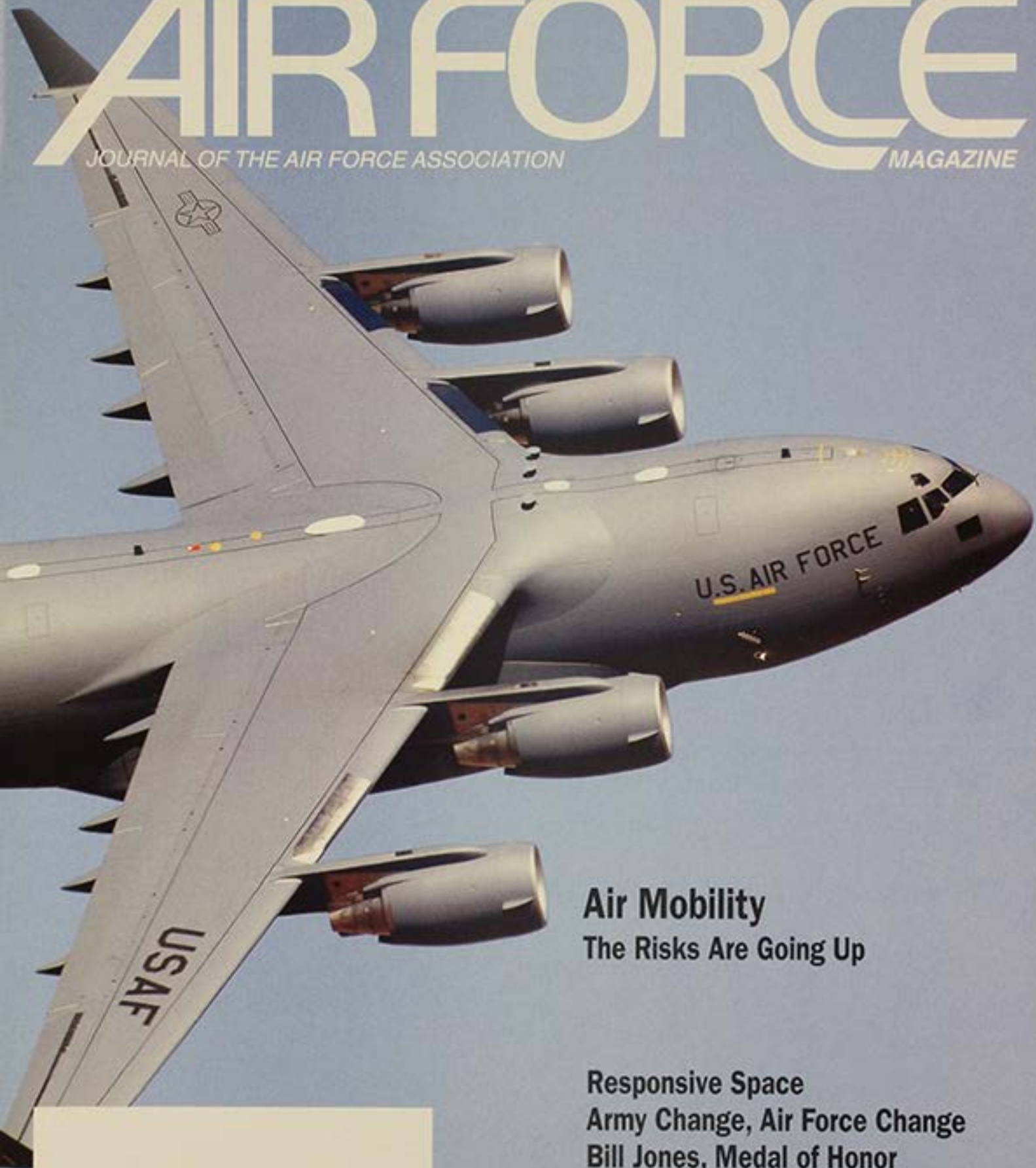


March 2006/\$4

AIR FORCE

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MAGAZINE



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By Robert S. Dudley, Editor in Chief

The QDR Has Landed, Sort Of

WASHINGTON, D.C., FEB. 16, 2006

IN times past, the Pentagon's big "quadrennial" reviews of US forces, weapons, and strategy provided specificity. Service force structure was projected in some detail. After the 1993, 1997, and 2001 reviews, the Air Force was authorized the equivalent of 20 fighter wings, a certain number of bombers, and so on. The same was true for the other services.

Things are different now. The Bush Administration's new Quadrennial Defense Review, unveiled on Feb. 6, put forth what it called a "refined" force-planning standard, but left hazy the actual size of the future force itself. Unlike the three previous QDRs, this one contained some puzzling gaps.

Secretary of Defense Donald H. Rumsfeld has kept in place a major provision of the previous planning standard—the requirement for forces able to win two near-simultaneous conventional campaigns (formerly known as "Major Theater Wars")—even as he puts more emphasis on homeland defense and combat with terrorist networks. The question is: What forces will be available to support this broad national defense strategy?

The lack of detailed information has raised questions about the sufficiency of the force. Rep. Duncan Hunter (R-Calif.) asserts the QDR was "a budget-driven exercise." Hunter, chairman of the House Armed Services Committee, is leading an effort to sort out what he sees as "actual" force requirements, as opposed to what the White House is willing to finance.

The QDR reports that the Air Force will organize itself around "86 combat wings." That number, however, covers all operational categories—fighter, bomber, transport, tanker, ISR, battle management, command and control, air operations center, space, and missile. Nowhere did the QDR break out what has always been the key category—wing equivalents of fighter-attack aircraft.

DOD now thinks in terms of broad "capabilities," rather than specific forces. The 92-page QDR document mentions 10 categories. USAF is particularly deeply engaged in Joint Air Capabili-

ties, Joint Mobility Capabilities, Intelligence-Surveillance-Reconnaissance, and Tailored Deterrence.

■ **Joint Air Capabilities.** Within this grouping, the QDR elevates long-range strike aircraft over fighters. The relevant section of the final report says US airpower "must be reoriented" to emphasize "systems that have far greater range and persistence; larger and more flexible payloads; ... and the ability to

**The question is:
What forces will be
available to support
this broad national
defense strategy?**

penetrate and sustain operations in denied areas."

The QDR calls for a new land-based, long-range strike system by 2018. The goals are ambitious. The report says that, by 2025, the Air Force will increase LRS capabilities by 50 percent and the "penetrating component" of LRS by "a factor of five." Yet no one seems able to state publicly the basis of the latter figure. When queried, top Pentagon official Ryan Henry said, "Specifically, how one's going to do it, we don't have the answers right now."

The QDR says nothing at all about fighter force structure. What we do know is that the Pentagon has cut the F-22 program in half, dropping it from the 381 fighters the Air Force said it needed to only 183, and suggests reductions in the F-35 program.

■ **Joint Mobility Capabilities.** The Pentagon said it plans to acquire 180 C-17s (fewer than anticipated by many observers) and 112 upgraded C-5s. DOD is also said to be "considering" the acquisition of a future KC-X aerial tanker to replace its old fleets of KC-135s. Even so, the QDR noted it would "continue to pursue enabling technologies" for innovative logistics ideas such as sea-basing of forces, which would leave open the question of the future size of the fleet. The

Pentagon maintains that a combination of sea-basing, overseas presence, enhanced long-range strike, "reachback" capabilities, and pre-positioning of combat gear all will influence the size of the mobility force.

■ **ISR Capabilities.** The Pentagon is putting lots of chips on unmanned aerial systems. It wants the Air Force to buy 13 Global Hawks over the next two years, phasing out its manned U-2 fleet as unmanned systems grow in strength. USAF will be increasing the size of its Predator UAS fleet but to an unspecified level. The QDR is equally vague about USAF's other ISR assets.

■ **Tailored Deterrence.** In the field of long-range nuclear forces, the QDR report announces that USAF's Minuteman III force will take a 10 percent cut, dropping from 500 to 450 ICBMs. Air Force officials said the 50 were "excess to our strategic needs." Still, Pentagon officials do not specify the future size of the ICBM force, or the Navy's strategic submarine force, for that matter.

Undoubtedly, the Pentagon knows the specifics of current and future service forces. However, Rumsfeld evidently wishes to play down these specifics as he moves to reshape the US military and the part played by each service.

The QDR, in fact, recommends that spending be structured by joint capability area rather than by specific service. Undersecretary of Defense Kenneth J. Krieg, DOD's top acquisition official, wishes to find a way to buy systems on a joint basis, rather than by service. Defense officials soon will experiment along these lines in the area of ISR, logistics, and command and control.

It could be that the Pentagon is following an internal timetable and may yet provide complete force structure data. That certainly would be a good thing, because, without such information, it is not possible to assess the Pentagon's power to carry out the national defense strategy.

Congress should insist that Rumsfeld provide the kind of force structure data it has required in the past. Until he does so, his comprehensive defense assessment can't really be assessed. The only grade we can give it is "incomplete." ■



Side by Side with The Air Force.

GENERAL DYNAMICS
C4 Systems

Battle Damage From the QDR

Thank you for [the] excellent summary of the QDR battle taking place in Washington [*Editorial: Battle Damage From the QDR*, January, p. 2]. I am continually amazed that the Air Force must keep justifying its existence and that the policy-makers do not see the crux of the issue at hand. There are two ways to destroy an enemy—in hand-to-hand combat or with firepower.

The ancient warfighters, such as the Roman legions, destroyed their enemies using hand-to-hand combat methods. However, with the advent of firearms, every army that could employ firepower used it in place of hand-to-hand combat. Firepower offered the obvious advantage of killing the enemy before he could reach you—unlike hand-to-hand combat where both combatants are about equally vulnerable to being wounded or killed. The ultimate goal when employing firepower is to use something lethal with longer range than what the enemy has so that you wipe him out before he can employ his firepower or close-in hand-to-hand combat. Ground armies all adopted firepower in the form of improved firearms, artillery, and other weapons.

Air forces offered even greater advantage as the firepower could be employed from the sky, generally out of reach of the enemy on the ground. The only disadvantage of airborne firepower, such as a bomber aircraft, is that it is harder to identify and hit the enemy than it is with a man on the ground, such as a rifleman. However, this disadvantage is fast disappearing as the US Air Force keeps perfecting intelligence-surveillance-reconnaissance assets, which can find and see the enemy, and precision munitions, which can hit the enemy.

We can foresee the day in the near future when a nearly invulnerable airborne platform can employ firepower that is as deadly and as pinpoint accurate as a sniper with a perfect view and perfect cover, picking off individual enemy soldiers—or terrorists—at will. The advantage of this type of combat force is plain to anyone who thinks for a moment.

Rather than using the centuries-old method of employing firepower, where we put a man with a rifle in harm's way to try to find and kill the enemy, now we have an airborne weapon—and eventually a spaceborne one—from which we can employ firepower with relative impunity. The QDR described in the editorial will sadly delay this development and instead perpetuate the old method of firepower, using ground soldiers who have proven to be more and more vulnerable to our enemies.

Lt. Col. Bryan Holmes,
USAF (Ret.)
Watertown, Conn.

"Battle Damage From the QDR" leaves me saddened and very disappointed. After 24-plus years of service, I believe I am on safe ground when I say, "The military is our very finest citizens." More is expected of them than any group of Americans.

My second tour to [Southeast Asia] was in EB-66E jamming aircraft, modified RB-66Bs from the 1950s. We night-refueled from KC-135A tankers, and they were 15 years old at the time. That was then; this is now!

It is, indeed, sad to realize that the world's wealthiest nation, the world's most noble nation, cannot or will not provide the very best to those who voluntarily put themselves in harm's way to protect this great nation. To not give them the best (and the most) is unconscionable!

Do you have a comment about a current article in the magazine? Write to "Letters," *Air Force Magazine*, 1501 Lee Highway, Arlington, VA 22209-1198. (E-mail: letters@afa.org.) Letters should be concise and timely. We cannot acknowledge receipt of letters. We reserve the right to condense letters. Letters without name and city/base and state are not acceptable. Photographs cannot be used or returned.—THE EDITORS

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It is my sincere hope and prayer that reason will prevail, and our fine aircrews will be given these fine aircraft to protect us all. Failure to provide the best will put this nation at great risk.

Perhaps two wise sayings would describe this situation. One: "You have never lived until you have almost died. For those who have fought for it, life has a special flavor the protected will never know." Two: "Nothing is more terrible to see than ignorance in action."

Maj. James S. Stipe,
USAF (Ret.)
Apache Junction, Ariz.

Strategy of Desert Storm

In "The Strategy of Desert Storm," January 2006 [p. 26], John T. Correll has once again written a superb account, as is customary for him. He is an exceptional writer who does excellent research and uses great support materials and interview quotes to flesh out his articles. I always enjoy reading John's work, which generally leaves me feeling better informed.

Having said that, however, his Air Force bias generally comes through in his articles. In a lengthy, but well written article, John devotes just three paragraphs to Army claims. Just once I wish someone would write a fair and balanced account that acknowledges Desert Storm was a joint effort that could not have been won by any single service. Each contributed to the mosaic whole that made victory possible.

Unfortunately, each time we win a war or battle or police action, or whatever terms are politically correct at the moment, each service rushes to take a disproportionate share of the credit. Because each service is in a constant struggle to justify its budget and mission, most of the articles tend to read with a decided slant toward the bias of the writer. *Air Force Magazine* articles invariably read as though the Air Force won Desert Storm single-handedly and the Army just mopped up after the battle was won. But articles in *Army Magazine* read as though Desert Storm was won in 100 hours of armored combat in the desert, and the Air Force contribution was only incidental to the victory.

I suspect the truth is somewhere in the middle of the hyperbole. It is also interesting that neither Air Force supporters or Army supporters give even passing mention of the Marine Corps contributions to that war, which is a shame because the Marines engaged the enemy in some of

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Can't we just acknowledge that all the services played important roles in that historic victory?

Lt. Col. Donald L. Gilleland,
USAF (Ret.)
Suntree, Fla.

■ *John Correll replies: "The Strategy of Desert Storm" was not basically about the competing service "claims," as you call them. It was mainly about the development of the strategy, and the article treated the Army perspective at length. There was considerable pressure—some of it coming from Tactical Air Command—to go with a traditional ground strategy. The individual most responsible for rejecting that was Gen. Norman Schwarzkopf, a soldier to the depths of his soul, who chose to begin with an offensive air campaign and stick with it until the enemy had been cut down to size.*

I would agree that the final ground attack was necessary to finish the war, and I have the highest respect for what the Army and Marine Corps forces did. By that time, though, the Iraqis were reeling. They were no longer capable of the actions that had been anticipated by some analysts six months earlier. The predicted US casualties had not

occurred. The war was long since past the point of decision.

You call for truth "somewhere in the middle." You seem to accord equal weight to the contributions of the 42-day air campaign and the four-day ground campaign in determining the outcome of the war. I don't think you can make the facts fit with such a conclusion.

John T. Correll's article on Desert Storm is excellent, though the introductory paragraphs seem too generalized. Parts of the Pentagon did see Iraq as an urgent problem—namely the services' intelligence and the Defense Intelligence Agency (DIA) saw clear indications and warning (I&W) that Iraq was going to invade Kuwait.

Following the Iran-Iraq war, Saddam had a large competent army that was also capable of overthrowing him, so he had to do something other than let them into Baghdad. Sending them to play "mad dog" on the Kuwaiti border every few months kept them occupied. In the game of "mad dog," you race your forces toward an opponent, stop short of the border and declare "military exercise." After playing wargames for a week or so, forces return to barracks. The Kuwaiti response was questionable diplomacy of asking Saddam to move his exercise elsewhere, and Kuwait would help "underwrite" the additional logistics expense, which can also be interpreted as payoff. As long as the games remained just games, then Iraq was indeed perceived as not likely to attack its neighbors, merely extort [them]. But after several rounds of "mad dog," the opponent is lulled into a false sense of security, whereupon the dog's chain is "slipped" for the last round, which becomes a full-scale assault.

As an intelligence applications officer at DIA, among the volume of I&W showing Iraq's invasion was imminent, the most prominent I recall was that the quantity of artillery rounds shipped to the Kuwait border in early July 1990 was 12 times that of previous exercises. No one ships that tonnage of rounds, consuming enormous logistics resources, for a mere exercise.

Mr. Correll's statement that intelligence assessments did not change appreciably when Saddam threatened military action on July 17, 1990, is counter to the fact that Pentagon concern about Iraq invading was urgently raised through the chain of command such that President Bush had US Ambassador April Glaspie meet with Saddam Hussein on July 25. Not to say that everyone in the Pentagon had the same level of concern, nor to discount the complex nature of Ambassador Glaspie's meeting with Saddam, which was influenced by State Department and CIA and included other important topics, but to say that the Pentagon "did

not see Iraq as an urgent problem" does not seem correct.

Paul Nanko
Herndon, Va.

The picture on p. 31 is not "as seen through the nose of a laser-guided bomb." This is an image from the IRADS targeting system on the F-117 stealth fighter. Images such as this one, and others, such as "the Luckiest Man in Iraq"—a truck just making it over a bridge before an F-117 destroyed the bridge—showed the folks back home what a great job our US armed forces were doing with precision targeting and laser-guided weaponry in the Desert Storm airpower campaign.

The debate of airpower vs. the ground war will continue, but perhaps the article would be more balanced if it also contained mention of the outstanding success of the US Army's M1 tank in the ground war. The M1's combination of "fire on the move" and long-range targeting against Iraq's Russian T72 tanks was key to the quick conclusion of the ground war. M1s were able to destroy T72s well beyond the range of the enemy's systems, resulting in a quick, decisive end to the "mother of all tank battles."

The bottom line is that *all* of the US armed services performed well in Desert Storm, the Kuwaitis were liberated, and the American public was supportive and well pleased with the results.

D. Gill
McKinney, Tex.

Terminal, Not Tactical

[In reference to] John A. Tirpak's article, "Eyes of a Fighter" [January, p. 40]:

You are not the only individual-organization guilty of butchering the acronyms ETAC and JTAC. A couple of years ago, I e-mailed the Air Force Chief of Staff concerning one of his "Sight Pictures" that gave kudos to the brave Air Force warriors who saved the Army's bacon during Operation Anaconda. Back in those days, they were known as ETACs, enlisted terminal attack controllers. The Chief was gracious enough to respond to my correction and apologized for his oversight. Although it might not seem like a big deal, rest assured that the men in the 1C4 career field notice the all-too-frequent instances of careless (lazy?) journalism. JTAC is the acronym for joint terminal attack controller, not "joint tactical air controller" as published in Mr. Tirpak's article.

Maj. Todd A. Craigie
Eielson AFB, Alaska

What a great article, what a great mission! Manned Predators? You're damned right we're manned, and we're

armed and dangerous! You guys at 9th Air Force, CENTAF, and "Hog Drivers" everywhere should be proud of your ability to provide real-time intel to the ground commanders to kill the enemy and to defend our troops in harm's way. You are carrying out a time-honored mission of supporting troops in contact (TIC), per the Vietnam era vernacular.

You carry on a mission lineage of the "long blue line" of your immediate predecessors, the A-1 Sandy drivers, and of the Navy AD-6 pilots who flew the attack and ground support missions in Vietnam. My friend, college roommate, fellow Air Force pilot, and AC-47 AC, the late Maj. Peter A. Larkin III, used to tell me how they supported TICs by spraying VC and NVA with mini-gun fire using iron sights and antique airplanes, while [the VC were] trying to kill our American soldiers and marines on the ground.

It gives me a warm fuzzy feeling to know you would be supporting our [folks] of the 3rd Infantry Division here from Savannah and Hinesville, Ga., and the new marines being turned out at Parris Island, S.C., with real-time intelligence about enemy activities. Get to know your ground counterpart; you'll like them.

It makes the saying "Forewarned is forearmed" hit close to home.

Michael W. Rea
Savannah, Ga.

McVicar's Legacy

The caption of your recent "Pieces of History" page titled "Miller's Legacy" [January, p. 80] contains an error. While you state that the depicted items are from the National Museum of the US Air Force at Wright-Patterson AFB, Ohio, they actually are part of my personal military memorabilia collection, left to me by my late father, CMSgt. Malcom W. McVicar Sr. They and other items were photographed by Paul Kennedy last summer.

My father was extremely proud of our rich Air Force history, as I am today. I have enjoyed seeing many items from his collections depicted within your magazine over the last several months, as they educate people on the pride we have in our heritage and history.

CMSgt. Malcolm McVicar
Director, USAF Enlisted Heritage
Research Institute
Enlisted Heritage Hall Maxwell
AFB, Ala.

■ *Chief McVicar is, of course, 100 percent correct about the items portrayed in "Miller's Legacy." Each one of them came from the personal McVicar collection. We regret the editing error which produced the caption mistake. We might add that artifacts from Chief McVicar's collection formed the basis of not only "Miller's Legacy" but also the previous*

the previous four back pages: "Stripes Through the Years" (September 2005); "From Air Forces to Air Force" (October 2005); "Milestones" (November 2005); and "From the Lithograph" (December 2005). While we noted the connection with Chief McVicar's collection in the first item, we did not do so in the others.—THE EDITORS

Tim Keating's Words

Regarding "A Few Words From Tim Keating" in the December 2005 issue of *Air Force Magazine* [p. 68]:

"The guys and girls who are flying the jets"?

With all due respect to the admiral, it seems to me that he might want to consider dropping back 10 and taking some "sensitivity training." With all of the problems that have come to light at both the Air Force Academy and [Annapolis], thoughtless remarks like these are the last thing we need.

David Wyllie
San Francisco

Khobar Towers: One More Time

I have read the various attacks and defenses of Brig. Gen. [Terry] Schwalier's performance with great interest over the years. I am sure that General Schwalier and his predecessors did everything they could to enhance the security and survivability of Khobar Towers. But I believe (and have not seen this aspect of the story discussed) that everyone has missed asking the most important question: Why were any troops living in Khobar Towers?

It is not widely known that the Khobar Towers buildings are not on the air base. The complex is across a road from the base, in a civilian area. It is also interesting to note that the Khobar quarters were four-star plush, resembling the DV suites at Langley.

I was the 1st CSG commander at Dhahran during Desert Shield-Storm. I and my SP commander (Army trained, Vietnam experienced, and a total professional) were greatly relieved when Khobar Towers was offered to the 1st TFW and turned down. While we were adamant that the Towers were impossible to defend, a primary reason for not moving to the Towers was that there was not a nearby gate into the air base. The logistics of moving people in and out through the existing gates was not workable. Whatever the reason, we were happy not to have to defend the place, which we saw as another Beirut waiting to happen.

As a remedy for our housing problems during Desert Storm, the Saudi base commander built a new complex,

called Eagle Town, deep inside the base, behind many yards of deep sand and wire, complete with a new pool, dining hall, recreation, and air-conditioned billets.

He built similar facilities next door for the Army, called Camp Jack and Camp Jill.

I went back to Saudi Arabia in 1992 as part of Operation Southern Watch. When I passed through Dhahran on my way home from Riyadh, I was appalled when I had to stay the night in Khobar Towers, in an outside room, facing the parking lot that is now so infamous. A new gate had been cut in the air base fence, fixing the travel problems of Desert Storm. Curious, I went to see Eagle Town and Camps Jack and Jill. They sat empty. Why did someone choose to use the off-base, difficult-to-defend Khobar Towers over the Spartan but comfortable on-base quarters that were so easy to defend? That is the question that should be asked. That decision doomed General Schwalier's career, not any deficiency on his part.

The critical question remains unanswered: Why were the on-base "cities" not used? Did someone choose plush over safety?

Col. David L. Peebles,
USAF (Ret.)
Huntsville, Ala.

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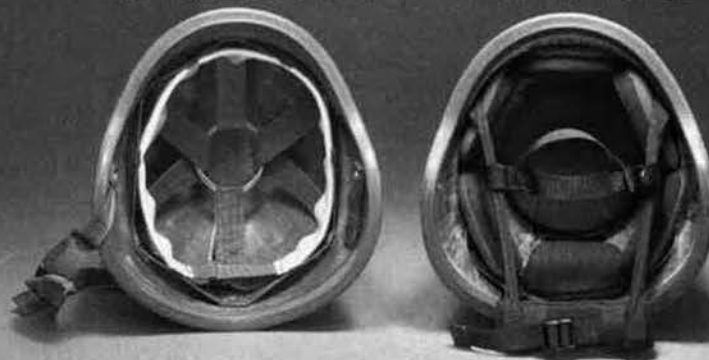
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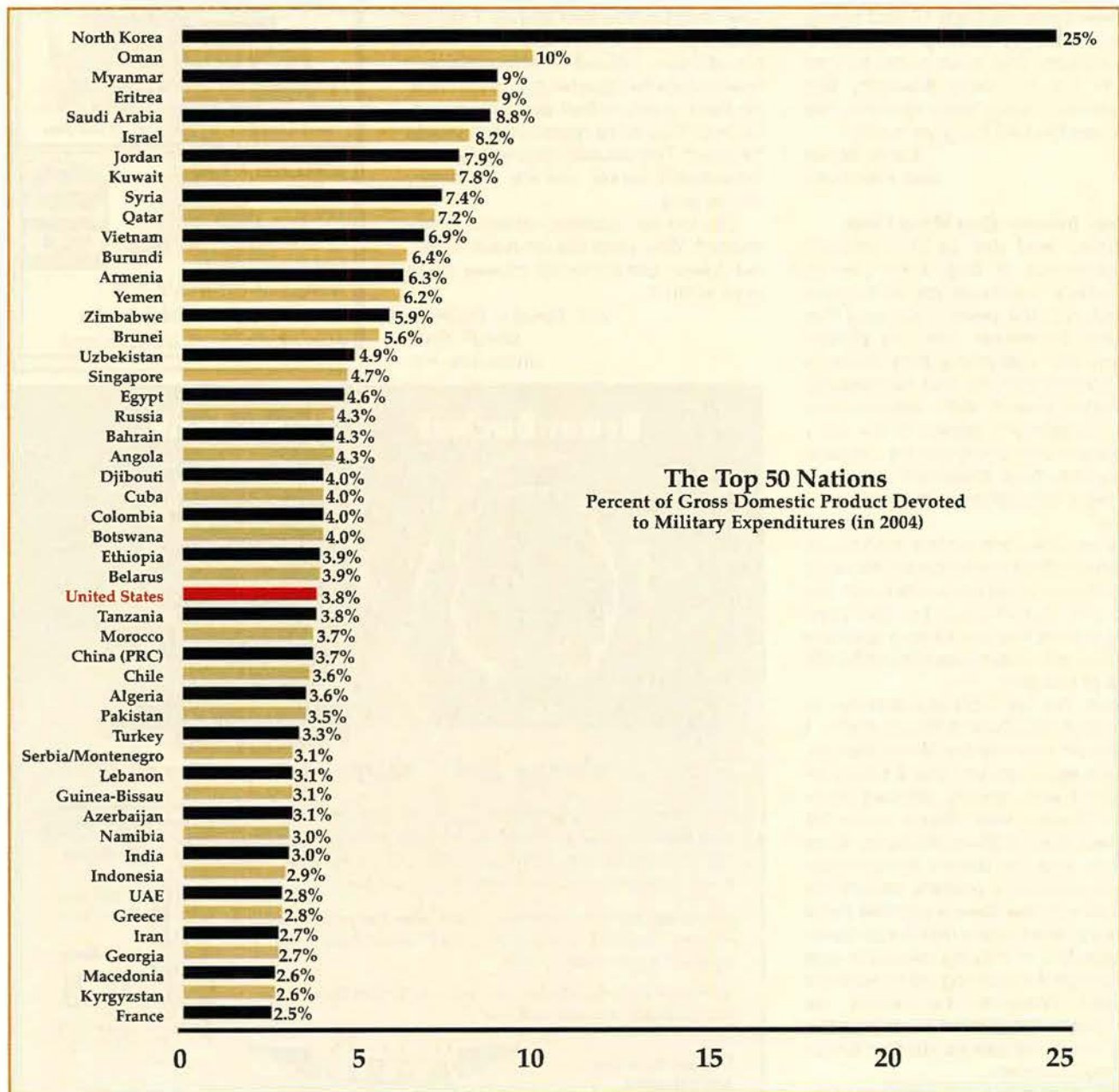
The Chart Page

By Tamar A. Mehuron, Associate Editor

America's Defense "Burden"

How "affordable" is US military power? Put a different way: How big is the economic "burden" of defense? To hear critics tell it, you'd think the Pentagon is driving the country to the poorhouse in a Cadillac ("record defense budgets!"), but that's far from true. The best measure of national

burden is not total dollars spent but the share of Gross Domestic Product—the national economy—that Americans devote to troop pay, weapons, and operations. This chart shows that the US, with a defense "burden" of 3.8 percent of GDP, lags behind many other nations.



The Top 50 Nations
Percent of Gross Domestic Product Devoted
to Military Expenditures (in 2004)

Source: Data from International Institute for Strategic Studies, *The Military Balance, 2005-2006*



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Verbatim

By John T. Correll, Contributing Editor

Cut Active Force First

"Should the American people calculate the threat to their security is better served by reducing military manpower as a cost-savings measure, then it seems obvious that the most expensive forces (the active component) should be sacrificed first, followed by the least expensive (the Guard and Reserve)." —**Brig. Gen. Stephen M. Koper, USAF (Ret.), president of the National Guard Association of the United States, letter to Congress, Dec. 21.**

Bad Year for Bad Guys

"I predict that the enemies of the United States of America are going to have a bad year in 2006." —**Marine Corps Gen. Peter Pace, Chairman of the Joint Chiefs of Staff, Stars and Stripes, Jan. 4.**

Imagine That

"The President is the President 24 hours a day, seven days a week, as we all know, wherever he goes." —**Trent Duffy, White House deputy press secretary, Washington Post, Dec. 29.**

Long-Range Force

"As of today, the Air Force has over 2,500 fighter aircraft but only 181 bombers. ... If the Navy were clever, it would buy strike versions of the joint unmanned combat aerial vehicle and put them on carrier decks, thus giving it a true long-range, penetrating strike capability from close-in bases. The Navy would then become heir to the long-range strike mission that the Air Force seems unwilling to take seriously." —**Philip S. Meilinger, author of 10 Propositions Regarding Airpower, Air and Space Power Journal, winter 2005.**

Tell Your Grandchildren

"One day some years out, you'll have children. One of them will come home with a textbook and there will be a chapter on Iraq and it will talk about the Saddam Hussein regime and hundreds and thousands of dead people killed by that regime in mass graves. And it will talk about the struggles, the victories that were achieved over Saddam Hussein, that regime, and the struggles that have helped Iraq along its path to democracy, ushering in a new chapter, a new hopeful era not just in Iraq but in

the Middle East. Each of you will be able to look down at your children or your grandchildren and say that you were there." —**Secretary of Defense Donald H. Rumsfeld to Task Force Freedom, Mosul, Iraq, Dec. 24.**

Prospects in Iraq

"I can think of more ways for it to come out badly than for it to come out well. But that does not mean it cannot come out acceptably." —**Former Secretary of Defense Harold Brown, Washington Post, Jan. 6.**

Osama Is Listening

"Every time we talk about withdrawal, you can see the ears of Osama [bin Laden] and his friends perking up." —**Lawrence S. Eagleburger, Secretary of State in the George H.W. Bush Administration, Washington Post, Jan. 6.**

Ralph Peters Again/Still

"The primary mission of today's Air Force is to support ground operations. Now, the Air Force doesn't like that, but you don't get to pick your wars. ... This is a service in crisis. They blithely go down the path to diminishing relevance at a time when we badly need a responsible, capable, and appropriate Air Force." —**Ralph Peters, retired Army lieutenant colonel, syndicated columnist, and frequently quoted critic of the Air Force, Inside the Pentagon, Dec. 15.**

Improved US Nukes

"You cannot tell people that nuclear weapons are bad for you but we are modernizing ours." —**Mohamed ElBaradei, head of the International Atomic Energy Agency, on proposal for new generation of US nuclear weapons, Wall Street Journal, Dec. 14.**

Peace in Our Time

"The reality is that, since the end of the Cold War, armed conflict and nearly all other forms of political violence have decreased. The world is far more peaceful than it was." —**Andrew Mack, former director of strategic planning for UN Secretary General Kofi Annan, op-ed column, Washington Post, Dec. 28.**

Opposes Fast Pullout

"I don't think that the United States

military at its current strength can sustain this level of deployment for an extended period of time. So one way or the other I think a drawdown will begin in 2006. But essentially just to walk away, to say that we're taking all of our troops out as fast as we can, would be a tragic mistake." —**Retired Gen. Colin Powell, former Secretary of State, Reuters, Dec. 18.**

Raptor Effect

"You can imagine if you are at 60,000 feet doing Mach 1.9 (about 1,400 mph) and these bombs are flying out of your airplane, the swath of hell you can produce going through a country saying, 'I'll take that target and that target.'" —**Lt. Col. David Krumm, F-22 instructor pilot, on selective multiple target capability of the aircraft, Associated Press, Dec. 23.**

Bigger Force or Fewer Wars?

"The Pentagon expects to face many Iraq-type conflicts in the coming years, wars that involve battling insurgents and restoring stability. As a result, a debate is beginning to churn in defense policy circles: Should the government enlarge the military so it can more easily fight these wars? Or should the government alter its policies, so as not to fight such wars as often, at least not alone?" —**Fred Kaplan, national security analyst, New York Times commentary, Jan. 1.**

Citizens Who Have Been There

"The only silver lining you can find in these numbers is that, for a generation to come, America will have many, many adults who understand the reality of what war is all about." —**Loren B. Thompson, Lexington Institute, on numbers serving in Iraq, Associated Press, Jan. 2.**

Zbig Restates the Options

"'Victory or defeat' is, in fact, a false strategic choice. In using this formulation, the President would have the American people believe that their only options are either 'hang in and win' or 'quit and lose.' But the real, practical choice is this: 'persist but not win' or 'desist but not lose.'" —**Zbigniew Brzezinski, national security advisor in Carter Administration, op-ed column, Washington Post, Jan. 8.**

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Washington Watch

By John A. Tirpak, Executive Editor

Next, the Unmanned Bomber?; Getting Congress To Go Along; To Organize, Train, and ... and

Long-Range Strike: The Future

With its Fiscal 2007 budget proposal, the Air Force embraces a dramatically new approach to long-range strike.

The Air Force is to launch a new, possibly unmanned, bomber program far earlier than planned, moving the in-service year from 2037 to 2018. Air Force documents refer to the system as the Next Generation Long-Range Strike Aircraft program.

To pay for part of it, USAF would sharply reduce today's bomber inventory, freeing money that would otherwise be spent on updates and maintenance. That won't be easy (see next item).

Word of the new LRS program leaked to the press in January. The project supplants the Air Force version of the Joint Unmanned Combat Air System—which is slated for termination—with a larger, faster unmanned bomber.

The aircraft would have to cover very long distances and be able to loiter in the target area with a good-size bomb load.

The Air Force's bomber roadmap has long held that the service doesn't really need to replace any parts of its bomber fleet until 2037, though USAF has been contemplating an "interim" capability that would begin production around 2014.

However, because the due date for the new system would be 2018, it would evidently eliminate the interim step.

At the behest of Congress, the Air Force considered various long-range strike options and seemed to be promoting a two-seat, enlarged version of the F-22 fighter, called the FB-22, for this purpose. (See "The Raptor as Bomber," January 2005, p. 28.) The FB-22 now seems dead in the water.

The Air Force has been tasked by the Office of the Secretary of Defense to study various approaches to an unmanned bomber and launch a program in next year's budget.

In recent years, the Air Force has said its next long-range strike system must provide a quantum leap ahead in capability but that technologies such as hypersonics have not yet reached the necessary level of maturity.

However, the qualities USAF wanted in a next genera-



Boeing photo

J-UCAS is no longer in USAF's long-range strike future.

tion aircraft have been taking it toward a larger platform, equipped with a sizable bomb load and the ability to loiter in enemy territory for long periods, with periodic refuelings from a tanker. The size of the objective Air Force version of J-UCAS had been upped several times and likely would have been enlarged again.

Also influencing the Air Force move is a push by the Air Force Research Lab to investigate hypersonic vehicles. A joint USAF-NASA project now in the works is expected to yield vehicles that can sustain speeds of Mach 10. First applications of the technology probably will appear in air-launched missiles.

The Air Force has considered converting some of its Minuteman ICBMs into conventional weapons that could put destructive power on a target anywhere in the world within 20 minutes. In studies conducted for USAF by industry two years ago, the "conventional ICBM" was deemed the nearest term and lowest cost solution to obtaining a rapid global strike capability.

Congress balked at the notion, however, as it worried that launch of a conventional ICBM would be indistinguishable from the start of a nuclear attack. Still, the Navy is requesting money in the Fiscal 2007 budget to explore converting some of its Trident submarine-launched ballistic missiles as conventional weapons.

Long-Range Strike: The Present

If the past is any guide—and it is—the Air Force will have great difficulty cajoling Congress to support its LRS plan.

The program probably will be unaffordable unless service officials can persuade Congress to drop its refusal to permit the retirement of "old iron." In the past, Congress has not shown a willingness to go along with that. The plan calls for a sharp reduction in old bombers.

Topping the list of Air Force proposals is a move to significantly reduce its inventory of B-52H bombers. Plans call for whittling the fleet from 94 to 56 aircraft, a move that officials say would save some \$600 million through 2011, not including the cost of future enhancements.

USAF photo by MSgt. Michael A. Kaplan



Cutting the B-52H fleet will reap \$600 million through 2011.



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our troops and deliver humanitarian relief anywhere. In service on five continents, the C-17 is the most capable, most versatile and most reliable airlifter in the world. That's why the world depends on the C-17.



The Air Force has long wanted to reduce the fleet of B-52s, the youngest of which was built in 1962. All are now well more than 40 years old. Eighteen of the aircraft have lingered on the books in a twilight zone status of "attrition reserve."

USAF wants to retire the most problem-prone of the aircraft and use the savings to upgrade the remainder with new weapons and capabilities.

However, when this was tried before, USAF took a beating. In 2001, the service asked Congress for permission to retire a third of its B-1B bombers so as to save money on chronically problem-prone airplanes and improve the rest of the fleet. After heated discussion and Capitol Hill battles, USAF got its way, but was forced to bring some of the retired aircraft out of mothballs a couple of years later. Legislators didn't like removing aircraft that employed many Guard and Reserve members, especially in the run-up to the Base Realignment and Closure process.

Congress also has refused so far to allow the Air Force to retire some of its oldest KC-135E tankers, despite corrosion and other age-related problems that have caused maintenance costs to skyrocket and safety issues to be raised.

The Air Force shouldn't expect any easier ride on the B-52 request.

"Radical" Acquisition Ideas

If the Pentagon goes ahead and adopts a controversial new acquisition proposal, the services could be limited to manning and training functions and be forced to give up the "equipping" part of their traditional roles.

Findings of the Defense Acquisition Performance Assessment, a 10-month study headed by retired Air Force Lt. Gen. Ronald T. Kadish, include turning over the job of setting requirements to the regional combatant commanders. A Pentagon senior leadership board would in turn select a service to develop the capabilities requested by the COCOMs.

That's different from today's system, wherein the regional commanders can offer lists of desired capabilities, but depend on the service leadership to get those items funded and developed.

The move would tend to focus on near-term requirements necessary for fighting the wars at hand, at the likely expense of developing long-term capabilities, but, in concert with other suggestions for change, would have the benefit of reducing the time and cost needed to field new systems. The study participants believed that DOD needs far more flexibility and speed in developing new weapons for unanticipated circumstances. They also said that the nature of warfare, once predictable in type and pace, has become thoroughly unstable, with new threats and challenges emerging every day.

The existing acquisition process is still based on the old, predictable model of the Cold War, which was why Kadish said "radical" change is needed.

The "organize, train, and equip" function is given to the services by law, and legislation would be necessary to alter it.

Deputy Defense Secretary Gordon England said the study would be incorporated into final Quadrennial Defense Review deliberations conducted late last year. They may have played a significant role in shaping program decisions attending the Fiscal Year 2007 budget proposal.

The DAPA panel suggested breaking out the R&D and procurement accounts from the rest of the Pentagon budget; defense leaders couldn't raid the modernization accounts to pay for contingencies, which has been the case for the last few years.

Walling off the modernization accounts would save money, though, because the panel determined that for every dollar

subtracted from a program—either to slow it down to add capabilities, or simply because the funds are needed for more immediate needs—four dollars have to be spent later.

The aim of the suggestions was to create more stability in programs. Other DAPA recommendations would rule out changing requirements after a program was launched and add improvements to later versions—what has become known as "spiral development." There also would be strict timetables for introducing a system, so that it became available during the precise window when it offers a "useful" capability.

This last characteristic would trump operational suitability or operational effectiveness in justifying new programs. It also would be easier to get rid of projects that have outlived their usefulness or that have been superseded by other technologies or capabilities. Testing would be changed to reflect the shift in emphasis.

The change also might save money by eliminating requirements that are added for the purpose of making the whole system easier to test.

In another significant shift, the DAPA study suggested that contractors be selected on the basis of offering the lowest-risk solution to a requirement, rather than "best value." The lowest-risk solution also presumably would be the most predictable, and contractors could be rewarded for making the system available at the called-for time, rather than meeting benchmarks that don't necessarily have anything to do with operational utility.

Other recommendations echoed those of previous acquisition process studies. One was that DOD must take more specific actions to build a professional corps of acquisition specialists, both uniformed and military. Another was to build more formal and informal ties to industry, to keep industry aware of what capabilities the Pentagon needs and what capabilities are no longer wanted. Finally, the report recommended restructuring the system from one of mistrust and oversight to one of direct accountability.

Affording the F-22

The Air Force will part with some significant systems—the U-2 spyplane, a new standoff jammer project, and the F-117 stealth attack aircraft, among other cuts—to extend its F-22 fighter program, according to budget documents.

Program Budget Decision 720, dated Dec. 20, 2005, showed that the Air Force was willing to retire older aircraft aggressively to extend production of the F-22 an extra two years, to 2010. The move adds only four new Raptors, but does bridge production of the F-22 to the start of production of the F-35. Senior USAF leaders have said that it's essential to keep a modern fighter assembly line warm. (See "Washington Watch: Clipping the Raptor," February, p. 14.)



USAF photo by TSgt. Ben Bickler

New plan cuts some programs to bolster the Raptor.

The move also extended the end of F-22 production into a new Presidential Administration, keeping open the possibility that the Air Force would be granted permission to keep producing the fighter. Under current plans, only 183 Raptors would be built, versus USAF's long-stated requirement for 381.

The retirements had the blessing of the Office of the Secretary of Defense.

"The Air Force proposes to realign resources so that it can transform to a more lethal, more agile, streamlined force with an increased emphasis on the warfighter," according to the document. It noted that the program "efficiencies" were meant to offset the costs of extending the F-22 line by two years.

"The Air Force proposal ramps down U-2 operations beginning in FY 2007 and retires the final elements of the fleet throughout FY 2011," according to the document. The last 10 U-2s would retire in 2011, about four years earlier than planned, and be replaced by the Global Hawk unmanned reconnaissance aircraft.

Global Hawk provides "near-real-time, high-resolution, intelligence, surveillance, and reconnaissance imagery" to combatant commanders, the Air Force said, noting that within the year 2005, the system had provided 15,000 images during more than 50 missions and 1,000 combat hours in Operation Enduring Freedom.

The Air Force had planned to transition more gradually to the Global Hawk, preferring not to let go of a proven capability before a new one was in hand. (See "ISR Miracles, at a Reasonable Price," February, p. 43.)

The F-117, USAF's first operational stealth attack aircraft, would retire in Fiscal 2008 instead of Fiscal 2011. Ten would come out of service in Fiscal 2007 and the last 42 the following year.

"There are other, more capable Air Force assets that can provide low observable, precision penetrating weapons capability," including the B-2, F-22, and the Joint Air-to-Surface Standoff Missile, the service noted.

Another program to be terminated would be the B-52 Standoff Jammer. This was a program to equip a number of B-52s with giant electronic warfare pods on the outer wings. Since the retirement of the EF-111 and the F-4G, the Air Force hasn't had a dedicated airborne electronic attack platform of its own, depending instead on jamming provided by the Navy's EA-6B Prowler and, in a few years, the EF-18G Growler.

In PBD 720, the Air Force said it "assumes risk" by killing the SOJ, "mitigated by other components" in the portfolio of DOD's electronic attack capabilities "until transformational capability, not reliant on the B-52 legacy platform, is identified."

The Air Force also wants to retire 38 of its 76 C-21A executive transports, as well as 38 of its B-52H bombers (See "Long-Range Strike: The Present," above.)

The document described the additional cost of extending the F-22 line by two years as \$1.05 billion, assuming a three-year multiyear contract with Lockheed Martin to build 20 a year in Fiscal 2009-11.

Save the Industrial Base

Concerns for the continued modernization of the military were running high on the eve of the Fiscal 2007 defense budget's release. A group of Republican Senators, including the chairman of the Armed Services Committee, asked President Bush to keep Pentagon procurement and research levels at previously requested levels, lest the whole of the military suffer seriously from aging, obsolescent, and worn-out equipment.

They also challenged the Administration's practice of cutting weapons procurement in wartime for purely financial reasons that are unsupported by military analysis.

Citing news reports that defense research and procurement accounts were to be reduced by \$7.5 billion in Fiscal 2007 and \$32.1 billion over the future years defense program, the six Senators, headed by Senate Armed Services Committee Chairman John W. Warner (R-Va.), asked Bush in December not to backtrack on equipment modernization.

"We urge you, at the very minimum, to recommend a funding level for procurement and research and development for Fiscal Year 2007 of no less than the previously planned \$158.3 billion, and \$443.1 billion for the entire Department of Defense, excluding supplemental funding," the group said.

The reductions described would "disproportionately cut weapons system development and procurement and would break the five-year trend of modest, but sustained, real growth needed to make up for the 'procurement holiday' in the 1990s," the Senators asserted.

"Failure to continue this growth would impair our ability to replace the existing inventory as required by wartime stress and would jeopardize procurement of new systems, which the department has declared for years are necessary to protect America against current and future challenges."



AP photo by J. Scott Applewhite

Warner and other Republican Senators made their case.

The actual budget request, released in February, came in at \$439.3 billion, of which \$157.4 billion was targeted at modernization projects. The latter figure, while still an increase from last year, was less than what the Senators wanted and less than the Pentagon itself planned in its previous budget.

While the group acknowledged the many constraints on the budget, "we remain a nation at war," they said. The budget level presented last year was agreed to be "the minimum which the Department believed it needed" for future requirements.

In their letter, the Senators chided Bush for last-minute budget changes that ignore real requirements or strategy.

"We do not believe it would be responsible to reduce (spending levels) at the 11th hour, especially for budgetary reasons obviously unrelated to any analysis of military necessity."

This last comment was at least in part a reference to treatment of the F-22 program, which in 2004 was slashed from 270 aircraft to 180 on the eve of the budget's release, without any analytical reason given.

The letter was signed by Warner and five other Republicans: Jim Talent (R-Mo.), Saxby Chambliss (R-Ga.), Elizabeth Dole (R-N.C.), Olympia J. Snowe (R-Maine), and Susan M. Collins (R-Maine).

Constituency was clearly a factor for some of the signatories; the F-22 is built in Chambliss' state, Navy F/A-18 and Air Force F-15 fighters are built in Talent's state, and Snowe and Collins have shipbuilding facilities in their state. ■

Aerospace World

By Breanne Wagner, Associate Editor

C-17 Line Imperiled

The Pentagon requested \$389.6 million in its 2007 budget plan to end production of the C-17 advanced airlifter. Unless Congress intervenes, the line will shut down in 2007.

The move would signal the closure of Boeing's Long Beach, Calif., C-17 assembly plant.

Both the Senate and the House included provisions in their separate 2006 defense authorization bills to allow the Air Force to buy 42 more C-17 aircraft, bringing the total number of Globemaster IIIs to 222, a figure the Air Force had previously touted as its minimum requirement.

However, the service recently has backed away from that figure, agreeing with the conclusion of a new Pentagon lift analysis that a fleet of 180 C-17s is sufficient. (See "Rising Risk in Air Mobility," p. 28.)

In their bill, lawmakers said they want further analysis of the C-17's role in intratheater lift, and they want the C-17 production capability intact until it can be determined whether a C-5 rehabilitation program will work as expected.



USAF photo by MSgt. Kevin J. Grunwald

An F-16 from the 64th Aggressor Squadron heads out to a range on Jan. 31 during Red Flag 06-1. The training event ran from Jan. 21 through Feb. 18 at the Nevada Test and Training Range near Nellis AFB, Nev. Red Flag tests aircrews' war-fighting skills in simulated combat situations.

Feds Sue American Airlines

The Department of Justice in January filed a class-action lawsuit against American Airlines, claiming that the

airline denied benefits to three of its pilots during their service with the Naval Reserve and Air National Guard.

The dispute arose when American allegedly denied the pilots credit toward paid vacation and sick leave while they were on military duty.

"No reservists ... should ever be punished or discriminated against for answering the call of duty," said Wan J. Kim, assistant attorney general for civil rights.

DOJ filed the lawsuit at the US District Court in Dallas on behalf of Naval Reservists Capt. Mark Woodall and Cmdr. Michael McMahon and Lt. Col. Paul Madson with the South Dakota Air National Guard.

The lawsuit was filed under the 1994 Uniformed Services Employment and Re-employment Rights Act.

Services Push LCA Deal

The Air Force and Army by the end of April will sign a deal specifying how they will jointly acquire a new Light/Future Cargo Aircraft.

The new aircraft will carry out a variety of missions, ranging from support of widely dispersed ground troops to ferrying gear from naval bases to units

England, in Recess Appointment, Becomes Deputy Defense Secretary

It took a Presidential recess appointment, but Gordon England on Jan. 4 finally became the official deputy secretary of defense. He had been the acting deputy for more than half a year.

President Bush acted during the most recent Congressional recess. The appointment allowed England to take the new title without going through the usual Senate confirmation process.

England served as both Secretary of the Navy and acting deputy defense secretary since May 2005. His nomination to be deputy defense secretary had been put on hold by Senators who questioned his impartiality in decisions related to military contractors.

England replaced Paul D. Wolfowitz, who vacated his post in April 2005 and now serves as head of the World Bank.

England twice served as Navy Secretary, from May 2001 until January 2003 and again from October 2003 until Dec. 29, 2005. He relinquished his post to Donald C. Winter, who was sworn in as Navy Secretary on Jan. 3. Between his Navy terms, England was the first deputy secretary of the Department of Homeland Security.

Before joining the Bush Administration, England was executive vice president of General Dynamics from 1997 to 2001.

ashore. It has not been decided if the aircraft will be fixed-wing, rotorcraft, or tilt-rotor type. It will replace the C-23 Sherpa, now flown by the Army National Guard.

Brig. Gen. Stephen D. Mundt, head of the Army Aviation Task Force, told reporters that the Army had already firmed up its requirements and was giving the Air Force a chance to do the same. The Army wants 145 new aircraft.

The Air Force had challenged the Army's plan to replace the Sherpa, arguing for a joint effort that would meet the needs of both services. The Air Force performs the vast majority of the airlift mission for the armed forces.

Raptor Declared Mission Capable

The Air Force declared the F-22A Raptor mission capable in early January after the aircraft successfully completed follow-on test and evaluation.

The FOT&E testing was conducted mainly at Nellis AFB, Nev. The F-22 was rated based on deployability, sortie generation, and ability to employ the Joint Direct Attack Munition. It passed on all counts.

Tactics development and future FOT&E testing will be conducted at Nellis.

The mission capable designation is part of Air Force Operational Test and Evaluation Center's new rating system for programs under test. The new system is intended to be more real-world, operationally focused than system evaluations in the past.

Airmen Pass Four Million Miles

Airmen truckers recently logged



USAF photo by MSGT. Maurice Hessel

An F-22 Raptor from Langley AFB, Va., is refueled by a KC-135 Stratotanker from McConnell AFB, Kan., during the Raptor's first operational mission Jan. 21. See "Raptor Declared Mission Capable," left. The mission was flown for Operation Noble Eagle.

their four millionth mile of Iraq convoy operations.

The 732nd Expeditionary Logistics Readiness Squadron, deployed to Balad AB, Iraq, reached the milestone on Jan. 7.

When war-weary Army forces were stretched thin in 2003, airmen stepped in to take over some of their duties, such as driving convoys of supply trucks to far-flung outposts in Iraq. (See "The Expeditionary Force Under Stress," July 2005, p. 30.) Airmen from the

732nd ELRS have kept supplies moving on some of Iraq's most dangerous highways since June 2004.

Besides combat convoy driving, the airmen have supported the Army by filling slots as gunners and security forces. In December, the first group of airmen graduated as Army interrogators. (See "Aerospace World: Army Gets USAF Interrogators," February, p. 21.)

England Targets F-35 Engine

The Pentagon may soon cancel a program to develop an alternative engine for the F-35 Joint Strike Fighter.

Now in danger is the proposed F136 power plant. The team of General Electric and Rolls Royce has been developing it for possible use in the JSF. (See "The F-35 Steps Out," April 2003, p. 46.)

If the alternate engine goes down, the F-35 fighter would be totally dependent on the Pratt & Whitney F135, a derivative of the F119 engine on the F-22.

Competition between the two power plants would be expected to drive down prices and raise quality. The model for this was the "great engine war" of the 1980s and 1990s, between the Pratt F100 and the GE F110, to power the Air Force's F-15s and F-16s. The initial multiservice requirement for the F-35 totals over 2,400 aircraft, with many more expected to be exported.

There have been no reports of problems with the alternative engine program.

Deputy Defense Secretary Gordon

Air Force Gets Gas Money

Air Force budget accounts got a break in January due to Program Budget Decision 723, a Pentagon budget directive that allocated \$1.1 billion in new funding to the service, mostly to cover fuel costs. The directive, approved by Pentagon officials right before the 2007 budget was completed, will boost Air Force accounts from FY06 through FY11.

The Air Force received extra funds in part due to a request from Lt. Gen. Stephen R. Lorenz, who was USAF's deputy assistant secretary for budget until October. Lorenz addressed the need for gas money in September at the Air Force Association's Air and Space Conference in Washington, saying that the Air Force budget was \$800 million short due to increasing fuel costs. (See "Aerospace World: Fuel Run-Up Hits USAF Accounts," November 2005, p. 21.)

Just for fuel costs, PBD 723 earmarks \$430 million in FY07, \$301 million in FY08, \$225 million in FY09, \$512 million in FY10, and \$1.07 billion in FY11, according to *InsideDefense.com*.

The shift in funds also will help pay for C-130 upgrades, NATO-operated AWACS aircraft upgrades, and the Joint Single Integrated Air Picture program.

The budget document also directs the Air Force to move \$112 million to US Strategic Command accounts to combat enemy weapons of mass destruction.

England wants to kill the program as a way to free up \$1.7 billion through 2011, according to his Dec. 20 memo ordering the termination. The GE-Rolls team was working under a \$2.47 billion contract to ready the engine in time for series production of the JSF in 2012.

Congress has to approve the move, however, and may not.

Airman Dies in Training Flight

First Lt. Jason Davis died Jan. 10 during a training flight aboard a T-39 Sabreliner in Walker County, Ga.

Davis was a student navigator with Training Squadron 86 at NAS Pensacola, Fla. He was one of four killed in the crash, along with Navy Lt. Jason Manse, Ensign Elizabeth Bonn, and Dave Roark, a civilian contract pilot.

A search began immediately after the aircraft failed to return to NAS Pensacola on Jan. 10. The downed aircraft



USAF photos by MSgt. Lance Cheung

TSgt. Andrew Morin, with the 732nd Expeditionary Logistics Squadron, brings up position data on a GPS receiver in Iraq. His unit is participating in convoy security, but is returning the mission to the Army. See "Airmen Pass Four Million Miles," p. 17.

Aggressors Come Back With F-15s

The 65th Aggressor Squadron, inactive for 17 years, is back in the saddle with a new mount: the F-15C Eagle.

The unit was inactivated in 1989 due to cost-cutting and last flew with Northrop F-5E Tiger IIs that were iconic of the aggressor mission. The 65th resumed operations with camouflaged F-15Cs on Jan. 12 at Nellis AFB, Nev. The squadron stood up with nine Eagles, but eventually will have 24 aircraft as they become available from Air National Guard units under Base Realignment and Closure actions.

The 65th will share ramp space at Nellis with the other adversary unit, the 64th Aggressor Squadron, which flies F-16s.

"The 65th and other aggressor units will provide realistic adversary training," according to Air Force Chief of Staff Gen. T. Michael Moseley. The unit's reactivation is a nod to the fact that foreign air forces now employ advanced aircraft more closely simulated by the F-15.

The squadron's heritage goes back to 1940 when it was known as the 65th Pursuit Squadron. In World War II, it became the 65th Fighter Squadron, flying P-40s and P-47s. The unit earned three Distinguished Unit Citations for missions in North Africa, Tunis, and Italy.

More than half of Predator's 130,000 flight hours have been during combat deployments to the Balkans, Southwest Asia, and the Middle East.

Poland Acquires C-130s

Poland's Air Force in late 2007 will take possession of and begin operating the first of five used USAF C-130E transports.

The Polish Defense Ministry announced the move in January. The five aircraft will be delivered through August 2009.

Neither Poland nor the US specified the cost of the purchase, but Poland will be given \$82.9 million in financial aid as part of the deal.

The aircraft will be used for troop and equipment transport, as well as rescue

was located Jan. 11. The cause of the accident is under investigation.

ANG Unit Gains Predator

The Air National Guard's 163rd Air Refueling Wing at March ARB, Calif., will be the first of several ANG units to take on the Predator unmanned killer scout aircraft mission, the Air Force announced on Jan. 4.

Located near Riverside, the unit will be renamed the 163rd Wing and will get MQ-1 Predators as part of USAF's Total Force initiatives. The unit will train Predator operators and maintainers, as well as conduct operations.

The move is meant as a way to provide a new mission for Guardsmen giving up old systems in California.

Predators are long-endurance, medium-altitude unmanned aircraft systems for surveillance and reconnaissance.



Pictured from left to right: SSgt. Tony Rivera, SrA. Jason Bauer, SrA. Darryll Morley, and SSgt. Jason Sawyers provide dedicated aircraft security for this C-130 Hercules deployed to Balad AB, Iraq.

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USAF photo

Airman Keeps Military Working Dog

After special intervention from Congress, an airman has been allowed to adopt her military working dog.

TSgt. Jamie Dana adopted her bomb-detecting dog Rex after President Bush signed special legislation in December permitting the animal to go home with his handler.

Dana and Rex were both injured in Iraq on June 25 when an improvised explosive device detonated and hit their Humvee during a convoy patrol in Kirkuk. Dana was evacuated to Balad Air Base with severe injuries and internal bleeding. She required 19 blood transfusions.

Rex also survived the attack, and Dana asked permission to adopt him. However, laws prohibited the adoption of animals still considered useful to the military.

Due to the nature of the incident, the Congressional defense committees changed the law in 2006 defense legislation, allowing military working dogs to be adopted by their handlers following a traumatic event.

Dana plans to leave the military and attend veterinary school.

nance; Building Partnership Capacity; Sensor-Based Management of the ISR Enterprise; Irregular Warfare; Authorities; Locate, Tag, Track; Joint Command and Control; and Strategic Communications.

\$1.1 Billion T-6A Contract Let

Raytheon Aircraft Co. of Wichita, Kan., received a \$1.1 billion contract for logistics support of the T-6A training aircraft used by the Air Force and Navy, the company announced in January.

The contract was awarded as part of the Joint Primary Training System (JPATS) program, which calls for nearly 800 aircraft to be delivered through 2015.

Raytheon awarded a subcontract to L-3 Communications' Vertex Aerospace Division for parts management and support of the T-6A program. L-3 Vertex will be responsible for buying, transporting, storing, and issuing all aircraft parts, equipment, and engines.

Competition in Space Launches

Boeing and Lockheed Martin were still awaiting Pentagon and Federal Trade Commission approval in mid-February to form United Launch Alliance, a joint venture to provide launch services for the US military. At issue is whether the deal would lock out competitors.

Kenneth Krieg, the Pentagon's acquisition, technology, and logistics chief, told reporters at a February press conference that he's in favor of competition, and for bringing "nontraditional suppliers into the marketplace." However, "it's got to be competition for which there is real competition," meaning a qualified alternate provider.

and humanitarian aid missions, in Poland and abroad.

The Hercules C-130E, made by Lockheed Martin, can carry 92 soldiers, 64 paratroopers, or 21 tons of cargo.

QDR Gets 10-Month Lease on Life

Despite the February release of the Quadrennial Defense Review, Pentagon officials think some issues need more work and will give them another 10 months of scrutiny.

Deputy Defense Secretary Gordon England called for a new analysis, dubbed 2005 Quadrennial Defense Review Execution Roadmaps, in a Jan. 5 memo to senior DOD leaders. The analysis will concentrate on eight areas that "warrant a greater degree of attention in execution," England wrote.

The new analyses will frame deliberations on the Fiscal 2007 budget and the 2008-13 Future Years Defense Program.

The eight new QDR roadmaps are: DOD Institutional Reform and Gover-

Col. Edward N. Hall, 1914-2006

Col. Edward N. Hall, USAF (Ret.), who was director of the Minuteman intercontinental ballistic missile program and developed solid-fuel rocket technology, died Jan. 15 in Torrance, Calif., at the age of 91.

Hall's knowledge of rocket propellants helped the Air Force develop its first solid-fuel ICBM, the Minuteman, in the late 1950s, decades ahead of the Soviet Union and China. The solid-fuel technology made missiles smaller, less expensive, and easier and safer to deploy.

Hall's work led to the development of engines for many US liquid- and solid-fuel missiles, including the Atlas, Titan, and Thor.

The first 10 Minuteman ICBMs were installed in underground silos at Malmstrom AFB, Mont., just weeks before the Cuban Missile Crisis in 1962. There are now 500 Minuteman rockets in silos in the United States.

Hall enlisted in the Army Air Corps in September 1939 and, after being commissioned, served in England supervising repair of aircraft engines. At the war's end, he studied German rocket-propulsion equipment and worked on liquid-fueled rocket engines. At Wright-Patterson AFB, Ohio, Hall worked on solid and liquid rocket power plants.

After retiring from the Air Force in 1959, he worked for United Aircraft Corp. for 14 years. In 1999, he was awarded the Air Force Space and Missile Pioneers Award and was inducted into the Air Force Space Command Hall of Fame.

News Notes

■ Former First Lady Nancy Reagan helped dedicate a C-17 Globemaster III in honor of former President Ronald Reagan on Jan. 13 at March ARB, Calif. Named *Spirit of Ronald Reagan*, the aircraft was the eighth C-17 to join the 452nd Air Mobility Wing, the first Air Force Reserve Command unit to fly its own C-17s.

■ US Central Command headquarters at MacDill AFB, Fla., will undergo a \$180 million renovation and expansion, due to failing infrastructure and tight quarters. Plans call for the renovation to expand the facility to 330,000 square feet from its present 187,000. Construction is slated to begin at the end of the year.

■ The Civil Air Patrol received the American Society of Association Executives' 2006 Associations Advance America Award of Excellence for hurricane disaster relief. CAP racked up 35,495 man-hours for relief efforts for Katrina, Ophelia, and Rita. Civil Air Patrol also was named to the association's Honor Roll for its 2005

hurricane media campaign and disaster response efforts.

■ Scott AFB, Ill., will get 1,593 homes, at no cost to the service, through a new 50-year privatization deal signed by Air Force officials in early January. The deal will provide airmen with homes at local base housing allowance rates and will save the Air Force billions in construction and renovation costs. The Scott deal will bring the number of privatized USAF homes to more than 16,000, with an additional 18,200 expected to be built or renovated at 19 Air Force bases by the end of 2006.

■ Raytheon was awarded a \$268 million contract to build 54 T-6A trainer aircraft as part of the Joint Primary Aircraft Training System program, the primary pilot training program for the Air Force and Navy. The 54 aircraft are scheduled to be delivered through 2009. The contract exercises the 13th of 19 planned option years. To date, 283 T-6As have been delivered—234 to USAF and 49 to the Navy.

■ Texas Air National Guard crews assisted firefighters in Texas and Oklahoma in battling wildfires that burned more than 600,000 acres in New Mexico. The Texas National Guard deployed personnel as well as several UH-60 Black Hawk and CH-47 Chinook helicopters carrying buckets of water to douse the flames.

■ The Air Force Research Laboratory has been working with the Indy Race League and US Air Force Academy boxers. The drivers and boxers have been wearing earplugs with "mini accelerometers" to capture data from the head during an impact. AFRL hopes to gather information that will lead to safety advances for aircrews. AFRL also wants to develop an even better sensor—one that does not require batteries and recorders—and expand this effort to help develop protective gear to limit blast effects from such things as improvised explosive devices.

■ A radar system, recently transferred from Uzbekistan to Afghanistan, provides better airspace control for the military in and around Kabul and Bagram Airfield, Afghanistan. The radar system, previously at Karshi-Khanabad Air Base in Uzbekistan, allows the military to fly with more visibility and flexibility during combat operations and poor weather conditions.

■ USAF gave permission to International Launch Services, a Lockheed Martin and Khrunichev State Research and Production Space Center joint venture, to launch a military weather satellite built for the Defense Meteorological Satellite Program on an Atlas V vehicle from Vandenberg AFB, Calif. The satellite, designed to collect meteorological, oceanographic, and solar-geophysical information, is slated to launch in late 2007.

■ The 309th Commodities Maintenance Squadron at Ogden Air Logistics Center, Utah, upgraded the pylons for F-16 Fighting Falcons in January. The 309th maintainers removed the wiring harness, machined the pylons to accept the new, larger harness, and then put the pylons through electrical tests. The upgrade allows the F-16s to use more precise weapons and limits collateral damage on the battlefield, USAF said.

■ Little Rock AFB, Ark., received two C-130J aircraft on Dec. 21, the last of Little Rock's seven assigned new Hercules aircraft. Lockheed Martin announced that the last two C-130Js had longer fuselages, strengthened cargo ramps, and an improved airdrop system. ■

USAF photo by TSgt. Shana A. Cuomo



A civic action team composed of 13 airmen is working in the Pacific Island nation of Palau, where they have finished building an emergency search and rescue station, built a pavilion for Palau Community College, and repaired roads and schools. At left, TSgts. Jamle Pahukoa, Dave Vlnatleri, and Mike Luhmann discuss an upcoming project with a Palauan during a visit to a Head Start program facility.

The War on Terrorism

Operation Iraqi Freedom—Iraq

Casualties

By Feb. 9, a total of 2,267 Americans had died in Operation Iraqi Freedom. This total includes 2,122 troops and six Defense Department civilians. Of those fatalities, 1,776 were killed in action by enemy attack, and 491 died in noncombat incidents.

There have been 16,653 troops wounded in action during OIF. This includes 8,947 who returned to duty within 72 hours and 7,706 who were unable to quickly return to action.

DOD Identifies Airmen Killed

TSgt. Jason L. Norton, 32, of Miami, Okla., and SSgt. Brian McElroy, 28, of San Antonio were killed Jan. 22 near Taji, Iraq. The airmen were conducting convoy escort duties when their vehicle struck an improvised explosive device. Both were deployed to Southwest Asia from the 3rd Security Forces Squadron at Elmendorf AFB, Alaska.

Air Strikes in Iraq

An Air Force Predator UAS provided close air support for coalition troops under attack from anti-Iraqi forces in the vicinity of Tikrit, Iraq, on Jan. 22. The Predator fired a precision guided munition and hit a vehicle armed with an IED.

On Jan. 21, USAF F-16s provided close air support to coalition troops fighting anti-Iraqi forces in the vicinity of Baqubah, Iraq. An F-16 fired a precision guided munition and hit an enemy target.

Operation Enduring Freedom—Afghanistan

Casualties

By Feb. 9, a total of 256 Americans had died in Operation Enduring Freedom, primarily in and around Afghanistan. The total includes 130 troops and one Defense Department civilian killed in action and 125 who died in nonhostile incidents such as accidents.

A total of 685 troops have been wounded in Enduring Freedom. They include 278 who were able to return to duty in three days and 407 who were not.

US Drops Cold Weather Gear

US forces dropped eight bundles of cold weather supplies near Bamian in Central Afghanistan to help hundreds of Afghan families survive the harsh winter, the Air Force reported in early January.

The bundles included winter clothing, beans, rice, cooking oil, tarps, health kits, tool kits, and blankets.

"The delivery of these items to Bamian allows our forces in that area to ensure that numerous families would be safe from the elements as the winter months move on," said Lt. Col. Josh Jose, deputy chief of operations for Combined Joint Task Force 76.

US reconstruction teams in the area distributed the supplies with the help of local Afghan officials.

Northrop Grumman wasn't happy with the arrangement, according to the *Wall Street Journal*, and sought antitrust protection against what it viewed as a Boeing-Lockheed monopoly in rocket launches. Northrop is a fledgling rocket maker and fears that the ULA merger could lock out other competitors in the space and launch services field.

Boeing and Lockheed, traditionally bitter rivals, set aside their differences in an attempt to salvage both of their struggling rocket-launch divisions.

The FTC was expected to follow the Pentagon's recommendation.

EADS Can Compete for Tanker

European Aeronautic Defense and Space Co. (EADS) can compete to supply the Air Force with aerial tankers, now that a "Buy American" clause has been withdrawn by Congress.

The Buy American language inserted

by Rep. Duncan Hunter (R-Calif.), chairman of the House Armed Services Committee, was previously approved by the House to help US contractor Boeing by barring military equipment made by EADS. Hunter agreed to remove the clause in December due to pressure from the Pentagon to keep foreign competition open.

The House bill sought to exclude foreign defense contractors that receive government subsidies. European jet maker Airbus—80 percent owned by EADS—receives subsidies from European governments.

Northrop Grumman has plans to team up with EADS for the Air Force tanker contract, potentially worth \$20 billion. Last year, EADS said it would build a manufacturing plant in Mobile, Ala., if it won the contract. (See "Aerospace World: EADS Chooses Alabama Site," August 2005, p. 18.)

President Bush was expected to approve the rewritten law.

E-8 Gets "Blue" Tracking System

The E-8 Joint Surveillance Target Attack Radar System now has a better means to tell friend from foe on the battlefield.

The Joint STARS will be fitted with the Army's Force XXI Battle Command Brigade and Below system, more commonly referred to as a blue-force tracking system. FBCB2 sends digital updates on unit locations to a local Army Tactical Operations Center that then rebroadcasts the information to friendly units. Now, Joint STARS aircraft will be able to receive the data as well.

Five of the systems were installed in January at Robins AFB, Ga. The data will be presented on Joint STARS

What Is a Wideband Gap-filler?

Even by the standard of military satellite names—Defense Support Program, Military Strategic and Tactical Relay, Global Positioning System—the name Wideband Gap-filler is dull. What is it?

The Wideband Gap-filler System (WGS) is a constellation of five satellites that will improve communications and intelligence-surveillance-reconnaissance for combatant commanders and troops in action.

It is designed to meet the ever-increasing demand for bandwidth created by modern warfare and its push for reachback—that is, the ability to tap into remote databases and command systems through the military internet.

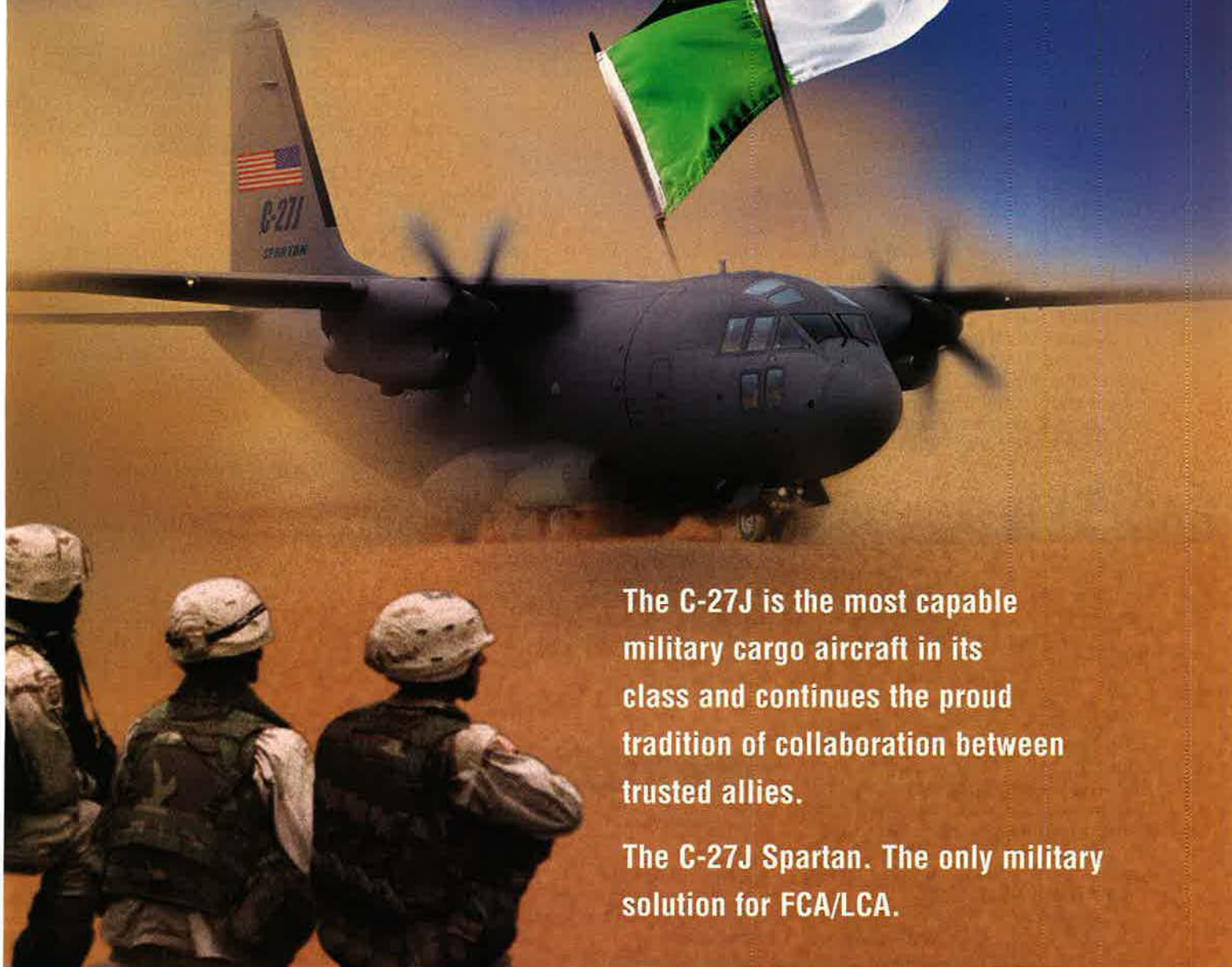
The WGS supplements the existing Defense Satellite Communications System (DSCS) III. It's considered a leap ahead in satellite communications, in that it can relay messages with enough power to penetrate building walls, and the frequency is more resistant to jamming.

WGS also provides 1,900 channels to military users, 10 times more than what's available under DSCS III. In fact, the first WGS satellite will provide more channels than the entire DSCS III constellation.

Once launched, the WGS unfurls to 135 feet long and 30 feet wide. It is positioned at geosynchronous orbit, 22,300 miles above the Earth's surface. Its coverage area can range from northern Russia to Cape Horn.

Boeing is the WGS prime contractor. The first satellite in the system is to be launched next year.

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operator work stations. When the information is relayed to the operators, they can narrow down potential targets with more confidence, reducing the chances of fratricide.

All FBCB2 installations on Joint STARS are scheduled to be completed in September.

England Orders Two Satellites

The Pentagon wants to buy two more Wideband Gap-filler System communication satellites, increasing the number to five. Three already are on contract.

The two new satellites were called for in a Dec. 20 memo from Deputy Defense Secretary Gordon England.

The satellites supplement the existing military secure satellite communications system, adding channels to handle voice, data, and video transmissions, the demand for which has risen sharply in recent years. (See "What Is a Wideband Gap-filler?," p. 22.)

If approved by the White House Office of Management and Budget, Boeing would get \$203.9 million for the two satellites, according to Bloomberg.com.

Original plans called for the \$1.8 billion program to produce its first satellite launch in 2004, but that has now been delayed until June 2007, largely because of problems with fasteners used to make the satellite.

Obituary

Retired Lt. Col. Horace E. "Sally" Crouch, a member of the Doolittle Raiders who flew the first US bombing mission over Japan in World War II, died Dec. 21 in Columbia, S.C., at the age of 87.

Crouch was bombardier-navigator aboard one of 16 B-25 bombers during the Doolittle raid of April 18, 1942.

The mission, led by Lt. Col. James H. Doolittle, was considered highly successful at building US morale after the bombing of Pearl Harbor. After launching from the aircraft carrier *Hornet* and bombing Japanese targets, the Army Air Corps bombers made for landings in China, but most ran out of fuel before reaching their intended airfields, forcing them to bail out or crash.

Three of the 80 raiders died during the mission and eight were captured. Three of the captives were executed by the Japanese. As of Jan. 20, 2006, there were 16 surviving members of the group.

Crouch was a 1940 Citadel graduate. After retiring from the Air Force, he became a high school teacher. He was inducted into the South Carolina Hall of Fame in 1998. ■

Senior Staff Changes

RETIREMENT: Maj. Gen. Perry L. Lamy.

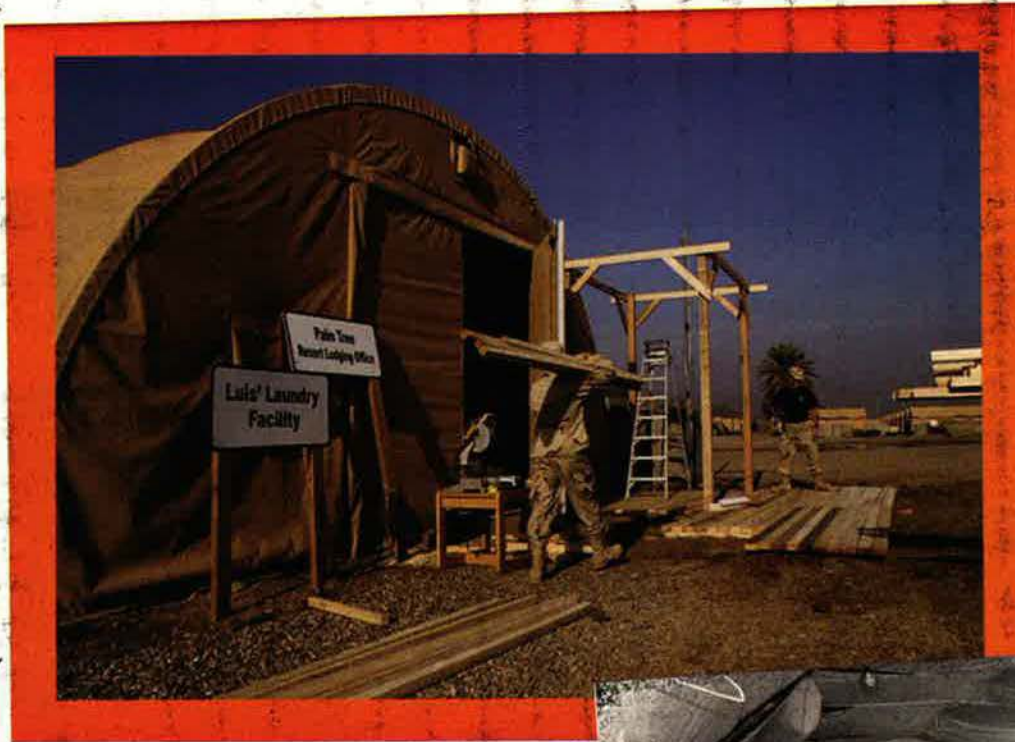
CHANGES: Brig. Gen. (sel.) Joseph D. **Brown IV**, from Executive Asst. to Cmdr., SHAPE, NATO, Casteau, Belgium, to Exec. to Cmdr., SHAPE, NATO, Casteau, Belgium ... Brig. Gen. (sel.) Michael W. **Callan**, from Asst. Dep. Dir., Spec. Ops., Jt. Staff, Pentagon, to Dir., Ops., AFSOC, Hurlburt Field, Fla. ... Brig. Gen. (sel.) Eric E. **Fiel**, from Dir., Ops., AFSOC, Hurlburt Field, Fla., to Dep. Commanding General, Jt. Spec. Ops. Command, SOCOM, Ft. Bragg, N.C. ... Brig. Gen. (sel.) Mark W. **Grapert**, from Dep. Asst. C/S, United Nations Command Korea/US Forces Korea, Yongsan Garrison, Seoul, South Korea, to Dir., Standing Jt. Force Hq-North, NORTHCOM Peterson AFB, Colo. ... Brig. Gen. (sel.) John W. **Hesterman III**, from Cmdr., 12th FTW, AETC, Randolph AFB, Tex., to Spec. Asst. to DCS, Air & Space Ops., USAF, Pentagon ... Brig. Gen. William L. **Holland**, from Dep. Dir., Ops. & Tng., DCS, Air & Space Ops., USAF, Pentagon, to Dir., Ops. & Tng., DCS, Air & Space Ops., USAF, Pentagon ... Brig. Gen. (sel.) Richard C. **Johnston**, from Exec. to Cmdr., TRANSCOM, Scott AFB, Ill., to Cmdr., 86th AW, USAF, Ramstein AB, Germany ... Brig. Gen. Robert C. **Kane**, from Cmdr., 86th AW, USAF, Ramstein AB, Germany, to Dep. Dir., Ops. & Tng., DCS, Air & Space Ops., USAF, Pentagon ... Brig. Gen. (sel.) Joseph A. **Lanni**, from Cmdr., 412th Test Wg., AFMC, Edwards AFB, Calif., to Vice Cmdr., Air Armament Center, AFMC, Eglin AFB, Fla. ... Brig. Gen. (sel.) Michael A. **Longoria**, from Dir., Jt. Air Ground Ops., ACC, Langley AFB, Va., to Commanding General, Jt. Interagency Task Force-Former Regime Elements, MNF-Iraq, CENTCOM, Baghdad, Iraq ... Brig. Gen. (sel.) Susan K. **Mashiko**, from Vice Cmdr., Air Armament Center, AFMC, Eglin AFB, Fla., to PEO and Sys. Prgm. Dir., NPOESS, Integrated Prgm. Office, Silver Spring, Md. ... Brig. Gen. (sel.) John D. **Posner**, from Cmdr., 27th FW, ACC, Cannon AFB, N.M., to Dep. Dir., Ops., Natl. Mil. Command Center, Ops. Team 1, Jt. Staff, Pentagon ... Brig. Gen. (sel.) James O. **Poss**, from Dir., Intel, USAF, Ramstein AB, Germany, to Dir., Intel, ACC, Langley AFB, Va. ... Maj. Gen. (sel.) David J. **Scott**, from Dep. Commanding General, Jt. Spec. Ops. Command, SOCOM, Ft. Bragg, N.C., to Dir., Spec. Ops. Center for Networks & Comm., SOCOM, MacDill AFB, Fla. ... Brig. Gen. (sel.) David B. **Warner**, from Dep. Dir., Ops. & Spt. Integration, Warfighting Integration and CIO, OSAF, Pentagon, to Dir., C2 Prgms., DISA, Arlington, Va. ... Brig. Gen. Thomas B. **Wright**, from Dir., Intel., ACC, Langley AFB, Va., to DCS, Strat. Comm., MNF-Iraq, CENTCOM, Baghdad, Iraq.

SENIOR EXECUTIVE SERVICE RETIREMENTS: Robert Q. **Fugate** ... James R. **Pennino**.

SES CHANGES: Thomas A. **Fitzgerald**, to Dir., Systems Acq., SMC, AFSPC, Los Angeles AFB, Calif. ... James L. **McGinley**, to Dep. Dir., Financial Mgmt. & Comptroller, AFMC, Wright-Patterson AFB, Ohio ... Daniel F. **McMillin**, to Dir., Policy, Planning, & Resources, Warfighting Integration and CIO, OSAF, Pentagon ... Bill R. **Moore**, to Assoc. Dir. of Intel., Intel. Directorate, CENTCOM, MacDill AFB, Fla. ... Marilyn M. **Thomas**, to Dir., Budget Investment, Office of Dep. Asst. SECAF (Budget), Pentagon ... John P. **Wheeler III**, to Spec. Asst. to SECAF, OSAF, Pentagon ... Barbara Jo **White-Olson**, to Dir., Budget Mgmt. & Execution, Office of Dep. Asst. SECAF (Budget), Pentagon. ■

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CAMSS30 Shelter NSN:5419-01-465-3019EJ
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Action in Congress

By Tom Philpott, Contributing Editor

Battle Over Tricare; What The Military Coalition Wants; Lower Taxes

Higher Tricare Fees Loom

A senior defense official confirmed Pentagon plans to raise Tricare fees for military retirees under age 65.

William Winkenwerder Jr., assistant secretary of defense for health affairs, delivered the news during a Jan. 11 meeting with members of The Military Coalition, a consortium of veterans and service groups, including the Air Force Association.

The coalition is attempting to block any Tricare changes that would impose more costs on retirees.

Winkenwerder said the government must impose the higher fees to save a "great" benefit.

Defense Department plans called for raising Tricare Prime enrollment fees and Tricare Standard deductibles sharply over Fiscal 2007 and 2008 for working-age military retirees and their families. (See "Action in Congress: Tricare Hikes?" February, p. 33.) This affects about three million beneficiaries.

Tricare fees for retirees have not been raised since they were set in 1995.

The draft Tricare proposals projected savings of \$12 billion over five years and \$32 billion through Fiscal 2015, by requiring retirees to pay a higher rate of medical costs and encouraging more of them to use employer-provided health insurance.

Why the Tricare Boost?

In promoting the hike in Tricare fees, defense officials argue that soaring military medical costs, accelerated by recent benefits gains (particularly for service elderly) are squeezing other military budgets.

Winkenwerder told the military association representatives that Tricare never was intended to relieve state and local government or private sector employers of the responsibility of providing health benefits to military retirees they hire.

House Democratic leader Rep. Nancy Pelosi (Calif.) and six colleagues attacked the Administration's Tricare fee plan in a Jan. 25 letter to President Bush.

"Not only is this premium increase unfair to the military retirees who have given 20 to 30 years of service and sacrifice, it will not help maintain our military strength," they wrote. The Democrats



Winkenwerder: Higher Tricare fees are required.

urged Bush not to "shift additional costs upon veterans or military retirees."

Defense officials have complained that civilian employers are offering retired military workers incentives to use Tricare instead of company insurance. (See "Action in Congress: Rising Health Care Costs ... And Ways to Curb Them," December 2005, p. 24.)

Bryan Whitman, a department spokesman, said DOD health care spending, left unchecked, could reach \$64 billion by 2015. That would represent 12 percent of total defense spending. In Fiscal 1995, he said, health care represented only five percent of the defense budget.

Winkenwerder told the service associations that the percentage of Tricare-eligible retirees and family members reliant on military health care has climbed from 66 percent in 2002 to 78 percent in 2006. It will reach 87 percent by 2011 unless Tricare fees and deductibles are raised.

2006 TMC Agenda

Besides battling to block Tricare fee increases, The Military Coalition vows to press Congress to pass new initiatives. TMC legislative priorities for budget year 2007 include:

- Further expansion of Tricare ben-

efits offered to drilling Guard and Reserve personnel.

- Lowering retirement age for the Reserve Components from 60 to 55.

- Easing transition problems associated with rebasing from overseas.

- Upgrading "seamless" health care coverage for active duty, National Guard, and Reserve members shifting to VA medical care.

- Ensuring a broad Tricare pharmacy formulary.

- Winning authority for pretax payment of health, dental, and long-term care premiums.

- Providing full funding for veterans enrolled in the VA health care system.

- Eliminating the Dependency and Indemnity Compensation (DIC) offset to the military's Survivor Benefit Plan.

- Resuming DIC payments for qualifying widows who remarry after age 55.

- Moving up the effective date (now Oct. 1, 2008) of the 30-year paid-up rule for SBP premiums.

- Allowing full concurrent receipt of military retired pay and VA disability compensation by disabled retirees.

- Allowing concurrent receipt for medical retirees with less than 20 years of service.

- Raising relocation reimbursements

DOD photo by R.D. Ward

to cover members' costs for government-directed moves.

- Reforming the government travel credit card program to reduce risk-shifting to members.

More 2006 Defense Act

President Bush signed the 2006 National Defense Authorization Act on Jan. 6, 2006, setting into law several dozen initiatives to improve military pay, benefits, and quality of life.

Here are some of the important, but low-profile, initiatives enacted into law:

- Household Weight Allowances—Senior enlisted personnel can ship more household goods at government expense when moving between assignments. Pay grades E-8 and E-9 saw the authorized weight allowance jump by 1,000 pounds and E-7s by 500 pounds.

- Hardship Duty Pay—The ceiling on hardship duty pay rose from \$300 a month to \$750. Defense officials indicated they could begin paying hardship pay to service personnel being deployed frequently to Iraq, Afghanistan, or other duty overseas. Payments of \$225 a month for three months would be the average, according to the Congressional Budget Office.

- Wounded Pay—Service members wounded in combat and evacuated from the theater for medical treatment will receive a special \$430 a month payment. This would last until they no longer are hospitalized or they begin to receive traumatic injury insurance of up to \$100,000.

- Reserve Housing Allowances—Reservists on active duty more than 30 days will receive the same basic allowance for housing as regular active duty personnel. Reservists called up on orders



USAF photo by SSGT Bradley C. Church

For some enlisted troops, the taxman never cometh.

lasting less than 140 days and tied to a contingency operation get a partial housing allowance.

Tax Issues

Combat-zone tax exclusions, along with recent changes to the Earned Income Tax Credit (EITC) and child tax credits, are wiping out the income tax liability for thousands of military members and are replacing tax bills for many individuals with refundable cash credits, say IRS officials.

The tax breaks are available even to officers in grades as high as colonel, so long as they have served lengthy combat tours overseas. Federal tax officials see this as a loophole in the tax law. This qualifies the troops for thousands of dollars in tax credits.

In Iraq and Afghanistan, enlisted troops and warrant officers are exempt from income tax on their military pay. Most commissioned-officer pay also is tax free, but the exclusion is capped. For tax year 2005, only the first \$6,529 a month of basic pay or other service compensation is tax-exempt.

Earned Income Tax Credit

Combat-zone tax breaks become even more valuable when combined with the Earned Income Tax Credit and the Child Tax Credit. Here's how:

For tax year 2005, EITC provides a refundable tax credit of up to \$4,400. For 2005, adjusted gross income must be less than \$37,262 for families with two or more qualifying children, and less than \$33,030 for families with one qualifying child.

For 2003, when the war in Iraq began, many low-income military families actually saw their tax credit decline because combat service left them with little or no taxable income. Many officers suddenly

qualified for EITC for the same reason: Combat tours had sharply lowered their taxable income. (See "Action in Congress: Combat-Zone Tax Relief," November 2004, p. 23.)

Higher income personnel continue to exclude combat-zone pay when calculating the tax credit. Lower paid members now include combat-zone pay in their EITC calculations.

Defense officials urged Congress in 2004 to restore EITC levels for enlisted serving in combat zones, but to end "windfall" credits for higher-paid personnel. Lawmakers ignored only the second request, and the more expansive eligibility rules for EITC are set through tax year 2006.

Child Tax Credits

Troops also can qualify for the Child Tax Credit, of up to \$1,000 per child up to age 16. For a family with two children, the child tax credits can knock \$2,000 off their tax bill.

If families have modest incomes but little or no tax liability because of combat tours, Congress approved the Additional Child Tax Credit. This allows families to convert the unused portion of the Child Tax Credit into a cash refund.

Tax Day

Military members serving in combat areas do not have to file 2005 tax returns by the usual April 15, 2006, deadline. All IRS tax actions are suspended while members are in a war zone.

After the service members leave the war zone, they have at least six months to file their tax returns.

Even that deadline, however, is extended by the number of days a member served in a combat zone between Jan. 1 to April 15, the normal US income tax-filing period. ■

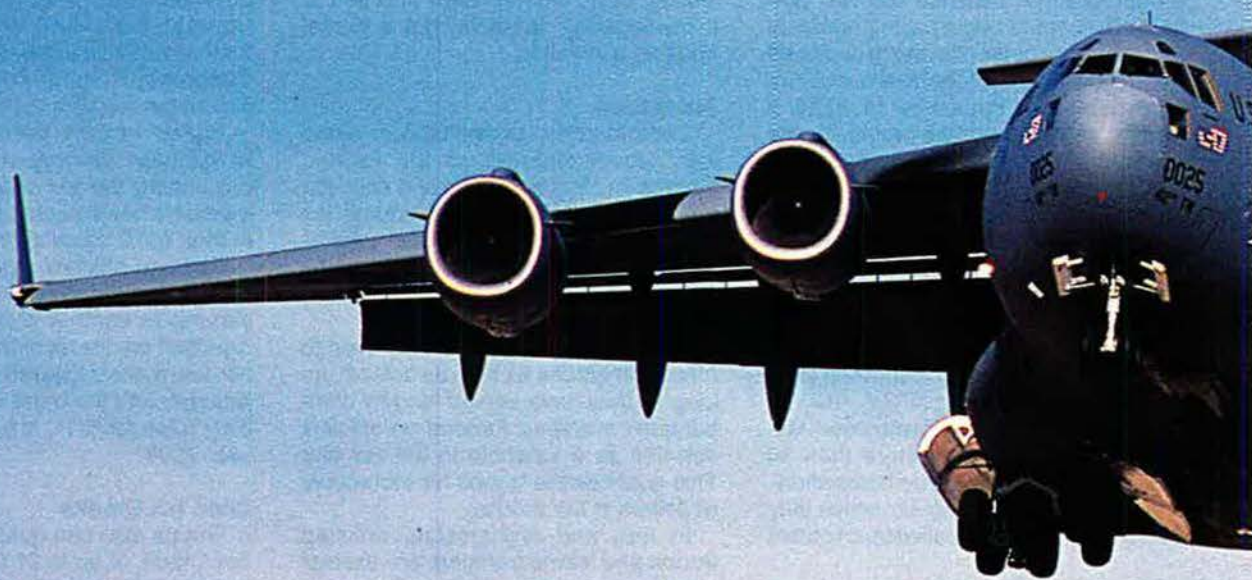
AP photo by Charis Dharapak



Pelosi sees "unfairness."

Rising Risk i

A new Pentagon study paints a rosy picture but glosses over lots of worrisome factors.



Having dragged on for years, the Pentagon's deepest-ever review of military mobility has ended with a wholly unanticipated conclusion.

It is that the United States military, far from suffering a shortage of lift, actually possesses enough air, sea, and surface transport to meet its current and future needs.

With that finding, the Mobility Capabilities Study turned aside years of warnings about a serious shortage of airlift.

The fundamental MCS finding likely spells the end of the line for production of the Air Force's C-17 airlifter and a shift toward the outsourcing to US commercial carriers much of the armed

forces' transport activities. However, the analysis also underscored the need to act as soon as possible to replace at least some of the Air Force's aged aerial tankers, most of which date to the Eisenhower era.

The MCS, nearly five years in the making, was carried out by members of the Joint Staff with little input from the armed services.

Its basic conclusion surprised many, because the Global War on Terrorism has placed such obvious stress and strain on the nation's mobility assets, especially airlift.

Mobility forces, note officials, have been operating at near-peak capacity almost since the opening of Operation Enduring Freedom on Oct. 7, 2001.

The nation's mobility leaders have said—frequently and consistently—that the nation needs more airlift capability to meet existing demand, let alone any new need.


An earlier study—completed in 2000 and released in January 2001, *before* the terrorist attacks of Sept. 11, obviously did not factor into its conclusions all of the new requirements generated by combat operations in Afghanistan, Iraq, and elsewhere. Yet even that outdated study concluded that the United States had a serious shortage of lift.

The new realities include sharply higher operating tempo plus a host of strategy-driven changes, such as stepped-up use of fast-moving special

n Air Mobility

Photo by Ted Carlson

By John A. Tirpak, Executive Editor



After years of dire warnings of an airlift shortage, the Pentagon has come to the surprising conclusion that the US military probably has enough lift capacity, and no more C-17s need to be bought.

operations forces, increased emphasis on expeditionary operations, expanded "home basing" of US forces, and pressure for humanitarian responses in times of disaster.

What MCS Left Out

Not all of those factors were counted in the new study.

Nor was the Army's new organizational strategy, in which that service is re-orienting itself toward smaller forces with lighter equipment, intended to get to the action more swiftly via airlift. (See "Army Change, Air Force Change," p. 36.)

While the MCS was supposed to have been comprehensive, the Pentagon left out so many critical factors that it already

has begun work on a follow-up study, called MCS-06.

The Pentagon had claimed that it would make the final MCS report available to the public, with release originally scheduled for mid-December. However, it was stamped "classified" by DOD, without explanation. Thus, any knowledge about its main findings has emerged unofficially from Congressional sources and the public comments of senior defense officials.

In briefings to members of Congress, Pentagon officials noted that the MCS was not intended to produce firm procurement recommendations. Those were to result from the Quadrennial Defense Review, which translated the

MCS findings into action items. These include moves to:

- Terminate the C-17 program with the 180th aircraft.
- Retain C-17 tooling for possible resurrection in the event the air mobility program runs into problems.
- Pursue development of C-5 reliability improvements with an eye toward extending its service life by 25 years.
- Buy up to a total of 79 C-130Js for intratheater airlift.
- Begin development of a new hybrid tanker-airlifter able to perform both refueling and transport operations.
- Develop a new small cargo aircraft suitable for resupply of forces ashore and ground forces served only by small, austere landing strips.



Production of C-17s would end at 180 under new Pentagon plans. Senior leaders admit, though, that their plan is risky enough that the tooling should be retained—at considerable cost—until it's known if other airlift options will work. Here, a formation of C-17s flies over the Blue Ridge Mountains of Virginia during low-level training.

- Enhance the Civil Reserve Air Fleet by adding more guaranteed work and financial enticements to promote and retain participation by the airlines.

- Use more pre-positioning of war stocks on land and at sea.

- Invest in the development and purchase of new, fast sealift ships.

In one controversial determination, the MCS concluded that the US already had achieved airlift capabilities specified in the previous 2001 study. That analysis, called the Mobility Requirements Study 2005 (because it was looking out to needs in that year), concluded that the US required airlift capacity of 54.5 million ton miles per day, but it could generate only 49.7 MTM/D. (See “The Airlift Shortfall Deepens,” April 2001, p. 54.)

The MRS-05 suggested a range of means to close the 10 percent gap. One was to increase the purchase of C-17s from the then-planned 120 to 180. That step was, in fact, taken.

Handy's Warning

Since the MRS-05, however, the now retired commander of US Transportation Command and USAF's Air Mobility Command, Gen. John W. Handy, had

said repeatedly that the increased operating tempo of the war on terror had pushed his estimate of the need to 222 C-17s or more.

In 2004, AMC estimated that its requirement had actually crested to more than 60 MTM/D. (See “The Airlift Gap,” October 2004, p. 34.)

The MCS rebutted those figures. In fact, after using the MTM/D as the yardstick for measuring capability for more than 45 years, the Pentagon now downplays it as a useful metric, claiming the measurement is not a reasonable way to gauge lift capability. Defense leaders said predictions made under the MTM/D metric consistently disagreed with actual needs and results and that investments will be made in better modeling of lift requirements.

The MCS concluded that the levels requested in the MRS-05, having been achieved, are adequate for day-to-day operations and, in concert with other “surge” capabilities such as the CRAF, ought to be good enough in the long run. It considers the current surge operations supporting two theaters of war as a temporary situation.

In its judgment that the existing fleet will suffice, the Pentagon gave great

weight to several factors. Example: DOD notes that modern equipment requires fewer personnel to maintain and fewer spares and pieces of repair equipment to fix, the result being a reduced overall need for lift. An F-22 squadron, for example, needs about half as many C-17s as an F-15 squadron needs to deploy overseas.

In addition, the logistics system has made dramatic improvements in developing precise knowledge of the location of an item, where it needs to go, and how it travels from point of origin to destination. This has led to a large reduction in the amount of materiel that must be moved.

Gen. Norton A. Schwartz, head of US Transportation Command, explained to reporters in December that, in the first Gulf War, the US moved “mountains” of materiel to the Middle East and that much of it was never used and had to be shipped back.

“The solutions were brute force,” Schwartz noted. “We shipped stuff just because it seemed like the right thing to do.” Large amounts of materiel were picked up, transported, and piled up in the combat theater with little knowledge of what was in these piles or where items

needed to go, leading, Schwartz said, to lots of duplication.

From Mountains to Mounds

Now, he said, "we're no longer talking about mountains of supply; we're talking about mounds." Thanks to commercial techniques such as use of computers and bar codes, he said, "we have ... exquisite insight into what's in those mounds, who it belongs to, and what is the end item."

Emulating big-box retailers, such as Wal-Mart and Home Depot, that have nearly perfected the automated tracking, ordering, and delivery of goods, gives Schwartz "confidence" that the US "can operate in a different way than we have in the past, and with somewhat less [safety] margin, not zero margin."

In other words, the US could make do with fewer assets, but not so few that the lack begins to pose a danger.

Other factors suggested lift requirements could be lowered, said officials. These include a decision giving TRANSCOM total "ownership" of the logistics process, removing service middlemen, and reducing the steps required in any resupply mission. In addition, the Pentagon is moving to reduce the lift burden by unlinking units and their equipment, rotating personnel in and out of a forward theater, but leaving their equipment in place. Such moves allow most of a redeployment to be accomplished by commercial passenger carriers, rather than large "organic" airlifters.

Secretary of the Air Force Michael W.



USAF photo by TSgt. James Mossman

Successful upgrading of the C-5 is critical to the new airlift plan. It is expected that the C-5, despite its age and size, can be brought up to snuff. In this photo, two C-5s stand ready at a base in Southwest Asia.

Wynne said in December that the MCS examined "every available mobility asset" and "scored it for the likelihood of usage." After calculating airlift along with those other assets—commercial air, commercial and naval sealift, self-deployment capabilities, and so forth—the Pentagon was "not uncomfortable" with its current lift capability.

"It became really very obvious that we had an overage—a margin—available," Wynne maintained.

At the same Pentagon press conference, Gen. T. Michael Moseley, Air Force Chief of Staff, said it was clear that, historically and under the scenarios

examined, the Army would not move mainly by air in the future.

"You move an army by surface," Moseley said, declaring that it is not efficient to move "thousands of heavy pieces of armor" by air alone.

Wynne discounted the idea that the Army actually means to move the bulk of its forces by air. "The Army is right to move to more agility," he said. "I do think, though, that it's a tactical move. I think when you're talking about strategic lift, you're going to be moving by sea."

Moseley observed that the Air Force had moved "a dozen M1 tanks by C-17" along with troops to the north of Iraq in Operation Iraqi Freedom and would stand ready to accomplish a similar, limited maneuver in the future, but the Air Force should not be considered the main mode of transportation for a wartime Army.

The C-5 Risk

The MCS conclusions take as given many things that are still uncertain. It assumed, for example, that a plan to upgrade the C-5 Galaxy fleet with new engines and other reliability improvements will actually pan out. The benchmark is that the C-5 must achieve an availability rate of better than 75 percent; more availability translates to more "airlifter equivalents." A development and test program is under way, but it won't be known if the program will work until 2008—well after the C-17 line would close under QDR decisions.

"A key assumption in the study ...



USAF photo by MSgt. Keith Reed

SSgt. Brian Munn takes cover behind a forklift as a C-17 Globemaster III taxis toward the Bashur Airfield in northern Iraq. C-17s have moved "a dozen" M1 tanks, but USAF should not be considered the main mode of transportation for the Army.



A C-130J lands at Little Rock AFB, Ark. The QDR recommended a total buy of 79 C-130Js for intratheater airlift and the development of a new small cargo aircraft suitable for resupply of forces served only by a small, austere landing strip.

for all of this is that the C-5 delivers,” Schwartz said, “and there is some risk in the current strategy until we have the answer to that question.”

To reduce the risk, Schwartz said, the Pentagon will consider a variety of hedges. One is to mothball the C-17 line or store the tooling so the Air Force could put the Globemaster III back into production should the C-5 upgrade come a cropper. Such a plan is not without cost; Schwartz didn’t have definitive numbers, but said storing the tooling would cost upward of several hundred million dollars.

C-5 assumptions include thoroughly funding the “program of record” for avionics and reliability upgrades, Schwartz said. He warned, “If that were not the case, if there was backsliding on that, ... my position [on C-17 termination] would not likely be the same.”

Still, he expected that the C-5, despite its age and size, can be brought up to snuff and last the required period of time. Such a program worked very well for the KC-135R conversion, he said. “If we do as well with the C-5,” said Schwartz, “we’ll be in good shape. ... I have to believe that this is within the state of the art of the American aerospace industry.”

Further MCS assumptions were that:

- DOD will provide all required funding for overseas basing, infrastructure, and pre-positioned stocks.

- Pentagon “transformation” reforms—intended to increase quality

and effectiveness while decreasing a force’s “footprint”—will bear fruit.

- Host nations and allies will honor existing agreements and that the global strategic situation doesn’t change dramatically.

Part of the pre-positioning assumptions include going ahead with some form of “Sea Basing,” a naval concept that calls for using offshore platforms as operating bases in a crisis.

Another assumption is that, even with two overlapping major theater wars, there won’t be more than about two to three weeks of peak demand that would tax the airlift system to its

limit. Such was the case in wars in the Balkans in 1999, Afghanistan in 2001, and Iraq in 2003.

Schwartz contended that additional purchases of C-17 would pose a direct threat to modernization of the Air Force’s tanker fleet. If he had the chance, he’d buy both, he said, but, faced with the need to make a choice, “I will recommend promptly moving into a multimission tanker [program] and accepting, reluctantly, curtailment of C-17 acquisition at 180.”

The reason, he said, is that more C-17s would create an organic capability the Air Force would be obligated to use to give the taxpayer a return on investment. Such a move would consume funds and create capability that would “take cargo away from those commercial operators” that the Pentagon wants to keep in the system as “commercial augmentation.”

More business for private carriers is needed as an inducement to keep oversize cargo aircraft in the CRAF, Schwartz explained. Otherwise, carriers will go “naturally to more efficient airplanes—narrower body airplanes, machines which are perhaps less accommodating [of] cargo”—and officials lose the ability to call up the CRAF capability “on which we rely.”

Two-Way Tankers

Schwartz said a new tanker capable of swinging between the roles of aerial refueling and hauling pallets of cargo would give him enough flexibility to handle an unanticipated problem, with-



USAF needs to keep commercial carriers available for surge cargo operations. More C-17s, officials argue, would take work and funds away from CRAF participants. Here, a C-17 lands at Balad AB, Iraq, while an F-16 readies for takeoff.



the E models makes more sense” than obtaining a multimission tanker, he said. Asked when the tanker program should be launched, Schwartz said flatly, “I think we need to get started without delay, ... right now. Get on with it.”

Wynne said he’s convinced the requirement for the new combi-tanker will be “more than 100, but I have a feeling it’s going to be far less than 500.”

Asked why it would make sense that, since adding a two-theater war, the mobility requirement has not grown compared to when MRS-05 was prepared, Schwartz said to look at real-world scenarios.

Airlift “Elasticity”

“Look at what we did during the hurricanes,” he noted. “We swung a healthy piece of the force to the Gulf Coast and yet maintained our ability to operate and support [commanders in Iraq] with virtually no impact. Now, again, this is not just using military

out investing too much either in a government fleet or relying too much on civil contractors.

He wants to find the right “tension between commercial and organic, and hitting what I call the ‘sweet spot.’”

Schwartz said he is mindful that, especially early in a conflict, there is simultaneous high demand for both tankers and airlifters and that one airplane can’t usually do both jobs at once. However, he insisted that his command is skilled at optimizing its assets and using them efficiently.

“More flexibility is always better than less,” he maintained.

“There are those whose only metric is capacity. And if you look at that metric, you come to one conclusion. If you look at the metric of reliability and versatility, you might come to a different conclusion. And, in fact, I do.”

Moseley said that the tanker-cargo combo also is a good tool to have because it sometimes has enough extra capacity to eliminate the need for more aircraft. He gave as an example the KC-10, which is “very useful in moving squadrons of fighters, because you can put a spare engine in there, plus your crew chiefs. You can put a deployable maintenance package on there,” as well as offload fuel



USAF photo by Judson Brohmer

USAF will likely not have to replace all of its KC-135s (foreground, above), but there is dwindling reason not to get rid of the oldest of the type, which are 45 years old. Instead, the Air Force should focus on a new combination tanker-cargo aircraft such as the KC-10 (in background above and, at left, refueling an F-22).

for the deploying squadron en route.

Schwartz said that while the Air Force likely will not have to replace all 500 of its KC-135s, there is dwindling reason to keep the oldest of the type, the 45-year-old KC-135Es that are saddled with safety restrictions and are in the worst physical shape. They should not be upgraded to get more years of life out of them, Schwartz said.

“I don’t think you can make the economic business case that modifying

aircraft, this was using all the assets at our disposal.”

There is, Schwartz said, even at high operating tempo, “some elasticity in this system.”

He cited as an example the movement of armor upgrade kits to Southwest Asia by air “because the requirement was to modify vehicles as quickly as possible.” However, after so many kits had been deployed that the modification team could continue at maximum rate until more

could arrive by sea, “we went to sealift ... because operating by sea is 10 to 20 times less expensive than by air.”

Schwartz declined to say what a new Light Cargo Aircraft would be, saying only that the niche exists and that it’s too early to define it. Such a machine would not only supply troops far afield, but also serve as the short-range transport connecting a sea base with shore. As such, he said, it could be anything from a fixed-wing aircraft to a helicopter to a tilt-rotor.

Last August, the Pentagon completed its overseas basing strategy, which called for the return to the continental US of some 70,000 troops now deployed overseas, in addition to the 50,000 that have returned in the last 10 years. Asked if this move would increase the need for lift, Schwartz said it would not.

“If you leave equipment in place,



DOD photo by Petty Officer 2nd Class James K. McNeil

USAF photo by Lt. Col. Bob Thompson



Upgrading C-5s (at top, unloading an MH-53E Sea Dragon at NAS Sigonella, Sicily) means some of the aircraft would be more than 60 years old at their planned retirement. Numbers of commercial carriers available for CRAF, such as this one being unloaded at Incirlik AB, Turkey, could dwindle as the industry trends toward slim, lightweight aircraft.

and you simply rotate the troops with personal equipment, ... I would envision that being done largely by commercial capability,” Schwartz asserted. Deciding to move the heavy equipment as well means “the sustaining requirement would probably go up.”

Another reason that the MCS decided the lift fleet is adequate is an assumption that the operating tempo of the overall force will decline, that today’s high operating tempo will eventually subside.

Asked why he believes this to be the case, Schwartz said the assertion “that we’re busier than we were in the ’90s

is absolutely true. And that’s unlikely to change.”

However, “the surge level of activity” associated with Iraq “is likely to subside over time. And I think that’s because it is unlikely that we’ll have 20 brigades in the [area of operations] indefinitely.” Schwartz said he sees this not as optimism but pragmatism.

Every commander, he said, wants some “management reserve,” but right now, “the ground forces, clearly, are more stressed ... than some of the other pieces of the force,” and “we need balance in the force.”

Wynne said it’s not necessary to keep the C-17 in production to maintain a critical defense industrial base.

Unlike the fighter base, which is militarily unique and has no civilian counterpart, Boeing, the maker of the C-17, “actually has large airplanes” in their current product lineup. “They have the engineering talent to go back” and design new cargo aircraft or update the C-17, if the nation should demand it, and those skills won’t atrophy.

Schwartz added, “It’s not rocket science.” The conclusion of the MCS leaves the mobility issue far from settled, hence the push for an MCS-06. Congress is performing its own version of the QDR, with an eye toward maintaining capabilities that provide the US with unique advantages. (See “Washington Watch: Hunter’s QDR Alternative,” November 2005, p. 12.)

The Pentagon’s QDR itself will be the subject of extensive hearings and scrutiny on Capitol Hill. Last fall, a nonbinding resolution, supported by more than 80 Senators, called for the Defense Department to go beyond production of 180 C-17s.

The C-5 upgrade is still in development, its success still uncertain.

The Air Force, aiming for a combination tanker-airlifter, also will have to prepare a new tanker analysis of alternatives to divine what kind of capability it wants and can afford.

All of these factors should keep the issue of mobility risk uppermost in the minds of military officials for some years. ■

The Keeper File

Truman's "Parity" for Airpower

For most of 1945, President Harry S. Truman listened as Army and Navy officers debated whether and how the US armed services should be unified. Senior Army officers favored a merger of the War Department (i.e., Army and Army Air Forces) and Navy Department (Navy and Marine Corps) under a single department. The Navy balked, preferring a principle of "mutual cooperation," in which the Army and Navy informally coordinated forces in battle.

Now, Truman was ready to give his decision. On Dec. 19, 1945, the President formally sent Congress legislation favoring unification under a single Cabinet head. One big reason, said Truman, was the need to organize a system that would "provide parity for airpower." As Truman astutely noted, such parity could be achieved in a single defense department, or in three separate military departments (for air, land, and sea forces), but not when just two—Army and Navy—controlled the air weapon.

Congress came down on the side of the Navy and Marine Corps, forcing President Truman to accept a compromise National Security Act. On July 26, 1947, Truman signed the act, which created a "coordinated" National Defense Establishment. However, it also established an independent Air Force, which, like its sister services, was essentially autonomous. In 1958, President Dwight D. Eisenhower said, "The entire structure ... was little more than a weak confederation of sovereign military units."

I RECOMMEND that the Congress adopt legislation combining the War and Navy Departments into one single Department of National Defense. Such unification is [an] essential step ... in the development of a comprehensive and continuous program for our future safety and for the peace and security of the world.

One of the lessons which has most clearly come from the costly and dangerous experience of this war is that there must be unified direction of land, sea, and air forces, at home as well as in all other parts of the world where our armed forces are serving. We did not have that kind of direction when we were attacked four years ago—and we certainly paid a high price for not having it.

In 1941 we had two completely independent organizations [i.e., Army and Navy] with no well-established habits of collaboration and cooperation between them. If disputes arose, if there was failure to agree on a question of planning or a question of action, only the President of the United States could make a decision effective on both. Besides, in 1941, the airpower of the United States was not organized on a par with the ground and sea forces. ...

Further studies of the general problem would serve no useful purpose. There is enough evidence now at hand to demonstrate beyond question the need for a unified department. ...

We should organize to provide parity for airpower. Airpower has been developed to a point where its responsibilities are equal to those of land and sea power, and its contribution to our strategic planning is as great. In operation, airpower receives its separate assignment in the execution of an overall plan. These facts were finally recognized in this war in the organizational parity which was granted to airpower within our principal unified commands.

Parity for airpower can be achieved in one department, or in three, but not in two. As between one department and three, the

"Army-Navy Merger"

President Harry S. Truman
Message to Congress
Washington, D.C.
Dec. 19, 1945

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

former is infinitely to be preferred. The advantages of a single department are indeed much clearer when the alternative is seen to be three departments rather than the present two. The existence of three departments would complicate tremendously every problem of coordination that now exists between the War and Navy Departments, and between the services and the rest of the government. ...

I recommend that the reorganization of the armed services be along the following broad lines:

(1) There should be a single Department of National Defense. This department should be charged with the full responsibility for armed national security. It should consist of the armed and civilian forces that are now included within the War and Navy Departments.

(2) The head of this department should be a civilian, a member of the President's Cabinet, to be designated as the Secretary of National Defense. Under him there should be a civilian undersecretary and several civilian assistant secretaries.

(3) There should be three coordinated branches of the Department of National Defense: one for the land forces, one for the naval forces, and one for the air forces, each under an assistant secretary. ...

(4) The undersecretary and the remaining assistant secretaries should be available for assignment to whatever duties the President and the Secretary may determine from time to time.

(5) The President and the Secretary should be provided with ample authority to establish central coordinating and service organizations, both military and civilian. ...

(6) There should be a Chief of Staff of the Department of National Defense. There should also be a commander for each of the three component branches—Army, Navy, and Air.

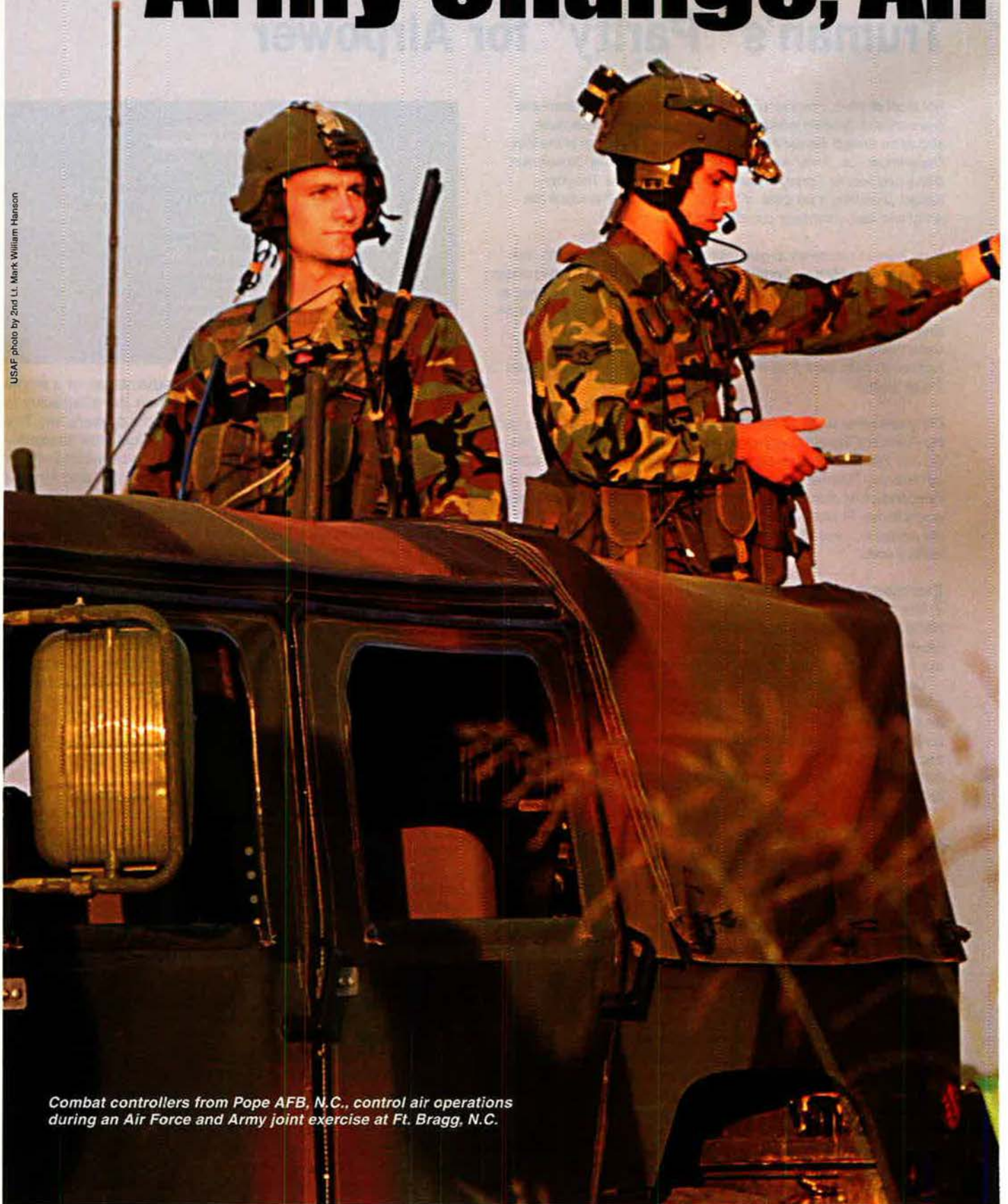
(7) The Chief of Staff and the commanders of the three coordinate branches of the department should together constitute an advisory body to the Secretary of National Defense and to the President. ...

Unification of the services must be looked upon as a long-term job. We all recognize that there will be many complications and difficulties. Legislation of the character outlined will provide us with the objective, and with the initial means whereby forward-looking leadership in the department, both military and civilian, can bring real unification into being.

I make these recommendations in the full realization that we are undertaking a task of greatest difficulty. ■

Army Change, Air

USAF photo by 2nd Lt. Mark William Hanson




Combat controllers from Pope AFB, N.C., control air operations during an Air Force and Army joint exercise at Ft. Bragg, N.C.

Force Change

The Army is going through a turbulent period of change, but the Air Force also feels the effect.

By Adam J. Hebert, Senior Editor



The United States Army is in the throes of its greatest makeover since World War II, with what was once a heavy, plodding Cold War fighting force being changed into what service leaders hope will be a collection of compact, easily deployable, hard-hitting, and independent combat teams.

And this turbulence will, in turn, have a far-reaching impact on the Air Force. It will be expected to meet the Army's rising demand for air mobility, battlefield information, air support, and resupply.

The Army has set ambitious—and possibly unrealistic—deployment goals. The Army wants its brigade-sized combat teams to be able to deploy in C-130 tactical transports and respond to a crisis anywhere in the world within 96 hours. This will force the Air Force to take new looks at airlift requirements.

Plans call for new brigade combat teams (BCTs) to be self-sufficient and able to operate autonomously in war zones. BCTs will bring with them relatively little “organic” firepower. They will, instead, rely heavily on what the Army calls “joint fires,” meaning, in most cases, USAF-supplied air support.

This means that Air Force intelligence-surveillance-reconnaissance and fire support capabilities once reserved for large ground formations will be pushed down to the brigade level and perhaps lower. USAF is already looking to double its inventory of joint terminal attack controllers, airmen who travel with the ground troops and direct attacks from the air. Modularity also may increase the demand for tactical airlift to resupply the Army's mobile units.

To be sure, the Air Force has in every era adjusted to the evolving require-

ments of ground combat. However, this time things are different, said USAF Brig. Gen. Andrew S. Dichter, deputy requirements director for joint integration. Dichter maintained that, because of its sheer magnitude, the Army's modularity push is a “bigger deal” than more evolutionary changes of the past. The speed of the change also has gotten Air Force attention.

Blowback of Task Force Hawk

At the heart of matters is the Army's abandonment of a heavy, division-based structure designed to face down the Soviet Union in Central Europe. The Army's heavy armored divisions, with about 12,000 combat soldiers and 70-ton M1A2 tanks, were ideal for countering an entrenched, armored enemy. Today, however, such formations are too large and inflexible to deploy swiftly and go into action on arrival.

Gen. Eric K. Shinseki, former Army Chief of Staff, set the changes in motion after the troubled 1999 deployment of Task Force Hawk, an AH-64 Apache attack helicopter unit that DOD tried to get into action in Operation Allied Force, the NATO war with Serbia. Twenty-four Apaches were supposed to help eliminate attacks by Serb units in Kosovo. Unfortunately, the Army was not configured for such limited deployments.

The Germany-based Apaches took 17 days just to travel to Albania, a few hours' flight time away from its forward bases. The task force and their support materiel, totaling 7,745 troops, ate up 269 C-130 sorties and nearly 500 C-17 sorties. After this enormous logistical undertaking, Task Force Hawk lost two helicopters and two crew members in training accidents, but never flew a



single combat mission. (See “Task Force Hawk,” February 2002, p. 78.)

The Army’s heavy forces were too heavy, and light forces lacked “staying power,” declared Shinseki. “Heavy forces must be more strategically deployable, ... [and] achieving this paradigm will require innovative thinking.”

In 2000, Shinseki further wrote that “with each passing year, our condition as a force becomes a greater liability.”

The solution was the creation of medium-weight brigades based on an all-new vehicle—the Stryker. This eight-wheeled vehicle is larger than a standard Humvee and offers troops better protection. Also, at 20 tons, it is less than a third of the weight of the Army’s main battle tank.

Strykers fit—barely—into a C-130 transport. (The Abrams tank requires a larger C-17 or C-5 transport.) Relative lightness pays off: Stryker BCTs need only half the airlift needed by traditional heavy brigades. Stryker teams can deploy in a total of 212 C-17 sorties, compared to 430 sorties for tank brigades.

Stryker brigade combat teams of about 4,000 soldiers form the centerpieces of the Army’s modular force, though the service will retain its armored, light infantry, and airborne brigades.

BCTs are designed to be the Army’s new “units of action,” replacing in that role the full division, along with its gear, large headquarters staff, and support and combat service support echelons. BCTs will carry everything needed to operate for the first three days in a combat zone.

BCTs will be responsible for many of the tasks traditionally performed at the division and corps level. These include



At top, airmen guide an A-10 to the target in an exercise at Ft. Polk, La. Above, a Warthog departs after destroying the target with its 30 mm cannon. The Army has come to rely increasingly on airpower for fire support. USAF is responding by enlarging its community of attack controllers and is pushing for more realistic, joint training.

ISR collection and analysis, logistics support, and battlefield command and control.

30 Percent More Power

By 2007, the Army will have completed the modular reorganization of its active divisions, “resulting in at least a 30 percent increase in combat power,” Army Secretary Francis J. Harvey told *Army* magazine.

The service’s “tiered readiness” approach of recent years has vanished. Plans call for increasing from 48 to 77 the number of “usable” BCTs. This will be achieved, say Army officials, by breaking down larger combat units and creating a rotational deployment pool, an idea similar to the Air Force’s decade-old expeditionary air and space force concept.

“With 20 brigades committed in the field as the baseline planning factor,” wrote Harvey, “active component forces can expect to deploy for one year with two years at home station.”

Modularity is also expected to increase available combat forces by 60 percent. To create this modular force, the Army will spend an additional \$30 billion through 2011.

Already, Stryker BCTs have successfully deployed to Iraq. The Lexington Institute’s Daniel Goure and Kenneth A. Steadman noted that such a unit began operations in Iraq in 2003, successfully policing an area that, they said, “previously required an entire regular division.”

In the transformation process, the Army will eliminate some Army air defense, engineering, and armor elements. Perhaps most significant to the Air Force is the forthcoming decrease in field artillery units. The mere fact that the Army will turn to USAF for additional fire support represents a major change in thinking. This shows that the Army leadership has begun to trust in the Air Force’s (and Navy’s) claims that airpower will be there when needed.

As the federally funded think-tank RAND noted in a recent report, “Newfound Army confidence in the accuracy and responsiveness of air-delivered fires will result in increased Army requests for CAS and air interdiction.”

The Army has often treated close air support and air interdiction as a layer of insurance, not an integral part of



Stryker brigade combat teams can be transported on the C-130. The units are easier to deploy than traditional heavy brigades, which require C-17s or C-5s to lift tanks. Here, soldiers practice a deployment at Lackland AFB, Tex.

ground combat planning. After the poor coordination that marked the unfolding of Operation Anaconda in Afghanistan in the spring of 2002, the Air Force leadership pledged to work harder to coordinate its efforts with the Army. (See "Aerospace World: Army Also Improving Air Coordination," August 2004, p. 15.) Senior leaders from both services got together to iron out differences. Consequently, the Air Force gave high priority to the creation of battlefield airmen who operate in the field with soldiers, emphasized joint training, pushed to upgrade its A-10 close support fighters, and pursued a short takeoff version of the F-35 Joint Strike Fighter.

Masters of the Mission

Fighter pilots, using advanced targeting pods and small-yield precision weapons, have mastered the mission of air support to dispersed ground forces in Iraq and Afghanistan. As long as air controllers are embedded with Army units, Dichter said, the Air Force will be there to provide precision firepower. Planning is key, he said, to ensure the right capabilities are available.

To that end, the Air Force seeks additional targeting pods as well as the 250-pound-class Small Diameter Bomb, which will offer Global Positioning System precision in a small package. Low-yield warheads are important in distributed and urban battles because they limit collateral damage and allow aircraft to carry larger numbers of weapons.

The new wave of air support to ground

forces has already become apparent on the world's battlefields. In Operation Iraqi Freedom, the Air Force positioned bomb-laden aircraft on patrol over "kill boxes." Orbiting heavy bombers provided "on call" CAS with GPS-guided weapons.

Air support will be even better in the future as stealthy aircraft such as the F-22A and F-35 patrol war zones, add vital intelligence to the "network," and provide even more on-call firepower.

"As adversaries adapt and move away from massed motorized forces operating in the open to dispersed, smaller forces exploiting difficult terrain, a well-practiced and -developed air-ground partnership will be increasingly necessary," RAND noted.

The Air Force agrees.

Additional brigade combat teams create a huge demand for the airmen who accompany the brigades, such as battlefield weathermen and tactical air control parties. The near-doubling of deployable brigades means a career field of 720 battlefield weathermen could require an infusion of 500 additional airmen. A new approach of battlefield weatherman "force pooling," in conjunction with reachback capabilities, may cut the demand for new battlefield weathermen to 150, officials said.

Fire observers, troops trained to identify and locate targets, show an even larger increase in demand.

The Technological Solutions

Recent technological innovations have tremendously improved the Air Force's ability to support mobile ground forces. Take the case of SMSgt. Robert Hicks, a joint terminal attack controller who spent four months in Afghanistan with an Army unit defending a checkpoint in the mountainous border region near Pakistan.

Hicks also served as an air controller during Desert Storm and told *Air Force Magazine* that, while the job had stayed the same, equipment has improved "by leaps and bounds."

In his four months of deployment, Hicks' unit came under rocket attack 14 times, found several improvised explosive devices on the roads, and was once ambushed by 15 to 20 enemy fighters.

Calling in air support is much easier these days. Hicks had one radio, compared to three during Desert Storm, and when reporting a "troops in contact" situation in Afghanistan, he would get a call back within minutes detailing what aircraft was on its way. On various occasions, air support came from AC-130 gunships, B-1 bombers, and A-10 attack aircraft.

Hicks, who deployed in 2004, didn't even have access to full-motion video through the ROVER system, which has since become a favorite of ground forces.

ROVER, the Remote Operations Video Enhanced Receiver, allows troops with special laptop computers to receive video imagery from Predator aircraft, C-130s equipped with the Scathe View imaging system, or fighters carrying Sniper targeting pods.

Rapid access to full-motion video "allows ground commanders to see and react to targets on the battlefield with a level of speed and accuracy unheard of five years ago," USAF officials wrote in an information paper. "A ground commander may find a mortar crew actively engaging blue forces. He can now watch their movement real time, positively ID them, and bring weapons to bear or direct ground forces to engage."

The MQ-1 Predator's ability to serve as both a "sensor" and "shooter" has made it the most requested asset in Southwest Asia, officials note. But the demand for these capabilities—full-motion video (FMV) in particular—has become boundless. In many cases, argues Brig. Gen. Kevin J. Kennedy, FMV may be overkill.

With limited bandwidth available, Kennedy said officials need to ask: Do you even need 30 frames per second? A convenience store surveillance system has nowhere near that level of quality, yet still has the desired effect. One frame-per-minute video would be good enough for some applications, Kennedy said. Other "sensors" such as signals intelligence and thermal imaging also are available.

Less reliance on "gold-plated" FMV would reduce the bandwidth burden the Air Force currently feels supporting ground forces. This is important as ROVER continues to proliferate and USAF's fleet of Predators more than doubles in size over the next six years.

Progress? Yes. Success? Not Quite Yet.

For the Air Force and Army to work together as an effective fighting force, they must streamline and coordinate their doctrine, training, and combat operations. The two services have made great progress, but they have a long way to go. The list of missed opportunities is extensive.

- On Feb. 27, 1991, an Army corps commander misplaced the fire support coordination line (FSCL), which determines the area in which a ground commander must approve all "fires"—including air strikes—to prevent accidental attacks on friendly troops. As ground forces moved out of Kuwait and Saudi Arabia, the FSCL was placed too far north, well beyond the reach of friendly land forces. (See "The Great Escape," March 2003, p. 38.) For hours, both the Air Force and Army were unable to attack fleeing Iraqi units.

- In February 2002, Air Force planners were kept in the dark about a major Army offensive being planned in the mountains of Afghanistan—Operation Anaconda. The battle revealed a lack of coordination between the services, even for an operation that would eventually rely on air strikes to offset a lack of "organic" Army firepower. (See "The Clash About CAS," January 2003, p. 54.)

- In March 2003, during Operation Iraqi Freedom, a handful of close air support "doctrinal issues" emerged. The fire support coordination line was a problem again but, for a reason that was the opposite of the one that cropped up in Desert Storm. The Army's 3rd Infantry Division almost overran a FSCL that was not moved forward quickly enough. "Twice during the operation, the lead brigade combat team (BCT) was on the verge of crossing the FSCL," stated an Army after-action report. The FSCL should "leave enough room for shaping operations supporting the ground scheme of maneuver."

The "hard work" in training, said Lt. Col. Paul Schmidt, commander of the 6th Combat Training Squadron for terminal attack controllers, at Nellis AFB, Nev., revolves around joint doctrinal issues. These include setting battle priorities, obtaining fire clearance, and protecting blue forces. Despite the progress in recent years, there is still a lack of Army understanding of airpower's rules of engagement and restrictions, said Schmidt.

A new joint fires center was recently established at Spangdahlem AB, Germany, where officials note that "much of the instruction focuses on doctrine—the official word on when, where, why, and how close air support is conducted," according to an Air Force news release.

Both services are pushing to increase joint training opportunities. As part of the Base Realignment and Closure process, the Air Force is even moving A-10s to Moody AFB, Ga., so the Warthog crews can be closer to the Army units with which they need to train.

The Army needs more than 4,000 fire controllers. The most highly trained of these are DOD's joint terminal attack controllers. With a current inventory of about 550 JTACs, the Air Force is simply unable to provide enough JTACs, such as tactical air control parties, to meet the Army's demand.

Fortunately, it doesn't have to. Most fire observer missions do not require a JTAC's highly specialized skills of designating precise targets, coordinating aircraft, and clearing weapons release. The Army is therefore creating a pool of roughly 3,000 joint fires observers who will handle missions such as artillery and mortar targeting. The JFOs can also serve as "sensors" for the Air Force's more highly trained JTACs, who will serve as the liaison between JFOs and combat aircraft.

Building JTACs

The Air Force JTAC inventory will still double to meet the new demands. This is not an easy field to build. There are shortages of joint training opportunities, and not enough strike aircraft sorties are available.

The Air Force's Joint Air-Ground Operations Group at Nellis AFB, Nev., which trains most USAF JTACs, in-

creased production from 90 to 120 air controllers per year. Plans call for JTAC production at Nellis to further increase to about 150 per year, to meet a goal of having 1,064 trained JTACs in the field by 2011.

US Air Forces in Europe opened a new joint fires center at Spangdahlem



The Army's emphasis on mobile, independent combat units means USAF must provide more tactical air controllers. Above, MSgt. Craig Hillsman of the 6th Combat Training Squadron, Nellis AFB, Nev., directs an A-10 during the JTAC qualification course.

AB, Germany, in October, to make joint firepower training more convenient for forces stationed in Europe. There are currently no plans to open additional Air Force JTAC schools.

Lt. Col. Paul G. Schmidt, commander of the JAGOG's 6th Combat Training Squadron, said a larger number of JTACs creates a "train and sustain" challenge because air controllers must practice 12 controls a year. The most challenging "sortie math" is for sustainment, he said.

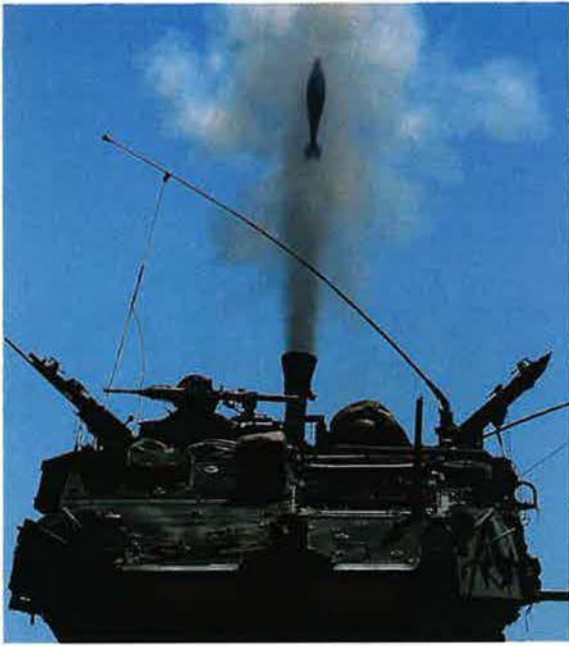
The controllers have complex, perishable skills and need additional "real, joint training opportunities," Schmidt said.

The "fundamental constraints remain the same," said RAND. There is a "shortage of qualified candidates, a demanding job that takes years to master, a shortage of training facilities, ... and heavy demands on strike aircraft that make it difficult for them to generate the necessary training sorties for more than the current [terminal attack controller] force."

The Air Force's planned cuts in tactical fighter inventories will make training even more difficult. A recent study of ground attack airframes determined that USAF can support a steady state of 1,064 JTACs and 200 airborne forward air controllers (FAC-As).

Aircraft retirements will change the equations. In 2010, about 950 JTACs and 300 FAC-As will be the sustainable level, said CMSgt. David Devine of the C2 battle management operations division at the Pentagon. (Even though the

USAF photo by TSgt. Kevin J. Gruenwald



A 120 mm mortar round exits a Stryker. The Strykers offer protection better than that provided by a Humvee, but they are lighter and more mobile than tanks. Overall, Army brigades are reducing their organic firepower to save weight and build agility.

number of airframes is decreasing, there will be no shortage of training flights for airborne FACs.)

To offset a potential drop in skilled JTACs, the Air Force is investing heavily in advanced simulators, Devine said. Simulated missions can reduce the number of sorties needed and have already cut the demand for live flights at Nellis.

Modularity is pushing advances in Air Force communications and ISR capabilities as well. At the Air Force Association's Los Angeles symposium in November, Maj. Gen. Roger W. Burg noted that the nation's military space systems were designed for a different era.

"Today's satellite communications architecture was designed for large stationary units," said Burg, director of strategic security on the Air Staff. "Smaller, more mobile forces require instant access to a myriad of different sources."

Internet in Space

Air Force officials want a space-based communications network, to bring the "Internet into space," if you will. The Army supports the Air Force with a "firm requirement" for this capability, Burg said. A space-based network that users access directly will help address both the communications and ISR needs of dispersed units.

The Air Force is working to provide rapid access to data at the "last tactical mile"—the dispersed forces in the field—to push them information in seconds instead of minutes or hours.

A Global Hawk could, for instance, survey a 10-square-mile area and upload images onto a server. Tactical end-users could then download the imagery as needed, explained Brig. Gen. Kevin J. Kennedy, deputy ISR director on the Air Staff. "We don't do that today, but we can," he said. This would help provide data at the last tactical mile, "even when we have a bandwidth challenge."

Spy satellites, meanwhile, "have predictable overflight times and are designed to provide a strategic look for the nation," Burg said in November. "Tactical space ISR capabilities could and should be dedicated to the theater commander."

Space Radar will play a key role in this shift. "Our desire is that [Space Radar] will support national decision-makers," Burg said, while "simultaneously responding to the theater commanders as they execute their operations."

Officials note that orbital ISR systems are already being used to support the Army's needs on the ground. Satellites have been used to locate cave entrances in Afghanistan, to survey drop zones, to search for improvised explosive devices in Iraq, and to provide route reconnaissance.

"This is intelligence operations," Kennedy said. The challenges are in persistence and speed. If it takes 10 minutes "to dig a ditch to put a bomb in, then I want to look at that road every five minutes," he said. The intelligence then needs to be relayed to those who need it in time for the news to be useful.

It is unclear how Army modularity will affect airlift requirements. In a 2002 study, RAND determined that the Army's goal to deploy a brigade in 96 hours is, in most cases, unrealistic. RAND estimates that the Army, with access to 60 C-17s, will take at least 12 days to deploy a Stryker BCT from a base in the United States to a typical combat location. In the most demanding scenario—a deployment to Kandahar in Afghanistan—the deployment would require 21 days.

"For each scenario, two operational factors play a critical role in determining the number of days required to deploy the SBCT," the report read. These were the number of C-17s available and the "throughput" of the available airfields. Though SBCTs are designed to be C-130-transportable, RAND did not include Hercs in its assessment. C-130s are "not a good choice for long-range deployments, given their range, speed, and payload limitations."

Mobility requirements must be looked at holistically—air, land, and sealift are all available, as are options such as pre-positioned forces and the Civil Reserve Air Fleet.

"Tell us what we need to move," said Col. Steve Gensheimer, chief of the global mobility requirements division on the Air Staff, and the Air Force will put its assets into action.

What those assets will be is the wild card. Gensheimer noted that there are numerous mobility studies recently completed or still in the works. The Joint Staff's Mobility Capabilities Study determined 180 C-17s is enough for projected needs. A Joint Staff Intra-Theater Lift Capability Study, to assess in-theater needs, is ongoing. (See "Rising Risk in Air Mobility," p. 28.)

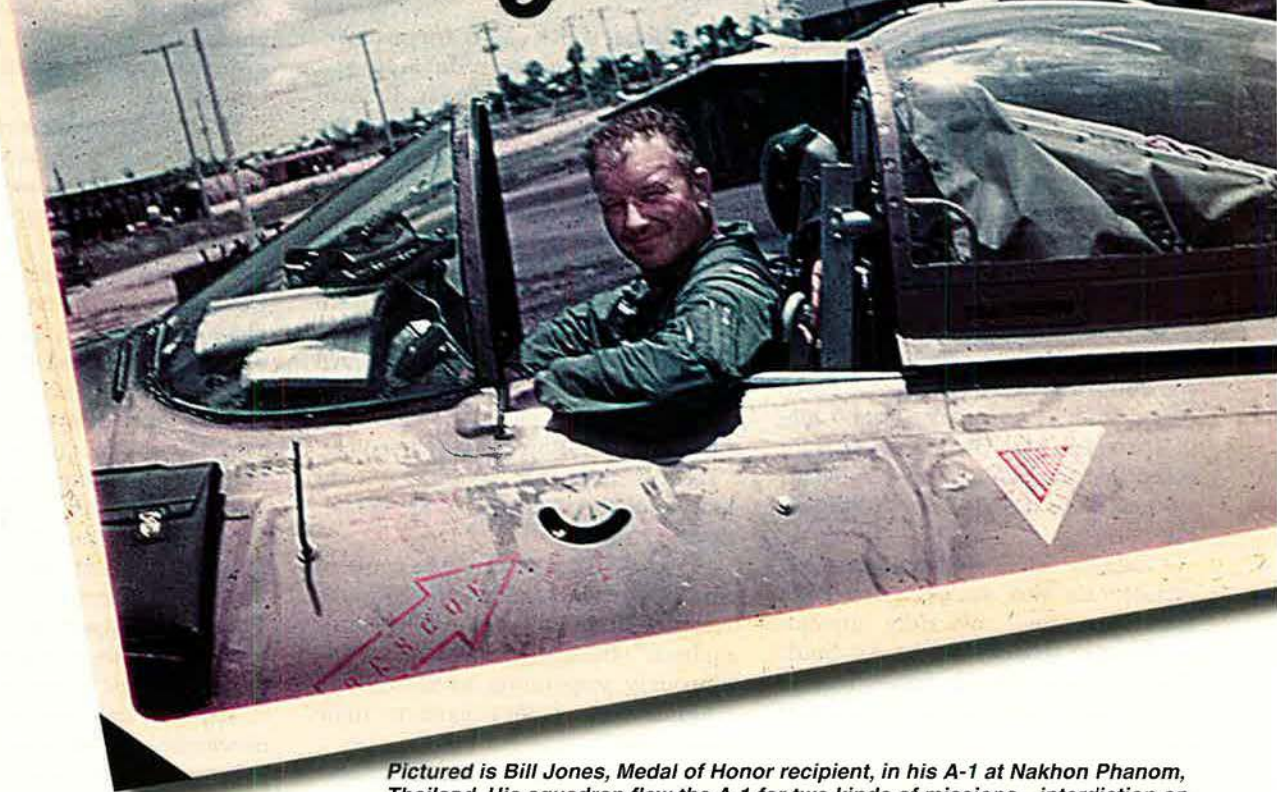
The Air Force and Army have both established a requirement for a next generation small cargo aircraft and are collectively looking for the best way to replace the Army's fleet of C-23 Sherpa light airlifters.

Further, as details of the Army's Future Combat System mature, the Air Force will need to re-evaluate its lift requirements once again.

RAND found that forward basing is the most effective way to ensure that Stryker BCTs can get to combat zones quickly. Army plans call for Stryker brigades in Germany, Alaska, and Hawaii, an airborne brigade in Italy, and other deployable units to be based in South Korea. ■

Badly burned when an explosion set his cockpit afire, Bill Jones refused to quit the mission.

Determination a Sandy



Pictured is Bill Jones, Medal of Honor recipient, in his A-1 at Nakhon Phanom, Thailand. His squadron flew the A-1 for two kinds of missions—interdiction on the Ho Chi Minh Trail and rescue. For rescue missions, the call sign was Sandy.

In September 1968, rows of propeller-driven fighters, bombers, and transports lined the ramp at the air commando base at Nakhon Phanom in northeastern Thailand.

NKP, as the base was called, was on the western side of the Mekong River, which formed the border with Laos. Just beyond the narrow neck of the Laotian panhandle lay North Vietnam.

Compared to other bases in Thailand, NKP was remote and austere. The runway was made of pierced steel planking and it was relatively short. No jet aircraft were stationed there. Anyone seeing NKP for the first time would think of it as a scene from *Terry and the Pirates*.

It was home to the 56th Special Operations Wing, an outfit that had been an air commando wing until its redesignation the month before.

The wing operated a mix of helicopters and vintage airplanes, including several squadrons of Douglas A-1 Skyraiders.

One of the A-1 units, the 602nd Special Operations Squadron, was a recent arrival, having moved from its previous base at Udorn Royal Thai Air Base in July. The squadron's crews were familiar with NKP, though. They had been coming over regularly from Udorn on three-day rotations to sit

of



By John T. Correll

rescue alert with the Jolly Green Giant helicopters at NKP. Rescue missions often launched from there because it was close to the war.

A new commander, Lt. Col. William A. Jones III, had taken over the squadron when it moved from Udorn. Jones, 46, came from a family where military service was a tradition reaching back for several generations. His father had qualified as an aviator and had orders to France when World War I ended.

As a child, Bill Jones lived in Warsaw, Va. His family then moved to Charlottesville, Va., where he finished high school at 16—too young for West Point. He went instead to the University of Virginia, earning his degree in three years. He then went on to West Point, where he was commissioned in 1945. After pilot training, he began a career that encompassed bombers, fighters, and airlifters and included two tours as a B-47 aircraft commander.

There was no requirement for B-47 pilots in Southeast Asia, so Jones volunteered for cross training in the A-1. He arrived at Udorn in April 1968.

The 602nd squadron had 24 Sky-raidiers. Half of them were single seat A-1H and J models and the other half were “fat-face” A-1Es and Gs, with side-by-side seating in the cockpit. The A-1 was a modified version of an attack bomber developed by the Navy at the end of World War II and used extensively in the Korean War. It was driven by a powerful single engine and a big four-bladed propeller.

The Air Force obtained surplus A-1s from the Navy for use in Southeast Asia. The air commandos began flying them in 1964.

Firefly and Sandy

The A-1 was slow, but that was an advantage for such tasks as searching and spotting. Its long loiter time was also useful. It was rugged and heavily armed, with a 20 mm cannon and 15 external stations for weapons and stores. In the air-to-ground role, it was accurate and lethal.

The disadvantage was that the A-1, weaving slowly through a search area, was an easy target for enemy gunners. When working on a rescue, though, the A-1s usually operated in flights of four, and they were very good at making ground gunners keep their heads down.

Jones' squadron flew the A-1 for two kinds of missions. The call sign was Firefly on attack missions to interdict the Ho Chi Minh Trail or to support the Royal Laotian government ground forces in their war against the Communist Pathet Lao. For rescue missions, the call sign was Sandy.

Rescue helicopters were too vulnerable to operate alone. The preferred

escort was a flight of A-1 Sandys. Their guns, bombs, and rockets kept enemy ground forces at bay, and they performed other services as well.

Sandy's job was to escort the helicopters, conduct a general search for the downed aircrew, talk to the survivors by radio, and determine their exact location. The A-1s also suppressed any hostile forces that were present before the helicopters went in.

In the rescue area, the Sandys usually separated into a low element and a high element. The low element searched for the survivors and directed the rescue, while the high element orbited above, conserving fuel and standing ready to assume a more active role when called upon.

The object of search operations in the early morning hours of Sept. 1, 1968, was Carter flight, two F-4D fighters from Udorn, shot down near the Ban Karai Pass in North Vietnam. The two aircraft, Carter 01 and 02, had been on a predawn strike mission against trucks entering the Ban Karai Pass en route to the Ho Chi Minh Trail in Laos, on the other side of the mountains.

Carter 01 was brought down by ground fire about 4:40 a.m. Both Carter 01 pilots had ejected. Carter 02 was attacking the North Vietnamese forces closing in on Carter 01 when it was shot down as well. The aircraft commander, Capt. Jack Wilson (Carter 02 Alpha), made it to the ground safely, but he was unable to raise the backseat pilot, 1st Lt. William L. Kinkade, on the radio.

The crew from Carter 01 was picked up, but Wilson was alone in the rough country north of Ban Karai, where karst limestone formations rose up hundreds of feet above the mountain valleys. The jungle canopy limited visibility from the air.

Wilson made radio contact with other aircraft working the area, and they called in a rescue team to retrieve him. (Kinkade was listed as missing in action until 1973, when the Air Force made a presumption of death in his case.)

Search for Carter 02

Four A-1Hs and two HH-3 Jolly Green Giant helicopters responded from Nakhon Phanom. The leader was Bill Jones in Sandy 01, flying his 98th combat mission in Southeast Asia. His wingman, Sandy 02, was Capt. Paul A. Meeks. Maj. Eugene McCormack Jr. was Sandy 03, and Lt. Col. John



Above and right in these 1972 photos, Jones' A-1 Skyraider—No. 738—takes off at Nahkon Phanom. After Jones' 1968 Medal of Honor mission, the airplane was refurbished and remained in service for four years, only to be shot down over Laos on Sept. 28, 1972. It was the last aircraft of its kind to be lost in combat in Southeast Asia.



Carlson, the vice commander of the squadron, was Sandy 04.

When the search and rescue team arrived, a forward air controller on the scene warned Jones of several 37 mm guns and some smaller anti-aircraft artillery that were active in the area. The task was complicated by bad weather, which would force the Sandys to fly low.

Jones and Meeks, flying as the low element in the rescue operation, began the search while the other two Skyraiders and the helicopters stood by in higher orbit.

A single F-4, call sign Liner, had been in radio contact with Wilson. "Liner was able to talk to the survivor," Jones said. "I heard him a little bit on the way in, and he thought he knew where the survivor was. Liner flew over, wiggling his wings, but it turned out this was off about eight miles and we got no more contact for almost an hour. We wasted a considerable amount

of time—almost an hour—searching in the wrong area."

An F-100 Misty forward air controller from Phu Cat, South Vietnam, got a better fix on Wilson, farther to the east. Time was a growing concern. The longer Wilson was on the ground, the less likely the rescue was to succeed. The North Vietnamese were looking for him, too.

Jones picked his way through the karst valleys, searching methodically. On the 10th or 12th pass, Jones' airplane was rocked by fire from a ZPU anti-aircraft gun. Some months later, a statement nominating Jones for a Medal of Honor recounted the next few minutes this way:

"Colonel Jones felt an explosion beneath his aircraft. His cockpit filled with smoke. Even though his aircraft had been hit, he maintained control of it, and, as the smoke cleared, he continued searching. Without regard for the fact that his aircraft might be

on fire, Colonel Jones continued the search for another 10 or 15 minutes.

"At the moment that the survivor radioed that Colonel Jones was passing directly overhead, Colonel Jones sighted a multiple-barrel gun position firing at him from above the survivor near the top of a rock outcropping. The gun position was so close to the survivor that the jets orbiting overhead could not be employed for fear of killing the survivor. Had the enemy known where the survivor was, they could have fired down directly at his location. Attacking the gun emplacement had to be done with extreme caution."

Explosion and Fire

Jones attacked the gun position with his cannon and rockets, broadcasting the newly discovered locations of the survivor and the gun position as he went. On his second pass, before he got acknowledgment of the information he had sent, his aircraft was hit by several

rounds from automatic weapons. The center section of the fuselage burst into flames that engulfed the area around the cockpit. Two-thirds of the windshield was blown away.

A 14.5 mm round had hit and ignited the rocket for Jones' parachute extraction system directly behind his headrest.

Newer fighters had emergency systems that ejected the entire seat of the aircraft with the pilot still in it. What the older A-1 had was the Yankee Extraction System, installed after the Air Force got the airplanes from the Navy. The A-1 was the first aircraft to use it.

It was triggered by a rocket connected by lanyards to the pilot's parachute risers. When the system engaged, the canopy was jettisoned and the rocket behind the headrest ignited. It pulled the pilot upward by his parachute harness and out of the airplane. Once clear, the parachute deployed.

"I looked back over my shoulder and saw fire coming out of the back end of the airplane," Jones said in an interview published in 1970 in *Airman*, the official magazine of the Air Force. "The instrument panel was clouded with smoke. Fire seemed to be everywhere. I knew there wasn't anything for me to do but get out.

"I pulled for altitude and headed for a clear area. Then I reached down and grabbed the extraction handle with my right hand and pulled. The canopy went off immediately, and I waited for the ejection for what seemed like an eternity. But nothing else happened.

"Here I sat in this thing with fire all around and I said to myself, 'This just can't happen to me. This is not the way it's supposed to be. I've got to get back and see my family. This simply can't happen.' I reached down and grabbed the secondary escape handle so I could ... climb out over the side."

The radio channels were flooded with calls telling Jones that he was on fire, which he knew already.

"His attempts to transmit the location of the survivor and the enemy gun position were blocked by other aircraft repeatedly telling him to bail out," recounted the Medal of Honor statement. "Before the fire died out, all of his radio transmitters had been disabled, and he could only receive on one channel."

So far as Jones knew, he was the only one with an exact fix on the downed pilot and the gun.

The statement continued, "As he

reached altitude, Colonel Jones' wingman came alongside, and, through hand signals, Colonel Jones indicated he would fly the Skyraider back to base—approximately 90 miles away—rather than bail out over the first secure area."

It was fortunate that Jones did not try to leave the airplane. As it was learned later, his parachute had been critically damaged by the fire.

Jones Keeps Going

Getting back to NKP was an ordeal. Jones had second- and third-degree burns on his arms, legs, face, neck, hands, and fingers. He looked at his hands and said later, "They looked like mozzarella cheese."

The upper half of the cockpit was burned. All of the plastic knobs had melted and half of the instruments were unreadable. With the canopy and most of the windshield gone, the wind blasting back through the cockpit was severe. Jones did not even have the protection of his oxygen mask. The straps had burned and the mask had fallen away. The wind increased the pain from his burns. It was also making his face swell around his eyes and impeding his vision.

Jones trimmed the Skyraider for uncoordinated flight, holding the nose of the airplane to the right, at an angle to the direction of motion. That positioned the unbroken part of the windshield in front of his face, giving him some relief from the rushing air.

To make matters worse, the weather

was deteriorating. Sandy 02, Paul Meeks, took the lead with Jones following him in close formation. Jones' radio receiver was still working, so he could hear directions from Meeks.

They approached the base on instruments and in heavy overcast and turbulence. Meeks led Jones down. Jones extended his landing gear manually and went straight in for a no-flaps landing.

Jones shut down the engine. The first person to reach the cockpit was Col. Leonard Volet, vice commander of the 56th Special Operations Wing. "I couldn't believe what I saw," Volet said. "Everything was burned to a crisp, including Colonel Jones' helmet, oxygen mask, survival vest, neck, and arms. Yet he kept flailing about the cockpit reaching for his maps as we struggled to lift his nearly 200-pound frame plus equipment out of the aircraft. We got him out, but he refused medical attention until he was satisfied that we knew where the survivor and guns were located."

Back at the Ban Karai Pass, McCormack and Carlson in Sandy 03 and 04 had taken charge of the rescue. Additional A-1s were scrambled from NKP to help, and Air Force and Navy fighters converged on the scene as well. The Sandys wiped out the gun, and an HH-3 picked Wilson up. "However, without the vital information obtained by Jones [earlier] in the day, we could well have lost several aircraft or been unable to rescue Carter 02 Alpha," Carlson said.



In an Aug. 6, 1970 White House ceremony, President Nixon awarded the Medal of Honor posthumously to Jones, presenting it to his wife, Lois, and their daughters. Nixon had approved the honor nine months earlier, but Jones died in an airplane crash before he could receive it.



A Walk of Fame in the outdoor airpark at Hurlburt Field, Fla., recognizes all five Vietnam War air commandos who were awarded the Medal of Honor. Here, Gen. Ronald Fogleman, then USAF Chief of Staff, joins Jones' widow, Lois, grandson Jack, and (l-r) daughters Elizabeth, Mary Lee, and Anne at the unveiling.

Jones was flown by medical airlift, first to Japan and then to San Antonio for months of treatment and rehabilitation. He wanted to go back to NKP to finish his combat tour, but permission was refused. He was eventually restored to flying status and assigned as commander of the 1st Flying Training Squadron at Andrews AFB, Md.

His charred airplane, Skyraider No. 738, also flew again. It was repaired and refurbished and remained in service for years. In its final duty, it was assigned to the 1st Special Operations Squadron, where it had the tail code "TC" in place of the "TT" it wore when Bill Jones flew it on its most famous mission. It was shot down over Laos on Sept. 28, 1972, the last US A-1 Skyraider to be lost in combat in Southeast Asia.

Medal of Honor

On Nov. 14, 1969, President Nixon approved the award of the Medal of Honor to Jones. According to Lois Jones, her husband had "gotten wind" of it, but he did not live to receive the medal.

Jones had recently been promoted to colonel, and a dinner party in celebration was planned for Nov. 15, a Saturday. Earlier that day, however, Jones took off from Woodbridge, Va., in his private airplane, a Piper Pacer. He had arranged for a flyover from Andrews to support the opening of a new airport at Culpeper, about 40 miles from Woodbridge, and he was

flying there in his Piper to check on arrangements.

Soon after he cleared the field at Woodbridge, he radioed that he was turning around. He came in too low, hit some power lines, crashed, and was killed. The investigators could find no problem with the flight controls. Their conclusion was that Jones had suffered some physical incapacity on his way out and that his heart failed and he lost consciousness as he was returning.

In a White House ceremony held on Aug. 6, 1970, President Nixon presented the Medal of Honor to Lois Jones and her three daughters.

Jones did not consider himself particularly heroic. He planned to say exactly that at the ceremony at which he would be given his Medal of Honor. He had already drafted the words: "I consider this great honor and high award to be a tribute not so much to me but to all Sandy pilots who have flown out of the 602nd. I'm honored to represent them in this manner."

There were other honors, too. The Air Force Association chapter in Charlottesville—the town in which he grew up and went to high school and college—bears his name. In 1971, the Air War College auditorium at Maxwell AFB, Ala., was named the William A. Jones Auditorium.

In 1997, a Walk of Fame was dedicated at the outdoor airpark at Hurlburt Field, Fla., headquarters of Air Force Special Operations Command and home of the air commandos. Recognized at this site are all five Vietnam War air commandos who were awarded the Medal of Honor. Four of them—Bernard F. Fisher, James P. Fleming, Joe M. Jackson, and John L. Levitow—were in attendance. The fifth, Bill Jones, was represented by his wife, Lois; their three daughters, Anne Gilfillan, Elizabeth Jones, and Mary Lee Kuhn; and by Kuhn's son, six-year-old Jack Davisson.

Gen. Ronald R. Fogleman, the Air Force Chief of Staff, joined the family in unveiling the commemorative plaque honoring Bill Jones.

Lois Jones keeps her husband's Medal of Honor in a glass display case in her home, where it lies alongside pictures and other memorabilia.

In a different kind of memorial, one that Bill Jones would probably have appreciated enormously, his middle daughter, Elizabeth, became a pilot.

Maxims for Men-at-Arms

Bill Jones was a man of many parts. He played the guitar and banjo, spoke Spanish, painted, sketched, and wrote. He was an athlete with an affinity for handball and raquetball. He liked to work on old cars.

He also enjoyed collecting nuggets of wisdom, especially when they concerned military topics. Each day, he posted a saying on the wall behind his desk. While doing research for a master's degree at George Washington University, he compiled his favorites into a book, *Maxims for Men-at-Arms* (Dorrance & Co., 1969). He illustrated the pages with formal borders, pen and ink drawings of weapons and military equipment from various eras in history.

Jones had received the first copy of his book the day before he died. His youngest daughter, Mary Lee, then nine, presented a copy to the President at the Medal of Honor ceremony.

The book contains 120 maxims. One of them, origin unknown, could well be applied to Jones himself:

Poor is the country that has no heroes, but beggared is that people who having them forgets. ■

John T. Correll was editor in chief of Air Force Magazine for 18 years and is now a contributing editor. His most recent article, "Calculated Courage at Thai Nguyen," appeared in the February issue.



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Responsive Space

Making space launch faster, easier, and cheaper sounds simple. It's not.

The Air Force is planning to launch TacSat-1 (shown here in an artist's conception) by the middle of this year. That satellite weighs about 240 pounds.

As a US combatant commander prepares for battle, he might need a close, up-to-date look at what is happening on the ground. He may need to put more "eyes" on a particular area. If so, a call may go out to Air Force Space Command, with the question: What have you got?

Today, Space Command could use

only those systems that are already overhead. Developing, launching, and certifying a new one would take years.

By 2010, however, Space Command may well have another option—to swiftly prepare and launch a small satellite that will survive only long enough to meet the intelligence-surveillance-reconnaissance (ISR) needs of the immediate mission. For that, 14th Air Force at Vandenberg AFB, Calif., would maintain a fleet of tiny

spacecraft ready to fly within days of a "go" order.

Shortly after reaching orbit, Air Force operators would turn the satellite on, and it would provide ISR data—almost immediately—to air, ground, or sea forces.

This is the Air Force's vision for what it calls "Responsive Space," as laid out by Gen. Lance W. Lord, commander of Air Force Space Command. Achieving that goal, however, will not be simple.

By Jeremy Singer



If they are to be swiftly “launchable,” responsive satellites need to be much smaller than the standard spacecraft that the Air Force uses today. Launches must be faster and less expensive. The satellites themselves must go into service almost immediately, without the lengthy “check out” period common for today’s systems.

USAF officials envision satellites weighing between 100 to 850 pounds, much smaller than satellites such as

today’s Milstar communications spacecraft. Each of those weighs about 10,000 pounds, Lord said.

With satellites of such small size, critical design and engineering work would be far less complex than is the case with today’s huge systems. Current birds can take a decade to develop, years to build, and cost billions of dollars.

Staying Simple

The Air Force also will keep the cost

down by not pushing the technological envelope. USAF wants immediately achievable results, not major technological breakthroughs, according to Lt. Col. Gus Hernandez, chief of space vehicle requirements for the operationally responsive spacelift effort at Air Force Space Command in Colorado Springs, Colo.

Using such satellites for short operational periods would allow the Air Force to further reduce the cost of the spacecraft, which soars whenever the system is expected to last for decades.

Such a change of philosophy would help the US circumvent a traditional and debilitating practice. Gen. John P. Jumper, in an interview shortly before he retired last fall, described it this way: “It costs so much to launch a satellite that, when you launch it, you have to pile everything you can on the satellite.”

Jumper went on, “If that’s the reason we build \$2 billion-to-\$3 billion satellites, then why don’t we make space launch easier, so that it’s not such an episodic event, and we don’t mind if they stay operational for only months? I think we need to recognize that it’s very hard to make big, expensive satellites that can look at any time anywhere on the Earth.”

Some missions, such as missile warning, require highly capable and durable satellites staring continuously at the ground. Those are the missions unlikely to be handled by small responsive spacecraft, Lord said.

Large satellites will always play a leading role for missions such as communications and intelligence, but responsive satellites can fill in the gaps for tactical forces. They can provide added persistence over areas of interest, so that the larger satellites do not need to be diverted from their primary mission, Jumper said.

There is certainly a niche to be filled for providing as-needed ISR or



communications capability to support unexpected contingencies.

The Air Force has primarily used small satellites to experiment with technology that is later to be used aboard much larger operational systems.

While the Air Force Research Laboratory and other military organizations are continuing their work with experimental research payloads, they have begun work on a series of small satellites called TacSats that are expected to pave the way for deployed commanders to call up space capabilities on short notice.

\$15 Million Goal

The Pentagon began pursuing the TacSat concept in 2003 with the goal of launching satellites for about \$15 million, including construction of the satellite and purchase of its launch vehicle. The concept took hold thanks to the advocacy of the Pentagon's Office of Force Transformation, which also funded the first TacSat experiment.

The satellites are intended to be accessed directly through secret Internet protocol router network links by commanders in the field. These end users have traditionally languished behind higher-level officials in the priority queue for space capabilities.

The Air Force is hoping the TacSat experiments will lead directly to the purchase of similar satellites for operational use, Hernandez said. The TacSats may prove to have some operational utility during the time that the military experiments with them, but that would simply be a bonus. Funding for responsive space satellites dedicated to operational missions will



At top, test crews at Edwards AFB, Calif., load a 65-foot mockup booster rocket onto a C-17. In the photo above, the "rocket" is released. AirLaunch's QuickReach was the sole contestant in a Falcon competition for boosters that do not take off vertically.

likely be requested for the first time in 2010, he said.

Some officials compare the payloads for the TacSat satellites to those of unmanned aerial systems. In fact, the first spacecraft in the TacSat series features a payload initially built by the Naval Research Laboratory for an unmanned aircraft.

After several delays, the Air Force is planning to launch TacSat-1 by the middle of this year. That satellite, weighing about 240 pounds, features a payload that includes an infrared camera and a low-resolution imaging camera.

US Pacific Command is among the groups planning to take advantage of

the capabilities offered by the TacSat-1 spacecraft over the next year.

Commanders who use the TacSat satellites will receive their new "space products" on the same ground equipment that today connects to existing assets such as unmanned aerial systems, Hernandez said. This will help avoid overburdening troops with additional infrastructure, he said.

TacSat-1 is expected to be followed next year by the second spacecraft in the series. TacSat-2 features a color imaging camera capable of taking pictures sharp enough to distinguish images three feet in diameter, Hernandez said. The TacSat-2 payload, also known as Roadrunner, is being built as a joint project led by the Air Force Research Laboratory.

As the Pentagon works to pack as

much capability as it can into the small TacSat packages and get the most bang for its buck, one way of keeping costs low may be to use common spacecraft platforms to host the sensor or communications platforms.

Work on the platform, or bus, for the future TacSat-4 satellite is expected to form the basis for a purchase of perhaps five platforms for future payloads, according to a paper written by TacSat program officials last year.

While members of Congress who oversee the Air Force budget have repeatedly expressed their frustration with the cost overruns and schedule delays that plague the entire space ac-

Responsive Space Experiments

The Air Force within a year is scheduled to launch two experimental satellites to test responsive space capabilities. After TacSat-1 this spring, TacSat-2 will follow in May 2007, with improved imaging capabilities. TacSat-2 is still considered a small satellite, though, at about 660 pounds, it is almost three times larger than TacSat-1, Air Force Space Command's Lt. Col. Gus Hernandez said.

The Air Force hopes to follow in July 2007 with TacSat-3, featuring a hyperspectral imaging sensor built by Raytheon. The hyperspectral imager can help see through camouflage, enabling US forces to better spot concealed targets, Hernandez said.

The imager also can help US forces learn more about the terrain on and around the battlefield, helping to determine whether the ground is capable of supporting a landing aircraft or the ingress and egress of troops and ground vehicles, Hernandez said. This capability also can be used to plan evacuation routes for refugees.

The planning process for TacSat-3 featured increased collaboration amongst the Air Force Research Laboratory, the Army, and the Navy.

Collaboration expanded further for the next satellite; the National Reconnaissance Office provided input for TacSat-4, Hernandez said. The fourth TacSat spacecraft, also known as Com-X, is expected to fly in 2008.

Com-X should feature a communications payload that helps connect troops with other forces located beyond their line of sight. The satellite also is expected to relay data from blue force tracking devices used by troops linked to the Global Positioning System, to help monitor the locations of friendly forces and avoid friendly fire accidents.

A third mission for the satellite is to relay data collected by buoys bobbing in the ocean, Hernandez said.

Com-X will be the first TacSat spacecraft placed in a highly elliptical orbit, unlike the rest of the series which are going into low Earth orbit.

A lower altitude improves the resolution of the sensors on the imaging satellites, but launching TacSat-4 into a highly elliptical orbit will keep the satellite in view of areas of interest for longer periods. That will maximize the utility of its communications payload, Hernandez said. The HEO orientation will likely keep TacSat-4 over target areas for hours at a time, rather than just a few minutes each day.

TacSat-4 also is expected to be near the upper limit of the definition of a small satellite, weighing in at more than 800 pounds.

The Air Force will likely seek to meet increasingly complex mission needs as it begins the planning process for TacSat-5 later this year.

quisition portfolio, the same lawmakers often have much kinder words for the TacSat effort.

Best Thing Going for US

Rep. Terry Everett (R-Ala.), chairman of the House Armed Services strategic forces subcommittee, called the TacSat "the best thing we have going for us" in space acquisition.

"My only regret is that we have so few of them," Everett said in a July interview. Everett indicated that he is interested in the capability that the TacSats could give to US troops seeking to flush out insurgents in Iraq or to locate American forces taken prisoner during battle.

The Air Force plans by 2008 to establish a program office to handle the purchase of small, responsive satellites such as the TacSats. The program office will be at the Space and Missile Systems Center's Det. 12 at Kirtland Air Force Base in New Mexico. The office will be known as the Joint Warfighting Space program office.

In the interim, the service established a "virtual" program office at Kirtland

that includes participation from AFRL's space vehicles directorate, the Space and Missile Systems Center's transformation office, and AFSPC's space battlelab.

The Joint Warfighting Space program office also will handle the purchase of so-called near-space vehicles operating between 12 and 62 miles above the Earth's surface. (See "Near-Space" July 2005, p. 36.)

Near-space vehicles are envisioned as loitering over areas of interest much longer than even satellites in highly elliptical orbits and are conceived as being able to respond quickly to combat needs. Near-space vehicles raise overflight issues not present for satellites, however, leaving a door open for responsive spacecraft.

Before the Air Force can take advantage of responsive space capabilities such as those on the TacSats, it needs rockets capable of launching on just a few days' notice. The Air Force today typically plans the majority of its space launches two years in advance—a duration service officials would like to cut to a matter of days for responsive satellites.

The late Vice Adm. Arthur K. Cebrowski, who headed DOD's Office of Force Transformation until his retirement in January 2005, said in 2003 that he hoped the TacSat work would stimulate the market for low-cost launch options.

One option available today is the Falcon-1 rocket built by Space Exploration Technologies (SpaceX) of El Segundo, Calif. The Falcon-1 rocket was scheduled to make its maiden voyage in February, carrying an experimental payload built by students at the Air Force Academy.

That launch is to be paid for by the Air Force and the Defense Advanced Research Projects Agency through a program also known as Falcon, Force Application and Launch from the Continental United States.

The Air Force and DARPA have used their Falcon program to fund the development of small launch concepts. SpaceX was further along with its rocket when the Pentagon began the Falcon program in 2003, with the goal of launches costing no more than \$5 million.

SpaceX, which advertises its Falcon-1 launches for \$6.7 million, is under contract to launch TacSat-1. SpaceX founder Elon Musk developed the Falcon-1 rocket with his own funds.

The Air Force is looking at additional launch options for the following TacSat launches, due to the inherent risk of relying on a single provider, Hernandez said.

The Air Force and DARPA had initially funded development of nine small launcher concepts under their Falcon effort and awarded a \$17.8 million contract in November to a company called AirLaunch. This is for continued work that could lead to a flight demonstration later this decade.

AirLaunch was the sole contestant in a Falcon competition for boosters that do not take off vertically from the ground—as most launch vehicles have since the dawn of the space age. AirLaunch's QuickReach booster is designed to be carried by an unmodified C-17 or other large cargo aircraft. From flight, QuickReach is released and heads to orbit.

The use of a standard aircraft is an appealing attribute, according to DARPA Director Anthony J. Tether, because that factor saves money.

DARPA had sponsored another aircraft-based small satellite launcher called RASCAL, Responsive Access, Small Cargo and Affordable Launch, but canceled the project in 2005. The



SpaceX, which advertises its Falcon-1 rocket booster launches for \$6.7 million, is under contract to launch TacSat-1. USAF is looking at additional launch options for the following TacSat launches. The Falcon-1 booster is shown here during a May 2005 test.

program was axed when it became clear that RASCAL would require a custom aircraft, which would have busted DARPA's budget for the work.

Other companies that hope to build quick-reaction launchers include Microcosm, which has been refining its concept for a family of rockets called Scorpius for years. (Microcosm was one of the nine companies that received initial Falcon contracts from the Air Force and DARPA.) The company is continuing to evolve its Scorpius concept with the hopes of winning future work.

Express Checkout

Working with responsive satellites and launchers also will require changes in the way the Air Force approaches space operations. One of the most important issues that must be addressed is the speed with which Air Force satellite operators can "turn on" the spacecraft following launch.

Satellites typically take months to "check out." That is anything but responsive, observed Gary E. Payton, deputy undersecretary of the Air Force for space programs.

If commanders have to wait for the satellites to be checked out over the course of two months, it practically

negates the benefit of having an inventory of satellites and rockets in storage to be launched on two days' notice, Payton said during a speech in December sponsored by the Space Transportation Association.

Satellite launch dates need to be more durable as well. Launches are typically scrubbed for weather conditions such as fog or heavy winds, but those traditional constraints cannot be allowed to interfere with responsive launches, Payton said.

It would be rather embarrassing for a range commander or a launch squadron commander to cancel a launch because of weather," Payton said.

To call up CENTCOM "and say, 'gee whiz, General, I'm sorry we couldn't launch today because there was fog at Vandenberg,'" would be unacceptable, he said. Under today's rules, responsive launch could quickly devolve into a nonresponsive situation of "there's going to be fog tomorrow morning, and the morning after that, so we can get around to launching your [crucial] satellite ... in a week

or so," Payton explained. That simply will not do.

Other issues that must be addressed before responsive satellites can become a regular part of Air Force operations include the approach to launch failures, Payton said. A launch failure today can ground a rocket fleet for months, while the cause of the problem is studied and corrected.

"Right now, we have a mentality in our space launch business that if one fails, you ground the fleet," scrutinize telemetry for weeks, call review teams, and write action items, he said. This takes "anywhere from six months to nine months to three years. ... That sort of system is not responsive to the combatant commander."

Operationally responsive space requires a different mind-set—one similar to that for aircraft, where a problem is usually dealt with in a matter of hours or days, he said.

In addition to launching small satellites at the beginning of a military operation, commanders may find themselves turning to small spacecraft to fill in the gap if an existing satellite is suddenly unavailable. This could be for any reason, from part failure to enemy attack.

Most of the details of the recent Schriever space wargames conducted by Air Force Space Command are classified, but a key theme was the use of small satellites to replenish spacecraft.

In fact, some officials believe that the capability to launch small replenishment satellites, even if they may not be as capable as standard spacecraft, may deter enemies from attacking the Air Force's space-based assets.

Despite their comparatively low cost and envisioned fast availability, responsive satellites are unlikely to replace their larger, pricier brethren. The Air Force still will need large satellites for the bulk of the communications flow to deployed forces and to watch out for enemy missile launches all over the globe, and durability certainly has value.

But smaller, cheaper spacecraft may become a prominent part of the Air Force's arsenal to fill in the gaps in capabilities leading up to or during conflicts. That is the Air Force's goal for responsive space. ■

Jeremy Singer is a staff writer with Space News in Washington, D.C. He covers the Pentagon and is the editor for special projects. This is his first article for Air Force Magazine.

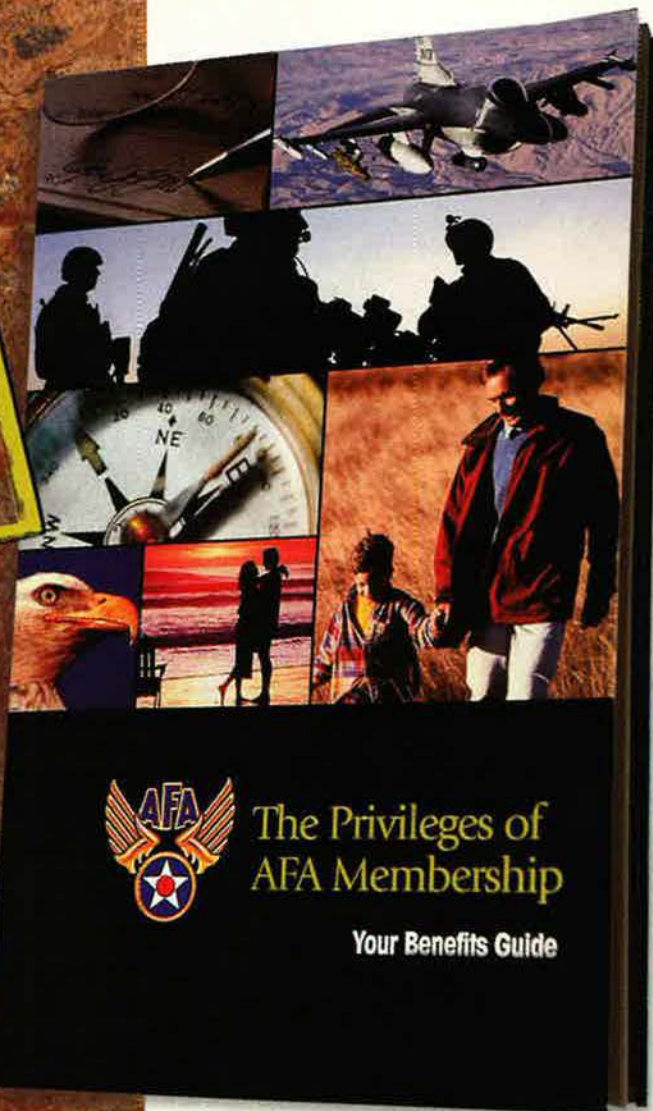
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A B-29 Superfortress on the ground at Iwo Jima after a flak shell had blown off its No. 3 propeller. Debris from the shattered prop flew into the No. 4 engine, knocking it out, and other pieces of shrapnel ripped open the fuselage. Despite total loss of power on the right side, the B-29's crew got it back down and lived to tell the tale.

ugh Old Birds

These amazing photos from the US National Archives leave you wondering: How on Earth did they ever make it back?

Photo research by Brick Elsel



Despite catastrophic inflight damage, thousands of World War II aircraft made it safely back to Earth, often carrying wounded and dead airmen. The aircraft of the era were beloved for their durability. They could often fly—and land—with damage that nearly defies comprehension.

Pictured at right is a B-17 Flying Fortress of the Britain-based Eighth Air Force. After being struck by flak over Ludwigshaven, Germany, during a raid against a chemical plant, the crew told intelligence officers that the hole in the wing was big enough for four men to stand in. They were right. Shown l-r are pilot 1st Lt. Roy Murphy, copilot 2nd Lt. Norman Tesch, navigator 1st Lt. John McComb Jr., and bombardier 1st Lt. Donald McKenna.



At left, after 65 missions, the B-17 General "Ike" received major damage. Flak ripped off the No. 3 propeller, and a blade tore through the fuselage on the side of the bomber, narrowly missing the supreme commander's image. This aircraft was christened by its namesake with a bottle of Mississippi River water. That was before he had become General of the Army, and the 91st Bombardment Group had not had an opportunity to add Ike's fifth star to the portrait.

At right, a pilot with the 7th Fighter Squadron on Okinawa inspects the damage to the propeller of his P-47 Thunderbolt. A Japanese 20 mm shell had torn a fist-sized hole straight through his prop.

Far right: A B-17 tail gunner's position is bracketed by damage where enemy 20 mm fire tore into the aircraft. This bomber, assigned to the 379th Bomb Group, made it back to England despite the loss of half its rudder. German fighters often tried to knock out a bomber's gun positions prior to administering the coup de grace.





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Top left: Decelerating after suddenly losing an engine over St. Omer, France, in October 1942, the Boeing B-17 shown here was inadvertently rammed by a following bomber. The B-17's rudder, much of its vertical stabilizer, tail gunner's position, and horizontal stabilizers were chewed up by the props of the trailing Fortress.



Top right: The crew of an Eighth Air Force B-26 Marauder inspects damage to the bomber's tail gun turret, rudder, and rear stabilizer.

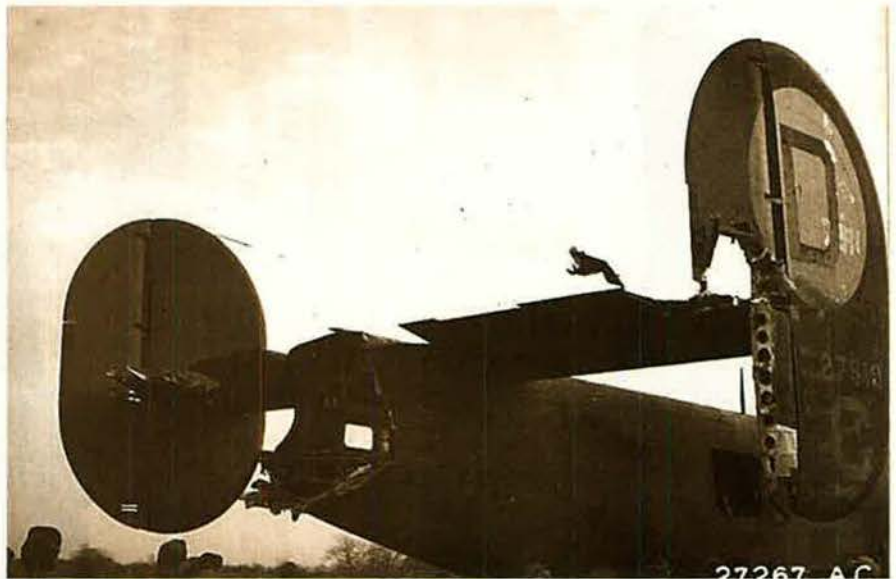
Above: The wing of a Fifteenth Air Force B-24 Liberator was badly damaged by flak during a mission over Austria in April 1945.



Above: The nose assembly is missing from the B-17 known as Duke of Paducah, which operated out of Bassingbourn, England.

Landing a crippled aircraft was often the most perilous moment of the recovery. At left, ground crews of the 303rd BG battle a fire.

The B-24 bomber at right, belonging to Eighth Air Force, completed its mission over Europe despite severe damage, shown here. The Liberator lost use of its rear stabilizers and was mostly missing its tail.



On Saipan in the Pacific, Capt. James Pearson and his crew line up before what is left of their B-29. The fuselage at left was actually lucky to be in such "good shape." After a mission over Tokyo, this bomber returned 1,500 miles through bad weather with both engines out on one side and with the fuselage torn open by a runaway prop. Finally, the nose was completely torn off in the aircraft's crash-landing.



Above, this B-26 Marauder landed hard in England in September 1943 after flak had hit its landing gear lock.

Right, Lieutenant James Fisk shows off the flak damage he survived over Italy.





A-567



Top left: This B-17 forward fuselage survived one of the more freakish accidents of the war. It was flying in a tight formation when the Fortress below it was hurled upward by unexpected turbulence, smashing the nose of this B-17. The other bomber's radio operator was killed and his body wound up inside the airplane above. The entire crew of the pictured Fortress survived.

Top right: Jeanette, a B-25 bomber, made it back to base missing its left elevator and part of the left rudder.

At right, in Pisa, Italy, pilot Lieutenant Richard Sulzbach (l) explains to Lt. Col. Harold Whiteman that he flew too low during a strafing run and went through a clump of trees.

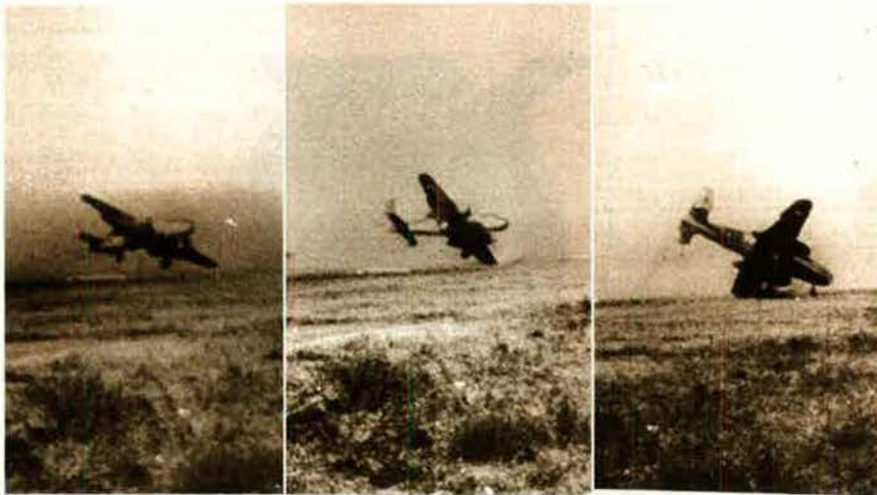


The photos at left show a pair of B-24s on the ground in England. The bomber at far left was hit by German attackers over Coblenz after attacking the railroad marshaling yards at Hanau in November 1944. The Liberator at near left had crash-landed a week earlier near Norfolk.

This photograph shows what happened to 1st Lt. Edwin King's P-47 after its main oil line was cut by enemy flak.

While strafing enemy gun positions near Brescia, Italy, King took return fire that severed his oil line. The R-2800 engine kept on chugging despite losing every drop of oil, which streamed over the airplane and coated the fuselage and canopy.

Since he could no longer see forward, King flew in formation with his wingman all the way back to base. The engine finally seized up while he was on final approach. The mission was this Thunderbolt's 110th—and last—combat sortie.



Series of photos at left shows the one-wheel landing of a crippled B-25, which was returning from a mission over Salerno. The pilot kept the bomber balanced on the left main gear and nose wheel until he ran out of airspeed. The airplane then ground-looped to the left. No crew member was injured.

Bottom left: First Lt. John Dooling of the 318th FG inspects the flak damage to the wing of his P-47. He was hit after a strafing mission over Japan in 1945.

Bottom right: Old Bill, a B-17 from the 305th BG, lost its nose but still made it safely back on the ground in England in 1943. In the foreground, Capt. Bruce Bairnsfather, the artist who drew the "Old Bill" cartoon character, surveys the damage.





At left, TSgt. Paul Taylor, the top turret gunner of this B-17, peers out a hole caused by a 20 mm cannon shell.

Below is the damaged top gun turret of a B-17 that survived a mission over France in 1943.



A flak shell pierced the bottom of this B-24 at right—but the shell didn't detonate until it struck the top of the bomber's waist section. Besides killing a crew member, the exploding round blew the top of the mid-section away, severing the aircraft's rudder cables.

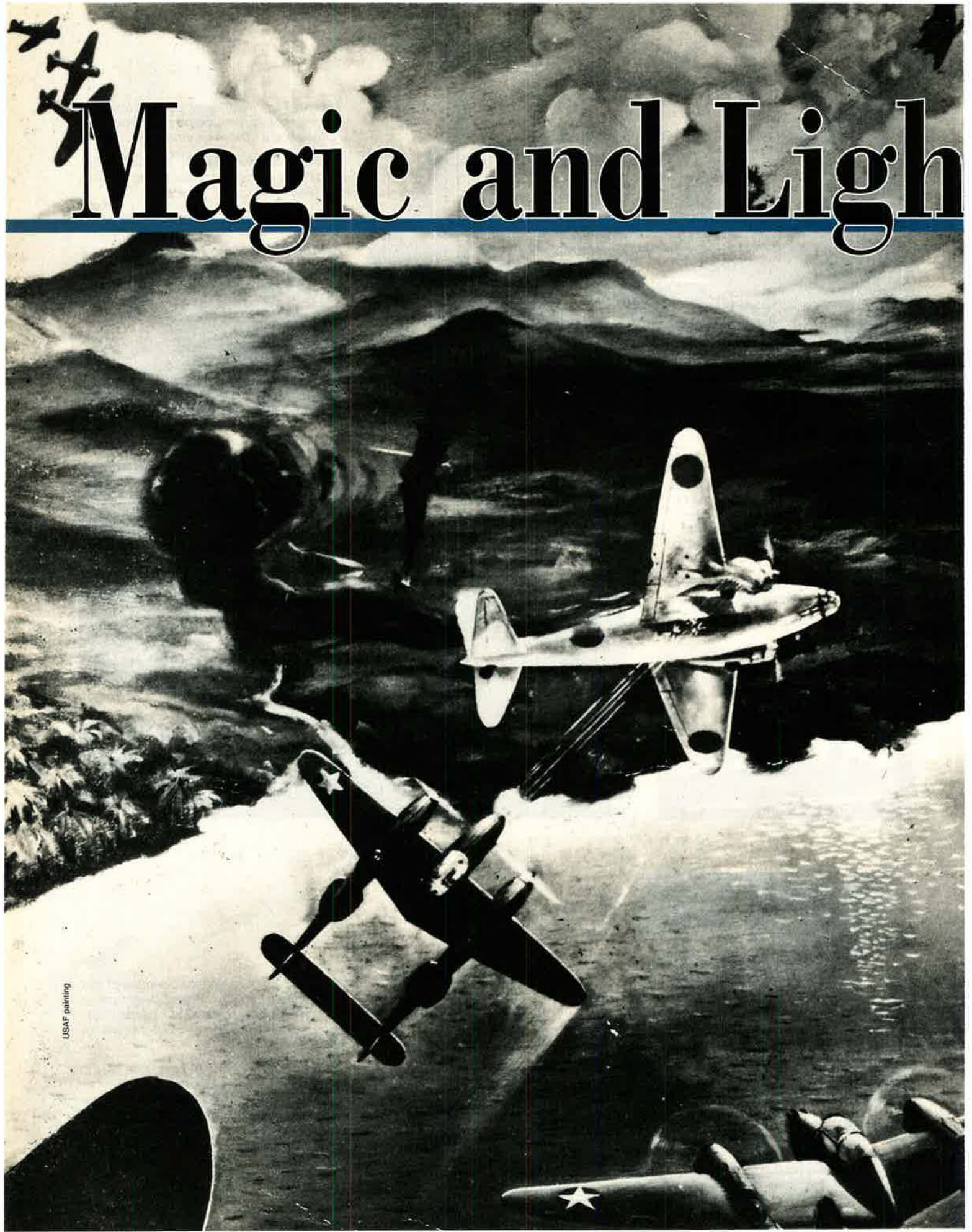
Below, a flak-riddled B-24 of Fifteenth Air Force skids in on a crash-landing at its base in Italy.



Left: The tail gunner's compartment of this B-17 nearly has been ripped away from the aircraft. This was an unfortunate fratricide incident: The damage was caused by a falling bomb.

USAAF's World War II aircraft were very tough birds. Many pilots and aircrew members owe their lives to the airplanes that made it back to base under the most extreme conditions. ■

Magic and Light



USAAF painting

tning

For US pilots, Adm. Isoroku Yamamoto was a "high-value" target but also a fleeting one.

By Rebecca Grant

At left is an Air Force artist's conception of the interception of Yamamoto's airplane. The painting, by Sgt. Vaughn A. Brass, is in the Air Force art collection.

On Dec. 7, 1941, 2,390 Americans died in Japan's surprise attack on Pearl Harbor, a military operation planned by Adm. Isoroku Yamamoto. It was an act that made Imperial Japan's greatest commander the focal point of intense American hatred and innumerable calls for vengeance.

Yamamoto's goal at Pearl Harbor was annihilation of the US Pacific Fleet, achievement of which would have decided the outcome of the war "on the first day," wrote his biographer, Hiroyuki Agawa. In this, Yamamoto failed. The US fleet began striking back early in 1942.

Even so, Yamamoto, mastermind of Japan's offensive, was still out there in the vast Pacific, commanding Japan's combined fleet. "Yamamoto was the beating heart of the Japanese Navy," wrote Donald A. Davis, in *Lightning Strike*, his 2005 book on the secret mission. The very thought of the admiral roaming free, attacking US forces, was a bitter one to US military officers in the theater.

Then, on April 13, 1943, fortune intervened. A coded Japanese message was intercepted and, when decoded by the Navy's cryptographers, it revealed, in stunning detail, that Yamamoto would be flying to a forward airfield near Bougainville, in the Solomon Islands. He would be there in five days.

As US military men saw it, there was just enough time to pull together a long-range P-38 mission to shoot down the airplane carrying Yamamoto and deeply wound the Japanese war effort. This would turn out to be World War II's most audacious attack on what today's airmen would call a "high-value" and "time-sensitive" target.

By April 18, 1943, Yamamoto was dead, killed on the direct order of his US counterpart, Adm. Chester W. Nimitz.

Shifting Momentum

After Japan's defeat in June 1942 at Midway, the initiative in the Pacific campaign shifted to the US and its Allies.

In February 1943, Japanese forces evacuated Guadalcanal. Yamamoto was stuck southeast of Guam aboard his flagship, the battleship *Yamato*. He stayed put for nearly a year in the harbor at Truk, forward headquarters for Japan's combined fleet.

The war in "the Slot," as the waters between the Solomon Islands were called,

was a joint project of Adm. William F. Halsey Jr., Vice Adm. Aubrey W. Fitch, and Rear Adm. Marc A. Mitscher.

Mitscher was the Solomon Islands air commander or, in modern parlance, the joint force air component commander.

The early AirSols missions were to prey on Japanese shipping, harass enemy efforts to build new airstrips, and most of all to win air superiority. Air combat was intense.

By mid-1943, Mitscher had nearly 700 aircraft at his disposal, but resources were still limited when Yamamoto made his next move.

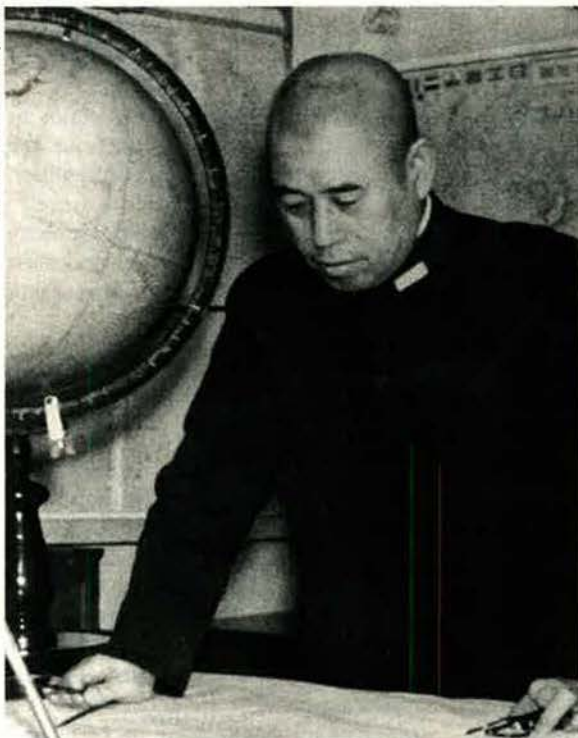
Yamamoto tried to get 7,000 troops through to Lae, New Guinea. The result was carnage. In the Battle of the Bismarck Sea, Lt. Gen. George C. Kenney's B-25s terrorized Japanese ships. Naval historian Samuel Eliot Morison said that, after Pearl Harbor itself, it was "the most devastating air attack on ships of the entire war." Air attacks sank seven of eight transport ships and two destroyers.

The American strategy in the Pacific was to wage a two-pronged war, and it was beginning to pay off. Nimitz ran Central Pacific campaigns, now focused on the Solomons. Army Gen. Douglas MacArthur was on the move in the southwest at New Guinea. Thus, in early 1943, Yamamoto had two major problems. The Japanese Army wanted more support for New Guinea, while other commanders insisted on striking back at Guadalcanal.

Yamamoto was not well placed to do either. The Japanese admiral was unwilling to risk more carriers in the Slot, because of local Allied airpower. He crafted Operation I, a series of large-package airplane attacks intended to wipe out American forces in the Solomons.

Most of Japan's local air units were ashore at Rabaul, a stronghold situated north of the Solomons. Rabaul was now feeding air units operating farther south. Yamamoto seized the chance to get out of Truk and go to the front lines. "I feel happy at the chance to do something," he wrote to his favorite geisha on April 2.

Operation I began on April 7, 1943, when 157 Japanese fighters and 67 bombers set out to find a US naval force and catch it off guard. Yamamoto donned his formal white uniform and stood at the edge of the airfield. "Each time aircraft took off," Agawa recounted, Yamamoto "waved his cap in farewell" then repaired to the operations shack



Yamamoto (pictured here in the early 1940s) had one goal at Pearl Harbor—to annihilate the US Pacific Fleet. Doing so, he believed, would give Japan the best chance of prevailing in war with the US.

to confer with his chief of staff, Adm. Matome Ugaki.

As the Japanese strike package swept down toward the Slot, the American Solomons air commander countered with all 76 Navy and Marine Corps Corsairs, Wildcats, and Army P-38s and P-39s available on Guadalcanal. In the ensuing aerial engagement, AirSols fighters shot down 39 Japanese aircraft.

More Japanese raids followed on April 11, April 12, and April 14. Returning Imperial Navy pilots brought back claims that they had shot down many US warplanes and sank many US warships. These claims were exaggerated, but Yamamoto did not know this. On April 16, according to biographer Edwin P. Hoyt, the Imperial General Staff ended the operation and the emperor congratulated Yamamoto for winning mastery of the air.

In reality, Operation I had seen Japan lose 25 carrier aircraft plus 41 land-based bombers and dive-bombers. Needless to say, the American buildup in the Solomons went on unabated.

Yamamoto was due back in Truk, but he planned to make one more trip to the front to emphasize to his pilots the absolute necessity of holding air superiority.

Magic ... and Lightnings

The message that went out April 13 gave the admiral's schedule in fine detail. It stated:

- At 0600, Yamamoto would leave

Rabaul in a medium attack airplane, escorted by six Zeros.

- At 0800, the admiral would arrive at Ballalae and proceed by subchaser to Shortland, from which he would make a short visit to Buin.

- At 1540, he would arrive back at Rabaul after a flight from Buin.

The telegram enraged the Japanese commander of the flotilla at Shortland. "What a damn fool thing to do," he charged, "to send such a long and detailed message about the activities of [the commander] so near the front!"

It was a prophetic statement. The itinerary was a gift to the Americans.

Since well before Midway, Navy cryptographers had been breaking elements of the Japanese code through a secret program known as Magic. Even when the Japanese ciphers changed, the code-breakers could usually catch at least 15 percent of the contents of a message and decode more with the help of early IBM computing machines.

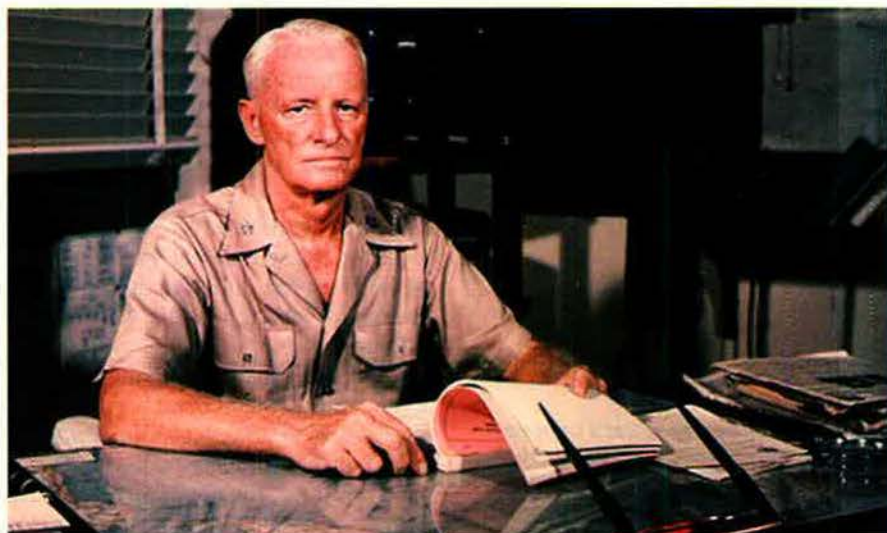
In April 1943, the chief of code and translator at Fleet Radio Unit, Pacific Fleet, usually scanned the messages. The American cryptographers knew that this message, while just partially decoded, was of immense value.

It fell to Cmdr. Edwin T. Layton, Nimitz's fleet intelligence officer, to bring the news to the boss. There were definite risks in acting on partially decoded information, but Nimitz did not hesitate. The intelligence was sent to the area commanders, including Mitscher.

The only in-place aircraft that were ready and able to take on the mission were US Army Air Forces P-38 Lightnings. There were 18 of them on Guadalcanal, flown by the 12th and 339th Fighter Squadrons.

The P-38 offered two big strengths for this mission. One was its heavy armament. The Lightning had four .50-caliber machine guns and a 20 mm cannon. Unlike most other World War II fighters, the P-38's guns were mounted in the nose, as the twin engines were on the wing nacelles. Nose guns meant one straight-ahead line of lethal fire.

The P-38's second, decisive advantage was its 1,100-mile range. To fly from Guadalcanal to the intercept point was a round-trip of nearly 1,000 miles.



Adm. (later, Fleet Adm.) Chester Nimitz was commander in chief, US Pacific Fleet. Yamamoto was killed on the direct order of Nimitz, who was the Japanese admiral's US counterpart.

The Message That Doomed Yamamoto

- TO: COMMANDER, 1ST BASE FLOTILLA
 COMMANDER, 11TH AIR FLOTILLA
 COMMANDER, 26TH AIR FLOTILLA
 COMMANDER, 958TH AIR DETACHMENT
 CHIEF, BALLALAE DEFENSE UNIT
- FROM: C-IN-C, 8TH FLEET, SOUTH EASTERN AREA FLEET
- INFORMATION: C-IN-C, COMBINED FLEET
- C-IN-C, COMBINED FLEET, WILL INSPECT RXZ, RXE, AND RXP ON "SETSUA" AS FOLLOWS:
- AT 0600 LEAVES RR BY "CHUKO," A LAND BASED MEDIUM BOMBER (6 FIGHTERS ESCORTING)
 AT 0800 ARRIVES AT RXZ
 AT 0840 ARRIVES AT RXE BY SUBCHASER (COMMANDER, 1ST BASE FORCE, WILL ARRANGE ONE CHASE IN ADVANCE)
 AT 0945 LEAVES RXE BY SAME SUBCHASER
 AT 1030 ARRIVES AT RXZ (AT RXZ A "DAIHATSU" WILL BE ON HAND AND AT RXE A "MOTOR LAUNCH" FOR TRAFFIC)
 AT 1100 ARRIVES RXZ BY "CHUKO"
 AT 1110 ARRIVES AT RXP
 LUNCHEON AT HQ, 1ST BASE FORCE (ATTENDED BY COMMANDANT, 26TH AIR SQUADRON, AND SENIOR STAFF OFFICERS)
 AT 1400 LEAVES RXP BY "CHUKO"
 AT 1540 ARRIVES AT RR
 - OUTLINE OF PLAN AFTER THE VERBAL REPORT ON THEIR PRESENT CONDITIONS BRIEFLY BY EACH UNIT. UNIT MEMBERS WILL BE INSPECTED (1ST BF HOSPITAL WILL BE VISITED).
 - THE COMMANDING OFFICER OF EACH UNIT ALONE SHALL WEAR THE NAVAL LANDING PARTY UNIFORM WITH MEDAL RIBBONS.
 - IN CASE OF BAD WEATHER IT WILL BE POSTPONED FOR ONE DAY.

Source: *Lightning Strike: The Secret Mission to Kill Admiral Yamamoto and Avenge Pearl Harbor*, by Donald A. Davis

The April 13, 1943 coded Japanese message contained stunning detail about Yamamoto's itinerary. Once it was decoded by Navy cryptographers, American leaders knew Yamamoto would be flying to a forward airfield near Bougainville, the hour and day of his departure, and the time of his arrival. "What a damn fool thing to do," said an enraged Japanese commander when he saw the telegram.

To avoid detection, the USAAF P-38s swung west and flew just above the water for nearly 500 miles. They intercepted Yamamoto's aircraft as it approached Bougainville and then headed back to Guadalcanal.

The joint air cell swung into action. Maj. John W. Mitchell, 339th FS commander, would lead all 18 P-38s on the attack. Mitscher handpicked four pilots for the killer flight. They were Capt. Thomas G. Lanphier Jr., 1st Lt. Rex T. Barber, Lt. Jim McLanahan, and 1st Lt. Joseph F. Moore.

Ground crews spent the night of April 17-18 modifying the P-38s to hold new 310-gallon fuel tanks in addition to a standard 165-gallon tank. Crews also crammed a ship's compass into Mitchell's airplane. Navigation over the first four legs of the flight would require open-water reckoning based on time and speed.

To avoid detection, the P-38s would swing west and fly just 30 feet above the water for nearly 500 miles. P-38s had no air-conditioning and at low altitude the cockpits would feel like a greenhouse, with pilots baking in the sun.

Yamamoto would be traveling in greater style, wearing a new, dark green dress uniform instead of the customary white. Most sources said he was sitting on the flight deck of a Japanese "Betty" bomber. His chief of staff, Ugaki, was flying in a second Betty.

The Navy code-breakers thought Yamamoto would land on Ballalae off the tip of the much larger island of Bougainville. Mitchell wisely planned to intercept Yamamoto's airplane at a point



Staff map by Zaur Elyanbekov



Brig. Gen. Dean Strother pins both the Distinguished Flying Cross and the Silver Star on Capt. Thomas Lanphier. Lanphier always maintained that he brought down Yamamoto.

40 miles farther out. That was fortunate, because, in fact, Yamamoto was flying to Buin, on Bougainville itself. If Mitchell hadn't planned to engage the admiral's aircraft at the earlier point, the Americans would have missed their target.

Mitchell's group hit trouble right at the start. McLanahan's P-38 blew a tire on takeoff, and, en route, Moore's drop tanks would not work and he had to turn back. First Lts. Besby F. Holmes and Raymond K. Hine, the backups, joined the killer flight.

Two-and-a-half-hours later, the Lightnings had flown for 494 miles. They tested their guns and were climbing through about 3,000 feet when pilot Douglas S. Canning spotted bogeys at 11 o'clock. Both groups of aircraft had arrived right on schedule.

Shocked to see P-38s, the escorting Zeros dove to attack.

The P-38s dropped tanks and leapt upward. Mitchell pushed his cover flight up to higher altitude, where they would be in position to fight off the horde of Zeros they expected to jump them from nearby Kahili airfield. He ordered Lanphier to take the killer flight through the six escort Zeros to get the bombers.

The killer flight was expecting just one Betty. Its pilots no doubt were surprised to find two. Still, Lanphier's flight committed to complete the job. There is considerable uncertainty and dispute about exactly who did what next.

First to be hit was Yamamoto's airplane. It caught fire and crashed into the jungle. Those aboard Admiral Ugaki's

bomber saw Yamamoto's Betty go down as they headed out over the sea, twisting to get away from the attacking Americans. They felt bullets hitting their bomber, and then it crashed into the water. The pilot, Flight Petty Officer Hiroshi Hayashi, and Ugaki both survived the sea crash.

Fog of War

Three pilots from the killer flight each told debriefers they shot down a Betty. Navy record keepers gave Lanphier, Barber, and Holmes each

At right is 1st Lt. Rex Barber. Official Air Force records gave Lanphier and Barber joint credit for the shootdown of Yamamoto's aircraft.



Photo courtesy of James F. Lamsdale via George T. Chandler

credit for one Betty. That account stood for years. Eventually, however, Japan released records showing that only two Bettys had been in the air that day.

According to mission reports and subsequent accounts, here is what happened on April 18, 1943.

Lanphier and Barber were heading for the Bettys at a 90-degree angle. Then the Zeros engaged. Lanphier attacked the lead Zero head-on—normal P-38 tactics. His wingman, Barber, realized he was heading in for the bombers too fast. Barber turned to get on the tail of what turned out to be Yamamoto's airplane. Hayashi, piloting the second Betty, later said he saw a P-38 almost sitting on top of him.

Barber completed the turn and put three long bursts into Yamamoto's Betty. Pieces of the engine cowling flew off, the bomber caught fire, and Barber did not see it again as he zoomed forward and the Betty fell.

Lanphier was at higher altitude. He rolled over, hanging in his straps for a quick look below. Lanphier bore down on Yamamoto's Betty at a 70-degree angle of deflection, making for an easy shot.

Meanwhile, Holmes and Hine were in the fight after having trouble releasing their drop tanks. Each attacked the Zeros. Then they took aim for the second Betty, which was now hugging the water.

Yamamoto: With a Gambler's Instincts

His origins were humble. Born Isoroku Takano in 1884, Yamamoto had samurai lineage but little money. The youngest son of his family, he learned English from a missionary and won a place at Japan's naval academy. At age 32, he was adopted by the Yamamoto clan—a warrior family that had no sons—and formally changed his surname.

Yamamoto made his mark as an ensign when he received a commendation for bravery in the 1905 Russo-Japanese naval battle.

He spent several years in America, first as a student at Harvard and later as an attaché. Yamamoto traveled widely and indulged his passion for gambling. He played everything from Japanese shogi (similar to chess) to bridge and believed he had a system for winning at roulette. According to biographer Edwin P. Hoyt, Yamamoto visited Monte Carlo and later maintained that if he did not advance in the Navy he'd happily return to the casino as a professional gambler.

The colorful side of Yamamoto came out in a definitive 1969 biography by Hiroyuki Agawa, published in Japan. Based on personal accounts and Yamamoto's own letters, the book caused a sensation because it revealed the intimate life of the hero admiral, complete with geisha dealings and ambivalence about World War II.

By 1929, Yamamoto was captain of the carrier Akagi, perhaps the most advanced aircraft carrier of its day. The experience was a searing one for him. On an early exercise, most of Akagi's air wing was lost when the aircraft could not be recovered in bad weather.

From then on, Yamamoto was just as concerned with technology as he was with tactics, and he was instrumental in shaping the Japanese Navy into the sophisticated fighting force it was by the time of Pearl Harbor.

His disinterest in politics served him well during Japan's turbulent 1930s. He was not harmed by a February 1936 Army coup attempt and was not associated with the sympathetic "fleet faction" of the Japanese Navy. Nearly put out to pasture, by 1939 Yamamoto was well-placed to take over top command.

He watched the early part of World War II with some misgivings. Japan's Army was already on its bloody march in China. Evidence suggests that Yamamoto had no taste for the Berlin-Rome-Tokyo axis, and his concern about fighting the Americans was apparent.

But broader war was coming, and there was no questioning the fact that Yamamoto was a formidable commander.

All agree that Holmes poured gunfire into this Betty.

Holmes thought he zoomed over Barber as Barber tangled with Zeros. According to Holmes, he hit the Betty on the third burst, drilling in bullets before he overshot it.

Barber told it differently, saying he was free of the Zeros when he saw Holmes fire on the Betty. It was smoking but airborne as Holmes and Hine overshot. Barber pulled to within 20 feet to deliver a burst that ignited the Betty and sent it into the water.

Holmes contended that Barber shot only at the wreckage.

One person who might have sorted the confusion out never came home. Hine, an experienced P-40 pilot who was not current in the P-38, was lost on the mission. Mitchell had seen a Lightning trailing oily smoke, being chased by a Zero. A Japanese ace named Shoichi Sugita, an assistant flight petty officer in Yamamoto's escort flight, reported severely damaging a P-38 that was flying next to another P-38 struggling to drop its tanks. It was Hine.

Lingering Controversy

The three pilots of the killer flight

straggled back. Doug Canning helped Holmes limp to an emergency landing on an uncompleted airstrip in the Russell Islands. Barber reached Guadalcanal with a dented fuselage and 104 bullet holes. Lanphier, just before landing, broke discipline and radioed a message to Guadalcanal's ground station. Yamamoto would not be "dictating any peace terms in the White House," he declared.

Nimitz, Halsey, and other commanders had tense moments wondering whether the Japanese would figure out their code was broken. The Navy concocted a cover story to the effect that coast-watchers had spotted Yamamoto boarding his bomber.

On Bougainville, a Japanese Army search party located the crash site of Yamamoto's airplane. According to Agawa, the soldiers found Yamamoto thrown clear of the crash. He was still

wearing his ceremonial sword.

Jubilation spread on Guadalcanal, but sparring between Barber and Lanphier began right away. Lanphier joyously claimed he'd shot Yamamoto and seemed to bask in Mitscher's congratulations. Official Air Force records gave Lanphier and Barber joint credit for shooting down Yamamoto.

In the 1950s, Lanphier recounted his version of events in many magazine articles, some of which seemed to leave Barber out of the action altogether. Barber protested.

Eventually, in 1985, a Victory Credit Board of Review upheld the shared credit.

Lanphier died in 1987, but the controversy did not disappear. Barber took his case to the Air Force Board for Correction of Military Records. The Air Force History Office advised in September 1991 that "enough uncertainty" existed for both Lanphier's and Barber's claims to be accepted.

The board split on Barber's petition and could not reach a decision. That prompted Air Force Secretary Donald B. Rice to rule that he was "not convinced that the award of shared credit for the Yamamoto shootdown was either in error or unjust."

Barber took his case to federal court with the argument that Rice had not abided by the eyewitness confirmation rule in assigning Lanphier even half-credit for killing Yamamoto. The 9th Circuit Court of Appeals also declined to change anything, deciding not to "express an opinion as to which pilot, if indeed only one pilot, was responsible for shooting down Yamamoto."

John Mitchell, who planned and led the raid, may have had the best perspective. As he later wrote: "No one on God's green Earth knew who had shot down which bomber, much less who had shot down Yamamoto."

Ultimately, the question of who did the shooting was far less important than the fact it had been done. The mission to kill Yamamoto was a success. Japan's greatest naval strategist, commander of its combined fleet, and the figure that the public connected with Pearl Harbor was dead. ■

Rebecca Grant is a contributing editor of Air Force Magazine. She is vice president, defense programs, at DFI 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's Aerospace Education Foundation. Her most recent article, "The Chinese Calculus," appeared in the February issue.

DOD

Senior Leadership

Compiled by Chequita Wood, Editorial Associate



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Donald H. Rumsfeld



Deputy Secretary of Defense
Gordon England

KEY:

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- ASD** Assistant Secretary of Defense
- ATSD** Assistant to the Secretary of Defense
- DASD** Deputy Assistant Secretary of Defense
- DATSD** Deputy Assistant to the Secretary of Defense
- DUSD** Deputy Undersecretary of Defense
- PADUSD** Principal Assistant Deputy Undersecretary of Defense
- PDASD** Principal Deputy Assistant Secretary of Defense
- PDUSD** Principal Deputy Undersecretary of Defense
- USD** Undersecretary of Defense



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Patrick A. Welsh is the Aerospace Education Foundation's National Teacher of the Year.

The "Doctor" Is In

By Bruce D. Callander

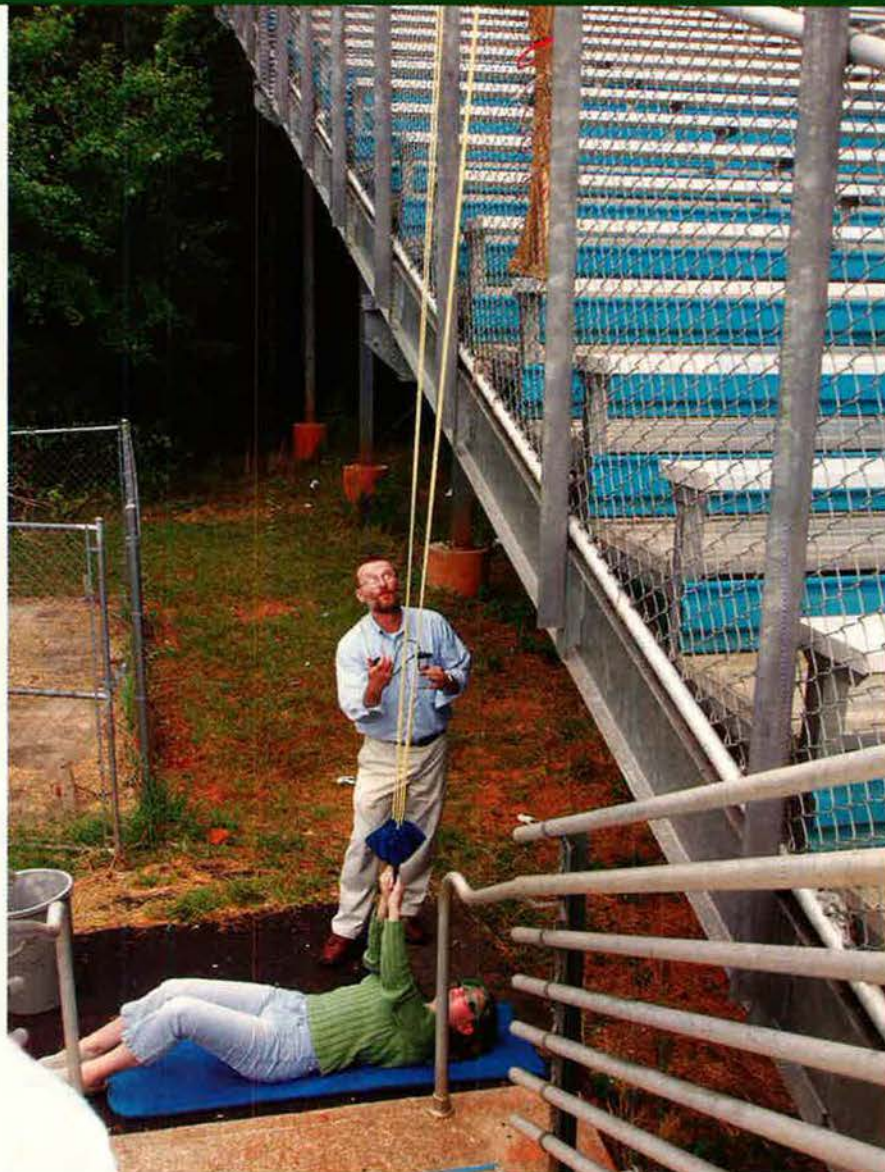
His students call him "Doc Welsh," in deference to his degree in veterinary medicine. He plays with a bluegrass band on a homemade violin. To illustrate Bernoulli's principle, he has his students build and fly boomerangs. He likes amateur radio, woodworking, military history, and, of course, teaching.

Patrick A. Welsh, a physics teacher at D.W. Daniel High School in South Carolina, is the Aerospace Education Foundation's 2005 national teacher of the year.

Welsh has taught physics in Central, S.C., for the past 23 years and in 2005 received the Christa McAuliffe Memorial Award as teacher of the year from AEF, an affiliate of the Air Force Association. Welsh was presented with the award during the AFA National Convention in Washington, D.C., last September.

The honor is given annually for excellence in furthering the concepts of aerospace technologies through successful, innovative classroom programs. That description is tailor-made for Welsh. His approach to teaching physics is based on demonstrating practical applications of natural laws. More often than not, he draws on aerospace for his examples.

"A big focus of my courses is teaching Newtonian mechanics," Welsh said. "We look at the way things move and



AEF Teacher of the Year Patrick Welsh prepares to time the flight of a free-falling water balloon about to be launched in a giant slingshot by student Kay Hemmings.

why they move the way they do. We study Newton's three laws of motion, the universal law of gravitation, and those kinds of things." Welsh said he hasn't found any more exciting applications of the principles than spaceflight,

the physics of orbital motion, microgravity, and flight in general.

Welsh came to teaching by a circuitous route. He was born in Walhalla, S.C., barely 20 miles from where he now lives. In high school, his favorite

subjects were math and chemistry, and his favorite activity was playing the French horn and sousaphone in the school band.

After graduation, he attended college at Clemson University, S.C., where the draws were his passion for the football team and the fact that he could afford the tuition. He earned a bachelor of science degree and went on to the University of Georgia to earn his degree in veterinary science. At age 25, he returned to Wallhalla and set up a veterinary practice but, after five years, sold the practice to his partner and returned to Clemson to earn a master's degree in bioengineering.

The Turning Point

It was while he was in graduate school that he decided to go into teaching. He was hired by D.W. Daniel High School to teach biology and physics. In time, he began teaching physics alone.

Today, Welsh teaches three levels of physics, each a little more concentrated than the last. "Technical Preparation" is mainly for students who will go on to technical schools or into the military. "College Preparation" is for students likely to go to college but not necessarily into science programs. The "Advanced Placement" (AP) course is designed to offer exceptional students enough college-level physics so they may be exempted from taking the first semester course.

Which level a student takes is influenced largely by his or her math ability. Welsh has designed the Tech Prep course so that students with marginal mathematics skills can pass it. The College Prep class is aimed at reasonably fluent mathematicians. The AP course is calculus based and intended for sophisticated mathematicians.

The course outlines for the College Preparation and AP physics classes are similar. Both include units on such subjects as Newton's laws, work and energy, and impulse and momentum. The Advanced Placement course, however, gets into areas such as rotation, conservation of energy, and harmonic motion. Students must be selected for the Advanced Placement course based on their math and science grades and teacher recommendations.

Despite the popular notion that today's American students tend to avoid science, Welsh said that 155 of the 193 seniors at Daniel are taking physics. He also does not buy the argument that that American youngsters aren't good at science. "I have found that the kids



Here, Welsh and students Duvall Young (left) and Josh Hale work with a "pinwheel" boomerang in a demonstration of the Bernoulli principle and a phenomenon called precession, which occurs when the axis of a rotating object is twisted.

who struggle the most with physics are the ones who have problems with math," he said. "The physics itself can be tough, but what causes problems for students usually is making little mistakes in algebra."

One reason for the high level of interest in physics may have something to do with Welsh's hands-on approach to the subject. He begins each school year with a unit on the physics of boomerangs. The class talks about the Bernoulli principle and predicts which way a boomerang should spin and why it should come back. Then they go out and throw boomerangs to test their performance. In the Tech Prep classes, the students often build their own boomerangs.

Welsh introduces other subjects in the same manner—by talking about the way things work and building on that approach one step at a time. By about Christmas, he said, the students have a pretty good sense of Newton's laws of motion.

Learning Trajectories

Welsh's interest in the history of World War II provides examples of physics principles. TV documentaries on bomber missions, for instance, lead to discussions of the forces acting on bombs as they follow a trajectory to the target.

Welsh also leans heavily on the space program for examples of Newton's laws in action. For example, he illustrates Newton's Second Law of Motion—dealing with acceleration—with rockets.

"They are acceleration machines," said Welsh. "Is there a better way to talk about how force is equal to mass times acceleration than rockets?"

Weightlessness provides an opportunity to illustrate Newton's Third Law: For every action there is an equal and opposite reaction. "We don't even think of that when we're here on the ground," he noted, "but when you are in space and suddenly you apply a force to an object, man, you are moving in the reverse direction." So, he said, if you turn a screwdriver in one direction in space, "now you're turning in the other."

Welsh's own enthusiasm for the space program dates back to his childhood, when the Mercury, Gemini, and Apollo projects were capturing the world's imagination. He remembers his first grade class watching Lt. Cmdr. Alan B. Shepard Jr.'s May 1961 launch. Every time there was another launch, a teacher would bring a TV to school and every child would be in that teacher's class watching it.

"You had to be excited about that," he said. "I don't believe there has ever been a more exciting time than those years. I can remember as a child when President Kennedy said we'll go to the moon within the decade and I was sitting there thinking, 'No, that's not going to happen. We're not going to get there.'"

Welsh thought the pursuit of that goal was "too good. We see this in science-fiction movies. But then you live through that decade and you think, 'It is going to happen.' I don't know what



Welsh secures to a railing a huge slingshot that is about to launch a water balloon. Welsh often uses demonstrations to illustrate principles of spaceflight and other aerospace-related topics.

we have right now to replace that kind of excitement.”

Welsh credits a fellow faculty member with putting him on the path to win the McAuliffe award. “Our Air Force JROTC instructor, a guy named Al Whitley, came to me and said, ‘Pat, you need to go for this award.’”

“I wasn’t that interested when Al first came to me,” Welsh said, but Whitley would not take ‘no’ for an answer. Retired Col. Alton C. Whitley is a Vietnam combat veteran who piloted the A-7, A-10, F-100, and F-117. In 1980, while working as a Fighter Weapons School instructor at Nellis AFB, Nev., he was picked to test the top-secret F-117 stealth fighter and became the first military pilot to fly the fighter. In 1990, he was named commander of the 37th (F-117) Tactical Fighter Wing just before it deployed to Saudi Arabia for the Persian Gulf War. (See “The Secret Doings at Tonopah,” January 1993, p. 72.)

After winning the award, Welsh said, he was reminded of the inspiration he received from some of his own teachers. Asked what he would like to do next, he said, “Well, the state of South Carolina probably would let me retire after 28 years, but my wife’s not going to let me retire [in five] years—we have two sons in college and my daughter is in the 10th grade.”

Hanging In

The main thing, Welsh said, is, “I still enjoy my job. I still look forward to going in to work every day. I grew up

where both my mom and dad had taught school early on but then worked in textile mills in the town where I grew up. And you know what? I didn’t hear my daddy come home talking about how great it was working in the cotton mill.”

Welsh said he is “fortunate to have a job where I’m looking forward to it every morning when I get out of bed. That’s something that’s not owed to me at all. Hopefully, I can teach until I get tired of it or they get tired of me.”

Sometimes, Welsh’s involvement with students extends well beyond the classroom. A case in point was the Habitat for Humanity project.

The idea took root during an annual event at Clemson. Each year, the students did a “blitz build,” erecting a Habitat house in a single week. One year, Welsh asked the Clemson faculty advisor whether high school students could build a house. As it happened, Habitat officials had been thinking about expanding to the high school level and encouraged him to take on the effort.

Students raised most of the money for materials and did most of the work. With time, the whole school, including students, faculty, and administration got behind the effort, and, for one school year, they all dedicated themselves to the building. Every Saturday, a couple dozen students turned up at the site.

Bruce D. Callander is a contributing editor of Air Force Magazine. He served tours of active duty during World War II and the Korean War and was editor of Air Force Times from 1972 to 1986. His most recent article for Air Force Magazine, “The Ground Observer Corps,” appeared in the February issue.

“I don’t regret it even for one minute,” Welsh said, but “any time you put a kid up on a roof, you are always concerned about safety. We were lucky and we didn’t have any major accidents all year long—construction sites can be pretty dangerous.”

Welsh keeps in touch with his students not only in class but on the Internet. He maintains a home page on the high school’s Web site. On it, he covers everything from his grading policies to outlines for his various courses and simple experiments students can do at home to demonstrate physics principles. Among the home demonstrations are one to test inertia, using Coke bottles and a dollar bill, and another illustrating the Bernoulli principle with Styrofoam cups.

Welsh’s advice on study time is direct and basic. A problem, he says, lies in the fact that some students believe that one hour is a great deal of study. In fact, four hours may be required to master the material.

He tells students to find a quiet place to study, not in front of the television or while listening to the radio, and to study when they are rested and alert.

Welsh believes the greatest amount of learning occurs in class and warns against studying other subjects in class. When taking notes, he says, students should write down what he says, not just what he writes on the overhead projection.

Stay Focused

He tries to make his demonstrations entertaining as well as instructive, but he warns youngsters not to get caught up in the excitement and miss the point of the experiments. They should keep their minds on what happened and why it happened and write down the physical principle that was illustrated.

He favors keeping notes—and re-copying them—as a way of studying. Studying in small groups works well for some students, he says. If they can teach someone else a difficult concept, it really increases their own understanding.

Welsh said he is not sure what he will do when he retires. “I hope that maybe my wife and I can travel some. I try right now to play as much fiddle as I can in a bluegrass band,” he said. ■



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The personality that built an aviation empire also contributed greatly to its downfall.

The Rise and Fall of Donald Douglas

By Walter J. Boyne

WORLD Cruiser. DC-3. Dauntless. DC-4. Invader. DC-6. B-66. Globemaster. Skyhawk. DC-9. The list of great Douglas airplanes goes on and on. Each one creates in the mind's eye an instant image of pioneering success, from victory in the 1942 Battle of Midway to the 1949 defeat of the Berlin Blockade.

The aircraft, magnificent as they were, constitute but a fraction of the legacy of Donald Wills Douglas, one of aviation's true giants. Though not a pilot, Douglas was an aviation star of the first magnitude. His combination of intelligence, integrity, and management skill placed him at the forefront of aeronautics for almost four decades.

Even after the greatest of the airplanes had been made, Douglas kept going, moving all the way into space. Douglas-built aircraft were the first to fly humans around the world, but Douglas spacecraft also helped get men to the moon.

Ironically, and sadly, the characteristics that brought Donald Douglas such immense success also ultimately

produced the downfall of the Douglas empire after decades of triumph.

Douglas achieved aviation immortality in a series of brilliant designs that began in 1921 with his ambitious Cloudster aircraft. Each of his great aviation achievements demonstrated the belief that aviation success depended on evolution rather than revolution.

Acceptance of this precept was the reason that Douglas' enterprise grew from a backroom operation in a Los Angeles barbershop into an international industrial giant.

Donald Douglas was born in Brooklyn, N.Y., in 1892, the second son of William and Dorothy Douglas. Bill Douglas was an assistant cashier in a bank, but he indoctrinated his sons, Harold and Donald, with a great affection for ships and the sea. Both boys were groomed for the Naval Academy at Annapolis, where Donald began his higher education as a midshipman in 1909. Yet he was soon caught up in the excitement of aviation—excitement caused by his witnessing Orville Wright

going aloft in his flying machine at Ft. Myer, Va.

Making His Move

In 1912, at age 20, Douglas demonstrated his decisive personality by quitting the Naval Academy to pursue aviation by furthering his education at the Massachusetts Institute of Technology. His father backed him, as he would often, and Douglas promptly embarked on a backbreaking schedule at MIT. He earned his bachelor of science degree in two years.

In short order, Douglas moved through a series of jobs in what was then a small but highly dedicated aviation industry. He showed the ability to meet any challenge—except the first one.

Douglas was first employed by the Connecticut Aircraft Co. of New Haven, where he was hired to help design and manufacture a dirigible. The DN-1 proved to be a failure, and before its first flight, Douglas left the firm.

Quitting was a providential step, because it caused Douglas to move into



Donald Douglas, shown in 1957 with models of the Douglas M-2 mail airplane (left) and the DC-6B, routinely worked an eight-hour day and traveled as little as possible.

the aircraft industry by joining Glenn L. Martin in California. Martin was the Johnny Appleseed of American aircraft manufacturers. He had an excellent eye for talent, and many Martin protégés went on to head their own companies. Martin was reportedly taken aback by Douglas' youthful appearance when he reported for duty as chief engineer, at the age of 23. Douglas, for his part, was dismayed by Martin's primitive (in his view) and intuitive approach to engineering.

After a one-year stint with Martin, Douglas resigned. He accepted the invitation of Col. Virginius E. Clark to become the chief civilian aeronautical engineer of the US Signal Corps. Douglas did not fit in with the bureaucracy of the time and left in 1917 to rejoin the Glenn L. Martin Co. after its move to Cleveland. There he directed the design and construction of the famous Martin GMB bomber.

The GMB was a great success, the first indigenous American warplane to enter production with a performance

comparable to its European counterparts. However, the GMB's first flight on Aug. 17, 1918, was soon followed by the World War I armistice. Only 10 production articles were built.

Douglas wanted to return to California and yearned to build commercial aircraft in a company of his own.

In 1920, Douglas met the wealthy David R. Davis, who wished to make the first nonstop flight across the continent. Douglas promised Davis that he could design and build the airplane to do it. They formed the Davis-Douglas Co., with \$40,000 in capital.

One year later, they rolled out the Davis-Douglas Cloudster, a large biplane powered by the ubiquitous Liberty engine.

The Cloudster was reputed to be the first aircraft able to carry a useful load in excess of its own weight, and only a routine engine failure halted its June 27, 1921, transcontinental attempt. Later it was converted to become a 10-passenger airliner on the Los Angeles-San Diego Air Line and was thus the

antecedent of the long line of Douglas passenger airplanes.

The Foundation

More importantly, the Cloudster laid the foundation for Douglas' first military contracts. He purchased Davis' interest with a \$2,500 promissory note and renamed the firm the Douglas Co. The company designed the Douglas DT-1 torpedo airplane for the Navy with a contract in April 1921. One hundred fourteen of the big torpedo airplanes were ultimately purchased.

The Army also was interested in the design and in November 1923 issued a contract for five versions that would gain fame as the Douglas World Cruisers. The 1924 World Cruiser flight around the world in 371 flying hours established Douglas as a first-class company.

He next sold two variations of the Cloudster to the Army, which over time bought 26 C-1 cargo airplanes and 246 O-2 observation airplanes. All during this turbulent but highly successful



The Douglas Cloudster, shown in 1921 shortly after roll out, was reputed to be the first aircraft able to carry a useful load. The Cloudster eventually was converted to a 10-passenger airliner.

period, Douglas maintained his family in a small, unpretentious two-bedroom home in Santa Monica, Calif., and kept, as he always would, a modest office at work.

A master of evolutionary design, he met Army Air Corps and Navy needs with a succession of observation airplanes and trainers and expanded his patrol and torpedo airplane offerings with the twin-engine, twin-float P2D-1 and T2D-1.

He continued to bring new talent into his growing organization, obtaining the services of fellow MIT graduate Arthur E. Raymond and James H. Kindelberger in 1925.

Douglas recognized that the biplane formula was obsolete and introduced a new design that catered to his inveterate interest in the sea. It was the twin-engine Dolphin amphibian featuring a wooden wing but an all-metal hull. Some 58 of these were built, including one for his arch rival, William E. Boeing.

The company carried metal construction over into a new line of observation airplanes and the much more radical twin-engine, gull-wing bomber, the Y1-B7. Many of these would serve in the Air Corps mail-carrying exploits in 1934.

It was in all-metal aircraft that Douglas' selective choice in engineers paid the biggest dividends. Douglas had financed the Northrop Co. as a partially owned subsidiary in 1932. There, John Knudsen Northrop developed a new metal construction method that he demonstrated in his famous

Alpha, Gamma, and Delta series of monoplanes. (See "The Low-Drag World of Jack Northrop," October 2005, p. 76.)

Then on Aug. 2, 1932, Trans World Airlines turned to the Douglas Co. for an airliner to rival the new Boeing 247. Douglas used Northrop's multicellular wing construction.

The result was the DC-1, built at the then-enormous expense of \$306,778, an amount that kept thrifty Douglas awake at night. The all-metal, twin-engine monoplane incorporated advanced cowlings and engine nacelles and was clearly the most advanced airline transport in the world.

There followed a succession of

brilliant airliners that dominated the world's market for the rest of the decade. The DC-2 was succeeded quickly by the DST (Douglas Sleeper Transport) and the DC-3.

Success with C-47

The budget-tight military bought small numbers of the DC-2 and DC-3 with scarcely remembered designations, but it was the C-47 that was the magic number.

Douglas built thousands of C-47s, bringing total DC-3/C-47 production to 10,654. As many as three thousand more were built under license in the Soviet Union and Japan, and the aircraft soldiered on to serve America in World War II, Korea, and Vietnam.

The basic design also served as the basis for some stopgap Douglas bombers of the era, including the stodgy B-18 and the more streamlined B-23.

Northrop's contributions to the Douglas line were enhanced by another capable self-taught engineer, Edward H. Heinemann, who became chief engineer at Douglas in 1936. Heinemann brought the basic Northrop Alpha formula to war-winning height in a series of attack airplanes, culminating in the Douglas SBD Dauntless.

Among more than a score of combat aircraft that Heinemann designed for Douglas were the A-20 Havoc, A-26 Invader, and early versions of what became the A-1 Skyraider.

Donald Douglas' engineering acumen was matched by his business prowess as he oversaw the wartime growth of the company from a one-man band to an



In this 1924 photo, Douglas World Cruisers are being prepped for takeoff. The World Cruiser's ability to circumnavigate the globe in 371 flying hours established Douglas as a first-class company.



Students at the airborne school at Ft. Benning, Ga., in 1946 file onto a Douglas C-47 for a practice jump. Douglas built thousands of C-47s, and as many as 3,000 were built under license in the Soviet Union and Japan.

international conglomerate with massive plants in Santa Monica, Long Beach, and El Segundo Calif., Chicago, and Oklahoma City and Tulsa, Okla. From a handful of workers, employment grew to more than 160,000 as the Douglas plants churned out nearly 30,000 airplanes between 1942 and 1945.

All during this rapid growth, Douglas' business habits rarely varied. He routinely worked an eight-hour day, traveled as little as possible, and spent his evenings at home in an almost reclusive fashion.

Douglas was given to pithy comments when something displeased him—and that something was usually an expenditure he considered questionable.

He doted on his four children, and daughter Barbara Jean in 1944 made the most notable military-industrial-complex marriage of all time. She wed William Bruce Arnold, son of the future General of the Air Force, Henry H. "Hap" Arnold.

Douglas knew the end of the war would mean the end of the era of huge military contracts. He also recognized that he would have to shut down his government-leased plants and confine the Douglas Aircraft Co. to its El Segundo, Long Beach, and Santa Monica facilities.

Douglas Aircraft's interest in rockets as weapons led to its direct involvement with space. The company's first effort was the ROC radar-guided missile of 1941. Other ROC variants were built including infrared and visual guidance, but none were employed in combat.

Next in line was the Sparrow air-

to-missile. It entered service with the McDonnell F3H-2M Demon fighter, but was largely unsuccessful. The Sparrow design was later developed into the successful AIM-7 series of air-to-air missiles.

Douglas also developed the Honest John surface-to-surface missile for the Army and the Thor IRBM for the Air Force. Thor became an important part of Great Britain's nuclear deterrent.

The firm also moved into the construction of huge launch vehicles, beginning with the Thor and including the Saturn

S-IV/S-IVB used for NASA's moon missions.

Hanging On

Douglas pursued the development of the basic DC-4 design far too long after the jet engine had arrived on the scene.

Douglas wanted to have his son, Donald Douglas Jr., succeed him at the head of his company. Unfortunately, the son did not possess the management and leadership skills of the father. Further, Douglas Jr. became president of the firm at a time when it faced extraordinary production, management, and financial challenges.

More than 1,200 four-engine DC-4s were built. They served admirably all over the world and starred in the Berlin Airlift. The basic DC-4 design was trumped by the introduction of the pressurized Lockheed Constellation, which quickly gained popular favor. Douglas responded somewhat later with the equally well-liked DC-6, building 770 of them.

A reckless competition ensued, with both companies trying to improve their transports to maintain airline customer loyalty. Lockheed's last effort in this race was the elegant L-1649A Starliner, powered by four Wright R-3350 turbo-compound engines. Douglas offered the DC-7C, which used a variant of the same power plant. (The reliability of the early R-3350 turbo-compound engines



Douglas and his DC-4. The four-engine airplane served admirably all over the world and starred in the 1948 Berlin Airlift.

Boeing photo



An A-4 Skyhawk performs a touch-and-go landing on USS Ronald Reagan. The aircraft's designer, Ed Heinemann, was an engineering wizard, but was forced out by Donald Douglas Jr. in 1960.

was notoriously poor, and both aircraft were jokingly called “the world’s fastest trimotors.”)

During this piston-engine airliner race, Douglas was building a wide variety of military jet aircraft, and Donald Douglas had personally monitored the development of the de Havilland Comet airliner.

His conservative nature, backed by the judgment of his vice president of engineering, Arthur Raymond, caused him to avoid the huge investment necessary to field the first American jet transport. Instead he spent his time considering the possibility of having a turboprop transport follow the DC-7 into service.

Unfortunately for the Douglas Aircraft Co., Boeing had been flying multiengine swept-wing jets since 1947 and had acquired vast experience building the B-47 and B-52 bombers. This experience was parlayed into the Boeing 367-80, the 707 airliner prototype, which made its first flight on July 15, 1954. It was not until almost a year later, on June 7, 1955, that Douglas announced a decision to build the DC-8 to compete with—and he hoped outsell—the 707.

A combination of issues paved the way for the 1967 merger with McDonnell, resulting in the new McDonnell Douglas Corp. and the eclipse of the influence of the Douglas family. The issues were complex, but reflected the effect of Douglas’ longtime conservatism and his determination to develop evolutionary aircraft at a time of great changes in aircraft engineering.

The Successor

Douglas had a hotly contested divorce in 1953, and Donald Douglas Jr.’s support of his father helped repair a falling-out. The younger Douglas had moved up slowly in the company from his first employment in 1939, but in 1953, he was made a board member. Four years later, he succeeded his father as president of the company, at age 40.

Douglas Sr. became chairman of the board. He was only 65—but he was tired.

Despite the best efforts of the firm, the DC-8 did not make its first flight until May 30, 1958—three years and 10 months after Boeing’s 707. A rush to production resulted in design deficiencies, particularly in higher-than-predicted drag.

Eventually, the DC-8 proved to be an excellent aircraft, but for a long, critical period, sales did not meet expectations. By 1962, Boeing had sold 320 of its 707s and 720 variants, to only 178 DC-8s. From this point on, Douglas could not match Boeing’s ability to build airliners tailored to varying route lengths and widely differing customer requirements.

At this crucial time, vice president for engineering Raymond became ill, and Douglas Jr. was not as able as his father in either personnel management or production expertise. Quick tempered,

he had a gift for antagonizing his father’s most trusted collaborators. Perhaps his most egregious personnel mistake was made in 1960, when he forced Ed Heinemann to resign from his position as vice president for military aircraft.

Heinemann had been an engineering gold mine for Douglas for 24 years. His leadership in creating classic first-line aircraft—such as the A4D Skyhawk and the very advanced F4D Skyray—kept Douglas profitable. Nonetheless, Douglas Jr. forced him out by abolishing his position and offering him an unacceptable substitute. Heinemann never forgave his dismissal.

By the mid-1960s, the conservative Douglas firm found itself in financial hot water. It lost more than \$16 million in its attempt to win the contract to build the C-5 transport.

At this time, Douglas had spent more than \$300 million on the DC-8 program, which was still about 75 aircraft short of reaching its break-even point. Ultimately, 556 DC-8s were sold, but not in time to save the company.

By 1966, radical change was coming.

One of the changes was Douglas Sr. resuming control of the company at age 74. Despite his best efforts, the value of Douglas stock continued to erode. In the end, Douglas was forced to announce to his board of directors that the firm was bankrupt.

James S. McDonnell already owned 300,000 shares of Douglas stock—about 30 times the amount that Douglas Sr. and his son owned. McDonnell presented the best offer to buy the Douglas company, and on April 28, 1967, the new McDonnell Douglas Co. was formed. Some niceties were observed as Douglas Sr. was made honorary chairman of the new firm, and Douglas Jr. received a long contract for his services.

The elder Douglas spent his retirement years quietly, with no public expressions of resentment. He died on Feb. 1, 1981, leaving behind a legacy of achievement that few have matched and a reputation for vision and integrity that anyone would envy.

Most of all, he left the world with the memories of those wonderful aircraft. ■

Walter J. Boyne, former director of the National Air and Space Museum in Washington, D.C., is a retired Air Force colonel and author. He has written more than 400 articles about aviation topics and 40 books, the most recent of which is Roaring Thunder. His most recent article for Air Force Magazine, “The Converging Paths of Whittle and von Ohain,” appeared in the January issue.



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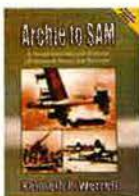
50 Years of the U-2: The Complete Illustrated History of the "Dragon Lady." Chris Pocock. Schiffer Publishing, Ltd., Atglen, PA (610-593-1777). 440 pages. \$69.95.



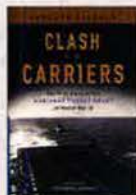
The Cambodian Campaign: The 1970 Offensive and America's Vietnam War. John M. Shaw. University Press of Kansas, Lawrence, KS (785-864-4155). 222 pages. \$34.95.



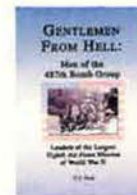
The Flying Circus: Pacific War-1943-As Seen Through a Bombsight. Jim Wright. Lyons Press, Guilford, CT (800-962-0973). 214 pages. \$22.95.



Archie to Sam: A Short Operational History of Ground-Based Air Defense. Kenneth P. Werrell. Air University Press, Maxwell AFB, AL (334-953-6281). 286 pages. \$29.00.



Clash of the Carriers: The True Story of the Marianas Turkey Shoot of World War II. Barrett Tillman. NAL Caliber, New York (800-631-8571). 348 pages. \$24.95.



Gentlemen From Hell: Men of the 475th Bomb Group. C.C. Neal. Turner Publishing Co., Paducah, KY (800-788-3350). 301 pages. \$36.95.

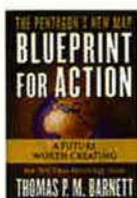
B-24 Liberator. Bill Holder. Squadron/Signal Publications, Carrollton, TX (800-527-7427). 64 pages. \$14.95.



The Dead of Winter: How Battlefield Investigators, WWII Veterans, and Forensic Scientists Solved the Mystery of the Bulge's Lost Soldiers. Bill Warnock. Chamberlain Bros., New York (800-631-8571). 314 pages. \$24.95.



Iran's Developing Military Capabilities. Anthony H. Cordesman. Center for Strategic and International Studies, Washington, DC (202-887-0200). 147 pages. \$22.95.



Blueprint for Action: A Future Worth Creating. Thomas P.M. Barnett. G.P. Putnam's Sons, New York (800-631-8571). 440 pages. \$26.95.



Deny Them the Night Sky: A History of the 548th Night Fighter Squadron. Eric Shulenberg. Order from: Eric Shulenberg, 3912 NE 127th St., Seattle, WA 98125 (206-367-5886). 518 pages. \$80.00.

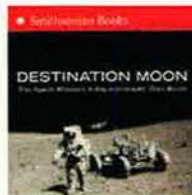


Loach!: The Story of the H-6/Model 500 Helicopter. Wayne Mutza. Schiffer Publishing, Ltd., Atglen, PA (610-593-1777). 144 pages. \$29.95.

Boeing B-29 Superfortress: The Ultimate Look: From Drawing Board to VJ-Day. William Wolf. Schiffer Publishing, Ltd., Atglen, PA (610-593-1777). 360 pages. \$59.95.



Destination Moon: The Apollo Missions in the Astronaut's Own Words. Rod Pye. Collins, New York (212-207-7000). 192 pages. \$24.95.



The Silverplate Bombers: A History and Registry of the Enola Gay and Other B-29s Configured to Carry Atomic Bombs. Richard H. Campbell. McFarland Publishers, Jefferson, NC (800-253-2187). 235 pages. \$45.00.



British Built Aircraft: Vol. 5. Northern England, Scotland, Wales and Northern Ireland. Ron Smith. Trafalgar Square, North Pomfret, VT (800-423-4525). 256 pages. \$45.00.



F-102A Delta Dagger in Action: Aircraft No. 199. Larry Davis. Squadron/Signal Publications, Carrollton, TX (800-527-7427). 50 pages. \$11.95.



USAF F-4 and F-105 MiG Killers of the Vietnam War, 1965-1973. Donald J. McCarthy Jr. Schiffer Publishing, Ltd., Atglen, PA (610-593-1777). 136 pages. \$59.95.

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For information on the Air Force Association, see www.afa.org

By Frances McKenney, Assistant Managing Editor

Welcome for the C-130J

Air Force Association National President Robert E. "Bob" Largent in December attended a ceremony at the Lockheed Martin facility in Marietta, Ga., where the Air Force took formal delivery of two C-130J Super Hercules airlifters.

Ross W. Reynolds, vice president for air mobility programs, and David Haines, C-130J program VP, represented Lockheed Martin. USAF officials on hand were Gen. William R. Looney III, commander of Air Education and Training Command, Randolph AFB, Tex., and Brig. Gen. Kip L. Self, commander of the 314th Airlift Wing, Little Rock AFB, Ark., home base for the new transports.

After the acceptance ceremony in Marietta, Looney and Self each flew a C-130J to Little Rock. Largent hitched a ride on the one piloted by Self, a former instructor pilot for helicopters and C-141s.

In Little Rock, US Rep. Vic Snyder (D-Ark.) headed the list of VIPs attending an arrival ceremony for the transports. Snyder is a five-term Congressman and Marine Corps veteran. He is the ranking member of the House Armed Services Committee's military personnel subcommittee and is on the House Veterans Affairs Committee.

Little Rock's factory-fresh C-130Js were the last two of 15 delivered by Lockheed during 2005. A news release stated that the Little Rock versions—112 feet long—are 15 feet longer than the standard C-130J and have a strengthened cargo ramp and improved airdrop system.

Largent commented that the ceremonies highlighted the partnership between the Air Force and industry, a partnership that AFA is "proud to support."

Know-How and How-To

Someone from another chapter eavesdropped, took notes, and picked up all kinds of useful information at the **Donald W. Steele Sr. Memorial Chapter (Va.)** executive committee meeting in January.

He wasn't a spy. He was Terrence J. Young, president of the nearby **Gen. Charles A. Gabriel Chapter**. He has



Lockheed Martin photo by David Key

Air Force Association National President Bob Largent (front row, far right) joined USAF and Lockheed Martin officials at the delivery ceremony for two C-130Js on Dec. 21 in Marietta, Ga. Front row, l-r, are Gen. William Looney, Ross Reynolds, David Haines, Brig. Gen. Kip Self, and Largent. Behind them is Self's crew.

been attending Steele Chapter executive meetings lately to learn—among other tips—how the chapter carries out one of its most high-profile, successful functions: a Salute.

For about 10 years, the Steele Chapter has hosted receptions and awards ceremonies to spotlight top-notch military and civilian personnel from major Air Force offices in the Washington, D.C., area. These Salutes have become so well-known that the Office of the Undersecretary of the Air Force for Space recently asked the chapter if it would host one for SAF/US.

"At present, we do five Salutes a year," wrote Steele Chapter President George DeFilippi, "and we didn't feel we could take on another one."

Chapter leaders asked the Gabriel group to host this Salute, particularly since the National Reconnaissance Office is located in its area of Northern Virginia.

DeFilippi said his chapter offered to pass on all its know-how about Salutes, and Steele Chapter's VP Tom Veltri, who organizes the receptions, began working with Young and Gabriel Chapter VP Maj. Joseph Price.

Exchanging information is nothing new to these two chapters, DeFilippi said. They have for several years sent liaisons to each other as a way to avoid scheduling conflicts, develop new ideas, and encourage attendance at sister-chapter activities. Rosalyn R. Knapp is their liaison to the Gabriel Chapter. Young has been her counterpart.

The Gabriel Chapter will host its first Salute—to the NRO—late this month.

Return to China

A November newspaper article told the story of an AFA chapter member's return to China, to a site that had been an aerial landmark to him on flights over the "Hump" in the China-Burma-India Theater in World War II.

Peter J. Goutiere's tale in Florida's *St. Petersburg Times* was so interesting to Dennis E. Foley, president of Florida's **John C. Meyer Chapter**, that he invited Goutiere to address the group's holiday gathering in December.

In 1943, civilian pilot Goutiere flew C-47s for China National Aviation Corp., an airline owned by the Chinese gov-

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.

Congressional Staffer Briefings Continue

The Air Force Association and the Air Force Legislative Liaison Office sponsored a lunch briefing on Capitol Hill to highlight the service's logistical contribution to the joint force in Iraq.

As one might expect, much of this effort is focused on traditional airlift missions. Aircrew flying platforms such as the C-130 and C-17 have done an excellent job to ensure that essential supplies make it to the front lines in the CENTCOM region. However, few people also realize that the Air Force has been providing drivers and gunners for Army truck convoys tasked with delivering supplies throughout Iraq. This AFA lunchtime briefing gave staffers a chance to hear from two airmen who have participated in these missions, one in the air and the other on the ground.

Maj. Julie E. **Petrina**, a former AFA national director, is a C-130J pilot with the 135th Airlift Squadron, Maryland Air National Guard. She deployed for Operations Iraqi Freedom and Enduring Freedom from February through April 2005 and will deploy again next month. SSgt. Jeff **Koenig**, a vehicle operator stationed at Bolling AFB, D.C., deployed to Iraq for lengthy tours in 2004 and 2005. He was an assistant convoy commander, truck commander, and gunner.

Lessons From the Past Tied to the Present

AFA organized a tour for Congressional staffers of the National Air and Space Museum's Stephen F. Udvar-Hazy Center in Dulles, Va. The museum's deputy director, retired USAF Lt. Col. Donald S. **Lopez**, guided the visitors through the facility.

The tour's purpose was to focus on some key Air Force aircraft and the lessons learned from them. As a World War II ace and a test pilot, Lopez had the firsthand knowledge to tie current Air Force concerns to some of the 123 aircraft on display at the museum.

The topics and the aircraft associated with them included: the dangers of a procurement holiday, as illustrated by the P-40; the impact of revolutionary technology on warfare, as the B-29 demonstrated; and the danger of an enemy reaching parity with US combat aircraft, as illustrated by the F-86. AFA's Government Relations staff drew these lessons together and tied them to the current Air Force through a discussion about the prototype Joint Strike Fighter.

ernment and Pan American Airways. His route took him from the Assam Valley in India to Kunming, China.

One of the sites he regularly noted from the air during his 680 missions was a white pagoda. It was located atop a 10,000-foot mountain near Dali, China, about 200 miles from Kunming and became a familiar checkpoint to him. On a May 1943 mission, "I leaned across my copilot and snapped a picture of the pagoda," Goutiere said.

Six decades years later, the Chinese government invited him and other Hump veterans to China for the September 2005 observance of a World War II anniversary. Goutiere decided he would visit his old landmark at the same time, so he packed his 1943 aerial photo of the pagoda and made his way to the foot of Ji-Ju-Shan mountain.

Because Goutiere was at the time only a few days shy of 91 years old, his driver and his translator hired porters to

carry him in a sedan chair for the first part of the climb. Goutiere said later that their route went "straight up, with nothing but steps." He caught a cable car for the next stretch, then climbed several flights of stairs to reach the pagoda. Goutiere said he lit candles and prayed for pilot colleagues who had died in Hump operations. He then presented his 62-year-old framed photo of the pagoda to a monk.

At the December AFA chapter gathering, Goutiere's description of his journey and his accompanying photographs "captivated" everyone, chapter president Foley reported. The chapter honored Goutiere with its first annual Veteran of the Year award.

64 Roses

On Dec. 7, an audience of more than 600—including AFA National President Bob Largent—gathered at Republic Airport in Farmingdale, N.Y., and watched a Navy color guard present 64 roses to a chaplain. The chaplain blessed the bouquets, and World War II warbirds then flew the American Beauties from the Long Island airport to New York Harbor. At 12:55 p.m., the roses were dropped into the waters surrounding the Statue of Liberty.

With this ceremony, the **Long Island Chapter** observed its annual "Dropping of the Roses," a remembrance of those who lost their lives when the Japanese attacked Pearl Harbor on Dec. 7, 1941. The 64 red roses represented the years that have passed since then, and the time marked the exact moment, on the East Coast, when it happened.

In his remarks to the audience at the airport, Largent drew parallels between the bombing of Pearl Harbor



AFA Board Chairman Pat Condon presents MSgt. Kenneth Jackson with AFA's CMSAF James M. McCoy Academic Achievement Award at the Senior NCO Academy graduation in December.

USAF photo by Paul Troy



Northern Shenandoah Valley Chapter President Arthur Andraitis (front row, far right) presents the check for a scholarship fund to Maj. Gen. Henry Hobgood, USAF (Ret.), Randolph-Macon Academy president. See "Cadet Scholarship."

and the 9/11 terrorist attacks. Guests at the ceremony included members of New York's **Iron Gate** and **Gen. Daniel "Chappie" James Jr. Memorial Chapter**. New York State President Fred Di Fabio and Long Island Chapter President Alphonse Parise organized the event. William G. Stratemeier Jr., state leadership development VP, was master of ceremonies.

Joseph S. Hydrusko, a resident of a town near Farmingdale, first held this unique Pearl Harbor observance in 1970. He had been serving on a hospital ship in the harbor when the Japanese attacked and, by some accounts, saved hundreds of sailors. Hydrusko passed on the Dropping of the Roses tradition to Long Island AFAers before he died in 1983.

Front Page

For five years until he joined the Air Force in 1953, Stephen Thompson delivered the *Times West Virginian* daily newspaper in Fairmont, W.Va.

On Dec. 19, 2005, as Thompson put it with a chuckle, "I finally made the front page."

Now president of the **Brig. Gen. Pete Everest Chapter** in Fairmont, Thompson was pictured on Page One that day, presenting \$500 to Air Force JROTC cadet Robin Jurasko at the chapter's holiday party.

The funds were to help Jurasko, a sophomore at East Fairmont High School, attend a national youth leader-

ship conference in Washington, D.C., in January. Jurasko came to the chapter's attention because of retired Maj. Mi-

chael Morrison, the senior aerospace science instructor at East Fairmont and a chapter member. At a Veterans Day memorial dedication last November, Morrison introduced Thompson to the cadet and suggested that the chapter help her in raising funds to attend the conference.

In publicizing the donation, the newspaper article noted that Jurasko, 16, comes from an Air Force family and plans to apply to the Air Force Academy.

Cadet Scholarship

In December, the **Northern Shenandoah Valley Chapter (Va.)** established a scholarship at the oldest US coed boarding school offering AFJROTC.

The Lt. Col. George C. Madden AFA Scholarship Fund—named for a chapter member who died in 2004—will help cover a year's tuition for a cadet at Randolph-Macon Academy in Front Royal, Va.

At the prep school's last chapel service for 2005, the president of Randolph-Macon Academy, retired USAF Maj. Gen. Henry M. Hobgood, and cadet Chauncy Rockwell accepted a \$10,000 grant from the chapter to begin generating scholarship awards

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for fall 2006. At the ceremony were AFA National Director Thomas G. Shepherd; Arthur Andraitis, chapter president; Norman M. Haller, VP; Philip A. Covell, secretary; Kevin J. Brooks, treasurer; and chapter members N.G. Brander, Arthur Olson II, and Raleigh H. Watson Jr.

Shepherd said the chapter had been working for more than eight years to raise the \$10,000 and has begun a fund-raising effort to double the amount.

More AFA/AEF News

■ The **Alamo Chapter** recently adopted 75 young people. Seventy-five cadets, that is, in AFROTC Det. 840 at Texas State University in San Marcos. Kaye H. Biggar, chapter secretary, explained that the Texas state AFA asked the chapter to "adopt" the detachment. The new "parents," of course, immediately faced college tuition bills. Biggar announced that the chapter's educational foundation will award \$250 to one cadet from each of the unit's three cadet classes. Detachment commander Col. Daryl W. Hausmann, who is also a chapter member, thanked the chapter for its support and noted that his unit ranks No. 6 in the nation in producing new second lieutenants, "averaging 33 a year for the last five years."

■ The **Chuck Yeager Chapter** in Charleston, W. Va., sponsored its 10th annual AFA Drill Competition in November in Nitro. The AFJROTC cadets from the hometown Nitro High School earned the first-place trophy. Second-place winners were from Cabell Midland High School in Ona. Third place went to Woodrow Wilson High School cadets from Beckley. Fourth-place cadets represented South Charleston High School.

■ The 100th anniversary of the Wright brothers' historic flight took place two years ago, but the **Mel Harmon Chapter** in Colorado has extended the celebration. Under the leadership of Jason Unwin, chapter aerospace education VP, and Teresa Tafoya, state secretary, the chapter

sponsored Centennial of Flight + 2 on Dec. 10. The all-day event attracted more than 250 visitors to the Pueblo Weisbrod Aircraft Museum in Pueblo. The visitors "flew" an aircraft, using computer flight-simulation software, sat in the cockpit of an F-104, built model rockets, played games with aircraft themes, and looked over displays of model and radio-controlled airplanes. The chapter sponsored a 30 percent discount on museum admission for Centennial of Flight +2.

■ The **Pasadena Area Chapter (Calif.)** called Bill Hackett back to their speaker's podium in January. A field representative for state assembly member Carol Liu (D), Hackett first spoke to the chapter last June. This time, he provided an update on his

boss's legislative efforts on behalf of the military.

Edmund Gagliardi, 1924-2006

Retired SMSgt. Edmund J. Gagliardi, a former Pennsylvania state president, died Jan. 28. He was 81 and had lived in Shiremanstown, Pa.

Born in Ambridge, Pa., he enlisted in the Navy in 1943, participated in the Normandy invasion, and in 1951 joined the Air Force Reserve. His military assignments ranged from life support superintendent to air police, medic, and food service. In his civilian career, he was an elected state constable.

He joined AFA in 1951 and held many leadership positions in the Eagle Chapter. He was most recently state president, 2003-05. ■

Reunions

reunions@afa.org

3rd BG (WWII), June 7-11 in Concord Township, OH. **Contact:** Connie Luhta (440-352-3228) (azteclady@aol.com).

4th Emergency Rescue Sq Assn. Oct. 4-8 in Chicago. **Contact:** Chet Gunn, 237 Franklin St., Reading, MA 01867-1030 (781-944-6616) (tightboot@msn.com).

21st FBW, Chambley AB, France (1954-58). June 8-12 in Branson, MO. **Contact:** Bob Sisk, Box 193, Emory, TX 75440 (903-473-2272) (sisk.judge.ret@verizon.net).

29th Troop Carrier Sq, Europe (WWII). April 19-23 in Cocoa Beach, FL. **Contact:** John Baldwin, 4820 Durango Pl., Melbourne, FL 32904 (321-768-8612) (klaatu113@earthlink.net).

84th ATS/MAS Sq. May 19-20 at the Hampton Inn in Vacaville, CA. **Contact:** John Burnett, 579 Leisure Town Rd., Vacaville, CA 95687 (jnburnet@cwnet.com).

96th ARS, Altus AFB, OK (1953-65). May 23-25 at the Quartz Mountain Resort in Altus, OK. **Contact:** Forrest Cox, 401 Buena Vista, Altus, OK 73521 (580-482-1795) (fcox@sbcglobal.net).

351st BG Assn, Polebrook, UK (WWII). June 15-18 in St. Louis. **Contact:** Clint Hammond, PO Box 281, Mechanicsburg, PA 17055 (717-766-1489) (bombgroup351st@aol.com).

485th Tactical Missile Wg. June 1-5 at the Doubletree Hotel Crystal City in Arlington, VA. **Contact:** Chris Ayres, 6 Northedge Ct., Stafford, VA 22554 (540-288-1835) (christopher.ayres@js.pentagon.mil).

611th and 621st AC&W Sqs. June 7-11 in Indianapolis. **Contacts:** Donald and Glenda Lavy (941-505-2692) (glavy541@msn.com).

667th, 932nd, 933rd, and 934th AC&W Sqs. Iceland. May 18-21 in Nashville, TN. **Contact:** William Chick (803-932-9596) (litttechick@msn.com).

6954th and 6988th Electronic Security Sqs. RAF Mildenhall, UK (1980s). June 23 at Jude's Ferry in West Row, Suffolk, UK. **Contact:** Erik Nilsen (enilsen_2002@yahoo.com).

Air Force Security Police Assn. Sept. 15-17 in Alexandria, VA. **Contact:** AFSPA, 818 Willow Creek Cir., San Marcos, TX 78666 (888-250-9876) (jbullock@grandecom.net).

Class 66-H, including instructors, Vance AFB, OK. May 18-21 in Las Vegas. **Contact:** Skip Foster, 8500 Carmel Ridge Ct., Las Vegas, NV 89113 (702-257-7455) (flyerskip@cs.com).

Hof Germany Reunion Assn. Sept. 17-23 in Hof/Saale, Germany. **Contacts:** Jerry Mangas (hofreunion@dejazzd.com) or Chuck Wilson (916-366-1811) (hofreunion@aol.com).

Jolly Green Assn. May 5-6 at the Ramada Beach Resort in Fort Walton Beach, FL. **Contact:** Lee Massey (850-863-3131) (leetmassey@earthlink.net).

P-40 Warhawk Pilots Assn. May 17-20 in Branson, MO. **Contact:** Bud Jones, 407 Meier Dr., Jefferson City, MO 65109 (budsp40@aol.com).

Pilot Space Class 56-Q and Nav 09. June 24-28 in San Antonio. **Contact:** Ned Derhammer, 11713 Covington St., West Lafayette, IN 47906 (765-463-4988) (ned3nola@gte.net).

Pilot Training Class 49-C. Sept. 11-15 at the El Dorado Hotel in Reno, NV. **Contact:** Dick Escola (209-358-6707) (rdaescola@earthlink.net).

Pilot Training Class 56-M. April 26-30 in San Antonio. **Contact:** John Mitchell, 11713 Decade Ct., Reston, VA 20191 (703-264-9609) (mitchellj@yahoo.com).

Strategic Air Command. May 24-27 in Tucson, AZ. **Contact:** Steve dePyssler, RAO PO Box 134, Barksdale AFB, LA 71110 (318-456-5976 or 866-544-2412) (rao@barksdale.af.mil).

WWII bombardiers, all units. May 3-7 at the Radisson Hotel in Branson, MO. **Contact:** Bob Thompson, 280 Sharon Dr., Pittsburgh, PA 15221 (412-351-0483). ■

Have AFA/AEF News?

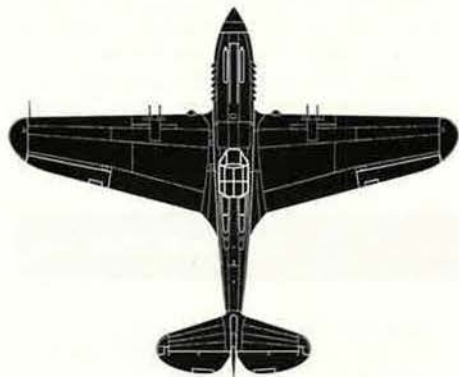
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Mail unit reunion notices four months ahead of the event to "Unit Reunions," *Air Force Magazine*, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information. We reserve the right to condense notices.

Airpower Classics

Artwork by Zaur Eylanbekov

P-40 Warhawk



The P-40 Warhawk, last of Curtiss' famous "Hawk" line, was the workhorse of US Army Air Forces tactical aviation early in World War II. The fighter was rugged and versatile. More importantly, it was available. It saw action on Dec. 7, 1941, at Pearl Harbor and bore the brunt of air combat in several theaters until the US could bring on more-advanced fighters.

Starting in 1940, Curtiss produced 13,738 of these single-engine, single-seat aircraft. The final copy of the last major variant—the P-40N—left the plant on Nov. 30, 1944. Thousands went to allies. The US Army called its P-40s Warhawks; the RAF used the names Tomahawk and Kittyhawk for its variants.

While designed for low-level ground support, the P-40 was effective in air-to-air combat when used properly. Its most famous air

battles were fought by Maj. Gen. Claire L. Chennault's "Flying Tigers," the American Volunteer Group in China whose shark-mouth Tomahawks (acquired from an RAF order) tangled with Japanese fighters in late 1941 and 1942. In a six-month period, the Tigers' P-40s destroyed 286 Japanese airplanes and lost 22 pilots in combat. For the most part, the P-40's favorable reputation stems from those encounters.

The Warhawk did not have the speed, maneuverability, or climb rate of its adversaries, but it was fast in a dive and could take tremendous punishment. Many pilots owed their lives to its rugged frame. Eventually, more-capable fighters took over the air-combat role and the P-40 shifted mainly to ground-attack missions. However, the Warhawk will always be remembered for holding the fort in the air early in World War II, at a time of desperate US need.

This aircraft: P-40C #P-8127 (originally an RAF Tomahawk IIB Model 81-A3)—Number 47—as it looked in mid-1942 when flown by Robert T. Smith of Flying Tigers' 3rd Squadron. Squadron insignia, Smith's kill tally, and Disney Flying Tiger decal were added at that time.



In Brief

Designed, built by Curtiss-Wright ★ first flight 1938 ★ crew of 1 ★ number built 13,738 ★ later models could carry up to three bombs.
Specific to P-40C: max speed 350 mph ★ cruise speed 280 mph ★ max range 904 miles ★ armament, 6 machine guns (four .30 cal and two .50 cal) ★ weight (loaded) 7,600 lb. ★ span 37 ft 4 in ★ length 31 ft 9 in ★ height 10 ft 4 in ★ one Allison V-12 engine.

Famous Fliers

Members of "Flying Tigers" and 23rd Fighter Group in China, including John R. Alison, Charles Bond, Bruce K. Holloway, David L. "Tex" Hill, Gregory Boyington; Tuskegee Airmen of 99th Fighter Squadron; Boyd Wagner, first USAAF ace of World War II; Donald S. Lopez, deputy director of the National Air & Space Museum.

Interesting Facts

April 1939 order for 524 P-40s was Air Corps' largest to date for a fighter ★ P-40s and P-36s first US fighters to engage Japanese forces (Pearl Harbor) ★ Built in eight major US variants ★ Featured in the famous film "God Is My Co-Pilot" (1945) ★ Served in 28 national air forces ★ First US fighter capable of speeds exceeding 300 mph.



Pictured l-r: Maj. John Alison, Maj. "Tex" Hill, Capt. Albert "Ajax" Baumler, and Lieutenant Mack Mitchell, who served with USAAF's 23rd Fighter Group in China.

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