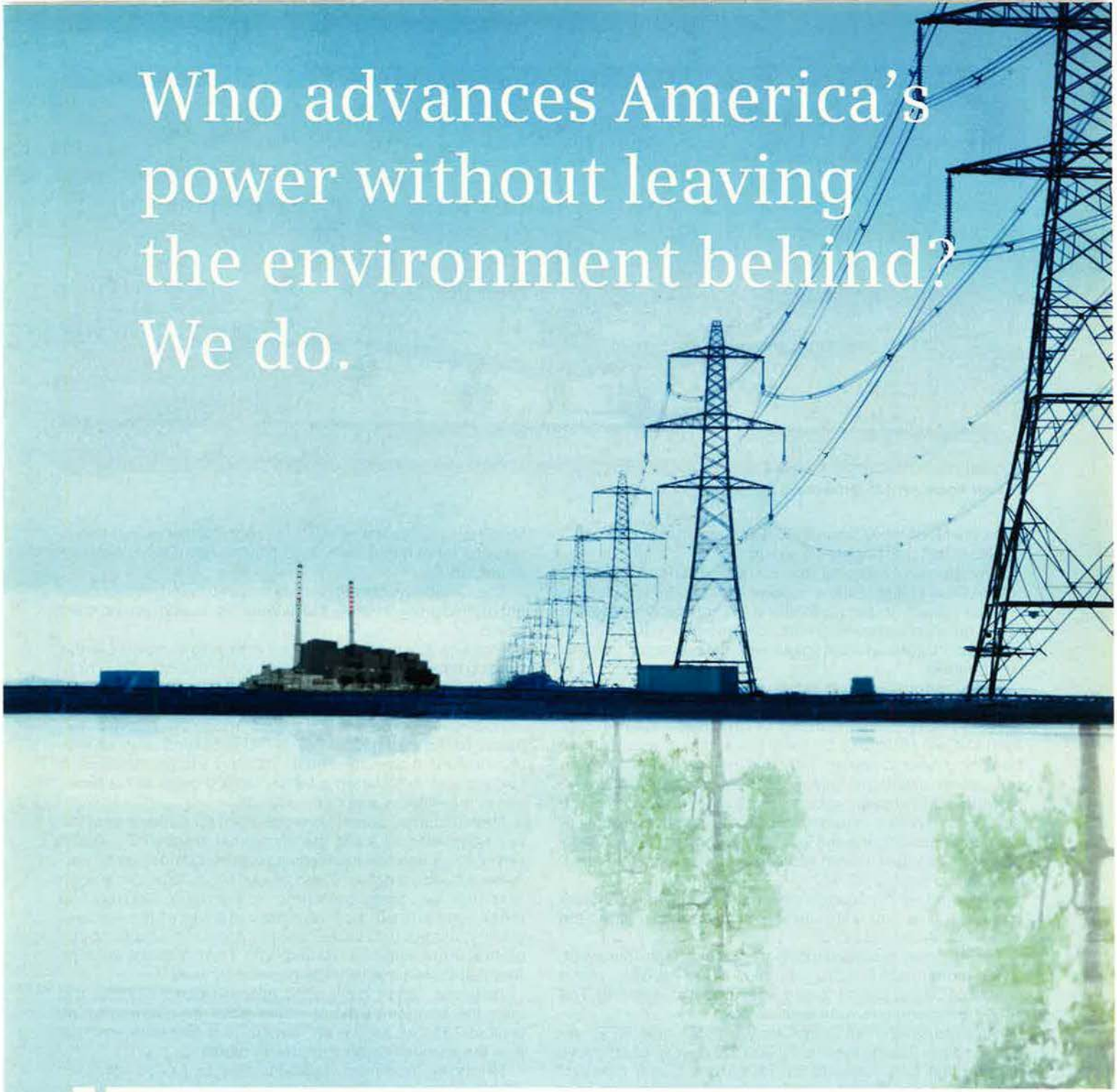

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Photo by Ted Carlson

The Air Force's K-135 tankers are the geezers of the fleet.

when the Northrop Grumman-EADS team announced that it would, in fact, participate as a bidder.

Why the relief? Boeing and EADS's Airbus unit are the only makers of large airliner-class aircraft in the world. Boeing was already in the race. Without Northrop Grumman, it would have no competitor. With no competition, there might not be a program at all; it might well have been shut down by Congress.

The Northrop Grumman-led team had threatened not to bid, arguing that terms of the draft RFP stacked the deck against its KC-30 entry. Some members of Congress—notably, Sen. John McCain (R-Ariz.)—believed the Air Force was trying to steer the project to Boeing. They said they would not tolerate a sole-source award this time, even if the program had to die.

Northrop Grumman said the draft RFP had blunted the KC-30's advantages of larger size, greater cargo- and passenger-carrying capability, and fuel-offload capacity. It seemingly preferred a smaller aircraft focused solely on aerial refueling, such as the Boeing KC-767.

Also, draft RFP language referred to World Trade Organization disputes over subsidies that might have penalized the Airbus A330-derived KC-30.

The Air Force amended the final RFP language somewhat, giving more credit to factors such as cargo capacity, with a goal of obtaining overall "best value" to the government. The WTO considerations were also relaxed.

Northrop Grumman, after studying the new RFP, announced on Feb. 8 that its KC-30 "is a very competitive offering that fully supports the Air Force's tanker mission." The company thanked the Air Force for its willingness to take industry concerns into account.

Under the terms of the contest, the winner will build 179 aerial tankers to replace the KC-135E fleet, which is more than 45 years old. The Air Force plans to buy between 12 and 18 tankers a year. The Air Force has more than 530 tankers, all of which will have to be retired before 2035.

Proposals are due this month, and the Air Force has said it will choose a winner before the end of this fiscal year. Wynne has said he wants work to begin before the end of calendar 2007.

Plans call for first deliveries in 2010.

Uniformity or Diversity?

Composition of the future tanker fleet might not turn out to be as one-dimensional as suggested in the RFP.

In late February, USAF Chief of Staff Gen. T. Michael Moseley said the future will bring more tanker competitions and that there might be "some utility" to having a mixed fleet of aircraft.

The Chief's words suggested the first-round winner does not necessarily foretell the winner of a second or third round.

Moseley, at a press conference in New York, noted that the existing tanker fleet is a mixture of a large number of KC-135s and a small number of much larger KC-10s and that USAF may want to obtain a similar high-low mix in the future.

Boeing in February said it would, in fact, offer its KC-767, based on the commercial 767-200ER because, after reviewing the RFP, it saw no value in offering a larger airplane. It had considered offering a tanker variant of its 777 airliner, which is similar in size to the KC-30.

Mark McGraw, Boeing vice president for tankers, said the company even rejected the somewhat longer 767-300ER design because the business case just did not justify "carrying around an extra 19 feet of aluminum." Speaking at an Arlington, Va., press conference in February, McGraw and other company officials said their reading of the requirement indicates that USAF wants an aircraft small enough so that many can be crowded onto small forward airstrips and distributed over a wide geographic area.

Italy and Japan have each ordered four KC-767s. If it wins the program, Boeing would build the airplane on its civilian 767 line at Everett, Wash., and militarize and test it at the company's Wichita, Kan., plants.

Northrop Grumman maintains that its KC-30, carrying 45,000 more pounds of fuel than the KC-135, with faster pumping capacity and the ability to make a quick switch to a large cargo or passenger configuration, is a good bet to win. At nearly twice the size of the KC-135, it will offer prodigious cargo-moving capacity when not being used as a tanker.

Australia, the United Arab Emirates, and the UK have all signed up to use the KC-30.

Should it win the tanker contract, Northrop Grumman would conduct final assembly in Mobile, Ala.

Previous chiefs of Air Mobility Command have promoted the two-tanker concept. With two types, there's less possibility that a serious technical problem could ground the entire fleet.

Air Force Gen. Norton A. Schwartz, commander of US Transportation Command, said last year he thinks the next tanker should be a combination tanker-cargo aircraft. ■

ABE: ALIGNING TOMORROW'S GENERATION OF USAF FIGHTERS. AND TODAY'S.

The maiden test flight of the U.S. Air Force next-generation F-35 Lightning II Joint Strike Fighter in mid-December was achieved with sensors and systems aligned by AAI's Advanced Boresight Equipment (ABE) Model 310A.

The Air Force has ordered 28 ABE systems for use on its C-130 gunships, C-17 Globemaster III transports, and C-130 AMP aircraft.

Other U.S. military platforms using ABE Model 310A systems are the Navy/Marine Corps AH-1W, MH-60R, and AH-1Z, and the U.S. Army's AH-64D and new Armed Reconnaissance Helicopter. In fact, AAI's ABE team has developed more than 60 aircraft-unique boresight adapters.

ABE Model 310A is the perfect candidate for today's F-16 Fighting Falcon and F-15 Strike Eagle boresight requirements, and it can transition to future Lightning II boresight needs.

Contact us at ABE@aaicorp.com or 800-655-2616.

An ABE system from AAI aligned sensors aboard the F-35 Lightning II on its inaugural test flight.

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Aerospace World

By Marc V. Schanz, Associate Editor

Afghan Crash Kills Airman

Air Force TSgt. Scott E. Duffman, of Albuquerque, N.M., perished Feb. 18 while on duty in Afghanistan.

Duffman, assigned to the 24th Special Tactics Squadron at Pope AFB, N.C., died in the crash of a CH-47 helicopter during operations in Afghanistan.

Duffman was one of eight persons killed in the crash. Another 14 passengers were injured.

The cause of the crash and all other details remain under investigation.

US Central Command said the helicopter suffered a sudden, unexplained loss of power and control before crashing in eastern Afghanistan.

A search and rescue operation was quickly mounted. Rescuers secured the crash site and recovered passengers and crew.

Staff photo by John A. Tirpak

A USAF-Japanese ground crew at Yokota AB, Japan, loads a JASDF C-1 transport for a mission to support US forces. Since 9/11, the C-1s have flown more than 400 missions—one or two per week—between US bases in Japan and Guam to free up USAF C-130s for Global War on Terror duties. The aircraft carry between 4,000 and 12,000 pounds of cargo on each flight, supporting all branches of US military. The cargo ranges from basic supplies to ordnance.

North Sees Improved ISR

Intelligence collection and dissemination in Iraq and Afghanistan improved last year, the top airman for the theater told reporters Feb. 16.

These improvements, said Air Force Lt. Gen. Gary L. North, account for the jump in strike sorties and dropped ordnance over the past 12 months. (See "The War on Terrorism: CENTAF Air Strike Numbers for 2006 Released," p. 22.)

"We've got better intelligence," said North. "We're finding the enemy. The enemy is presenting himself. Where the enemy presents in the theater, airpower creates an effect."

North, commander of US Central Command Air Forces, said coalition forces in the two nations launched about 24,000 strike sorties, but not all entailed expenditure of munitions.

Many involved simply a "show of force" by aircraft, helping ground forces ferret out enemy fighters. However, strike sorties have become steadily more effective due to improved ability to gather, direct, and use intelligence.

He added that every weapon dropped "is by the direction of the ground commander," whether the targets are time sensitive or targets of opportunity. Close coordination with ground commanders has led to better use and application of airpower.

Collaboration with Iraqi and Afghan forces has increased the amount and quality of information obtained, he added.

OK for "Surge," Says CENTAF

The current level of Air Force assets in Iraq is sufficient to handle an increased workload brought on by the "surge" in US ground forces, according to Lt. Gen. Gary North.

The CENTAF commander said his current allotment of forces and personnel are performing well, and he has not had to request additional air and space expeditionary forces as a result of the new focus on securing Baghdad.

Is a Resurgent Russia Looking to Rearm?

Russia has unveiled an ambitious military modernization campaign that, if actually carried to conclusion, would provide new bombers and ICBMs, replace half the Russian Army's aged ground equipment, and produce new warships.

The target year is 2015. The plan is to fund the effort with some of Russia's burgeoning oil and gas revenues.

Defense Minister Sergei Ivanov announced the plan to Russian lawmakers, saying the government plans to spend the equivalent of $200 billion on the upgrade.

The idea is to bolster Russia's nuclear deterrent and sharpen its dilapidated conventional force. Specifics include the purchase of 50 new Topol-M ICBMs, 50 new bombers, and 31 naval vessels. Ivanov added that the plan calls for the re-arming of 40 tank, 97 infantry, and 50 parachute battalions.

With this plan, Moscow is signaling a commitment to military power unseen since the last days of the Soviet Union.

Pavel Felgenhauer, a Moscow-based defense analyst, told the Voice of America that Russian industry may not be ready for such a modernization effort. The secrecy-shrouded acquisition process will ensure lots of cost overruns and corruption.

Russia's military doctrine also forbids the Defense Ministry from procuring anything from abroad.

Air assets in theater are "sizing appropriately and positioning appropriately" to support increases in troop strength in both Iraq and Afghanistan.

North said air assets have been moved to where they can be best applied and maintained.

Scoping the SAM Threat

A sharp increase in attacks on Army and Marine Corps helicopters in Iraq is getting close attention, CENTAF commander Lt. Gen. Gary North reported. USAF also operates helicopters in the region, although none have gone down recently.

North said he is leading the effort to examine aircraft wreckage for clues as to how they were hit—by missile, rocket, or bullet—and the Air Force is developing tactics and procedures on how the aircraft move and apply their defensive systems.

USAF photo by SSgt. Jasmine Reif

Airmen from the 379th Expeditionary Logistics Readiness Squadron pull a hose on a new hydrant servicing vehicle. The hydrant system allows faster, more efficient refueling of all types of aircraft on their flight line.

UAVs Will Still Be Flown by Rated Officers

The Air Force is expecting to increase annual active duty pilot production from 1,000 to 1,100, but it won't be peeling off unmanned aircraft operators as a specialty.

That's the word from Gen. William R. Looney III, commander of Air Education and Training Command.

The increase in pilot production to 1,100 annually—and 1,300 with Guard and Reserve pilots included—does not stem from any sharp increase in aircraft enthusiasts. Rather, it comes from emerging nonflying needs, Looney said in February.

"What drives this is a number of requirements that require expertise, but are not necessarily associated with flying an aircraft," Looney said, noting that personnel who staff air and space operations centers need an understanding of flight operations. Rated pilots are also in demand on major command staffs and the Joint Staff.

There are requirements in these other areas "that we are not quite able to meet with the current pilot inventory," Looney said. The air staff and the major commands are now trying to figure out what the right number is.

Looney also noted a growing demand for battlefield airmen, from tactical air controllers to pararescuers, and said AETC will stand up a common schoolhouse for them by Fiscal 2011. The first class will teach basic military skills and common battlefield airmen skills and will enroll combat weathermen, explosive ordnance technicians, and tactical air controllers.

The program is slated to expand incrementally, as construction projects are completed. The battlefield airman schoolhouse will grow from 1,700 airmen in 2011 to 7,000 in 2012 and will teach 14,000 airmen annually at full capacity, Looney added. Sites currently being surveyed include Arnold AFB, Tenn., Barksdale AFB, La., and Moody AFB, Ga.

Rated pilots will continue to operate unmanned aircraft for the foreseeable future, Looney said, waving off the notion of a new special UAV curriculum.

The need for UAV operators will continue to grow, Looney said, and the Air Force is still "at the beginning stages" of deciding who will operate them, long-term. The service is still learning about the limits of UAV operations, and Looney acknowledged that the structure of manned flight is "not necessarily accommodating" to UAVs.

The Air Force and other federal agencies have yet to iron out the details of how UAVs will operate in civilian airspace, and until they do, USAF wants a rated pilot at the controls.

The Air Force has merged what used to be the weapons system officer and navigator career fields into the combat systems officer field, Looney said.

"Technology has allowed us to come to a point where one person can do both," Looney said. Much of the training currently occurs at Randolph AFB, Tex., but will eventually move to NAS Pensacola, Fla.,where Air Force CSOs will train alongside naval flight officers in a joint program.

The Air Force is also expanding its distance learning capabilities, because so much of the force is frequently deployed around the world. USAF has merely "scratched the surface" of what it can do with distance learning, Looney said. Increasingly, classes will come to an airman wherever he is deployed through "reachback" communications. Some classes will still have to be given in person though—such as the first time a medic hooks up an IV to a real person.

"We track every one of these every day," North said, adding that such attacks are tracked to see if they are random or part of a larger, orchestrated effort.

In the first two months of the year, seven military and civilian helicopters were shot down. The cause was concentrated ground fire and some shoulder-fired anti-aircraft weaponry.

Army Maj. Gen. James E. Simmons, the deputy commander for Multinational Corps-Iraq, told the *Washington Post* Feb. 20 that hostile Sunni insurgents had likely used an SA-14 Gremlin or SA-16 Gimlet to shoot down a Marine Corps CH-46 helicopter on Feb. 7, with the loss of seven troops.

Both the SA-14 and SA-16 are Russian-made portable anti-aircraft weapons, probably brought into Iraq relatively recently, Simmons added.

Urban Bomb Unveiled

Lockheed Martin officials said they are trying to interest the Air Force in an enhanced laser guided training round, as well as a weaponized version for use in close air support.

The Enhanced Laser Guided Training round, already in use by the Navy, has helped training efforts since it can be used on smaller ranges than the full-size laser guided bomb, Lockheed Martin officials reported.

The cost of the bomb is only about 15 percent that of a standard LGB and usually hits within 10 feet of a target. The company described the weapon at AFA's Air Warfare Symposium.

In addition to the training round, the company is rolling out a weaponized version called SCALPEL (Small Contained Area Laser Precision Energetic Load).

From Its Test Pilot, the F-35 Gets Two Thumbs Up

The F-35 may not have the agility of the F-22 Raptor, but it will prove to be an exceptional strike platform, says the first Lightning II test pilot.

Jon Beesley, Lockheed Martin's lead test pilot for the F-35, had taken seven flights in the new fighter.

Talking with reporters in Orlando, Fla., at the Air Force Association Air Warfare Symposium, Beesley said the F-35 was not meant to be a fighter in the F-22's class. It was not given thrust-vectoring or extreme post-stall control because those capabilities weren't considered essential for an attack airplane.

However, he asserted, the F-35 will easily hold its own with any other fighter and is an extraordinarily "stable platform" for conducting strikes. He also said the aircraft flies so smoothly that it may exceed its combat radius requirement of 690 miles.

Beesley observed that one potentially troublesome piece of equipment has proved to be "a star performer."

He was referring to the Integrated Power Pack. It is an amalgam of three separate. problem-prone systems: auxiliary power unit, environmental control system, and emergency power pack. In Beesley's view, the new IPP is an "elegant" way to cut weight while improving reliability.

He said that the Air Force version, known as the F-35A, can carry as much fuel as the Raptor, without external fuel tanks.

The only in-flight glitches concerned faulty readings from an air data probe, which was quickly fixed, Beesley said. He also tested the air brakes.

With few exceptions, Beesley said, the aircraft has matched simulations with high fidelity.

He also noted that the test program will seek to find those areas that have been overengineered, so that future weight gains can be offset by weight reductions.

Unlike standoff weapons such as the Small Diameter Bomb, SCALPEL is a close-range, dual-mode LGB that features a lighter warhead and improved accuracy for close air support missions in tight urban environments, said Lt. Col. Robert Balserak of the Indiana Air National Guard's 122nd Fighter Wing.

"All I need is a laser beam to take the guy out of the window without leveling the building," Balserak said.

A concept demonstrator should be ready late this year.

"Mini-JASSM" Makes Appearance

Lockheed Martin officials are now promoting a new, small cruise missile similar to the Joint Air-to-Surface Standoff Missile, or JASSM.

The Low Cost Miniature Cruise Missile would could offer a 750-mile range and fit inside the F-22 Raptor's internal weapons bay. Company officials maintain it would give the Air Force an advantage in the early hours of a conflict with the ability to hit stationary or moving targets.

The missile is about 144 inches long, compared to the 169-inch JASSM.

Lockheed Martin is planning an advanced concept demonstration in 2008. A concept demonstrator was recently tested at Holloman AFB, N.M.

C-130J Posts High Optempo

Under wartime conditions, the C-130J has demonstrated an ability to maintain a high operating tempo, hauling more and completing more missions than its older predecessors, Col. Larry Gallogly of the Air National Guard reported.

Gallogly, commander of the 143rd Airlift Wing of the Rhode Island ANG, said his crews now have hard data to evaluate the performance of the C-130J. The deployment to the Southwest Theater involved aircraft from the 143rd AW, the 135th Airlift Group of the Maryland ANG, and the 146th AW of the California ANG.

When the 143rd first took the aircraft to the theater, Gallogly said there was an assumption that the new model was just another Hercules.

"It was a totally different airplane," he said, noting that the internal avionics and systems made the aircraft 70 percent different from the E models and allowed 50 percent greater range.

Integrated precision radar equipment allowed J crews to make single-pass landings at narrow, difficult landing areas in Iraq and Afghanistan, he said.

The 143rd is due to receive upgrades soon. These will include large aircraft

USAF photo by Steve Zapka

In a February flight test from Edwards AFB, Calif., a B-1 carries a Sniper targeting pod in its belly. See "Give That Bone a Pod," p. 22.

USAF photo by A1C Nathan W. Lipscomb

A1C Thomas Hickey, SSgt. Robert Izzett, and MSgt. James Triplett (l-r), of the 728th Air Mobility Squadron, load a C-17 at Incirlik AB, Turkey, in February. USAF and Turkish forces provided 94,000 pounds of equipment and supplies for the Afghan Army to use in the Global War on Terror.

infrared countermeasures (LAIRCM) to fight the threat of surface-to-air man-portable missiles.

Reserve Unit for Beale

Air Force Reserve Command announced in February that it will partner with Air Combat Command to form a new associate unit with the 548th Intelligence Group at Beale AFB, Calif.

The new unit will complement the current Reserve presence at the base, which operates the Global Hawk unmanned aerial vehicle. Under Base Realignment and Closure rules, personnel authorized for the Reserve's 940th Air Refueling Wing headquarters and support will remain in place to provide the command structure for the new mission. The new associate unit is expected to stand up in Fiscal 2008.

The 548th IG operates the Distributed Ground System-2 and the Deployable Shelterized System-Film—elements of USAF's Distributed Common Ground System. The group produces strategic, operational, and tactical intelligence to support combat operations around the world.

Ops Group Reactivated on Guam

The 36th Operations Group at Andersen AFB, Guam, has been reactivated to serve as the support point for the Air Force's growing expeditionary operations on the island.

The group took over the mission of the 36th Expeditionary Operations Group and will establish a permanent command structure for Air Force assets deployed to Andersen.

The reactivation of the 36th will help to provide greater stability and longer-range planning for the Air Force's mission in the Pacific. The group will provide forces needed to enhance security, demonstrate US commitment to the western Pacific, and provide integrated training for airmen.

The 36th's heritage goes back to World War II and postwar Germany, where it was in US Air Forces in Europe until 1994.

F-35 Engine Axed Again

The Pentagon, slapped down once in its effort to eliminate the F-35 alternate engine, is back trying for the kill.

In 2006 deliberations, Congress countermanded a Pentagon decision to eliminate funding for the engine, instructing DOD to maintain the program as planned. The Defense Department, however, has done it again in its Fiscal 2008 budget, proposing to drop the engine and use $2 billion in savings for other purposes.

Sen. John W. Warner (R-Va.) objected during a February hearing of the Senate Armed Services Committee.

Warner, the panel's ranking Republican, told Defense Secretary Robert M. Gates that he and others had worked hard to keep the F-35 properly funded and expressed irritation that the Pentagon had ignored the clear intent of Congress.

Warner also said partner countries would like to get the benefits of competition on engines. Rep. John P. Murtha (D-Pa.), chairman of the House Appropriations defense panel, told Air

Unified Command Plan Turns Sights on Africa

President Bush on Feb. 6 announced the long-expected creation of United States Africa Command.

AFRICOM will be a regional military component in the Pentagon's unified command plan. It aims to integrate Defense Department activities now parceled out among various other US combatant commands.

The four existing regional military commands are US Central Command, US European Command, US Pacific Command, and US Southern Command. DOD also maintains a subunified command on the Korean Peninsula, under PACOM. These geographical commands are supported or supplemented by US Joint Forces Command, US Northern Command, US Special Operations Command, US Strategic Command, and US Transportation Command.

Planners said that AFRICOM will coordinate with other government agencies such as the State Department. Many of the missions will be "nonkinetic," said Ryan Henry, the Pentagon's policy chief. AFRICOM will work to reduce conflict, improve security, defeat or prevent the development of terror networks, and support crisis response.

Army Lt. Gen. Walter L. Sharp, the director of the Joint Staff, said DOD will emphasize building the capacity of African militaries, conducting training and medical missions, and supporting organizations such as the African Union.

Until now, defense activities in Africa had been parceled out among EUCOM, PACOM, and CENTCOM. EUCOM's heavy involvement in particular has brought US Air Forces in Europe into the equation.

USAFE leadership believes it will still have a big role in Africa operations to complement its work in Europe.

"Even if [USAFE's] role in Africa is reduced over time, there's so much work left to be done in Eastern Europe that USAFE will remain ... fully employed," said Brig. Gen. Michael A. Snodgrass, USAFE's director of plans, programs, and requirements.

An AFRICOM transition team, with a staff of 60, was set up in Stuttgart, Germany. Sharp said the team is deciding the proper size of the new AFRICOM headquarters, the eventual location of the headquarters, and how troop rotations will be handled. The goal is to have AFRICOM at full capability by the end of Fiscal 2008.

Force Secretary Michael W. Wynne that Congress believes that it is in the best interest of the Air Force to have a competitive engine—noting that if the eventual F-35 production levels grow by 50 percent, as Wynne predicts, another engine is vital.

First Raptor for Alaska

Representatives from Pacific Air Forces and Lockheed Martin gathered in Marietta, Ga., on Feb. 12 to accept the first F-22 Raptor assigned to PACAF.

Dignitaries present at the ceremony included Sen. Ted Stevens (R-Alaska) and PACAF commander Gen. Paul V. Hester.

Elmendorf will be the first base in the Pacific Theater to have Raptors permanently based there. The F-22 will operate in the 90th and 525th Fighter Squadrons, as well as a Reserve associate squadron, the 302nd FS.

Boeing's Bomber Vision

The next long-range strike system is likely to be a stealthy, subsonic platform armed with a high-speed missile, said the head of Boeing's advanced systems division.

George K. Muellner told reporters in February that it's not likely that a new and survivable supersonic bomber could be ready in time for the Air Force's 2018 deadline.

Going supersonic doesn't buy much survivability, Muellner said, unless it can top Mach 3. Heat generated at those speeds would make an easy target for infrared detectors, he added.

The Boeing official noted that Air Force and Navy operators who have come to Boeing's simulation facilities to game out long-range strike ideas are coming to the same conclusion.

"We think high subsonic is the way to go," Muellner said.

Iron Thunder Over Carolina

More than 100 aircraft from the Air Force, Navy, Marine Corps, and Royal Air Force in February participated in Exercise Iron Thunder, a four-day multinational exercise hosted by the 77th Fighter Squadron at Shaw AFB, S.C.

Exercise sorties practiced suppression of enemy air defenses and air-to-air combat scenarios in two phases.

The first featured blue air assets protecting a target from red air aggressors, then later featured blue air assets attacking an enemy target. The next phase featured a blue air attack on an enemy location on the North

Senior Staff Changes

NOMINATIONS: To be Brigadier General: Thomas J. **Masiello. To be ANG Major General:** Shelby G. **Bryant,** Howard M. **Edwards,** Norman L. **Elliott,** Steven E. **Foster,** Robert D. **Ireton,** Emil **Lassen III,** George T. **Lynn,** Robert B. **Newman Jr.,** Timothy R. **Rush,** Stephen M. **Sischo. To be ANG Brigadier General:** Craig W. **Blankenstein,** William J. **Crisler Jr.,** Johnny O. **Haikey,** Rodney K. **Hunter,** Jeffrey R. **Johnson,** Verle L. **Johnston Jr.,** Jeffrey S. **Lawson,** Bruce R. **Macomber,** Gregory L. **Marston,** James M. **McCormack,** Deborah C. **McManus,** John E. **Mooney Jr.,** Daniel L. **Peabody,** Kenny **Ricket,** Scott B. **Schofield,** John G. **Sheedy,** John B. **Soileau Jr.,** Francis A. **Turley,** James R. **Wilson,** Paul G. **Worcester.**

CHANGES: Maj. Gen. David M. **Edgington,** from Dir., Global Power Prgms., Office of the Asst. SECAF for Acq., Pentagon, to Dir., Air Component Coordination Element, MNF-Iraq, ACC, Baghdad, Iraq ... Brig. Gen. (sel.) Craig A. **Franklin,** from Exec. Asst. to the Vice Chairman of the JCS, Pentagon, to Cmdr., 31st FW, USAFE, Aviano AB, Italy ... Brig. Gen. (sel.) John E. **Hyten,** from Cmdr., 50th Space Wg., AFSPC, Schriever AFB, Colo., to Dir., P&R, AFSPC, Peterson AFB, Colo. ... Brig. Gen. Larry D. **James,** from Dir., Signals Intelligence Systems Acq. & Ops. Directorate, NRO, Office of the Asst. SECAF for Space, Chantilly, Va., to Vice Cmdr., 5th AF, PACAF, Yokota AB, Japan ... Brig. Gen. Joseph M. **Reheiser** from Vice Cmdr., 5th AF, PACAF, Yokota AB, Japan, to Cmdr., AF Security Assistance Center, AFMC, Wright-Patterson AFB, Ohio., Maj. Gen. Loren M. **Reno,** from Vice Dir., DLA, Ft. Belvoir, Va., to Cmdr., Oklahoma City ALC, AFMC, Tinker AFB, Okla. ... Maj. Gen. Stephen T. **Sargeant,** from DCS, UNC & US Forces Korea, Yongsan Army Garrison, South Korea, to Cmdr., AFOTEC, Kirtland AFB, N.M. ... Maj. Gen. Mark D. **Shackelford,** from Dir., P&R, AFSPC, Peterson AFB, Colo., to Dir., Global Power Prgms., Office of the Asst. SECAF for Acq., Pentagon ... Maj. Gen. Johnny A. **Weida,** from Cmdr., AF Security Assistance Center, AFMC, Wright-Patterson AFB, Ohio, to DCS, UNC & US Forces Korea, Yongsan Army Garrison, South Korea ... Brig. Gen. Robert **Yates,** from Cmdr., 31st FW, USAFE, Aviano AB, Italy, to Dep. US Mil. Rep. to NATO Mil. Committee, Brussels, Belgium.

SENIOR EXECUTIVE STAFF RETIREMENT: James E. **Short.** ■

From the Drawing Boards at Materiel Command

Gen. Bruce Carlson says the challenges posed by today's War on Terror are posing tough problems for the airmen of Air Force Materiel Command, which he heads.

Carlson told attendees at AFA's Air Warfare Symposium in Orlando that such challenges are broad in scope. On the top of the list is figuring how to get reliable, persistent tactical intelligence-surveillance-reconnaissance data into the hands of deployed forces and how to integrate that data into a common operating picture.

Using technology as simple as off-the-shelf cameras and linking them with other sensors could accomplish that goal in real time, Carlson said, and store the data for retrieval or playback. This could lead to UAVs with 24/7 capability both in the visual or infrared spectrums.

"You could watch a suspected bad guy, ... see who he meets with, when he meets with them, where he goes," he noted.

The airmen and civilians across the command are working on a range of projects that include tools to provide real-time, wide-angle surveillance to forces on the ground to ways that troops can better perform their mission in urban environments and defeat improvised explosive devices.

The command had just completed an assessment last summer of its Project Angel Fire real-time ISR program at the Marine Corps Air Ground Combat Center, Twenty-Nine Palms, Calif., Carlson announced. The system is currently being deployed to Southwest Asia for further testing.

AFMC is also working on developing new lighter and more survivable hydrogen-cell batteries for use in tactical radios and other field equipment. They would reduce the overall weight that ground forces and battlefield airmen must haul.

Carlson announced the start of a six-week test of a new high-resolution navigation tool at Air Force Special Operation Command at Hurlburt Field, Fla. The goal: Produce virtual flight rules tools to help pilots safely navigate in brownouts.

The command is also heavily invested in aeronautics efforts—particularly the development of hypersonic engines. Carlson said the Scramjet Engine Demonstration is moving ahead toward a series of four to eight flight tests in Fiscal 2009. The program uses a hydrocarbon fuel-cooled scramjet with Defense Advanced Research Projects Agency technology that relates to the shape of the airframe and the inlet duct, Carlson explained. The test platform will soon be flown on a B-52, using an old booster to accelerate from 40,000 feet to Mach 4 then to Mach 6 or 7 on scramjet power.

The SED will be capable of cruising at Mach 6.5 to 7 and could have applications in a number of areas—particularly the Air Force's planned future long-range strike effort.

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Operation Iraqi Freedom—Iraq

Casualties

By March 20, a total of 3,222 Americans had died in Operation Iraqi Freedom. This total includes 3,215 troops and seven Defense Department civilians. Of those fatalities, 2,601 were killed in action by enemy attack, and 621 died in noncombat incidents.

There have been 24,187 troops wounded in action during OIF. This includes 13,415 who returned to duty within 72 hours and 10,772 who were unable to quickly return to action.

CENTAF Air Strike Numbers for 2006 Released

During a teleconference with Pentagon reporters in early February, US Central Command Air Forces commander Lt. Gen. Gary L. North released the collected air statistics for Operation Iraqi Freedom in 2006, which showed a steady number of air strikes and sorties over Iraq compared with the previous two years.

In 2006, coalition air forces performed 15,676 close air support sorties over Iraq, compared with 16,924 in 2005 and 14,292 in 2004.

Coalition aircraft dropped 229 munitions in 2006 in OIF CAS strikes, compared with 404 in 2005 and 285 in 2004. The busiest month of 2006 was November, when air assets dropped 48 munitions during CAS strikes.

North said these recorded sorties or strikes do not include those where rockets were employed or where aircraft used their 20 mm or 30 mm cannons.

F-16s and A-10s Make the Difference in Najaf Battle

More than 200 insurgent fighters were killed and 100 captured near An Najaf, Iraq, Jan. 28, during a fierce battle involving enemy forces, US ground troops, and support from the Air Force's 332nd Air Expeditionary Wing at Balad Air Base.

The 332nd's F-16s and assisting A-10s performed close air support after insurgents had attacked ground forces with small arms, explosives, and rocket-propelled grenades. Fighters expended more than 3.5 tons of precision munitions, 1,200 rounds of 20 mm cannon and 1,100 rounds of 30 mm cannon fire in the five square miles of the battle.

Participating aircraft included the F-16s of the 510th Expeditionary Fighter Squadron, the 14th EFS, and 332nd EFS, as well as A-10s from the 74th EFS at Al Asad Air Base.

Operation Enduring Freedom—Afghanistan

Casualties

By March 17, a total of 370 Americans, including one DOD civilian, had died in Operation Enduring Freedom, primarily in and around Afghanistan. The total includes 197 killed in action and 173 who died in nonhostile incidents such as accidents.

A total of 1,133 troops have been wounded in Enduring Freedom. They include 455 who were able to return to duty in three days and 678 who were not.

Air Strike on Afghan Site Kills Taliban Commander

A coalition air strike called in by NATO International Security Assistance Force troops in Afghanistan killed a Taliban chief and at least 10 others on Feb. 14, the alliance reported.

Precision, laser guided munitions blasted the target in a compound in Helmand Province—not far from the town of Musa Qala, which Taliban forces had overrun on Feb. 1. The strike killed the unnamed commander and his associates.

The leader was linked to the uprising in Musa Qala and an attack on a nearby dam. In a statement, NATO said there was no appreciable damage to other buildings in the compound and that ground forces had observed Taliban elements removing the bodies of 11 fighting age males from the wreckage—refuting claims that women or children were killed in the strike.

Air Strike Numbers for OEF Released

During his February briefing with reporters, CENTAF commander Lt. Gen. Gary North released coalition air strike statistics for Operation Enduring Freedom for 2006—revealing a sharp increase in the number of strike sorties and munitions fired last year.

In 2006, coalition air assets performed 10,519 close air support sorties in Afghanistan. In 2005, the number of CAS sorties was 7,421, and in 2004 it was 6,495.

In 2006, air assets performing CAS strikes expended 1,770 munitions—a huge jump from 2005 where only 176 munitions were dropped. Only 86 munitions were used during close air support strikes in 2004, according to CENTAF. The busiest month of 2006 was September, where air assets dropped 329 munitions in close air support strikes.

The sorties or strikes do not include those where rockets or 20 mm or 30 mm cannons were used.

Carolina coastline. (For a description of the July 2006 exercise, see "Iron Thunder," October 2006, p. 52.)

Participants included B-1Bs from Dyess AFB, Tex.; an E-3 AWACs from Tinker AFB, Okla.; E-8 Joint STARS from Robins AFB, Ga.; F-15Es from Seymour Johnson AFB, N.C.; F-16s from the 55th FS, 77th FS, and 79th FS at Shaw; F-16s from the Alabama Air National Guard; F/A-18 Hornets from NAS Oceana, Va., and MCAS Beaufort, S.C.; KC-135s from RAF Mildenhall, Britain; and an RAF E-3 Sentry from RAF Waddington, Britain.

Three Commit to JSF

Italy, Norway, and Turkey in January and February signed up for the F-35 production, sustainment, and follow-on development phase.

The move ensures participation by those nations in the cooperative program arrangements for the next phase of the F-35's production.

Australia, Britain, Canada, Italy, the Netherlands, Norway, and Turkey are all now committed to produce the fighter. Cooperation will extend beyond the system development and demonstration phase of the program.

The remaining partner nation, Denmark, is expected to sign the memorandum soon.

SNIPERs in High Demand

Lockheed Martin says it plans to keep building its SNIPER advanced targeting pods for years to come.

Company officials, speaking at AFA's February Air Warfare Symposium, said production will continue until at least 2011. That is because SNIPER is seeing heavy combat use in Southwest Asia.

Both F-15Es and F-16s have used the pod extensively for so-called "nontraditional" ISR as well as strike operations. The pods have turned in a mission-capable rate of 96 percent.

The Air Force currently has 522 SNIPER pods on order. Officials expect that number to rise, given requirements to equip both the A-10 and the B-1B with the precision targeting tool, said program manager Mark Fischer.

The original order was sufficient to equip only the F-16 and F-15Es, Fischer added.

Belgium, Norway, Oman, and Poland also have signed on to the program. Canada is in talks with the company to equip its F-18s with the pod as well, Fischer said.

Give That Bone a Pod

Boeing has tested the Sniper XR targeting pod on the B-1B bomber, demonstrating a capability that "Bone" crews have long asked for.

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Using a multipoint refueling system, a KC-135 from the 340th Expeditionary Air Refueling Squadron refuels an RAF GR-4 Tornado over Iraq. USAF tankers with the MPRS can refuel Air Force, Navy, and coalition aircraft during the same mission.

The pod lets the B-1B to use laser guided weapons. It also enables recording and transmission of high-fidelity, real-time video or infrared imagery.

The demonstration was completed in January at Edwards AFB, Calif., and validated the crew's ability to identify moving and stationary targets in a variety of conditions.

Air Force leaders put high priority on equipping B-1Bs with such targeting pods. They are hoping to have the pod equipped on aircraft in theater by 2008.

Hurricane Hunters in Pacific

The Hurricane Hunters of Air Force Reserve Command's 403rd Wing flew their WC-130Js to Alaska in February for a month-long mission to support winter storm reconnaissance efforts.

The Keesler AFB, Miss.-based unit deployed to Elmendorf AFB, Alaska, where it flew 12-hour-long weather missions directed by the National Centers for Environmental Prediction, which is part of the National Oceanic and Atmospheric Administration.

Winter missions require crews to fly at altitudes higher than is the case in tropical weather; most of the Alaska missions were flown above 30,000 feet.

While the Hurricane Hunters are patrolling the northern Pacific, NOAA uses Gulfstream aircraft to fly out of Honolulu. Between the two units, the

News Notes

■ US airmen in February for the first time staged joint combat search and rescue exercises with the Peruvian Air Force. Falcon and Condor Exercise 2007 featured a simulated rescue of a US pilot and Peruvian pilot in Peru's remote and deserted north. C-130s of the Puerto Rico Air National Guard delivered Peruvian special forces into the area, to help locate the missing pilots.

■ North Dakota Gov. John Hoeven announced Feb. 8 that the 91st Space Wing and North Dakota adjutant general shook hands on a deal to create a new Air National Guard squadron at Minot AFB, N.D. The unit will support ICBM operations and consist mostly of ANG security forces, which will train and serve with the active duty 91st Security Forces Group. The move will bring 60 full-time and 80 part-time ANG positions to Minot.

■ The 820th REDHORSE Squadron, Nellis AFB, Nev., on Feb. 15 helped open New Horizons Nicaragua, a US Southern Command readiness and training exercise held in the village of Santa Teresa. Fifty-eight members of the 820th built a new school and clinic. Construction projects, performed across the region, provide realistic joint and combined training for USAF, Army, Marine Corps, and reserve engineers, medical personnel, and support troops.

■ The Air Force, completing its inquiry into the Oct. 26 F-16 accident at Luke AFB, Ariz., determined that a malfunction of a third stage fan disk caused the mishap, which happened on the runway. The disk fractured the airframe and pierced the fuel tank, igniting a fire that caused the engine to explode. The fighter was assigned to the 56th Fighter Wing. The pilot was not injured.

■ BAE Systems on Jan. 23 announced the first flight of its Joint Strike Fighter Cooperative Avionics Test Bed. The flight capped a three-year effort to turn a regular 737 aircraft into a flying lab for development of the fighter's advanced avionics. Known as the "CAT-bird," the aircraft will develop and verify the F-35's abilities to collect data from multiple sensors and fuse it into a working situational awareness display.

■ The North American Aerospace Defense Command in January conducted Exercise Falcon Virgo 07-04 in the Washington, D.C., area. The exercise featured a series of training flights coordinated with the Federal Aviation Administration, the National Capital Region command center, and the Joint Air Defense Operations Center. The exercise tested NORAD's intercept and identification capabilities, with Civil Air Patrol aircraft and US Coast Guard helicopters participating in the event.

■ Pilot error on the part of a civilian contractor caused the crash of an MQ-1B Predator during an Aug. 3 training mission at Creech AFB, Nev., claims an accident investigation report released Jan. 25. There were no injuries because of the accident, but the aircraft suffered $1.5 million in damage. The pilot depressed an incorrect switch while attempting to retract the aircraft's landing gear, causing the engine to shut off. The Predator crashed just off the runway.

■ Lockheed Martin and Kongsberg Defense and Aerospace of Norway

effort can cover most of the weather systems that affect the US.

The support missions run through April.

Kirtland Ospreys Take Wing

The 58th Special Operations Wing at Kirtland AFB, N.M., announced Jan. 30 that it had all of the assets required to start training CV-22 Osprey aircrews.

The tilt-rotor aircraft is replacing the MH-53J Pave Low helicopter for long-range insertion and extraction of special operations forces.

With training now under way, Air Force Special Operations Command expects to declare initial operational capability with the CV-22 in January 2009.

USAF Osprey pilots go on temporary duty assignment to MCAS New River, N.C., for initial training on the MV-22, then return to Kirtland to form crews with flight engineers and complete instruction on the CV-22.

JPADS Airdrop in Iraq Is a Success

C-130 aircrew members from the 777th Expeditionary Airlift Squadron at Balad AB, Iraq, on Feb. 16 demonstrated the Joint Precision Air-Drop System for the first time over Iraq, delivering six 1,200-pound bundles during a resupply mission. The new air-drop tool—known as JPADS—was first successfully demonstrated in combat last year over Afghanistan. (See "Aerospace World: Now, Air-Dropped Cargo Pallets Steer Themselves," November 2006, p. 18.) JPADS uses a wind sonde sensor and GPS technology to steer packages from altitudes of up to 25,000 feet into a desired drop zone. The C-130 crew is deployed from the 463rd Airlift Wing at Little Rock AFB, Ark.

Boeing, Canada Sign C-17 Deal

Boeing on Feb. 1 signed a contract to sell Canada four C-17 airlifters, which are to provide strategic mobility for Canadian armed forces. Delivery of the first aircraft could come this fall. The new order already has been factored into Boeing's plans and does not change plans to shut down the Long Beach, Calif., line in mid-2009, according to company officials.

Canada joins Australia, Britain, and the US as operators of C-17s. ■

Index to Advertisers

announced Feb. 1 that the companies have entered into an agreement to market an air-launched version of the Naval Strike Missile—to be called the Joint Strike Missile. The new weapon is designed to be carried internally and launched externally from the F-35 Lightning II fighter. The stealthy 1,000-pound missile has a range of more than 150 miles.

■ The 36th Airlift Squadron at Yokota AB, Japan, is trading its old C-130Es for newer C-130Hs, with final deliveries expected by May. The conversion will bring 50 airmen and their families to Yokota by the end of March, *Stars and Stripes* reports. The 36th is the Air Force's only forward-based tactical airlift squadron in the Pacific region.

■ A quick reaction team from Eglin AFB, Fla., helped to install new solid state recorders in a pair of 494th Fighter Squadron F-15Es based in Southwest Asia. The December action permitted the fighters to carry out combat missions and collect intelligence data without interruption while the SSR instrumentation systems helped troubleshoot a problem. The 379th Expeditionary Maintenance Group had requested help from Team Eglin to assist in finding the cause of discrepancies with the Strike Eagles' flight displays.

■ Workers at the Arnold Engineering Development Center at Arnold AFB, Tenn., in late January completed the first of eight planned Minuteman motor tests. The heavy test schedule is needed to acquire data on the reliability of the motors. The testing took place at the Large Rocket Motor Test Facility, where an estimated $2.1 million in testing will be carried out in 2007.

■ More than a dozen Canadian Air Force officials, aircrew members, and maintainers went to Little Rock AFB, Ark., recently for an up close look at C-130J training. The Canadian delegation teamed up with members of the 48th Airlift Squadron for the instruction. Canada is purchasing 17 of the new J models and must begin training programs now. Canada currently flies 32 C-130s—all E and H models.

■ Airmen of the 332nd Expeditionary Logistics Readiness Squadron at Balad AB, Iraq, set a new single-month record in January when they pumped 3.8 million gallons of aviation fuel. The squadron delivered 3.6 million gallons of fuel to all aircraft that touched down at Balad and more than 220,000 gallons of diesel fuel for support equipment and vehicles at the base. The 332nd's petroleum, oil, and lubricant flight is made up of six Guardsmen and 30 active duty airmen at the base.

■ Reservists of the 920th Rescue Wing, Patrick AFB, Fla., on Feb. 13 took part in an exercise at Cape Canaveral AFS, Fla. Helicopter crews from the wing's 310th Rescue Squadron provided security for a space shuttle launch, while the 308th Rescue Squadron stood by to rescue and provide medical care to astronauts if a shuttle veered off a runway during landings. In the exercise, Pave Hawk helicopters airlifted NASA firefighters and USAF pararescuers to a remote training site to practice egress attempts and medical skills. Airmen with the 45th Space Wing at Patrick also participated in the exercise. ■

Action in Congress

By Tom Philpott, Contributing Editor

Stacked Decks, Poisoned Water; Equalizing Education Benefits; Expanding CR ....

Tricare Assumptions

Key lawmakers and military retirees' advocates challenged Defense Department assumptions of $1.86 billion in new Tricare revenue in the Fiscal 2008 defense health budget. It assumes Congress will pass a raft of new Tricare fees.

William Winkenwerder Jr., assistant secretary of defense for health affairs, suggested a medical budget shortfall can be avoided if Congress embraces future recommendations of the Task Force on the Future of Military Health Care.

Rep. Vic Snyder (D-Ark.), chairman of the House Armed Services' subcommittee on military personnel, blasted the projected savings, saying the projection "poisoned the water" for the task force by reinforcing a perception that the task force has been "stacked" to recommend fee changes and hit cost-cutting targets.

Last year Congress rejected a DOD plan to raise Tricare fees, deductions, and co-payment costs for under-65 retirees. After a two-year phase in, beneficiary cost-shares would have been indexed to rise annually by the percentage increase in health care premiums for federal civilian employees. (See "Action in Congress: DOD Upholds Tricare Increases," April 2006, p. 25.)

Winkenwerder confirmed that the $1.86 billion projected for Fiscal 2008 signals that DOD would now implement full changes in a single year, if allowed.

Rep. John McHugh (N.Y.), ranking Republican on the personnel subcommittee, asked Winkenwerder what DOD would do if Congress doesn't approve fee increases to produce the anticipated Tricare savings.

There would have to be "fairly dramatic" program cuts, Winkenwerder answered.

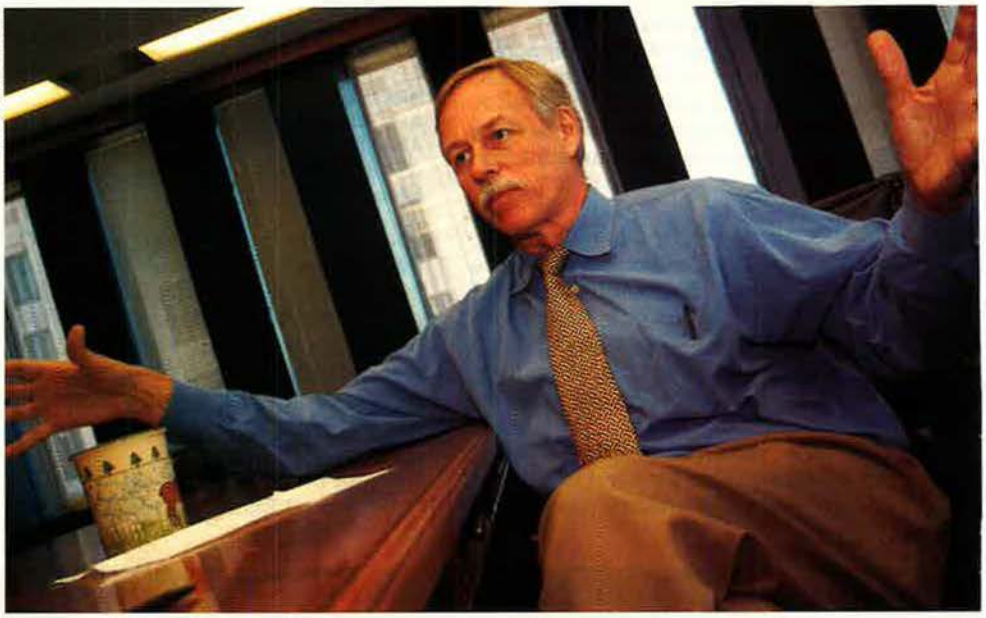
Pocketing Savings

Snyder noted that the Tricare task force isn't scheduled to produce a final report until long after the House and Senate need to pass a Fiscal 2008 defense budget.

The assumed savings, said Winkenwerder, are a signal of how committed defense officials, particularly military leaders, are to seeing Tricare cost-sharing rebalanced. Costs have grown dramatically in recent years with fees frozen, and DOD wants retirees and their families to pay more.

Winkenwerder denied that the task force had been stacked, and he also expressed confidence that its recommendations will be endorsed. DOD selected the panel's 14 members.

AP photo by Mike Wintroath



Rep. Vic Snyder (D-Ark.) thinks the deck may be stacked.

Blocking Moves

Some lawmakers, meanwhile, are building barricades against hefty Tricare fee increases. In February, Sen. Frank R. Lautenberg (D-N.J.) and Sen. Chuck Hagel (R-Neb.) introduced a bill to limit annual increases in health care fees to no more than the percentage increase each year in military compensation.

The bill also would block any enrollment fee for Tricare Standard, the military's traditional fee-for-service health insurance, and block any increase in the Standard inpatient copayment.

The bill would establish in law that health benefits offset the demands of a military career.

The Military Coalition, an umbrella group for 35 separate military associations and veterans groups including the Air Force Association, endorses the bill.

Meanwhile, Rep. Chet Edwards (D-Tex.) and Rep. Walter Jones Jr. (R-N C.) in January introduced legislation to block fee increases.

Total Force GI Bill

Lawmakers, urged on by service associations and veterans groups, have unveiled fresh plans to pass a Total Force GI Bill that would bring education benefits for reservists more in line with those of active duty members.

The legislative vehicle for all of this

is the Total Force Educational Assistance Enhancement and Integration Act of 2007, introduced in the House and Senate by key Democrats and Republicans.

The bill was drafted by the Partnership for Veterans' Education, a consortium of military, veterans, and higher-education groups.

"The big motivator for all of us," said Rep. Vic Snyder, chairman of the House Armed Services' subcommittee on military personnel, is ending the disparity in education benefits—particularly when both active duty and reserve are serving year-long tours in a war zone.

Drilling reservists have seen the gap in education benefits widen compared to active duty members. Most significantly, reserve personnel, even those mobilized for war, still lose their education benefits when they separate from service.

Beyond REAP

Supporters contend a modern Montgomery GI Bill for Reservists is overdue. Congress a few years back passed the Reserve Educational Assistance Program, which enhanced GI Bill benefits to reservists activated for 90 days or more after Sept. 11, 2001.

Payments are set at 40, 60, or 80 percent of active duty MGIB, depending on length of activation. But as with Selected Reserve MGIB, REAP can't be used once a reserve component member is discharged from service.

The Total Force MGIB would guarantee that Reserve and National Guard education benefits rise proportionally with active duty MGIB benefits. It would allow REAP benefits to accrue month by month for mobilized members at the active duty rate, currently $1,075 per month. And it would establish "portability" for REAP benefits so once-mobilized reservists who leave service have up to 10 years to use their GI Bill benefits.

First Things First

The first step Congress must take, said Snyder, is to consolidate active and reserve MGIB programs under the Department of Veterans Affairs. (Reserve benefits now are awarded and funded by DOD.) This split in responsibility between agencies also splits Congressional committee oversight and has led to the current disparities.

Defense officials oppose such consolidation. They see Reserve GI Bill benefits as a retention tool they need to control. Officials have testified that making reserve benefits portable risks harming retention goals.

"We don't agree," Snyder said.

Officials also fear Congress will give the VA management of all GI Bill programs but continue to require that DOD fund reserve benefits. Congress must ensure that doesn't happen, Snyder said.

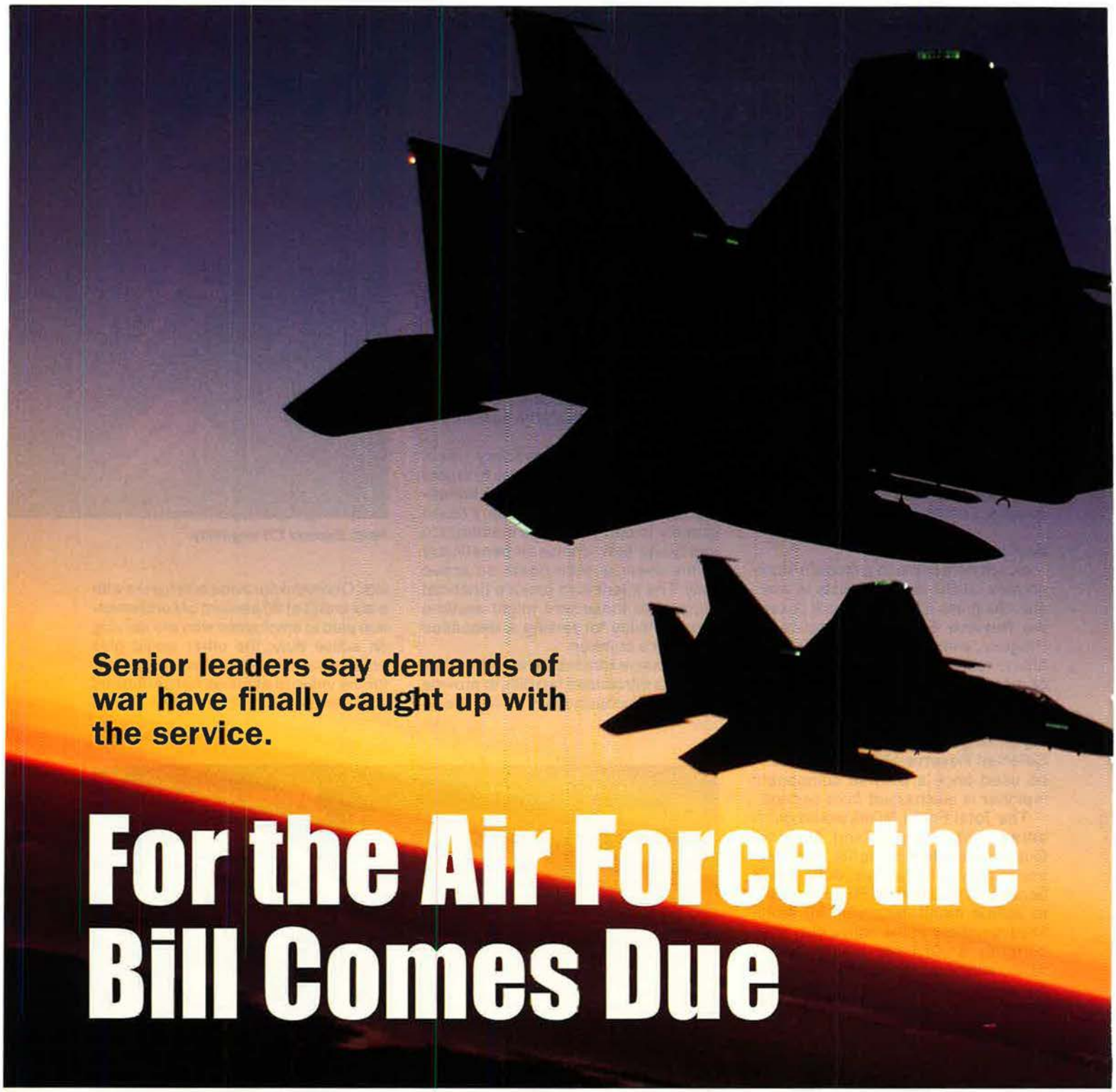
Other New Measures

Several other measures to help pay and benefits for service people have been recently introduced. They include:

- Concurrent Receipt—Senate Majority Leader Sen. Harry Reid (D-Nev.) seeks to expand eligibility for concurrent retirement and disability payments to all retirees with at least 20 years of service and disability ratings from the VA. Freshman Rep. Gus M. Bilirakis (R-Fla.) has introduced a companion bill in the House.
- Death Gratuity Beneficiary—Sen. John McCain (R-Ariz.) wants to repeal the statutory designation of beneficiaries of the $100,000 military death gratuity to permit service members to designate their choice of beneficiary in the event of their death on active duty. The intent is to provide financial support to those who might assume responsibility for raising a deceased member's children.
- Reserve Hire Incentives—Bilirakis also has introduced two bills to provide incentives for businesses to hire reservists. One would provide employers with a tax credit of 50 percent of compensation paid to employees who are serving on active duty; the other would give employers a tax credit of 10 percent for the value of services not performed while employees are on duty. ■

AP photo by Pablo Martinez Monsivais

Reid: Expand CR eligibility.



Senior leaders say demands of war have finally caught up with the service.

For the Air Force, the Bill Comes Due

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

After four years in Iraq, five-and-a-half years in Afghanistan, and 16 nonstop years of combat operations throughout Southwest Asia, the Air Force stands at a strategic crossroads. One path leads to continuation of a dominant air and space power, while the other leads to something less—perhaps a lot less.

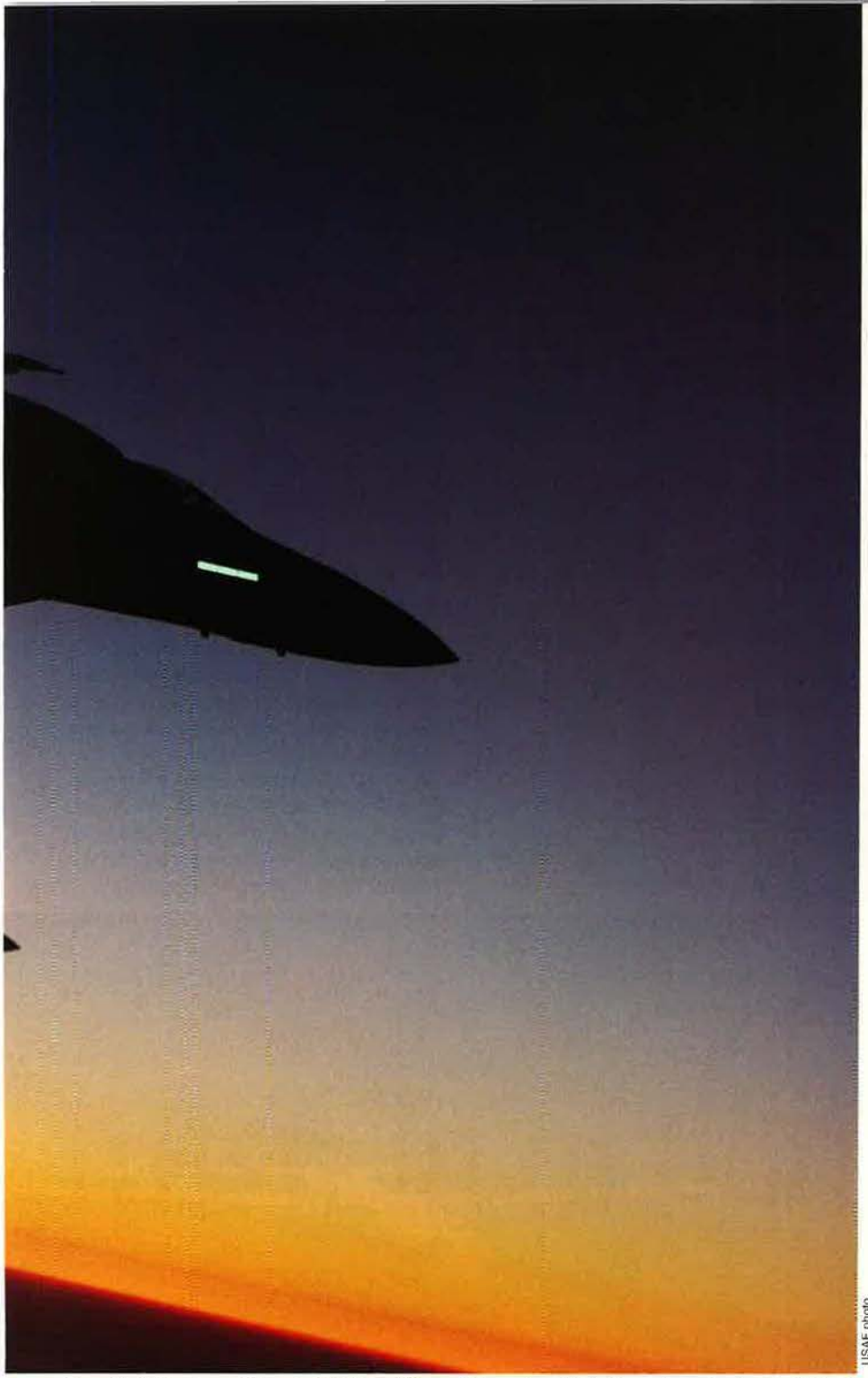
Such was the import of somber public remarks from the service's senior officials at the Air Force Association's annual Air Warfare Symposium in Orlando, Fla.

The Air Force must find a way to sustain today's creaking equipment, modernize the force with next generation systems, and provide airmen to support the proposed addition of 92,000 troops to the Army and Marine Corps.

It must do all of this with what officials openly concede is an inadequate budget for Fiscal Year 2008, which begins on Oct. 1, and years beyond.

"We are at a great crossroads in the national dialogue," said Air Force Secretary Michael W. Wynne, who spoke along with other USAF leaders at the symposium.

He explained that "not since the early 1950s" has the question of paying for deterrence, situational awareness, global reach, and the full spectrum of strike



USAF photo

Two F-15 Eagles of the 1st Fighter Wing at Langley AFB, Va., return to base at dusk.

options "been on the table for debate," as it is today.

A major issue is recapitalization. The Air Force will likely be "recapping by bootstrap," Wynne allowed, because asking for an overall budget increase at this time is probably a "nonstarter" with Congress. "Strategy is about choices," he said, "almost always about hard choices."

One of USAF's recent choices was to cut the equivalent of 40,000 full-time airmen to free up funds for modernization. When Stop-Loss personnel are included, the Air Force would actually lose 65,000 personnel by 2009.

The service did this because it believed it could survive the reductions through increased efficiency, and "we saw the personnel account as the fastest growing component of our cost structure," Wynne said.

The Air Force Chief of Staff, Gen. T. Michael Moseley, agreed. "Trying to sustain manpower levels without budget increases would have delayed recapitalization and modernization," said Moseley. "When you hold infrastructure, military family housing, and [military construction] as constant as you can, ... the only two places to go for money are the personnel accounts and the investment accounts."

The wisdom of going forward with those personnel cuts is now in question, however.

The recent national decision to expand the size of the Army and Marine Corps by 92,000 troops means the numbers must be re-evaluated. "We are at a point where we absolutely must assess our size relative to our ground force brethren," said Wynne.

Five thousand airmen are tied down performing ground force taskings for the Army and Marine Corps, noted Moseley. These airmen are serving as prison guards, combat convoy drivers, interpreters, and in other ground force missions. Many other airmen are embedded in Army and other ground force units.

The Surge Effect

Moseley warned, "A larger ground component will certainly mean a corresponding growth in Air Force-provided vigilance, reach, and power." More boots on the ground means that more combat weather teams, tactical air control parties, and other battlefield airmen and embedded specialists will be needed.

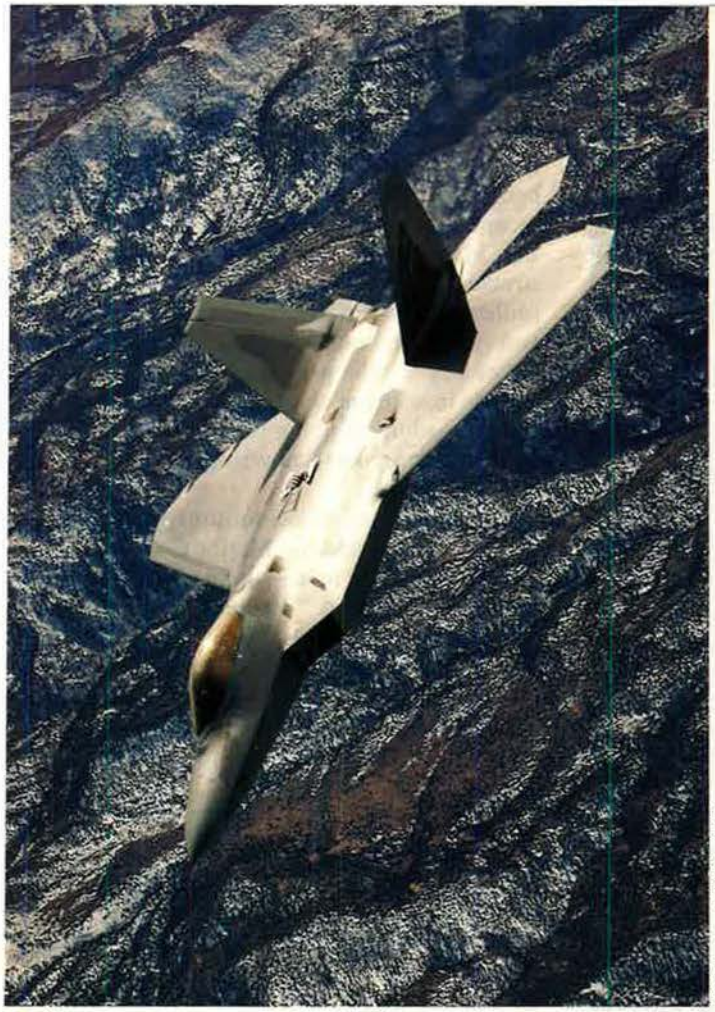
Taskings are certain to increase as well, as the Air Force will feel the effect of the "surge" of forces into Iraq in early 2007. Moseley told reporters in Orlando that there will be more demand for bomber sorties, for example, and for intelligence-surveillance-reconnaissance missions by Predator and Global Hawk drones and U-2 spyplanes.

"Intratheater lift is going to go up, because you are now in the business of resupplying more people in bulk," he said.

The demand for combat search and rescue will increase, he added, and calls for air strikes are likely to increase. Air Force mobility assets will need to make all of this possible.

Wynne and Moseley said the service has not determined how many additional airmen will be needed to support the new troops and taskings, but the 40,000 cut is likely to be discarded.

Wynne added, however, that the Air



USAF photo by 1st Lt. Randi Norton

At left, an F-22 flies above Nevada in the Raptor's first Red Flag, which was held in February. Below is a C-130J along the coast of Santa Cruz Island off California. Recent wartime demands have pinched modernization accounts, and senior Air Force leaders are now making the case for a larger recapitalization effort.

Force will live with its Fiscal 2008 budget request, sent to lawmakers in early February. The service will come back to Congress later with an updated personnel request, which will be developed once USAF understands exactly what will be needed.

Airmen in ground force taskings are performing a national service, but perhaps enough is enough, Air Force leaders suggested. "Given the ground force buildup, perhaps it is time to reassess this" use of airmen, Wynne said. The Air Force is not the Army, and putting air component troops into ground force missions "fails to leverage the airman's role" and the unique skills airmen bring to the table, he said.

The Toll of High Optempo

The Air Force is not alone in wanting to preserve what makes it unique. Marine Corps Gen. James E. Cartwright, head of US Strategic Command, told the attendees that service cultures must be preserved even as the Defense Department searches for efficiencies and new ways of doing business.

"We have got to figure out how to ... build these [joint] organizations and integrate them without losing the culture, without losing that part of a service's ethos that makes us—either in the cockpit or in the foxhole—willing to die for the person that's standing next to us," said Cartwright. "We cannot erase that in the name of 'joint.'"

The Army is benefiting from airmen performing traditional Air Force missions. In an attempt to make the roadside improvised explosive device irrelevant, for example, USAF has increased its intratheater airlift in Iraq and Afghanistan. Wynne said 3,500 trucks and 8,000 troops per month have been taken off the roads through increased use of C-17s, C-130s, and new precision drop capabilities.

The increased tempo, however, has taken a toll that has gone largely unnoticed. Moseley noted that, since the Sept. 11 terrorist attacks, USAF has suffered 62 on-duty deaths. It has lost 83 manned aircraft—18 in contingencies, 65 in preparation for combat—and 44 unmanned air vehicles.

These totals include 48 fighters—two squadrons' worth—and 11 manned special operations aircraft, five airlifters, two U-2s, and one B-1B bomber.

Moseley described this attrition as "least understood by all" and said supplemental funding is needed to replace these losses. To that end, the service is seeking three F-35 Joint Strike Fighters to replace F-16s lost in combat, among other war supplemental requests.

Wynne told reporters the Air Force expects normal attrition in fleets, and builds these losses into its requirements, but wartime losses were not part of the Air Force's fleet management planning.

USAF photo by SMSgt. Dennis Goff

The service is asking for F-35s instead of replacement F-15s or F-16s for two reasons. First, the fourth generation fighters still under construction are new derivatives for foreign customers and do not fit into the US logistics chain. Second, USAF believes it is time to move forward with next generation capabilities, and F-35s are

Staff photo by Zaur Eylanbekov

At left, a C-17 prepares to take on fuel from a venerable KC-135 of the 459th Air Refueling Wing (AFRC), Andrews AFB, Md. Below is the F-35 Lightning II during its first flight. USAF's budget crunch compelled the service to slash its maximum F-35 purchase rate to 48 aircraft per year.

Lockheed Martin photo by David Drais

available in the same time frame as legacy fighters.

The Air Force does not get a warm reception when it raises the issue of aircraft attrition and the need for replacement systems, observed Gen. Bruce Carlson, head of Air Force Materiel Command.

No Replacements

Nevertheless, attrition creates "a real requirement" for recapitalization and sustainment, said Carlson. "Unlike our last long war, where we were ... building F-4s and F-105s to replace those that we lost," the Air Force is not receiving replacements for the F-16s and special operations forces aircraft it loses today.

Therefore, Carlson said, "we have to be able to sustain these systems for a long, long period of time."

Upgrades are being pinched as well. Lt. Gen. John A. Bradley, chief of the Air Force Reserve, noted in a press roundtable in Orlando that his biggest unfunded need is to provide additional protection systems for AFRC's large aircraft. Defensive systems such as the Directional Infrared Countermeasure system that foils infrared missiles are expensive. The Air Force only has 49 of its total fleet of C-17s DIRCM-equipped.

With demands increasing across the board and a fixed pot of funding, something's got to give. So far it has been readiness.

Wynne said that "operating a smaller, older fleet" is the underlying cause of the Air Force's current readiness decline. That decline is now pronounced; officials say that unit operational readiness is down 17 percent. Wynne said USAF is flying at the same rate as 13 years ago, but with 1,280 fewer aircraft and a fleet that is far older than it was in 1994.

"Without the continuous investment we seek," Air Force readiness will continue to decline, Wynne said. More than two air and space expeditionary forces have been deployed nonstop since 9/11—with some high-demand specialties deployed at a steady state of four AEFs. (The system was set up for two AEFs, on a rotating basis, to support contingency requirements.)

There is no relief in sight. Wynne said threats to the United States are "proliferating and, I believe, accelerating." It is dangerous, therefore, to become overly fixated on the demands in Iraq and Afghanistan at the expense of the other security challenges facing the Air Force.

Moseley said the events that occurred just since September 2006 illustrate the dangerous world in which the Air Force now operates. In those four months:

- Russia began delivering advanced SA-15 surface-to-air missiles to Iran.
- China announced that its most advanced fighter, the J-10, had become operational.
- China successfully tested an anti-satellite weapon against a target spacecraft, creating a large debris field in space.
- North Korea claimed to have nuclear weapons and tested a nuclear device.

Meanwhile, the operations in the

USAF photo by A1C Melissa Flores

At left, SSgt. Zachariah Ellis performs a structural maintenance inspection on a B-1B bomber at Ellsworth AFB, S.D. Below, a KC-135 on the flight line at Manas AB, Kyrgyzstan, awaits deicing before a mission.

Wynne said the planning assumption is that the air bridge to the Middle East will continue at least until 2010.

Noble Eagle will continue indefinitely. Moseley said "about 100 fighters are involved in this," every day, along with roughly a dozen tankers and four or five E-3 AWACS aircraft.

Such nonstop missions have inexorably shifted funding from modernization to operations accounts. Moseley said this "regrettably coincided with a period when the Air Force expected to recover" from the decade-long "procurement holiday" of the 1990s. In 2007, the Air Force will take delivery of about 60 aircraft; Wynne noted that with a 6,000-aircraft fleet, this translates into a 100-year recapitalization rate.

Eye opening numbers are not mere hyperbole. The Air Force fighter fleet now averages 24 years of age—the oldest it has ever been. In most of the rest of the fleet, the story is much the same.

Current plans call for the service to buy 48 F-35 Lightning II fighters per year at peak production. At that rate, it will take more than 36 years to buy the planned inventory of 1,763 fighters.

And the Air Force expects to buy 15 new KC-X refueling tankers per year, a pace at which it will take more than 30 years to recapitalize the KC-135 fleet. "By the end of the buy, we will have 75-year-old tankers," observed Moseley. "It is unconscionable to think about sending America's airmen into combat in planes that old."

The cracks in the old aircraft fleet are beginning to show: Carlson, speaking at the symposium, noted that Air Force Materiel Command's depots are moving aircraft through the system

US Central Command area of responsibility continue to grab most of Washington's attention. The Air Force is certainly busy in Southwest Asia, but Moseley said the region is "not our only concern." The Air Force cannot "afford to become target-fixated on counting terrorists or insurgents," he said. "We cannot completely focus on Iraq or Afghanistan and forget about the potentially global ... competitions of the future."

USAF photo by SSgt. Paul Clifford

Fifty-Three Percent

Moseley noted that 25,000 airmen are deployed to the Southwest Asia Theater, and 213,000 additional airmen are directly supporting the combatant commanders in other locations.

"On the active side, that is 53 percent of the active duty force that is committed every single day to a combatant commander," Moseley said. "No other service has 53 percent of its active component committed."

Airmen are operating worldwide, performing missions such as the long-range bomber "presence" mission on Guam for US Pacific Command; conducting the "air bridge" delivering fuel, troops, and materiel between the US, Europe, and the Middle East for US Transportation Command; providing nuclear missile alert for US Strategic Command; and monitoring the skies over the United States through Operation Noble Eagle for US Northern Command.

Making the Most of Everything

The US military needs to be careful that it does not inadvertently build shortcomings into its capabilities, said Marine Corps Gen. James E. Cartwright, chief of US Strategic Command. In the case of aircraft, he said, future platforms will be limited if they are built with closed architectures that require major software overhauls for updates instead of simple "plug-and-play" upgrades.

"If we're relying on what we designed five years before we flew and [which] then got to the warfighter five years later, Moore's Law has just been lost to the warfighter," he said, referring to the principle that computing power will double every 18 months at the same cost.

Meanwhile, with stealthy and survivable missiles and strike aircraft proliferating throughout the Air Force, it may be time to consider an overlooked mission area. "That survivability attribute has to be brought not only to our missiles and our aircraft, but also to our ISR platforms," Cartwright said.

There is a definite operational shortcoming a stealthy surveillance or reconnaissance aircraft could fill. "I love the SR-71," he said. Unfortunately, "when we gave it up, we also gave up penetrating ISR. We're hurting as a result of that. We've got to change that equation."

well. The concern is with the aircraft, not the depots.

Carlson said that aircraft coming in for their overhauls are requiring evermore "over and above" sustainment activity before the aircraft can return to the fleet. Over and above work results from the unanticipated problems that spring up in old airplanes.

He told reporters that the most troubling thing to him is that some fleets experience unexpected "spikes" in problems, because there are no accurate prediction models for aircraft this old. It means more work must be done in less time to stay on schedule.

Out of Blood

Compounding the problem, Carlson said, is that the old aircraft are not proving as reliable as desired when they return to the combat fleet because "there's only so much blood you can squeeze out of a turnip."

The solution, he said, is for different—translation, newer—aircraft to be the ones going into depot.

Further pinching readiness is the fact that fuel costs are up nine percent, and the average cost per flying hour has increased 10 percent. The Air Force only budgeted for a 2.4 percent cost of inflation.

Depot-purchased equipment for maintenance is funded at 74 percent of the requirement—down from 85 percent the year before. Spare parts costs are up six percent.

Threats in space and cyberspace also garnered considerable attention at the symposium. Wynne said neither domain is a sanctuary where the US can operate without threat.

Officials found China's January ASAT test, which proves China has the ability to destroy US satellites, particularly noteworthy.

"The recent Chinese test marks a turning point in the work our country must do to assure space dominance," said Wynne. "There can be no place in space for piracy or blackmail, and the Chinese, willingly or not, have sent a message that our guard must be stronger."

STRATCOM's Cartwright said the US has been much too passive about space situational awareness. "We're willing to wait days and weeks to make sure we understand who's out there and what they're doing," he said. "It is a very reactive type of mind-set" that needs to change.

Carlson said that, in the future, the Air Force must anticipate emerging threats and what is needed to counter them. "Our strategy is that [AFMC] will develop the technology and the capabilities needed ... as we prosecute the wars of the future as well as those that we're involved in today."

AFMC's Air Force Research Laboratory has already been at work on a way to improve space situational awareness, he said. If ordered, USAF in about nine months could field new hardware that fuses disparate strands of data and would "provide increased situational awareness for our friends" at Air Force Space Command.

Cyberspace poses unique challenges and is an area where the US does not have dominance, as it does in air and space.

"In the cyber domain, our foes can mass," noted Wynne. "There is asymmetry, the cost of entry is low, and the enemy can throw many trained operators into the fight."

He went on to say that the service is setting up Cyber Command to lead operations in networks and the electromagnetic spectrum. The command will initially be run out of 8th Air Force at Barksdale AFB, La., and is expected to later become a major command in its own right. (See "War in the Third Domain," p. 58.)

Cartwright said DOD cannot "let the geeks turn [cyber operations] into a special language behind a bunch of closed doors so that a warfighter has no idea how to use it."

Cyber Command was put under 8th Air Force, which provides bombers and network capabilities to Air Combat Command and STRATCOM, partly to emphasize its combat mission. "Cyberspace is a fighting domain where the principles of war do apply, and we need true warfighters in this domain," observed Wynne.

As in space, a more aggressive mind-set is needed. "We've got to get out of the mind-set that it is purely a defensive activity," said Cartwright, with the implication that DOD is "willing to accept attack and then respond by building a better defense."

The Air Force recognizes that cyber operations require a skilled cadre of personnel, and 8th Air Force is determining exactly what resources and personnel need to be devoted to the mission. Cartwright said getting qualified cyberwarriors is not the only issue—DOD will also need to keep them.

"When you train a person to be good in this environment, it's not unlike the Manhattan Project," he said. "You've given them the key to the kingdom. So how are we going to retain them? What are we going to do about responsibility after they leave?"

For the cyber domain, and across the Air Force, the service needs to "think outside the box a bit and derive new solutions, find new technologies, and develop new tactics, techniques, and procedures," said Moseley. "In short, we need to build the 21st century Air Force."

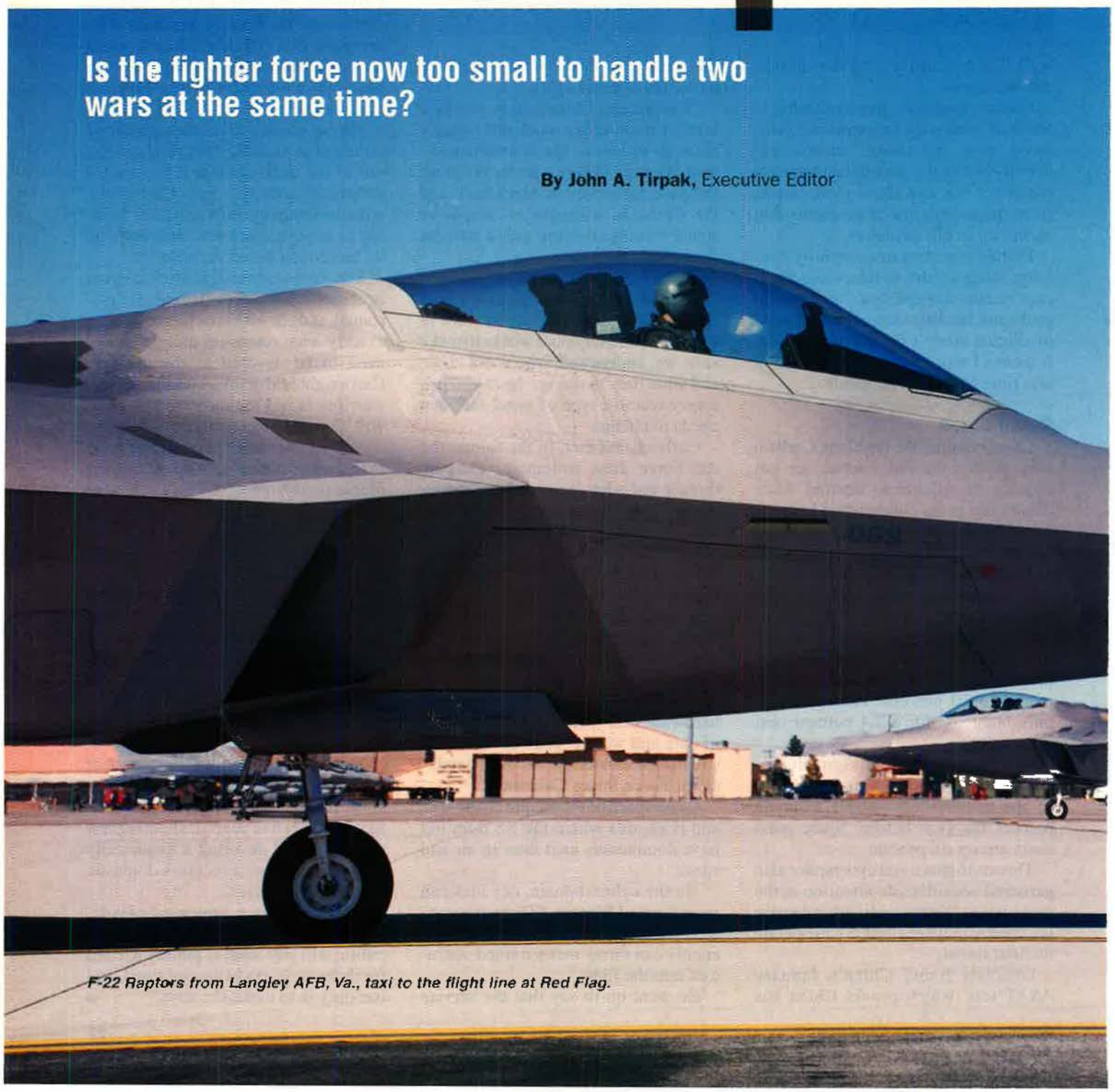
This means, he told reporters, that it may be time to begin a new debate about defense spending, in light of the fact that after five years of shooting war the US is still devoting a historically small percentage of its gross domestic product to defense.

If the needs are presented clearly, Wynne said, "I believe the American public will pay what is plainly needed for defense. It has to be explained, and our duty is to make the case." ■

The Risk Goes Up

Is the fighter force now too small to handle two wars at the same time?

By **John A. Tirpak**, Executive Editor



F-22 Raptors from Langley AFB, Va., taxi to the flight line at Red Flag.

The Air Force is losing its battle to strike a balance between fighting wars in Iraq and Afghanistan while providing long-term investment in future readiness, service leaders reported at AFA's Air Warfare Symposium in Orlando, Fla.

For the time being, the Air Force is meeting its heavy commitments to both operations—by juggling people and money, by seeking ever-greater efficiencies, by shifting some attack options to the cyber world, and by applying lessons learned along the way. It is also looking ahead to both the technical and political realities of dealing with rising challenges—and challengers—beyond today's fight, in the Pacific and elsewhere.

However, because its future investment accounts have been consistently raided to pay for the demands of today, the Air Force is facing a decade-long period in which it may not be able to fight two major regional contingencies in close succession, as called for in the national strategy.

That's the assessment of Gen. Ronald E. Keys, head of Air Combat Command, who told *Air Force* Magazine in an interview during the symposium that USAF is going to "have a one-MRC force for a while. That 'while' could be 10 years."

Photo by Jim Dunn

Keys was referring to the fact that USAF's fighter force, much of which has reached or exceeded its planned retirement age, will not be renewed at the needed rate. Specifically, the Air Force's budget calls for a maximum of 48 F-35s a year—less than half of what it would take to replace the F-16 fleet in the needed timely manner.

Keys said 48 "is not the right number."

No matter how good the new fighters may be, relative to those they replace, they cannot be in two places at the same time "or three places at the same time," Keys said. When called for, the fighter force is likely to already be deployed somewhere, he said. If another emergency pops up, he said, it will take longer to prosecute a fight and likely cost more lives.

Keys' warning about increasing risk was echoed in more general terms on Feb. 28 by Marine Corps Gen. Peter Pace, Chairman of the Joint Chiefs of Staff. He said US military action in a second theater would be "less precise and more heavy-handed" than it should be. However, Pace said the question is "not whether ... we will get it done." He asserted: "No one in our country or any potential adversary should question our ability to handle another crisis tomorrow."

The slower replacement rate means that it will be necessary to keep existing fighters going longer than now planned—and they have already been stretched, Keys said.

"The question is, can you bridge that gap with current airplanes?" he asked.

Catch-22

The situation raises a Catch-22 in Keys' mind: If the Air Force can't get the money it needs to buy new generation aircraft, it will have to patch up the old ones and somehow lengthen their lives and capabilities to keep them relevant. But such life-extending is expensive, and if the Air Force can afford it, then it should apply those funds to buying new airplanes.

"It is 'pay me now, or pay me later,'" Keys asserted, adding that the ACC chief who "follows me, or the one that follows him, is going to have to face up to this." (See "Making the Best of the Fighter Force," March, p. 40.)

ACC has scrutinized the problem

USAF photo by MSgt. Val Gempis

SrA. Mindy High, a crew chief with the 509th Bomb Wing, Whiteman AFB, Mo., prepares a B-2 bomber for launch at Andersen AFB, Guam.

"two dozen ways, probably," Keys said. No easy answers have emerged, and all are scenario-dependent.

The last time the Air Force was in such a huge predicament, he said, it raided the readiness accounts to put hardware on the ramp, creating "the hollow force of the '70s," Keys said.

However, "we can't do that today. We're in the middle of a war. We have to preserve our readiness and still recapitalize, and the only place you get that kind of money is from reducing people and platforms." Even so, readiness accounts are ailing because the costs to keep up old airplanes "has gone up 87 percent, and it's climbing. That's a staggering cost."

"The only good news in all of this," Keys reported, "is. the train wreck is not happening inside the budget cycle, so I don't have to do something today. I have time to build my plan." The time will also be important to build what Keys called a "coalition" of support in the Pentagon, on Capitol Hill, and in the White House to recognize the urgency of the replacement issue.

Can USAF "live with" the glacial rate of replacing worn-out airplanes?

"You can live with anything; it's just a matter of how much risk you want to take," Keys explained.

Keys reported that ACC is exhausting every conceivable work-around to diminish the impact of dwindling capacity. The new long-range strike system, he told reporters, could perform some of the role of a gunship, and Keys said provisions will be made—holes, wiring—to allow that to happen as the strike system takes shape. It would be able to fill the role even better if destructive lasers come along.

Cyber Substitutes

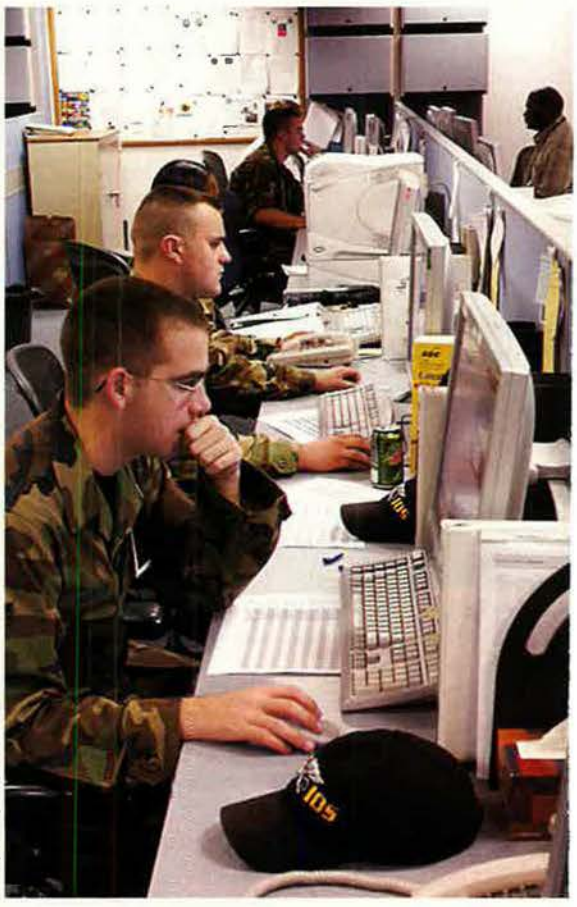
In his speech to the symposium attendees, Keys also touted the development of cyber capabilities for both attack and defense. Cyber-attacks could substitute for kinetic attacks under certain circumstances, he told reporters, potentially offloading some of the burden carried by combat aircraft.

However, cyber warfare is its own domain with its own demands and not simply a substitute for aircraft and munitions.

Keys told reporters at a press conference that he sees three levels of cyber-enemies in the world. The first level comprises smart people who "are trying to get a trophy," to be able to boast that they broke into a difficult security system and caused disruption. Level two includes people who "have money," such as organized crime, drug cartels, and terrorists, and who are making attacks to achieve a political or financial end. Finally, there is "state sponsored" cyber-attack.

"Not only do you have money behind it, but you've got some fairly high level technological stuff," Keys noted. He also pointed out that hacker tool kits are readily available on the Internet, and some Websites are actually subscription services that send out updates to clients when better defenses are developed—a reverse form of anti-virus protection.

Keys noted that most computer chips are now manufactured in China.



USAF photo by MSgt. Jack Braden

Airmen with the 67th Network Warfare Wing monitor Internet activity at Lackland AFB, Tex. Efforts are now under way to thwart a cyber-attack.

USAF photo by SSgt. Marie Harmon

TSgt. Bruce Hart (left) and TSgt. Scott Edsell from the Pennsylvania ANG secure an AGM-65 missile to an A-10 Warthog during an operational readiness inspection.

"Do you think they're putting anything in those chips?" he asked rhetorically. "If they're good enough, how would you know? [Until] the day comes and they pull a lever and everything shuts down."

The efforts now under way—with a Cyber Command; dedicated cyber squadrons and wings; and growing integration of cyber awareness, defense, and attack—are to make sure that a computer attack does not represent "a single point failure," like aerial tankers or space access, Keys said.

The threat to individuals, the economy, and government from modestly funded cyber-enemies is "scary," Keys summed up, and USAF is stepping forward to confront it.

No Zealots Needed

"I have to balance risk, ... capability, and ... transformation," Keys asserted. "I can't afford to be a zealot, and I don't [have] the money to be a zealot, so I've got to figure out what the right answer is."

All these priorities are "competing for limited resources," he said.

"Sometimes it forces us to stop doing things we'd like to do or delay things that we need to in order to meet some future demands, and that's why you see buys being truncated, installs of equipment not being done fleetwide."

He said he's leery of "the golden BB" that will solve all his problems and is instead looking for capabilities that make all his systems better and more adaptable to "prevail at irregular warfare."

Keys told his industry listeners that he wants advanced hyperspectral sensors that can penetrate foliage and even the earth, "machine-fused intelligence," open architectures, collaborative systems, and persistence that is "weeks, even months, long."

Flying hours are being reduced by 10 percent a year in the budget just tendered to Congress, Keys noted, and some of that reduction will be made up by simulation time. However, the war has "masked" the flying hours situation, he said, and many pilots are getting many extra hours of combat flying time, which helps make up for the reduction.

Despite the difficulties, Keys said, "we're dealt a hand and we've got to play it. So we're going to balance ... acquisition and sustainment and ensure we can do the things we have to do today in the war, and we'll build a force for the future."

Gen. Duncan J. McNabb, head of Air Mobility Command, told the symposium that his organization has managed to sustain a breakneck pace of operations by learning on the job, by being adaptable, and by selectively using hardware innovations.

"After five years of ... this Global War on Terrorism, we have gotten pretty good at this," McNabb said, noting that AMC is lofting about 900 airlift or tanker sorties a day, or about one every two minutes, worldwide.

The key to pulling it off, McNabb said, is aiming for "velocity" in every step of operations. He said AMC has mimicked NASCAR pit crews and Southwest Airlines in trying to steadily reduce turnaround time between missions, getting the effect of more aircraft by keeping the ones he has in the air almost nonstop.

Another way to streamline and make more efficient the activities of AMC aircraft was to close down various en route planning facilities and consolidate everything at the Tanker Airlift Control Center at Scott AFB, Ill., AMC's home base. From there, he said, AMC has clear visibility into its entire fleet at a glance.

Optimize the Flow

"We can really optimize the flow" and manage the sequence of where things go, when they show up, and when they move on to their next destination, McNabb explained. Aircraft are moving with fuller loads, cargo is reaching its destination faster, and the whole system is more responsive to commanders who either want to reroute aircraft or stop the process entirely for an emergency.

Analysis of the way cargo is moved has either deleted steps in getting gear to the front lines or been rationalized better to make breaks and transshipments more logical, McNabb reported.

The whole system, he said, is "rapidly tailorable for max effect."

Moreover, AMC has created new ways of managing people, both active duty and reserve, to reduce their individual burdens. Some reservists are being called for shorter periods because they can manage these better with their regular jobs, allowing them to volunteer more readily.

There have been some technical innovations that have also improved AMC's wartime edge, McNabb said. Precision airdrops have been instituted, relying on GPS-aided instrumentation to put parachute-laden gear closer to where it needs to go—in some cases, within a few feet. The new wrinkle is that these drops can be made from much higher altitudes, above small-arms fire and even some anti-aircraft systems, such as man-portable missiles.

It is the getting-shot-at part that McNabb said causes him to lose sleep. Most AMC aircraft are large and slow and make an inviting target for enemies on the ground. The fact that, early on, the flight patterns were predictable made getting in and out of forward bases hazardous. AMC aircraft were shot at "215 times in '06," McNabb reported, and the knockdown of a big American aircraft is a main goal of many US enemies.

To combat the problem, AMC has

USAF photo by SrA. Bradley Lail

Left: SrA. Joshua Ramos, SrA. Alberto Nava, and A1C Shequita Spence (manning gun) conduct a perimeter scan at Kirkuk AB, Iraq.

Below: TSgt. Bob Weigold and his detection dog, Timo, perform a perimeter check at a base in Iraq.

trained its pilots to act unpredictably, to vary their approach and departure patterns, and to routinely perform maneuvers once only done by highly trained special operations pilots.

Tactics, techniques, and procedures are constantly being adjusted to keep the crews and their aircraft safe. Other innovations include widespread use of night vision goggles for nighttime takeoffs and landings and "spiral" approaches.

The crews are using these procedures "every day and they're doing it safely," McNabb said. His big wish is to put more self-defense systems on aircraft as soon as possible.

First, a Tanker

McNabb said he's delighted that the Air Force has finally gotten its KC-X tanker competition under way and emphasized that the aircraft will be a "tanker first," rather than a mixed-use aircraft. It will be employed as a cargo airplane if the tanker requirements are moderate on a given day, he said, and AMC will look into the use of tankers as data and communications relays, but not as a primary function. In fact, such a capability, if put on tankers, will have to be transparent to the crew, meaning that such a capability will function automatically, without the crew's involvement.

The new tanker will be able to refuel with both hose-and-drogue and boom equipment on the same mission, McNabb noted, and this will make a huge difference in the velocity at which aircraft of dissimilar types can be refueled in midair. It will also be able to operate in the "sweet airspace" where temperature, winds, and other conditions make for the most efficient flights.

McNabb said AMC's efforts have directly reduced casualties in the ongoing wars. He noted that, thanks to a determination to put lives first, wounded soldiers have better than a 90 percent survival rate if they can be moved to an aircraft. (See "The 90 Percent Solution," October 2006, p. 60.) Also, the decision to move a great deal of cargo shipment from road convoys to aircraft has taken personnel off the roads, where they would be subject to mines and roadside bombs.

"What a difference this has made; it has saved lives."

As an instrument not only of resupply in wartime but also as an answer to humanitarian distress calls and noncombatant evacuation operations, AMC "gives us great ability to slow down events or speed them up, to play or not to play, but everybody knows we have it." No other country, McNabb said, has our "ability to move."

The wars in Afghanistan and Iraq

USAF photo by SSgt. Michael R. Holzworth

Two F-16s from the 510th Expeditionary Fighter Squadron taxi toward the runway at Balad AB, Iraq, in preparation for a close air support mission.

are commanding the attention of the Air Force in many ways, but in the long term, it is the Pacific region that will "be the primary interest for our children [and] ... grandchildren," according to Gen. Paul V. Hester, head of Pacific Air Forces.

Hester said that the Pacific's huge and growing influence in the world economy and the military rise of China and India mean the region will command greater focus by USAF, and it is preparing now to meet that challenge.

There is no NATO-like organization in the Pacific that keeps nations there "talking, ... not shooting at each other," Hester said. Toward that end, the Air Force is taking steps to create cooperative arrangements for the region's air forces.

He said he is planning to engage various countries in jointly buying, operating, developing, and sustaining Global Hawk reconnaissance aircraft. He envisions a joint effort with the aircraft, based at Guam, that could provide information on the region giving many participants both an insight into each other's military activities and a common program to foment more cooperation.

"We've started our investment in platforms and technologies that can be revolutionary in the ability to build coalitions and find common agendas for building answers," Hester asserted.

"We will bed down roughly 10 Global Hawks out in Guam starting in '09. No bullets, no bombs, no missiles, only sensors. If crafted correctly, we have an opportunity for an American platform to fly jointly funded, researched, and produced Australia and Japan sensors on it, run by Indian software, downloaded into a multinational assessment center in Singapore, ... drop into Thailand, and do a gas and go at a refueling station, and then get up and go out into the Indian Ocean to go help our friends in Sri Lanka or Bangladesh or others who need our assistance with the persistency of this [intelligence-surveillance-reconnaissance] platform."

Beauty of the Plan

The beauty of such a plan, Hester said, is that it will build cooperation and a means to get a common picture of the region "before there is a crisis, not after the crisis has started."

Potential partners will be able to participate in an experiment this summer either by coming to Guam or traveling to a command center in Hawaii to "see all the sensor data that is published and put to us" from an analysis center at Beale AFB, Calif.

USAF photo by SSgt. April Quintanilla

Hickam AFB, Hawaii, has eight C-17s such as these (lined up to taxi at Charleston AFB, S.C.), and eight more are coming.

Hester called it an opportunity for countries to get involved in regional activities, to provide "overflight ... alternative airfields, pick the routes, pick the targets to look at."

Numerous countries have accepted offers to participate in wargames run at Hickam AFB, Hawaii, PACAF's home, Hester reported. The Air Force has also sponsored and underwritten a number of small airpower symposia in various Pacific countries, he said. "The common feedback to us was, we need to do more of this. Sit around a tabletop, talk, look at a problem, discuss, ... talk some more. It is the start of how to solve common problems."

Guest countries are also more frequently accepting offers to come train at Red Flag Alaska, he added.

The current deployment of F-22 Raptors to Kadena AB, Japan, is the first step in introducing this new capability to the theater, Hester noted. Elmendorf AFB, Alaska, will be getting a full squadron of F-22s over the next year, and by 2011, there will be two squadrons there and one in Hawaii. Eight C-17s are based at Hickam and eight more are coming.

Guam, however, will be the centerpiece of the Pacific engagement strategy, Hester noted, saying that island facilities are scheduled to receive $14 billion worth of improvements over the next 10 years. Guam will receive large improvements in infrastructure. The Navy will be in charge of military construction activities there, because 16,000 marines and family members are being relocated to permanent bases on Guam, from Japan, by 2014. More and more exercises, particularly with Japan, are being run on Guam.

Kadena is also gaining in importance, given its location in what Hester called the "strategic triangle with Alaska and Hawaii." Kadena will get a battalion of Army PAC-3 Patriot missile defense systems soon, "pointing to the north" toward North Korea.

Yokota AB, Japan, will soon get a Japan Air Self-Defense Force air operations center, to be integrated with USAF facilities there. It will focus on national defense, "including ballistic missile defense," Hester reported.

There has been discussion that Korean takeover of operational control of joint forces in wartime might signal a change in the role of the Air Force there.

However, Hester said that "American airpower is going to stay on the Korean Peninsula in the same form it is today, as long as the Koreans continue to ask us and we have an alliance agreement with them."

As operational control of ground forces shifts to Korea in 2012, it remains to be determined how air forces will be coordinated or commanded.

"We're working our way through with the doctrine center" about how to work the issue, Hester said, "as to who's in control and how that might blend with an operational commander that might be a Korean." ■

The critical importance of this German base has sparked a building and flying boom.

Ramstein on the Rise

Photography by Greg L. Davis

Army paratroopers board C-130s at Ramstein AB, Germany, for a massive training airdrop.

Ramstein AB, Germany, has long been important to the Air Force. Now, though, it is in the middle of a building boom, with USAF upgrading facilities, taxiways, and runways and constructing more infrastructure to handle increased traffic.

The upsurge in activity follows the closing of Rhein-Main Air Base, near Frankfurt, which was a major transit point for US aircraft. Ramstein has now become the hub for cargo and passenger transport through Europe. It is home to the 86th Airlift Wing and its C-130s, but has also become one of the major bases supporting Europe-based units from sister services.

Right: Troops of the Army's 173rd Airborne Brigade Combat Team approach C-130E Hercules transports at Ramstein.

Below: SSgt. Benjamin Comer of the 86th Aircraft Maintenance Squadron performs post-flight checks on the wing of a C-130E that has just returned from a drop exercise.

Two above: A C-17A of the 62nd Airlift Wing, McChord AFB, Wash., begins its take-off roll.

Above: Members of the Ramstein Contingency Aeromedical Staging Facility team form a barrier to keep ambulatory patients moving up a ramp into a waiting C-17. The CASF handles patients—mostly from the wars in Iraq and Afghanistan—as they travel from the combat zone to the United States for treatment.

Counterclockwise, from left: Airmen of the 86th AW (on the tarmac and in the cockpit) perform maintenance checks on a C-130 on the ramp at Ramstein; the aircraft bears the markings for the 86th Operations Group commander. • SSgt. Waylon Westbrook, deployed from Pope AFB, N.C., removes bolts holding the lubrication pump housing for a C-130 propeller. • C-130E engines, wing, and tail as seen from a bubble inside the aircraft's cockpit. This aircraft and another seen in the background are on a training mission over Germany.

Counterclockwise, from above: Aerial view of the main aircraft parking area, new runway, and terminals for processing cargo and passengers. • USAF SSgt. Derwood Burk looks out a C-130E paratroop door; he worked as a jumpmaster with the US Army's 173rd Airborne BCT in a recent exercise. • Three VIP transport aircraft of the 76th Airlift Squadron line up at Ramstein. The 76th moves VIPs on C-21, C-20, and C-40 aircraft.

Right: Air Force ambulances park behind a Mississippi Air National Guard C-17A, waiting to take patients from Landstuhl Regional Medical Center to the US.

Below: Paratroopers prepare to board a Hercules of the 37th Airlift Squadron.

Bottom: A C-130E maneuvers into the Mosel River valley during a training mission over Germany.

Two above left: A soldier secures the static line of a jumpmaster in the paratroop door as he configures the C-130 for a safe jump.

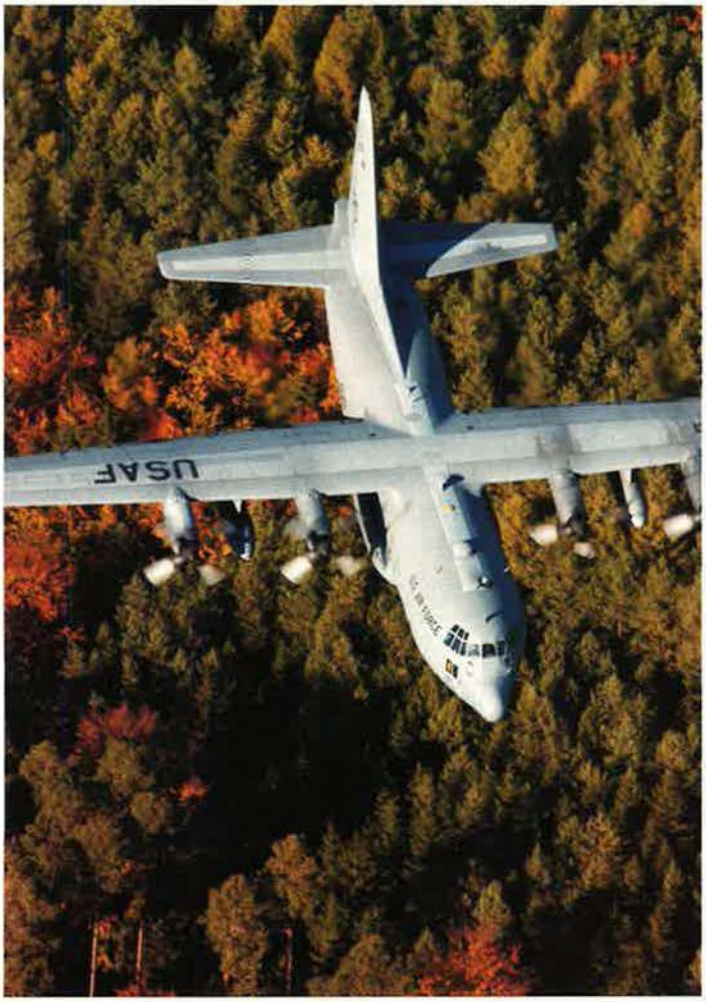
Two above right: A C-130's T56 engine runs inside a specially built $2.1 million test cell at Ramstein. The test cell allows the 86th Aircraft Maintenance Squadron to check engines and propellers without generating complaints about noise.

Above: Capt. Shawn Cones, a C-130E crew member, looks toward the cockpit while positioned under a clear bubble that allows him to look out from atop the cockpit area. He was monitoring the skies around the C-130 for flight safety.

Left: The tail of a C-130E gets a close inspection from SSgt. Benjamin Corner. The age of these transport aircraft make careful examinations a must.

Bottom left: C-130E serial #72-1299 skims over a German forest during a low-level training mission. The aircraft, assigned to Ramstein, is the last E model ever built.

Below: Army soldiers relax after donning their parachutes; they are awaiting the signal to board C-130s nearby.



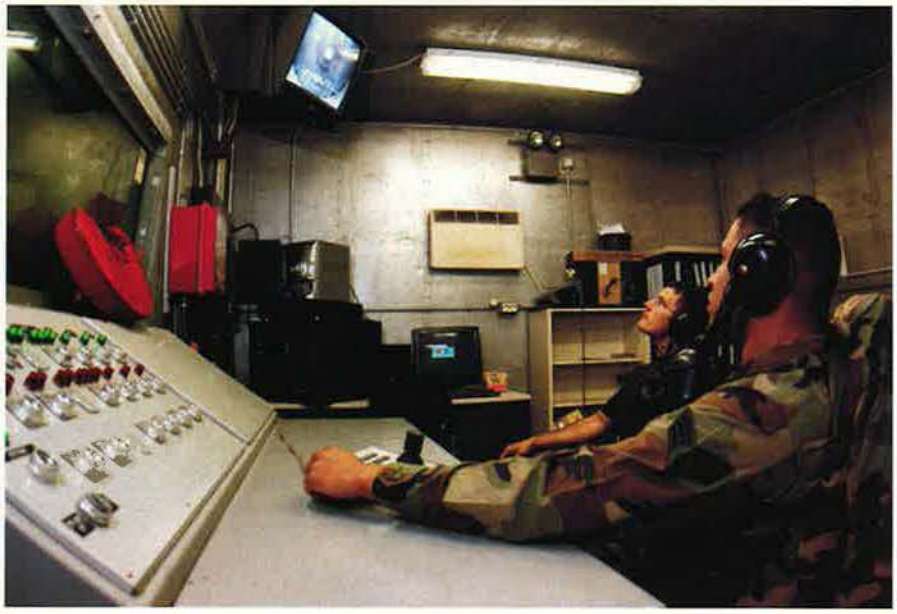
Above: Two USAF C-130Es fly over Germany during a training mission.

Left: Army Sgt. Maj. Lyle Womack, bracing himself in the paratroop door, performs safety checks in preparation for a drop while an airman holds his back.

Clockwise from above: At Ramstein, a C-130 awaits action on a rare day of fair weather in Germany. This aircraft has just been checked out by a maintenance team before a training flight. • A soldier arches his back and raises his arms while a parachute rigger performs safety checks on the parachute. This must be done before a soldier can proceed to a waiting aircraft. • C-130E #63-7840 waits on a taxiway hold-short line while another C-130 performs a go-around at Ramstein. • A1C Chris Spratt reviews cargo manifests inside the busy cargo processing facility at Ramstein. Spratt is pushing through the paperwork for "up-armor" kits needed in Iraq and Afghanistan. He is assigned to the 723rd AMS.

Counterclockwise from left: C-130E overflies picturesque vineyards lining the Mosel River in Germany. • Soldiers quickly move to the paratroop door of a USAF C-130E Hercules during a training exercise. • A 37th AS C-130 leaps into the air as it leaves Ramstein to begin a training mission. Construction equipment and mounds of dug-up earth—the result of runway improvements–can be seen in the background. • SrA. Aaron Arechiga (foreground) and SSgt. Anthony Vandersee monitor the status of a T56 engine being tested at Ramstein's unique enclosed C-130 engine test cell. Arechiga is deployed from the 46th AMS at Pope, while Vandersee is deployed from the 3rd Component Maintenance Squadron, Elmendorf AFB, Alaska.

Ramstein is busier than ever, but all signs are that optempo growth has just begun. ■

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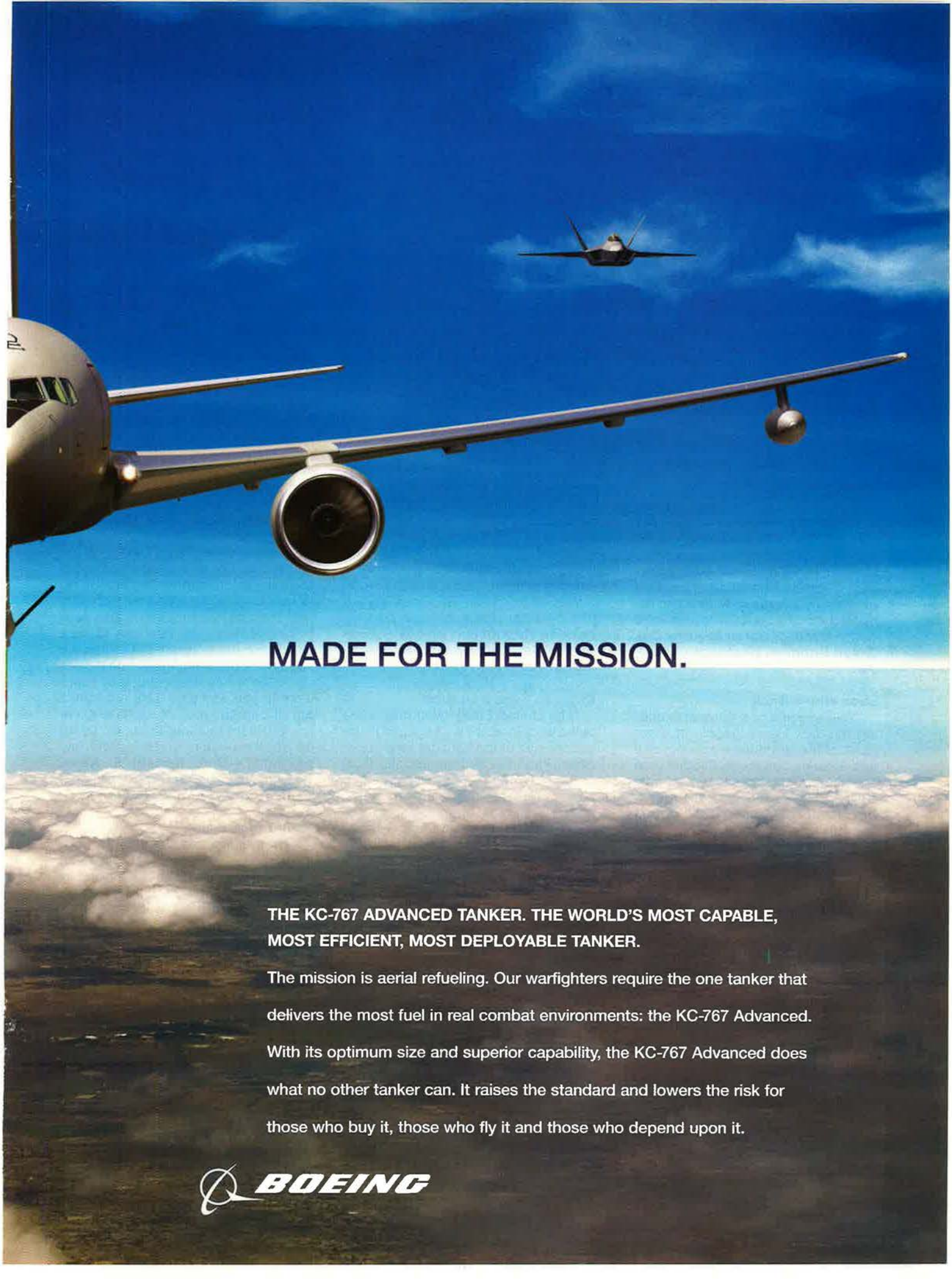
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BOEING

Verbatim

By John T. Correll, Contributing Editor

Dawn Patrol

"Aircraft designers have mimicked many of nature's flight 'inventions,' usually inadvertently. Now it seems likely that Microraptor invented the biplane 125 million years before the Wright 1903 Flyer."***—Sankar Chatterjee of Texas Tech University, on fossil evidence that a flying dinosaur may have had upper and lower sets of wings,*** **Proceedings of the National Academy of Sciences,** ***January.***

Busy, Busy Reporters

"There should have been a story. National Editor Scott Vance said the national staff was scrambling to do follow-up stories on Bush's Iraq policy speech the night before."***—Ombudsman Deborah Howell's explanation of why the newspaper had not reported on the posthumous award of the Medal of Honor to Army Cpl. Jason Dunham,*** **Washington Post,** ***Jan. 21.***

Look Who's Back

"Your ongoing commitment to ending this war allows people in other parts of the world to remain hopeful that America has the stuff to become again a country that they can love and respect."***—Jane Fonda, speaking at anti-war rally in Washington,*** **Washington Times,** ***Jan. 28.***

The War We Have

"This is not the fight we entered in Iraq, but it is the fight we're in."***—President Bush, State of the Union Address, Jan 23.***

Two Words

"Mr. President, I have two words for you. Be bold."***—Sen. Joseph I. Lieberman (I-Conn.) at a White House meeting on the war in Iraq,*** **Washington Post,** ***Jan. 21.***

A Larger Concern

"Five years into the 'Global War on Terror,' the evidence suggests that Islamic radicals are real good at blowing each other up, but not so good at projecting power abroad. As long as Western nations maintain halfway decent domestic security arrangements, the fundamentalists seem to be hobbled in repeating their one major success of Sept. 11, 2001. Given that fact—five years and counting without a second big terrorist attack in America—maybe we ought to be paying more attention to the kinds of state-based challenges that roiled the world so much in the past."***—Loren B. Thompson, Lexington Institute, UPI*** **"Outside View,"** ***Jan. 16.***

The Previous Surges

"'I regret that I was not more outspoken' during the Vietnam War. 'The Army generals would come in, "Just send another five thousand or 10 thousand." You know, month after month. Another 10 or 15 thousand. They thought they could win it. We kept surging in those years. It didn't work. ... Well, you don't forget something like that.'"***—Sen. John Warner (R-Va.), ranking Republican on the Senate Armed Services Committee,*** **Washington Post,** ***Jan. 28.***

Kroesen Sees a Lesson

"The United States won only three of the wars in which we engaged in the second half of the 20th century—Grenada, Panama, and the Persian Gulf. In each, we employed overwhelming power and won in a matter of hours. ... The lesson is there for all to see and understand: It is time to restore our land forces to the war-dominating power they have exhibited in the past at a manpower strength that assures sustainment during a long-term crisis."***—Ret. Army Gen. Frederick J. Kroesen,*** **Army Magazine,** ***journal of the Association of the US Army, February.***

More Where That Came From

"If the Iranian leadership has a desire to purchase more defensive weapons, we would do that."***—Russian Defense Minister Sergei Ivanov, after delivery of Tor-M1 air defense missiles to Iran,*** **USA Today,** ***Jan. 17.***

Get Your Bargains Right Here

"Right Item, Right Time, Right Place, Right Price, Every Time. Best Value Solutions for America's Warfighters."***—Motto on the Web site of the Defense Reutilization and Marketing Service, a Department of Defense agency that turned out to be the source of F-14 fighter parts, missile and helicopter parts, and other military gear delivered to Iran, Associated Press, Jan. 17.***

War on Warming

"Terror only kills hundreds or thousands of people. Global warming could kill millions. We should have a war on global warming rather than the war on terror."***—Stephen W. Hawking, internationally acclaimed physicist, Associated Press, Jan. 17.***

Airplane Costs, Simplified

"We don't know if people are going to raid us for money. They're going to tell us, 'You're behind on technical risk, therefore we're going to take your money.' When they take the money, we stretch the program out. When we stretch the program out, the cost goes up. When the cost goes up, they come back to you and say, 'This program's out of control, your costs have gone up.' You want to shoot them. It's going up because you're screwing with my program!"***—Gen. Ronald E. Keys, head of Air Combat Command, on a likely future for the F-35 fighter.***

Well, Yes and No

"The Intelligence Community judges that the term 'civil war' does not adequately capture the complexity of the conflict in Iraq. ... Nonetheless, the term 'civil war' accurately describes key elements of the Iraqi conflict."***—National Intelligence Estimate, January.***

One Bomb, No Problem

"I would say that what is dangerous about this situation is not the fact of having a nuclear bomb. Having one, maybe a second one a little later, well, that's not very dangerous."***—French President Jacques Chirac declaring—a position from which he later retreated—that Iran's having a few nuclear weapons would be acceptable, interview with*** **New York Times** ***and two other newspapers, Jan. 29.***

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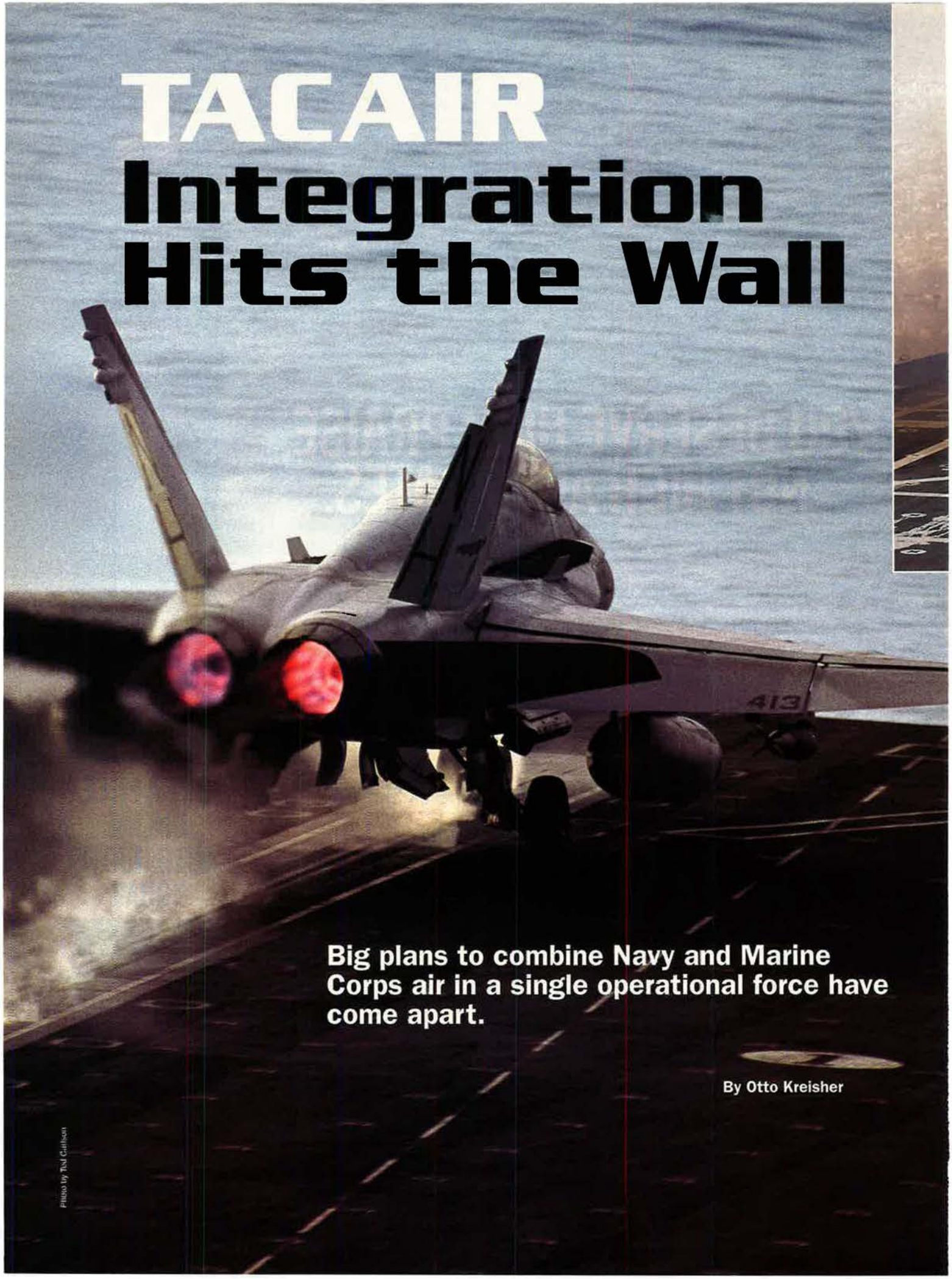
TACAIR Integration Hits the Wall



Big plans to combine Navy and Marine Corps air in a single operational force have come apart.

By Otto Kreisher

Photo by Ted Carlson

USN photo by Electronics Tech. 3rd Class Daniel Ball

***Opposite page: A Navy F/A-18C Hornet takes off from the carrier USS* Carl Vinson.**

***Left: An AV-8B Harrier lands on the flight deck of the amphibious Navy transport USS* Juneau.**

It was given the official name "naval forces tactical air integration," and much was expected of it. The idea: The Navy and Marine Corps, both possessing large air arms, would combine their tactical fighter units to the benefit of both.

Creation of a single operational force, said proponents, would reduce the overall size of tactical air forces in the Navy Department and, in turn, save billions and increase combat power. In a controversial move, some Defense Department aides began portraying the plan as but the first step in a push to amalgamate the air assets of all services, Air Force included.

That was then, however, and this is now. The sea services' airpower project has been delayed and possibly derailed, done in by Global War on Terror operational demands and competing modernization priorities. The all-service integration idea seems dead, too, though it could at some point rise from the grave.

The naval services have had to scale back the goals of tacair integration, principally because of the Marine Corps' new and heavy operational commitments in Iraq and Afghanistan.

"OIF is probably the biggest challenge, the rotation of squadrons they have there," said Navy Capt. Andrew Whitson, operations and readiness officer for the commander of Naval Air Forces, in San Diego. The war has "effectively taken three or four [Marine Corps] squadrons out of the hunt for air wing integration."

Because of its commitments to Operation Iraqi Freedom, the Marine Corps has actually removed squadrons from carrier air wings, instead of adding more, said Whitson, and Marine Corps fighter requirements have increased by a third because of OIF. "We have to work through this," he said.

Whitson said the Marine Corps has contributed only three fighter squadrons to carrier service. The Navy has contributed only two fighter squadrons to regular unit rotation to Japan.

"Perhaps when the Joint Strike Fighter comes on line and OIF settles down and some of these other worldwide commitments that we have get on perhaps a more steady state, maybe then we'll get ourselves back on track" to the original integration goals, Whitson said.

Where It Started

The recent campaign for tacair integration started in 2002 with the signing of a formal agreement between what were then the three top officials in the Navy Department—Gordon England, the Secretary of the Navy; Adm. Vern E. Clark, Chief of Naval Operations; and Gen. James L. Jones, Commandant of the US Marine Corps. (See "Air Wings Built for Two," December 2002, p. 68.)

Their agreement required the Marine Corps to contribute an F/A-18 Hornet squadron to each of the Navy's 10 carrier air wings. (This accord superseded a 1997 Marine Corps commitment to put one strike-fighter squadron in each of four Navy carrier wings.) The new integration effort was to be completed by 2012.

In exchange, the Navy would have assigned three of its Hornet squadrons to augment the six-month Marine Corps deployments to Iwakuni, Japan. The units deployed to Iwakuni serve as an on-call tactical aviation asset in the Western Pacific and frequently are dispatched to other locations for exercises with allies or in response to contingencies.

To demonstrate the unity of the tacair force, a Marine Corps colonel, rather than a Navy captain, would command a carrier air wing, and a Navy captain, rather than a Marine Corps colonel, would command a Marine Air Group, a similarly sized collection of aircraft.

While operational synergy was a

key goal of the integration initiative, its real driving force was a growing gap between the Navy Department's budget figure and its two most critical needs—maintenance of an aged aviation force and procurement of new generation fighters.

Estimates were that integration would slice roughly $35 billion from procurement costs over 20 years. That would greatly ease the impact of a projected Navy Department procurement bow wave by reducing the number of tacair squadrons and aircraft in each squadron. When completed, the sea services would have 35 percent fewer naval strike fighters.

Pocketing, Spending

The savings from eliminating existing units were to be used to improve the readiness of the remaining aircraft, but, as often happens in the world of defense budgeting, the financial moves were implemented before the promised efficiencies were actually realized. In other words, the savings were pocketed and spent before they existed.

The Navy Department slashed nearly 500 F-35s and F/A-18E/F Super Hornets from its long-term spending plans, and the Pentagon commissioned studies to determine whether and to what extent it should pull the Air Force into the arrangement.

In 2004, the Pentagon decommissioned one of the Navy Reserve's three strike-fighter squadrons and one of the Marine Corps Reserve's

USMC photo by Pfc. Charlie Chavez

Above, the Nimitz-class USS* Dwight D. Eisenhower *churns up the Arabian Sea on a regularly scheduled deployment. At left, an F/A-18 Super Hornet moves so quickly through the sky that it condenses moisture around the aircraft.

four squadrons. The Navy followed up with elimination of an active duty Hornet squadron. This spring, it will decommission another Navy Reserve squadron. Meanwhile, the Marine Corps has decided to cut two more active duty and two more Reserve Hornet squadrons, mainly in an effort to make funds available for more-urgent modernization efforts.

The Marine Corps also has plans to trim the number of fighters in each squadron. These squadron reductions could occur with the transition to the F-35 Lightning II.

Also under review is the Navy Department's declared intent to cancel procurement of 497 fighters—mostly F-35s. This cut may well be affected by a comprehensive review of the Navy's future aviation program, ordered last year by the current CNO, Adm. Michael G. Mullen.

To some extent, the lofty tacair integration plan has been replaced by a concept called "capabilities-based scheduling," which seeks to use all naval service strike-fighter assets to meet the global commitments. Matching the new CBS concept with the agreements between the Navy and the Marine Corps, Whitson said, "we prioritize what the global requirements are" and determine "what squadrons will go where, based on that."

The new scheduling concept allows the Navy and Marine Corps to put "the most capable squadron in the right place at the right time," he said. Because of the demands of the war on terrorism, he went on, there are now no plans to disband any additional Navy squadrons.

From the start, the project was controversial.

The integration process itself attracted loud catcalls from respected naval authorities. "It's the most ridiculous thing I've ever heard," said Norman Polmar, a military scholar and author of a history of carrier aviation and many other books on maritime power and personalities. "If you integrate, what's the need for Marine air?" Polmar went on, "The reason for Marine air is to support the grunts [infantry]. If you start to put them together [with the Navy], you lose the uniqueness of the Marine air."

The planned cuts in procurement and in the total naval tacair force raised a number of concerns from government analysts and within the naval services. Ronald O'Rourke, veteran naval programs analyst at the Congressional Research Service, suggested Congress should reconsider the impact of the aircraft reductions on the Navy Department's ability to fulfill its share of the total Defense Department's operational requirements, including surge.

USN photo by Photographer's Mate Chief Dolores L. Parlato

Tacair integration began with a formal 2002 agreement between (l-r) Gen. James Jones, Commandant of the Marine Corps; Gordon England, Secretary of the Navy; and Adm. Vern Clark, Chief of Naval Operations.

Changes in the Navy's squadron reduction schedule indicate that O'Rourke's concerns were justified.

Analysts also questioned the soundness of an outside contractor's study, which concluded that the naval services could meet their obligations with fewer strike fighters because the new airplanes would be more effective and have higher availability.

Similar arguments are used today to justify cutting the size of the Air Force's F-22 and F-35 fighter fleets.

Different Forces, Missions

Forecasting difficulties, O'Rourke noted the two services' differences in pilot training, which reflect the primary purpose each sees for its strike aircraft. Navy fighter pilots, much like their Air Force counterparts, often focus on air-to-air tactics. They protect the carrier and its escorts and, after they have done that, they practice interdiction and suppression-of-enemy-air-defenses (SEAD) missions.

The Marine Corps traditionally has held that the fighter's key mission is support of its engaged ground forces. Hornets and Harriers serve as flying artillery to make up for limited amounts of heavy weapons in those units. That is why the Marine Corps organizes its operational units into Marine Air-Ground Task Forces (MAGTFs), which are combined-arms teams integrating rotary and fixed-wing aircraft, infantry, and supporting assets.

Preparing today's specialized Navy pilots and Marine Corps pilots to perform all Navy Department missions could require much additional training, O'Rourke suggested. In an article in *Naval Aviation News,* a VFA-97 squadron officer described the steep learning curve the unit faced in preparing for an integrated deployment. It included training for close air support and force protection on the ground, including small-arms training.

Despite the cultural differences, Whitson said Marine Corps pilots—normally shore-based—have performed well on the carriers, and Navy pilot training for "expeditionary" assignments at foreign bases has been manageable.

When integration was launched, some officers in the infantry-heavy Marine Corps worried that their aircraft assigned to carrier air wings would not be available and on station when the grunts needed them. Navy Department leaders, however, assured Congress that tacair integration "retains our culture and reinforces our expeditionary ethos." The plan also "globally sources all Department of the Navy tacair assets to ensure support to the nation and MAGTF."

During actual combat operations in Afghanistan and Iraq, Navy and

Lockheed Martin photo

The Marine Corps is buying F-35B STOVL fighters, such as this one, to replace the F/A-18C Hornets and AV-8B Harriers, its current fixed-wing combat aircraft.

Air Force aircraft were as likely as Marine Corps types to provide close air support. This was made possible by the availability of precision guided munitions that reduce the need to go low to ensure accuracy.

Economy of Scale

Then there were cost problems. O'Rourke warned that the naval services' reduction in F-35 procurement could cause higher unit costs for all three armed services that are buying them. Currently, the Air Force plans to buy the conventional takeoff and landing F-35A; the Marine Corps the short takeoff and vertical landing F-35B; and the Navy the carrier-based F-35C. (See "Struggling for Altitude," September 2006, p. 38.)

Although each variant is optimized for its particular operating environment, the three have many common parts and subassemblies. This is critical to achieving low unit costs—an important F-35 selling point. F-35 program managers insist that the reduced US buys will be offset by the purchases from foreign allies. That claim has yet to be substantiated.

Within the naval services themselves, a sharp F-35 dispute threatens the tacair integration effort.

The Marine Corps, because of its focus on support for their ground forces, wants to buy only the short takeoff and vertical landing version of the F-35s. These would replace both their CTOL Hornets and their Harriers, the current STOVL attack airplane. The "jump jets" can operate from both the large-deck amphibious assault ships sailing just off shore and from expeditionary airfields close to the front lines. That would let the Marine Corps meet its goal of delivering tacair support within 30 minutes of a request from engaged ground forces.

In Operation Iraqi Freedom, for example, the Marine Corps sent many of its Harriers to Kuwait and then into Iraq as their ground forces moved north toward Baghdad. Other AV-8s flying from the nearby amphibious ships rearmed and refueled at the crude forward operating bases to make additional strikes before returning to sea.

However, Navy officials argue, STOVL aircraft are not compatible with carrier operations, which are geared to the rapid cycles of catapult launchings and arrested landings. The STOVL F-35s also carry less ordnance and fuel than either the Navy's carrier version or the Air Force's conventional type, reducing their strike capability.

The Navy has made no final decision on whether to bring their jump jets onto the carriers, but it has no strong desire to do so.

The different plans for F-35s are "certainly a challenge," Whitson reports. The Navy is conducting "several studies" right now to determine "what the carrier-VSTOL mix should be," he said. Whitson added, "Clearly there are pretty big implications not only for tacair integration, but for overall force structure capabilities."

Marine Corps officials declined to speak on the record about the various issues involving integration. Marine Corps Headquarters spokesman Lt. Col. Scott Fazekas said only that the Corps is "fully committed to tacair integration."

Despite all the turmoil, there was some progress toward the naval services' goal of tacair integration.

Marine Corps Col. Douglas P. Yurovich made history when he took command of Carrier Air Wing 9 in January 2006 and led it on a deployment of the carrier USS *John C. Stennis*. This air wing was one of those with a dedicated Marine Corps Hornet squadron attached. In a similar vein, Navy Capt. David B. Emich is now commanding Marine Aircraft Group 12 during its deployment to Iwakuni. This is another first.

In September 2004, Strike Fighter Squadron 97 became the first Navy Hornet squadron to deploy to Japan with marines. A second Navy squadron has now joined the Marine Corps rotation.

And the Air Force?

England, the former Secretary of the Navy who presided over the project, is now deputy secretary of defense, the Pentagon's second highest civilian position. Although England has discussed extending the tacair integration concept to all of the services' air assets, his spokesman, Kevin Wensing, said, "There has not been a lot of significant movement on that."

He noted, however, that the naval services' efforts "could certainly set up future integration." Wensing also suggested that the F-35 "could lead to integration down the road, not only with our services, but with allies" because of widespread international interest. The tilt-rotor V-22 Osprey, which the Marine Corps and the Air Force are buying and which the Navy may buy, offers another possible vehicle for fuller joint-service integration, he said.

Air Force representatives declined to discuss whether the Navy-Marine Corps integration has had any effect on their combat operations or procurement plans, saying there was nothing to report. But Air Force and Marine Corps officials plan to meet this month to discuss the issue, a spokeswoman said. ■

Otto Kreisher is a Washington, D.C.–based military affairs reporter and a longtime contributor to Air Force *Magazine. His most recent article, "Toward Zero Mishaps," appeared in the December 2006 issue.*

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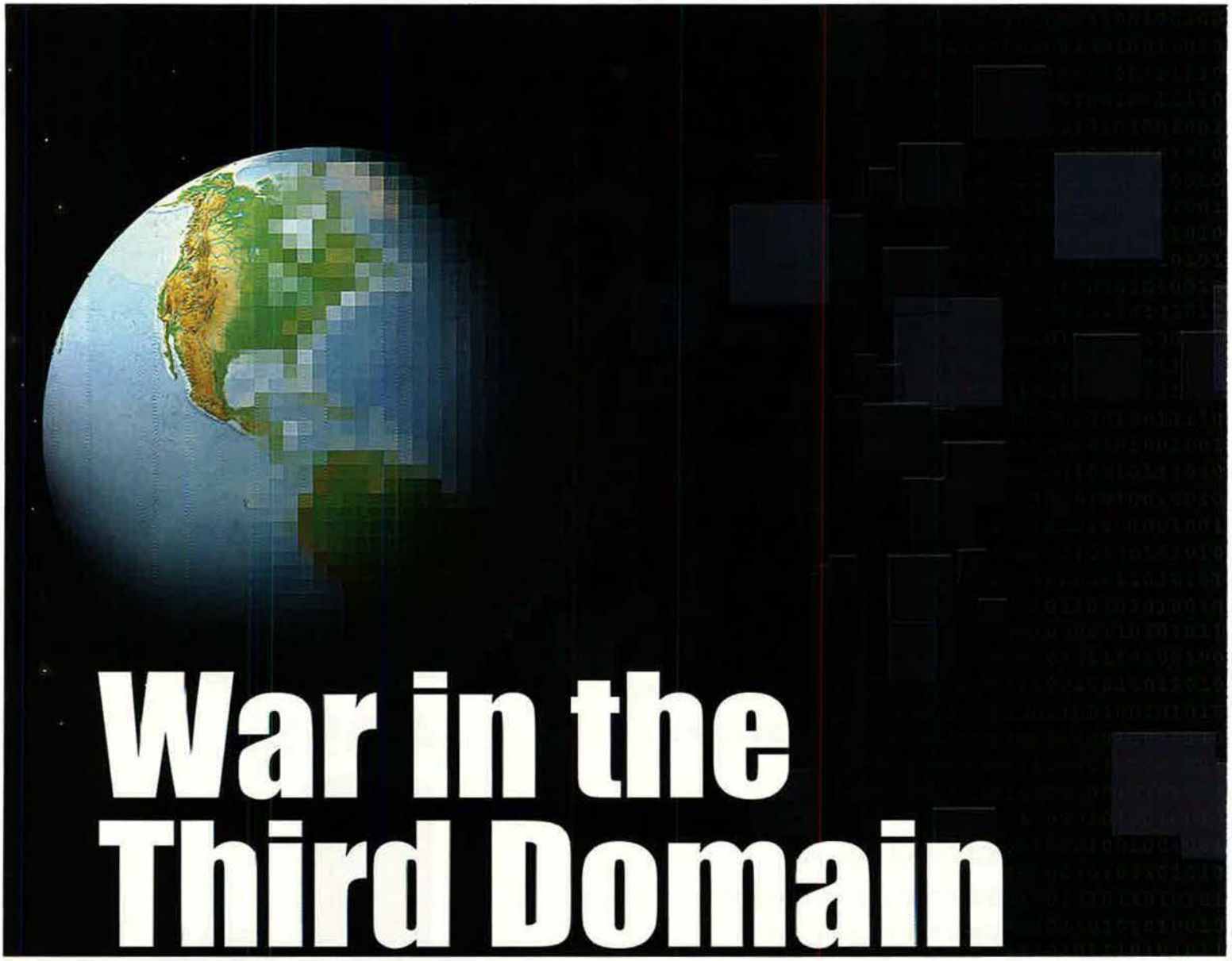

War in the Third Domain

The maneuver space is the electromagnetic spectrum, where forces range globally at the speed of light.

By Hampton Stephens

When the Air Force formed Air Force Space Command in 1982, it marked formal recognition that space was a distinct operating arena. The first commander, Gen. James V. Hartinger, said, "Space is a place. ... It is a theater of operations, and it was just a matter of time until we treated it as such."

Meanwhile, around that same time, sci-fi author William Gibson published a novel entitled *Neuromancer,* a work that gave the world a strange new term—"cyberspace." The book didn't call cyberspace "a place" but a "consensual hallucination" of billions of humans. Few military men gave it much thought.

Nearly a quarter of a century later, though, it's deja vu all over again. The Air Force has come to recognize cyberspace, like "regular" space, as an arena of human activity—including armed activity. It is, to reprise Hartinger, a theater of operations.

The Air Force took a first big organizational step along those lines last fall. Air Force Secretary Michael W. Wynne and Gen. T. Michael Moseley, Chief of Staff, announced a plan to form a new Cyber Command to be established by Lt. Gen. Robert J. Elder Jr., head of 8th Air Force. Its purpose: Organize, train, and equip forces for cyber-war.

Though Cyber Command has not yet reached full major command status, it already is providing combat capabilities in cyberspace to the unified US Strategic Command and combatant commanders, according to Air Force officials.

Cyber Command has in place systems and capabilities for integrating cyber operations into other Air Force global strike options. All that is lacking, according to one top official, are the "organizational and operational constructs" to integrate cyber ops with those of air and space operations.

The Air Force believes it must be able to control cyberspace, when need be, as it at times controls the air. The goal is to make cyberspace capabilities fully available to commanders.

"Almost everything I do is either on

Staff illustration by Zaur Eylanbekov

an Internet, an intranet, or some type of network—terrestrial, airborne, or spaceborne," said Gen. Ronald E. Keys, head of Air Combat Command, Langley AFB, Va. "We're already at war in cyberspace—have been for many years."

The creation of Cyber Command received not only lots of attention but also produced lots of confusion. What, actually, does its establishment mean for the Air Force? For the US military?

In answering the questions, definitions are surprisingly important. Lani Kass, special assistant to the Chief of Staff and director of the Chief's Cyberspace Task Force, is at pains to declare that cyberspace is not a mission, not an operational method or technique, and not just about computers.

"Cyberspace is a warfighting domain," Kass said flatly.

The National Military Strategy for Cyberspace Operations, adopted in 2006, defines cyberspace as "a domain characterized by the use of electronics and the electromagnetic spectrum to store, modify, and exchange data via networked systems and associated physical infrastructures."

Thus, said Kass, the virtual world is "like air, space, land, and sea"—all places in which US forces operate. The whole electromagnetic spectrum constitutes the maneuver space, where forces range globally at the speed of light.

This is a startlingly expansive concept. Moseley, in fact, has quipped that cyberspace today includes everything "from DC to daylight"—that is, direct current to visible light waves.

We Fight There

Kass added that the cyber world comprises not just computer networks but also any physical system using any of various kinds of electromagnetic energy—"infrared waves, radio waves, microwave, gamma rays," she said, "and rays we have not thought about."

By this definition, someone who uses a computer to crash a Web site used by terrorists has carried out a cyber operation. The same can be said of someone who jams local cell phone traffic to keep the enemy from detonating a remotely controlled bomb. Using a space-based satellite to collect infrared imagery? That, too, is a cyber operation.

"You could actually say that operations in cyberspace preceded operations in the air," Kass maintained. After all, the telegraph—"the Victorian Internet"—ran on electricity and was a tool of military operations. It was a cyber weapon, she said.

The Air Force's goal is plain: to be able to operate in and, if necessary, dominate this nebulous, artificial "place" in which humans interact over networks without regard to physical geography. It is USAF's third domain of combat.

Wynne and Moseley on Dec. 7, 2005 published a new mission statement for the service. In it, cyberspace joined "air" and "space" in the catalog of Air Force domains. They said that the Air Force, from now on, would "fly and fight in air, space, and cyberspace."

Kass and her colleagues on the Cyberspace Task Force see this development as a historic step. In Kass' office hangs a painting that depicts two World War I biplanes—one American, one German—in a swirling dogfight. Kass said it reminds her that today's airpower, so supremely advanced and sophisticated, had humble origins and that cyber power stands at a comparable stage in its development.

Why is the Air Force only now demarcating and defining cyberspace as an operational domain? In the past several years, it has been made critically important by the emergence of two interrelated factors. The confluence of these developments has created a worrisome, if not explosive, situation.

- Rise of the cyber badlands. Simply put, cyberspace has become major bad-guy territory. Air Force officials say it never has been easier for adversaries—whether terrorists, criminals, or nation-states—to operate with cunning and sophistication in the cyber domain.

Kass said there is "recognition by our leadership that ... cyberspace is a domain in which our enemies are operating, and operating extremely effectively because they're operating unconstrained."

When it comes to cost and skill, the barriers to entry are indeed low. "You don't have to be a rocket scientist," said Kass. The ubiquity of low-cost off-the-shelf cyber technology means would-be cyber-warriors don't need governmental financing or even backing of a well-organized criminal or terrorist network.

"One has to have concern about a range of potential adversaries, including other nation-states, including terror networks and ... transnational criminal enterprises," says John Arquilla, author of *Networks and Netwars* and a professor at the Naval Postgraduate School in Monterey, Calif.

Arquilla also worries about a "wild-card" threat: "individual hackers of very great skill."

He believes 21st century warfare is a new animal, one in which nonstate actors have more prominence than ever before. The cyber domain is tailor-made for this new kind of warfare, he added, and traditional militaries neglect it at the peril of the states they are defending.

"As opposed to traditional physical warfare where you tend to focus on the major militaries of the time, here you have to give equal attention to a great nation as well as to a particular network," said Arquilla. "And of course there may be ties between nations and networks, like the link between a Hezbollah and an Iran."

- Growth of US vulnerability. Cyberspace has become a potentially great US military Achilles heel. The Air Force has never been so heavily dependent on cyberspace as a medium supporting critical systems.

"Military activities in all domains—air, land, sea, space—and our way of

life increasingly depend on our ability to operate in the cyber domain," Kass noted.

It follows that the loss or compromise of these systems would bring catastrophe. American adversaries cannot confront the world's most powerful military head on, so they look to exploit chinks in the US armor. Cyberspace contains many such chinks because the nation's military power is more dependent than ever on systems based on the electromagnetic spectrum.

What's Important

"The Air Force in particular has some very highly automated systems upon which it's reliant," said Arquilla. He noted, for example, the development of an air tasking order, or ATO. Today, it is virtually a fully automated system and is vulnerable to enemy disruption or destruction. "It's not even clear that the Air Force could [produce] an air tasking order manually anymore," said Arquilla, "and so the security of the information system over which it's transmitted and through which it is undertaken is extremely important."

He went on, "Whether you are slowing down a bombing campaign, or slowing down the movement of troops to some theater, we're talking about a ... great difference."

Wynne said the American "information mosaic"—the sum of data from all sensors that can be "collected and downloaded and cross-loaded for use by all in the fight"—is the key target of Air Force adversaries and a key cyber vulnerability.

"All the information flow moves in the cyber domain, meaning the entire flow can be vulnerable to a cyberspace attack," Wynne said in a Nov. 2 speech in suburban Washington.

In cyberspace, the United States is lagging behind competitors, according to Kass. She declined to specify states or nonstate actors outpacing the United States. However, US enemies or competitors are known to be working hard to build their capabilities.

The list of national and subnational cyber threats is long. Arquilla reported that he hasn't seen "anything quite like a cyber arms race going on just yet," but "leading countries are all involved" in cyberspace operations.

The list of potential cyberspace threats starts with al Qaeda. The militant group "has focused extensively on developing a capacity for cyberspace-based operations," said Arquilla.

Al Qaeda has focused heavily on using the Internet for recruiting, fund-raising, and propaganda-spreading. However, it also has trained its operatives "in computer network attack techniques," Arquilla said.

As for nations, China and Russia generally are viewed as the greatest potential threats.

"China is one of the more active countries in thinking through the whole business of cyberspace-based operations," said Arquilla. Beijing's cyberspace thrust comports with the Chinese military's well-documented practice of using asymmetric tactics against its superpower military rival.

Evidence of Chinese interest comes in the form of statements of Chinese officials, as well as past incidents.

Example: Beginning in 2003 and for several years thereafter, a cyber espionage ring code-named "Titan Rain" stole information from various US government computers, including DOD networks. In their origin and style, the attacks "seemed to suggest a Chinese connection," Arquilla said.

Writing in a People's Liberation Army publication, a Chinese general in 1996 touted Chinese plans to move into cyberspace as a combat arena. The CIA quoted the general as saying, "We can make the enemy's command centers not work by changing their data system. We can cause the enemy's headquarters to make incorrect judgments by sending disinformation."

And that was more than a decade ago.

Kass said Chinese officials have published "strategic documents" outlining "unrestricted warfare" against the American information constellation. They "understand how reliant the United States is on the ability to conduct global command and control," she added.

Moreover, said Arquilla, "the Russians are quite good" at cyber work. Indeed, it is only too apparent that Moscow takes cyberspace operations very seriously. At least one Russian official has said that a cyber-attack on Russia's critical transportation or power infrastructure would warrant a nuclear response.

"This is probably the only warfighting domain in which we have peer competitors," said Keys of ACC. "We have to stay ahead of them."

USAF is not exactly a fledgling. It electronically jabbed Serbian air defense computer networks during the 78-day NATO bombing campaign over Kosovo in 1999. Later, the then-Chairman of the Joint Chiefs of Staff, Army Gen. Henry H. Shelton, said, "We only used our capability to a very limited degree," but with apparent success.

USAF's dive into the cyber world brings not only gains but also certain risks.

For civil libertarians, cyber operations cause jitters, which Kass insisted are overblown and are, in any event, offset by the benefits of US power in this area.

Early Cases

Keys, for his part, noted the potential for confusion in defining which service entity does what. "There's more to cyber than just computers. I mean, it's the ether that all this stuff flies through, so people start talking about electronic warfare. Well, is electronic warfare cyber warfare or not? I don't know."

Marine Corps Gen. James E. Cartwright, head of US Strategic Command and thus the nation's top cyber warfighter, sees dangers in spreading such expertise.

"When you train a person to be good in this environment it's not unlike the Manhattan Project," said Cartwright. "You've given them the keys to the kingdom."

The Air Force doesn't have much choice in the matter, though. Cyberspace, nebulous as it is, has moved front and center in the military's order of battle. "Without cyber dominance," said Wynne, "operations in all of the other domains are in fact placed at risk."

Like Kass, Arquilla sees parallels with the 20th century development of military aviation. In a long 2003 interview with the PBS news program "Frontline," he put it this way:

"The real meaning of cyber warfare is on the battlefield. Much as aircraft ... transformed 20th century warfare, I think cyber-attacks will transform 21st century warfare. Militaries which are highly dependent on secure information systems will be absolutely crippled [if they are destroyed], just as if they didn't have aircraft above to protect them in the 20th century." ■

Hampton Stephens is the former managing editor of Inside the Air Force *and is now a freelance writer and editor of the online news site* World Politics Watch *in Washington, D.C. His most recent article for* Air Force *Magazine, "Toward a New Laser Era," appeared in the June 2006 issue.*

The Keeper File

The Putin Manifesto

The audience was warned; Vladimir Putin had said he would "avoid excessive politeness." Still, many were startled when the Russian President loosed an anti-American blast without equal in the post-Soviet period.

The event was Putin's Feb. 10 speech to a security affairs group in Munich. His 4,000-word address seethed with bitterness at today's "unipolar"—that is, one-superpower—world. Putin called US moves "pernicious" and "illegitimate." He slammed not only "hyper-use of force" and NATO expansion but also US "economic, political, cultural, and educational" imperialism.

The ex-KGB chief's speech sparked concern in Washington, where some thought it might signal the end of the post-Cold-War partnership and the beginning of a more-hostile Russian stance.

"The Munich Speech"

Vladimir Putin
President, Russian Federation
Conference on Security Policy
Munich, Germany
Feb. 10, 2007

Find the full text on the Air Force Association Web site
www.afa.org
***Air Force* Magazine**
"The Keeper File"

What is a "unipolar world?" However one might embellish this term, at the end of the day, it refers to one type of situation—namely, one center of authority, one center of force, one center of decision-making. It is [a] world in which there is one master, one sovereign. And at the end of the day, this is pernicious, not only for all those within this system but also for the sovereign itself, because it destroys itself from within. ...

What is happening in today's world ... is a tentative move to introduce precisely this concept into international affairs, the concept of a unipolar world. And with which results? Unilateral and frequently illegitimate actions have not resolved any problems. Moreover, they have caused new human tragedies and created new centers of tension. Judge for yourselves: Wars as well as local and regional conflicts have not diminished. ... Even more are dying than before. Significantly more, significantly more!

Today we are witnessing an almost uncontained hyper-use of force—military force—in international relations, force that is plunging the world into an abyss of permanent conflicts. As a result we do not have sufficient strength to find a comprehensive solution to any one of these conflicts. Finding a political settlement also becomes impossible.

We are seeing a greater and greater disdain for the basic principles of international law. And independent legal norms are, as a matter of fact, coming increasingly closer to one state's legal system. ... First and foremost, the United States, has overstepped its national borders in every way. This is visible in the economic, political, cultural, and educational policies it imposes on other nations. Well, who likes this? Who is happy about this? ...

This is extremely dangerous. It results in the fact that no one feels safe. I want to emphasize this: No one feels safe, because no one can feel that international law is like a stone wall that will protect them. Of course such a policy stimulates an arms race. The force's dominance inevitably encourages a number of countries to acquire weapons of mass destruction. Moreover, significantly new threats—though they were also well-known before—have appeared, and, today, threats such as terrorism have taken on a global character. ...

The use of force can only be considered legitimate if the decision is sanctioned by the UN. And we do not need to substitute NATO or the EU for the UN. When the UN will truly unite the forces of the international community and can really react to events in various countries, when we will leave behind this disdain for international law, then the situation will be able to change. Otherwise the situation will simply result in a dead end, and the number of serious mistakes will be multiplied. Along with this, it is necessary to make sure that international law has a universal character both in the conception and application of its norms. ...

So-called flexible front-line American bases [have] up to five thousand men in each. It turns out that NATO has put its front-line forces on our borders. ... I think it is obvious that NATO expansion does not have any relation with the modernization of the Alliance itself or with ensuring security in Europe. On the contrary, it represents a serious provocation that reduces the level of mutual trust. And we have the right to ask: Against whom is this expansion intended? And what happened to the assurances our Western partners made after the dissolution of the Warsaw Pact? Where are those declarations today? No one even remembers them. ...

We very often—and personally, I very often—hear appeals by our partners, including our European partners, to the effect that Russia should play an increasingly active role in world affairs. In connection with this I would allow myself to make one small remark. It is hardly necessary to incite us to do so. Russia is a country with a history that spans more than a thousand years and has practically always used the privilege to carry out an independent foreign policy.

We are not going to change this tradition today. ■

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In South Vietnam, airpower was subordinated to a ground strategy—and the ground strategy didn't work.

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THE IN-COUNTRY

THE prevailing military wisdom going into the 1960s was that the United States should not get bogged down in a ground war in Asia. This admonition was well known to policy-makers in the White House and the Pentagon as they struggled with the impending problem of Vietnam.

In late April of 1961, the new President, John F. Kennedy, was cautioned again by Gen. Douglas MacArthur, who had fought two wars in the Pacific and Far East. MacArthur told Kennedy it would be a mistake to commit American soldiers on the Asian mainland.

Nevertheless, two weeks later, JFK's National Security Council asked the Joint Chiefs of Staff to examine "the size and composition of forces which would be desirable in the case of a possible commitment of US forces to Vietnam." The Chiefs estimated that "40,000 US forces will be needed to clean up the Viet Cong threat."

US involvement began as advice and training for the South Vietnamese armed forces but the mission expanded. In mid-1965, the United States plunged into what it had so often been warned against—a land war in Asia. By the end of 1965, there were 155,000 US troops on the ground in South Vietnam, with more on the way.

By decree from Washington, the "In-Country" War in South Vietnam took precedence over all other efforts in Scutheast Asia. The air campaign against North Vietnam, the interdiction of the Ho Chi Minh Trail, and the "secret war" in Northern Laos were strictly secondary to the ground war in South Vietnam.

The In-Country War was run by the Army. The other services—primarily the Air Force—flew hundreds of thousands of sorties in support of the ground war, but they had little say in the strategy.

"The US military strategy employed in Vietnam, directed by political decisions, was essentially that of a war of attrition," said Army Gen. William C. Westmoreland, commander of Military Assistance Command Vietnam, MACV.

The assumption was that "search and destroy" operations could win the war in the South by inflicting more casualties than the enemy was prepared to withstand. Westmoreland—who devised the attrition strategy—dismissed any concern about "Asia's legendary hordes of manpower" and said the war in Vietnam was against "an enemy with relatively limited manpower."

Despite assurances from the White House and MACV that the war was going well, progress was difficult to see, and after the Tet Offensive of 1968, the attrition strategy lost whatever credibility it might once have had.

Tet, envisioned by North Vietnam as a master stroke to end the war, was a colossal military failure for the com-

munists. Despite that, it was the turning point of the war. The scope and strength of the offensive, amplified by graphic news reports flowing back to the United States, undercut public confidence and support for the war.

After Tet, the United States made no serious attempt to win. The driving objective became "peace with honor," which meant settling with the enemy and getting out of Vietnam. Withdrawal of US ground troops began in July 1969.

Vietnam came along just after the Kennedy Administration introduced "Flexible Response" in 1961. Flexible Response was not a highly developed doctrine but was more a concept or even a philosophy of conflict. Its emphasis was on having a number of military options—particularly conventional options—with which to meet a crisis. It was the seedbed of "limited war."

Flexible Response was based in considerable part on the theories of retired Gen. Maxwell D. Taylor, the former Army Chief of Staff.

Taylor had been opposed to the Eisenhower Administration's doctrine of Massive Retaliation and the associated prominence of the Air Force in national

WAR

by John T. Correll

strategy. He resigned and wrote *An Uncertain Trumpet,* published in 1959. It called for more emphasis on nonnuclear, limited war and a much bigger role for the ground forces. Kennedy read the book and was impressed. Taylor's concept of flexible response seemed to fit with the challenges emerging in Southeast Asia.

The Soviet Union had already declared its support for "wars of national liberation." Insurgency in South Vietnam was of particular concern. In 1961, the White House ordered the armed services to develop capabilities to defeat counterinsurgency and dispatched special forces, including a detachment of air commandos, to assist the South Vietnamese government.

Kennedy in 1961 recalled Taylor to active duty, and in 1962 he became Chairman of the Joint Chiefs of Staff. MACV was established in 1962 as a subunified command of US Pacific Command. Second Air Division, which later became 7th Air Force, was also activated as the air arm of MACV.

Gen. Curtis E. LeMay, the Air Force Chief of Staff, argued without success that the locus of the war was in North Vietnam, not in the South, and declared, "We should stop swatting flies and go after the manure pile."

Gulf of Tonkin Incident

US forces, supposedly limited to training and support, engaged routinely in combat on a clandestine basis during the "advisory" period. The combat role broke into the open in 1964 when US naval vessels were attacked in the Gulf of Tonkin by North Vietnamese patrol boats, and the Air Force moved fighters and bombers into Southeast Asia.

In response to attacks on air bases in South Vietnam, US Air Force and Navy airmen struck selected targets in North Vietnam. They began with small-scale reprisal raids and escalated in March 1965 to Operation Rolling Thunder, sustained air strikes against the North.

On March 8, a week after Rolling Thunder began, two battalions of US marines landed at Da Nang to defend the US air base there. For the moment, they had no other mission.

During the 1964 election campaign, President Lyndon B. Johnson had declared that "we are not about to send American boys nine or ten thousand miles away from home to do what Asian boys ought to be doing for themselves." Six months later, he would reverse his position and send American troops to Vietnam.

The opening rounds of Rolling Thunder did not amount to much. There were not many sorties flown and the targets were chosen by officials in Washington—who were more interested in sending signals than in fighting a war—to be as nonprovocative as possible. Adm. U.S. Grant Sharp, commander of US Pacific Command, said the bombing was "completely insignificant." He added, "The North Vietnamese probably didn't even know the planes were there."

The politicians gave this weak-willed effort less than a month before they decided that Rolling Thunder was a failure and shifted to a ground option. On April 1, the White House changed the mission of the marines at Da Nang

At peak deployment in 1968, USAF had 56 squadrons and 1,200 aircraft based in South Vietnam. They were arrayed at 10 major bases, depicted here.

US Military Personnel in South Vietnam

	Air Force	All Services
1960	68	875
1961	1,006	3,164
1962	2,429	11,326
1963	4,630	16,263
1964	6,604	23,310
1965	20,620	184,314
1966	52,913	385,278
1967	55,908	485,587
1968	58,434	536,134
1969	58,422	475,219
1970	43,053	334,591
1971	28,791	156,776
1972	7,608	24,172
June 1973	14	49

Except for 1973, totals are as of Dec. 31. Whereas most Army forces in Southeast Asia were stationed in Vietnam, the Air Force also had a large presence in Thailand, which was closer to North Vietnam and the mountain passes that led to the Ho Chi Minh Trail. Sources: MACV, Department of Defense

from defense of the air base to "more active use" and directed that "premature publicity be avoided" to "minimize any appearance of sudden changes in policy."

At a conference in Hawaii April 20, Secretary of Defense Robert S. McNamara declared that henceforth the emphasis would be on the ground war in the South. The air campaign against the North would continue, but as a secondary priority. Targets in the South would take precedence, and if need be, airpower sorties would be diverted from the North to fill the requirement.

"This fateful decision contributed to our ultimate loss of South Vietnam as much as any other single action we took during our involvement," Sharp said.

Westmoreland, assigned the lead role by Johnson and McNamara, was ready to move ahead. In July, the President approved Westmoreland's request for 44 Army battalions in South Vietnam. According to the Pentagon Papers, an internal DOD history of the war, that commitment "was perceived as a threshold—entrance into Asian land war." The 44 battalions were a down payment on a ground force that would eventually grow to 450,000 troops.

"I knew ... that I was flouting the shibboleth of avoiding a ground war in Asia," Westmoreland said, "yet I recognized that that shibboleth was subject to modification in terms of the nation's objectives, as it had been modified in the past."

The first approach to employing the ground force was the "enclave strategy," advocated by Taylor, who by that time had become US ambassador to South Vietnam. Under that concept, US troops would occupy secure enclaves along the coast and range out as far as 50 miles for selected operations, after which they would return to the enclaves. Other ground force action would be the job of the South Vietnamese army.

Westmoreland did not like the enclave strategy and he managed to replace it with "search and destroy" operations in which US troops could be deployed anywhere MACV wanted them to go. The main objective was to eliminate large enemy units. "It was, after all, the enemy's big units—not the guerillas—that eventually did the South Vietnamese in," Westmoreland said in his memoirs.

It soon boiled down to a war of attrition in which MACV used "body counts," "kill ratios," and other measures in its attempt to quantify the progress. However, the expectation of wearing down the enemy turned out to be wrong. North Vietnamese and Viet Cong fighting strength kept increasing instead of decreasing. MACV had critically misjudged the staying power of the adversary.

"In any case," Westmoreland said, "what alternative was there to a war of attrition? A ground invasion of North Vietnam was out." The White House would not approve a more aggressive approach for fear that China or even the Soviet Union might be drawn into the war. Disengagement was not an option either.

Gen. John P. McConnell, who had replaced LeMay as Air Force Chief of Staff, argued for an air strategy, but he was no more successful than LeMay had been. The official view was that the place to win the war was on the ground in the South.

The Rolling Thunder air campaign against the North continued, but it was hamstrung by all manner of political constraints and prohibitions. McNamara "insisted that the requirement for airpower in South Vietnam must get the first call on our air assets," Sharp said.

The Commanders

	MACV	2nd Air Div/7th AF	PACAF	PACOM
1962	Gen. Paul D. Harkins	////////////////////////	Gen. Jacob E. Smart	Adm. Harry D. Felt
		Lt. Gen. Joseph H. Moore		
1964				
	Gen. William C. Westmoreland		Gen. Hunter Harris Jr.	Adm. U.S.G. Sharp
1965				
1966				
		Gen. William W. Momyer		
1967			Gen. John D. Ryan	
1968				
	Gen. Creighton W. Abrams Jr.	Gen. George S. Brown	Gen. Joseph J. Nazzaro	Adm. John S. McCain Jr.
1969				
1970				
		Gen. Lucius D. Clay Jr.		
1971				
		Gen. John D. Lavelle	Gen. Lucius D. Clay Jr.	
1972				
	Gen. Frederick C. Weyland	Gen. John W. Vogt Jr.		Adm. Noel A.M. Gayler
1973				

Military Assistance Command Vietnam (MACV) was a subunified command of US Pacific Command (PACOM). The commander of 7th Air Force (formerly 2nd Air Division) was also MACV deputy for air operations. However, the air campaign against North Vietnam and other out-of-country operations were controlled by PACOM, with the 7th Air Force commander reporting to Pacific Air Forces (PACAF), the Air Force component of PACOM.

"Air assets programmed for attacks in the North would be diverted to satisfy the needs in the South."

"The only aspect of the war in which we had the initiative was our air campaign against the North Vietnamese heartland," said Gen. William W. Momyer, who took over 7th Air Force in 1966. "On the ground in South Vietnam, the North Vietnamese had the initiative since their forces could fight when they wanted and retreat into the jungle or into sanctuaries in Laos or Cambodia when they didn't."

There was no requirement in South Vietnam to establish air superiority—enemy aircraft did not operate there—and there were no strategic targets. The Air Force mission was supporting the Army and servicing the Army's target list.

MACV headquarters spent 80 percent of its time on Army matters. Westmoreland made no pretense that it was a joint force operation.

Col. Gordon F. Bradburn (l), commander of 14th Air Commando Wing, and Gen. William Westmoreland, the top US commander in Vietnam, hold an impromptu 1966 conference in Saigon.

No Pretense

"Aware that my deputy might have to succeed me, I resisted pressure from the Air Force for my deputy to be an air officer," Westmoreland said. "Why place an air officer in a position where he might have to run what was essentially a ground war? I similarly resisted pressures for an equal-quota system for officers of the various services on the MACV staff."

MACV, however, did not control the entire war. Westmoreland's authority was limited to South Vietnam and control of air strikes in adjacent territory designated as extensions of the battle in South Vietnam.

Sharp, the airpower-minded commander in chief of PACOM, wanted the air war in North Vietnam and Laos to be conducted by his two component commands, Pacific Air Forces and the Pacific Fleet. When directing out-of-country operations, 7th Air Force reported to PACOM through PACAF. Westmoreland, with his parochial focus on the ground, was not in the chain of command.

Nevertheless, McNamara had made those operations subordinate to the In-County War. Thus, as historian John Schlight has aptly noted, Westmoreland "had veto power over bombing, interdiction, and reconnaissance programs outside South Vietnam, many of which were PACAF programs the Air Force believed should have higher priority."

Sharp reported, "Any request by Westmoreland for more airpower always got a sympathetic hearing from the Secretary of Defense, who was determined that all in-country requirements would be satisfied, no matter how inflated they were, before we used any effort against North Vietnam. His priorities for air strikes were (1) South Vietnam, (2) Laos, and (3) North Vietnam—and North Vietnam was a very poor third."

But, Schlight said, "not all kinds of missions in the South were of equal importance. First priority must go to supporting ground troops actually engaged with the enemy. After this, airpower could be used for prestrikes and air cover for units carrying out major ground operations. Escort for trains and convoys came next. Planes could be used for interdiction outside South Vietnam only after these close air support needs were met."

The Navy refused to put a Navy component at MACV, but its aircraft, flying off carriers at Dixie Station in the South China Sea, did operate under the control of 7th Air Force when they flew missions in South Vietnam. Until late in the war, the land-based Marine Corps fighters in South Vietnam were controlled by the Marine Corps commander on the ground, not by 7th Air Force.

Most air attack missions in the South were directed by a forward air controller, an Air Force pilot flying a light spotter airplane over territory he knew very well and marking targets with smoke rockets for the strike aircraft. FACs reported to air liaison officers, who were attached to the Army.

It was not until July 1972 that Air Force Gen. John W. Vogt Jr., the sixth and last commander of 7th Air Force, finally became the deputy commander of MACV. By then, nearly all of the US ground combat forces in Vietnam had gone home, so MACV was not conceding all that much.

At peak deployment in 1968, the Air Force had 56 squadrons and 1,200 aircraft based in South Vietnam. In the beginning, the air commandos had flown only propeller-driven airplanes. When the Air Force first employed jet aircraft in South Vietnam in 1965, there were only three airfields—Da Nang, Bien Hoa, and Tan Son Nhut airport in Saigon—capable of handling jets. That infrastructure soon grew to 10 major air bases.

Air support was crucial as the Army began deploying to Vietnam in 1965 but had not yet achieved full strength. In October 1965, repeated air strikes by the Air Force and the Navy kept two regiments of the North Vietnamese Army, augmented by Viet Cong irregulars, from overrunning allied ground forces in the Ia Drang Valley in the Central Highlands.

By 1968, the Air Force had supported the ground forces in 75 large battles and in hundreds of smaller ones. Almost every kind of aircraft in the USAF inventory that could carry weapons or be adapted to do so saw action. In addition to the support strikes by US fighters, light bombers, and gunships, Strategic Air Command B-52s flew almost 125,000 Arc Light bombing missions in Southeast Asia, more than half of them in South Vietnam.

Attack sorties, however, accounted

Cumulative Totals Serving in South Vietnam, Jan. 1965-Dec. 1972

Army	Navy	Air Force	Marine Corps	Total
1,642,832	144,239	358,619	448,065	2,593,755

US in-country personnel strength peaked at 549,000 in early 1969. Navy totals shown here include the Coast Guard. Service in South Vietnam prior to 1965 was designated as the Vietnam Advisory Campaign, even though it sometimes included clandestine combat.

Sources: MACV, Department of Defense

for only about 20 percent of the sorties the Air Force flew in South Vietnam. By far, the biggest mission was airlift, which accounted for about 51 percent of the total. Reconnaissance accounted for another 20 percent or so. The remainder of the sorties were various kinds of combat support, including combat search and rescue.

"Ninety percent of the ground battles in South Vietnam were fought without the benefit of tactical air support," said historian Schlight. "One reason for this was that half of all ground contacts lasted less than 20 minutes, too short a time to bring airpower to bear."

About 70 percent of the Air Force strike support sorties were of the "preplanned" variety. The mission was planned ahead of time, the pilots were briefed on the target area, and the aircraft were loaded with the best munitions for the job.

The strong preference of the troops on the ground, though, was for "operations immediate" strikes, in which the aircraft came in response to a call for help. A fighter sitting ground alert could be there in 35 to 45 minutes. An aircraft diverted from another mission might arrive in 20 minutes or less, in time to cover a firefight.

Most targets of substance could wait the 40 to 45 minutes for alert aircraft to respond. "Usually a ground force commander took longer than this to decide to call for air support rather than handle the situation with organic weapons or artillery," Momyer said.

The most spectacular engagements of airpower in the In-Country War were when the North Vietnamese Army invaded the South in strength in 1968 and in 1972.

After years of sapper attacks and hit-and-run operations in the jungle, the North Vietnamese made a major change in strategy with the Tet Offensive of 1968. It was planned and directed by Gen. Vo Nguyen Giap, hero of the defeat of French colonial forces at Dien Bien Phu in 1954. It was timed to catch the US and South Vietnamese forces off guard at Tet, the most important holiday in Vietnam, and it was supposed to be a master stroke that would win the war for the North.

On Jan. 20, the North Vietnamese struck the US Marine Corps base at Khe Sanh, an isolated outpost near the Demilitarized Zone. Giap's intention, apparently, was to create a diversion that would screen the coming Tet attacks as well as neutralizing the Khe Sanh garrison as a counter to Giap's forces that would be moving South for the invasion.

Saving Khe Sanh

Khe Sanh depended on airpower, both for defense and resupply. It was easy for the North Vietnamese to cut off ground access. The base had no strategic value except as a staging area from which the marines conducted operations. When the North Vietnamese laid siege to Khe Sanh, official chest-beating back in Washington imbued it with great symbolic importance and there was no backing off.

Airpower kept Khe Sanh alive. The breakout of sorties on any given day, according to Momyer, included the following: tactical fighters, 350; B-52 bombers, 60; C-123 and C-130 tactical airlifters, 12 to 15; RF-4 reconnaissance, 10; and O-1 and O-2 forward air controllers, 30. AC-47 gunships kept the area illuminated at night and the enemy's heads down. Various kinds of helicopters and other aircraft lent their support as well.

The main blow of the Tet Offensive fell on the night of Jan. 30-31, the beginning of the lunar new year. The combined forces of the North Vietnamese Army and the Viet Cong struck at population centers and military bases all over South Vietnam.

The offensive did not last long in most places, although fighting continued around Hue and Saigon. Giap did not achieve any of his military objectives. Ground forces, supported by more than 16,000 air sorties, held the line. After 77 days, Giap lifted his unsuccessful siege of Khe Sanh. Heavy casualties had broken the back of the Viet Cong irregulars, who would never again be a significant force in battle.

"By any standard of measurement," Momyer said, "this was a major military defeat. The North Vietnamese would need almost three years to prepare for another offensive of such magnitude, and they could do it then only because of the bombing halt in North Vietnam that provided secure supply points above the DMZ."

The effective outcome of the Tet Offensive was just the opposite. It was the turning point of the war and a great psychological defeat for the United States. Overly optimistic assessments from MACV and Washington had left the American public unprepared for the size and strength of the attacks. Support for the war was already declining in public opinion and fell further with critical news reports of the Tet Offensive, some of them erroneous.

This bad situation was made worse by a blunder by the Pentagon and MACV. In February, Army Gen. Earle G. Wheeler, Chairman of the Joint Chiefs of Staff, encouraged Westmoreland to ask for

Tactical Attack Sorties in South Vietnam

By US Air Force, Navy, Marine Corps, and South Vietnamese Air Force

	USAF	USN	USMC	VNAF
1966	70,646	21,610	32,430	31,632
1967	116,560	443	52,825	29,687
1968	134,890	5,427	64,933	22,817
1969	96,524	5,744	49,823	36,217
1970	48,064	3,895	24,146	28,249
1971	11,842	2,124	2,250	30,693
1972	40,322	23,505	13,833	48,569
January 1973	1,303	4,149	1,160	4,429

Totals shown here do not include B-52 Arc Light sorties, about half of which were flown against targets in South Vietnam. Attack sorties accounted for only about 20 percent of the total sorties in the south. More than half of the sorties were airlift. The report from which these statistics were taken did not include 1965, but other accounts set the total USAF attack sorties in South Vietnam that year at 37,645.

Source: DOD report, November 1973.

reinforcements. MACV did not need more troops to meet the Tet attacks, and Wheeler's real agenda was to force a call-up of the National Guard and Reserve, thus replenishing military strength worldwide.

Westmoreland drew up a plan that included proposed ground operations against enemy sanctuaries in Laos, Cambodia, and on the other side of the DMZ. To cover "all contingencies," he asked for 206,000 additional troops and raising the authorized US strength ceiling in South Vietnam to 671,616.

The proposal was discovered and reported on the front page of the *New York Times* March 10 under the headline, "Westmoreland Requests 206,000 More Men, Stirring Debate in Administration." That was the end of the troop increase and the attrition strategy as well. The leak, it was discovered later, was the work of Daniel Ellsberg of RAND in a preview of his famous role in leaking the Pentagon Papers to the *Times* in 1971. Ellsberg had obtained a copy of a report from Wheeler to the President forwarding Westmoreland's request. (See "The Pentagon Papers," February, p. 50.)

Khe Sanh—which had been officially depicted in January as vitally important—was abandoned June 26 on the judgment that it was no further military value. MACV's credibility went down another notch.

Tet marked the end of the US attempt to win the war. Lyndon Johnson's political operatives began talking instead about "peace with honor." In a television address to the nation March 31, Johnson announced that he would not seek re-election and that he would stop the bombing of North Vietnam in hopes of facilitating peace talks to end the war.

The Nixon Administration, which took office the following January, adopted a program of "Vietnamization," a continuation of the withdrawal policy and the gradual turning of the war over to the South Vietnamese.

US forces in South Vietnam reached their peak strength of 549,000 in early 1969. Of those, about 450,000 were Army and Marine Corps ground forces. The drawdown began in July 1969. Ground forces left first, with airpower assuming a greater share of the burden of in-country defense.

"We were clearly on the way out of Vietnam, by negotiation if possible, by unilateral withdrawal if necessary," Nixon's national security advisor, Henry A. Kissinger, said later.

By the beginning of 1972, most all of the US ground forces were gone and the South Vietnamese Air Force was flying 70 percent of the air combat operations. Seventh Air Force had only half as many aircraft as before.

Meanwhile, North Vietnam's Giap had recovered from his losses and defeat during Tet in 1968 and was ready to try again. On March 30, in the so-called Easter Offensive, he crossed the DMZ with 40,000 troops and 400 armored vehicles, once more determined to win the war with a direct conventional attack.

Halting the Offensive

The South Vietnamese F-5s and A-37s could not handle the invading force, which was strongly supported by surface-to-air missiles and anti-aircraft artillery. Interdiction required USAF F-4s and F-105s.

To add starch to the defense, the Air Force staged fighters out of its bases in Thailand to bases in South Vietnam, from which they flew their missions. The Navy and the Marine Corps increased support from carriers offshore, and SAC B-52s came from their bases in Guam and Thailand. Airpower disrupted the enemy's supply lines and struck at the invasion forces. Giap's 1972 offensive stalled, and in June, he pulled his forces back.

American bombing of North Vietnam, which had now resumed, did not stop until the peace agreement and cease-fire in January 1973. MACV was disestablished in March 1973. All US forces left Vietnam. South Vietnam held out until Giap mounted his third invasion two years later. Saigon fell to the advancing North Vietnamese Army on April 30, 1975. The war was finally over.

There were many instances of achievement and valor in the In-Country War, both by the ground forces and the air forces. The ground offensive, supported by airpower, achieved results that were typically good and often excellent.

These victories, however, were mostly tactical and local. They did not add up to anything of decisive strategic importance. The attrition strategy did not lead anywhere.

The big mistake was treating the war as an insurgency to be won or lost in the South. This ignored what should have been fairly obvious: The war was initiated, directed, and sustained from the North. "Although the only real pressure on the North was being applied by airpower, the ground campaign in South Vietnam remained the primary element in US strategy," Momyer said.

We will never know whether a determined air campaign against North Vietnam might have won the war. The Johnson Administration gave up on Rolling Thunder after less than a month's worth of timid effort. After that, operations in the North were limited and constrained lest they become too aggressive.

The ground strategy violated the principle that, in combat, one should pit one's strength against the enemy's weakness. The United States forfeited its unique advantage—airpower—and chose instead to conduct the war in the only venue in which the enemy could hope to compete: ground fighting in the jungle. Most of the time, the initiative lay with the enemy.

The attrition strategy was a complete miscalculation of North Vietnam's commitment, staying power, and willingness to accept casualties if necessary to achieve victory. Westmoreland had also assumed that the United States would outlast the enemy in the attrition exchange. As it happened, US commitment wavered well before reaching the final total of 47,378 battle deaths.

By contrast, 1.1 million North Vietnamese and Viet Cong fighters were killed and 600,000 were wounded in the period 1954-75 during the long struggle first with France, South Vietnam, and the United States and its allies.

Years later, Giap said that Westmoreland had "committed an error following the Tet Offensive, when he requested another 206,000 troops. He could have put in 300,000, even 400,000 more men," said the great Northern military man. "It would have made no difference." ■

John T. Correll was editor in chief of Air Force *Magazine for 18 years and is now a contributing editor. His most recent article, "Bird Dog's Last Battle," appeared in the March issue. For Correll's interpretation of the other campaigns in Southeast Asia, see "Rolling Thunder" (March 2005), "The Ho Chi Minh Trail" (November 2005), "Barrel Roll" (August 2006), and "Disunity of Command" (January 2005). All are available at* Air Force *Magazine Online, www.afa.org.*

The Chart Page

By Tamar A. Mehuron, Associate Editor

The Defense Budget at a Glance

In February, President Bush presented his defense budget for Fiscal 2008. The document recuests $481.4 billion in budget authority and $459.8 billion in outlays for the direct program (DOD activities only). The budget request for the total national defense program (DOD activities and defense activities in the Department of Energy and other federal agencies) is $503.9 billion in budget authority and $483.1 billion in outlays.

Funding levels can be expressed in several ways. Totals are most frequently stated in **budget authority,** which is the value of new obligations that the government is authorized to incur. These include some obligations to be met in later years. Figures can also be expressed in **outlays** (actual expenditures, some of which are covered by amounts that were authorized in previous years).

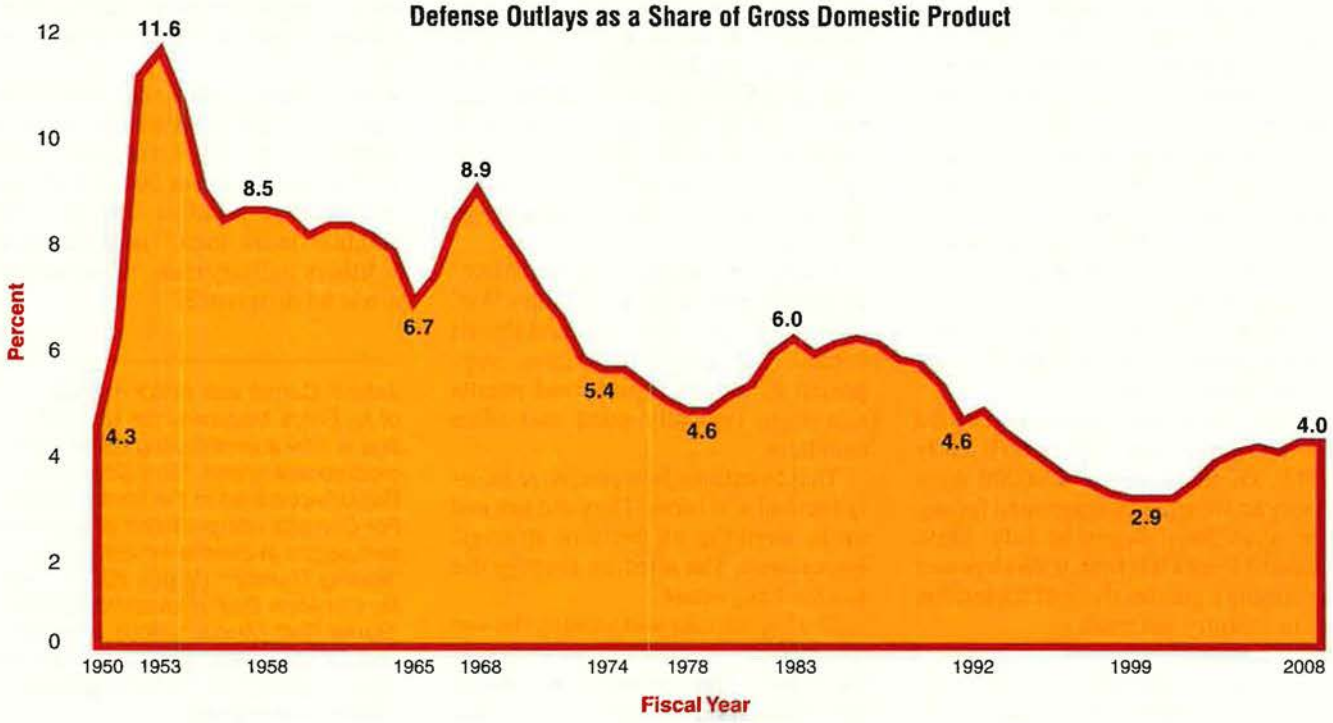
Another difference concerns the value of money. When funding is in **current** or **then-year** dollars, no adjustment for inflation has taken place. This is the actual number of dollars that has been or is to be spent, budgeted, or forecast. When funding is expressed in **constant dollars,** or **real dollars,** the effect of inflation has been factored out to make direct comparisons between budget years possible. A specific year, often the present one, is chosen as a baseline for constant dollars.

The following charts address only the Defense Department program. Numbers on the charts in this section may not sum to totals shown because of rounding. Years indicated are fiscal years. Civilian manpower figures are now measured in terms of full-time equivalents. ■

DOD Budget Topline*
($ billions)

	2006	2007	2008	2009	2010	2011	2012
Budget authority (current)	$410.7	$432.4	$481.4	$483.8	$493.9	$504.2	$538.5
Budget authority (constant FY 2008)	$428.1	$442.3	$481.4	$472.6	$471.9	$471.2	$492.1
Outlays (current)	$499.3	$516.5	$459.8	$466.3	$484.0	$499.9	$527.4
Outlays (constant FY 2008)	$520.5	$528.4	$459.8	$455.5	$462.5	$467.2	$482.0

*Does not include supplemental appropriations to cover costs of the war in Iraq.



Service Shares

(Budget authority in constant FY 2008 billion dollars)

Dollars	2006	2007	2008	2009	2010	2011	2012
Air Force	117.5	130.4	136.6	138.7	136.5	137.0	143.0
Army	120.0	111.4	130.1	116.5	116.0	115.1	120.3
Navy/Marine Corps	120.7	128.5	139.8	140.3	141.3	141.6	147.9
Defense agencies	69.9	72.0	74.9	77.2	78.1	77.6	81.0
Total	**428.1**	**442.3**	**481.4**	**472.7**	**472.0**	**471.2**	**492.2**
Percentages							
Air Force	27.4%	29.5%	28.4%	29.4%	28.9%	29.1%	29.1%
Army	28.0%	25.2%	27.0%	24.6%	24.6%	24.4%	24.4%
Navy	28.2%	29.0%	29.0%	29.7%	30.0%	30.0%	30.0%
Defense agencies	16.3%	16.3%	15.6%	16.3%	16.5%	16.5%	16.5%

Cutting the Pie: Who Gets What

(Budget authority in constant FY 2008 billion dollars)

	2006	2007	2008	2009	2010	2011	2012
Military personnel	113.7	113.7	116.3	114.2	114.0	113.8	118.9
O&M	145.1	152.6	164.7	161.7	161.5	161.2	168.4
Procurement	81.0	83.2	101.7	99.8	99.7	99.5	104.0
RDT&E	75.1	76.8	75.1	73.8	73.6	73.5	76.8
Military construction	8.3	9.5	18.2	17.9	17.9	17.8	18.6
Family housing	4.2	4.1	2.9	2.9	2.9	2.9	3.0
Other	0.7	2.5	2.5	2.4	2.4	2.4	2.6
Total	**428.1**	**442.3**	**481.4**	**472.7**	**471.9**	**471.2**	**492.1**

Manpower

(End strength in thousands)

	1990	2005	2006	Est. 2007	Est. 2008	Change 1990-2006
Total active duty	2,065	1,389	1,385	1,374	1,371	-680
Air Force	535	354	349	334	329	-186
Army	751	493	505	518	525	-246
Navy	582	363	350	338	328	-232
Marine Corps	197	180	180	184	189	-17
Selected reserves	1,128	821	826	843	838	-302
Civilians (FTE)	997	653	662	667	672	-335

Operational Training Rates

	1990	2000	2005	2006	Est. 2007	Est. 2008
Air Force						
Flying hours per crew per month, fighter/attack aircraft	19.5	17.2	15.3	16.0	16.7	14.4
Army						
Flying hours per tactical crew per month	14.2	12.7	n/a	n/a	n/a	13.1
Annual tank miles	800	669	899	850	850	846
Navy						
Flying hours per tactical crew per month	23.9	20.9	22.6	23	17.5	18.7
Ship steaming days per quarter						
Deployed fleet	54.2	50.5	56.0	39.0	36.0	45.0
Nondeployed fleet	28.1	28.0	25.0	24.0	24.0	22.0

Acronyms

AEHF	Advanced Extremely High Frequency
AFRC	Air Force Reserve Command
AMRAAM	Advanced Medium-Range Air-to-Air Missile
ANG	Air National Guard
AWACS	Airborne Warning and Control System
BUR	Bottom-Up Review
DSP	Defense Support Program
EELV	Evolved Expendable Launch Vehicle
FTE	Full-Time Equivalent
GPS	Global Positioning System
JASSM	Joint Air-to-Surface Standoff Missile
JDAM	Joint Direct Attack Munition
JPATS	Joint Primary Aircraft Training System
JSF	Joint Strike Fighter
MLV	Medium Launch Vehicle
NPOESS	National Polar-orbiting Operational Environmental Satellite System
O&M	operation and maintenance
ORL	Operationally Responsive Launch
QDR	Quadrennial Defense Review
RDT&E	research, development, test, and evaluation
SBIRS	Space Based Infrared System
STARS	Surveillance Target Attack Radar System
TSAT	Transformational Satellite
UAV	unmanned aerial vehicle
WCMD	Wind-Corrected Munitions Dispenser

Major USAF Programs RDT&E

(Current million dollars)

Program	2006	2007	2008
A-10	55.7	31.9	2.0
B-1B bomber	76.5	130.1	159.1
B-2 bomber	281.7	241.6	244.0
B-52	23.1	76.0	41.9
Next generation bomber	24.1	25.5	0.0
C-5 transport	225.7	150.6	203.6
C-17 transport	160.6	173.1	181.7
C-130 transport	232.3	230.7	188.1
C-130J transport	11.4	40.4	74.2
CSAR-X	0.0	200.7	290.1
CV-22 transport	33.7	26.5	16.7
E-3 AWACS	129.3	165.0	152.7
E-8 Joint STARS	110.9	155.6	65.9
E-10 Multisensor C2	378.9	366.0	39.7
F-15E fighter	135.0	137.5	101.3
F-16C/D fighter	124.5	152.0	90.6
F-22 fighter	413.6	472.5	743.6
F-35 fighter (JSF)	2,264.8	2,132.9	1,780.9
KC-X tanker	0.0	69.6	314.5
T-6 JPATS	0.0	0.0	0.0
AIM-120 AMRAAM	31.8	43.3	36.8
JASSM	58.8	40.7	12.2
JDAM	0.0	15.4	0.0
Sensor Fused Weapon	0.0	0.0	0.0
Small Diameter Bomb	64.5	105.5	145.2
WCMD	14.5	0.0	0.0
AEHF satellite	639.2	630.9	603.2
Counterspace systems	28.2	50.3	53.4
DSP satellite	0.0	0.0	0.0
GPS satellite	264.1	490.1	708.2
MilSatCom terminals	254.1	269.9	388.5
Milstar satellite	0.0	0.0	0.0
NPOESS	318.6	347.4	334.9
SBIRS High satellite	706.6	664.9	587.0
Space Radar satellite	98.1	185.4	n/a
TSAT	416.8	730.0	963.6
Wideband Global System	97.7	37.5	19.2
EELV booster	19.1	19.7	0.0
MLV booster	0.0	0.0	0.0
ORL booster	45.2	0.0	0.0
Minuteman III ICBM	31.0	0.0	0.0
Global Hawk UAV	257.7	247.7	298.5
Predator UAV	54.1	67.9	22.3
Reaper	0.0	0.0	61.1

Major USAF Programs Procurement

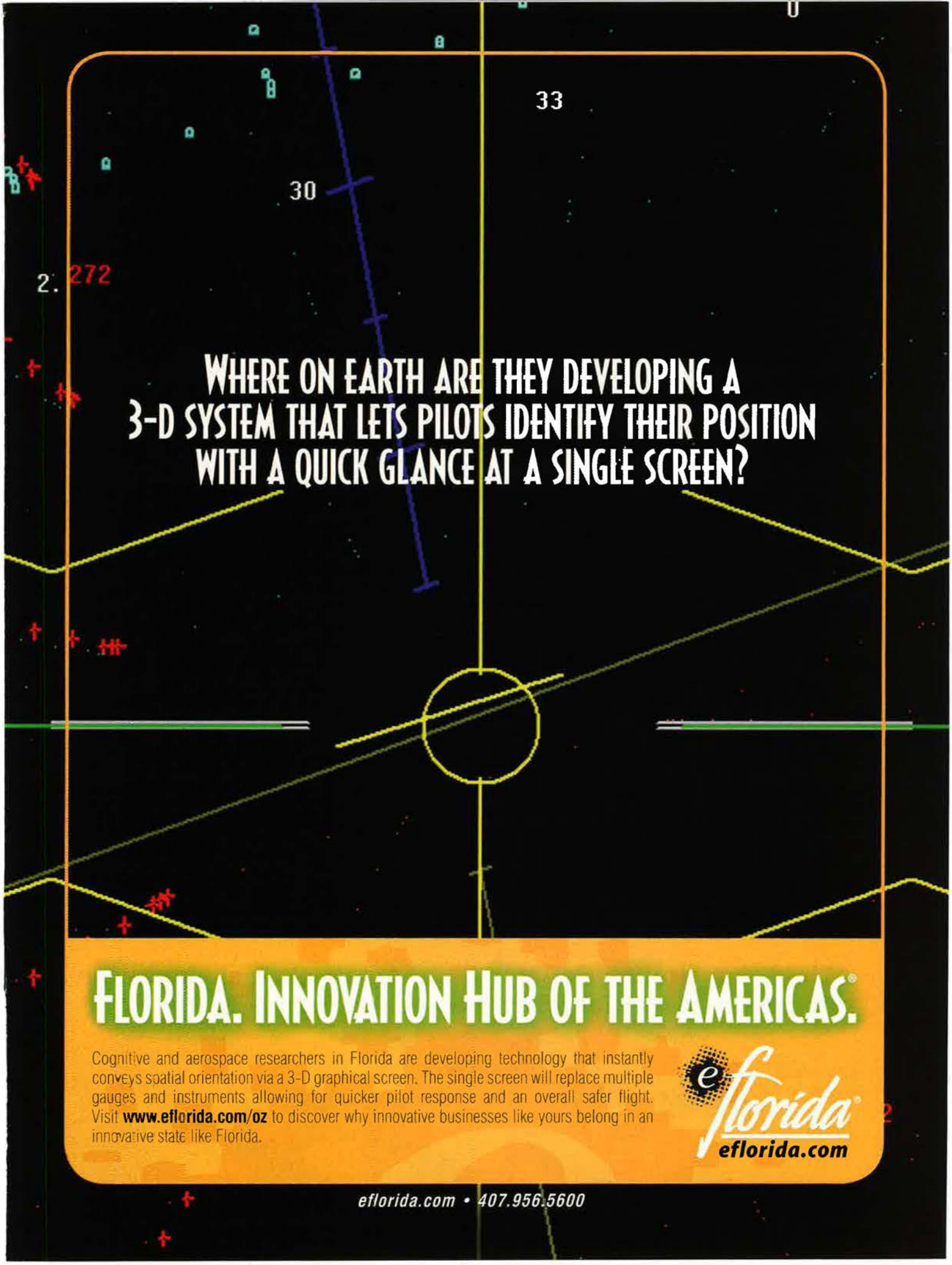
(Current million dollars)

Program	2006	2007	2008
A-10	72.0	106.9	167.1
B-1B bomber	33.5	53.1	53.1
B-2 bomber	61.3	192.6	316.1
B-52	128.5	69.9	18.1
Next generation bomber	0.0	0.0	0.0
C-5 transport	111.6	227.6	398.7
C-17 transport	3,697.6	4,597.7	471.8
C-130 transport	180.2	182.6	384.4
C-130J transport	975.6	784.0	686.1
CSAR-X	0.0	0.0	0.0
CV-22 transport	229.7	242.1	495.0
E-3 AWACS	48.8	64.3	54.3
E-8 Joint STARS	34.6	137.6	79.7
E-10 Multisensor C2	0.0	0.0	0.0
F-15E fighter	192.8	164.3	19.2
F-16C/D fighter	418.2	366.3	329.4
F-22 fighter	3,688.9	3,531.0	3,861.3
F-35 fighter (JSF)	117.4	571.5	1,421.7
KC-X tanker	0.0	0.0	0.0
T-6 JPATS	328.8	304.0	245.9
AIM-120 AMRAAM	103.1	115.4	224.6
JASSM	98.7	166.5	201.1
JDAM	224.6	174.3	112.8
Sensor Fused Weapon	118.8	118.4	0.0
Small Diameter Bomb	52.2	98.7	95.3
WCMD	15.5	15.5	0.0
AEHF satellite	521.9	0.0	0.7
Counterspace systems	14.3	31.3	22.8
DSP satellite	62.1	38.2	0.0
GPS satellite	349.9	96.5	221.6
MilSatCom terminals	27.8	75.4	116.9
Milstar satellite	0.0	0.0	0.0
NPOESS	0.0	0.0	0.0
SBIRS High satellite	3.6	4.2	483.0
Space Based Radar satellite	0.0	0.0	n/a
TSAT	0.0	0.0	0.0
Wideband Global System	71.3	412.5	325.2
EELV booster	603.2	852.1	1,166.6
MLV booster	144.6	101.3	117.7
ORL booster	0.0	0.0	0.0
Minuteman III ICBM	664.4	648.7	505.4
Global Hawk UAV	359.6	448.0	577.8
Predator UAV	283.4	293.1	352.7
Reaper	0.0	0.0	79.0

Selected Force Structure

	Cold War Base 1990	1990 Base Force	1993 BUR Plan	1997 QDR Goal	Most Recent Published Plan 2003[b]	2008
Air Force						
Active fighter wings	24	15	13	12+	12+	11+
AFRC/ANG fighter wings	12	11	7	8	7+	7+
Army						
Active brigades[a]	54	36	30	30	30	41
Army National Guard/Reserve	30	34	24	24	40	28
Navy						
Aircraft carriers						
Active	15	12	11	11	10	10
Reserve	1	1	1	1	1	1
Carrier air wings						
Active	13	11	10	10	10	10
Reserve	2	2	1	1	1	1
Marine Corps						
Active Marine Expeditionary Force	3	3	3	3	3	2.5
Marine Forces Reserve	1	1	1	1	1	1

[a] For prior years, data converted to standard brigades. For 2008, data reflects new brigade combat team force structure.
[b] Force structure plans were not provided in FY2004-FY2007 budget data.



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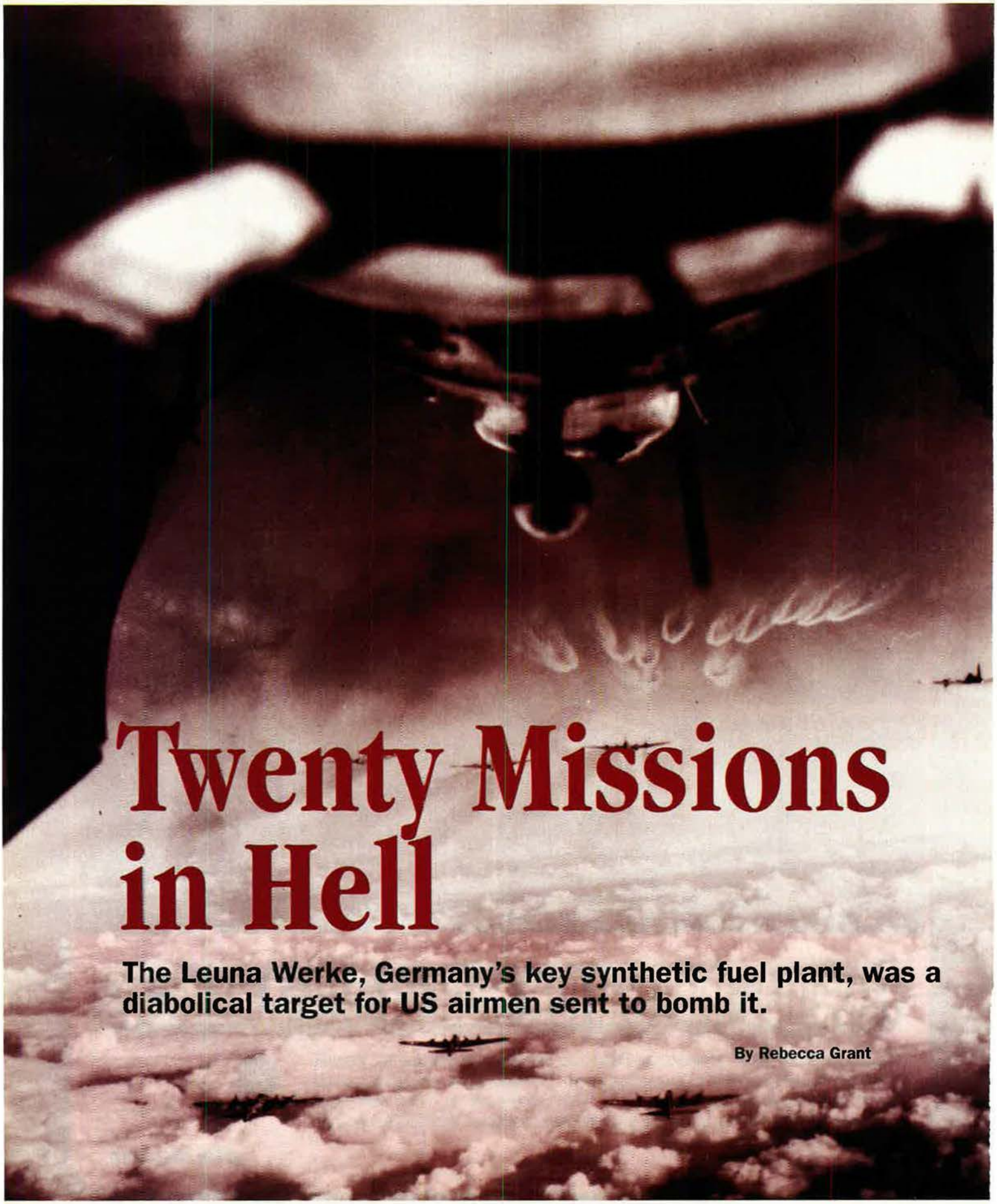


Twenty Missions in Hell

The Leuna Werke, Germany's key synthetic fuel plant, was a diabolical target for US airmen sent to bomb it.

By Rebecca Grant

The ham, bacon, sausage, and fresh eggs were an ominous sign. B-17 copilot Lt. Ted Abbott had never flown an operational mission before, but so sumptuous was the 4 a.m. breakfast served to crews of the 384th Bomb Group at Grafton Underwood, England, that he knew a tough mission must be ahead.

The mission briefing on that morning of July 29, 1944 confirmed Abbott's forebodings. "After a few words, the officer drew the curtain and immediately there was deathly moan from all the experienced personnel," Abbott recalled.

The target? The Leuna Werke, at Merseburg, deep in the heart of Germany.

The US bomber crews were only too aware that this sprawling I.G. Farben chemical factory was the crown jewel of Germany's synthetic fuel industry. By mid-1944, it was also one of the most protected targets in Germany, ringed by a bristling array of at least 1,700 88 mm and 105 mm flak guns.

"I didn't think I would live long enough to get out the door of the briefing room," Abbott later wrote in the 384th's unit history.

"Aircrews viewed a mission to Leuna as the most dangerous and difficult assignment of the air war," concluded the *United States Strategic Bombing Survey.* No wonder. The United States Army Air Forces' IMPACT report determined that flak was behind a full 62 percent of bomber losses by the fall of 1944.

Another who vividly remembered Leuna was Tom Landry, then a 20-year-old B-17 copilot, who later found fame as coach of the NFL's Dallas Cowboys. "I can still picture the angry black cloud of exploding flak filling the sky as we approached our target that day," said Landry, "and I remember the helpless, sinking fear I felt as we followed our squadron leader into the heart of that cloud."

In all, American airmen flew 20 missions to the place they called "Flak Hell Leuna."

Crews that flew to Leuna were part of a deadly duel over Germany's synthetic fuel production, and their success—or lack of it—was watched anxiously by both sides.

There was no question that oil was a strategic weakness for Germany. In 1938, Germany imported 28 million barrels of oil—about 60 percent of its total supply. Germany was already in the synthetic fuels business and produced about nine million barrels in 1938. The Leuna plant had started producing fuel from coal in 1927.

When war broke out on Sept. 1, 1939, Hitler annexed Austria's oil facilities. The German fuel program shifted gears in other ways, too. Romania, an Axis ally, cranked up national production from 2.8 million barrels in the year 1938 to 13 million barrels in 1941. That decision made Romania's giant Ploesti refinery and oil works a supercritical target. (See "Ploesti, Through Fire and Flak," April 1994, p. 78.)

Synthetic fuels would ultimately supply the bulk of Germany's aviation gasoline, high octane fuels, and other vital chemical byproducts.

Pressure Point

Early in the war, British analysts kept a close eye on this potential weak point. Conquering Europe left Germany short on oil reserves—at first. RAF Bomber Command made a few costly efforts to bomb major oil targets like Politz. However, synthetic fuel production doubled from 1940 to 1943.

For their part, US officials had high hopes for oil missions. They saw oil as the vulnerable jugular of the German military machine both on the ground and in the air.

As a result, oil targets were consistently featured on US target lists. In early 1944, synthetic fuel looked more and more like a critical pressure

At far left, the open bomb bay doors on a B-17 Flying Fortress frame this view of B-17s heading to Leuna Werke on a 1944 raid. Pictured here is some of the damage caused by the B-17 raids.

Gen. Dwight Eisenhower in 1944 sits in the cockpit of a B-26 bomber in the European Theater. Ike knew the importance of oil to the German war machine and was anxious to disrupt production.

point relevant to the upcoming ground campaign.

"In the first few months of 1944," wrote British historian Lionel Lacey-Johnson, "overall reserves of fuel for the German Army and the Luftwaffe were as high as they had been at any time since 1940."

Those operational reserves preyed on the minds of the senior American commanders as they prepared for Normandy. Attacks on oil targets might be a way to impede enemy operations.

Lt. Gen. Carl A. "Tooey" Spaatz, commander of US Strategic Air Forces in Europe, was not seeking a knockout "panacea" blow to the Germany economy. Rather, he believed that disruptions in the synthetic fuel supply could lead to huge battlefield advantages. Oil tied in directly to German military effectiveness. The operational impact of fuel shortages would also be easy to track via Ultra intelligence intercepts.

Tedder's Skepticism

But Gen. Dwight D. Eisenhower's deputy, British Air Chief Marshal Arthur Tedder, was skeptical about targeting oil. "I am not sure as to the real vulnerability of the new synthetic oil plants, where the enemy has presumably taken immense precautions against an air attack by means of dispersal, protection, etc.," Tedder noted at the time.

Spaatz made the case to Eisenhower during a meeting in March 1944. Everyone knew that the Germans were stockpiling fuel in France, which meant that oil attacks would not have an instant effect. Spaatz briefed that concentrated attacks on the synthetic fuel plants might force German ground commanders to be more cautious with their maneuver plans later in the game.

More important, Spaatz saw the synthetic fuel plants as the best targets to lure the Luftwaffe into battle. "We believe they will defend oil to their last fighter plane," Spaatz told Eisenhower and other commanders.

That got the supreme commander's attention: Keeping the Luftwaffe out of the Normandy battle was the basic precondition for the whole invasion. Even Tedder was gloomy about beating down the Luftwaffe in time.

The supreme commander noted in his memoirs that he had been "most anxious to continue the destruction of German industry with emphasis upon oil." He also said Spaatz convinced him that over time the diminishing oil reserves would have a "profound" effect on the land battle to unfold across Europe and "the eventual winning of the war would be correspondingly hastened."

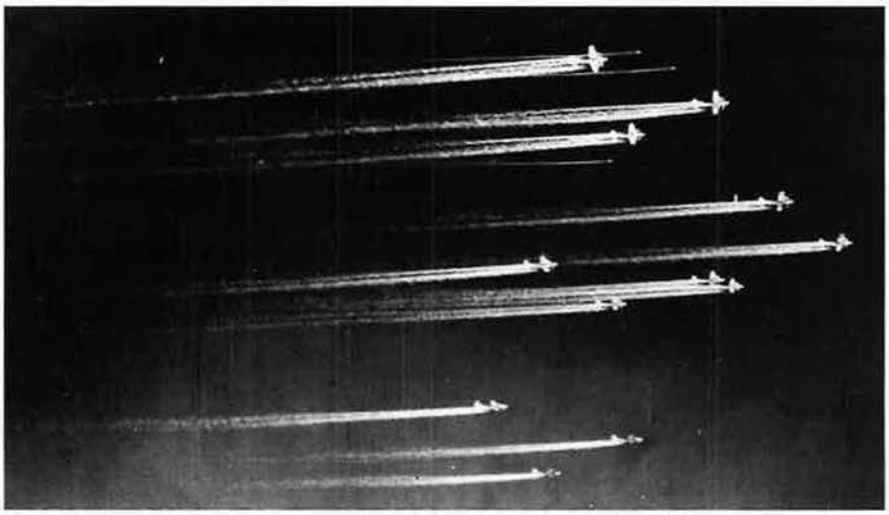
Spaatz and Eisenhower were both thinking beyond the Normandy hedgerows. "Every German commander had always to calculate his plans in terms of availability of fuel," Eisenhower reasoned.

In early May 1944, the oil plan got rolling and it was to soak up 11 percent of the total USAAF effort in theater before it was over. Eighth Air Force bombers first attacked Leuna on May 12. The impact was immediate.

"Surveying a bombed hydrogenation plant from the air, I was struck by the accurate carpet bombing of the Allied bomber fleets," noted Hitler's armament minister Albert Speer on May 19, 1944. Production at Leuna stopped, but repair crews numbering in the thousands restored partial operations in 10 days.

Bombers struck Leuna again on May 28 and shut it down for a week. On June 6, Britain's cryptographers delivered a high-level intercept stating that "Allied action" against Germany's synthetic oil plants, as well as Ploesti, left the Germans without enough fuel for training, according to historian Williamson Murray.

Thus began a protracted duel between the bomber crews and the Luftwaffe pilots, flak directors, and conscript labor forces trying to keep production going. At stake was the tactical mobility of the Wehrmacht and the last hopes for



B-17s and their fighter escorts head for targets in Germany. From May 1944 on, German oil consumption outpaced production.

Lt. Gen. Carl Spaatz made the case for the Leuna raids to Eisenhower. Interrupting oil production was only one value of the targets—the USAAF wanted to disable the Luftwaffe before the Normandy Invasion.

the Luftwaffe to challenge Allied air superiority.

At the center of it all was dreaded Leuna. Overall, 6,552 bomber sorties dropped 18,328 tons of bombs on it.

More than a million people were in the German flak forces by mid-1944. "Most flak gunners were deployed in batteries of six to 12 guns," wrote historian Donald L. Miller in his bomber history *Masters of the Air.* "Around Leuna, Speer set up Grossbatterie, each of them equipped with up to 36 guns capable of firing a barrage or box of shells into a prearranged spot."

Normandy gave Leuna a respite. When July began, the Leuna Werke was up to nearly 70 percent capacity. However, that was to be the last time the plant produced at that level. Four attacks on July 7, 20, 28, and 29 plastered the sprawling facility and introduced many a crew to its dangers.

"Deathly Moan"

Copilot Abbott, who'd heard the "deathly moan" when the Merseburg target was briefed on the morning of July 29, had an eventful first mission led by Col. Dale O. Smith, who later became a general.

"I noticed that the 88s were tracking us perfectly, but exploding about a thousand feet below us," Abbott recalled. The flak adjusted fast. In moments, he saw red flak bursts "not 25 yards out." Next, flames shot up through the B-17's floor under the rudder pedals. Part of a shell exploded through the Plexiglas nose. Shrapnel hit the bombardier's helmet and sunk into the navigator's oxygen system, starting a flash fire that also cut off oxygen to the pilot.

Abbott yelled to the flight engineer for a fire extinguisher. The engineer, stunned, did not respond. Abbott started to get out of the seat when the flight engineer came to his senses and passed forward a fire extinguisher.

While Abbott was squirting out flames and attending to other anoxic crew members, the pilot passed out due to the disrupted oxygen system.

The B-17 first entered a dive and sliced through the low squadron. Other B-17s scattered to get out of its way. Then it climbed, wreaking havoc in another section of B-17s before radio operator Bob Myers figured out that no one was flying the airplane. Myers revived the pilot with a fresh oxygen bottle and the B-17 leveled out.

The July 29 mission was typical in its terrors. Me-109s and FW-190s attacked on the way in. "They only made one pass, but got some B-17s out of the group behind us," recorded TSgt. John Pratt, who flew in another B-17 of the 384th Bomb Group.

"The flak was the worst I'd ever been in—boy could they shoot," remembered Pratt. Every B-17 in the squadron was hit.

In August came a windfall. Russian forces overran the smoldering ruins of Ploesti and soon took other plants, tightening German fuel supplies even further. Now the strikes against Leuna and other targets were squeezing Germany even harder.

USAAF planners sent bombers to Leuna five times from Aug. 24 through Oct. 7, 1944.

They had to keep the plants from rebuilding, so the bomber crews returned to the Leuna Werke again and again. For the most part, they bombed regardless of the weather conditions.

The repeated attacks had a psychological effect on the German workers as well. "Today we have finished rebuilding the plants and tomorrow the bombers will come again," ran one popular saying attributed to German workers.

Key to the USAAF ability to keep up the attack was the blind bombing system known as PFF—Pathfinder Force. Select Pathfinder bombers carried a radar whose trained operator could distinguish dense urban area targets.

Coordination between the "Mickeymen" radar operators and Norden bombsights enabled formations to bomb through the overcast no matter how bad the weather.

In the fall of 1944, the Luftwaffe made its last spasmodic efforts against the bombers. Synthetic fuel plants produced nearly all the Luftwaffe's aviation gasoline—and the supplies were dwindling.

Fighter production actually peaked in mid-1944, but the Luftwaffe was not able to capitalize on this. Fuel was a limiting factor that hampered everything from engine run ups for new aircraft to the scant training hours for green pilots.

Over Leuna, sometimes the Luftwaffe fighters showed up and sometimes they didn't—but flak greeted the bombers every time.

B-17 copilot Alan Cook had this to say of his first visit to Merseburg on Oct. 7, 1944: "When I describe the flak over Leuna as a cloud, I don't mean just a wall of smoke; it was a box, the length, width, and depth of our route to the 'bombs away' point." Cook's B-17 lost two engines to flak, but made it back to an RAF advance field in Holland. The aircraft was a write off.

Horrific Attrition

Nov. 2, 1944 brought the costliest Leuna mission of all. The armada headed to Leuna consisted of 683 B-17s escorted by 642 P-51s and a handful of P-38s.

In the raid, 38 bombers were lost, and an astonishing 481 took damage. At the time, the USAAF estimated that as many as 500 Luftwaffe fighters took to the skies.

Almost 400 men did not return; the vast majority were MIA after bailing

Robert Femoyer, a 23-year-old second lieutenant, earned the Medal of Honor for his actions on Nov. 2, 1944—the day of the deadliest Leuna raid for US airmen.

out. B-17 losses topped 5.5 percent for the day, a horrific attrition rate.

Cook was on the schedule Nov. 2 as well. His B-17 flew low section lead. Flak set engine No. 1 on fire just before the bomb run; the bombardier released, then the B-17 broke formation to put out the flames. The crew struggled west through flak and fighters until a 21-year-old P-51 pilot of the 357th found them and escorted them to allied airspace.

It was on this mission that 2nd Lt. Robert E. Femoyer earned the Medal of Honor.

Femoyer was navigator in a B-17 that was hit by three flak bursts and fell out of formation. He was wounded in the back and sides and bleeding heavily. Forced to low altitude, the B-17 was on its own. The wounded navigator refused a morphine shot in order to keep his mind clear for navigating home around the flak concentrations. For two-and-a-half hours, the 23-year-old Femoyer sat propped up with his charts as his own blood pooled around him. He finally agreed to sedation when the bomber was safely over the English Channel. Femoyer died shortly after being taken from the B-17. (See "Valor: I am the Captain of My Soul," May 1985, p. 222.)

Nov. 2 was the deadliest but not the last of the missions to Leuna. Crews risked their lives on half a dozen more missions over the flak den.

The mission of Nov. 21 was led by Lt. Col. Immanuel J. Klette, a legend who would end the war with a record 91 bomber missions. With weather closing in, Klette took the group down from 27,000 feet for clear visual bombing at 17,000 feet. Half the groups followed.

"Merseburg at 27,000 feet was perilous enough; 17,000 feet was madness," one crew member said later. Klette's 91st Bomb Group unit followed him down and brought 35 of its 36 bombers home.

Another group, the 398th, chose to climb above the cloud layer to 31,000 feet. It was there that the German fighters caught them, destroying five B-17s.

The sacrifices of Femoyer and many others were not in vain.

Production Losses

The attacks on Leuna and the other synthetic fuel plants were adding up. IMPACT, the classified bulletin, estimated that synthetic plants as a group were producing just 20 percent of capacity in September and 31 percent in November.

The Germans were aware of the grim situation. Speer sounded the alarm to Hitler louder and louder in the fall of 1944.

In September, he wrote Hitler of an airfield in the west where the 37 fighters could fly only every third day, when their fuel arrived. On the Italian front in October, Speer saw "a column of 150 trucks each with four oxen hitched to it."

Reduced production at Leuna and elsewhere had the side effects of stagnating the chemical industry and reducing materials available for explosive shells.

"The orders to the heavy bombers were to keep pounding all sources of oil, refineries, and distribution systems to the limit of their ability," said Eisenhower. "This tactic had a great effect not only generally upon the entire warmaking power of Germany but also directly upon the front," he said.

The Battle of the Bulge was a case in point. The Germans hoarded fuel for months prior to the Dec. 16, 1944 attack, then tried and failed to capture Allied stocks.

Overall, the effect of the bombers was nothing short of devastating. The *US Strategic Bombing Survey* found that from May 1944 on, the Leuna Werke averaged only nine percent capacity.

"Consumption of oil exceeded production from May 1944 on," concluded the survey.

On the battlefield, the oil attacks were crippling for Germany. Spaatz said in 1945 that while he couldn't measure it, "I am convinced that much of the Russian advance has been due to the immobility conferred on the German ground forces by our attacks on oil."

He didn't know the half of it. With Soviet soldiers on German soil, Hitler reacted by sending his 6th SS Panzer Army 350 miles south toward Hungary. His reason? According to Panzer General Heinz Guderian, Hitler argued that the destruction of the synthetic oil plants made it essential to guard Hungarian oil fields—instead of attacking the Soviet spearhead on its flanks, which Guderian wanted to do.

More humiliation was to come. "In February and March of 1945, the Germans massed 1,200 tanks on the Baranov bridgehead at the Vistula to check the Russians," noted the USSBS. "They were immobilized for lack of gasoline and overrun."

Of course, the Germans had lost countless tanks, guns, and a million men in the retreats. Still, airpower's destruction of the synthetic oil plants cramped the Reich's reaction at its final critical moments, just as Spaatz and Eisenhower had hoped.

The crews that made this possible never forgot the flak and fighters they encountered. ■

Rebecca Grant is a contributing editor of Air Force Magazine. *She is president of IRIS Independent Research in Washington, D.C., and has worked for RAND, the Secretary of the Air Force, and the Chief of Staff of the Air Force. Grant is a fellow of the Eaker Institute for Aerospace Concepts, the public policy and research arm of the Air Force Association. Her most recent article, "Operation Gomorrah," appeared in the March issue.*

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The Wars of Eigh

An Israeli F-15 pulls behind a Syrian MiG-23. This scenario recalls the 1982 Bekaa Valley war, in which the IAF shot down 86 Syrian MiGs. Israel took possession of this MiG-23 after its pilot defected to Israel, with his aircraft, in 1998.

IDF/AF Magazine via Tsahi Ben-Ami

Twenty-five years ago this spring, two short and intense armed conflicts—fought in widely separated theaters—delivered a jolt to military thinking. Defense establishments the world over vigorously debated all of the "lessons learned" from the small wars of 1982. They still do.

In the first, Britain and Argentina came to blows over the Falkland Islands, bleak South Atlantic outposts whose ownership had long been in dispute. This war, which ran from April 2, 1982 until Argentina's surrender on June 14, 1982, boiled up like a sudden storm and vindicated some basic military truths.

The second war played out in more familiar terrain—that corner of the Mideast where Israel, Syria, and Lebanon converge. Starting on June 9, 1982, and for two weeks thereafter, Israel's Air Force tangled with Syrian air and ground forces. In the end, the reputation of high technology soared.

The United States had no direct role in either, but the equipment and tactics used by the winning sides were familiar to Americans then—and are even more familiar now.

These wars provided the first real tests for state-of-the art US and NATO equipment. F-15, F-16, and Harrier fighters, along with AIM-9 Sidewinder missiles and French Exocet anti-ship weapons, were stars of the battles. Modern versions of these systems still serve as front-line weapons.

Military men still heed the conflicts' lessons, the most prominent of which

ty-Two

In the South Atlantic and the Middle East, two short air wars taught some lasting lessons.

By Adam J. Hebert, Senior Editor

was that the side with the better training and leadership is tough to beat—and is almost impossible to beat if it also possesses advanced weapons.

At the time, victory for the US allies didn't seem like such a sure thing.

Many wondered how Britain would manage to defeat a numerically superior foe while fighting at the end of a logistics tail that stretched more than 7,000 miles away from its home ports and bases. And because of Syrian weaponry emplaced throughout Lebanon's Bekaa Valley, many wondered whether fighters would be obsolete in the face of modern integrated air defenses.

Most especially, critics doubted that complex, high-tech equipment would work as advertised in the crunch of combat.

The Falklands War began with a strategic miscalculation on the part of Argentina's ruling junta. Britain had held the Falklands, a pair of islands 300 miles east of Argentina's southern tip, since 1833, but Argentina had never given up claim to the islands, which it called Islas Malvinas.

On March 19, Argentine scrap workers were laboring on the island of South Georgia, another British dependency east of the Falklands. Unexpectedly, they raised the flag of Argentina and refused to let British authorities stamp their passports.

London did not immediately respond to this provocation, a fact noted in Buenos Aires. The junta calculated Britain would not act to save the Falklands and would merely cede possession of the islands, which had just 2,000 inhabitants and scant economic or strategic significance.

Argentina invaded the Falklands on April 2. After a brief firefight, the Falklands governor ordered the garrison's 84 Royal Marines to surrender to the more than 500 Argentine invaders. Argentina also occupied South Georgia and the South Sandwich Islands.

To Argentina's great surprise, Britain's reaction was instant and warlike. Led by Prime Minister Margaret Thatcher, the nation quickly chose to stand and fight. Three days after the invasion, lead elements of a British task force set sail to retake the islands.

The task force's 7,000-mile voyage took nearly a month. The nearest British-owned staging location was Ascension Island—a spit of land 3,900 miles away from the Falklands—with a modest airfield. This would be a naval campaign, but airpower was the clincher for both sides throughout.

As an RAF history of the campaign noted, "British forces were equipped and trained to fight a war in Europe as part of NATO," so to suddenly fight an expeditionary war with no prospect of local basing "meant that everything previously accepted as operational doctrine had changed."

Britain cobbled together every available asset, commandeering cruise ships as troop transports and freighters as supply ships. The RAF hastily added refueling capability to its Vulcan bombers. The Vulcans were due to be replaced by shorter-range Tornado fighters, but they were spared retirement for the duration of the Falklands campaign.

On April 25, Britain's lead ships were within several hundred miles of the Falklands. That day, Royal Marines retook South Georgia from a token Argentinian force. Soon, the 7,000-man invasion force would encounter 10,000 dug-in defenders on the Falklands.

Vulcan Surprise

The RAF had Vulcans, Nimrod surveillance aircraft, and Victor tankers based at Ascension and ready to perform long-range missions. The first strike from the British forces came May 1 and was a masterpiece of mission planning. From Ascension, two Vulcan bombers (one was a backup) and 12 Victor tankers took off for the mission to disable—but not destroy—the main Falklands airfield at the capital of Stanley.

Achieving total surprise, a Vulcan dropped 21 separate 1,000-pound bombs on the airfield. One cratered the main runway. Others damaged facilities and parked aircraft. Minutes later, 18 Sea Harriers from the carriers *Hermes* and *Invincible* hit the airfields at Stanley and Goose Green and set up combat air patrols.

The Vulcan attack had critical aftershocks. If the RAF's long-range bombers could reach the Falklands, the junta reasoned, they could also reach Buenos Aires. Argentina's Mirage III fighters were soon committed to air defense. In effect, they sat out the war.

Argentina had reasonably high-quality aircraft. Its most formidable elements were 78 US-built A-4 Skyhawks and five French Super Etendard fighter-bombers. The Skyhawks were old but still served in many militaries, including the US Marine Corps.

The Super Etendards had only recently arrived from France. Each was equipped with an Exocet anti-ship missile, which would be used to devastating effect.

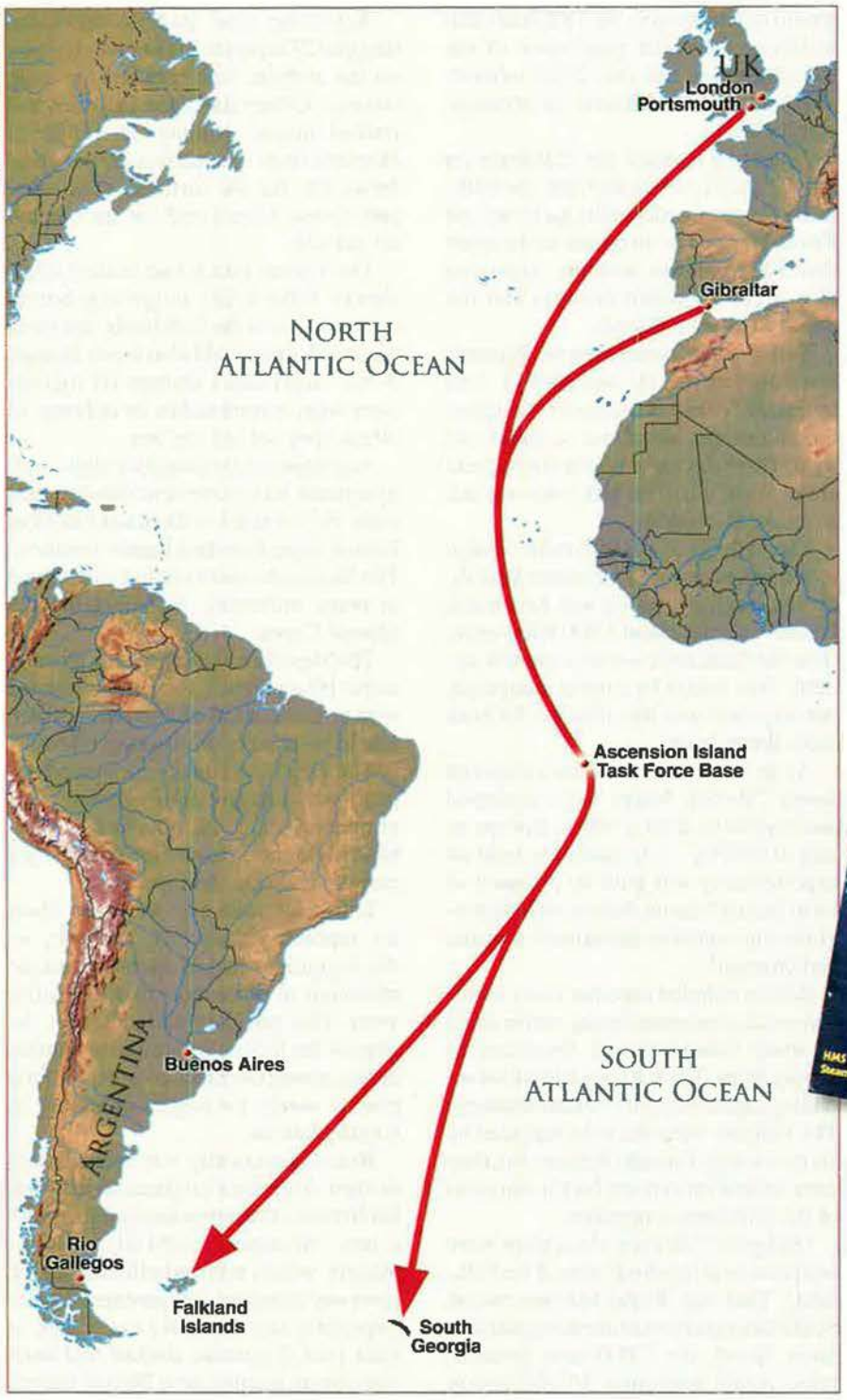
The Day One attacks convinced Argentina that an amphibious assault was imminent. The junta launched 40 land-based fighters to attack the Royal Navy's carriers and assault ships.

Falklands runways were too short for modern jet aircraft, however, so the Argentines had to operate from the mainland, at bases more than 400 miles away. This put the Falklands near the edge of the fighter's unrefueled combat radius, giving the attackers precious little time to search for targets or engage in lengthy battles.

British superiority was immediately evident. Argentina's fighters were faster, but Britain's Harriers were equipped with a new "all-aspect" AIM-9L air-to-air missile, which allowed pilots to attack from any direction. (Argentine missiles required a tail shot.) By day's end, at least four Argentine aircraft had been shot down, against zero British losses.

The next day, HMS *Conquerer,* an attack submarine, sank the *General Belgrano,* Argentina's second largest warship, with loss of 321 sailors. A stunned junta pulled back its Navy, including its only carrier. This greatly simplified Britain's task and further increased the importance of airpower for both sides. Airpower was all Argentina had left.

And it was quite a bit, as was demonstrated on May 4. Two Argentine pilots flying Super Etendards, convinced they had found the carrier *Hermes,* launched a pair of Exocets. One of the sophis-



ticated weapons, skimming at Mach 1 just above the water, locked on to HMS *Sheffield,* a destroyer, and struck amidship just above the waterline. The weapon, which miraculously did not explode, nevertheless tore through the hull and set the warship on fire. Twenty sailors died, and *Sheffield* sank six days later.

Over the next two weeks, Britain marshaled its arriving forces and staged air attacks on key targets. Argentina knew that its best hope was to defeat the invasion force, because once the highly trained British troops went on the offensive, there would be little hope for poorly trained Argentine conscripts.

The invasion began May 21. Argentina launched 75 combat aircraft to attack the invading force. They sank one frigate and damaged four others. Operating at the very end of their combat range, they had little room for maneuver. Britain shot down 13 enemy aircraft.

The Super Etendard-Exocet combination proved deadly again on May 25. A missile struck the converted container ship *Atlantic Conveyor,* one of the task force's two primary supply ships, and killed 12 men. *Atlantic Conveyor* later sank with most of the task force's tents and 10 helicopters.

Fortunately for Britain, Argentina soon ran out of Exocets and failed to obtain more, despite its best efforts.

Over the next days, attacking aircraft sank another Royal Navy frigate and hit two landing craft. Fifty British troops died in a June 8 attack on the landing ship *Sir Galahad.* The carnage would have been worse if Argentina's bombs worked properly; about half of those that hit ships failed to explode.

The problem was poor fusing. Argentine pilots flew at extremely low altitudes to survive, but their bombs were designed for drops from higher altitudes. Many did not have time to properly arm. Some passed straight through ships they hit.

For the Falklands campaign, Britain was forced to scrap its NATO-based war plans. Britain hastily assembled a task force to recapture the islands, 7,000 miles away. A* Newsweek *cover of the time played off the 1980 movie "The Empire Strikes Back."

Argentinian airmen continued to score hits on the task force, but also suffered horrendous losses. The Sidewinder-armed Sea Harriers were brutally effective. They fired 27 AIM-9Ls and scored 24 hits, destroying 19 enemy aircraft.

British troops, now ashore, made short work of the cold and demoral-

ized Argentine garrison. On June 14, it surrendered.

For Britain, however, the war had been no walkover. Argentina's naval and air force aviators generally performed with skill, bravery, and success. Britain never achieved air superiority around the islands, and British ships were under threat of air attack to the bitter end. Attacking aircraft regularly managed to get through combat air patrols, wreaking havoc.

All told, the Falkland Islands campaign took the lives of 255 British troops and three civilians. The Royal Navy and RAF lost 34 aircraft. Yet the Falklands remain part of the British Empire.

The task force's inability to achieve air superiority or protect the fleet from marauding Argentinian fighters highlighted Britain's need for an effective airborne early warning capability. In 1986, the RAF ordered six E-3 AWACS aircraft, and Britain now flies a fleet of seven AWACS.

Argentina coughed up more than just the islands it had seized. It suffered 746 fatalities and lost about 100 aircraft, of all types, to a wide variety of causes. It also lost the cruiser *General Belgrano.*

Furious Argentinians soon threw out the junta that had led it into the Falklands disaster, and democratic elections were held in 1983. The RAF's history of the campaign had this observation: "One result of the Falklands conflict was the liberation of the Argentine people."

The Bekaa Valley

As the Falklands War was reaching its climax, another high-intensity war—this one an air war—was about to begin. On June 3, 1982, PLO terrorists attempted to assassinate the Israeli ambassador in London. The next day, the Israeli Air Force staged 60 air strikes against PLO targets in southern Lebanon. The PLO responded with large-scale artillery and rocket attacks on Israel.

On June 6, 1982, Israel launched a major ground invasion of Lebanon, in an effort to eliminate the PLO as a military threat and wipe out the Syrian military presence in Lebanon.

Syria had been preparing for this event for a long time. In 1973, the IAF suffered heavy losses to Egyptian air defenses at the beginning of the Yom Kippur War. In response, Syria had invested heavily in a Soviet-designed integrated air defense system, which it set up in Lebanon's Bekaa Valley—a transit point between Beirut and Damascus.

Staff map by Zaur Eylanbekov

Lebanon's Bekaa Valley is a key transit point between Beirut and Damascus, Syria. Syria loaded the valley with advanced Soviet anti-aircraft systems, in hopes of destroying the Israeli Air Force. It was not to be.

But Israel had also learned the lessons from the previous war and had spent the intervening nine years developing ways to counter enemy air defense networks. And while "Operation Peace for Galilee," as Israel called it, had the look of a spontaneous reaction to the assassination attempt, Israel had actually been preparing for a year for this specific mission.

The main air campaign against the surface-to-air missile sites in the Bekaa Valley began on June 9. The Israelis had mapped out the locations of 19 SAM batteries and their associated radar sites and knew the Syrian radar and communications frequencies. Israel had also set up dummy radar sites in the Negev desert so its pilots could practice attack missions.

The air war began with a slew of Israeli unmanned aerial vehicles over the valley, followed by strike packages. With the strike force in the air, Syria recalled its fighters to give the land-based air defenders free reign to shoot at anything overhead.

Syria's itchy trigger fingers would come back to haunt them as air defense radars stayed on and anti-aircraft gunners showed a lack of firing discipline.

Israeli Scout, Mastiff, and Firebee UAVs drew fire intended for manned aircraft and were able to keep constant track of the enemy radar and missile sites, relaying real-time data to the Israeli commanders.

Then, from the strike packages, cluster bombs and anti-radiation missiles rained down on the SAM sites, and 10 of the 19 SAM batteries were hit within 10 minutes, some by artillery. For Syria, the worst was yet to come. All 19 SAM sites were destroyed within two hours —with no Israeli losses.

This forced Syria to scramble its fighters to prevent the IAF from having free reign over the battlespace. The result was one of the largest dogfights since World War II, with top-of-the-line Soviet MiG-21 and MiG-23 fighters going head-to-head against the then-new F-15 and F-16. The battle turned into a rout of historical proportions.

Israel now held every advantage. It had newer, more capable aircraft, a monopoly on airborne early warning capabilities, and a cadre of battle-

IDF/AF Magazine via Tsahi Ben-Ami

After Israeli UAVs and strike aircraft wiped out the Syrian SAMs and radar sites, Syria was forced to scramble its fighters. Israeli F-15s and F-16s then routed the Soviet-built MiGs. These IAF F-15s show their kill markings from the war.

hardened pilots. Israel knew the enemy communications frequencies and had the capability to jam them, it had the new AIM-9L, and it even possessed greater numbers of aircraft.

85 to Nothing

Israel's AWACS capability meant it knew where Syrian aircraft were the minute they took off, and the Syrian pilots themselves found their communications jammed, leaving them on their own against the coordinated Israeli defenses. This was especially problematic for Syria because the nation practiced Soviet-style control, in which ground-based commanders typically micromanaged the pilots.

"Within half an hour, we shot down about 26 MiGs," David Ivry, who was second in command of the IAF at the time, previously told *Air Force* Magazine. (See "The Bekaa Valley War," June 2002, p. 58.)

Two days of air combat ended with the Syrian air forces decimated and the IAF basically untouched. Claims vary widely, but Israel says it shot down 85 MiGs with no air-to-air losses. This was all in air combat—the IAF never went after air bases, and it never went into Syrian airspace.

A margin of 85-to-nothing sounds preposterous. It is the sort of result that various dictatorships and communist regimes have claimed in battles against democracies over the years and is not unlike the assertion in the Soviet military newspaper *Red Star* that Syria shot down 67 Israeli aircraft in the battle, including F-15s and F-16s.

In a 1984 RAND report, Benjamin S. Lambeth noted that "we cannot rule out the possibility that much of the press comment that has appeared on the Bekaa Valley operation has been a product of intentional Israeli disinformation, both to protect the more sensitive aspects of IAF operational tactics and perhaps also to exaggerate the image of Israel's combat prowess for its psychopolitical effect."

But no matter whose version you believe, Israel and its largely American equipment undeniably trounced Syria and its front-line Soviet equipment. Even Syria acknowledged the loss of 60 aircraft while claiming just 19 kills.

As was the case in the Falklands, advanced Sidewinder missiles resulted in most of the kills. The MiG-21 and MiG-23 were victimized equally.

Israel said 37 F-15s shot down 40 Syrian jets with no losses, and 72 F-16s downed an additional 44 Syrian fighters. An IAF F-4E accounted for the final air-to-air kill. Two or three IAF fighters are believed lost to ground fire.

The battle also discredited the argument, in vogue at the time, that sophisticated aircraft were too complex, and therefore unreliable, to be effective. The IAF reportedly maintained 100 percent readiness for its F-15s and F-16s throughout the Bekaa Valley battle.

As Lambeth noted, "This performance record drove a stake through the heart of the argument, most vocally propounded in James Fallows' *National Defense,* ... that there is an inverse correlation between the sophistication and operability of modern fighter aircraft."

After the war, the Soviet Union quickly dispatched several teams to Syria to seek out possible systemic problems in the hardware the Soviets were shipping to client states worldwide.

The equipment was part of the problem, but Syria was outclassed by Israeli skill as well. Lambeth reported a sarcastic story circulated in Soviet circles: "A Syrian general, upon being told by his Soviet patrons that he already had the best Soviet surface-to-air missiles, replied that what he really needed were some good surface-to-air*craft* missiles!"

The lesson was that it is hard to stop the combination of sophisticated weapons and quality training. It is a lesson that resonates even today. In 1982, Syria lacked both and was routed by the better-prepared Israeli Air Force.

Thousands of miles away, the performance of Argentina's pilots—equipped with a handful of advanced weapons—was a lone bright spot in that nation's battle against Britain over the Falklands. They were done in by geography, poor bomb maintenance, and poor leadership.

Britain had put together a masterful and unexpected expeditionary campaign that made the most of its advanced weapons and highly skilled troops. Britain achieved everything but air superiority around the Falklands. That flaw meant British ground and sea forces were vulnerable through the conflict.

A quarter of a century later, the wars of 1982 can still teach quite a bit to anyone willing to learn. ■

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CONSTANT PEG

A tale of purloined MiG fighters, secret desert airfields, and double-wide trailers ...

By Peter Grier

WHENEVER a US pilot swept in over the desert, the first thing he noticed was how truly small the MiGs were. Their engines didn't smoke, and they didn't swiftly change from tiny dots into giant fighters, as was true of US aircraft. To find these MiGs, you had to visually scour small sections of the Nevada sky.

The Soviet-designed fighters were agile, too. In an engagement, the enemy's first turn would be eye-watering—unless, that is, the model in question was a MiG-23. Then, there typically was no turn at all. The MiG-23 would simply tear away so fast that it seemed like a Ferrari leaving Fords behind.

Then there was the visual impact of the insignia. This was only training, and adversaries were carrying sensor pods instead of missiles. For many US aircrews, though, there was something electric about seeing that red star on the side of an enemy fighter during the height of the Cold War.

For more than a decade, until just before the November 1989 fall of the Berlin Wall, a secret Air Force aggressor unit flew Soviet MiGs in more than 15,000 sorties against US Air Force, Navy, and Marine Corps pilots.

Neither current nor former Air Force members will discuss how and where the US obtained the Soviet-designed aircraft. However, that information remains classified.

During the Cold War, however, there were rare instances of communist pilots defecting with their aircraft, and, in the late 1970s, Egypt shifted from being a Soviet-supplied adversary to a US-equipped ally.

The locus of this activity was the 4477th Test and Evaluation Squadron, based at a remote airfield at Tonopah Test Range, which itself was set in the desolate desert north of Las Vegas. Facilities there were spartan. For years, on-site personnel lived in double-wide trailers, with the roofs weighed down by tires so they wouldn't blow off in high desert winds.

The squadron's very existence was highly classified. Exercise participants all pledged in writing to keep quiet about the MiGs, on pain of losing their careers. The aircraft themselves were routinely shunted indoors or sent aloft at times when US intelligence calculated Soviet spy satellites would not be overhead.

Late last year, USAF finally declassified this MiG effort, officially

named "Constant Peg." Air Force officials thought that it was time to recognize the generation of pilots and maintenance personnel who made good use of the sometimes balky and often dangerous aircraft of the West's main adversary.

"You knew you were part of a select group doing very important work," said retired Brig. Gen. David L. Stringer, chief of plans and programs for the 4477th from 1980 to 1983. "The challenge was significantly greater than what you had in the ordinary Air Force."

For example, ask "Hawk" Carlisle how he got lucky. Therein lies a tale about the challenges that faced elite pilots who flew Constant Peg's MiGs.

Facing page: Cigar-shaped MiG-17s such as the one shown served as North Vietnam's primary fighter. Here: The MiG-23, a model that was built for speed, was nevertheless unstable and difficult to fly.

Today, Brig. Gen. Herbert J. Carlisle is commander of the 3rd Wing at Elmendorf AFB, Alaska, but from 1986 to 1988 he was chief of weapons and tactics for the 4477th. One day he put a MiG-23 Flogger into a flat spin and had to eject. The Soviet-designed seats were equipped with barometers that deployed parachutes once they fell to a certain altitude. When the squadron commander arrived to retrieve him, Carlisle said they were going to have to turn the barometers up. He'd hurtled well below the ridges of the surrounding mountains before his chute opened.

Carlisle "was lucky he was over the valley," said the squadron commander in question, retired Col. John T. Manclark, who is now USAF's director of test and evaluation.

Typically the 4477th had a constant stable of 16 aggressor pilots. Most were from the Air Force, though the mix often included Navy and Marine personnel. All had the problem of flying aircraft for which they'd had little formal training, with no manuals, and no access to anyone who'd designed the fighters or flown them for more than a few hours.

Their accident rate was 100 per 100,000 flying hours, according to former squadron officials—far higher than the rate for domestic Air Force aircraft. Two pilots died in crashes. The Air Force has only released the name of one—Capt. Mark F. Postai, whose family only last year learned he died at the controls of a MiG-23.

They Flew Three MiGs

Unconfirmed reports in various publications have long held that Lt. Gen. Robert M. Bond was flying a MiG when he died in a 1984 crash in Nevada airspace. Bond, however, was "not connected to the [Constant Peg] program," said Air Force spokeswoman Maj. Dayan Araujo, declining to answer further questions on the subject.

Over the course of its history, from 1977 to 1988, the 4477th pilots flew three models of Soviet-designed MiGs.

MiG-17 Frescos were a subsonic, early jet aircraft design. Though originally meant to counter American bombers of the 1950s and 1960s, durable, cigar-shaped MiG-17s became North Vietnam's primary fighter and eventually served in at least 20 air forces worldwide.

MiG-21 Fishbeds were cone-nosed, supersonic fighters that were somewhat less maneuverable than MiG-17s. They also saw action with the North Vietnamese and became a popular export aircraft, with more than 8,000 produced.

MiG-23 Floggers were the MiG-21's replacement. Their swing-wing was patterned on that of the F-111, but unlike their US antecedent, the MiG-23s were small and light enough to serve as dogfighters.

On the whole, the aircraft weren't as capable as US models, say those who flew them. Their fit and finish were vastly inferior, characterized by such defects as protruding rivets.

That does not mean they could be written off. Far from it. "They performed very well for the state of technology they had," said Manclark.

All the models had quirks. The MiG-17 did not have an electric seat, so pilots had to use cushions to position themselves properly inside the cockpit. Both it and the MiG-21 had pneumatic brakes applied by squeezing a lever on the front of the stick. Many of the MiG-21s did not have steerable nose gears, making them difficult to taxi; the sign of a novice Fishbed pilot was the zigzag track he made while moving on the ground.

"The real trick was to taxi fast enough so the rudder worked," said Manclark.

If a pilot put the throttle back on a MiG-21, it would take a long time to spool up again when trying to accelerate. Thus many of those who flew it stayed on afterburners as much as possible. The MiG-23 did not have that problem, as it was designed for speed—but it was unstable and difficult to fly.

Constant Peg pilots would typically fly MiG-23s only after they had acquired extensive experience on the other Soviet models. "The guys really didn't like flying the 23," said Manclark. "They were scared of them."

None of the Soviet-designed aircraft at Tonopah flew in bad weather or at

Photos from Andrey Zhirnov/FoxtatFiles.com

night. All were very short-legged, compared to contemporary US aircraft, and sorties were limited to 20 minutes or so. The MiGs had US airspeed indicators and a few other minor instrument and safety modifications. Other than that, they were stock—down to their Warsaw Pact paint jobs.

None of the squadrons that arrived at Nellis or NAS Fallon, Nev., for training with the 4477th were supposed to know that they were going to face an aggressor squadron flying Soviet-designed aircraft. Unofficially, however, almost all the trainee pilots had heard stories about the MiGs.

On the second day of their stay, incoming squadrons would take their first flight up to Tonopah. The Constant Peg pilots had a picket line of T-38s up in the air to tell them of the students' arrival. When it was time, they took off from their desert strip and rose up to greet their guests.

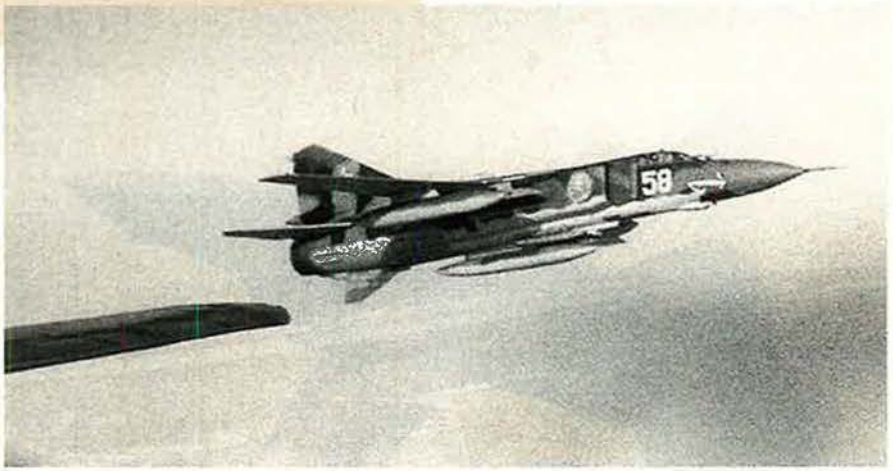
The mere shock of their presence accomplished one of the main goals, participants say. Even if the student pilots knew what was coming, nothing could prepare them for the shock of seeing an unfamiliar airframe with a real red star, edged in white and black. Far better that they have that experience over Nevada, than somewhere over Western Europe in some future war.

"You were really trying to get the 'Oh my God' factor away from people," said Stringer, who recently retired as commander of the Arnold Engineering Development Center, Arnold AFB, Tenn.

The Constant Peg pilots would show how quickly they could pull a MiG-17 nose around, or roll a MiG-21, or run. If he tried to turn, officials said, you owned him.

For the Constant Peg pilots, the point was not to win every engagement. If the student pilots paid attention, eventually they would do well. "I think people left there with a lot more confidence in what they were going to do," said Manclark.

If flying the MiGs was hard, keeping them in the air was a tremendous challenge. One day, the Constant Peg maintenance shop noticed it was running out of MiG-21 brakes. With no place to buy any off the shelf, they sent out some worn brakes for duplication.



MiG-21s, such as the one at top, were cone-nosed supersonic fighters, but were less maneuverable than the MiG-17. The Constant Peg pilots found that a MiG-23, such as the one shown here, had one chance to make a pass and run. Once the pilot tried to turn, he was done.

how a MiG-23 could out-accelerate anything. However, given the expense of running the MiGs, and their limited number, the Air Force used great caution in preparing these engagements. Eventually they would progress to two students vs. one MiG, or two on two. Every day of the weeks-long stay, the combat problems would get tougher.

Eventually, the student pilots would learn new tricks to deal with the enemy. Example: Don't try and turn with a MiG-17 from behind, because he'll just turn tighter and you'll overshoot him. Instead, go vertical, then fly up and down in a sort of sewing machine stitch.

Maintenance Nightmares

The MiG-21 could also turn abruptly; you didn't want to fight one at low speed. Again, the answer was to use the more powerful engines of the US fighters to make it a vertical engagement.

And the MiG-23? Well, the Flogger pilot was going to make one pass and

Six weeks and untold dollars later they got back a brand-new set of worn-out brakes. The new parts had been made to look exactly like the old.

The maintainers of the 4477th were just as responsible as the pilots for the program's success, say former officials of the squadron. Unlike the pilots, who commuted in every day on a transport from Nellis (where they would brief and debrief their students), the maintainers lived at Tonopah five days a week. Their housing was in the trailers, which were impossible to keep dust-free. They were allowed to wear civilian clothes and have nonmilitary haircuts so they could blend with the few locals.

Like the pilots, the maintainers had elite skills. For transport, they built vehicles from scrap. At the beginning of the program, they had to cook their own food. "It was truly more or less pioneer days," said Stringer.

The maintainers' first problem was

that the MiGs were not built to last. The Soviet design philosophy was based on consumption; they made a lot of any given aircraft, expecting they would break down and be discarded. The cheapness of the materials used in some of the MiG engines limited their expected life span to 500 hours, for example. For the 4477th, which had no access to Soviet factories, that wasn't good enough. The crew members had to do something to make them last.

This led to the second maintenance problem—the lack of instruction manuals and tech data. US intelligence supplied some of the information they needed but not nearly enough, as far as Constant Peg officials were concerned.

Parts were their third, and maybe biggest, problem. "For things like hydraulic pumps, we would use American components that looked about right," said Stringer. "But it was only about five to 10 percent replacement. Most of the time we tried to recondition."

The MiG-17s were straightforward, but eventually the 4477th crews lost faith in the engines. It was an obsolete airframe, in any case, flown mainly by developing nations, so the MiG-17 was phased out in 1981.

The MiG-21 had a few more problems than the MiG-17, including spotty fuel couplings. One day, the fuel couplings of a MiG-21 failed and caught fire as the crew was testing its engine on the trim pad. "Fortunately, it was right across the street from the fire station," said Stringer.

It was the MiG-23 that was the maintainers' nightmare. The Flogger was a compromised design, in the US view. Made light for speed, the airframe didn't have sufficient strength. The wing box which carried the weight of the swing wings was particularly prone to cracks.

USAF photo by John Rossino

Here, Brig. Gen. Herbert Carlisle speaks to the press at an F-22 rollout at Elmendorf AFB, Alaska. While chief of weapons for the Constant Peg project, Carlisle survived an ejection from a MiG-23.

Eventually the cost of keeping the MiGs in the air caught up to the program. By the late 1980s, the decline of communist rule in the Soviet Union made Constant Peg seem anachronistic. The Air Force ended the program in March 1988.

However, the MiGs of Tonopah went out with a big last hurrah. Toward the very end of the program, the 4477th sent up 10 MiG-21s, four MiG-23s, and a couple of T-38s, all at once. A Blue Force of US aircraft had deployed from bases across the country, then hit tankers and continued in to Nevada. Their mission: Fight their way into a target area, drop bombs, and fight their way out.

Electronic pods on both the MiGs and the attackers sent back images that could be monitored on the ground. When a MiG was "killed," it would go back and fly a low approach at Tonopah and then regenerate, as if another airplane had been launched.

The whole thing was about as close to actual combat as an American pilot could aspire to, without actual shooting.

"I think everybody was proud of their work there," said Manclark of the time when the only opportunity for the Air Force to fly against the enemy's aircraft was to head to Nevada. ■

Putting the MiGs to Good Use

Constant Peg was a natural outgrowth of the frustration many Vietnam-era pilots had with the structure of their training.

At the time, USAF tactics dictated a four-man, welded-wing formation for such fighters as the F-4. It was a configuration designed for combat with machine guns, with two aircraft serving as shooters, and two wingmen preventing adversaries from getting in close enough to attack the leaders.

In Vietnam, though, the enemy used missiles. A MiG could launch a tailshot from a mile back. In addition, the welded wing was unwieldy, taking as long as 30 seconds to turn 180 degrees.

As Vietnam veterans began to filter into the Air Force Fighter Weapons School and other training institutions, tactics began to change. The combat veterans established ways to turn the welded wing faster. They developed a two-aircraft fluid two formation.

Significantly, aggressor programs slowly took shape, with Weapons School instructors using Navy A-4s to simulate MiG-17s.

In this context, the idea of using actual MiGs seemed a natural next step. "It was a logical progression, in my opinion," said now-retired Col. Gaillard R. Peck Jr., the first commander of the 4477th at Tonopah.

US intelligence technology exploitation programs such as Have Drill-Have Ferry, and Have Doughnut began pulling MiGs apart to study their strengths and weaknesses as early as the 1960s. And so, one day in the mid-1970s, Peck found himself briefing Maj. Gen. Charles L. Donnelly Jr., Air Force deputy director of plans and policy, on the idea of a training program featuring actual MiGs.

Donnelly thought it sounded good. He said he'd provide the airplanes if Peck, then a tactics officer based at the Pentagon, could produce an airfield. Peck asked Donnelly if he had a call sign. It was "Constant."

Wandering back to his Pentagon office, Peck thought of his wife, Peg. He recalls thinking, "Constant Peg" had a nice ring to it, "and that's what it became."

Peter Grier, a Washington editor for the Christian Science Monitor, *is a longtime defense correspondent and a contributing editor to* Air Force *Magazine. His most recent article, "Chief McKinley" appeared in the November 2006 issue.*

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EMA

AFA National Report

natrep@afa.org

By Frances McKenney, Assistant Managing Editor

Gala Salutes USAF's 60 Years

The 23rd annual Air Force Gala sponsored by the **Central Florida Chapter,** in conjunction with February's Air Warfare Symposium, celebrated 60 years of USAF history. During the program portion of the black-tie formal in Orlando, the audience took a look back at some milestones in those first six decades and learned how they tie in to the Air Force today.

Master of ceremonies for the program was Chapter President John Timothy Brock, who wove together USAF's past and present achievements in his remarks. He noted that air-to-air combat tactics in the Korean War laid the foundation for air superiority, exemplified today in the F-22. Representing the legacy of air superiority, F-22 pilot Maj. Paul Moga and F-22 crew chief SSgt. Brian Sarafin were brought on stage.

Brock next noted that the Vietnam War was a foundation for close air support. A-10 pilot Capt. Brian Erickson and ground forward air controller TSgt. Wesley Bloechle received recognition as today's practitioners of CAS.

The Air Force's Cold War mission of nuclear deterrence was represented by two Minuteman missile combat crew members, Capt. Jason Whitman and 1st Lt. Phillip Patrick. "Even today," said Brock, "the Minuteman is still poised to protect our freedom."

Through technical superiority, air and space forces in the past gained the upper hand against tyrants, genocide, and terrorists, Brock told the audience. Today the defense industry and Air Force Laboratory bring technical superiority to bear in the War on Terror through, for example, the Predator unmanned aerial vehicle. Predator pilot Capt. Mark Ferstl and sensor operator SrA. William Swain represented this legacy.

MSgt. John Harbaugh, a computer network superintendent, stepped on to the stage to highlight what is the latest battlefield challenge, cyberspace.

Gen. Ronald E. Keys, commander of Air Combat Command, and the Central Florida Chapter's Tommy G. Harrison, this year's gala chairman, presented award plaques to the airmen.

In other presentations that evening, H. Ross Perot Jr. and retired Maj. Gen. Edward F. Grillo Jr. were named AFA H.H. Arnold Fellows. Perot is chairman of the Air Force Memorial Foundation's board of trustees. Grillo is the foundation president. Perot also received a $10,000 donation from the chapter for the memorial, bringing Central Florida Chapter's total contribution to the foundation to $200,000.

Photo by Dan Higgins

At the Air Force Gala in Orlando, Fla., AFA Board Chairman Bob Largent (second from right) and (l-r) gala chairman Tommy Harrison, AFA Vice Chairman, Aerospace Education, Boyd Anderson, and Central Florida Chapter President John Timothy Brock show the audience the chapter's latest donation to AFA. Funds raised by the gala for AFA's educational programs now total nearly $600,000.

The chapter wrapped up more than two decades of gala sponsorship with the presentation of a $45,000 donation to AFA. Chairman of the Board Robert E. "Bob" Largent and L. Boyd Anderson, the Vice Chairman, Aerospace Education, accepted the funds.

Capital Connection

Several **Lincoln Chapter (Neb.)** members parlayed a business trip to Washington, D.C., into a meeting between Nebraska's Congressional leaders on Capitol Hill and AFA's top elected officials.

In February, Jerry J. Needham, the Nebraska state president and an **Ak-Sar-Ben Chapter** member; Robert A. Athan, the **Lincoln Chapter** president; Lang W. Anderson III, the Lincoln Chapter VP; Steven H. Plamann, the chapter membership VP; Jon Fago; and Bradley Musick flew to Andrews AFB, Md., on Air Force business.

Since they were going to be in Washington anyway, they had scheduled meetings with their US Senators and Congressmen to discuss USAF active duty, Guard, and Reserve topics. After arriving in Washington, they learned that AFA Chairman of the Board Largent and AFA Vice Chairman of Field Operations Joseph E. Sutter were introducing themselves at numerous Capitol Hill offices, too. (See "AFA In Action.") The Nebraskans invited the AFA officials to join forces with them.

Together, they met the entire Nebraska delegation: Sen. Chuck Hagel (R), Sen. Ben Nelson (D), Rep. Jeff Fortenberry (R), newly elected Rep. Adrian Smith (R), and Rep. Lee Terry (R). They were also invited to take reserved seating at a Senate Foreign Relations hearing on Iraq.

Needham said this made the Cornhuskers' visit "more successful than we had dared hope."

Two weeks earlier, the Nebraska AFAers had met with the state governor, David Heineman (R). They spoke to him about Air Force active duty and reserve issues and invited him to their AFA events. Heineman graduated from West Point and served in the Army from 1970 to 1975.

A Gift of Art

At Offutt AFB, Neb., last fall, the Airman Leadership School moved into a newly renovated space. It was a great improvement over the school's former facility, but its walls were starkly bare—until the **Ak-Sar-Ben Chapter** stepped in.

Following the renovation, Offutt organizations began sponsoring displays at the school, aiming to highlight Air Force heritage. Chapter President John D. Daly asked AFA for suggestions on how to contribute to this effort, and the association responded with a donation from the AFA Art Collection.

The collection is a group of 16 reprints of paintings that depict historic events from USAF's first half-century. The artist, as well as someone associated with the event, has signed each print. For example, the print called "Staying Power, Berlin 1948-1949" is signed by artist Gil Cohen and by the Berlin Airlift "Candy Bomber," retired Col. Gail S. Halvorsen, a **Salt Lake City Chapter** member.

Ak-Sar-Ben Chapter's former president Mike Cook donated a 17th print, of an RC-135 Rivet Joint, to represent one of the primary missions of Offutt's 55th Wing.

The chapter bought framing material for the prints, and chapter member Bob Atkins framed all 17 pieces of art.

On Feb. 7, chapter members, including former AFA Chairman of the Board James M. McCoy, presented the collection to Col. Curtiss R. Petrek, 55th Wing vice commander, and MSgt. Melissa B. Lutat, ALS flight chief. The Airman Leadership School is named for McCoy, who was USAF's sixth Chief Master Sergeant of the Air Force.

Smooth Sailing

The **Gen. Nathan F. Twining Chapter (Fla.)** selected a mother-daughter duo, Reguli and Regula E. Granger, as its Science Student of the Year and Science Teacher of the Year.

The chapter chooses the winners for these awards from among the entries in the annual Pinellas Regional Science and Engineering Fair, held in Seminole. As the Twining Chapter president, Henry L. Marois Jr. has been invited to be a judge at the February competition for the past six years. This time, he asked several fellow judges what entry they deemed as outstanding. They pointed him to the experiment called "The Effects of a Sailor's Mass on the Speed of a Laser Radial Sailboat."

It was submitted by Reguli Granger, a homeschooled 10th-grader from St. Petersburg and, for the past five years, a competitive sailor. Laser Radial sailboats, just under 14 feet long, are designed for a single sailor.

Marois said experienced sailboat operators, like himself, would have guessed that a lighter crew means a faster boat. However, Reguli's experiment proved that, for the Laser sailboats, at least, heavier is better. This is because a heavier sailor is able to keep the boat more upright and this, in turn, keeps the sail in its most efficient position, making the boat go faster.

At the "Granger Home High School," Regula Granger is the principal, athletic director, advisor, and—as Reguli's instructor—now also the Twining Chapter's Science Teacher of the Year.

Scholarships for Cadets

The **Miami Chapter** awarded $7,500 in scholarships to six AFROTC cadets at the University of Miami.

The chapter's aerospace education VP, Stanley J. Bodner, attended a Det. 155 assembly at the university in February and presented scholarships to cadets

Nathaniel Lesher, Elkin Medina, Alain Percial, Fernando Perez, and Nicholas Thomas. Also named as a scholarship recipient was cadet Brandon Viani.

Bodner said that since 1993, the chapter has distributed more than $300,000 in scholarships through its nonprofit South Florida Aerospace Scholarship Foundation. He said that the basic funds were raised through donations from a private nonprofit organization and chapter members and through silent auctions conducted at the South Florida Air Force Ball.

Michigan's Teacher of the Year

Michigan AFAers recently honored Laura A. Speegle as their state Teacher of the Year 2006.

Thomas C. Craft, the state president and a **Mount Clemens Chapter** officer, presented the 4th- and 5th-grade science teacher with her award at a November faculty meeting of the Elizabeth Courville Elementary School in Detroit.

Speegle has taught in Detroit for 14 years and uses an aviation- and aerospace-oriented approach to motivate her students. They have built whirligig, glider, and seltzer-propelled rocket models. Speegle has taken them on field trips to Selfridge Air National Guard Base to participate in Starbase. This is a federally

AFA In Action

The Air Force Association works closely with lawmakers on Capitol Hill, bringing to their attention issues of importance to the Air Force and its people.

AFA Meets Newcomers to Congress

AFA's top leaders spent three days in January and February meeting newly elected members of Congress.

AFA Chairman of the Board Robert E. "Bob" **Largent,** the Vice Chairman of Field Operations Joseph E. **Sutter,** and AFA President Donald L. **Peterson** visited 39 offices on Capitol Hill.

They met 26 freshmen Representatives and professional staff members from the offices of 13 others.

The AFA officials introduced the association and its mission; discussed the value of joining the Congressional Air Force Caucus; and explained how AFA can serve as a resource to help members of Congress serve their constituents. They also invited the members and staffers to the many AFA Congressional Education Programs held throughout the year on the Hill.

At many offices, the AFA leaders learned that they were the first military association officials to visit since the freshmen representatives arrived on Capitol Hill.

The AFA officials met House Armed Services Committee members Rep. Nancy **Boyda** (D-Kan.), Rep. Kathy **Castor** (D-Fla.), Rep. Brad **Ellsworth** (D-Ind.), Rep. Kirsten E. **Gillibrand** (D-N.Y.), Rep. Joe **Sestak** (D-Pa.), and Rep. Carol **Shea-Porter** (D-N.H.).

They met new members of the House Veterans' Affairs Committee: Rep. Gus M. **Bilirakis** (R-Fla.), Rep. Phil **Hare** (D-Ill.), Rep. Doug **Lamborn** (R-Colo.), and Rep. Timothy J. **Walz** (D-Minn.).

The AFA leaders also met Rep. Michael A. **Arcuri** (D-N.Y.), Rep. Michele **Bachmann** (R-Minn.), Rep. Mary **Fallin** (R-Okla.), Rep. Maizie K. **Hirono** (D-Hawaii), Rep. Paul W. **Hodes** (D-N.H.), Rep. Jim **Jordan** (R-Ohio);

Rep. Nick **Lampson** (D-Tex.), Rep. Harry E. **Mitchell** (D-Ariz.), Rep. Christopher **Murphy** (D-Conn.), Rep. Heath **Shuler** (D-N.C.), Rep. Albio **Sires** (D-N.J.), and Rep. Betty **Sutton** (D-Ohio), Rep. Tim **Walberg** (R-Mich.), and Rep. Charles A. **Wilson** (D-Ohio).

Professional staff members were: Matt **Benham** from the office of Rep. Gabrielle **Giffords** (D-Ariz.), Evan **Brennan,** from the office of Pennsylvania Democrat Rep. Jason **Altmire,** Gilliam **Carroll** with the office of Rep. Zachary T. **Space** (D-Ohio), Tobin **Dietrich** with the office of Rep. Jerry **McNerney** (D-Calif.), Jeff **Gabriel** from the office of Rep. Christopher **Carney** (D-Pa.), Mike **Goodman**, Rep. Bruce **Braley** (D-Iowa);

Eric **Jotkoff** in the office of Rep. Tim **Mahoney** (D-Fla.), Ryan **McConnahey** at the office of Rep. John **Hall** (D-N.Y.), Chris **Montana,** Rep. Keith **Ellison** (D-Minn.);

Virginia **Neale** with the office of Rep. Ron **Klein** (D-Fla.), Greg **Sacchinao** from the office of Rep. Dean **Heller** (R-Nev.), and Kirsten **Sutton** in the office of Rep. Peter J. **Roskam** (R-Ill.).

As a former longtime Georgia resident, Largent particularly enjoyed meeting Rep. Henry C. **Johnson Jr.** (D-Ga.).

Sutter, who calls Knoxville, Tenn., home, had the opportunity to meet with his home state's Republican Rep. David **Davis** and with staffer James **Park,** from the office of Rep. Steve **Cohen** (D).

In addition, Nebraska AFAers helped open some doors on Capitol Hill, using their connections. See "Capital Connection," p. 91.

AFA encourages state and chapter organizations to be a part of the association's "Election 2006" program by making appointments to meet with district or state staff members of newly elected members of Congress.

The Air Force Office of Legislative Liaison is in the process of providing the newcomers with opportunities to meet senior USAF leaders and to attend events where Air Force initiatives and programs are explained.

Sen. Chuck Hagel (R-Neb.) welcomed a visit by AFA's Vice Chairman, Field Operations, Joe Sutter (right). The Lincoln Chapter arranged the meeting.

Meet an Air Force Chief of Staff

Congressional staffers recently attended a lunchtime roundtable with retired Gen. John P. **Jumper,** who was Air Force Chief of Staff from 2001 to 2005.

AFA prides itself in facilitating such meetings, which allow USAF leaders to share their thoughts and ideas with key personnel on Capitol Hill.

funded program that demonstrates the real-world application of math, science, and—particularly through its aircraft at the military base—technology. Starbase also provides hands-on math and science activities.

Speegle had earlier received an AFA Educator Grant and used the $250 to purchase model rocket kits for her students.

Job Well Done

In February, the **Northern Shenandoah Valley Chapter** hosted the Virginia State Meeting, with former Air Force Chief of Staff Gen. John P. Jumper as the dinner's guest speaker. Joseph Sutter, AFA Vice Chairman of Field Operations, also attended the meeting and spoke at the dinner, held at Randolph-Macon Academy in Front Royal, Va.

During the evening, the chapter acknowledged a job well done by a neighboring state's Air National Guard unit, many of whose members belong to the chapter. Norman M. Haller, chapter VP, and Raleigh H. Watson Jr., membership VP, presented a Resolution of Appreciation to the 167th Airlift Wing, Eastern West Virginia Arpt., W.Va. The award recognized the unit's contribution to the Global War on Terror. Col. William R. Gain, the 167th air commander, and

CMSgt. John Alderton accepted the award for their unit.

Thomas G. Shepherd, chapter leadership development VP, introduced the keynote speaker, Jumper, who spoke to the audience about his experiences as USAF Chief of Staff. Jumper and Scott P. Van Cleef, the Virginia state president, presented the state's Teacher of the Year award to Marty Rothwell.

An engineering and physics teacher at Chantilly (Va.) Academy, Rothwell had earlier been named the **Gen. Charles A. Gabriel Chapter's** Teacher of the Year.

At the same dinner, retired Maj. Gen. Henry M. Hobgood, president of Randolph-Macon Academy, received a Resolution of Appreciation from the Northern Shenandoah Chapter. The award noted that the chapter was formed in 1992 on the initiative of two academy staff members, Ivan G. Mieth and William E. Sneath.

More Chapter News

■ The **Montgomery Chapter** in January wrapped up its fund-raising campaign for the Enlisted Heritage Hall at Gunter Annex, Maxwell AFB, Ala. CMSgt. Malcolm W. McVicar Jr., the EHH director, accepted a check for $126,236.06 from Chapter President Thomas W. Gwaltney and VP Robert M. Clowers. CMSAF Rodney J. McKinley was on hand to help celebrate the successful fund drive. The donation helps pay for exhibits in the EHH's new 3,000-square-foot addition called the Berlin to Baghdad Wing. Gwaltney said chapter members, enlisted USAF personnel worldwide, and businesses pitched in to help. The chapter even raffled off a sheet metal panel from the Air Force-sponsored NASCAR race car.

■ The Civil Air Patrol cadets thought it was "cool" when they got to meet the Air Force Academy hockey team and several retired Air Force officers. The opportunity came at an academy vs. Rochester Institute of Technology game in February and at the postgame reception hosted by the **Genesee Valley Chapter,** RIT's AFROTC Det. 538, and academy parents groups from Rochester and Williamson. The CAP cadets were introduced to retired Lt. Col. Kent W. Hemphill, who is the chapter's aerospace education VP, and retired Brig. Gen. William C. Rapp, from the **L.D. Bell-Niagara Frontier Chapter.** The cadets were undaunted by the academy hockey team's loss to RIT; CAP cadet Missy Mortimer said, "The greatest part of the evening came during the reception when each academy player autographed an Air Force shirt for the squadron."

■ A Vietnam War Marine Corps veteran addressed the **Columbus-Bakalar Chapter (Ind.)** in February, recounting some of his experiences at several air stations. Zack Ellison, who enlisted in 1968 and in his civilian career became an engineer, also spoke about his role in creating the Bartholomew County Memorial for Veterans. The memorial is located at the county courthouse and consists of 40-foot-tall limestone columns, inscribed at the base with the names of 171 men and one woman from the area who gave their lives in military service in the past century. ■

Reunions

reunions@afa.org

2nd Bombardment Assn. Oct. 11-14 at the Marriott North at Greenspoint in Houston. **Contact:** Kemp Martin, 806 Oak Valley Dr., Houston, TX 77024 (713-464-0401) (kmartin1@pdg.net).

5th AF, Hq & Hq Sq, 314th Composite Wg (WWII and Korea) and **5th Bomb Command** (WWII). Sept. 16-20 in Dayton, OH. **Contact:** Louis Buddo, Box 270362, St. Louis, MO 63127 (314-487-8128).

5th/108th Station Hospital (WWII). Sept. 16-20 in Dayton, OH. **Contact:** Jeff Seabock, P.O. Box 3635, Hickory, NC 28603 (828-324-6464).

5th Bomb Gp, 13th AF, Pacific Theater (WWII), including the **23rd, 31st, 72nd, 394th Bomb Sqs,** and the **4th Recon Sq.** Sept. 6-10 in Montgomery, AL. **Contact:** Lockwood Scoggin, 2116 Greenview Dr., Montgomery, AL (334-281-4665) (lockbarr@knology.net).

80th Service Gp, 5th AF (WWII). Sept. 16-20 in Dayton, OH. **Contact:** Virgil Staples, 306 E. Watson St., Garnavillo, IA 52049.

99th BG (WWII). Oct. 4-8 at the Best Western Bradbury Inn in Savannah, GA. **Contact:** David Hill, 5385 Gwynne Rd., Memphis, TN 38120 (dohill@att.net).

306th BG (WWII). Sept. 12-16 at the Doubletree Hotel in Dayton, OH. **Contact:** Robert Rockwell, 229 Beverley, Munster, IN 46321 (219-836-5745).

394th BG, including **584th, 585th, 586th,** and **587th Bomb Sqs** (WWII). Aug. 23-27 in Casper, WY. **Contact:** Elden Shook, P.O. Box 277, Enon, OH 45323 (937-864-2983) (shook585@aol.com).

405th Signal Co., 5th AF. Sept. 16-20 in Dayton, OH. **Contact:** Phil Treacy, 2230 Petersburg Ave., Eastpointe, MI 48021-2682 (810-775-5238).

502nd Tactical Control Gp, 5th AF (Korea). Sept. 16-20 in Dayton, OH. **Contact:** Fred Gorsek, 445 S. State St., Greenview, IL 62642 (217-968-5411).

526th FS, Landstuhl, Germany, all years and ranks. Sept. 6-9 in Rapid City, SD. **Contact:** Wayne Rebischke, 1200 2nd Ave., South Buffalo, MN 55313-1217 (763-682-2685 or 612-716-0948) (wkreb@att.net).

A-37 Assn. Sept. 6-9 in Fairfax, VA. **Contact:** Ollie Maier, 306 Village West Dr., San Marcos, TX 78666-9436 (512-353-7432) (omaier@txstate.edu).

AFN/AFRTS (1940s to present). June 29-July 2 at John Ascuaga's Nugget Casino Resort in Reno, NV. **Contact:** Tom Scanlan (906-458-1265) (tomandsue@pasty.com).

Air Force OCS Class 58-A. Sept. 11-13 in Council Bluffs, IA. **Contact:** Don Aldridge, 1004 Lincoln Rd., PMB 168, Bellevue, NE 68005-2361 (402-293-0543) (daldridge@cox.net).

CBI Hump Pilots. Sept. 5-9 at the Doubletree Hotel in San Diego. **Contact:** Nick Hudson, P.O. Box 489, Deer Park, WA 99006 (qwantumconf@aol.com).

Pilot Class 43-K, including all flying training commands and flying schools. Aug. 22-26 at the Holiday Inn-Airport in Dayton, OH. **Contacts:** Hal Jacobs, 5404 Victory Ct., Fairfield, CA 94533 (707-436-4959) (jakes43k@aol.com) or Tom Schuler, 149 Cincinnati Cir., Monroe, OH 45050 (513-539-7185) (t-schuler@sbcglobal.net).

Pilot Training Class 67-G, 3645th PTS, Laughlin AFB, TX. April in Atlanta. **Contact:** George Tymitz (270-312-4015) (timex2@bbtel.com).

Pilot Class 63-A, Webb AFB, TX. Oct. 12-14 at the Crystal City Marriott in Arlington, VA. **Contact:** Bud Utendorf, 1021 South Collier Blvd. #502, Marco Island, FL 34145 (239-393-9129) or 222 South Dwyer Ave., Arlington Heights, IL 60005 (847-259-2331) (aeubud@sbcglobal.net). ■

E-mail unit reunion notices four months ahead of the event to reunions@afa.org, or mail notices to "Unit Reunions," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information. We reserve the right to condense notices.

AFA Conventions

April 20-21	**Ohio State Convention,** Dayton, Ohio
May 4-5	**South Carolina State Convention,** Columbia, S.C.
May 11-12	**Tennessee State Convention,** Chattanooga, Tenn.
June 8-10	**New York State Convention,** Albany, N.Y.
June 23	**Pennsylvania State Convention,** State College, Pa.
June 29-30	**California State Convention,** Sacramento, Calif.
July 14	**Florida State Convention,** Daytona Beach, Fla.
July 27-28	**Colorado State Convention,** Denver
July 27-29	**Texas-Oklahoma State Convention,** Wichita Falls, Tex.
Aug. 11	**Georgia State Convention,** Warner Robins, Ga.
Aug. 25	**North Carolina State Convention,** Raleigh, N.C.
Sept. 22-23	**AFA National Convention,** Washington, D.C.
Sept. 24-26	**Air and Space Conference,** Washington, D.C.

Airpower Classics

Artwork by Zaur Eylanbekov

Bf 109

In the story of World War II air combat over Europe, a prominent place must be given to Messerschmitt's Bf 109, the German Luftwaffe's best fighter. The Bf 109 became famous early for its duels with RAF Spitfires in the Battle of Britain. Later, it pressed relentless attacks against US and British bombers attacking German cities.

The Bf 109 was sinister-looking and tricky to handle. When it first flew in 1935, it instantly became the world's most advanced fighter and was still a workhorse a decade later. The 109 blended superior climb, dive, and handling traits with astonishing speed, and was beloved by pilots, despite its limited visibility and shaky, narrow-track landing gear. Even when the later FW 190 entered the force, some German aces insisted on sticking with the Bf 109. The 109 had a tiny but sophisticated airframe, with automatic leading edge slots, trailing edge slotted flaps, and slotted ailerons that helped low-speed characteristics. The all-metal Bf 109 featured a single spar wing and slender fuselage. However, it had short legs; in the desperate fighting over Britain, the Bf 109's fighting time was limited to about 20 minutes, and thus it lacked the staying power needed to win its most important fight.

The Bf 109 was versatile, flying missions of air superiority, escort, intercept, ground attack, and reconnaissance. However, it will be best remembered as the aircraft that scored more kills than any other in World War II—the fighter that always showed up for the fight.

—Walter J. Boyne

This aircraft: Bf 109E-4/N—*#5819*—as it looked in December 1940, when flown by then-Lt. Col. Adolf Galland. Note 58 victory bars (Galland ended with 104), Mickey Mouse emblem, chevron and bars of a wing commander, S on JG.26 shield, and yellow nose and rudder from the Battle of Britain. Note also the protruding telescope for long-range IFF and yellow symbol for high-octane C3 fuel.

A German Bf 109 in flight in 1942.

In Brief

Designed by Messerschmitt ★ built by Messerschmitt, others ★ first flight May 28, 1935 ★ crew of 1 ★ number built 33,675 (German production only) ★ **Specific to Bf 109G:** one Daimler-Benz DB 605A-1 engine ★ armament (typical) one 20 mm nose cannon, two 7.9 mm machine guns in cowling ★ max speed 406 mph ★ cruise speed 365 mph ★ max range 324 mi ★ weight (loaded) 7,055 lbs ★ span 32 ft 6 in ★ length 29 ft 7 in ★ height 8 ft 2 in.

Famous Fliers

Top three German aces: Erich Hartmann (352 kills), Gerhard Barkhorn (301), Gunther Rall (275). **Notable:** Adolf Galland, fighter chief 1942-45. **Aces with 150+ kills:** Heinrich Erhler, Hermann Graf, Gordon Gollob, Anton Hafner, Walter Krupinski, Helmut Lipfert, Hans-Joachim Marseille, Walter Nowotny, Johannes Steinhoff.

Interesting Facts

Production highest of any Western combat aircraft ★ "Bf" prefix from *Bayerische Flugzeugwerke A.G.*, forerunner of Messerschmitt ★ first model used Rolls Royce engine ★ Israeli Bf 109s fought Egyptian Spitfires in 1948 war ★ 10 main variants ★ Spanish Bf 109s used in 1969 film "Battle of Britain" ★ first displayed at 1936 Olympic Games in Berlin ★ five percent destroyed in landing accidents.

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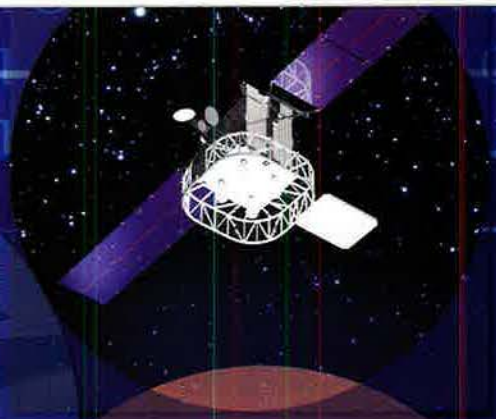

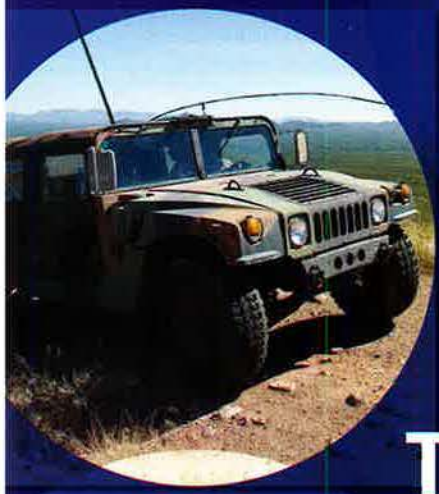

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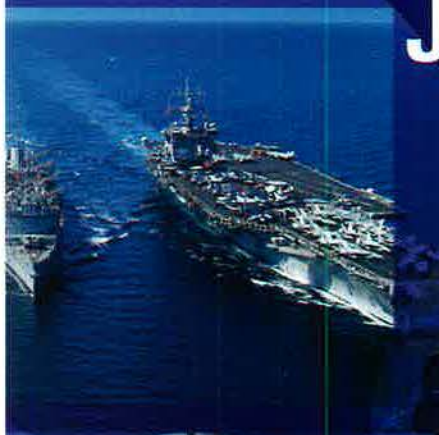

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