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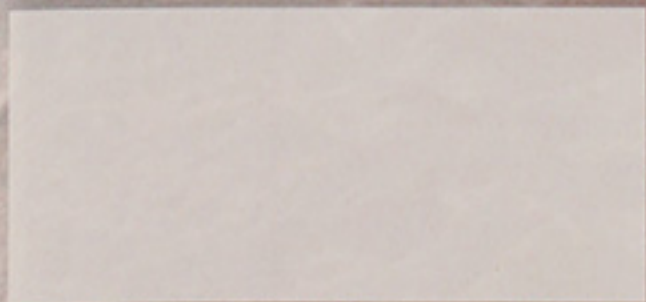
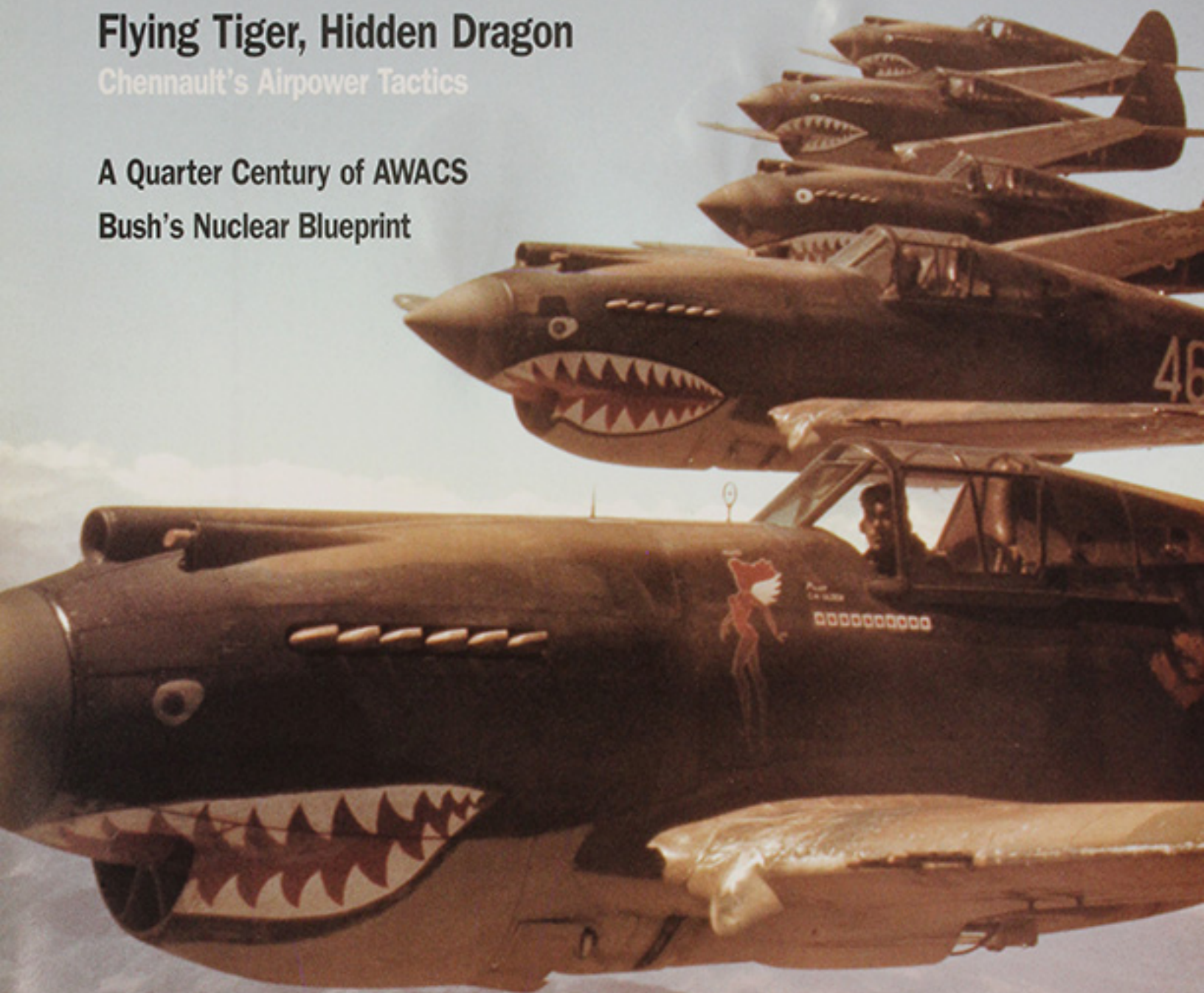
MAGAZINE

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A Quarter Century of AWACS

Bush's Nuclear Blueprint



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March 2002, Vol. 85, No. 3

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- 4 Letters
- 12 Aerospace World
- 22 Senior Staff Changes
- 23 Index to Advertisers
- 24 Verbatim
- 69 Flashback
- 78 This Is AFA
- 80 State Contacts
- 81 Books
- 82 AFA/AEF National Report
- 86 Unit Reunions
- 88 Pieces of History



About the cover: The distinctive shark teeth mark these P-40s as Flying Tigers. See "Flying Tiger, Hidden Dragon," p. 70. Photo by R.T. Smith, via Robert F. Dorr.

2 Editorial: The Nation at War
By John T. Correll
Either we get them or they get us.

26 Bush's Nuclear Blueprint
By Robert S. Dudley and Peter Grier
The Administration projects an overhaul of strategic nuclear forces, perhaps with fewer than 2,200 warheads.

32 Texans Built for Two
Photography by Greg L. Davis
At Moody AFB, Ga., the next generation of pilots flies with a next generation trainer.

38 Roche Sorts It Out
Remarks by Secretary of the Air Force James G. Roche
The Secretary surveys the issues, from Combat Air Patrols to tanker leasing.

42 A Quarter Century of AWACS
By Peter Grier
It eluded the critics who wanted to kill it and it went on to greatness.

48 The Little Predator That Could
By Richard J. Newman
It is not officially operational, but it proved itself in Afghanistan.



42



48

54 Airpower for the Long Haul
By John A. Tirpak
What if it becomes necessary to sustain a military operation for an extended period—like years?

58 The Wild Blue Yonder Is Shrinking
By Bruce D. Callander
The civilian world is pushing in on ranges, runways, and electronic frequencies.

62 DOD Senior Leadership
Compiled by Chequita Wood
Who's who in the Bush Administration's Pentagon.

66 Cannibalization
From the General Accounting Office
All too often, the armed forces must borrow parts from one airplane to fix another one.

70 Flying Tiger, Hidden Dragon
By Rebecca Grant
Irascible, opinionated, and under-appreciated, Chennault was the champion of innovative fighter tactics.

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By John T. Correll, Editor in Chief

The Nation at War

Terrorism Fades as Nation's Most Important Problem," said the headline on an analysis by the Gallup News Service in January.

In a Gallup poll last October, 64 percent of the public said terrorism and national security were the most important problems facing the nation. The number saying that in the January poll was down to 35 percent.

Gallup explained that this does not necessarily mean that Americans no longer regard terrorism as important, just that other matters, such as the economy, weigh more directly on their minds.

If the war on terror slips too far in the national awareness, that becomes a problem in itself.

We are engaged with an implacable enemy who seeks our destruction. Our passive response to attacks before Sept. 11 emboldened our adversaries and rallied converts to their cause.

The diagrams of American nuclear power plants and public water facilities, left behind in Afghanistan by al Qaeda, give us a preview of what else they have in mind. We do not know how close they are to having nuclear weapons.

In his State of the Union address, President Bush said that the war on terror is only beginning and that his budget for next year would propose the largest increase in defense spending in two decades.

A *Los Angeles Times* poll in February found that 76 percent of Americans support an increase in military spending. More than half are for such an increase, even if it means cutting domestic programs.

Perhaps national awareness has not slid that far after all.

The budget President Bush sent to Congress Feb. 4 asks for \$369 billion for defense next year, plus another \$10 billion, if needed, to fight the war on terrorism. That is an increase of 12 percent. Adjusted for inflation, it would put the defense budget about where it was in 1990.

Not everyone agrees we can afford that much, or that we need to.

"I'm becoming a little nervous as I hear we're going to spend more and more and more on the military," said Sen. Robert C. Byrd (D-W.Va.). "It's going to have to come out of somewhere, out of somebody else's hide."

The *New York Times* calls the budget proposal "bloated" and says it siphons too much money away from

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domestic programs and "undermines the security of the nation's social safety net." We can thank our lucky stars, then, that we are not faced with a real wartime budget. During World War II, defense outlays were 38 percent of the Gross Domestic Product and almost 90 percent of federal spending.

The Bush budget allocates 3.3 percent of GDP for defense, the same as in 1997. Even by peacetime standards, that is a moderate burden.

The amount proposed, it is said, is bigger than the economy of some of the world's nations and more than the combined military spending of a dozen of them.

Okay. But so what?

Those countries do not have the capability to take on global terror. Only the United States can do that. When NATO wanted to put down Slobodan Milosevic and the Serbs in 1999, the United States had to take the lead, although any number of Alliance members were closer to the scene.

If US forces were scaled back to the world average, you can bet there would be panic in many a foreign clime.

Another recurring theme is that our existing forces are good enough. The *New York Times*, for example, says that our F-14s, F-15s, and F-16s "al-

ready dominate the skies." Thus, in the opinion of the editorial writers, new investment should go to unmanned aircraft and special forces rather than "outmoded" systems like the F-22.

It is true that existing US weapons were effective in Afghanistan. The unmanned Predator drone performed well, for example, as did many of the weapon systems that have been around for awhile.

The enemy's lack of advanced air defenses made it possible for older aircraft to operate freely. Stealthy, radar-evading platforms were not required after the initial strikes. However, it must be regarded as exceptional that 50-year-old bombers and 30-year-old fighters got in that close. Anyone who believes they will "dominate the skies" of the future is severely deceived.

War is expensive. This one is costing \$30 million a day. At the same time, the Pentagon is struggling to recover from a decade of underfunding, when we failed to replace aircraft and other capital equipment as it wore out.

Decision-makers of the 1990s thought they could divert defense resources to other priorities because they saw no threat to national security for another decade or two. The threat showed up sooner than expected.

Over the past 50 years, the nation has agonized about its involvement in various conflicts, from Vietnam to Kosovo. This war is different. We have no choice but to fight.

The United States has been singled out as a target by terrorist fanatics committed to bringing us down. The latest intelligence says they are preparing to strike again. Either we get them or they get us.

So far, many Americans have been inconvenienced, but few of us have been called upon for sacrifice. That is likely to change.

Fifty years ago, Americans were equal to the commitment required of them in wartime. Now history is about to take its measure of our own generation. ■



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Task Force Hawk

After reading [Benjamin S.] Lambeth's article [*"Task Force Hawk," February, p. 78*], I see similarity to another incident involving US Army helicopters. The shutdown of UH-60 Black Hawks in 1994 was the result of Air Force blunders, but some articles at the time also noted that US Army Europe refused to allow helicopters flying in northern Iraq to coordinate their operations with the Air Force-run Combined Air Operations Center.

That unwillingness to work jointly with USAF clearly contributed to the incident: Closer coordination would have meant better situational awareness aboard the AWACS and more opportunity to "clue in" the F-15 pilots. But since the lion's share of the blame went to blue-suiters, the institutional Army didn't feel any heat and failed to learn.

In both the shutdown incident and Task Force Hawk's embarrassing impotence, the Army refused to coordinate its aviation operations with USAF. In both cases, the Army suffered. It's about time for the Army as a whole to learn that "jointness" is not just when other services line up to support it but when all services work together toward a common goal. When the Air Force supports the ground battle, we coordinate extensively with the Army and the Army is in charge. When Army aviation conducts operations deep into enemy territory and far from friendly ground forces, it's supporting the air battle. It needs to coordinate its operations with the Air Force, and the Air Force must be in charge.

If you prefer, substitute "Joint Force Air Component Commander" (potentially USN or USMC) for "Air Force." The logic doesn't change.

Maj. Kenneth J. Pascoe
Wright-Patterson AFB, Ohio

The Return of NORAD

In your article "The Return of NORAD" [*February, p. 50*], I was rather surprised that you would report "NORAD simply can't connect all the radars and create an all-inclusive radar monitoring facility. The technology simply does not exist to do this."

The technology to do that existed in the 1960s when SAGE [Semiautomatic Ground Environment system] (and later BUIIC [Back-up Interceptor Control system]) were built and still exists today.

We as a nation may not have the will, or we may not be willing, to allocate the funds necessary to build such a system, but we cannot blame the absence of such a defensive system on the lack of technology. We had such a system operating, and operating well, and we killed it.

Leslie R. Pawson
Shrewsbury, Mass.

Adam J. Hebert's article did a fine job giving the reader a sense of the heroic changes that occurred within NORAD, the CONUS NORAD Region (CONR), and the air defense sectors in response to the attack on our nation. However, it is my opinion that the article was incomplete. The events of Sept. 11, 2001, imposed a national tragedy upon all of America. The air defense response was a national response, not merely a military response.

For example, FAA immediately reversed its long-standing position of dismantling interior radars in lieu of new cooperative technologies. FAA implemented technological solutions to bring about more radar and radio service to the Air Force without staffing a memorandum of agreement or any other formal bureaucratic paperwork.

The US Customs Service has a very mature relationship with NORAD,

based upon decades of jointly interdicting Air Targets of Interest crossing the national borders. The two organizations [have long exchanged] ATOI identification information and radar data as well as the use of Customs interceptors to interdict air targets. Customs assets [have been used to complement] NORAD elements when NORAD [was reduced] to seven alert sites. Customs Airborne Early Warning aircraft immediately went into service in support of NORAD on Sept. 11 and have been providing more than 25 percent of the nation's AEW coverage. Customs and CONR [provided] air security for the 2002 Winter Olympic Games. This partnership is a good example of the interagency response required to meet the current extraordinary needs of national security.

I would also like to debate Lt. Gen. [Ken R.] Pennie's assertion that technology simply does not exist to create an "all-inclusive radar monitoring facility." US Customs has aircraft and vessels operating throughout the Western hemisphere as part of the "Defense in Depth" strategy of protecting the nation's borders from smuggling. Three interagency task forces established by the National Interdiction Command-and-Control Plan support this effort.

Customs funds and leads one of these task forces from our Air and Marine Interdiction Coordination Center. AMICC currently receives radar data and ATOI information from the Remote Over the Horizon Radar System, the Cooperating Nations Information Exchange System, the Tethered Aerostat Radar System, all Joint Surveillance System radars (NORAD), Anti-Drug Network, three of the 20 FAA Air Route Traffic Control Centers' radar feeds, and numerous approach control radars. Through the partnership with NORAD, we are in the final stages of approval for integration of selected Canadian radar feeds and continue our negotiations for Mexican radar data.

Our engineers are working to expand the AMICC software to include data links and all of FAA's ARTCC

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radar feeds. We project this effort to be complete by summer 2002. We estimate that the system will then be capable of integrating 900 radar sensors into a single air picture. This fused air picture is superimposed upon maps so detailed that Customs operators many times use the highway mileage marker posts to coordinate air and ground interdiction operations.

Currently, the AMICC is integral to the overall process of sorting air targets over the domestic airspace. AMICC has representatives from many organizations, to include the Air Force, working together to provide as complete an air picture as is possible. Considering all the nation's assets, I would submit that we do have the tools to "create an all-inclusive radar monitoring facility." In fact, I would suggest we are closer than many think.

Homeland air defense is a tremendous challenge that will require resources from many of our nation's institutions. The Joint Theater Air and Missile Defense Organization recognized this fact and has been leading an interagency process, to include

NORAD and CONR, to determine what the nation's air defense architecture should be.

Tony Crowder,
US Customs Service
Washington, D.C.

The Disconnect

Seldom does one issue of *Air Force Magazine*, or any publication for that matter, illuminate the huge disconnect between our acquisition plans and the geopolitical strategy the Air Force is supposed to support.

Your January issue does just that. First, we have an article [*"A Strike Fighter for the Future," p. 24*] about a new "cheap, lightweight fighter" that is to form the backbone of our attack capability. Later, we have an article [*"The Search for Asian Bases, p. 50*] about a search for forward bases that are crucial because we do not have a strike force with the range to operate against likely targets. To get such bases, we have to make deals with unlikely, unstable, and unreliable partners. Finally, we have an article [*"Tankers and Lifters for a Distant War," p. 56*] that discusses a shortage of airlifters to

supply such bases and a shortage of tankers to refuel our short-legged attack force.

Since the end of the Cold War, we have truncated our bomber force modernization at 20 airplanes. The deep strike tactical aircraft, the F-111s, have been retired without replacement, as have the Navy A-6s. Our strike force will now consist of a fleet of short-legged, single-seat, single-engine fighters. In order to use such a force, we will have to make deals with the devil, thereby subverting our own strategic objectives.

I believe that aircraft range and its close derivative, staying power, are the fundamental characteristics that the Air Force brings to the table in joint operations and that amply and correctly justify our operating as a separate service. To our discredit, in the decade since the end of the Cold War, we have seriously compromised on these fundamentals. As a consequence, our national political leaders will have nothing but bad options in the coming global conflicts.

Maj. Robert D. Klimek,
USAF (Ret.)
Fort Smith, Ark.

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JSF will be the premier air to ground fighter for the foreseeable future. The F-22 will take care of air to air. The JSF will be stealthy and carry long-range smart ordnance. What is in doubt is why the Air Force needs so many—1,763—and the Marines 609, in addition to 480 for the Navy. Since this is primarily an air to ground fighter, the implication is that we will be fighting a major ground war. Against whom? Where? It would take decades for a viable threat to evolve.

Even if we had such a force, we would have no place to base significant numbers close enough to the battlefield. I'm not talking about an aluminum plank runway somewhere. I mean a base with petroleum, oil, and lubricants storage, logistics, and personnel facilities capable of supporting two wings (150 JSFs) as well as support aircraft. (Aviano [AB, Italy], for example, is 2,000 [miles] from Baghdad [Iraq].) Saudi Arabia and others are reluctant to allow us to fly combat missions out of their bases. In addition, we have overflight restraints that lengthen the distances even more.

Why not upgrade some F-15Es or F-16s or buy some new ones, since those production lines are still hot? [Why not] upgrade our F-117s?

I don't advocate canceling the [JSF] program. Rather, I suggest that far fewer aircraft would be more than adequate, and only a small fraction of those should incorporate very expensive stealth. A significant portion of the projected \$200 billion could be better used for other crucial defense needs.

Col. Morton T. Eldridge,
USAF (Ret.)
Madison, Ala.

They're a Gold Mine

[Timothy D.] Moore cites a prominent executive recruiter who refuses to accept Air Force officers with an operational background because they lack leadership or managerial experience. [See "Letters: Developing Aerospace Leaders?" February, p. 6.] While I understand this thought, I believe it to be a misperception due to a lack of understanding of what pilots accomplish during their careers. Moore characterizes "official" leadership roles as those requiring oversight, counseling, or writing performance reports.

A fighter pilot's development up to the first 10 to 12 years, during which Moore states they're "only expected to look out for No. 1," includes training for and upgrading to "official" positions such as flight lead, instructor pilot, and mission commander. No-

tice the words "lead" and "command."

A young flight lead has to accomplish the toughest of interpersonal leadership challenges. He or she is not just responsible for leading subordinates, they also have to lead their peers and superiors. This type of leadership at least equals and arguably surpasses [that of] their counterparts [who lead] enlisted troops they absolutely outrank.

The flight lead not only leads the individuals of his flight, he does it while simultaneously operating a multimillion dollar weapon system solo. He is responsible for all aspects of mission accomplishment, including planning, coordinating, briefing, leading, execution, and debriefing. The leading of the mission includes making real-time adjustments for unknowns such as weather changes, equipment failures, aircraft dropouts, flight member mistakes, and a myriad of others. The debriefings are painfully honest, detailed assessments of performance with life and death consequences. A flight debrief would easily measure up to any counseling session or performance report.

Later, as a mission commander, the complexity is dramatically increased by not only accomplishing all the above aspects of leadership, but doing it while coalescing many disparate weapon systems as a team. A mission commander may typically lead 60 aircraft of eight types involving 80 to 100 people in the air and on the ground against an integrated air and ground threat system intending to shoot down every one of his charges. A person who is only looking out for No. 1, or not exercising service before self, would never obtain the rating of flight lead or mission commander.

I would think that a prominent executive recruiter looks for qualities of leadership [that show a person] can operate in a challenging environment, including many unknowns, and lead many people to mission success. Many of our Air Force pilots who have progressed through their flying careers can do just that in spades. They have risen to many senior Air Force and industry leadership positions. If that recruiter did a little research on those Air Force officers, he'd find a gold mine of skilled and experienced leaders who can take on just about any challenge and win.

Col. Larry New
Langley AFB, Va.

Blood and Thunder

I read with great interest John Correll's editorial "Blood and Thun-



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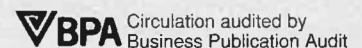
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der" [January, p. 2]. I am appalled by [Max] Boot's illogical comment concerning our image as fat and indolent. Perhaps I am doing him a disservice since I have not read his entire comment concerning fighting against al Qaeda and the Taliban. However, I doubt that I have misunderstood his attitude.

In Vietnam, thanks to then-Secretary of Defense [Robert S.] McNamara, and to a lesser extent then-President Lyndon Johnson, our military fought a foolish and unsuccessful jungle-guerrilla war against North Vietnam. For all of his reputed acuity, McNamara's policies were deeply flawed and idiotic. We should not have fought the enemy's type of war on their turf with their relatively logistical advantage. We should have used superior firepower delivered by air to their weakest points. This approach may not have satisfied Boot, but the results would have been far superior to the outcome we experienced, which was defeat.

We greatly increased aerial attacks on North Vietnam too late, when the momentum was clearly in favor of the enemy. Perhaps our civilian leaders were concerned that China might enter the war. They bluffed us into inaction, and we decidedly lost the struggle. As for our fat and indolent youth, I have two fine sons in Afghanistan, both of whom are extremely fit and patriotic young Americans. I believe their colleagues in that theater are similar in physical ability and motivation.

I greatly resent Boot's comments and invite him to leave the plush surroundings of his New York office with his excellent lunches and martinis and don the uniform of a United States military man and go fight the Afghans on their terms. I weary of deskbound and overweight critics who have not the slightest concept of actual combat. Perhaps the recent deaths of Marines and special forces military men might partially satisfy his yearning for more casualties.

Correll's response was reasoned and compelling, if a bit too civilized.

Osama bin Laden and the Taliban have brought their people unprecedented misery, oppression, death, disease, and starvation. If the Afghan men would get rid of their status symbols, the Kalashnikov rifles, and start working to produce food and needed shelter and goods, the country—including their women and children—would be far better off.

As for Max Boot, he should restrict his journalism to financial news.

Lt. Col. Frank R. Rodriguez,
USAF (Ret.)
Colorado Springs, Colo.

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Thank you for offering a sound approach to the value of airpower in the war with Afghanistan. This is not a territorial war. It is unconventional to say the least, and the largest part of this war will not be fought with airpower, for sure, as seeking and destroying terrorists may ultimately boil down to virtual single-person identification and elimination.

Truly the mind-set of war has always been the overpowering of an enemy and the securing of land. Airpower is the fastest, most predictable method to gaining an immediate advantage over an enemy, which leads to the securing of land.

Confusion in war is essential to victory—you must keep the enemy off balance and fearful of the power that can be released at any moment, the timing of which is unpredictable. You never fight an enemy on his terms. This is war, not a video game. When bombs explode they rattle everything for miles. You want the ground to shake, windows to break, buildings to fall.

From the comments of Max Boot, it is clear that he has never been in war. He has never witnessed the fury of a B-52 strike. He has never seen literally hundreds of tracers whiz by the cockpit in the space of just a few seconds. He has never visited a medical tent filled with the casualties of war. We do not need hundreds of casualties to show the brutality of war. We need to use our strengths to outmaneuver the enemy and bring him to surrender. Take airpower out of the equation and you repeat the Russian experience in Afghanistan.

Col. Joe Cordina,
USAFR (Ret.)
Parker, Tex.

I applaud Correll for his honest assessment of the capabilities of airpower and observation of the obvious successes of past campaigns. It

amazes me that day in and day out, journalists—typical armchair quarterbacks—second-guess a superb representation of how warfare should be fought.

The Afghanistan campaign bookmarks overwhelming force being applied to an enemy at its weakest point. Break the chain, and the rest will crumble. Fly high, above their air defenses; don't bring your \$30 million jet down to low levels because of complaints of a sense of "unfairness." This is war. Utilize every last precision munition we have, if necessary. Bomb their command and control, air defenses, their assembly areas, the front-line trenches, and their supply depots in the rear.

Make the enemy fear congregating in groups. Have them look over their shoulders, waiting and wondering when the fury of a 2,000-pound bomb is going to end their happy day, when an AC-130 will unleash hell on Earth directed on their heads. Every waking moment of the enemy should be filled with the questions "Why am I here?" and "Do I truly want to die?" These are the tools we have, utilize them to a gruesome effect, and don't offer any apologies.

As offered by Osama [bin Laden]: "We call on every Muslim who believes in God and wishes to be rewarded to comply with God's order to kill the Americans."

Ask yourself this question: Why, in God's name, would we want to fight fairly? War is for keeps. When we lose a soldier to combat, he is dead and gone. His family grieves and his hopes and dreams disappear.

Richard Glanville
Kent, Ohio

Correll's editorial is well-reasoned, however I would go further. The decisive importance of American airpower goes back to World War II (not forgetting Billy Mitchell's early experiments



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AFA's Mission

To promote aerospace power and a strong national defense.

To support the needs of the Air Force and Air Force people.

To explain these needs to the American people.

Letters

of 1917–18). The American air supremacy achieved some strategic and tactical results. The British bombing of German civilians was not very important from a strategic and tactical point of view. However the American strategic and tactical air effort was decisive in that: 1) It made the movement of war materiel very difficult since it severed German lines of communications such as roads and railroads. 2) It significantly slowed down German war production (remember here that even a 10 percent slowdown is significant), just as the American war industry was reaching full production in overwhelming quantities of materiel. 3) It kept American casualties down.

As an example, millions of Russians died. Remember that the Soviet air force was always a stepchild, undertrained and badly led. The total fatalities of the American war effort were about 200,000 to 300,000 men (true that if your brother died it was horrible), which is far less than five percent of the forces deployed. The German Ardennes offensive made good progress till the weather broke and it was hammered to dust by American airpower.

And let's face it: The ludicrously few casualties so far in Afghanistan and in the 1991 Gulf War were due to the fact that hostile forces were hammered into submission by our airpower. As a former pilot and a history buff, I listen to various people like [retired Army Col. David H.] Hackworth and historian John Keegan (among others) and wonder that people of their intelligence and military experience simply cannot see the obvious facts staring them in the face.

I talked to the late Gen. [Adolf] Galland (the German fighter ace) in 1988, and he told me just how decisive American airpower was, and he ought to know.

J.F. Polma
Garland, Tex.

Just finished reading your editorial. It was thought provoking and to the point. As I read it, I was reminded of a statement purported to have been said by the late Gen. George S. Patton: "The object of war is not to die for your country [but to make the other bastard] die for his."

I. Distenfeld
Baltimore

Let me relate a World War II event. Prior to the invasion of Sicily, [to ensure] no interference from enemy

forces in other areas of the Mediterranean, we were given and carried out missions to knock out the forces on the islands of Pantelleria, Lampedusa, and Linosa.

My squadron history [relates]: The plan for the conquest of Pantelleria was code-named Corkscrew. Flying from its new base at Soliman, the 321st [Bomb Group] bombed the island six times between June 5 and 10. On June 10, the sky over Pantelleria was so congested with aircraft that the bombers frequently circled the island waiting their turn to drop bombs. On June 11, a big white cross of surrender was seen on the field at Pantelleria. The island garrison surrendered without so much as an Allied soldier setting foot on the island. When ground troops did land they were surprised to know the garrison had already surrendered. This is the first time in history that an enemy had surrendered or been beaten by airpower alone.

Nevertheless, teamwork and coordination between all forces is in my estimation the way to winning—whatever the circumstances. It is always the man on the ground who has to take and hold an objective.

Frederick Lawrence
Wofford Heights, Calif.

About Black Hawk Down

First I went to the movie ["Black Hawk Down"]. Then I read the book. Now I am looking for old articles about the men who were there. With the movie's popularity, have you considered rerunning your article from the June 1994 issue?

Glenn Macy
Essex Junction, Vt.

■ *We are not going to rerun the article "Heroes at Mogadishu," but we moved it up on the list of older articles that we have been adding to our Web site (www.afa.org).—THE EDITORS*

What's the Number?

In the article "A Strike Fighter for the Future," in the January issue [p. 24], you refer to the winning JSF contender as either the F-35 or F-24, since the official designation has not yet been announced. Unfortunately, Defense Secretary [Donald] Rumsfeld has called it the F-35. Other aviation publications are [now] using the F-35 label.

This is an unfortunate error and flies in the face of the standard designation conventions adopted for mili-

tary aircraft. The two contenders for the JSF competition were designated X-32 and X-35 because they were *experimental* aircraft, not production prototypes. As such, they were assigned the next designations available for that category of aircraft.

However, now that a winner has been selected, the operational JSF no longer will fall into the experimental category. As a *fighter*, the next available designation (barring classified projects that have yet to see the light of day) would be the F-24, not the X-35.

The numbering systems was instituted for a reason but has been violated in recent years. For example, the Navy's ill-fated A-12 should have been the A-13 (following the A-12 Blackbird), and the T-1 Jayhawk should have been the T-48. Hopefully, the proper conventions will be followed for the F-24 and thereby avoid headaches and confusion for future historians.

Hank Caruso
California, Md.

On the B-2 Record

As a veteran maintainer of B-52s conducting very long sorties (31 hours round trip Minot AFB [N.D.] to Egypt) and a current engineering provider to the B-1 program, I think the essence of this "record" was missed. [See "Enduring Freedom," February, p. 32, specifically p. 34, which talks about the 44-hour-long B-2 missions.]

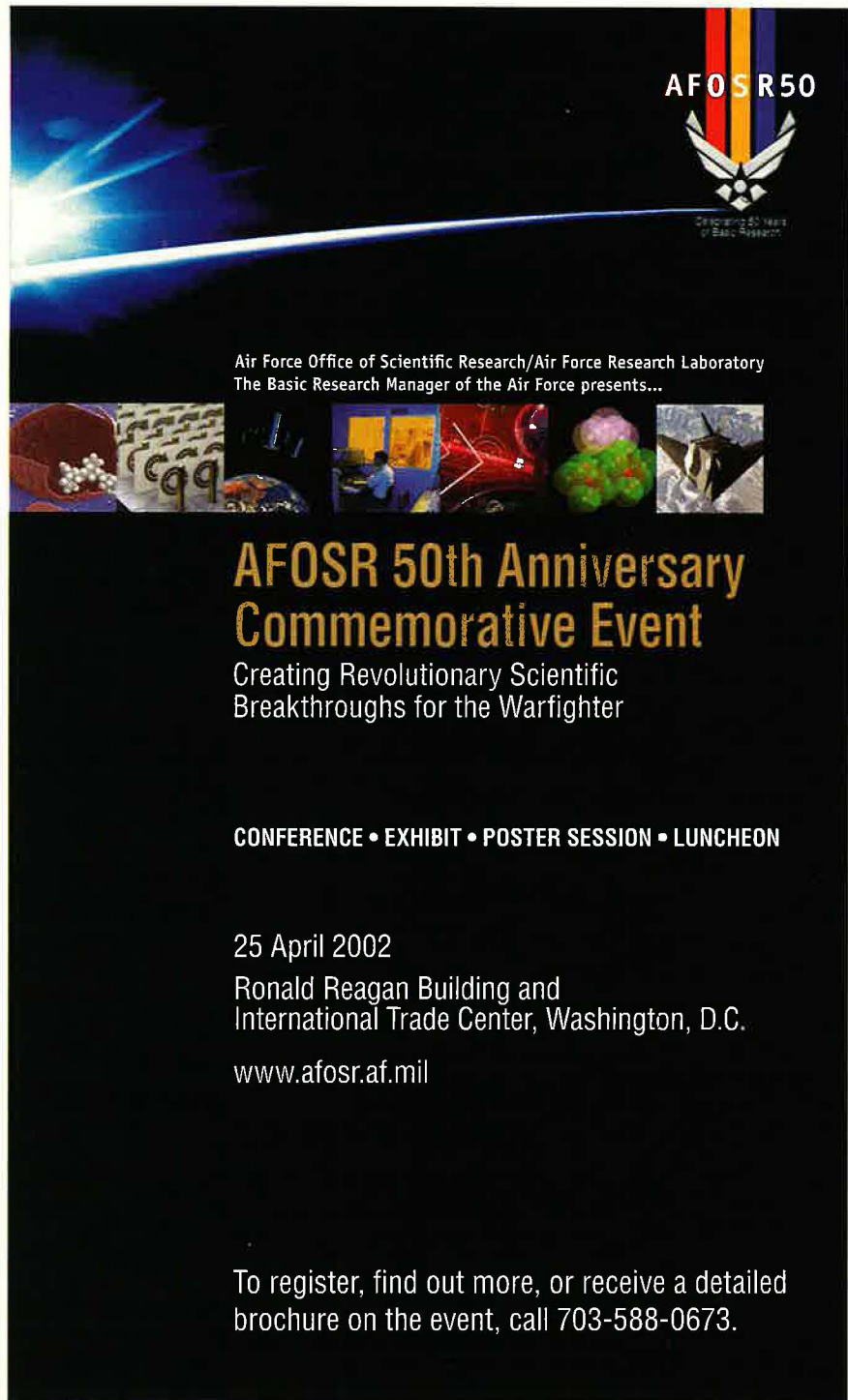
The nature of the B-2's maintenance requirements precludes deployment for long periods (apparently [anything] beyond 30 hours), thereby necessitating establishment of the "record" to accomplish the mission!

CMSgt. Larry R. Anderson,
USAF (Ret.)
Edmond, Okla.

Tankers and Lifters

Thanks to Richard J. Newman for his excellent article ["Tankers and Lifters for a Distant War," January, p. 56]. The article sure brought back some great memories of my long and rewarding tanker years. I was on the maintenance side but still got a lot of flying time in. In the late 1950s and '60s I was crew chief on the KC-97s, and we transported almost 100 percent of our support equipment and personnel when we went TDY, which was very often. Even after I got on the KC-135s in the mid-'60s, we still hauled a lot of our own equipment and people. I know if it had not been for the tanker cargo space, on many occasions there would have been some B-52s sitting on the ramp waiting for engines.

I made many a trip on tanker task forces to and from Southeast Asia,



The poster features a dark background with a bright blue and white streak resembling a comet or a high-speed aircraft trail. In the top right corner, the AFOSR 50 logo is displayed, consisting of the letters 'AFOSR50' above a stylized eagle emblem with the text 'Celebrating 50 Years of Basic Research' below it. Below the main graphic, a row of six small images shows various scientific and technological scenes: a red sphere with white particles, a person in a lab, a red and white structure, a green and red molecular model, and a white aircraft. The text on the poster reads: 'Air Force Office of Scientific Research/Air Force Research Laboratory The Basic Research Manager of the Air Force presents...' followed by the main title 'AFOSR 50th Anniversary Commemorative Event' in large, bold, orange letters. Below the title, it says 'Creating Revolutionary Scientific Breakthroughs for the Warfighter'. At the bottom, it lists the event details: 'CONFERENCE • EXHIBIT • POSTER SESSION • LUNCHEON', '25 April 2002', 'Ronald Reagan Building and International Trade Center, Washington, D.C.', and the website 'www.afosr.af.mil'. A registration notice at the bottom right says 'To register, find out more, or receive a detailed brochure on the event, call 703-588-0673.'

and it was a great feeling to know that you help to keep those tankers in the air. And the fighter pilots liked it, too. You tanker crews and maintenance personnel are the best. Keep up the good work.

CMSgt. Donald W. Grannan,
USAF (Ret.)
Fort Worth, Tex.

With reference to the C-17 fleet dropping humanitarian rations in Afghanistan, Newman states that these planes are sometimes required to drop at high altitudes to avoid ground fire.

He says that, as a result, aircrews run the risk of exposure to altitude sickness after the aircraft are depressurized for these drops. Altitude sickness? What's that? From personal experience in making similar drops from C-141s, our crews never had an altitude-related problem as long as we used our oxygen masks and wore proper cold-weather clothing. I would assume that our C-17 aircrews are taking similar protective measures.

MSgt. James B. Walker,
USAF (Ret.)
Dayton, Ohio

About "Ruthless" Ataturk

Author [Peter] Grier should be careful in labeling Ataturk "ruthless." [See "Turkey Stands Forward," February, p. 64.] He apparently has never been to Ankara nor seen [Ataturk's] huge mausoleum there. To Turks, he is a highly revered combination of George Washington [and] Abe Lincoln.

I was there as a young first lieutenant reservist in 1965–67. Believe me, any Cold War cooperation from the Turkish government was then well paid for by American taxpayers. I managed the only "bank" of its kind in the area as the deputy [accounting and finance] officer.

Payrolls for those "listening posts" [mentioned in the article] at places such as Trabzon and Sinop originated in my office. Every 90 days I was also ordered to personally deliver a multi-million dollar treasury check, our foreign aid payment, to the Central Bank (Merkez Bankasi) downtown. I also was required to periodically hand out old currency in \$60,000 to \$80,000 lots to be used as bribe money by plainclothes Army sergeants and supposed CIA operatives for "information" from Turkish citizens.

D.M. Rostad
Roswell, N.M.

Thanks, Refuelers

A salute to Capt. Don Long of the 99th Air Refueling Squadron for reminding us once again that aerial tankers take the lead in responding to any emergency. [See "Letters: War on Terror," December, p. 7.] It is amazing the lack of knowledge regarding the modern Air Force. I was surprised at a knowledgeable individual remarking after reading that B-2s had flown from Missouri to Afghanistan that he did not know that the B-2s had that kind of range. He certainly would not have read about the tankers' part in any news article I have seen. How fortunate we are to have guys (and gals) like Long doing the heavy lifting with very little recognition.

William J. Spelliscy
Orange, Calif.

More on the B-52

In the February propaganda pit Lt. Col. Anthony P. Callanan, USAF (Ret.), gives us a fighter pilot's rendition of why the B-52s did not go "up north" in the 1965 time frame. [See "Letters: The B-52," p. 7.] Probably a more accurate assessment of the theater of operations at that time can be obtained by reading Mark Clodfelter's *The Limits of Air Power: The American*

Bombing of North Vietnam. It should be required reading for any officer aspiring to rise above captain. In 1966, as a radar navigator from Glasgow's famous 322nd Bomb Squadron, I studied for raids against any number of targets in the Hanoi area, however the only B-52 sortie of significance to me came on Thanksgiving Day 1966.

Ken Brown
Byron, Ga.

I agree with CMSgt. [Donald W.] Grannan, USAF (Ret.), about Gen. Curtis E. LeMay. He was one of the greatest generals of the Air Force. I was at Castle AFB [Calif.] and I worked on the B-29s and B-50s, then worked at Lincoln AFB [Neb.] on the KC-97s. Most of my time was in Strategic Air Command and that was some of my best duty. I do not see much in your magazine about the Hound Dog missile (AGM-28). I worked on this missile at Kinchloe AFB [Mich.]. SAC was great, and I think we should have kept it.

TSgt. Condie J. Taylor,
USAF (Ret.)
Tucson, Ariz.

I was based at Edwards AFB, Calif., from 1959 to 1963. I was involved in testing the C-130B for capsule recovery, Project Discover/Corona. They started testing the B-52H, I believe, in 1960. [I was] invited to go on a mission. I declined when I found out they lasted 12-plus hours. They had multiple crews flying the aircraft around the clock—high altitude to Florida and 500 [feet above ground] or less on the return. They broke a main spar at about 1,200 hours. Edwards repaired it and the tests continued until the aircraft was returned to Boeing. Modifications were made, and that is why BUFF is still flying.

Donald R. Curtin,
Palos Verde Estates, Calif.

It may be too late, but I would like to have a hero of mine—Col. Patrick D. Fleming, who as the [instructor pilot] without an ejection seat, died in the first B-52 [crash]—mentioned in some way. He was the [93rd Bomb] Wing vice commander [at] March Field, Calif. When his B-52 experienced a catastrophic cockpit fire—fuel in the air-conditioning vents, I believe—Fleming got out, but his chute failed because of fire damage. What most people don't know about this first B-52 loss is that Fleming was a Naval Academy graduate [and] fighter ace, finishing the war as top gun in VF-80 on the *Ticonderoga* with

[19] kills in the Pacific and more carrier landings than anyone else in the fleet at the end of World War II. Fleming [met] Gen. Curtis LeMay on Okinawa near the end of the war. In answer to LeMay's question "What are you going to do now that the war is over?" Fleming said, "Well, I suppose I'll have to fly a desk, I've been at sea so much." LeMay responded, "How about coming with us, where you can really fly?" Fleming said he "would love to." Consequently, Fleming was transferred to the Air Force and as a full colonel worked directly for LeMay and headed up the B-47 Operational Engineering Section, expediting the introduction of the B-47s at MacDill [AFB, Fla.] in 1951–53. Fleming flew some of the first B-47 recon missions over Russia in this time period. LeMay then became anxious to expedite the B-52 into service and assigned Fleming to March AFB to be the vice commander of our first B-52 wing. I worked for Fleming in the B-47 OES at MacDill as a second lieutenant just out of West Point awaiting a waiver on my physical to go to flying school. He helped get me into flying school by taking me for flights in the T-6 and T-33 and attesting to my readiness.

Maj. Gen. Gerald K. Hendricks,
USAF (Ret.)
Alexandria, Va.

As I read the letters on the B-52, I remembered my first duty was as a weapons loader on the B-52G at Wurtsmith AFB, Mich., 1986–89. Oh, to be back in SAC [and] to have a DCM [Deputy Commander for Maintenance]. Those were the days.

I remember walking up to my squadron (339th Munitions Maintenance Squadron) to sign in, and an "Elephant Walk" was starting. Watching those birds with the pylons hanging, throttling up down the runway gave me goose bumps. What a sight! I knew right then that I was going to love that plane. And of all of the other planes that I have loaded, the F-111F, F-15E, and OA-10A, the BUFF is by far my all-time favorite. The B-52G model was the cornerstone of America's might.

TSgt. Michael A. Ford
Bolling AFB, D.C.

The February issue contains a letter from CMSgt. Donald W. Grannan ["Letters: The B-52," p. 8], the text of which states "and takeoffs at one minute intervals." This is an error. The time between takeoffs for B-52s in a Minimum Interval Take Off (MITO)

exercise was 15 seconds. This was increased to 30 seconds behind a KC-135, which could occur if a B-52 encountered a takeoff maintenance delay after the klaxon sounded.

Lt. Col. Glen P. Goffin,
USAF (Ret.)
Fruitland Park, Fla.

Love the "Herc"

I am a little disheartened whenever I pick up a copy of *Air Force Magazine*. Every time, I find that there are extremely few or no pictures or articles about the most venerable aircraft in Air Force history. I'm referring to the C-130 Hercules, the only tactical airlift plane we have. According to Lockheed Martin, the C-130 has logged over 15 million accumulative hours for the US alone. The Hercules has served in every operation since its development. As I write this, I am deployed in Europe, flying combat missions in the C-130. Contrary to most thought, the Hercules is not an old, obsolete airframe. It is still being built and will be for some time.

Those of us who love the "Herc" are fond of saying that when the last C-17 is flown to the "boneyard," a C-130 will take the crew home. All I ask for, as I'm sure many others do, is for a little acknowledgment, credit, and respect for the Hercules.

TSgt. Michael K Driscoll,
C-130 Loadmaster
Sembach AB, Germany

On the Osprey

I read the letter from [retired] Lt. Col. [William] Warwick about the control system on the V-22. [See "*Letters: Misgivings on Osprey*," *October*, p. 4, and "*Aerospace World: Osprey to Restart Flight Testing*," *February*, p. 15.] I had a similar experience while [I was] the chief engineer and technical director of the C-17 System Program Office at Wright-Patterson AFB [Ohio] from 1993 to 1995.

The C-17 has a stick instead of the more common yoke/wheel of most heavy aircraft. This was done at the insistence of the commander of [Air Mobility Command], when the C-17 was first planned, who felt that all real aircraft have a stick (or so I was told). We were getting complaints about the difficulty of aerial refueling the C-17. The pilots were refueling from the right seat, which meant they were flying with the left hand and using the throttles with the right hand. We got many complaints about the effect of the "bow wave" and responsiveness of the C-17 in this very high-gain tracking task.

The dynamics between a stick and a yoke are very different in the man-machine interface. Slight movements

in the stick have bigger responses than a seemingly similar displacement in the wheel. Couple this with the fact that most people are right-handed, there was a natural difficulty in making the refueling. Gen. Ron Yates, then commander of [Air Force Materiel Command] and a former test pilot, pointed this out during a meeting with me to discuss the progress of the test program.

I flew the airplane myself and right away was uncomfortable in the left seat. The problem was the stick was "left-handed," so all the switches and controls were oddly placed to my right hand. Changing hands made life much better and with practice became "normal." We suggested more simulator time and comparisons between left seat/right seat refueling and found that pilots flying with the right hand on the stick and left hand on the throttles, like all fighters, had an easier time. We never did make any changes to the aircraft to alleviate refueling problems and as far as I know, once the pilots get used to flying left-handed, the problem disappears.

Such simple solutions are often overlooked and great expense is lavished on the control system. If the design of the pilot-machine connection is not well thought out and planned for, nonexistent problems are worried to death or real problems are overlooked, with resulting loss of aircraft and lives. I hope that the C-17 experience and the comments of Warwick are taken seriously when the V-22 enters USAF testing and operational use. Assuming a pilot can fly anything given proper training is true, but the training must reflect the background and experience of the pilots flying the machine.

Eric E. Abell
Kettering, Ohio

Add This Position

In the "Aerospace World" section of the December 2001 issue, the aircrew position of aeromedical evacuation technician was omitted. [See "*Enlisted Needed for Aviation Posts*," p. 20.] In my squadron, the 932nd Aeromedical Evacuation Squadron, Scott AFB, Ill., we have individuals with 20-plus years of continuous flying experience and 10,000-plus flight hours. It seems to me that the managers of the enlisted aircrew assignments branch should add our personnel to their list of "career enlisted aviator specialties" and come fly with us as we provide exemplary care to our patients and passengers in the friendly—or not so friendly—skies.

MSgt. Russ Hauser
Scott AFB, Ill.

It's Heartening

I was heartened by Gen. [John P.] Jumper's comments concerning the evolving nature of USAF. [See "*Aerospace World: Jumper Says Air, Space Complementary*," *December*, p. 22.] This evolution seems painfully slow to many of us, but clear statements of support from senior Air Force leaders, backed by substantive actions, are always welcome. It is worth noting the general's reference to applying not only air and space capabilities but both manned and unmanned assets.

Jumper's position that "our entire force is a warrior force" also illustrates a growing awareness of what USAF is about in the 21st century. Perhaps a simple, visible, unifying signal of this warrior culture is in order. Some years ago the leather A-2 jacket was adopted in the operations communities to acknowledge our link to air warriors of the past. Is it possible that the A-2 could be designated an optional item available for any USAF member to purchase and wear with pride? Whenever I wear my A-2 I can't help but reflect back on the air warriors who came before me. It would be great if I could also look forward to the air, space, info, log, etc., warriors who will come after me.

Peter J. Flores
Stuttgart, Germany

More on C-46

Please add the Berlin Airlift to C-46 uses and accomplishments! [See "*Pieces of History*," *January*, p. 80.] After having lived with my grandparents in the eastern sector of [Berlin], I (13 years old then) caught a hop on a Royal Air Force C-46 from Gatow [RAF station in Berlin] to Fassberg [field in West Germany] in 1948. I know there were more [C-46 airlifts into Berlin] but even if it had been the only one, the C-46 played a very important role in my life.

CMSgt. Peter Schieferdecker,
USAF (Ret.)
Minot, N.D.

Correction

The January "Aerospace World: Charleston Reservists Aid HDR Campaign" news item on p. 10 should have stated that the first Air Force Reserve Command C-17 flight to drop Humanitarian Daily Rations during Operation Enduring was made on Oct. 12. Thanks to MSgt. Allen Larson of the 701st Airlift Squadron, Charleston AFB, S.C., for clarifying this information.

Aerospace World

By Suzann Chapman, Managing Editor

Bush Proposes Major Increase for Defense

The Fiscal 2003 defense budget unveiled Feb. 4 calls for a \$48 billion boost over last year, with a sustained five-year increase of \$120 billion.

President Bush called it the largest increase since the 1980s.

He announced his intention during the State of the Union address Jan. 29, saying, "While the price of freedom and security is high, it is never too high. Whatever it costs to defend our country, we will pay."

Bush stated that it cost more than a billion dollars a month to fund operations in Afghanistan. He added, "Afghanistan proved that expensive precision weapons defeat the enemy and spare innocent lives, and we need more of them."

He also said that the US military must replace aging aircraft and become more agile.

"Our men and women in uniform deserve the best weapons, the best equipment, the best training, and they also deserve another pay raise," the President emphasized.

Bush has asked for a 4.1 percent increase in military pay for Fiscal 2003.

Other details of the budget proposal will appear in the April issue.

Iraq Continues to Engage Coalition Aircraft

After almost two months of relative quiet, Iraq again began firing on coalition aircraft enforcing United Nations resolutions in the no-fly zones. In a late January attack, Iraqi forces directed gunfire and radar targeting on coalition aircraft patrolling the no-fly zone over southern Iraq.

In retaliation, US fighter airplanes dropped precision guided munitions on Iraqi anti-aircraft artillery and missile sites on Jan. 21, 23, and 24.

Air Force Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff, told reporters that it was basically what Iraq had been doing for some time in both the southern and northern no-fly zones.

"Sometimes it's triple-A and sometimes it's missiles," he said. "Any time



USAF photo by Steve Zapka

Col. Chris Seat, from Edwards AFB, Calif., fires an Advanced Medium-Range Air-to-Air Missile from an F-22, destroying a subscale drone over a military range in California, in a test of the Raptor's look-down, shoot-down capability.

we can ascertain where it's coming from, we'll react to those threats to our patrolling aircraft."

Bin Laden Network Is Still Most Serious Threat

CIA chief George J. Tenet told a Congressional committee Feb. 5 that Osama bin Laden and his al Qaeda network still pose "the most immediate and serious threat" to the US.

Despite the progress in Afghanistan, where some al Qaeda leaders have been killed, bin Laden's terrorist network has not been destroyed.

"Al Qaeda leaders still at large are working to reconstitute the organization and to resume its terrorist operations," Tenet emphasized to the Senate Select Committee on Intelligence.

He said newly discovered documents from al Qaeda facilities in Afghanistan "show that bin Laden was pursuing a sophisticated biological weapons research program."

In addition, Tenet said, intelligence pointing to bin Laden's efforts to acquire or develop a nuclear device revealed that "al Qaeda may be pursuing a radioactive dispersal device—what some call a 'dirty bomb.'"

The coalition war on terrorism has crippled the terrorist network by choking off funds and arresting nearly 1,000 al Qaeda members. "The group has been denied its safe haven and strategic command center in Afghanistan," stated Tenet. "We are uncovering terrorists' plans and breaking up their cells."

However, he said that al Qaeda may have cells or infrastructure in more than 60 nations.

Tenet said bin Laden underestimated the US, believing it would not invade his sanctuary. The US must not underestimate bin Laden, he added.

"I must repeat that al Qaeda has not yet been destroyed," Tenet cautioned the Senators. "It and other like-minded groups remain willing and able to strike us."

"We must be prepared for a long war, and we must not falter," he maintained.

Jumper Looks to New Task Force Approach

Air Force Chief of Staff Gen. John P. Jumper plans to create several new task forces to handle counterterrorism and other missions.

Jumper revealed his concept during an interview with *Inside the Pentagon* and *Inside the Air Force* on Jan. 29.

The first new task force Jumper plans to create is a Global Response Task Force. It would probably include strike aircraft on alert at deployed locations to respond to events as they emerge and could go beyond a regional commander's boundary to deal with terrorist situations.

Another task force would feature command, control, intelligence, reconnaissance, and surveillance assets—essential to any operation.

The Air Force is still developing the concept and plans possibly up to 10 task forces, including one for humanitarian relief operations.

Jumper said he also intends to marry the concept to weapons development and acquisition.

Teets Announces Two New Positions for Space

The Pentagon's new top space leader, Peter B. Teets, took his first official steps toward a new look for space Feb. 7 when he announced creation of two new offices.

The offices are a Deputy for Military Space and a Directorate of National Security Space Integration.

Teets, whose official title is undersecretary of the Air Force and director of the National Reconnaissance Office, was just confirmed last December. He has the lead for the entire military space program since Defense Secretary Rumsfeld named the Air Force as executive agent for space.

Teets declined to name the individual who would be the military space deputy, saying, though, that he had "in mind an extremely qualified and competent individual." He did say the person would be a civilian.

For the NSSI position, Teets named Maj. Gen. (sel.) Michael A. Hamel.

Questioned about why he needed a deputy for military space, Teets replied that he needed two individuals who could focus on day-to-day operations, leaving him free to focus on the big picture.

"Frankly I'm doing this in an effort to allocate time better," said Teets. "I find I'm pretty busy these days, and I would like to have time to reflect on the overall issue of national security space."

Teets explained that he already has an NRO deputy director, Dennis Fitzgerald, to help oversee daily operations for the "large constellation of vitally important national security assets in space right now."

It is important, he said, to have a similar role for military space. And

Rumsfeld: Now Is Time to Transform

Defense Secretary Donald Rumsfeld believes that now—in the midst of "a difficult and dangerous war on terrorism"—is exactly the time to transform the US military.

"The impetus and urgency added by the events of September 11th powerfully make the case for action," Rumsfeld told an audience at the National Defense University at Ft. McNair, D.C.

He said that every day the Pentagon faces "urgent near-term requirements that create pressure to push the future off the table. ... Our challenge is to make certain that, as time passes and the shock of what befell us that day wears off, we do not simply go back to doing things the way we did them before."

The challenges of the new century are not as predictable as those of the Cold War, stated the defense chief.

"An ability to adapt will be critical in a world where surprise and uncertainty are the defining characteristics of the new security environment," he said.

As the events of Sept. 11 emphasized, the challenge is "to prepare to defend our nation against the unknown, the uncertain, the unseen, and the unexpected," added Rumsfeld.

"And, let there be no doubt: In the years ahead, it is likely that we will be surprised again—by new adversaries—who may also strike in unexpected ways," he cautioned. "And as they gain access to weapons of increasing power, these attacks could grow vastly more deadly than those we suffered September 11th."

Potential adversaries know that "challenging our armed forces head-on is foolhardy," he said, "so, they will challenge the US asymmetrically, looking for vulnerabilities and building capabilities to exploit them.

"Our job is to close off as many of those avenues of potential attack as possible," said Rumsfeld.

DOD must prepare for new forms of terrorism, attacks on US space assets, cyber-attacks, cruise missiles, ballistic missiles, and nuclear, chemical, and biological weapons. At the same time, he said, the Pentagon must build up its areas of advantage—the ability to project military power, precision strike weapons, and space, intelligence, and undersea warfare capabilities.

Transformation is not just about developing new capabilities; it includes rethinking and rebalancing existing forces and capabilities, stated Rumsfeld. For example, the Pentagon must add more low-density, high-demand assets, which he explained is a euphemism that in plain English means "our priorities were wrong and we didn't buy enough of the things we now find we need."

what that individual will be doing "frankly, [is] fighting acquisition fires."

ANG Wants Troop Increase

Air National Guard officials are working with the Air Force to get a boost in the Guard's end strength. The number they would like to see is an additional 6,400—raising the level to 113,000.

The reason for the increase, the Guard's deputy director, Brig. Gen. David Brubaker, told *Inside the Air Force*, is the Guard's operations since Sept. 11.

USAF's Long-Haul Task Force is reviewing the situation. (See "Airpower for the Long Haul," p. 54.)

The Guard has carried the brunt of duty for Combat Air Patrols over US cities, taxing both aircrews and maintenance personnel. It has also called up 5,000 Guardsmen to serve as security forces.

Although no funds for additional personnel are included in the Fiscal 2003 budget request, officials said funds could be added to either the Fiscal 2004 request or as a supplemental to Fiscal 2002.

Jammer Could Cost \$82 Billion

The Air Force and Navy study into a replacement for the aging EA-6B Prowler, currently DOD's sole tactical electronic jamming aircraft, iden-

Commentary

Ramsey Clark and Friends Bring Suit on Behalf of al Qaeda Prisoners

Amid the uproar created when a London newspaper labeled the treatment of Taliban and al Qaeda detainees brought to Guantanamo Bay as "torture," a group of academics, clergy, and lawyers filed a lawsuit to have the detainees tried in civil court.

The group is led by longtime US foreign policy critic Ramsey Clark, who served as US attorney general from 1967 to 1969 under President Johnson.

Their petition, which was filed in Los Angeles Jan. 19, charges that the captives are being held in violation of the Geneva Convention and the US Constitution. It demands that they be brought to court and the charges against them defined.

At a preliminary hearing Jan. 22, a federal judge said he had "grave doubts" about his jurisdiction in the matter but set a Feb. 14 hearing to consider it further.

There are about 200 Taliban and al Qaeda detainees at the US Naval Station at Guantanamo Bay (called Gitmo), Cuba. They are being held in a portion of the naval facility now known as Camp X-ray.

US officials have maintained from the beginning that the captives are not Prisoners of War and thus not entitled to be governed by the convention's rules on POWs.

Defense Secretary Donald Rumsfeld told reporters traveling with him to Gitmo on Jan. 28, "There is no ambiguity in this case." He emphasized, "They are not POWs."

Despite that, senior Administration officials have noted on several occasions that the captives' treatment has been humane and appropriate under convention rules.

In early February, though, President Bush decided that convention status would apply to Taliban detainees but not al Qaeda. The reason: Afghanistan is a party to the convention treaty, but al Qaeda is an international terrorist group not a party to the treaty.

He did not change his stand on the POW issue. Thus the detainees may still be subject to military tribunals and will continue to be questioned.

"These are bad people," said Vice President Dick Cheney on CNN in late January. "They may well have information about future terrorist attacks against the United States. We need that information."

"These are the worst of a very bad lot," Cheney told Fox News Jan. 27. "They are very dangerous. They are devoted to killing millions of Americans, innocent Americans, if they can, and they are perfectly prepared to die in the effort."

Part of the cries of "torture" and "inhumane treatment" stemmed from a photograph released by US forces. It showed a captive hooded and shackled and on his knees.

Asked about that in mid-January, Rumsfeld replied, "When they are being moved from place to place, will they be restrained in a way so that they are less likely to be able to kill an American soldier? You bet. Is it inhumane to do that? No. Would it be stupid to do anything less? Yes."

Nonetheless, the furor created by claims of inhumane treatment prompted visits by the International Red Cross, British officials, and US Senators.

The result was positive by all accounts, with just a few recommendations from the Red Cross, such as keeping only one detainee per eight-by-eight-foot cage.

Comments from some of the US Senators who visited Camp X-ray:

Sen. Daniel Inouye (D-Hawaii): "I assure you they ate better and continue to eat better than what they ate in Afghanistan."

Sen. Kay Bailey Hutchison (R-Tex.): "The medical care is the same as the men and women of the military who serve on the base."

Sen. Dianne Feinstein (D-Calif.): "If I were faced with lockdown in San Quentin or Folsom, ... I would rather be in Guantanamo Bay."

Laying aside the hysterical and groundless claims of mistreatment, the primary issue for Clark's group is the order President Bush issued last November that gives him the option to try the detainees by military tribunal.

Clark and friends are adamantly opposed to that option. And they want immediate prosecution, preferably in a civil court. If that were to happen, US officials would lose any hope of further interrogation.

Clark has long espoused the "underdog." For instance, among his more recent endeavors, he has been helping former Yugoslav President Slobodan Milosevic, who is being tried for war crimes.

In the 1990s when he was protesting the US role in the Persian Gulf—saving Kuwait and Saudi Arabia from takeover by Iraq—Clark called the senior Bush's Administration "an imperial Presidency as unrestrained as any military dictatorship that ever lived."

Wonder what appellation he has chosen for the younger Bush's Administration?

tified 27 options. The costs range from \$21 billion to \$82 billion.

USAF has been sharing jammer crews with the Navy and Marine Corps using Prowler aircraft. The Air Force retired the last of its EF-111 Raven electronic warfare aircraft in 1998.

As noted here last month, one option the Air Force had been considering was whether to pursue a replacement of its own.

The results of the joint study, a copy of which was obtained by *Defense News*, do not appear to preclude that option. Among the solutions under consideration is buying a fleet of business jets at a cost of \$26 billion. Another approach would be to equip a force of Navy F/A-18s and

USAF B-52s and F-22s with jammers—the \$82 billion approach.

Pentagon officials briefed members of Congress in mid-January on the report. More work, though, is to be done by an oversight group, according to *Defense News*, that will brief Pentagon acquisition head Edward C. Aldridge early this summer.

CIA Cites Rise in Terrorist CBRN Weapons Capabilities

According to a new CIA report, the likelihood of a terrorist attack using Chemical, Biological, Radiological, or Nuclear weapons has grown since the Sept. 11 attacks here in the US.

"Several of the 30 designated foreign terrorist organizations and other

nonstate actors worldwide have expressed interest in CBRN," states the report, which was made public Jan. 30.

However, it added that terrorists "probably will continue to favor proven conventional tactics such as bombings and shootings."

The report also outlined Osama bin Laden's pursuit of CBRN materials and his interest in staging unconventional attacks.

The report stated that a senior bin Laden associate on trial in Egypt in 1999 claimed his group had chemical and biological weapons.

That claim has gained credence with more recent discoveries in Afghanistan that have "confirmed our

worst fears," as President Bush said in the State of the Union address.

"We have found diagrams of American nuclear power plants and public water facilities, detailed instructions for making chemical weapons, surveillance maps of American cities, and thorough descriptions of landmarks in America and throughout the world," stated Bush.

US Supports Stricter WMD Controls

The Bush Administration urged the international community, through the Conference on Disarmament, to approve tighter restrictions on the spread of chemical, biological, and nuclear weapons.

"Almost every state that actively sponsors terror is known to be seeking Weapons of Mass Destruction and the missiles to deliver them at longer and longer ranges," stated John Bolton, undersecretary of state for arms control and international security, before the 66-nation conference in Geneva on Jan. 24.

"Their hope is to blackmail the civilized world into abandoning the war on terror," he emphasized.

Bolton urged the conference to focus on the new threats—terrorists and their drive to gain mass destruction weapons. He said the conference must reinforce the international inspection system and forge additional restraints against the spread of mass weapons.

He specifically cited Iraq and North Korea for their violations of the non-proliferation treaty. He said the US believes, with few exceptions, that terrorists need the support of nation states to gain WMD.

"The September 11th terrorist attacks ... taught [the US] not to underestimate the intentions and capabilities of rogue states and terrorist groups," Bolton stated.

FB-22: Short Road to a Speedy Medium Bomber

The F-22, USAF's stealthy new air superiority fighter, is not yet operational, but it could be just what the Pentagon is looking for in a new bomber.

DOD acquisition chief Aldridge, reports *Defense Daily International*, believes a medium bomber version of the F-22 could provide a relatively quick solution for development of a high speed strike aircraft that could carry a sufficient load to take out highly mobile targets.

The so-called FB-22 would fill a void confirmed by recent operations in Afghanistan.

Air Force Secretary James G.



USAF photo by TSgt. Vic Owens

SSgt. Craig Musselman, an Air Force weatherman on the ground in Afghanistan for Enduring Freedom, receives a Purple Heart from Gen. Charles Holland, commander in chief of US Special Operations Command.

Roche said last year that the service needs a stealthy, supersonic bomber for mobile targets.

One reason the F-22 would make an ideal basis for a new bomber is it has performance to spare. To produce an FB-22, the basic F-22 would need airframe modifications for a

larger weapons payload and greater fuel capacity.

Even at that an FB-22 would have greater speed than the B-1B, the fastest US bomber.

Although Defense Secretary Rumsfeld and other DOD officials reportedly are still considering an offer to

Pentagon Seeks New Homeland Defense Command

Defense chief Donald Rumsfeld plans to ask President Bush and Congress for approval to create a new unified command to handle the homeland security mission.

The proposal apparently has the support of the Joint Chiefs of Staff, although details have yet to be worked out. The command would have a new four-star flag officer.

As first reported by *Inside the Pentagon*, it would draw some of the capabilities from existing unified commands and the US-Canadian North American Aerospace Defense Command. For instance, it would take over direction of USAF jets patrolling over US cities, Navy ships providing coastal security, and national guard troops securing airports and borders.

Initially, according to the *Washington Post*, the military chiefs argued for assigning the mission to one of two commands already headquartered in the States—NORAD, in Colorado Springs, Colo., or Joint Forces Command, in Norfolk, Va.

The Commander in Chief of NORAD is already dual-hatted as the CINC of US Space Command. The Commander in Chief of JFCOM not only has the full responsibility for developing new ways the services can fight together and the training to go with it but is also dual-hatted as head of NATO's North Atlantic Region.

Rumsfeld decided that adding new responsibilities to either of those CINCs would be too burdensome.

Already one Senator put in a bid to house the new command at Ft. Leonard Wood in Missouri. Sen. Christopher S. Bond (R-Mo.) introduced a bill Jan. 29 to create the new unified command with a four-star CINC as head and an Army National Guard or Air National Guard officer as deputy CINC.

At least one Democrat from Missouri, Rep. Ike Skelton, wants more details before he buys into the plan.

As for a name for the new command, Rumsfeld appears to be leaning toward US Northern Command, reports ITP. The name would reflect its area of responsibility, the continental US, Canada, and Mexico, much as Southern Command covers Latin America and the Caribbean.

All of this is contained in a forthcoming revision to the Unified Command Plan.

reopen the B-2 bomber line, Aldridge and Roche have said that's not the answer.

They maintain the B-2 is too slow and too expensive for this mission.

USAFE Commander Targets ISR

The US does not have enough Intelligence, Reconnaissance, and Surveillance assets. And many ISR resources available today are not

interoperable, limiting their usefulness.

That message came from Gen. Gregory S. Martin, US Air Forces in Europe commander.

Martin, speaking at an air and space power seminar on Capitol Hill in early January, called the nation's current ISR situation "woefully short" of requirements.

He said US ISR capabilities out-

strip those of other countries, but they still cannot support the needs of US regional commanders.

Canada Joins JSF Program

Defense acquisition leaders for the US and Canada signed a Memorandum of Understanding Feb. 7 for the Joint Strike Fighter program.

Canada will provide \$150 million over the next 10 years for the system development and demonstration phase of the program.

The MOU also partners Canadian industry with US and British industries on the program, said a Pentagon statement.

The United Kingdom signed the first JSF memorandum last year.

Canada has not decided which of the three JSF variants they will need. It currently flies the CF-18 and plans to keep them through 2017.

The USAF variant is a conventional takeoff and landing fighter designed to replace the F-16 and A-10 aircraft. The US Navy is purchasing a carrier-based variant to complement the F/A-18E/F and replace earlier versions of the F/A-18 and an aircraft that has already retired, the A-6. The US Marine Corps has requested a Short Takeoff and Vertical Landing aircraft to replace the AV-8B and F/A-18.

The British Royal Navy and Royal Air Force plan to purchase the STOVL variant.

USAF Bumps Recruit Goal Again

Air Force officials announced in February the need to increase the Fiscal 2002 enlisted recruiting goal by an additional 833—all destined for security forces positions.

This marks the second recruiting increase for this fiscal year. The new goal is 37,283.

The original goal was 36,000, but officials raised the bar by 450 last October.

Air Force personnel officials said Fiscal 2002 was already on the road to be the best on record.

"We know our recruiting force will rise to the challenge," said Brig. Gen. Duane W. Deal, commander of Air Force Recruiting Service.

All 28 recruiting squadrons worldwide met their contract goals in January—the best shipping record for January in 25 years, stated officials.

Bush Signs 2002 Defense Appropriations Measure

President Bush traveled to the Pentagon to sign the Fiscal 2002 defense appropriations act, which

Commentary

It Is Not About Being an Ugly American

Some seven years ago, a top Air Force female fighter pilot stood up and said the rule forcing US servicewomen in Saudi Arabia to wear the black head-to-toe garment, known as an abaya, is wrong. That rule was changed Jan. 22 by the Commander in Chief of Central Command.

The rub is that it was not entirely eliminated.

The abaya rule was instituted in the early 1990s, when US forces were invited into Saudi Arabia to battle Iraq. Pentagon officials have offered at least two reasons for its adoption. One is that it protects American personnel, and the other is that it was done out of respect for Islamic law and Saudi custom.

In issuing a new order, Army Gen. Tommy R. Franks sent an e-mail to commanders in the theater. They were to revise policies to indicate that "wear of the abaya in the Kingdom of Saudi Arabia is not mandatory but is strongly encouraged and to remove any requirement to wear civilian clothing to cover the uniform."

The old rule forced US military women to wear the abaya, which covers everything except the eyes, hands, and feet and is worn by Saudi women as part of their Islamic religion. The American women had to wear the garment whenever they were away from their US military facility.

It was supposedly not a rule required by the Saudis, yet recent public pronouncements by Saudi officials would indicate otherwise. In fact, the rule was not applied to US State Department female personnel. They, like other foreign women, were simply told to wear conservative clothing.

When Lt. Col. Martha McSally was assigned to Saudi Arabia, she had to leave the US facility on occasion for official business. Then a major, McSally flew some 100 hours patrolling the no-fly zone over Iraq in an A-10 aircraft.

For nearly six years she tried to get the rule changed through official channels. When that failed to generate any interest, McSally finally took her case to the public early last year. She talked with news media and with Congressmen. Five Republican Senators sent a letter in midyear asking Defense Secretary Donald Rumsfeld to review the policy.

Late last year McSally filed a lawsuit against the Defense Department. A Central Command spokesman said that the lawsuit did not influence the recent rule change because the policy was already under review.

An attorney with the Rutherford Institute, a religious freedom group that is aiding McSally with the suit, said the policy change doesn't go far enough. "What it says to us is that it has not been rescinded," he said.

In fact, the *Washington Times* reports that US commanders in Saudi Arabia are interpreting Franks's order as saying the rule is no longer set down by CENTCOM but is instead their decision to make.

McSally's lawsuit has not been withdrawn.

Although some Americans have referred to McSally's grievance as an "ugly American" issue, logically it cannot be when only one segment of US female personnel is targeted.

This was an issue about a supposed ally trying to enforce, directly or indirectly, its own religious practices upon US military personnel, simply because they are female—second-class citizens in Saudi minds—and because they were wearing a US military uniform.

US military personnel were invited to Saudi Arabia and without their presence Saddam Hussein would no doubt be sitting in Riyadh.

Of course, some Saudi officials are now saying the abaya religious custom applies to all foreign women within Saudi Arabia not just US female military personnel. That's interesting.

It is probably a good thing, then, that the current US Secretary of State, Colin Powell, is a man.

allocates \$317.2 billion in defense spending and another \$20.1 billion as an emergency supplemental.

At the Jan. 10 signing, Bush stated that the bill provides nearly \$30 billion more than in Fiscal 2001.

It includes an average 6.9 percent increase for military pay, as well as increases in Operations and Maintenance, Research and Development, and other areas. The amounts and increases include:

- O&M—\$105.1 billion, an increase of \$8.2 billion over 2001.

- R&D—\$49 billion, \$7.6 billion over 2001.

- Procurement—\$60.9 billion, \$1.7 billion over 2001.

- Defense health program—\$18.4 billion, \$6.1 billion over 2001.

The R&D increase also includes about \$8 billion for missile defense programs.

The health care increase includes funding for the Tricare for Life program established last year for military retirees and family members who are 65 and older and eligible for Medicare.

USAF Considers More C-17s

The Air Force could include an option for more than the 60 additional C-17s airlifters authorized by Congress in the Fiscal 2002 defense bill when it cuts its deal with Boeing next month, according to *Inside the Air Force*.

The service may not decide on a final number of aircraft for at least a couple of years Col. Thomas Owen told IAF.

USAF's decision on how many additional C-17s it needs hinges to a large degree on the re-engining and reliability upgrade program for C-5s. If that works well, the service might need fewer C-17s.

Currently C-5Bs and one C-5A will get the upgrades. At issue is whether it makes sense to do more A models. Congress stipulated in the 2002 bill that at least one C-5A was to be refitted.

US Rocket Programs Need Help

Both Boeing and Lockheed Martin are asking for government funds to bolster their space booster programs.

National security officials, reported the *Wall Street Journal*, believe the help is warranted.

In the 1990s the Air Force developed a joint government-industry strategy to produce two new launch systems—the Boeing Delta IV and Lockheed Martin Atlas V—that would provide more reliable and lower cost launches. Both new boosters are set to launch their first government payloads this fiscal year.

The problem is that each new

“It’s Time To Get Serious”

While some international leaders have decried President Bush for going too far in his comments about Iran, Iraq, and North Korea—labeling them the “axis of evil”—in his State of the Union address, National Security Advisor Condoleezza Rice said his remarks were a call to our allies “to do what all of us must do.”

Speaking on Fox News on Feb. 3, Rice said these three countries pose a serious threat and “it’s time to get serious about it.”

“You don’t get anywhere by pulling punches about the nature of regimes like the Iraqi regime or the North Korean regime,” she emphasized. “It’s not as if anybody really believes that these are good regimes that are just engaging in a little bad policy.”

Rice went on to explain that in the war on terrorism “speaking plainly is the way to rally people, not the other way around.”

These countries “are a clear and present threat to us and to all of the responsible and civilized world,” she said. “The Iranians who spread and support terror around the world, the North Koreans who proliferate these weapons [of mass destruction], the Iraqis who make a region of great importance to us unstable, clearly are a clear and present threat to America, America’s interests, and America’s allies.”

Rice also noted that the focus on these three countries is not a change in US policy. She said they have been on notice for some time, adding that Bush’s words were “a call to the international community, to our friends and our allies, to do what all of us must do in terms of nonproliferation, in terms of cutting off the vehicles for these regimes to get these weapons.”

“I would say to everyone, ‘Let’s step back here,’ and instead of worrying so much about what the President said on Tuesday night [Jan. 29], let’s put equal energy into working to make sure that these regimes don’t get these weapons of mass destruction,” declared Rice.

launch vehicle will likely need years to demonstrate reliability and require continuing investment for quality-control and engineering improvements.

Under USAF’s original strategy for the evolved expendable launch vehicle program, commercial launches would provide much of the capital for those ongoing improvements.

That strategy is on shaky ground because of the significant downturn in commercial satellite launches.

Details of an aid package would have to be worked out, but the goal, officials say, would be to keep each rocket program healthy.

Pilot Is Killed in A-10 Crash

Two USAF A-10 aircraft collided Jan. 17 about 18.5 miles east of Douglas, Ariz. One pilot was killed and the other ejected successfully.

Lt. Col. Lance A. Donnelly, an A-10 pilot with the 355th Fighter Squadron at Davis–Monthan AFB, Ariz., was killed.

The other pilot, Capt. Patrick Bolland, was treated for minor injuries.

The two single-seat A-10 fighters and one other, not involved in the accident, were on a training mission near the New Mexico and Mexico borders.

USAF officials said a board of officers appointed by Air Combat Command are investigating the accident.

C-21 Crash Kills Two

Capt. Brian D. Rizzoli and 1st Lt. William B. Satterly were killed when

a C-21, a small transport jet, crashed Feb. 2 near Ellsworth AFB, S.D.

The two were the only occupants of the aircraft, which is a military version of the Learjet 35A.

Witnesses said the airplane was taking off from Ellsworth when it turned, slowed, and went upside down before hitting the ground, according to the *Dayton Daily News*.

The two airmen and the aircraft belonged to the 47th Airlift Flight at Wright–Patterson AFB, Ohio.

Air Force officials said the cause of the crash is under investigation.

USAF Lifts Some Stop-Loss Restrictions

Air Force personnel officials announced that an exit plan for the current Stop-Loss program would free some personnel in 24 officer and 40 enlisted career fields to retire or leave the service beginning this month.

Officials decided to release some specialties based on a 90-day review of the program. Stop-Loss measures were instituted Oct. 2 to ensure the service could retain the right personnel to conduct Operations Enduring Freedom and Noble Eagle.

In announcing the decision, USAF Chief of Staff Jumper said, “Because this is a very dynamic situation, we will continue to review the Stop-Loss program every 60 days, and if world events change significantly, we will re-evaluate Stop-Loss decisions immediately.”

Public Supports Higher Defense Spending

A Gallup poll conducted days before the President's State of the Union address showed that more than half (58 percent) of Americans said they supported giving defense spending a dominant place in the budget. Just 38 percent favored other programs.

After the speech, the support for increased defense spending soared to 76 percent, according to a *Los Angeles Times* poll conducted Jan. 31–Feb. 3. The support for spending on homeland defense was even higher—84 percent.

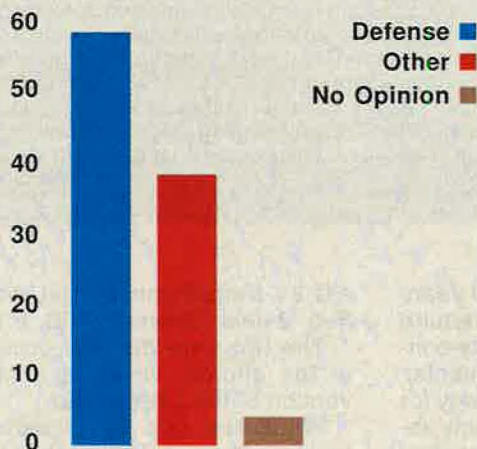
What is perhaps even more remarkable is that more than half of all Americans would support the increase even at the

risk of having to cut back on spending for domestic programs.

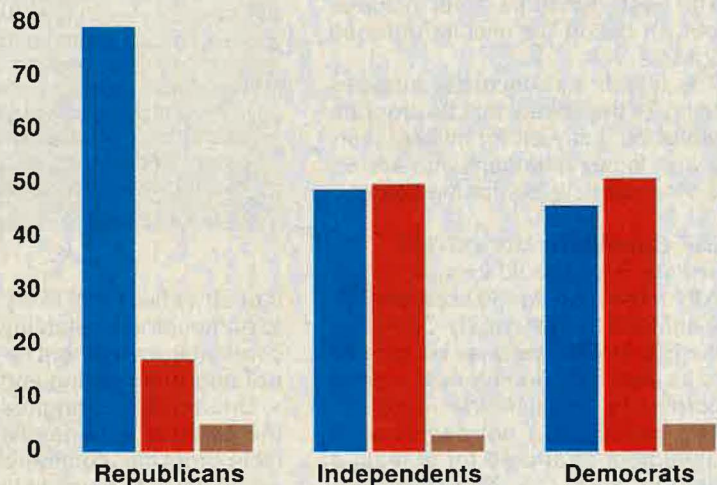
However, both polls revealed differences when viewed along party lines. In the LAT poll, seven in 10 Democrats approved of higher military spending, but the level of support dropped to only 36 percent if domestic programs had to face cutbacks.

In the Gallup poll, which was conducted Jan. 25–27, nearly 80 percent of Republicans said military spending is most important. That compares to less than half of Independents and Democrats.

Which Should Have Higher Priority?



How Priorities Differ by Political Persuasion



Officials said that a number of factors went into the decision as to which career fields to release. One major factor was the balance between active and reserve forces, and another was the evolving mission of homeland defense.

"Clearly, we still need experienced people, and we want all active duty, Reserve, Air National Guard, and civilians to consider remaining in the Air Force to help our nation wage the war against terrorism," said Jumper.

Local personnel flights have information about the specific career fields released from Stop-Loss.

Dutch Award Flying Cross to USAF Pilot

US Air Force Maj. William Thomas received the Flying Cross from Dutch Minister of Defense Frank de Grave at a ceremony at The Hague, Netherlands, on Jan. 23.

It is the first time the medal has been awarded since World War II.

Thomas was assigned as an ex-

change pilot with the Netherlands air force during Operation Allied Force. During a mission on June 7, 1999, Thomas flew his F-16 into an anti-aircraft artillery zone and dispensed flares to draw artillery barrages toward his aircraft when he realized his flight lead, Dutch Maj. Marcel Duivelseijn, had been temporarily blinded by the plume from a surface-to-air missile and was in trouble.

The ploy worked and both pilots escaped.

Thomas is currently the weapons and tactics chief with the 52nd Operations Support Squadron at Spangdahlem AB, Germany.

Troops to Teachers Gets Boost

The Troops to Teachers program got a big boost from the Fiscal 2002 federal budget—\$18 million.

In addition, said DOD officials, the Fiscal 2002 defense budget opened the program to service members who separate from the military after six years or more of service. Previously, the program had only been open to

those personnel who retired from military service.

The program will pay service members up to a \$5,000 stipend to help defray the costs of completing a teacher certification program.

Some participants, said officials, would receive a \$10,000 bonus in lieu of the stipend if they accept a job in a "high needs" school district. A high needs district is defined as one in which 50 percent of the students come from low-income families.

Troops who take advantage of the program must teach for at least three years. Additional information about the program is available at local Air Force base education offices.

F-16s Get Identical Cockpits

Air Force Materiel Command announced Jan. 24 completion of the first retrofit of an F-16 Block 50 fighter aircraft in the Common Configuration Implementation Program.

Over the next 10 years, all USAF Block 40 and Block 50 F-16s will receive the modification—giving them

identical cockpits and improving their communications capabilities.

"This is the biggest electrical modification ever performed on the F-16," said Rick Merrill, F-16 CCIP production chief. And, it's going smoother than expected, with all work either on or ahead of schedule, he added.

Technicians at AFMC's Ogden Air Logistics Center at Hill AFB, Utah, work around the clock in three shifts, said Merrill. The technicians went through nearly a year of classroom and hands-on training to prepare for the work.

USAF is sending entire squadrons of F-16s to Hill for the retrofit. That, said Merrill, makes it important to work smarter and faster.

"Daily, technicians are finding ways to reduce flow time," he noted.

For the pilots, having identical cockpits in all F-16s will mean they will only need to learn one configuration—a significant boon to training.

Milstar Launch Completes Worldwide Coverage

USAF officials announced the successful launch of a Milstar II communications satellite via a Titan IVB booster Jan. 15 from Cape Canaveral AFS, Fla., and successful deployment about 6.5 hours later on Jan. 16.

The deployment, officials said, means the Milstar constellation will be able to provide worldwide, secure jam-resistant communications for warfighters.

This satellite, they said, should be fully operational some time next month after undergoing on-orbit testing.

To ensure the safety of the launch, the Air Force had ANG F-15s from the 125th Fighter Wing at Jacksonville, Fla., fly Combat Air Patrol missions over the Cape for several days before and during the launch. There was also enhanced ground security.

USAF provided the same type of security for the shuttle launch last December. "The Air Force will take all reasonable measures to protect America's national space assets and missions," said Maj. Mike Rein, with the 45th Space Wing at Patrick AFB, Fla.

"And we plan on doing it for all future launches as well," he added.

VA Educational Payments Rise

Veterans Affairs announced that monthly educational reimbursement payments under the Montgomery GI Bill will rise over the next two years.

For full-time students, the rate has increased from \$672 to \$800 per month. This fall it will jump again, to

Guard and Reserve Get More Re-employment Protection

The Secretary of the Air Force James Roche issued a determination that reservists who voluntarily return to active duty to support Operations Enduring Freedom and Noble Eagle will be eligible for the broadest application of re-employment rights.

By law, those rights are normally only extended to reservists who are involuntarily called to active duty.

USAF officials announced in late January that Roche had decided to include volunteers for broader protection under the law.

However, they cautioned, not every Air National Guard or Air Force Reserve Command individual on active duty will get the exemption. For example, those already performing annual tours or on active duty for training would not qualify.

Basically the Uniformed Services Employment and Re-employment Rights Act of 1994 provides re-employment rights for a cumulative period of up to five years of active duty service away from a civilian employer, said Col. Ray Knapp, a personnel reserve advisor at the Pentagon.

"When you are involuntarily recalled, the [five-year] clock stops ticking," he said. "It does not automatically stop for those who volunteer for duty, even during a national emergency."

The individual service Secretaries may declare an exemption to the clock for some volunteers for periods of active duty during a war or national emergency declared by the President or Congress, Knapp stated.

"It's limited to those who are ordered to active duty, or retained on active duty beyond their stated separation date due to Stop-Loss, in direct or indirect support of the national emergency," he said.

Those who were already on an Active Guard and Reserve tour before the national emergency was declared will not automatically be covered, even if their duties now relate to the current national emergency, explained Knapp.

To address all the individual situations at the lowest level, the Air Force has directed that the orders-issuing official, usually the unit commander, be the determining authority. "They will be the stewards of this benefit," Knapp said.

"However, there may be situations where the Secretary of the Air Force will make the determination," he added.

Knapp also noted that the difference regarding nonvolunteer and volunteer status in the law was basically designed with the employer in mind.

"It's a two-way street," he said. "When reservists enter onto military duty even for short periods of time, it places an additional burden on the member's civilian employer and coworkers who must either hire extra people or pick up the workload to fill the void."

Under normal peacetime conditions, stated Knapp, the law limits how much time volunteers can be away from their civilian employers.

In unusual times, there is the exemption rule.

ANG and AFRC personnel eligible for the exemption will have a specific statement on their active duty orders, said officials. For those who received orders before the Secretary's determination, the statement will appear on their separation orders.

\$900, and in October 2003 will rise to \$985.

Additionally, VA educational payments will extend to high-technology courses not necessarily provided at traditional two- and four-year colleges. Veterans may receive a lump sum for certain expensive courses such as those leading to certification of computer network professionals.

VA will cover up to 60 percent of the cost of such high-tech courses beginning in October.

BAS Changes for Enlisted/Officer

For enlisted personnel, the Basic Allowance for Subsistence changed to an entitlement, just as it has been for officers.

The current monthly BAS rate for enlisted members is \$241.50.

The new year also brought a BAS change for officers. The Pentagon lifted the old one percent growth cap on officer BAS.

Now BAS will increase by the same percentage for officer and enlisted members. It increases each January, based on the annual percentage increase of US Agriculture Department food costs.

Another change for enlisted members is that those in pay grades E-1 through E-6 who are assigned to single-type government quarters are entitled to BAS and may also receive essential station messing. That means those personnel will be charged the discount meal rate for all meals made available by a government dining facility, said officials.

The result is that they will be get-

USAF photo by SSgt. Greg L. Davis



A pilot at Shaw AFB, S.C., wears a full-size plastic bag to protect himself from simulated chemical agents during Operational Readiness Exercise Sea Lion in January.

ting a slightly greater amount than when they were receiving partial-rate BAS.

Pavement Is Not All the Same

Before any USAF pilot touched down on an “unknown” airfield in Southwest and Central Asia, the pavement engineers were there to ensure it could handle the load.

A pavement evaluation team from the Air Force Civil Engineer Support Agency at Tyndall AFB, Fla., was sent to check out potential airfields for use during Enduring Freedom. USAF said they arrived Oct. 21 and were still there in late January.

The team determines pavement thickness and the strength of underlying soil, then analyzes the gross

allowable load for each of USAF’s 14 classes of aircraft.

“What the airfield operator needs to know is, ‘Can 5,000 C-17s take off at full weight at this location, and will I still have a viable airfield at the end of that?’” said Capt. Anthony Davitt, chief of the pavement evaluation section.

The team has been conducting pavement evaluations in 10 countries in the region.

“Most airfields can support a few passes of an aircraft,” said Davitt. It’s the team’s job to determine any limitations that may be necessary for longer-term operations.

Davitt said they quickly realized that evaluating Soviet-built airfields would pose unique problems because of differences in Western and Soviet construction techniques.

He said the Soviets used reinforcing steel and put it down in slabs, unlike most European and American airfields. “That presents different challenges, assumptions, things to look for.”

Pilot Braves Icy Water to Save Child and Dog

Maj. Timothy Baldwin, an Air Force Reserve Command C-141 and Delta airlines pilot, rescued nine-year-old Ashlee Ball and her dog from an icy pond Dec. 27 in Bright, Ind.

Ball had gone out onto the thin ice of the pond in her family’s backyard to try to save her dog, which had fallen through into the freezing water, and fell through herself.

Baldwin was driving by and stopped along with other motorists. He was the first to jump in.

Both the girl, after treatment at a hospital in Cincinnati, and her dog recovered.

Baldwin flies with the 445th Airlift Wing at Wright-Patterson AFB, Ohio.

FDA OKs Anthrax Vaccine Facility

The US Food and Drug Administration announced Jan. 31 its final approval for BioPort, the Michigan-based anthrax vaccine producer and the sole supplier in the US, to begin routine distribution of licensed vaccine from its renovated facility.

Beginning in December 1999, the Pentagon sharply curtailed its program to vaccinate all US military personnel when BioPort failed to pass FDA inspections of its facility. DOD officials worried that they would run out of the vaccine, so they began inoculating only those in the most high-risk areas.

DOD began working with BioPort to get the program back on line.

CAF Becomes “Commemorative Air Force”

The members of the Confederate Air Force voted to change the name of the volunteer, nonprofit World War II heritage organization to the Commemorative Air Force—retaining the group’s acronym identification.

The CAF dates its origin to 1951, when Lloyd Nolen purchased a surplus Curtiss P-40 Warhawk. Several World War II-vintage aircraft were purchased over the next few years, including a P-51. Someone painted Confederate Air Force on that P-51’s fuselage as a joke, but the name stuck when the group was officially chartered in Texas in 1961.

Since then the membership has grown to more than 10,000 in 27 states and four foreign countries. About two years ago, the group started discussing a new name because an overwhelming number of members felt it did not really reflect the primary objectives of the organization, CAF officials said.

Among the 1,000 names proposed were Ghost Squadron, Heritage Air Force, and Heritage Flying Museum. The name Ghost Squadron received the second highest number of votes.

Over the years the CAF has purchased more than 140 World War II military aircraft—60 different types. If they are not in flying condition, the CAF restores them.

CAF members take a number of the aircraft out for US air shows each year, performing before an estimated 10 million people.

In addition to preserving military history through its vintage aircraft, the CAF began to collect World War II artifacts and built its first museum building in 1965. In 1989 the American Airpower Heritage Museum was set up as a separate nonprofit organization. The museum’s oral history program has collected more than 2,000 taped interviews of firsthand accounts of World War II veterans.

In 1991 the CAF and its museum moved from south Texas, where they had been for 34 years, to Midland, Tex.

With the FDA announcement, Pentagon officials said they were reviewing all factors relating to future use of the vaccine. They expected to make an announcement about its policy soon.

ESC Speeds E-mail for AWACS

An Electronic Systems Command office went into high gear after the Sept. 11 terrorist attacks to add e-mail capability to the portion of the Airborne Warning and Control System E-3 fleet working homeland defense.

ESC officials announced in mid-January that the AWACS program office at Hanscom AFB, Mass., was able to deliver six units nearly a year ahead of their planned schedule.

The systems, produced by Rockwell Collins, allow the transfer of secure data between the AWACS command center located at Tinker AFB, Okla., and the E-3s via e-mail rather than voice.

"Having the message in writing really reduces the likelihood of error," said 2nd Lt. Bill Hargrove, the program office's high frequency e-mail program manager.

The six units include two portable ground station kits, which have a laptop computer and a high frequency radio, and four airborne kits. The airborne kits consist of a customized laptop computer and printer the size of a large briefcase.

It provides high-speed data transfer, air-to-air and air-to-ground connectivity, and can be used for either classified or unclassified transmissions.

The AWACS unit, the 552nd Air Control Wing at Tinker, began using the new units in early January. The wing had been using two test kits immediately after Sept. 11. Those were sent to support Enduring Freedom over Afghanistan when that operation started.

Program officials said they plan to purchase 32 airborne kits, one for each E-3 in the fleet, plus spares.

Eventually the system will work without ground kits. The airborne units will connect directly to the secure Internet network known as SIPRNET, at 14 fixed ground stations worldwide.

Any aircraft with a high frequency radio and an automatic link establishment capability could potentially use this system, said Hargrove.

News Notes

■ On Jan. 25, the Missile Defense Agency, formerly the Ballistic Missile Defense Organization, and the Navy successfully flight-tested a developmental Standard Missile 3, part of the

Medal of Honor Recipient "Red" Erwin Dies



MSgt. Henry Eugene "Red" Erwin Sr., a World War II B-29 radio operator, died Jan. 16 at age 80.

In April 1945 Erwin, as a staff sergeant, was radio operator aboard a B-29 on a low-level attack on a chemical plant at Koriyama, Japan. One of his additional duties was to drop a phosphorus smoke bomb through a chute in the B-29's floor when the lead bomber reached the assembly area over Japan.

He pulled the pin and released the bomb into the chute, but the fuse malfunctioned, igniting the phosphorus—burning at a temperature of 1,300 degrees. The canister blew back up the chute into Erwin's face, blinding him and searing off his nose. The heavy smoke obscured the pilot's instrument panel.

Erwin knew the bomb would burn through the metal floor into the bomb bay and the crew and aircraft would be lost. Though completely blinded, he located the burning bomb on the floor, picked it up, and stumbled forward. He reached the cockpit and threw the bomb out the copilot's window but was by then a walking torch.

As the smoke cleared, the pilot pulled the bomber out of a dive at 300 feet above the water and turned toward Iwo Jima, the nearest location to get medical treatment for Erwin.

At Iwo, the medics did not think the young radio operator could survive. Army Air Forces officials cut through red tape to get a Medal of Honor approved within hours so they could present it to him while he was still living.

They presented the MOH to Erwin, but he surprised them all by surviving. After 30 months and numerous reconstructive surgeries in the States, Erwin regained his eyesight and the use of one arm. He received a disability discharge at the rank of master sergeant.

The Air Force honored Erwin again in 1995 by creating the Henry E. Erwin Outstanding Enlisted Aircrew Member of the Year Award.

AAF Commanding General Henry H. "Hap" Arnold wrote to Erwin while he was at Iwo Jima: "I regard your act as one of the bravest in the records of this war."

Two-War Ace Gabreski Dies



Retired Col. Francis S. "Gabby" Gabreski died of an apparent heart attack Jan. 31 at Huntington Hospital on Long Island, N.Y. He was 83.

Gabreski was a leading Army Air Forces ace in World War II, with 28 aerial victories. He was set to return to the States after completing 193 missions, had his bags packed, but wangled just one more mission. His airplane was damaged and he had to belly-in. He eluded the Germans for five days but was finally captured and remained a prisoner of war for eight months, until the war ended.

His aerial victories didn't end there. Gabreski racked up another 6.5 victories in the Korean War. He was one of only seven USAF pilots who were aces in both World War II and Korea.

Gabreski went on to command several tactical and air defense wings. He was enshrined in the National Aviation Hall of Fame and was a president of the Air Force Association's Iron Gate Chapter in New York.

Ace Watson Dies

Retired Col. Ralph J. "Doc" Watson, 85, died at his home at Hilton Head, S.C., Dec. 14. Watson earned five aerial victories during World War II in the European and North African theaters.

After the war, he helped establish air bases in Turkey and went on to fly supersonic and experimental airplanes. He was featured in a film "Fighter Ace: The True Aces." He also served as president and chairman of the board of the American Fighter Aces Association.

Former Academy Superintendent Dies

Retired Lt. Gen. Paul E. Stein died Jan. 10 at his home in Basye, Va., after a 14-month struggle with Lou Gehrig's disease. He was 57.

Stein had last served as the superintendent of the Air Force Academy in Colorado Springs, Colo. He graduated from the academy in 1966. Among his assignments, he served as commander of Keesler Technical Training Center and chief of staff at Tactical Air Command.

Sea-Based Midcourse program. This was the fourth in nine planned developmental test flights. Though not part of the test, the kinetic warhead did impact the target.

■ A 22nd Airlift Squadron C-5 crew from Travis AFB, Calif., faced an unusual challenge when it loaded and transported a bottom-mapping twin hull Navy boat to support Operation Enduring Freedom. The one-of-a-kind boat was designed to be hauled by the C-5, but it had only been test loaded once and never flown, stated loadmaster SrA. Michael Turner. Load-

master SSgt. Tracey Heller said there was only about five inches of clearance on each side.

■ USAF officials announced Jan. 17 their basing decision for the first operational wing of F-22 Raptors—Langley AFB, Va. The first F-22s are scheduled to arrive in September 2004.

■ The US and Russia agreed in mid-January to set up several working groups to discuss defense-related issues prior to President Bush's planned visit to Moscow later this year. Russian Gen. Col. Yuri Baluyevskiy said his country would like the groups to reach

a solid agreement on strategic nuclear weapons that Bush and Russian President Vladimir Putin could sign during Bush's visit.

■ Looking for a way to teach engineers how to test and evaluate electronic warfare systems—a discipline not found in engineering schools—the 412th Test Wing's Electronic Warfare Directorate set up a new program, called Electronic Warfare Test and Evaluation University, at Edwards AFB, Calif.

■ L-3 Communications announced Jan. 29 that its Link Simulation and Training division received a \$26 million contract to build two full mission trainers and four weapon tactics trainers for the F-22 program. They are to be delivered to Tyndall AFB, Fla. in February 2003.

■ On Jan. 30 officials at Ramstein AB, Germany, celebrated the opening of the base's new passenger terminal—three times the size of the old facility. Ramstein is slated to be the European theater airlift hub as Rhein-Main AB continues toward closure in 2005. The new terminal, which took three years to build, is expected to be operational this month.

■ Congress approved, in the Fiscal 2002 defense authorization act, a Pentagon plan to create a deputy undersecretary of defense for personnel and readiness. In exchange DOD must eliminate an assistant secretary position, probably the assistant secretary of defense for force management position held by Charles S. Abell, reported *Defense News*. Abell would then become the new deputy undersecretary.

■ AFRC opened a new C-141 schoolhouse Jan. 7 at Wright-Patterson AFB, Ohio. It is a one-of-a-kind facility since the active force schoolhouse closed last year. Only AFRC and ANG units now fly C-141s, the last of which are slated for retirement in 2006.

■ In mid-January, the Marine Corps brought out the first of its new camouflage uniforms. The pattern is so new, the Corps has actually applied for patents. The colors are basically similar to those in use now by the Air Force, Army, and Marines, but the pattern is a collection of tiny squares, like pixels in a computer photograph. Other changes include shoulder pockets, pockets for knee and elbow pads, and easy-care fabric. They'll be phased in by 2006.

■ The Air Force Research Laboratory announced in January an award to Northrop Grumman of a \$22.9 million contract to develop technologies for long-range precision engagement of moving surface threats. The De-

Senior Staff Changes

RETIREMENTS: Maj. Gen. Claude M. **Bolton Jr.**, Maj. Gen. Tiiu **Kera**, Maj. Gen. William A. **Moorman**, Lt. Gen. Lansford E. **Trapp Jr.**, Maj. Gen. Paul A. **Weaver Jr.**

CHANGES: Brig. Gen. (sel.) Bradley S. **Baker**, from Chief, Global Mobility Division, DCS, P&P, USAF, Pentagon, to Spec. Asst. to Dir., Prgms., DCS, P&P, USAF, Pentagon ... Maj. Gen. John R. **Baker**, from Asst. DCS, Air & Space Ops., USAF, Pentagon, to Vice Cmdr., AMC, Scott AFB, Ill. ... Maj. Gen. John L. **Barry**, from Dir., Strat. Planning, DCS, P&P, USAF, Pentagon, to Dir., P&P, AFMC, Wright-Patterson AFB, Ohio ... Maj. Gen. Ronald J. **Bath**, from Spec. Asst. to DCS, P&P, Quadrennial Defense Review/Defense Integration, USAF, Pentagon, to Dir., Strat. Planning, DCS, P&P, USAF, Pentagon ... Brig. Gen. David E. **Clary**, from Cmdr., 51st FW, PACAF, Osan AB, South Korea, to Dir., Homeland Security, DCS, Air & Space Ops., USAF, Pentagon ... Brig. Gen. Michael A. **Collings**, from Cmdr., 82nd Tng. Wg., AETC, Sheppard AFB, Tex., to Dir., Maintenance & Log., ACC, Langley AFB, Va. ... Brig. Gen. Felix **Dupré**, from Exec. to SACEUR, EUCOM, Mons, Belgium, to US Defense Attaché France, DIA, EUCOM, Paris, France ... Brig. Gen. William L. **Holland**, from Dep. Dir., Engagement, CENTCOM, MacDill AFB, Fla., to Cmdr., 51st FW, PACAF, Osan AB, South Korea ... Brig. Gen. Robert H. **Latiff**, from Vice Cmdr., ESC, AFMC, Hanscom AFB, Mass., to Dir., Advanced Sys. & Tech., NRO, Chantilly, Va. ... Brig. Gen. Paul J. **Lebras**, from Vice Dir., Intel., Jt. Staff, Pentagon, to Cmdr., AIA, ACC, San Antonio, Tex. ... Maj. Gen. Steven R. **Polk**, from Cmdr., 19th AF, AETC, Randolph AFB, Tex., to Vice Cmdr., PACAF, Hickam AFB, Hawaii ... Brig. Gen. Jeffrey R. **Riemer**, from PEO, C² & Combat Spt. Sys., Asst. SECAF (Acq.), Arlington, Va., to Cmdr., AF Security Assistance Center, AFMC, Wright-Patterson AFB, Ohio ... Brig. Gen. Arthur J. **Rooney Jr.**, from Dir., Log., USAF, Ramstein AB, Germany, to Cmdr., 82nd Tng. Wg., AETC, Sheppard AFB, Tex. ... Maj. Gen. James E. **Sandstrom**, from Spec. Asst. to Cmdr., AETC, Randolph AFB, Tex., to Cmdr., 19th AF, AETC, Randolph AFB, Tex. ... Maj. Gen. Craig P. **Weston**, from Dir., Advanced Sys. & Tech., NRO, Chantilly, Va., to Vice Cmdr., ESC, AFMC, Hanscom AFB, Mass. ... Maj. Gen. (sel.) Donald J. **Wetekam**, from Dir., Maintenance & Log., ACC, Langley AFB, Va., to Cmdr., Warner Robins ALC, AFMC, Robins AFB, Ga.

COMMAND CHIEF MASTER SERGEANT RETIREMENT: CMSgt. Kenneth F. **Van Holbeck**.

CCMS CHANGE: CMSgt. Michael R. **Kerver**, to CCMS, AMC, Scott AFB, Ill.

SENIOR EXECUTIVE SERVICE RETIREMENTS: David G. **Ardis**, Garry W. **Barringer**.

SES CHANGES: Daniel P. **Barker**, to Technical Dir., AF Studies & Analyses Agency, Pentagon ... William H. **Booth Sr.**, to Senior Advisor, Manpower & Orgn., DCS, P&P, USAF, Pentagon ... David J. **Carstairs**, to Prgm. Dir., Strategic & Nuclear Deterrence C², ESC, Peterson AFB, Colo. ... Walter F. **Jones**, to Dir., Aerospace & Materials Sciences, AFOSR, Arlington, Va. ... Richard W. **McKinney**, to Dep. Dir., Space & Nuclear Deterrence, OSAF (Acq.), Pentagon ... Michael R. **Nicol**, to Technical Advisor, Embedded Computer Sys. Software, ASC, Engineering Directorate, Wright-Patterson AFB, Ohio ... John C. **Truesdell**, to Dep. Asst. Secy., Reserve Affairs, OSAF, Pentagon ... Michael C. **Wicks**, to Senior Scientist, Sensors Signal Processing, AFRL, Sensors Directorate, Wright-Patterson AFB, Ohio ... Virginia L. **Williamson**, to Dep. PEO, C² & Combat Spt. Sys., AFPEO (C² & Combat Spt.), Pentagon ... Patricia J. **Zarodkiewicz**, to Dep. Dir., Financial Mgmt. & Comptroller, AFMC, Wright-Patterson AFB, Ohio. ■

fense Advanced Research Projects Agency is serving as agent for the Affordable Moving Surface Target Engagement program. The contract is scheduled for completion in November.

- NATO is sending two more Airborne Warning and Control aircraft to the US. It already has five AWACS, operating out of Tinker AFB, Okla., assisting with US Combat Air Patrols.

- An armed F-15C fighter on its way to perform a CAP over Washington, D.C., skidded and burst into flames Jan. 17 when its front landing gear collapsed during takeoff at Langley. The pilot was able to exit the aircraft without injury. The flames went out quickly, and the weapons were removed without incident. The pilot and aircraft were from the 60th Fighter Squadron at Eglin AFB, Fla.

- Lt. Gen. Paul V. Hester assumed command of Air Force Special Operations Command, headquartered at Hurlburt Field, Fla., Jan. 16.

- Minnesota ANG C-130s transported members of the Minnesota Guard's 55th Civil Support Team to Minot, N.D., Jan. 18 to help with a train derailment and accompanying spill of anhydrous ammonia, a chemical used in fertilizer. The CST received its federal certification last November. Its area includes Minnesota, part of North Dakota, South Dakota, and Wisconsin.

- Fire department and hazardous material team personnel from the 5th Civil Engineer Squadron at Minot AFB also responded to the train derailment as the ammonia fumes spread over the city of Minot. Base medical personnel set up an urgent treatment center and treated several local residents suffering from exposure to the fumes.

- India successfully test fired a nuclear-capable missile, the Agni, Jan. 25 from its eastern coast. A few days later it test fired a naval version of a short-range surface-to-air missile from its western coast.

- On Jan. 28, the Indian Prime Minister Atal Bihari Vajpayee said there would be no war between India and Pakistan, saying all issues would be resolved peacefully. Each nation had put one million troops on standby. Even with that declaration, border clashes continued.

- Northrop Grumman announced Jan. 18 that it now owns 100 percent of Newport News Shipbuilding.

- USAF announced Jan. 14 that R. Russell Butts and Jacqueline R. Henningsen received Defense Distinguished Civilian Service Awards, the highest DOD award for civilians.



USM photo by Ted Banks

Airmen, Marines, sailors, and soldiers participating in Enduring Freedom watch the Super Bowl from their base camp at Kandahar airport in Afghanistan.

Butts is a research physicist with AFRL's directed energy directorate at Kirtland AFB, N.M. Henningsen is the associate director of the Air Force's modeling simulation and analysis office at the Pentagon.

- The Civil Air Patrol was part of the security force enlisted for the Winter Olympics in Salt Lake City. CAP provided more than 150 members for air and ground support. CAP members also planned to assist with the Paralympics in Salt Lake City this month.

- A USAF RQ-1 Predator Unmanned Aerial Vehicle supporting Enduring Freedom crash-landed Jan. 25 while returning to its base in the theater of operations. Officials said the crash was not the result of hostile fire. The cause of the crash is under investigation.

- DOD notified Congress Jan. 28 that the Weapons of Mass Destruction-Civil Support Teams from the

Arkansas, California, Florida, Iowa, New Mexico, Oklahoma, and Virginia National Guard are certified. Congress has authorized a total of 32 teams. All 10 teams authorized in Fiscal 1999 are certified. These seven new teams were part of the 17 authorized in Fiscal 2000. Another five being formed now, said officials, were authorized in Fiscal 2001.

- F-22 Combined Test Force officials at Edwards AFB, Calif., certified the F-22 for hot pit refueling operations Jan. 25. That means the Raptor can be refueled on the ground while the engines are running—shortening the time needed for turnaround during testing. Officials said hot refueling was not scheduled until after April 2003, but they moved ahead to ensure they have the ability to fly multiple sorties per test mission even if air refueling support is unavailable because of real-world operations.

Index to Advertisers

Air Force Office of Scientific Research	9
Air Force Reserve Command	25
AT&T	3
Boeing	Cover IV
General Atomics	5
Lockheed Martin	Cover II
Motion Models	7
Northrop Grumman	Cover III
<hr/>	
AEF Wings Club	87
AFA Membership	79
AFA Résumé Service	84
AFA Brass Coins	85

By Robert S. Dudley, Executive Editor

Expect Action

"I will not wait on events, while dangers gather. I will not stand by, as peril draws closer and closer. The United States of America will not permit the world's most dangerous regimes to threaten us with the world's most destructive weapons."—**President George W. Bush, Jan. 29 State of the Union address.**

"Axis of Evil"

"North Korea is a regime arming with missiles and weapons of mass destruction, while starving its citizens. Iran aggressively pursues these weapons and exports terror, while an unelected few repress the Iranian people's hope for freedom. Iraq continues to flaunt its hostility toward America and to support terror. ... States like these, and their terrorist allies, constitute an axis of evil, arming to threaten the peace of the world."—**Bush, in State of the Union address.**

What Kind of Byrd?

"I'm one of the hawks ... when it comes to defense, but I'm becoming a little nervous as I hear that we're going to spend more and more and more on the military. It's going to have to come out of somewhere, out of somebody else's hide."—**Sen. Robert Byrd (D-W.Va.), in Jan. 24 remarks to reporters.**

Maritime Strategy

"This [President Bush's major defense budget increase] provides a unique opportunity for the Navy to put forward a bold initiative to correct the steadily declining number of ships in the Naval fleet. ... When you appear before the Congress, I will ask the tough questions regarding the need to build more ships. You will have the opportunity to make your case for a bigger piece of the national defense budget."—**Sen. John Warner (R-Va.), senior Republican on the Senate Armed Services Committee, in Jan. 25 letter to Secretary of the Navy Gordon England and Adm. Vernon Clark, Chief of Naval Operations.**

Veiled Threat ...

"Not mandatory, but strongly encouraged."—**Army Gen. Tommy Franks, commander in chief of Central Command, in Jan. 19 memo referring to the need for US servicewomen in Saudi Arabia to wear a head-to-toe covering, called an abaya.**

Threat Unveiled?

"What it [Franks's message] says to us is that it's [a requirement for servicewomen in Saudi Arabia to wear an abaya] not been rescinded. It's like saying, 'You're equal to us, but you can't eat in the same restaurant, because you're strongly encouraged to eat at one more fitting with your lower class.'"—**John Whitehead, lawyer for Air Force Lt. Col. Martha McSally, who sued the Pentagon to have the abaya requirement lifted.**

"Vastly More Deadly"

"Who would have imagined, only a few months ago, that terrorists would take commercial airliners, turn them into missiles, and use them to strike the Pentagon and World Trade Towers, killing thousands? But it happened. And let there be no doubt: In the years ahead, it is likely that we will be surprised again, by new adversaries who may also strike in unexpected ways. And as they gain access to weapons of increasing power, these attacks could grow vastly more deadly than those we suffered September 11th."—**Secretary of Defense Donald Rumsfeld, in Jan. 31 speech at National Defense University, Washington, D.C.**

Leave That Part to Us

"We in the Kingdom of Saudi Arabia have been your friends when very few people wanted to be your friends. During the Cold War, we stood by you. Our relationship over the years has been based on equity and based on common interests and a shared world view. As your friends and as your allies, we are very proud of our relationship with you. In the current environment, we find it very difficult

to defend America, and so we keep our silence. Because, to be very frank with you, how can we defend America?"—**Crown Prince Abdullah Ibn Abdul Aziz Al Saud, de facto leader of Saudi Arabia, in Jan. 28 interview with US reporters in Riyadh.**

Woolsey's Requirements

"We need Turkey [for any US action against Iraq], but we really don't need the Europeans. Anyways, they will be the first in line patting us on the back, following our success, and saying they were with us all along."—**R. James Woolsey, former CIA director, quoted in Dec. 27 Washington Post.**

The Horror

"If a US serviceman were captured by Taliban forces we—and the US—would be fighting to ensure that he be entitled to protection as a prisoner of war. ... The Geneva Conventions are very explicit about avoiding public curiosity. Imagine the families seeing these pictures or the Muslim community worldwide."—**Darcy Christen, a Red Cross spokesman, in Jan. 22 Wall Street Journal, speaking after DOD released photos of some al Qaeda detainees with their legs in shackles.**

Rumsfeld's Reason

"When they are being moved from place to place, will they be restrained in a way so that they are less likely to be able to kill an American soldier? You bet. Is it inhumane to do that? No. Would it be stupid to do anything else? Yes."—**Rumsfeld, DOD briefing, Jan. 22.**

ISR Deficiencies

"Our ISR posture as a nation is woefully short of the needs, from space to [human intelligence]—every bit of intelligence, reconnaissance, and surveillance capabilities. ... We have to have a more connective and more persistent intelligence network."—**Gen. Gregory S. Martin, commander of US Air Forces in Europe, speaking Jan. 24 at a Capitol Hill seminar.**



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The Administration projects an overhaul of strategic nuclear forces, perhaps with fewer than 2,200 warheads.

Bush's Nuclear Blueprint

By Robert S. Dudley and Peter Grier

FOR decades, the US nuclear deterrent has rested on a "triad" of land-based missile, bomber, and submarine forces. That familiar triad will continue to exist for years to come, but it might become merely a subsidiary aspect of a larger constellation of strike forces, missile defenses, and revitalized nuclear weapons facilities.

That, at least, is the plan as sketched out in the Bush Administration's wide-ranging Nuclear Posture Review, unveiled at the Pentagon on Jan. 9.

This so-called "New Triad" would offer national leaders a broader array of options for ensuring the nation's security, the Administration said. It better reflects today's geopolitical reality, in which the rigidly defined threat of one superpower adversary has been supplanted by the bewildering uncertainties of the post-Cold War world.

The New Triad would require deployment of many fewer warheads, according to the nuclear review, which was more than a year in the making. The US nuclear stockpile can be cut to 2,200 or fewer deployed warheads, said the NPR, as President Bush announced after his November meetings with Russian President Vladimir Putin.

Bush Administration officials firmly believe that such a reduction should not be irreversible, however. Thus, they reject the framework of traditional arms control treaties, negotiated and written so laboriously over the last 30 years, as pieces of

paper that might inhibit US flexibility in years to come.

"Threat-Based" No More

The NPR bills these changes as a much-needed shift from "threat-based" to "capabilities-based" planning. In other words, the key question no longer will be, "What do we need in order to counter Soviet nuclear intimidation?" but "What do we need to handle any contingency likely to arise?"

At a press briefing to announce the new policy, J.D. Crouch II, assistant secretary of defense for international security policy, summed up the basic question this way: "What are the kinds of capabilities that we need to counter the potential adversaries or the capabilities of potential adversaries that are either extant today or that will emerge in the years to come?"

The full NPR is a classified assessment of existing and proposed US nuclear forces and strategy. The study was mandated by Congress in the 2001 defense authorization act. The last full-up nuclear review was conducted in 1993-94. Portions of that study were made public in September 1994.

In some ways, the new NPR completes the work begun in the Clinton-era study. The 1994 nuclear review was itself an initial attempt to revamp US forces to deal with a new, post-Soviet era. However, it was undertaken in an era of continued uncertainty about the direction that Russia

and other former Soviet states might take regarding nuclear weapons.

The US problem in 1994 was finding the correct balance between the acts of “leading” and “hedging,” in the words of then-Secretary of Defense William J. Perry. To what extent, asked the Pentagon chief, should the US cut its stockpile to demonstrate leadership in controlling and reducing nuclear weapons worldwide, while at the same time allowing sufficient margin for error to guard against any turn toward hostility in Moscow?

“Already the Russians are reducing their warheads more slowly than us, and there’s a question about what might happen in the future,” warned Deputy Secretary of Defense John M. Deutch in a September 1994 press conference.

Thus, Clinton’s Pentagon leadership rejected radical cuts in the arsenal, such as an elimination of an entire leg of the US nuclear triad. Instead, defense officials outlined the need for a slightly downsized force structure that closely corresponded with the terms of existing and prospective strategic arms control treaties.

The START I pact, signed in 1991, committed both the US and the Soviet Union (later, Russia) to reduce their nuclear arsenals to 1,600 strategic delivery vehicles and 6,000 “accountable” warheads on each side.

START II, which was signed in 1993 and ratified by both nations several years later but which never entered into force, called for new reductions, down to the 3,000- to 3,500-warhead level.

A START III accord never was negotiated, but the so-called “Helsinki accords,” announced by Clinton and Russian President Boris Yeltsin in 1997, called for further reductions to a level of 2,000 to 2,500 in each nation. This was to be the basis for a START III accord.

Clinton Force Cuts

The Clinton-era review did call for some force cuts. These included retirement of four Ohio-class missile-carrying strategic submarines (reducing the fleet from 18 to 14) and removal from the strategic force of 28 B-52 bombers (shrinking the fleet from 94 to 66). That NPR also called for stripping the B-1B bomber of any nuclear role and accepted an

earlier decision to cap the number of B-2 stealth bombers at 20, down from the planned 75.

The “hedge” aspect of the 1994 NPR included elements that would preserve an option to start building the US arsenal back up again if relations with Russia turned sharply for the worse. The warheads necessary for such a buildup would come from an active reserve of semiretired weapons, said the Clinton NPR. As Deutch pointed out, “I think that both countries have warheads in reserve, warheads out of the military stockpiles.”

In 2001, the incoming Bush Administration also was determined to strike a balance among some important principles, but those principles differed greatly from Clinton’s.

■ **Russia.** Bush wanted to recog-

nize—formally—the dramatic change in US relations with Russia. Almost from the beginning of his term in office, Bush has sought closer cooperation with his Russian counterpart, Vladimir Putin. He insists that, today, Russia poses no threat to US security and vice versa. In the words of Secretary of Defense Donald Rumsfeld: “The US will no longer plan, size, or sustain its forces as though Russia presented merely a smaller version of the threat posed by the ... Soviet Union.”

■ **Treaties.** The new Administration was determined to dispense with the formal and frequently Byzantine structure of strategic arms control between Washington and Moscow. As Administration officials saw things, signed treaties such as the

Shrinking Superpower Arsenals

United States	Dec 1994	Dec 2001	Change
ICBM, SLBM, Bombers	1,838	1,238	-600
Warheads, Force Loadings	8,824	5,949	-2,875
Missile Throw Weight (metric tons)	2,176	1,732	-444
Russia	Dec 1994	Dec 2001	Change
ICBM, SLBM, Bombers	1,956	1,140	-816
Warheads, Force Loadings	9,568	5,520	-4,048
Missile Throw Weight (metric tons)	5,930	3,320	-2,610

Source: State Department, “Final START I Treaty Strategic Offensive Arms Levels,” Dec. 5, 2001.



Staff photo by Guy Acelo

Fewer Warheads. The Bush plan calls for cutting deployed warheads by two-thirds, at least. Here, a USAF maintainer fits the last of 10 re-entry vehicles atop an LG-118A Peacekeeper ICBM.

START series may have made sense in the context of the Cold War but in today's world would only constrain US options and limit its flexibility for years to come.

■ **Defenses.** Bush was prepared to deploy strategic defenses as fast as possible. The Bush team knew that any President's time in office is limited, and they wanted to take concrete steps to put the nation on an irreversible path toward missile defense.

When the Bush Pentagon team combined these principles with the existing and planned nuclear force structure and doctrines, the result was a blueprint that it bills as a major change in US strategy. As stated by Rumsfeld in a letter to Congress, "This Nuclear Posture Review puts in motion a major change in our approach to the role of nuclear offensive forces in our deterrent strategy."

The unclassified version of the NPR states anew the basic goal of reducing the nation's nuclear holdings, over 10 years, to no more than 2,200 and perhaps as few as 1,700 operationally deployed warheads, as announced by Bush in his November summit with Putin.

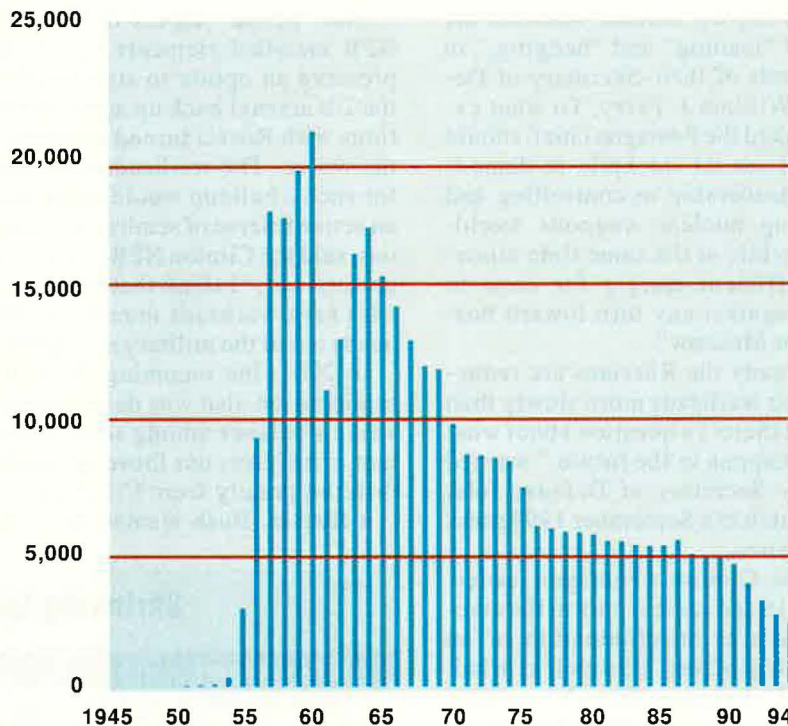
Two Steps

At present, the US warhead stockpile hovers at START I levels—around 6,000—according to Defense Department officials who briefed reporters on the NPR. The Pentagon's interim goal is to cut this number to 3,800 by 2007. A second cut—which would do away with 1,600 to 2,100 more warheads—would play out over the ensuing five years.

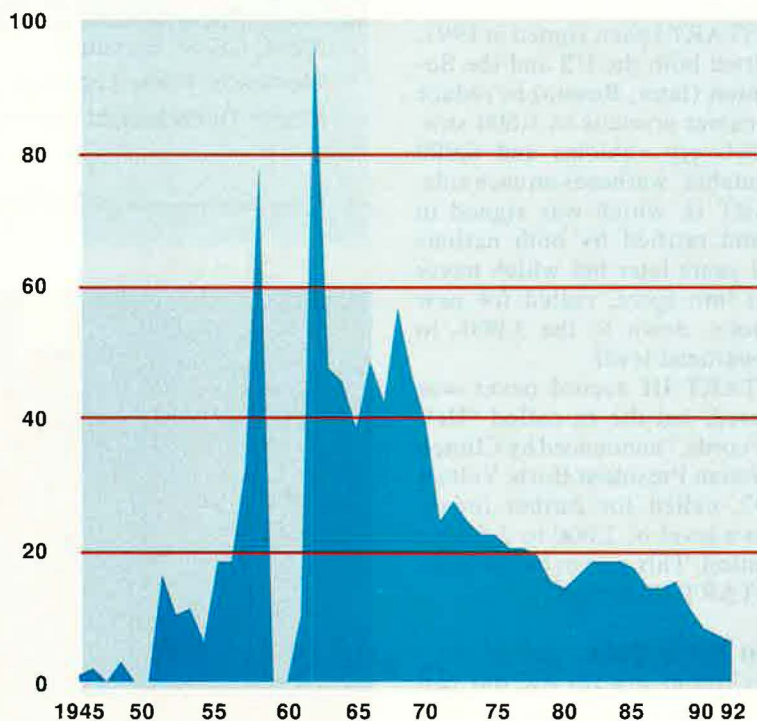
Much of the initial reduction will result from force structure decisions taken in the Clinton years. These include elimination of four Tridents, withdrawal from nuclear service of the B-1B, and retirement of the 10-warhead Peacekeeper ICBM, elimination of which was included in START II.

Pentagon officials were frank to say that they have not determined how to make the second round of reductions. "Beyond FY '07," said Crouch, "we'll be making the force structure decisions on how we will be bringing down the force to 1,700 to 2,200 operationally deployed warheads." In general terms, officials said, the reductions would stem from removing warheads from weapons

Total Megatonnage of the US Nuclear Weapon Stockpile



Total US Nuclear Tests From 1945 to 1992



All Trends Down. While the count of US and Soviet/Russian warheads has been declining for about a decade, downward trends have long been evident in other nuclear areas. The chart at the top shows that US nuclear megatonnage—that is, the raw explosive power of weapons—has been declining since the early 1960s as weapons became more accurate. The number of US nuclear tests—another key indicator of nuclear activity—spiked in the early 1960s and ended altogether in 1992. The Bush plan, however, envisions a possible need to resume testing.

such as the triple-warhead Minuteman III ICBM and the five-warhead D-5 submarine-based missile.

In the context of overall reductions, a key phrase is “operationally deployed.” The United States, for purposes of arms control discussions, diplomatic talks, and day-to-day planning, will focus only on weapons actually deployed on operational launchers. However, a second, non-operational group of warheads will be maintained. An unknown percentage of warheads withdrawn from active service will not be destroyed but rather held in reserve.

DOD has made no final decisions about the makeup of this reserve stockpile, according to officials. They point out that most arms control treaties do not require warhead dismantlement—and that the Russians still maintain extra warheads, as well.

For years, the US has had both active and inactive warheads on its nuclear bench. The active stockpile is an intact weapon, fully ready to be deployed and used. An inactive warhead, in contrast, has been stripped of its limited-life components such as neutron generators.

“When the weapon is transitioned to the active stockpile from the inactive, those components are reinstalled in the weapon,” said John Harvey, director, Office of Policy, Planning, Assessment, and Analysis, Department of Energy.

Critics charge that the Bush Administration’s continuation of this “hedge” practice of saving decommissioned warheads somehow makes a mockery of its claim to be making deep nuclear force cuts and that its plan amounts to a shell game.

Levin’s Heartburn

Charged Sen. Carl Levin (D-Mich.), chairman of the Senate Armed Services Committee: “It is quite a stretch, it seems to me, to be talking about major cuts in the number of nuclear weapons and to give the impression that you are making major reductions in nuclear weapons if you are simply deciding unilaterally we are going to take some weapons off planes and put them in a warehouse, ready to go back on planes in a matter of weeks or days.”

Administration officials point out that the process of warhead destruction entails more than just loosening bolts and screws and throwing old



Staff photo by Guy Acelo

Ace in the Hole. DOD decided to preserve the ICBM leg of the triad for the indefinite future. Here, a missile crew conducts maintenance on a Minuteman III at F.E. Warren AFB, Wyo.

parts in the trash. Demilitarization is a difficult and expensive process, and in its current state, the US nuclear industrial infrastructure might not be able to handle large-scale dismantlement.

Nor is it right to imply that the Bush NPR is proposing fake reductions that will simply remove weapons from delivery vehicles and then hide them in secure warehouses somewhere. Crouch stated flatly, “There will be weapons that will be destroyed.”

He added, “This is what we might call truth in advertising. There are no phantom warheads here. This is the actual number of weapons that we will deploy on the force.”

The Bush review contained more than just specific force decisions. The underlying rationale is that the United States, in today’s chaotic world, faces a larger number of adversaries than it has in the past. Pentagon officials explain that the very term “strategic deterrent” needs to be broadened to include more than nuclear warheads.

During the Cold War the size of the US nuclear arsenal was determined by the size of the Soviet threat. All other strategic threats were “lesser included cases,” according to Crouch.

Today, Crouch continued, those once-subsidary threats have become primary and dangerous. They are also less predictable. In this view, the old considerations of exchange ratios and

throw weight will have little bearing on whether the US can deter Iraqi dictator Saddam Hussein from using weapons of mass destruction against America or its allies.

Nor can the US be sure it even knows the identities of all the world’s Saddams. The sudden emergence of the Taliban Islamic extremists in Afghanistan and al Qaeda terrorists throughout the world as major strategic threats only highlights this unpredictability.

“I think capabilities is a great way to go, because you can measure capabilities against anybody, whether he’s an enemy or not,” said one retired Air Force officer with long experience in nuclear matters. “Whether he’s an enemy or not is sort of what you think about him on that particular day.”

The bottom line, according to the latest NPR: The United States must stop measuring the value of its deterrent against the known, Soviet-built nuclear arsenal in Russia and instead focus on the weapons and policies that will be required to deal with the unknown threats and pressures of the new world. “A broader array of capability is needed to dissuade states from undertaking political, military, or technical courses of action that would threaten US and allied security,” said Rumsfeld.

Wash Out the Russians

One defense expert familiar with the nuclear planning process main-

tains that Bush must have made some dramatic changes to the US strategic guidance that long has determined nuclear force structure. The guidance, which is the province of the executive branch, tells military officers what they are to plan to achieve with nuclear weapons. For decades, the mission was to be able to attack and disable Russia's offensive forces and capability for waging war.

"And with that guidance, you can't get to 1,700 [total operational warheads]," said this defense expert. "You had to wash out the Russians, and I guess that's what they did. I mean, they washed them completely out."

The traditional US triad will exist into the foreseeable future, under Bush plans. The current force of land- and sea-based ICBMs and bombers will continue to play a vital role until at least 2020, the Pentagon explained.

To this end, the Administration plans to fully fund life extension programs for all systems that need them. In terms of a system's average age, some strategic platforms are already quite elderly:

- Minuteman III ICBM, 26 years.
- B-52H strategic bomber, 40 years.
- Trident submarine, 10 years.
- D-5 submarine missile, nine years.

Bush Administration defense officials said they intend to study possible alternatives for follow-on sys-

tems. At this point, however, actual delivery of any such new platform wouldn't take place until far in the future.

However, plans call for this old triad of nuclear weapons to form only one part of the first leg of a New Triad, according to the Bush nuclear review. The three points of the New Triad would be strike forces, strategic defenses, and a more responsive infrastructure.

The most innovative part of the New Triad concept is this: The strike force leg would comprise not only nuclear but also non-nuclear weapons. Improvements in miniaturization, explosives, and precision guidance in conventional weapons hold out a promise of greatly improved performance against hard and deeply buried targets, according to Bush officials. A more robust conventional strike capability could bolster deterrence of rogue states or terrorists who might believe the US would not respond with nuclear weapons to biological or chemical weapon attack and thus would not respond at all.

The proposed transformation of four Trident SSBNs into enormous, stealthy cruise missile carriers offers one example of non-nuclear strike development, said the Pentagon. Another: special conventional warheads that would burrow deeply below ground level to destroy leadership bunkers and weapons facilities.

Missile defenses—both active and passive—are similarly intended to reduce dependence on offensive nuclear forces to enforce deterrence, in the Bush strategic calculus. These will not be perfect, but they do not need to be perfect.

"By denying or reducing the effectiveness of limited attacks [on US territory or forces], defenses can discourage attacks, provide new capabilities for managing crises, and provide insurance against the failure of traditional deterrence," according to Rumsfeld.

The Dissuasion Factor

In the view of some in the Administration, such defenses might dissuade nations even from attempting to acquire ballistic missile technology and nuclear weapons. Thus they might add to US security even if they are never tested in actual combat.

The Administration announced late last year that it would withdraw the United States from the 1972 Anti-Ballistic Missile treaty, the better to develop and construct active defenses against ICBMs.

That step has not stirred up as much controversy as opponents predicted. Russia remains opposed to the move but does not "make a tragedy of this fact," said Gen. Col. Yuri Baluyevskiy, first deputy chief of the General Staff of the Russian federation armed forces. In other words, Russia will learn to live with limited US missile defenses.

Despite Russia's equanimity, some key members of Congress remain adamantly opposed to accelerated defense deployment. These critics claim defense technology remains unproved even after years of work and billions of dollars. It can be easily spoofed by balloons or other countermeasures, they assert. A rogue state would be much more likely to try and sneak a nuclear weapon into the US in a shipping container or truck than via missile, say critics. Plus, the effort costs money.

"There is a huge issue in missile defense separate and apart from the ABM Treaty issue," said Levin. "That issue is whether or not it makes sense for us to spend huge resources to deploy a system against the least likely [nuclear] threat."

The third aspect of the New Triad, a responsive infrastructure, is perhaps less self-explanatory than the

Staff photo by Guy Aceto



Still in Business. The youngest B-52 is 40 years old, but the BUFF continues to be a major part of the strategic arsenal, even more so now that conventional strike has a key role.

others. In essence, it means improvement in the ability of the US to maintain and improve its nuclear weapons—or build new designs, if necessary.

Since the end of the Cold War, the US nuclear weapons infrastructure has atrophied, according to the new NPR. This was the result of both disuse and policy decisions. The United States, for example, has not conducted a nuclear test detonation in a decade. Since 1992, Washington has observed an informal moratorium on such testing.

The Bush Administration announced that it will continue to adhere to the moratorium. “The President is observing the moratorium and has said so,” noted Rumsfeld.

However, the new Administration opposes ratification of the Comprehensive Test Ban Treaty, unlike the Clinton Administration. It wants to rebuild the nation’s ability to carry out an underground nuclear test, if that is needed to ensure the safety and reliability of America’s nuclear weapons.

“We need to improve our readiness posture to test from its current two- to three-year period to something substantially better,” said Crouch.

“Serious Challenge”

This step seemed timely. On Jan. 2, the Department of Energy released a report, prepared by its inspector general, that called attention to continuing problems associated with the safety and reliability of the nation’s nuclear weapons, which without nuclear testing, have become a “most serious challenge area.”

Improvement of the nuclear weapons infrastructure would permit the US to reduce its current arsenal more comfortably, according to the Bush NPR, secure in the knowledge that it could respond quickly to technological surprise or a change in geopolitics.

Knowledge that the US had not written off the ability to create and test new weapon designs might also dissuade any future adversary from starting a new competition in nuclear armaments, in that the US could respond simply by making a political decision to restart production.



Staff photo by Guy Aceto

Always Ready. Despite a dramatic drop in nuclear tensions, the need to be prepared continues. USAF troops keep their edge in exercises such as this one with a training version of the B-61 weapon.

New strategic arms control treaties (such as a signed, ratified, and in-force START III accord) clearly would inhibit Washington’s ability to pursue a future nuclear buildup. That, in fact, would be the point of such a treaty. But it is also the major reason that the Bush Administration is resisting Russia’s desire to codify deep reductions in a detailed, written form.

On a recent visit to the Pentagon, Baluyevskiy spoke to the press about this disconnect. Where the US wants flexibility, Moscow desires transparency and predictability, he said. “We are for irreversibility of the reduction of the nuclear forces,” said Baluyevskiy.

Not every expert agrees that the Bush nuclear program represents a true break with the Cold War past. The NPR’s planned force structure and warhead levels—and least those envisioned for 2007—are comparable to those planned by Clinton, they note. Even a level of 2,200 warheads might reflect a continued emphasis on counterforce targeting of Russian weapons, some maintain.

One skeptic is Jan M. Lodal, a National Security Council official during the Nixon and Ford Administrations who also held high Pentagon positions in the Clinton Administration.

“There is no need to keep American force levels as high as 2,200 offensive weapons,” he wrote in the *New York Times*. “That number comes out of war planning calculations that presuppose extended deterrence to protect Europe from a Soviet invasion—a mission no longer necessary in today’s world. If that mission were dropped, 1,000 nuclear weapons could meet our post-Cold War nuclear security needs.”

Those needs, he said, boil down to deterrence of Russia and China, deterrence of attacks by rogue states, and “the very unlikely (but not impossible) need to use a nuclear weapon to pre-empt chemical or biological attack on the United States.”

Bush officials insist that their plan adequately addresses the problems of today’s security environment. It reduces American reliance on nuclear forces with an approach that offers some non-nuclear deterrent options and provides synergies between all parts of defense, they say.

It is, said the Pentagon study, “the first step in military transformation” of United States forces.

“The Cold War is over,” said Crouch. “We have a nuclear capability that was built then. ... We are transforming our forces in a way that ... is much more appropriate to the security environment and the threats that we believe we will face in the future.”

Robert S. Dudney is the executive editor of Air Force Magazine. Peter Grier, a Washington editor for the Christian Science Monitor, is a longtime defense correspondent and regular contributor to Air Force Magazine. His most recent article, “Turkey Stands Forward,” appeared in the February 2002 issue.



At Moody AFB, Ga., the next generation of pilots flies with a next generation trainer.



Photography by Greg L. Davis

Texans Built for Two

A pair of T-6A Texan II trainers from Moody's 3rd Flying Training Squadron fly over southern Georgia.

This past November, the first class of student pilots to train exclusively on the T-6A Texan II began flying at Moody AFB, Ga. The students, who are undergoing Joint Specialized Undergraduate Pilot Training, use USAF's newest trainer to learn the flying skills basic to all military pilots.

At Moody, the 479th Flying Training Group—which was activated at the base in July 2000—conducts training through three operational units: the 49th and 435th Flying Training Squadrons, both using versions of the AT-38 trainer, and the 3rd FTS, operating the T-6As shown here.



DOD began the drive for a new USAF and Navy trainer in the 1980s. Raytheon won the contract for the aircraft element of the Joint Primary Aircraft Training System in 1996. JPATS also encompasses simulators, training devices, and computer management systems.



The T-6A is to replace USAF's T-37 and the Navy's T-34C over the next eight to 10 years. The first production T-6A flew in July 1998. Air Education and Training Command at Randolph AFB, Tex., took delivery of the first operational version about two years later.

The new trainer is a single-engine turboprop with stepped-tandem seating (as shown at right) instead of side-by-side seating. The instructor sits in back, on a seat slightly raised to improve visibility. The aircraft has features designed for ease of maintenance, such as large, hinged access doors on the sides of the fuselage, giving maintainers easy access to avionics and other equipment.





The Texan II was named after one of the most widely used aircraft, the North American AT-6 Texan. The original T-6 first flew in 1935 and was flown by nearly every Army Air Forces pilot who trained during World War II. At least a dozen allied nations also flew the trainer.



Today's Texan II has a maximum speed of 368 mph, with a ceiling of 35,000 feet. Its single engine delivers 1,100 horsepower. The aircraft's thrust-to-weight ratio enables it to make an initial climb at 3,300 feet per minute. It is fully aerobatic. Unlike the T-37, a student can recover from a spin simply by reducing power and releasing the stick—the T-6A does the rest.

At Moody, the 3rd FTS has taken precautions to ensure safe flightline operations around the T-6A's four-blade aluminum propeller. Ground crews painted large red arcs on the tarmac to mark each aircraft's parking space. This reminds everyone to keep clear of the prop, which has a diameter of 97 inches.

The Texan II's wide field of view benefits the student and instructor, especially when it comes to visual approaches and learning formation flying. The canopy, as well as the wing and tail assembly leading edges, windscreen, and engine inlet, were designed to withstand bird-strikes. In an emergency egress situation, a pilot can pull a firing handle to activate a Martin-Baker ejection seat. The canopy fracturing system automatically severs the transparencies from the canopy to provide a clear path for the seats.



Photos by Greg L. Davis



The 3rd FTS was activated at Moody in April 2001, and this first class of Texan II students began training six months later. The 15 students will graduate from their six-month course next month.

About 250 students will train at Moody each year, with classes starting every three weeks. The students undertake hours of academics and practice on simulators before getting into the cockpit.

State-of-the-art instrumentation includes liquid crystal displays resistant to glare from sunlight. Because the cockpit is fully pressurized with an anti-G system, training can take place at higher, less-congested altitudes.





The trainer's tricycle-type landing gear is down and locked as the T-6A above makes its final approach to Moody.

Below, T-6As flying in a "finger four" formation make a right-hand turn together. Tight formation flying enhances situational awareness as well as attention to the basic stick-and-rudder skills.



USAF is slated to receive about 400 T-6A Texan IIs. Laughlin AFB, Tex., is next on the list, followed by the other Air Force JSUPT bases: Columbus AFB, Miss., Randolph, Sheppard AFB, Tex., and Vance AFB, Okla. For the Navy, Texans will be assigned to NAS Corpus Christi, Tex., and NASs Pensacola and Whiting, Fla.

After graduation from primary training, USAF pilots go on to training for the bomber-fighter, airlift-tanker, or helicopter track. Whatever their next step, pilots from Moody's JSUPT Class 02-01 will always have the distinction of being the first trained in the Texan II. ■

Organization

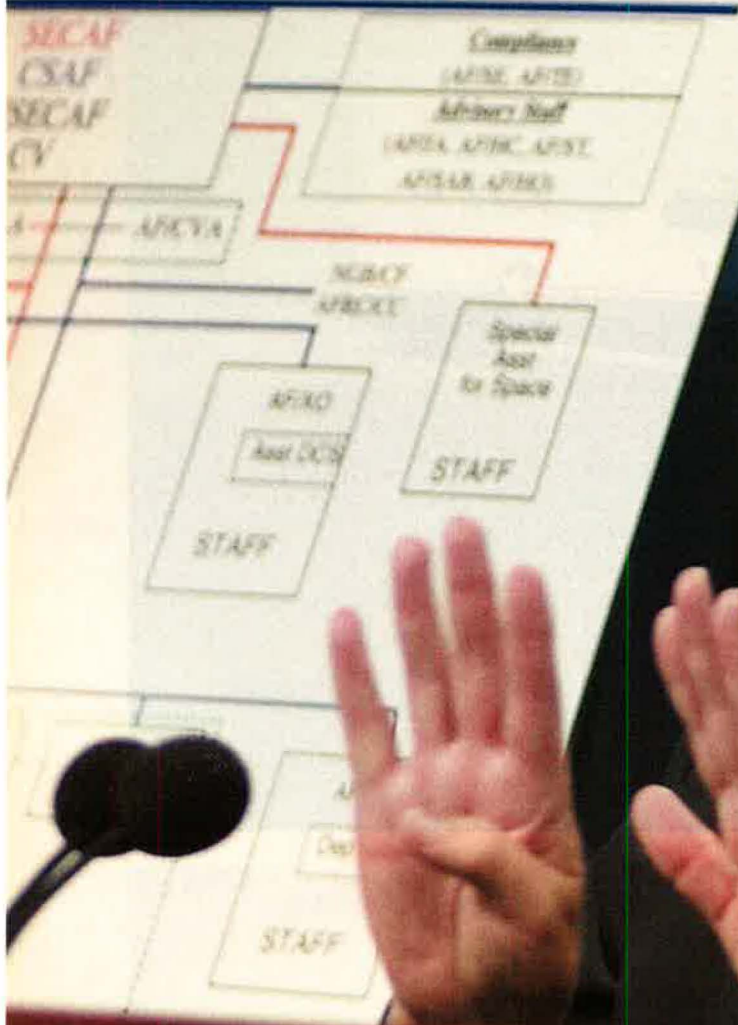


Photo by TSgt. Jim Varragy



Roche speaks at a briefing at the Pentagon on Dec. 18, 2001.

The Secretary surveys the issues, from Combat Air Patrols to tanker leasing.

Roche Sorts It Out

James G. Roche, Secretary of the Air Force, met with the Defense Writers Group in Washington, D.C., on Jan. 18 to discuss issues facing the service as it continued engaging in combat in Afghanistan and planned future structure and strategy. These are excerpts of his remarks.

Noble Eagle: How Long?

“Roughly, we have committed today 260 planes, 350 crews, and about 11,000 to 12,000 airmen for the defense of homeland. That includes three parts: the CAP [Combat Air Patrol by F-15s and F-16s flying over US cities], AWACS [Airborne Warning and Control System aircraft], and the fact that we have C-130s pre-positioned around the country to aid any emergency action team—the sensible things you would expect of us.”

“With regard to the CAP, do you recall why it was done? It was done after the 11th, when we didn’t have airport security the way it is now, when we didn’t have strengthened [cockpit] doors on airliners, a series of things like that. And you went to the last resort, which is to potentially deflect or shoot down a plane. That was never intended to be a permanent thing. The issue is, at what point can we start to come back from the full package we’ve had out there to something that may be more easily managed?”

“Can we maintain the confidence of the government and the American people [without constant CAPs], recognizing that much has been done on the airliners, much has been done on airport security, and can we start to have a less burdensome posture?”

Catch-22

“The biggest hit we are having is on training. AWACS, for instance: ... When they are free to do training, there are no fighters because the fighters are all tied up in CAP. When the fighters are free, the AWACS are busy. We can’t get the regular training.”

Caution About Lessons Learned

“Let me make the following points about the current conflict [in Afghanistan]. ... We have had a very minimum air defense problem, to be very blunt. This is not a massively air-defended country. The air defense system was really taken out, what there was of it, in the first couple of days. And ... we have had terrific weather. ... You have to be careful with inferences you try and draw from the current conflict.”

More Bombers

“I am not wrestling with [the question of buying] more B-2s. ... Bombers ... are still superb going after a large collection of fixed-point targets. ... But you don’t need as many bombers because you carry so many bombs per bomber and each of them is so accurate that you don’t have the problem of the old days where you had to drop a hundred to get a hit. [Now] you drop one and get a hit. ... If it is a fixed point, we’ve got that solved, guys. ... It is not the problem. The problem that we saw, beginning in the Gulf War and Kosovo and even here, is things that move and things that are interleaved with friendlies.”

Fighters vs. Bombers

“What we have found is that there is probably in the future going to be troops in a number of places, probably very distributed ... and therefore also having aircraft that can also be distributed over the top of a hostile country is

probably the best way to go. ... Because we can hook to the troopers on the ground in ways we never could before, fighter-bombers take on a much greater importance.”

The Big Bomber UCAV ...

“If big bombers carrying lots of [bombs] are going to go to fixed points in the sky and drop weapons against fixed points on the ground, why do we need pilots in them? So maybe the future bomber is the real UCAV [Unmanned Combat Air Vehicle]. ... And then you say, ah, that has certain advantages. It can be bigger. How do you refuel a tiny little UCAV in the air?”

... And the Smaller UCAVs

“We tend to think of UCAVs ... as small and highly maneuverable. ... But that is just a two-way cruise missile. ... The bandwidth in your head is bigger than anything we know how to bring back right now. Because you have archival information, you have hunches. ... Now if you try and bring all that back [in bandwidth] you are paying a fortune. Why don’t you just put somebody in the plane? So, where does a person make a real difference? ... When the situation is more complex. ... If you have one pilot per UCAV, how is this efficient? So, if they are small, you want to learn how to fly them in swarms. That starts to become a software issue, big time.”

Saudi Cooperation

“The Saudis have cooperated with the Air Force ... in everything we have asked of them. ... I have not been asked to look at alternatives [to using Saudi facilities], and so I genuinely can’t comment on it, other than that we have had fabulous use of Prince Sultan Air Base, especially the Combined Air Operations Center there.”

“I think it would be difficult [to replace capabilities in Saudi Arabia]: ... PSAB, especially the air operations center. But that doesn’t mean you could not. One of the things about modern technology is that if you can control, from a military point of view, the airspace over Afghanistan for Army-Navy-Air Force-Marines from a combined center in PSAB, you could do that from a combined center [elsewhere].”

Working With the Ground Troops

“This is something we started working with the Army on, [with] special forces, back in the summer, really at [Deputy Defense Secretary] Paul Wolfowitz’s behest. He sort of chided me on, ‘Why can’t we work more closely with troops on the ground?’ I said I don’t understand why they couldn’t. I found nobody in the Army disagreed and nobody in the Air Force disagreed. We just hadn’t looked at it for awhile.”

“My idea, which is now starting to come to reality, is the trooper is inserted somewhere, special forces or Army, takes a pair of binoculars, which are built such that he pushes a button, he gets a laser on a target, and he knows instantaneously the GPS position of that target. And then he pushes another button—which he makes sure doesn’t communicate his own position—and communicates [the enemy] position. That simple.”

"Mistakes can be made. You don't want him to send his own [position]. But we can deal with that by technology that says, no, you can't send your own position unless, God forbid, you are in that position where you feel you absolutely have to, then we'll make you go through three or four steps so that, consciously, you are bringing something down on you."

Supporting the Ground Element

"I think our Air Force is thinking, more in the future, in a transformed military, we want to be able to support this light, dispersed Army, and we have now demonstrated we can do it. ... We have found that we are able to do something that we have not been able to do for a very, very long time. And that is to relate airpower to troops on the ground."

Hats Off to the CINC

"We have had [in Afghanistan] a CINC who has allowed us to do a lot of experimentation in the area of intelligence, surveillance, reconnaissance, putting lots of things together and try to fuse them and see best how to do that; and Gen. [Tommy R.] Franks really deserves credit for letting us do it."

"Put ... Rivet Joint, Joint STARS, U-2, Global Hawk, and Predator, ... and ... Navy P-3 ... all in there and see how we can put information back and forth. ... Never before have we brought all that into a Combined Air Operations Center with naval officers, special forces officers, Air Force officers."

Goals for the Future

"We have ... to achieve two goals. ... Can we have intelligence, surveillance, reconnaissance 24-hours-a-day, good weather/bad weather, seven days a week for a year? Can we do that for a particular part of the globe? And then, secondly, can we move, over a number of years, to develop capabilities to have almost instantaneous attack?"

Inward Look

"The FAA [Federal Aviation Administration] and the Air Force are both spending money to link the military radars and the civilian radars around the country. ... We are trying to do it by hooking that which exists together to be able to give us a good enough picture ... for the Air Force to respond to the FAA, ... to be able to respond to an FAA 'track of interest' as needed. ... And in areas of the country where we have a lot of radars—between the approach radars for airports, route radars, military radars—you can [watch domestic airspace] without AWACS. ... Not that the Air Force would have any control over the airspace. That is the FAA's role. ... You wouldn't want us to have that."

Funding the F-22

"In [the Fiscal 2004 budget], will we look at some of the F-22? I don't want to. I hope to take this program and produce—the most conservative numbers were 295 planes. If we can manage this thing well, we can build as many as 331. Under the program we've put forth with

the Congress, the Congress is giving us the chance to take this challenge on. If we don't get 331 planes, every plane we get less than that is no one's fault but ours. And I like that kind of a deal. That means the better we are, the more planes we build. But we'll build the planes. We have to."

Bridging to the Joint Strike Fighter

"I don't see [a Service Life Extension Program for the F-16 fleet] right now. The philosophy that I am employing is to not spend money on old technology but to spend money on new technology. ... We are not buying attrition reserve F-16s anymore. We may be taking down numbers of F-16s per squadron to bridge to the Joint Strike Fighter. Now, if the Joint Strike Fighter should run into some crisis, we can change, because there is an international buy of F-16s that is going on. ... That line will go for a number of years, so we have the flexibility to ... buy back into the F-16."

Airlift

"How does lift look for the future? Pretty good. With the multiyear [buy] for the C-17, it looks very good. We are taking a look at multiyear for C-130s as well. ... We are looking to refurbish some of the C-5Bs. In the process, we will take a look at one of the [C-5As] to see if the As are worth doing. ... So the lift future picture seems quite sensible."

No Commercial C-17s Just Now

"We are still looking to see if there is a way of reducing our costs by combining them with a production run from Boeing that could include some commercial ones, but it missed this cycle."

Air Supremacy

"We still need air supremacy. We note the Su-27s/Su-30s have a level of technology that is very Western. ... Therefore, the F-22 is going into production, fully funded. We have an incentive-based contract, incentive for [Lockheed Martin] and the Air Force that manages these things well on behalf of the taxpayer. If that is the case, we will do better."

Harnessing Space

"We have to take a good look at space and harnessing space. ... We want to think of space and each satellite not as something that has to do the job all by itself, but how does it work with things like Global Hawk, Joint STARS, Rivet Joint, etc.?"

Space Difficulties

"We are wondering why we are having some of the difficulties [of reducing the cost of space systems] and trying to go back and take a look. Is it a matter of basics? Is it a matter that we've lost a generation in the industry? Is it a matter that requirements have been too easily set? Is it a matter that we've assumed software can too easily be written? ... These are systems that you cannot go and make a quick change to them, like you can aircraft. ... These things are up there, so you've got to do it right to start with. We need to recognize that we

have to go after these differently than we go at airplanes.”

Smallsats?

“When we start something like space based radar, can we ... make sure early on that we don’t fall into the same traps? ... Do we demand too much of each space system? Do we assume the space system is supposed to do so many things, including curing world hunger? Or should we be thinking of space systems as part of a larger portfolio—and therefore not try to get the supermaximum, go way the hell out on the efficiency curve and therefore get the cost very high.”

That Horrible Expression

“The horrible expression: ... My boss challenged me by saying, ‘What kind of an organization would create an expression like ‘high-demand, low-density’ and not fix the problem?’ We are looking at that. And there you heard us try to say, look, we think we have to migrate to a new platform.”

Tanker Mania

“The tanker has become critical. The average age of our tankers is 41 years. We have more 707s than I think anyone in the Air Force deserves in this century, and it is time to draw a line.”

“We would like to migrate to another vehicle, and one of the keys there is the intelligence, surveillance, reconnaissance aircraft. ... We have a nice series of those. And then the tankers, we recognize, are in the [operating] area. There is no reason they cannot have apertures, antennas, and become part of the intelligence, surveillance, reconnaissance world. That is what we call ‘smart tankers.’ In the dumbest level of smart tanker, we’ll put a communications relay on it so we can get greater range from things and take some load off the satellites. That ... is the track that you see us working on.”

Support Your Sister Service

“Currently, 55 percent of the [aerial refueling] tankings that we do in the Afghani situation are for Navy airplanes—which is absolutely appropriate, exactly as it should be. We should be supporting them because they are there. And then we also tank F-15s ... and F-16s.”

Would Iraq Be Like Afghanistan?

“It would be wrong to try ... mapping from the Afghanistan situation to the Iraqi situation, should the government choose to look at it. One, there is an air defense system in Iraq. Two, there are a lot of military forces. Three, it is a much more populated country. And systems that they have are more dangerous and the quality of their pilots is better. The quality of their air defenses is better. There is a lot of investment. I don’t think you see much fiber optics in Afghanistan. You see a lot of fiber optics in Iraq. So you are talking about two very different levels.”

“What sort of things might translate? I think this notion of our aircraft being associated with Army forces or Marines on the ground.”

The Significance of the CAOC

“The significance is that [the data coming in are] fused. And now we are going to put links into the airplanes so we can more easily get right to the airplane, so we have an electronic picture in the cockpit of fused information that comes from all kinds of sensors, including that which is on board. One of the thoughts for the F-22 and the Joint Strike Fighter is, eventually, we will have people flying with us in the net. They will have a far less opaque understanding of the battlespace, but they won’t recognize whether that is from their own sensors [or] off-board sensors. Their own sensors, as they are traveling, will feed the net.”

The Aging KC-135

“The number of days to get one of those tankers through the depot is now 400 and some. We are asking of these [maintenance] people heroic efforts. If we could get that down by starting to replace the worst of them [KC-135s], so that the depot would deal with those that are newer ... we can save a lot more money.”

Buy or Lease 767 Tankers?

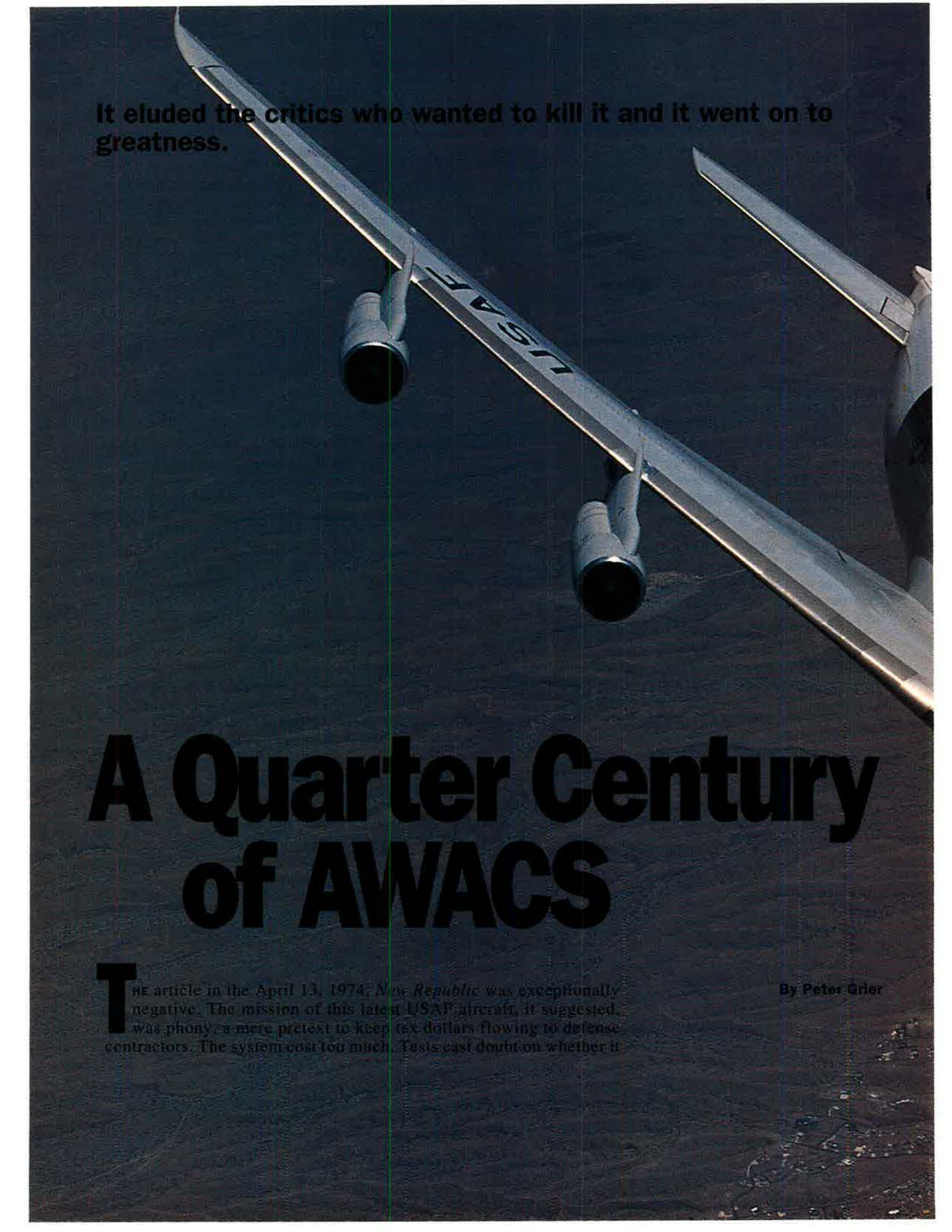
“We are spending an enormous amount of money on 707s [KC-135s]. ... If we can replace some of them, especially the most expensive, we’ll save some money. So, that means a quicker acquisition of a new tanker saves us more money. Do we have the procurement funds to do the other things [as well as] a big acquisition [of tankers?]. No. So what would you do in a company? Well, you’d lease.”

“All we asked for was authority to begin negotiating. The conditions that [Congress has] set in the various and sundry things that have come out of it are all subject to negotiation. If, in fact, we can’t get any relief from any of those [legislative] provisions, it may be impossible to do. ... The point is to have the opportunity to do it and then to see if the savings are worth the cost of leasing, and how you can deal with the provisions that have been added. ... If it looks like a good deal ... we’ll go forward. ... If it looks like we can’t get there, we won’t do it.”

Baby and Bath Water

“Transformation is a word that talks about adapting to the times we’re in. ... [Defense Secretary] Don Rumsfeld is very clear. He said you don’t throw away something unless there is something better, and his natural sense of caution has paid off big time for us here because we maintained a lot of systems which we are using [in Afghanistan].”

“You always have an obligation not to the current force but to the force that will actually go into combat when you are long gone. We are still, under those circumstances, devoting an enormous amount of money to transformational things, ... unattended vehicles. Taking something like the F-22 and making sure it works very closely with the trooper on the ground is all brand new. Smart tankers. Brand new ideas. Trying to go to ISR systems and fuse information. Brand new ideas.” ■



It eluded the critics who wanted to kill it and it went on to greatness.

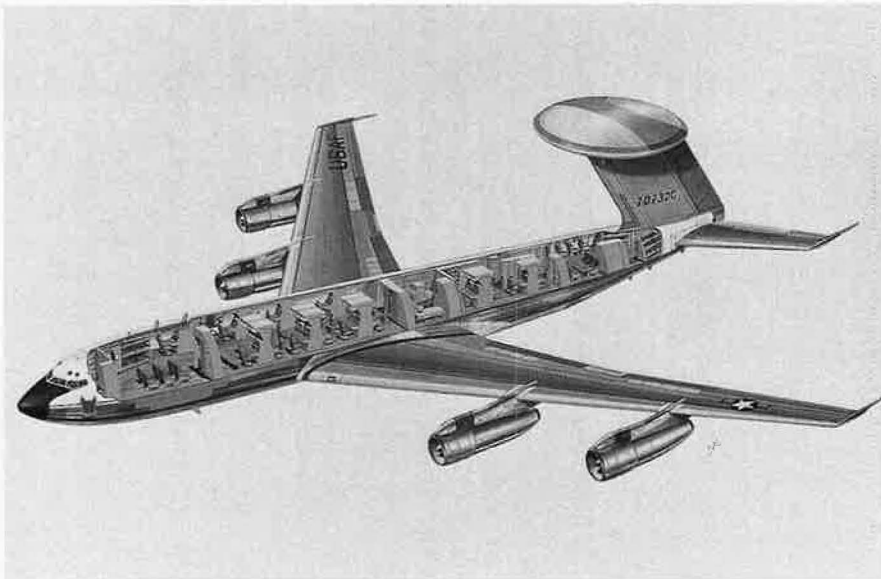
A Quarter Century of AWACS

THE article in the April 13, 1974, *New Republic* was exceptionally negative. The mission of this latest USAF aircraft, it suggested, was phony, a mere pretext to keep tax dollars flowing to defense contractors. The system cost too much. Tests cast doubt on whether it

By Peter Grier



An E-3C Sentry out of Tinker AFB, Okla., performs reconnaissance duty over the continental United States.



An artist's early concept drawing shows the saucer-shaped rotodome mounted on a forward-swept tail instead of on the fuselage, behind the wings.

would actually work. It was an obvious pouch of flab in a bloated defense budget.

The mocking title said it all: "AWACS: The Plane That Would Not Die."

At least the title was accurate. The E-3 Airborne Warning and Control System certainly would not die—and for good reasons. Far from turning out to be an expensive boondoggle, the 707 with the huge rotating radar dome ("a mushroom with elephantiasis," sneered TNR) has become a bedrock of US military power.

Twenty-five years ago, on March 24, 1977, Boeing delivered the first basic production version of the E-3 Sentry to Air Force officials at Tinker AFB, Okla. The ensuing quarter century has shown the AWACS to be indispensable, often the first system to go into action when a threat arises and the last to leave once operations cease.

The AWACS has turned out to be even more important than envisioned by its Air Force proponents. It was the first of a new class of systems that would give US forces a revolutionary edge in military capability. AWACS transcended its Cold War origin to help dominate the air wars over Iraq, Bosnia, Kosovo, and Afghanistan, plus numerous other armed actions.

"I don't think any of us knew, as the world changed and missions evolved, that it would have such a

continuing important role in multiple contingencies," said Col. Brian M. Waechter, AWACS system program director at Air Force Materiel Command's Electronic Systems Center, Hanscom AFB, Mass.

The All-Seeing Eye

The E-3 has become the "eyes" and battle manager for virtually all Air Force combat operations. Its actual value can be measured in flying hours. The venerable B-52 bomber and KC-135 tanker are both nearly twice the age of the AWACS, in calendar years. Yet today's B-52 and KC-135 airframes have logged fewer flight hours, on average, than AWACS airframes.

"This platform has been heavily used since its inception," said Waechter.

The impetus to build a system such as AWACS came from the manner in which air forces learned to deal with electronic waves of radar in the years following World War II. Radar had been a revolutionary weapon in the struggle against Nazi Germany. Its ability to spot everything from an approaching bomber to the conning tower of a U-boat gave the Allies an edge in some of the most crucial battles of the war.

Yet one feature of radar is vulnerable to exploitation by opponents. Its beams travel only in straight lines. Thus aircraft that hug the ground can take advantage of the curvature of the Earth and penetrate close to

ground transmitters before popping up to attack.

Fast forward to the 1960s. The miniaturization of electronics had reached a point at which Air Force officials came to believe that a single airframe could now transport a powerful search radar plus computers able to handle the difficult task of differentiating moving aircraft and ground clutter. The aircraft would also contain communication equipment sophisticated enough to give commanders a real-time view of the battlespace.

On Dec. 22, 1965, Air Force Systems Command set up an Airborne Warning and Control System Program Office, and the AWACS effort officially was born.

From the start, the Pentagon treated development of the system as a high-priority effort. For example, AWACS had its own streamlined procurement rules, and its management came under the direct supervision of the Secretary of Defense.

The first question to settle was what airframe to select. There was a battle between the McDonnell Douglas DC-8, Lockheed EC-121, and Boeing 707. In July 1970, after a tough flyoff, Boeing won the prize.

The first test airframe flew in February 1972. After some 500 hours of radar test flights, Boeing selected the Westinghouse radar system over competing equipment manufactured by Hughes.

On Jan. 26, 1973, USAF announced it had given approval to Boeing to proceed with full-scale development of AWACS aircraft.

In these early years the main mission of AWACS, as defined in official military requirement documents, was to provide aid in the air defense of North America. It was to be a sort of early warning radar in the sky, alerting North American Aerospace Defense Command to the approach of Soviet bombers if and when they ever flew over northern latitudes toward US and Canadian territory.

Nixon's Second Look

By the early 1970s, however, the fast-flying Soviet intercontinental ballistic missile equipped with multiple nuclear warheads had surpassed Russia's manned bomber as the most dangerous strategic threat. Defense against a bomber strike

was still important, but the Nixon Administration in 1973 decided to take another look at the AWACS program and assess its continued relevance.

This second look at AWACS produced yet another mission for the system. Secretary of Defense James R. Schlesinger decided that AWACS needed to be enhanced so it could serve not only as a strategic early warning aircraft but also as an airborne command-and-control center for tactical air operations, particularly in Western Europe.

This was not a particularly difficult technical change, recalled retired Gen. Lawrence A. Skantze, who was deputy for the E-3A program at Hanscom in the key 1973–77 period. It meant changing the way in which some data were monitored and adding a few internal consoles. It increased the cost somewhat.

From a political point of view, however, the addition of a new mission generated many problems.

“It created a lot of turmoil,” said Skantze. “Some of the program’s opponents in Congress declared that we really didn’t have a mission.”

The AWACS program encountered strong opposition in the powerful House Armed Services Committee. A number of lawmakers on the panel saw the E-3 as a duplicative competitor to the Navy’s E-2 Hawkeye, a carrier-based airborne early warning aircraft. One vocal critic was



The E-3s were nameless during testing. Come delivery, that would change.

“I Dub Thee Sentry”

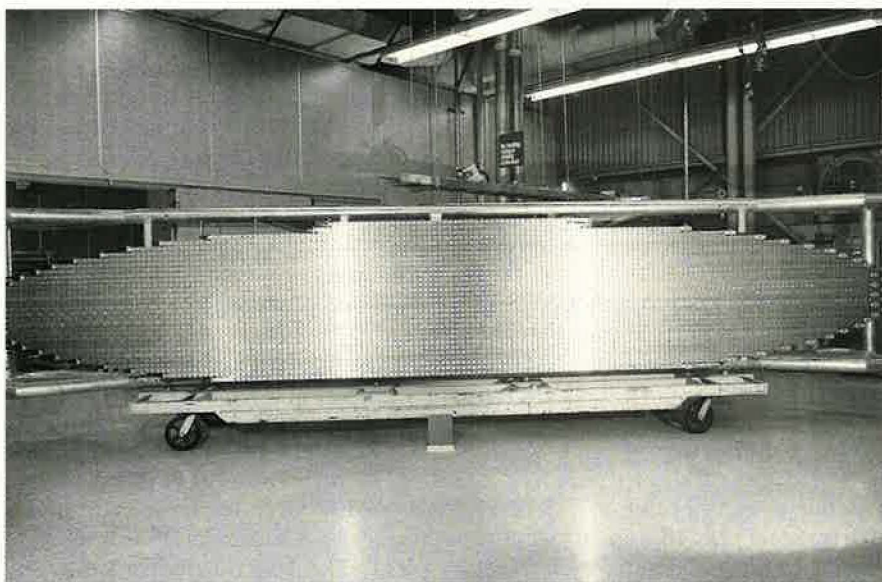
As time for delivery of the first E-3 AWACS approached in 1977, the question was what to name it. Gen. Robert J. Dixon, commander of Tactical Air Command, wanted to call it Sentry.

Securing the name, however, was the job of the developer, Air Force Systems Command. It was up to AFSC to run the bureaucratic and legal traps for approval. A host of other things, including an insurance company, were already named Sentry. The lawyers said the E-3 would have to be called something else.

Dixon, sometimes known as “The Alligator” for good reason, was not pleased. The AWACS remained unnamed.

On delivery day at Tinker AFB, Okla., the first airplane taxied up to the reviewing stand. The band played and the crowd cheered. The Alligator stepped to the microphone and announced, “I dub thee Sentry.”

And that was that.



The lookdown radar inside the signature rotodome provides a 360-degree view. The dome itself rotates, is 30 feet wide and six feet thick, and sits on two struts that support the radar 14 feet above the fuselage.

Rep. Patricia A. Schroeder, the liberal Democrat from Colorado. In the Senate, the main adversary was Sen. Thomas F. Eagleton, the liberal Missouri Democrat.

One technical argument made by critics in the program’s early years was that the AWACS radar could be easily jammed. That would have made it ineffective in Western Europe, they argued, because the Soviets had powerful jamming equipment on their densely militarized side of the Iron Curtain.

Eventually Congress voted to establish a special review committee to investigate this claim and other AWACS questions. Legislative language also required the Secretary of Defense to certify that the system would work before it could proceed in development.

In the end this arrangement worked

to the program's advantage. The review committee concluded that the radar would in fact work, and on that basis Congress in early 1975 released the initial batch of long-lead money for the first six airplanes.

Skantze observed: "The committee was very helpful in saying that it did not see [jamming] as a show-stopper."

In March 1977, the first AWACS was formally delivered to Tactical Air Command's 552nd Airborne Warning and Control Wing at Tinker.

Production of USAF's aircraft continued until June 1984, when the last of 34 Air Force E-3s rolled off Boeing's line. (A September 1995 crash in Alaska left USAF with only



Photos by Ted Carlsson



Four aircrew members man the flight deck (here), while up to 19 mission specialists, such as the two in the top photo, can be on board monitoring the airborne early warning, battle management, and command, control, and communications functions at various stations.

32 operational aircraft today. One is assigned to Boeing for tests.)

Even at the program's inception, other nations had a keen interest in buying AWACS's capability. The NATO Alliance, France, Saudi Arabia, and United Kingdom all now fly 707-based AWACS aircraft, bringing the total worldwide fleet to 66. In addition, Japan purchased four 767-based AWACS models.

Back in 1977, Skantze and others estimated that AWACS would remain in service for some 20 or 30 years. Since then, that figure has doubled, with current plans calling for the aircraft to remain in service

until perhaps 2035. AWACS's continuing value is due to both its operational capabilities and its power as a symbol.

When the US deploys AWACS to a troubled region, it shows that the Air Force means business. At the same time, the system itself is not provocative, as it has no inherent offensive capability.

"The thing we didn't perceive at first but which became apparent as time passed was the ability of the system to surveil airspace in great depth but not pose a threatening aspect," said Skantze.

The basic E-3 aircraft is a milita-

rized version of Boeing's 707-320B. The most obvious modification is the large rotodome put on the back of the airplane. The dome is 30 feet in diameter, six feet thick, and sits on two struts that support the radar 14 feet above the fuselage.

Inside the dome are identification, friend or foe and data-link fighter-control antennas and the antenna of the powerful AWACS radar system. The radar has a range of more than 250 miles for low-flying targets. It can see medium- to high-altitude fliers at even greater distance.

Data are collected, processed, and displayed on onboard consoles for 13 to 19 mission specialists in real time. AWACS can forward the location and track of friendly and adversary systems to users ranging from the individual pilot in a fighter cockpit to the White House Situation Room—at the same time.

It can fly a mission profile for eight hours without refueling. In-flight refueling, plus the use of an onboard crew rest area, can extend missions greatly.

Coasting Toward Retirement

Though it is now 25 years old, the E-3 platform is not just coasting toward retirement. Intensive upgrades and modifications have taken advantage of modern technology to make the system more reliable and efficient. The Extend Sentry program, for instance, began in 1994. Its goal: Upgrade almost all aspects of the aircraft, from software to the air-

frame itself, to improve performance and reliability.

The AWACS Block 30/35 modification added more computer power, GPS integrated navigation, and more data links, among other things. Plans call for the Radar System Improvement Program to boost performance against low radar cross section targets, including cruise missiles, and other goals.

"The total complexity of this system ... far exceeds things I've worked on before," said Ed Froese, Boeing's vice president for the AWACS program. "It's an antenna farm."

Since it entered US service, the E-3 has proved its worth time and again, carrying out its vital mission in conflicts from Grenada to Haiti, Kuwait, Iraq, the Balkans, and Afghanistan.

During Desert Storm in 1991, E-3s flew more than 400 missions and logged more than 5,000 hours of mission time. AWACS crews provided data used in more than 120,000 coalition sorties and played a major role in all but two of the coalition's 40 air-to-air kills of the Gulf War.

The Leading Edge

The impressive performance of AWACS in the Gulf War led analysts to herald it as the exemplar of a whole new approach to fighting wars.

One of those analysts was William J. Perry, a former senior Pentagon official in the Carter Administration who later became Secretary of Defense in the Clinton Administration. Writing in *Foreign Affairs* in 1991, Perry said the US in Desert Storm had employed for the first time a new class of military systems that provided a revolutionary advantage in capability. AWACS, he said, was one of the most important of these new force multipliers, particularly when the aircraft operated in concert with the Joint STARS ground surveillance system.

"One AWACS aircraft can instantaneously survey the airspace over an area larger than Kuwait and detect and locate every aircraft flying in that area," he wrote. "AWACS



USAF photo by TSgt. Jeff Clontkey

USAF has enhanced the capabilities of E-3s over the years. The E-3C featured circa 1984 console and radar improvements. With Extend Sentry, begun 10 years later, the service will upgrade everything from software to the airframe.

played a critical role in giving coalition aircraft a significant advantage over Iraqi fighters."

Subsequent action in Operation Allied Force only confirmed this impression. A total of 27 E-3s took part in NATO operations against the Yugoslav air force, logging some 4,800 hours on 500 missions while contributing to the destruction of an estimated 85 percent of Belgrade's most modern fighters.

Operations in the war against terrorism sparked by the events of last Sept. 11 have included a new AWACS first: the deployment of NATO's AWACS aircraft in America. Beginning last October, five NATO E-3As and their multinational crews flew to Tinker and set up operations, thus freeing up US assets to deploy overseas. The NATO contingent felt right at home operating with 552nd Air Control Wing base personnel, as the units have trained together often and operated together in combat for Allied Force. (US officials recently asked for two additional NATO E-3 aircraft.)

What does the future hold for AWACS? A balancing act, if nothing else. The Air Force must keep enough E-3s on line for operational use, while also taking sustainment

actions sufficient to keep the aging 707 platform viable for years to come and planning upgrades to take advantage of technological breakthroughs.

Currently, Mission Capable rates on AWACS run from 75 to 77 percent, against a goal of 85 percent. A few years ago, MC rates were somewhat lower, averaging around 71 percent.

"We've done a lot on the sustainment side to improve the Mission Capable rate over the last few years," said Waechter of ESC at Hanscom.

Corrosion on the AWACS airframe is a major concern. In the works is a lower lobe refurbishment project, as yet unfunded, that would completely rework the area beneath the AWACS main deck with corrosion mitigation, replacement of wiring and air-conditioning, and other improvements.

The Air Force wants eventually to combine the functions of AWACS and Joint STARS on a single platform, most likely on a new satellite of some kind. But such capability is still years away. Until then, the E-3 AWACS, conceived in the 1960s, built with 1970s technology, combat proven in the 1990s, and undergoing updates with 21st century systems, will remain the pre-eminent radar and command-and-control aircraft in the force.

"People might think the [E-3] platform is in its sunset years," said Waechter. "That's not true at all." ■

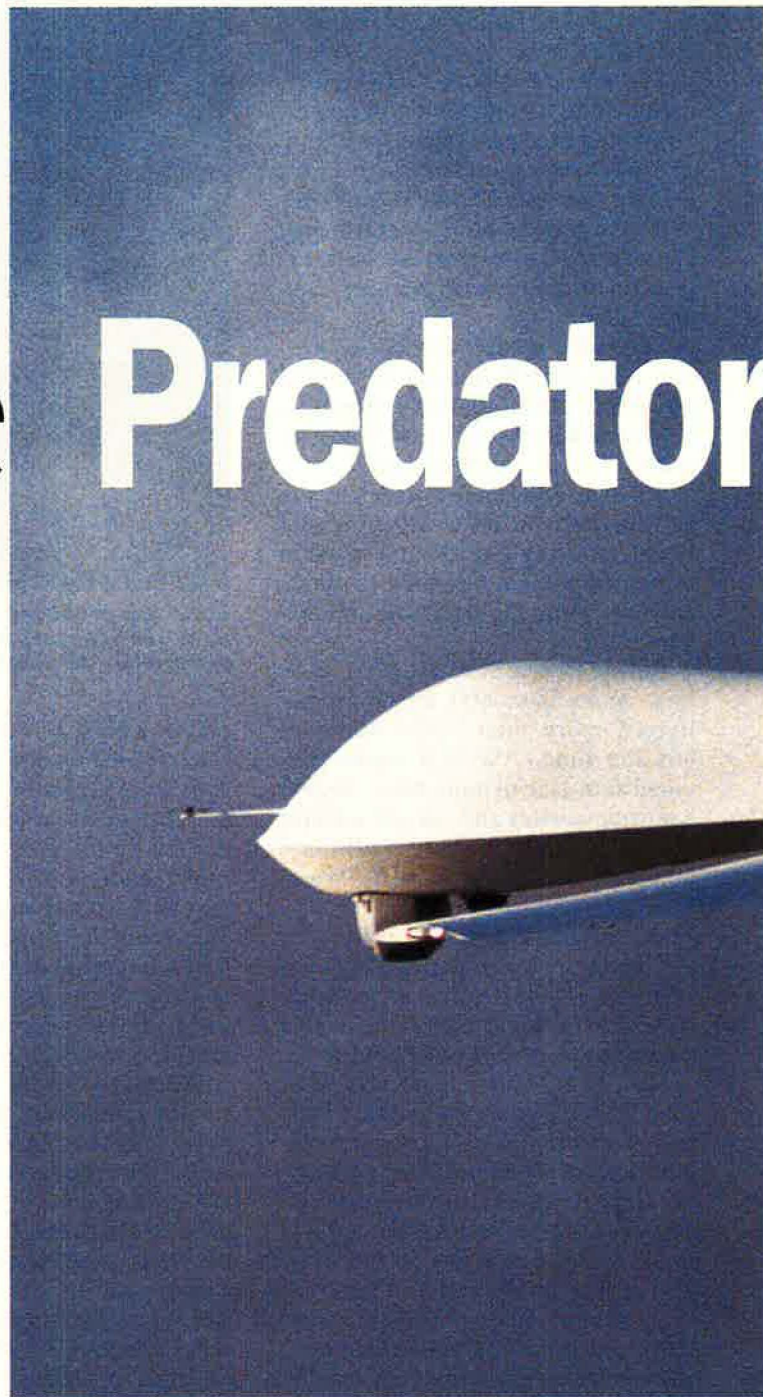
Peter Grier, a Washington, D.C., editor for the Christian Science Monitor, is a longtime defense correspondent and regular contributor to Air Force Magazine. His most recent article, "Turkey Stands Forward," appeared in the February 2002 issue.

**It is not yet
officially operational,
but it proved itself in
Afghanistan.**

The Little Predator



By Richard J. Newman



The job is mainly reconnaissance, but some Predators flying in support of Operation Enduring Freedom were outfitted with Hellfire missiles.

THE Afghanistan campaign featured most of the aircraft showcased in the 1990s: B-52, B-2, and B-1 bombers; Air Force and Navy fighters; C-17 transports; aerial tankers; surveillance and intelligence systems; and more. Yet the war's media darling was a relative unknown—Predator.

It was an unlikely star. The Predator Unmanned Aerial Vehicle is an ungainly, slow-flying airplane. Made by a San Diego-based company called General Atomics Aeronauti-

That Could



cal Systems, its major mission is reconnaissance.

However, Predator was an instant hit because it could transmit live video footage of enemy actions to commanders on the ground and aircrews above the battlefield. It illuminated targets for precision weapons fired from afar. It even, on occasion, fired its own weapons, a rarity for a UAV.

Now, as airpower analysts pore over the facts of the war, they seem convinced that Predator played a key role in one of the war's major break-

throughs: the sharp compression of the sensor-to-shooter cycle, the amount of time that elapses between the moment a target is identified and the moment it is attacked.

Slashing that time from hours to minutes—or less—has long been a goal of the Revolution in Military Affairs, a fundamental shift in warfare in which rapid processing of targeting data and other information would supposedly provide dramatic advantages on the battlefield. The Predator appears to have validated some of those beliefs.

“The Predator worked really well,” says a senior Air Force official involved in Operation Enduring Freedom. “It enabled dramatic increases in timing and accuracy.”

Afghanistan wasn't the Predator's first combat appearance. It carried out missions over Bosnia during NATO's brief 1995 air campaign there.

Although it made only minimal contributions in that war, defense officials were impressed and intrigued by the UAV's power to provide real-time video feeds of ground



In Afghanistan, the Predator provided live video footage of enemy actions to allied ground and air forces. Operations center officers were able to see the effects of a B-52 strike while it happened as a Predator flew over the action.

activity. This stood in stark contrast to the often days-old images typically provided by satellites and U-2 spyplanes.

Even though it hadn't officially reached initial operational capability (and still hasn't), Predator was assigned to two active duty Air Force units—the 11th and 15th Reconnaissance Squadrons (activated in 1995 and 1997, respectively), based at Indian Springs Air Force Auxiliary Field near Nellis AFB, Nev.—so that it could be deployed on real-world missions if needed.

See It Now

NATO's Operation Allied Force over Kosovo in 1999 brought raves for the Predator. This time, air planners were prepared to take advantage of Predator's real-time capabilities. Video feeds were downloaded via satellite links to the command center at Aviano AB, Italy. Planners there relayed data to airborne forward air controllers to help them find targets that, without spotters on the ground, were difficult to locate.

The setup produced some dramatic moments. During a bomber raid in southern Kosovo, a Predator circled above Yugoslav troops even as they were being struck. This enabled staff officers at the operations center to see the effects of a B-52 strike for themselves—while it happened.

By the end of the Kosovo war, the Pentagon had outfitted Predators with laser designators that would have

enabled them to highlight targets for F-16s, F/A-18s, and other bomb dropers that carried ordnance. The war ended, though, before the Predator actually got a chance to designate any targets.

Meanwhile, Predators had also begun flying above Iraq to help with reconnaissance in Operation Southern Watch, their first mission in the Central Command area of operations. The Predators flew from Kuwait and helped locate targets, mainly for strikes against Iraqi air defense systems. These missions still take place.

There were problems, too. At least

two Predators crashed in Kosovo, and three crashed in Iraq. Those incidents reveal several vulnerabilities. The Predator can fly as high as 25,000 feet, beyond the range of many surface-to-air weapons. But the resolution of video and still images from that altitude can be spotty, forcing the airplane to fly much lower, perhaps as low as 10,000 feet.

At low altitude, the unstealthy, relatively slow-moving Predator presents an easy target for air-defense weapons. The Pentagon hasn't released exact details of all Predator crashes, but it does acknowledge that it has lost about 20 of the aircraft since the program began. "The bulk of those," says an Air Force official, "were lost over enemy territory."

As testing continued, the Pentagon highlighted other deficiencies. In a 2001 report, the Pentagon's operational test and evaluation office argued that "the Predator UAV system is not operationally effective or suitable."

A Laundry List

That scathing report listed many instances in which the Predator failed to meet the Pentagon's own performance standards. Problems included "poor target location accuracy, ineffective communications, and limits imposed by relatively benign weather, including rain." The system was unreliable and failed to meet maintainability requirements. It was unable to spend enough time on station when



The Predator Ground Control Station is the largest component and is designed to roll onto a C-130. The GCS crew is an air vehicle operator—the "pilot"—and three sensor operators.

flown from a base 400 miles distant, the required operating range. Its pictures weren't accurate enough at the required slant range of 30,000 feet, meaning it would have to fly at lower, more vulnerable heights to gather data that was truly useful.

In addition, the report warned that Predator is delicate. "The Predator," said the report, "cannot be launched in adverse weather, including any visible moisture such as rain, snow, ice, frost, or fog."

Despite those findings, Army Gen. Tommy R. Franks, commander in chief of Central Command, evidently considered the Predator a high priority, since several Predator teams were among the first troops dispatched to central Asia after the Sept. 11 terrorist attacks. Central Command sent at least one team each to Uzbekistan and Pakistan.

Each Predator team includes four airplanes. The aircraft itself measures 27 feet in length, with a wingspan of nearly 49 feet. There's also a ground station, where the "pilots," or controllers, fly the airplane remotely, using a TV camera in the nose to monitor airspace and runways.

A satellite link handles communications between the aircraft, controllers, and anybody receiving imagery. About 60 people man the team; this includes controllers, maintenance personnel, and intelligence specialists.

The Air Force has purchased enough Predators to equip 12 teams, though only 10 systems have been delivered. The Air Force also buys seven or eight per year as "attrition aircraft," held in reserve to replace aircraft lost in action. Each Predator aircraft costs about \$2.5 million. An entire system, including ground control stations and peripherals, runs to \$25 million.

The Predators that flew over Afghanistan were outfitted with a mix of electro-optical cameras that shoot video, an infrared sensor that can pick up images at night, and synthetic aperture radar that can see objects through clouds. The sensors are sufficiently powerful to recognize large facilities such as supply dumps and identify vehicles smaller than a tank. They're not as sophisticated as sensors on U-2s or satellites because they need to be small and light enough to fit one of the Air



A 2001 report from Pentagon test officials claimed the RQ-1 was not operationally effective, but CENTCOM head Gen. Tommy Franks thought otherwise. Predator troops were among the first he dispatched for Enduring Freedom.

Force's smallest airframes and still leave room for enough fuel to keep the Predator aloft for up to 24 hours.

Teamwork Is Best

For this reason, Predator is at its most effective when used in conjunction with other intelligence sources, to confirm the location of enemy troops, gather real-time intelligence on targets that may already have been identified, or scout for targets that troops on the ground or other intelligence systems might be able to examine in great detail. "We have now demonstrated that, with something like Predator, we can stay in an area, we can focus, we can watch something develop," says Air Force Secretary James G. Roche. "We have time to say, 'OK, let's move some aircraft into the area.'"

The unmanned spyplanes take off like a normal airplane, except that the pilot is in the ground control station and not in the aircraft. Takeoffs and landings must be manually controlled, but the Predator, once it is en route to its monitoring orbit or on-station site, can fly a preprogrammed flight path. The controller can even leave his seat in the ground control station. If there's some kind of in-flight problem, or if new intelligence feeds require the Predator to fly to a new location to gather information, the controller can retake command of the aircraft and direct it where it needs to go.

As real-world operations over Af-

ghanistan got under way, some shortcomings began to surface. At least three Predators crashed in the theater. Two of those were the result of wing icing caused by flying in clouds. With the capability to fly as high as 25,000 feet, the Predator, theoretically, can stay above bad weather. But with its sensors unable to gather quality images at that height, it had to fly lower, where icing occurs.

The Predator can also be outfitted with a de-icing system, but the added weight would either reduce the payload of sensors the airplane could carry or cut short the length of the mission. The Air Force hasn't said whether the Predators were carrying the de-icing package.

Another problem was the satellite communications link, which occasionally broke off—and was very difficult to re-establish when it did so. That may have contributed to one or more of the losses.

Aside from the crashes, operators who worked with the Predator in real-world conditions over Afghanistan are much more upbeat about its performance than the Pentagon testers.

"I read that report," says one Air Force general, "and I thought, 'That's very interesting, because it's working well with us.'"

One standout success: use of intelligence from the Predator to set up strikes by AC-130 gunships, which fire artillery-like 105 mm shells along with smaller rounds from chain guns. Central Command outfitted the AC-

130s with terminals that enabled the aircrews to get Predator feeds directly in the airplane—a major improvement on the 1999 Kosovo war, when Predator video was downloaded to the operations center and then passed piecemeal to pilots in the air, usually by voice communications. “You have the ability to do something and have the operator of the Predator work with the gunship team to rein the target into their targeting system,” says Roche.

Downloading data right into the gunships allowed the aircrews to gather situational awareness of the area they were headed to attack before they even got there.

Start Blasting

Typically, a Predator would be orbiting above a target such as a troop emplacement or a convoy of vehicles, undetected by the enemy forces on the ground. AC-130s en route to the target would be able to study the real-time video of the target until they got within firing range. Then, instead of having to make a pass or two to get oriented, they could just arrive and blast away.

“The AC-130, when it’s teamed with Predator, pretty much hits what it’s going after, after the first practice round,” said one senior officer at Central Command headquarters in Tampa.

Getting raw, fresh intelligence data into the aircraft is a breakthrough for pilots and other operators who have long been considered “customers” of the intelligence system. “In the past, we have always relied on something associated with a time delay,” says one USAF general. “A third party was always involved in distribution.” That was an enormous frustration during the 1991 Persian Gulf War, when it often took days for intelligence experts to complete their analysis and obtain the classification clearances required to get targeting information or other critical data to pilots and others who needed it. “Now,” says the general, “there’s no intel geek involved in the processing.”

Predator data was still distributed to the air operations center in Saudi Arabia, to Central Command headquarters at MacDill AFB, Fla., and to the Pentagon and Central Intelligence Agency in Washington, D.C. But the pilots in the air over the



RQ-4 Global Hawk is a longer range UAV and may eventually replace the U-2.

Predator’s Bigger Brother

Another Unmanned Aerial Vehicle, the Global Hawk, had its operational debut over Afghanistan. The Global Hawk is newer than the Predator and at an earlier stage of development. The Air Force initially received five test systems, one of which crashed during a test flight. One crashed in the war. The Pentagon hasn’t said why, although it appears that it was not hostile fire. Bad weather or a mechanical problem seem more likely causes.

The Air Force isn’t scheduled to stand up a Global Hawk squadron until 2004, but the Pentagon still shipped at least two Global Hawks to the theater near Afghanistan. They were an enormous hit.

“Global Hawk is amazing,” said one USAF general. “It is magnificent.”

While Predator’s role is to zero in on “dwell” targets and provide situational awareness for pilots working a particular area, Global Hawk does much broader surveillance. It flies at elevations of 60,000 feet or more, like the U-2, and has higher resolution cameras than the Predator. It doesn’t shoot live video but can capture images through clouds and at night.

Follow-on versions may collect signals intelligence as well as imagery. Global Hawk can fly for nearly a day and a half without being refueled, meaning it can take off from a base 1,200 miles away, loiter for 24 hours, then fly back. It is designed to work in conjunction with the Predator and other intelligence systems to gather a layered picture of the battlefield and the space above it. Many analysts believe it will ultimately replace the U-2.

It certainly seems to have the range to do so. One USAF official estimates that three to five of the \$50 million Global Hawks could have kept tabs on all of Afghanistan, which is roughly the size of Texas. “It’s like a low Earth orbit satellite that’s present all the time,” he explained. “You can see why a warfighter would be pretty excited about that.”

Like Predator video, Global Hawk images can be fed directly to the commanders and warfighters who need it most urgently. The man is not leaving the loop entirely, but in future wars there will certainly be fewer chances for him to foul things up.

target got it just as quickly as the bureaucrats half a world away.

Certainly UAVs and other advanced technology systems have been touted as cornerstones of the Administration's military transformation. Now it appears President Bush is ready to put dollars on the line. He announced Jan. 23 that such high-tech weaponry is a top priority in his Fiscal 2003 budget.

Bush called them expensive but declared "the tools of modern warfare ... essential."

"Buying these tools may put a strain on the budget," he maintained, "but we will not cut corners when it comes to the defense of our great land."

With that kind of endorsement, there



Staff photo by Guy Aetio



The Predator B, shown here, is a larger version of the RQ-1 above. It is nine feet longer, has a wing span 18 feet wider, and is nearly twice the weight of the original. It can reach speeds of nearly 250 mph and altitude of 45,000 feet.

should be little doubt that the Pentagon can expand its UAV programs. The next push will be to get Predator video into the cockpits of all the Air Force and Navy fighter jets.

And airpower planners want to continue fusing all intelligence data, whether from Predator or other sources, into a single common picture that will tell pilots everything that is known about a target area into which they are flying.

The trick now is building the airplane data links that can handle a fairly large stream of data. "With the data link, all the things somebody else knows can be shared," says Maj. Gen. Daniel P. Leaf, the Air Force's director of operational requirements. "The data links give situational awareness with far less effort."

Another breakthrough in the war was the use of the Predator to fire weapons, specifically anti-armor

Hellfire missiles. The Pentagon is tight-lipped about this effort, mainly because it was run by the Central Intelligence Agency. Claims of success may be overstated. Reports suggest that armed Predators were reserved for high-value targets, such as one convoy carrying the Taliban leader Mullah Mohammad Omar. The same reports also suggest they missed.

Even so, tests of the concept of using Predator as a shooter have been encouraging. About a year ago, the Air Force equipped several Predators with two Hellfire missiles each, one under each wing. Of 16 Hellfires fired from Predators, 12 scored direct hits on old tank carcasses. Three of the misses hit right behind the tank, while one missed by miles, but a defense official attributed that miss to the missile.

One senior Air Force official says that additional lessons from Afghanistan are that "we need to put more weapons on the plane. Two is not enough." He also derides the 100-pound Hellfire as a "teeny weapon." That suggests the Hellfires may have come close to killing the intended targets but failed because they lacked the explosive force and there were no follow-on strikes. Since it is difficult to put more or bigger weapons on the small Predator, one solution may be equipping big bomb dropers like the B-52 with some of the sensors on board the Predator. That would put ample combat power on the same platform as the sensors finding the targets. ■

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What if it becomes necessary to sustain a military operation for an extended period—like years?

Airpower for the Long Haul

By John A. Tirpak, Senior Editor

ON Christmas Eve, Operation Enduring Freedom became the longest sustained US military action since Vietnam. The nation's leaders warned from the start that this would be a different kind of war, not at all like the swiftly won conflicts of the 1990s. Victory, they said, might take years.

To ensure that the Air Force would not be ravaged by the stress and strain of a no-notice but long-duration conflict, USAF leaders quickly set up what they called the Long-Haul Task Force. They charged its members with anticipating problems that might flow from an extended operation. They were to come up with answers before they were needed.

Those problems are formidable. Sustained high operating tempo, both in overseas theaters and at home, has generated clear needs for more Air Force people, greater numbers of aircraft, more spare parts and maintenance capability, and a bigger supply of munitions. Because of long lead times, it's not possible to solve these problems instantly.

The LHTF comprises experts from the Air Staff, Secretariat, and principal Air Force organizations. The initial intent was to prepare for further attacks and try to prevent them or find ways to limit damage. The task force has evolved into a mechanism for smoothing the transition from a peacetime posture with forward presence missions to one able to sustain a wartime pace for years.



USAF photo by Lt. Col. William Ramsey

Since last fall, more than half the USAF fighter surge has taken place in the US, not overseas, leaving officials grappling with how to maintain that high optempo without breaking a force designed for limited-duration foreign conflicts.



USAF believes it may need to increase end strength by as many as 10,000 troops to handle its expanded missions at home and abroad. Here, a C-130 taxis on a runway in Afghanistan.

“There are all kinds of important issues you have to think about when you’ve just had your building run into by an airliner,” said Maj. Gen. John R. Baker, assistant deputy chief of staff for air and space operations, an organization functionally referred to as XO.

In an interview with *Air Force Magazine*, Baker said the effort began on Sept. 12, the day after the terror attacks in New York City and Washington, D.C. Lt. Gen. Robert H. Foglesong, who was then the deputy chief of staff for air and space operations, ordered the XO staff to “sit down and think about the long-term impact of this thing.”

Foglesong has since received his fourth star and now serves as USAF vice chief of staff.

No Short War

“We had already gotten indications from remarks made by the President and Secretary of Defense” that the global war on terrorism would not end swiftly, Baker said.

In short order, big questions emerged. For example, USAF’s 150-person Crisis Action Team, which hastened to put up Combat Air Patrols over the US and batten down the hatches at overseas locations, was composed of regular staff officers. These officers were working 24 hours a day, seven days a week. As a result, regular staff work was going to be left undone.

“So we went right away [to] Total

Force,” Baker said, calling in Air National Guard and Air Force Reserve Command officers to augment and supplement the CAT and regular staffs.

Decisions had to be made about whether to relocate personnel, many of whom were in private office buildings nearby due to the ongoing Pentagon renovation. They stayed put, but security considerations had to be worked out with the owners of those buildings.

The LHTF was at first made up of departmental deputies from the Secretariat and Air Staff. Its meetings soon became a form of “rumor control,” Baker noted. It began attracting representatives from more and more staff offices. No department or agency was excluded from LHTF meetings.

The group started out by deciding which events—promotion boards, inspector general visits, readiness inspections, exercises, and things like Red Flag—should be canceled or postponed. Many were, but Bright Star, a major US and coalition exercise conducted in Egypt by Central Command, went forward.

The next main item on the LHTF’s agenda was how to sustain Operation Noble Eagle, which entailed establishment of fighter Combat Air Patrols over major American cities. It was obvious such an operation would not be easy to keep going indefinitely.

Baker said 24-hour CAP was ordered over New York City and Wash-

ington, D.C., the focus of the Sept. 11 attacks and the centers of American political, governmental, and economic activity. Over other cities, random CAPs were ordered, sustained by fighters at 24 bases.

“We have had anywhere from eight to 12 CAPs airborne over the United States every day since the eleventh of September,” Baker noted. That translates into “120 to 130 fighters [that are] dedicated” to the mission, each flying four-to-six-hour sorties and with support from 50 to 75 tankers, he added.

Moreover, CAP missions are supported by 10 E-3 Airborne Warning and Control System aircraft from the Air Force and five more AWACS supplied by NATO.

“A lot of people have forgotten NATO has five E-3s over here, with crews, and they’ve been flying ever since they got here” in October, Baker pointed out. (In mid-January, NATO agreed to a US request for two additional AWACS aircraft.)

Sorties at Home

By late December, the flights run for Noble Eagle had far eclipsed the number of USAF combat missions flown in Central and South Asia for Operation Enduring Freedom, in itself a major commitment of pilots, maintainers, machines, engines, and spare parts. The Air National Guard and Air Force Reserve Command have shouldered 85 percent of the Noble Eagle effort, Baker pointed out.

“The number of sorties the Air Force has flown for Noble Eagle is several thousand more than what we’ve flown in support of the war in Afghanistan,” he said. By mid-December the Air Force had flown more than 10,000 sorties in the domestic operation; a month later the figure had risen to more than 13,000. The cost has now topped \$400 million.

“If you are flying CAPs at 10 to 12 locations every day, and you are doing it for 12 hours and in some cases 24 hours, that takes a lot of airplanes to do that,” said Baker. “It will take a lot of tankers to do that. It takes AWACS in several locations.”

Still, the domestic effort, said Baker, is “invisible to most people,” including senior civilian and military leaders who are responsible for homeland defense. USAF has since made a point of sending a “weekly



The hot pace of operations is “burning up” engines and airframes at a rate far greater than expected, but the Air Force isn’t planning to invest in replacements. It’s waiting for the next generation.

report” to the Office of the Secretary of Defense, spelling out USAF’s support for homeland security.

The fast pace of the flying has proved a “real challenge,” Baker said. The flying hour budget originally envisioned for the whole of the 2002 budget year will be consumed “some time in March,” which is the midpoint of the fiscal year.

“We budget to be prepared to go to war,” said Baker. “It requires a supplemental [funding bill] to fight it.”

Air Force logistics experts are closely watching the hours being accumulated by F-15s and F-16s, Baker said. Without question, there will have to be a major infusion of money for spare parts and engine maintenance, he noted.

“They are eating up spare parts at a greater rate than you might imagine,” Baker reported. “Using supplemental funds to increase the production of spare parts for both those airplanes is going to have to happen.”

Last year, KC-135 aerial refuelers were stacked up in depot maintenance because inspections and overhauls planned to take 200 days were taking twice that long. Aging airframes and unexpected corrosion were typically blamed. Baker said that, in early 2000, “we started a concerted effort to try to reduce the [KC-135] backlog at the depot, and in fact [Air Force Materiel Command] cut into it before [the current operations] started. And we are on a path to get it down to a targeted level

... like 25 percent less than it was a couple years ago.”

Now that the tanker overhaul issue is thought to be in hand, attention is shifting to the fighters. “We are now having to look at that for F-16s, F-15s, and particularly engines because that is the most stressed area right now,” Baker said.

No New Airplanes

Increased work on aircraft in depot can be achieved only by going to “longer shifts, hiring more people, and buying more spare parts,” said Baker. “That is the only solution. I don’t see buying new airplanes any sooner as feasible.”

Over the last decade, the Air Force has declined to buy new fighters in quantity, preferring to wait for the F-22 Raptor and Joint Strike Fighter. The F-22 will not start entering squadron service until 2005, and the JSF, 2010.

Not only is USAF “burning up” fighters and engines, claimed Baker, but fighter pilot proficiency is beginning to sag.

“We train very carefully against a set standard,” Baker explained. “Certain events have to be accomplished every 30 days and every six months. If all you are doing is flying CAP missions, and all the AWACS guys are doing is supporting them, and you are doing tanker rendezvous, there are a lot of required continuation training tasks that are not being accomplished.”

For example, said Baker, a fighter pilot on a CAP mission gets to practice the tasks of managing his fuel and doing tanking procedures but not much else. He certainly does not use those hours honing combat skills. “For the guys in the States that are doing Noble Eagle,” said Baker, “their combat skills are atrophying.” For AWACS operators supporting the operation, they “aren’t running combat intercepts.”

Air Force officials have sought relief from CAP missions over the US, wanting to reduce their scope, duration, or coverage, but a Pentagon spokeswoman said in mid-January that the flights “have been and will continue to be a very important part of protecting the American people.” Noble Eagle aircraft had, by January, responded to more than 200 incidents involving unidentified aircraft or aircraft on which there were disturbances.

A senior Air Force official said he worries that when the Noble Eagle pilots come up for their turn in an overseas deployment, their skills “won’t be up to our normal standards.”

Personnel is another looming problem identified by the Long-Haul Task Force. Air Force Secretary James G. Roche said in January that USAF is probably undermanned to the tune of 10,000 people, a figure he considers a minimum estimate.

The high pace of operations is fast outstripping the capability of USAF’s Aerospace Expeditionary Forces to provide sufficient people to do the mission, since they were designed for peacetime coverage that would claim only two AEFs at once.

Complicated Problem

However, said Baker, acquiring another 10,000 personnel within a short period of time is not as simple as it might sound. The LHTF is trying to “figure out if we could absorb them,” he said, noting, “This is pretty complicated.”

Bringing in substantially more recruits would require more facilities to house them, more instructors to train them, and more equipment to train on. Instructors, for example, are already in short supply. Baker noted that such a move has implications for bonuses, housing, retention, and many other issues.

The LHTF is watching to see what

effect the ongoing operations will have on retention throughout the force—active, Guard, and Reserve. He noted that, even as reservists come and go, since Sept. 11, “probably 20 to 25 percent, in any given period that we’ve looked at, have been volunteers.” The rest have been involuntary call-ups. In December, the Air Force was still capped at 40,000 activated reservists, and about 10,000 of those were volunteers. When one volunteer leaves, said Baker, another appears to take his place.

Baker is anxious to see more data because Stop-Loss—the policy by which personnel in needed specialties are prevented from separating from the service—“can only go on for so long,” he said. When it does stop, he said, he expects it will be done in a phased way. “In other words, we won’t just cut it off for everybody.” Watching how many choose to stay when they can leave will provide insight as to how to work the increase in end strength, Baker said.

A large number of pilots volunteered to return to active duty, said Baker—not so many that it “overwhelmed the system” but a very “encouraging” number.

The training issue is perhaps most acute for careers known to be at below minimums before the conflict began. These are the so-called low-density, high-demand systems such as AWACS, Joint STARS, Rivet Joint, and combat search-and-res-

cue forces. Baker warned that the pace could not be sustained without having a severe impact on future training.

“We are going to eat their seed corn” without a letup, Baker said. While the units are getting plenty of real-world operating time, in many cases, they do not operate as vigorously as they would in a training situation, and they, too, are missing important proficiency upgrades.

He noted that, after the 78-day Balkans operation in 1999, it took the Air Force 18 months to recover because of the missed training, absence of instructors for new recruits, and missed rest and recuperation for the troops.

“Entry-level and continuation training is suffering,” Baker noted. “The time to allow low-density, high-demand [assets] to recover and get new entry-level people trained could exceed that following Allied Force.”

There will be money in the Fiscal 2003 budget for additional systems in short supply, but again, the spigot cannot be turned full on because of structural limitations.

The worst personnel situation, Baker noted, was in the area of security forces. In previous conflicts of the last decade or so, security forces would deploy forward, since the home base was considered secure. Now, the home base also needs protection, and there simply aren’t enough troops to go around.

Reducing the threat condition at many domestic bases from “Charlie”

to “Bravo” helped alleviate the problem somewhat, but that does not provide anything close to a final solution, Baker noted. Many facilities, like the Pentagon, are still at Charlie, the highest level of alert. “Delta” means there is an active assault.

Few Predator Operators

Baker said there are adequate numbers of Predator Unmanned Aerial Vehicle operators, but like AWACS crews, there are not enough Predator instructors available to keep the pipeline of new operators moving.

Airlift has worked well and shows no signs of breaking down, Baker said. However, the call on airlift is greater than it seems. He noted that many C-130s are away from their home bases but not overseas. They are standing by, ready to airlift soldiers to the scene of some domestic “major catastrophe.”

Given the breakneck pace at which the Air Force was consuming precision weapons early in the Afghanistan operation, concerns were voiced as to whether USAF would have enough to sustain operations, particularly if there was a shift to another campaign.

The LHTF spun off a splinter group known as the Forward Look Task Force, which is focused on aircraft, munitions, and training, Baker said, and it will address the issues of using up airplanes, bombs, and their operators.

It’s clear “the Air Force needs to manage [munitions] better,” Baker acknowledged. “We’ve given a lot of them to the Navy. ... The Navy practically ran out, so we gave a lot of JDAMs to the Navy.” Because the pace of bombing began slowing in December, “we are OK right now,” Baker observed. If usage had continued at the previous rates, though, and no steps had been taken to increase production, USAF would have run through its stocks early this year.

Supplemental funding was used to “expedite the ramp-up in production,” Baker said. By July, he continued, “production numbers will double.” That will be the maximum rate of production unless more production facilities are built—something not yet decided. However, the Pentagon is “looking favorably” at expanding production facilities, he said. The Navy has said “me, too” in the push for greater production levels. ■

USAF photo by MSgt. Keith Reed



Low-density, high-demand systems, such as the E-3 AWACS shown here, are under acute strain. Training pipelines are breaking down because potential instructors have their hands full with real-world operations.

The civilian world is pushing in on ranges, runways, and electronic frequencies.

By Bruce D. Callander

The Wild Blue

Yonder Is Shrinking

FOR decades, the Air Force has been enmeshed in a high-stakes struggle to fend off civilian encroachment on the airspace and weapon ranges it deems vital to its continued effectiveness in combat. The battle usually flared over the training of USAF's aircrews. However, the encroachment problem now goes far beyond training. It affects development and testing of new weapons, the exercise of joint forces, and in a relatively new development,

access to electronic communications frequencies long used by the armed services and now being eyed by the commercial telecommunications industry.

The Air Force's most immediate difficulty still entails holding on to its share of the nation's airspace and the weapons ranges it needs to hone the skills of its fliers.

The US services now have their own bases, test areas and ranges, and large zones of airspace specifically marked for their operations. However, their use of those spaces faces a growing number of impediments—both in the air and on the ground. Because of civilian encroachment in a variety of forms, the wild blue yonder is shrinking, and the legendary wide-open spaces that have been the military's practice grounds are being gobbled up by developers and coveted by environmentalists.

In May 2001, Gen. John P. Jumper, then commander of Air Combat Command and now Chief of Staff of the Air Force, laid out the service's predicament in stark terms. At a hearing of the House Committee on Government Reform, he said: "Maintaining continued access to our ranges and airspace is absolutely critical. In fact, if our ability to train our aircrews continues to diminish, America will soon lose its only edge in air combat proficiency."

In future conflicts, Jumper said, the Air Force cannot rely solely on technology to give it the advantage. "It is only our superior training that enables our pilots to have the upper hand in air combat," he said. "That training depends on the right amount and the right type of ranges and airspace."

"National Assets"

Maj. Gen. Walter E. Buchanan III, USAF's director of operations and training in the Office of Deputy Chief of Staff for Air and Space Operations, gave similar testimony to a Senate Armed Services Committee subcommittee, calling the Air Force's ranges and airspace "national assets."

The House committee chairman, Rep. Dan Burton (R-Ind.), and several of its members signed a letter to President Bush urging him to initiate reforms to address the problem. Then, last December, Deputy Defense Secretary Paul Wolfowitz ordered a Pentagon working group to

develop legislative and regulatory proposals on ranges "with a goal of obtaining relief in 2002." A similar all-services effort is under way to protect the military's use of airspace.

Holding onto what it has is only one of USAF's problems. New, advanced aircraft that soon will enter the inventory will require more room to operate (airspace) and larger practice areas (ranges). This forthcoming expansion already faces challenges from airlines, environmentalists, local residents, developers, and many other competing interests.

The most visible conflicts have flared over traditional areas for practice bombing and gunnery. Air Combat Command operates nine such facilities and does most of the Air Force's combat training. Its biggest facilities are the Eglin Range in Florida, Nevada Test and Training Range, Barry M. Goldwater Range in Arizona, and the Utah Test and Training Range.

Other flying organizations—Air Education and Training Command, Air National Guard, Air Force Reserve Command, US Air Forces in Europe, and Pacific Air Forces—manage ranges used mostly for individual crew training. Air Force Materiel Command has ranges for USAF test activities and Air Force Space Command runs the East and West Coast launch ranges.

There is nothing new about the range concept or the public objections to it. A major concern during World War I was that US crews were poorly trained in bombing and gunnery. It was mainly because they received little or no Stateside schooling and there were few uninhabited areas in Europe where they could practice. In World War II, the Army Air Forces opened hundreds of Stateside training bases, many of which had nearby "Primary Training Ranges" for the use of student gunners and bombardiers. Aircrew training bases used more distant practice ranges, most of them in sparsely populated Western states.

The key factor is that relatively few civilians were bothered by the air activity. Those who were bothered generally accepted the inconvenience as the price of victory.

Of ACC's nine major ranges, seven date to World War II. Since that conflict, however, these facilities have been upgraded to accommo-

date electronic warfare and instrumentation systems to track and record aircraft maneuvers. The trouble is that the military is using land that others now want reserved for other purposes.

Scared Chickens

Concerns about airspace also have evolved over the years. In the early days of aviation, the military did most of the flying and, except for the occasional farmer who complained that the airplanes frightened his chickens, few Americans objected. Even the post-World War I barnstormers had no real competition for the use of the skies.

By the 1930s, however, commercial airlines were sharing the airspace and raising concerns about safety. In 1938, Congress created the independent Civil Aeronautics Authority, shifting the responsibility to license pilots, regulate the use of the airways, and develop the rules of flight from the Commerce Department. Later CAA's functions were taken over by the Federal Aviation Administration. The FAA now manages the National Airspace System for both military and civilian users. It marks specific areas on a temporary or ongoing basis as Special Use Airspace, most of them for the military.

Nonmilitary fliers complain that these SUA designations put much of the country off-limits to all but military aircraft. USAF officials, however, point out that these restrictions are less extensive than they often seem. For one thing, many SUA restrictions apply only to certain altitudes. For another, the times at which the military can use these demarcated areas often are limited.

USAF's need for airspace will grow, however, as it concentrates more units at fewer bases, acquires new aircraft, and adds more sophisticated systems. Air Force officials said the service will need:

- Small ranges near bases for units to practice basic skills.
- Intermediate-size ranges for more advanced training.
- Large ranges where composite forces can conduct combat exercises.

For some purposes, crews can use instrumentation and simulation to practice, but they will still need places for firing live rounds and dropping real bombs. This means that the ser-

vice will continue to fight for both air- and ground space and the right to use it at times compatible with its operational schedules.

Holding on to the current airspace and ranges will not be easy. Developing and expanding them for additional requirements will be even tougher. In his testimony, Buchanan said, "The legal and procedural requirements are more and more complicated and time consuming, and military needs can change quickly. ... Our goal is to meet the military need while addressing and resolving, to the extent possible, public concerns and federal, tribal, state, and other agency issues."

Building Partnerships

Echoing that sentiment was Col. Lynn Wheelless, chief of ACC's Airspace and Airfields Division. "Realistic training is a critical part of military readiness," said Wheelless, "which means we must work actively with the public to balance our training with their concerns. Building partnerships with the public and communicating our intentions and plans for the natural resources we share are the basic pillars of support to our training."

This attitude contrasts with the public-be-dammed approach often attributed to the military, but the service has found it a necessary one in an era where local governments increasingly challenge the federal presence and private groups sue over environmental issues. In the mid-1990s, the Air Force set up a separate airspace and range staff at the Pentagon to work such issues, and ACC created a similar group to address them on a day-to-day basis. Since then, the Defense Department has moved to coordinate the efforts of all services.

Both the military and its critics use the term "encroachment" to describe each other's activities. Developers, environmentalists, and Native American groups all say the military is encroaching on wildlife habitats, wetlands, tribal lands, or whatever areas they are trying to protect or use. The services, in turn, claim the civilian interests are encroaching on their traditional airspace and practice grounds.

Both are right to a degree. Today's military aircraft are faster, more powerful, and noisier than those of the

past and require more room to exercise. Although there are fewer of them, their presence is more noticeable.

At the same time, the services' desires to avoid heavily populated areas have been frustrated by relentless development. Once-isolated bases now find themselves in the

"The legal and procedural requirements are more and more complicated and time consuming."

—Buchanan

suburbs of the cities they tried to avoid, and remote areas once ideal for ranges have become popular recreation sites. It is less a case that the military has moved in on the public, officials say, than that the public has moved closer to the services and, once there, found its military neighbors objectionable.

In early 2000, the Rural Alliance for Military Accountability and the Center for Biological Diversity, a coalition of environmental and citizen groups, sued the Air Force for violating the National Environmental Policy Act and charged that low-level military training flights harm wildlife, livestock, and rural communities. The RAMA case eventually was dismissed, Wheelless said, but other similar suits still are pending in Texas and New Mexico.

Those new cases involve what the Air Force calls the Realistic Bomber Training Initiative. The idea, developed in the 1990s, was to expand B-1 and B-52 training in west Texas or New Mexico. At the time, bomber crews from Barksdale AFB, La., and Dyess AFB, Tex., were able to prac-

tice in Texas but had to fly as far away as South Dakota to use scoring ranges. That, the Air Force said, limited how often bombers could operate as a team, as they would in combat. If they could get all their training closer to home, it would save time and make the training more realistic.

Worried Ranchers

The Air Force considered two training sites in Texas and another in New Mexico and ran into opposition from local groups in all three places. West Texas ranchers formed the Heritage Environmental Preservation Association and mustered almost 500 members in an area already used for practice. HEPA said it could live with high-altitude flights but feared the impact of low-level training.

Similar opposition groups sprang up at other sites. A Congressman whose district was in one of the proposed areas said he understood the need for the training but feared it would put greater hardship on the already strained landowners in the area.

After extensive environmental impact studies, the Air Force announced its selection and began construction on an electronic scoring site southwest of Pecos. Opposition groups in the other areas were relieved, but local groups filed new lawsuits to block the project.

In other areas, the Air Force has addressed range and airspace problems such as unexploded ordnance, air quality, noise, and endangered species. All have proved complicated and expensive to solve.

The Air Force for many years has been clearing debris at its active ranges at regular intervals. Air quality has become a greater concern as the services have closed bases and consolidated their forces at the ones remaining. Many installations are in areas that are seeing rapid growth and increased pressure to meet air quality standards. To add units, increase activities, and introduce new weapons, the service must meet tough clean-air and occupational-health requirements not only at the bases but at the ranges they use. Again, the environmental studies and required remedies are costly.

Noise problems have been a concern from the days when the Air Force first introduced jet aircraft. When complaints mount, units chart

the areas concerned and avoid them when possible. The problem, officials say, is that the number of refuges is dwindling.

Wildlife problems are a relatively new concern, but it is one that the service takes seriously. The Air Force is responsible for some nine million acres of land and water areas that form the habitat for almost 80 federally listed threatened or endangered species. The Barry M. Goldwater Range in Arizona, for example, is home to the last remaining Sonoran pronghorn antelope in the United States. The service surveys the seven target areas there daily before it flies sorties. If it finds that antelope are present at a target site, USAF pilots don't drop explosives on or strafe that target.

Safe Sturgeon

USAF's Air Armament Center at Eglin AFB, Fla., faces similar problems. Its units release live munitions over the Gulf of Mexico. For this, the Air Force has worked out an arrangement with the US Fish and Wildlife Service under which FWS electronically tags and tracks gulf sturgeon to make sure they are not in the area when live ordnance detonates.

Still, officials warn, designation of range areas as critical habitat could seriously limit the service's ability to modify missions on its lands. The key to addressing the problem, they say, is adequate science and good communication with the groups concerned.

Encroachment by the human species is another matter. A prime example is Nellis AFB, Nev., which has felt the explosive growth of the Las Vegas area and changing zoning rules beneath its flight corridors. The Air Force has acquired another 250 acres east of Nellis to prevent safety problems at its live ordnance loading area, but commercial and residential growth has forced operational restrictions on arrivals and departures south of the base, and increasing development beyond the northern runway poses similar threats.

In other areas, the Air Force has had to pay dearly to hold on to facili-

ties. The service struck an agreement with the Fish and Wildlife Service in which it had to put up \$15 million to use portions of the Desert National Wildlife Range that it has been using since the early 1940s. At Shaw AFB, S.C., it had to obtain permits from the Corps of Engineers to perform new missions at the Poin-

**The
Air Force
has had
to pay dearly
to hold on
to facilities.**

sett range, much of which is protected wetlands.

In other areas, there are concerns about the effect of aircraft noise on endangered birds. In the Southwest, the aircrews have had to modify their flight patterns during nesting seasons of species such as the Mexican spotted owl, the bald eagle, and the northern aplomado falcon. Again, such efforts to accommodate its neighbors cost the service both financially and in lost training time.

Officials recognize that such measures are the price of continued readiness, but in some cases the remedies also have created new problems. In the early 1990s, for example, ACC expanded its environmental programs and hired professional natural resources experts at most installations and ranges. This has helped reduce mission constraints, but it also has focused attention on the biological diversity of the bases.

Officials are concerned that, as more areas are marked as habitats, their military use will be limited further.

The service has improved its relations with the Native American tribes, many of which live near bases and ranges. It now conducts operations with an eye to the impact on traditional cultural resources and lifestyles. Officials meet with tribal representatives to work out problems posed by the Air Force's use of airspace. In the process, however, they have found that some tribes want the service to address issues such as health care, employment, emergency response, and facilities improvement.

In May 2000, an international conference identified a number of radio frequencies that it wanted tagged for possible use for cell phones and other forms of wireless technology. Clinton directed executive branch agencies to work with the Federal Communications Commission and the public sector to pick frequencies that FCC could auction off for that purpose.

The armed services argued that changing frequencies would generate billions of dollars in replacement costs, and the General Accounting Office recommended the sale be put off to allow more study. The Bush Administration ordered the delay and made plans for a February meeting between the FCC, the services, and other interested parties.

Like other encroachment issues, this one is not likely to see any quick solution. Competition for scarce land and airspace continues unabated. Burton noted that DOD's answer to the encroachment problem has been to "work around" problems. "When we call upon our military ... to go into harm's way," he warned, "we should do so only with complete confidence that they are thoroughly trained and ready."

Buchanan told a House Armed Services Committee panel: "In the Air Force we have been able to make some accommodations. However, at the same time, we can rapidly see that if, in fact, we find ourselves having to restrict our training more, we're going to find as we begin to move into the future and we lose this technological edge, we are going to run the risk of sending our young men and women into combat without clear assurance that they are going to have the edge that they need to be able to win." ■

Bruce D. Callander, a regular contributor to Air Force Magazine, served tours of active duty during World War II and the Korean War. In 1952, he joined Air Force Times, serving as editor from 1972 to 1986. His most recent article for Air Force Magazine, "Keeping Track of the Force," appeared in the January 2002 issue.

DOD

Senior Leadership

Compiled by **Chequita Wood**, Editorial Associate

KEY:

USD Undersecretary of Defense
PDUSD Principal Deputy Undersecretary of Defense
DUSD Deputy Undersecretary of Defense
ASD Assistant Secretary of Defense
PDASD Principal Deputy Assistant Secretary of Defense
DASD Deputy Assistant Secretary of Defense



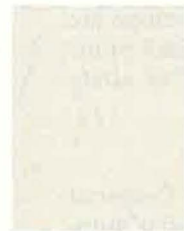
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Vacant



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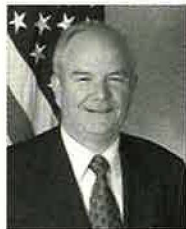
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All too often, the armed forces must borrow parts from one airplane to fix another one.

Cannibalization

The Pentagon defines “cannibalization” as removing serviceable parts from one piece of equipment and installing them in another to make repairs otherwise unattainable. As the General Accounting Office points out in a recent report, it has again become a popular maintenance practice.

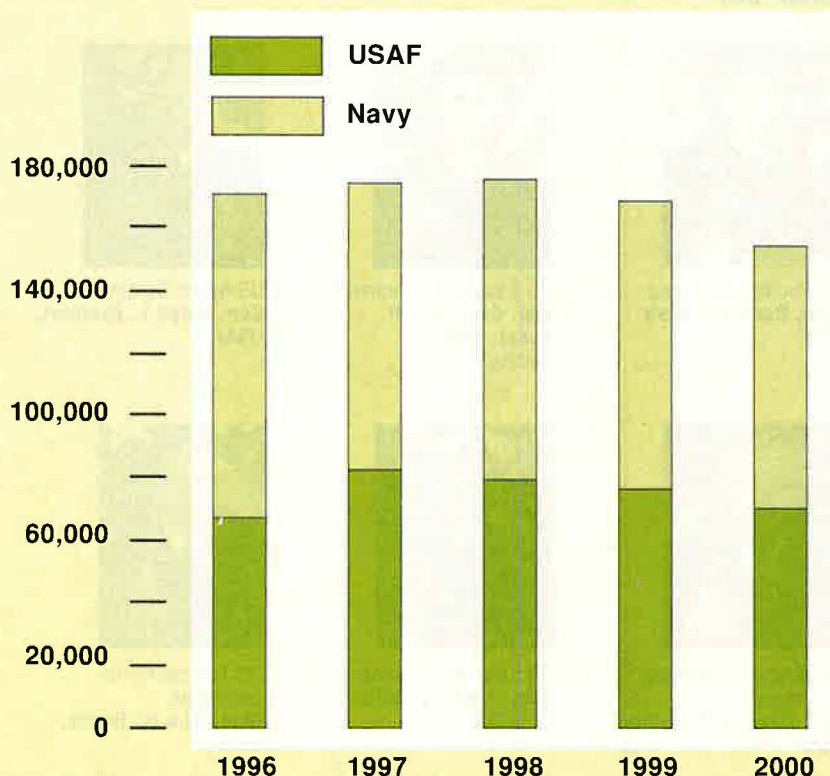
All military services rely on cannibalization extensively, so much so that it has become routine, reports GAO. In the five-year period 1996–2000, USAF and the Navy made roughly 850,000 reported cannibalizations, requiring 5.3 million additional maintenance hours. These figures are no doubt understated.

GAO said cannibalization increases maintenance

costs by increasing mechanics’ workloads. This, it is said, affects troop morale and takes aircraft out of service for long periods. It also can create new mechanical problems.

In the broadest sense, cannibalizations are done because of pressures to meet readiness and operational needs and because of shortcomings in the supply system. In some cases, inexperience is the culprit: Parts are swapped from one aircraft to another until the problem is solved, said GAO.

DOD acknowledged that cannibalization is a serious issue and has initiated an in-depth assessment of cannibalization processes, including data collection and reporting procedures.

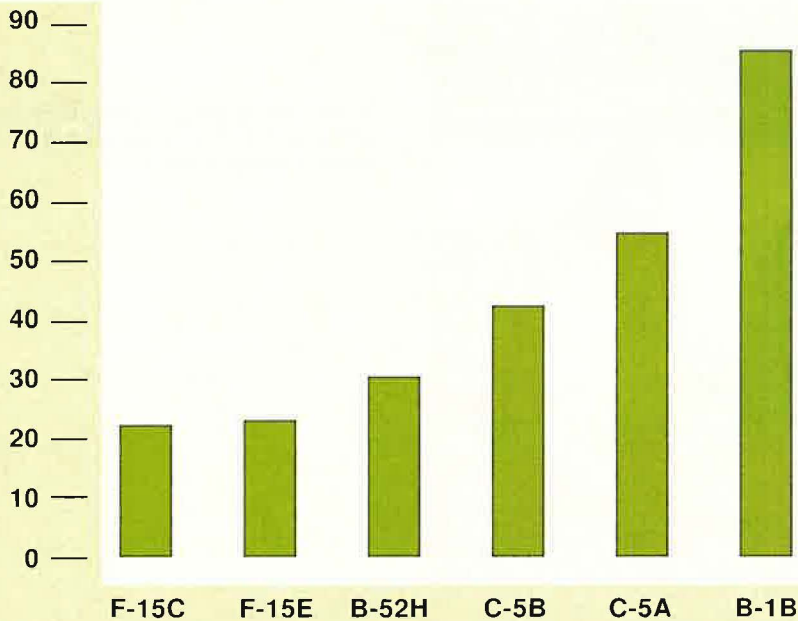


Total USAF and Navy Cannibalizations 1996–2000

In 1996–2000, Air Force and Navy units reported a total of about 850,000 cannibalizations and reported annual figures ranging between 154,000 and 176,000. The numbers have remained relatively stable for several years, dropping slightly in 2000, when the two services reported 154,000 cannibalizations.

During the five-year period, the Navy reported a higher number—approximately 468,000 cannibalizations, or on average, about 94,000 a year. Actual number of cannibalizations may be much higher—perhaps twice as high. The Air Force reported fewer, about 376,000 cannibalizations, or on average, about 75,000 a year. As with the Navy, these numbers may also be low.

Source: Air Force and Navy data.



Most-Cannibalized Aircraft, USAF, Year 2000

The Air Force in 2000 reported cannibalizations of 28 different aircraft types. However, roughly 60 percent of USAF's cannibalizations were generated by only four aircraft. This group comprised three fighters—F-16C, F-15C, and F-15E—and the long-range B-1B bomber. Several other aircraft types, including the A-10A, OA-10A, F-15B, E-3C, and F-117A, reported 100 percent increases in cannibalizations over the same period.

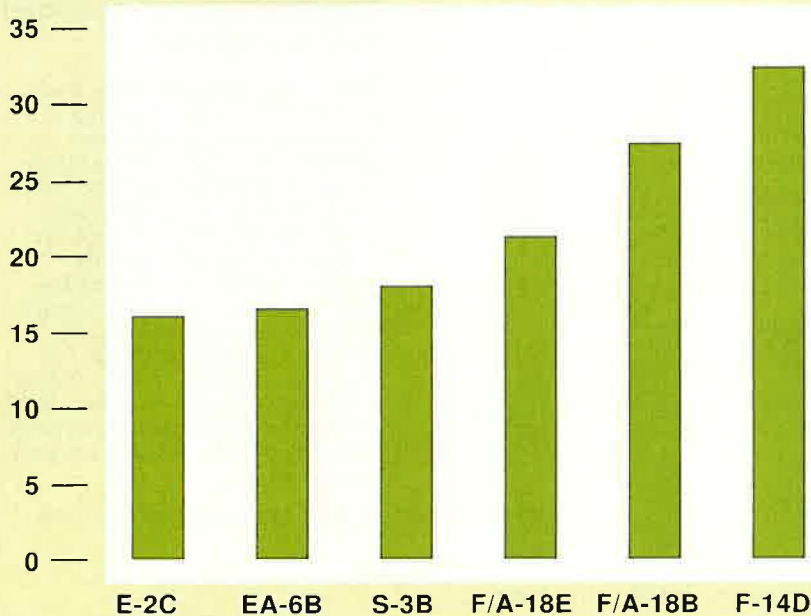
The average USAF cannibalization rate was 11.6 actions for every 100 sorties. As shown at left, the rates for the F-15C and F-15E were almost twice the average, while the rates for the B-52H, C-5B, C-5A, and B-1B were even higher.

Source: Air Force data.

The B-1B bomber is one of four aircraft that required a large share of the cannibalizations reported by the Air Force in 2000.



USAF photo by SSgt. Shane Cuomo



Most-Cannibalized Aircraft, Navy, Year 2000

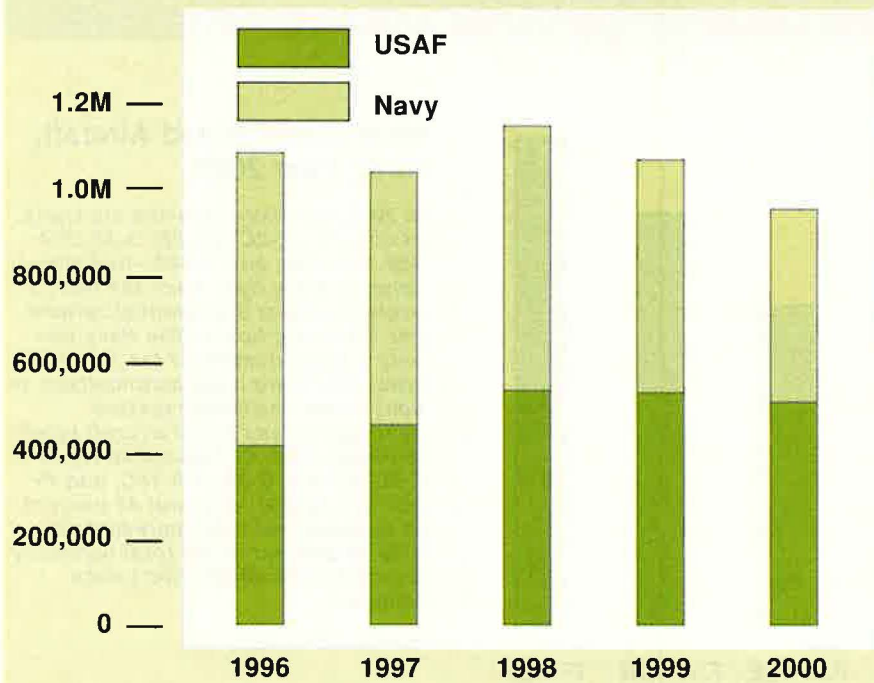
In 2000, the Navy reported six types of aircraft—E-2C, EA-6B, S-3B, F/A-18E, F/A-18B, and F-14D—had almost twice or more than twice the Navy's average rate of 8.8 cannibalizations per 100 flying hours. The Navy has only a small number of the three types that were most-cannibalized. In fleet terms, the Navy reported cannibalizations on 63 aircraft types in Fiscal 2000. Of these, five types—E-2C, EA-6B, S-3B, F/A-18C, and P-3C—accounted for about 42 percent of the total, yet they represented only 26 percent of the total inventory for which cannibalizations were reported.

Source: Navy data.



These and other USAF maintenance personnel bear the brunt of the cannibalization problem.

Maintainers routinely work long, hard hours to patch aircraft to meet the day's sortie schedule—providing an illusion of readiness.



Cannibalization Personnel Hours, 1996-2000

Since year 1996, the Navy and the Air Force have reported spending about 5.3 million maintenance hours on cannibalizations—the equivalent of more than 500 aviation maintenance personnel working full time for five years. Aircraft with the highest number of cannibalizations also accounted for a large share of maintenance hours spent on cannibalizations. For example, the Navy's E-2C, EA-6B, S-3B, F/A-18A, F/A-18C, and P-3C consumed 45 percent of the total reported cannibalization hours in year 2000.

Source: Navy and Air Force data.

Flashback

Credible Sport



In 1980, Lockheed Martin refitted three C-130s to ultra-STOL capability under the code-name Credible Sport. The YMC-130Hs were to be used in a rescue attempt for US hostages being held in Iran. Extensive modifications included the addition of lift rockets slanting downward, slow-down rockets facing forward, missile motors facing backward, and even more rockets for stabilization. Mounted in a stretched nose was a terrain-following radar. There were extensive airframe modifications.

In one test, the slow-down rockets misfired while the C-130 was still in flight (above), resulting in a crash that destroyed the aircraft. All crew members survived. Soon after, the hostages were freed and the remaining two YMC-130Hs were stripped of modifications. One was sent back into service. The other (right) is on display at the Museum of Aviation in Warner Robins, Ga.



Staff photo by Guy Aceto

Irascible, opinionated, and underappreciated, Chennault was the champion of innovative fighter tactics.

Flying Tiger, Hidden Dragon

By Rebecca Grant



Photo by R.T. Smith via Robert F. Dorr

GEN. Claire Lee Chennault died nearly 44 years ago, but even now, he is still a famous man, widely renowned as the glamorous leader of the World War II "Flying Tigers." Chennault's heroics against Japanese forces in the Far





Chennault, pictured here as a major general, wore not only US wings but also those of the Chinese air force.

East made him an enduring legend. When he died in 1958, the *New York Times* put his obituary on Page One.

Famous? Yes. But highly regarded as an airpower thinker? Surprisingly, no.

Chennault today rates only occasional mention in books and studies on the evolution of airpower. His status as an innovator does not compare with that of Mitchell, Arnold, or Doolittle. The image of Chennault rests mainly on his long-ago operational exploits, not his long-term contribution to airpower or the Air Force.

Chennault was an outsider in the service. Early in his career, he challenged the strategic airpower doctrine of the Air Corps Tactical School, creating more than a few enemies. His sensational postwar memoirs only poured salt into wounds opened during that clash. The bitterness lingers.

Decades after that political battle, doctrine guru I.B. Holley Jr. continued to slam Chennault as one whose “shoddy thinking and self-serving retrospective distortions muddied the doctrinal picture.” Holley declared his regrets that Air University had given the Flying Tiger a prominent memorial.

Today, AU’s summary biography calls Chennault’s ideas on airpower “not sound.” It laments, “He has been the subject of a number of biographies—probably more than he deserves.”

For others, however, Chennault is revered as a man of great sub-

stance, one whose headstrong pursuit of proper fighter tactics and refusal to be swept up in bomber theories of the 1930s made him more than a Hollywood hero. These analysts say that, from his days at the Tactical School in the early 1930s to his actions in the China–Burma–India theater and afterward, Chennault stood out for his grasp of how to win air supremacy in harsh conditions.

For supporters, the American Volunteer Group is Exhibit A. During its brief, one-year existence, Chennault’s AVG—the Flying Tigers—outflew and outfoxed far more experienced Japanese pilots. It fought a highly mobile air battle over Burma and much of China. It tallied a 15-to-1 kill ratio.

Chennault’s true achievement stemmed from his intuitive grasp of fighter tactics and his successes in defensive air wars in the neglected China–Burma–India theater. It is a record of achievement matched by few others.

The Tactician

Chennault was born in 1890 in Commerce, Tex. As a young man, he taught school in Louisiana. Then came World War I, and he left teaching for good to take an Army officer commission in the Infantry Reserve in November 1917.

He soon transferred to the aviation section of the Army Signal Reserve Corps and served in the war. The Army rejected his request

for flight training four times before finally granting approval after the Armistice. Chennault learned to fly the Curtiss Jenny at Kelly Field in San Antonio, where he was awarded the rating of “fighter pilot” in 1919.

Chennault was honorably discharged from the Reserve in 1920, but within three months, he was back in the Army with a regular commission and serving in various flying capacities. Before long he was commanding a squadron in Hawaii. In due course, Chennault attended the Air Corps Tactical School at Langley Field, Va., where he stayed on after graduation as the senior instructor in pursuit tactics.

Chennault made good use of his five years at ACTS. He dedicated himself to modernizing the concept of fighter tactics at a time when mainstream thinking among his peers favored bombers.

Chennault certainly was not “anti-bomber.” Far from it; his views about the strategic application of airpower paralleled Mitchell’s writings. Col. Peter R. Faber, an officer on today’s Air Staff who has studied and written about Chennault’s career, called his beliefs “indistinguishable from those of a typical Douhet—quoting strategic bombing advocate of the 1930s.”

In a 1933 article for the Army’s *Coast Artillery Journal*, Chennault said, “The aerial weapon can be applied directly to the national resistance of the enemy’s population, as well as to his means of resistance, before surface forces gain contact and after surface forces attain a static condition.”

What drove a wedge between Chennault and his peers was not differences over the value of bombers but Chennault’s passionate belief that fighters could effectively handle hostile aircraft, whether they were incoming enemy bombers or enemy fighters threatening America’s own bombers.

Chennault was influenced by his personal study of World War I operations. He rapidly absorbed the overriding airpower lesson of the Great War: Air supremacy was essential for all operations. Only pursuit aircraft trained to “destroy hostile enemy aircraft” could win air supremacy, he concluded.

In Chennault’s view, “no new aero-

nautical development or invention" since the Great War had changed that fact. Chennault said the next war would start with a battle for air supremacy, and pursuit aviation would be the most useful tool in the opening phases. He held firm on this belief even as others shifted to the notion that bomber assaults on cities would dominate the war.

Tired Tactics

Chennault, for all his interest in the Great War, had no intention of flying like a World War I American pursuit pilot. On arrival at ACTS, he was dismayed to find that pursuit instructor Clayton Bissell still taught the dawn patrol and fighter sweep tactics of 1918.

Chennault's prime interest lay in building on German air tactics developed in the middle of the war by German ace Oswald Boelcke. He was impressed with Boelcke's pioneering discovery: "Two planes could be maneuvered to fight together as a team." Chennault thereafter spurned all tactics of individual dogfight pilots seeking kills at the expense of tactical success for the whole formation.

Chennault left an impression—for many, a negative one—through his harassment of the Navy and coast artillery in Hawaii. He once led his squadron in a formation Immelman to climb out and get on the tail of a group of Navy dive bombers. Another day, the squadron flew mock



Generals Chennault (center) and Bissell (right) meet with Col. Robert Scott, one of Chennault's commanders, at Kunming airfield, China, in 1942.

dive-bombing and strafing runs against coast artillery units practicing on the beach. No one had notified the artillerymen that the raid was an exercise.

He goaded his pilots into flying formation aerobatics to give them a tactical edge. By emphasizing basic fighter maneuvers, Chennault trained his pilots to learn the maximum capabilities of their airplanes, compensate for weaknesses, and use all advantages.

Technically, Chennault was on solid ground, but advances in bomber design were about to change matters dramatically.

"As far as Chennault was concerned, pursuit aviation had the technical capability to neutralize strategic bombardment," said Faber.

The task, then, was to update pursuit tactics, which just happened to be part of Chennault's job. From his arrival in 1930 at ACTS through 1935, Chennault carried out, taught, and wrote on fighter tactics and the general requirements for "air force."

Chennault got permission to form an ACTS aerobatic team, which he dubbed "Three Men on a Flying Trapeze." The trio was a laboratory for fighter tactics as well as a way to titillate the public. Spectators at air shows across the South saw three airplanes performing loops, spins, and chandelles in synchronization.

Tactically, some of the moves were startling and of little use for real combat. Such was the case with one that Chennault described as "a squirrel-cage effect in which each plane rolled around the other while doing an individual barrel roll."

However, Chennault's passion for stunt flying was all part of a deep belief that fighter tactics had to move toward greater concentration of force to keep control of the air in the next war. He later wrote that the Trapeze act proved Boelcke's theory that "fighters could battle together through the most violent maneuvers of combat."

In other words, air supremacy began with the flight lead.

He noted, too, that pilots experi-



Chennault (center), in the "Trapeze" days, is pictured here with two members of that aerobatic team, William MacDonald (left) and John Williamson. All three would go on to become aviation advisors to Chiang Kai-shek.



Hap Arnold (left) met with Chennault and American and British officers at a Flying Tiger base during a trip to China.

enced at flying together “need not follow an inflexible rule as to relative positions in formation in order to get effective results.”

Pursuit Advocate

From his obsession with fighter tactics emerged a violent opposition to the increasing emphasis placed on the new notion of operating bombers alone. Chennault entered the debate as pursuit aviation was going downhill. Doctrine published in 1923 had made protection of bombers a cardinal role for pursuit aircraft. In the 1930s, ACTS put out a text on bombardment that ignored the idea of fighter escort altogether.

Chennault did not dispute the need for bombers. He flew them often in Hawaii and wrote in his memoirs that “bombardment is, of course, the sledgehammer of airpower.” His journal articles from the early 1930s discussed bomber support. In China, he once pined for a dozen bombers to knock out Japanese supply ships after an aerial reconnaissance photo showed them massed in Bangkok harbor in Thailand.

However, Chennault’s enthusiasm stopped well short of infatuation. Historian Robert F. Futrell notes that Chennault was one of the few airmen of the day who refused to accept the concept of “bombardment invincibility.”

The nub of Chennault’s argument was that bombers could indeed be successfully intercepted and shot down by fighters and that this made

fighters the cornerstone of an air-power force. He conceded that there was “circumstantial” evidence in favor of the bombers; the 235 mph B-10 was slightly faster than the 225 mph P-26 fighter. However, he concluded that fighters would prevail in actual combat operations.

In coming to this conclusion, Chennault saw through many exercises of the late 1920s and early 1930s in which conditions—and sometimes the rules—were rigged to favor bombers.

Take, for example, 1931 Air Corps maneuvers in Ohio. The pursuit commander failed to intercept any bomb-

ers in two weeks of action. The major general in charge concluded, “Due to increased speeds and limitless space, it is impossible for fighters to intercept bombers and therefore it is inconsistent with the employment of air force to develop fighters.”

Chennault had a different explanation: The pursuit commander improperly employed his fighters.

Key Innovation

One of Chennault’s key insights was to sense the need for early warning nets to track hostile aircraft and give fighters the data and time needed to intercept them. The “biggest problem of modern fighters was intelligence,” Chennault wrote of this era. “Without a continuous stream of accurate information keeping the fighters posted on exactly where the high-speed bombers were, attempts at interception were like hunting needles in a limitless haystack.”

His handwritten notes for an April 1933 lecture stated, “In the future, an organization must be provided so that pursuit can operate upon accurate information against definite targets.”

This timeless observation set Chennault apart from other “pure” air-power tacticians. Something in his studies of World War I, his conclusions from wargames, and his own experiences had provided a basis for a brilliant piece of innovation.

Later in 1933, more air exercises were held, and Chennault helped



Great leaps in bomber design swayed many but not Chennault. He insisted that even the massive B-15, shown here with a P-26, needed a fighter escort.

prepare a warning net comprising 69 posts covering 16,000 square miles, all reporting by telephone and radio to the pursuit operations center. Fighters sent from Louisville, Ky., intercepted and “attacked” bombers flying from Dayton, Ohio, to Ft. Knox, Ky.

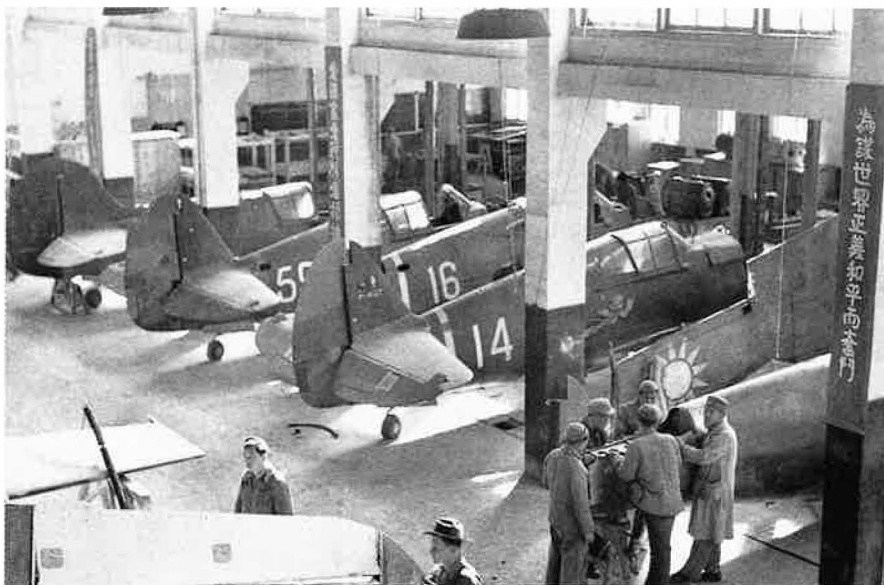
Ft. Knox was a decisive event, and Chennault lost respect for any who did not grasp its meaning. It reinvigorated his work and soon Chennault became an abrasive advocate for pursuit. He laid into the “bomber generals,” Douhet, and eventually, fellow faculty members such as Haywood S. Hansell Jr. (ironically, an original Trapeze member), Harold L. George, Kenneth N. Walker, and Laurence S. Kuter. These airmen, Chennault charged, “preached the bombardment gospel according to Douhet and considered fighters [to be] in the same dodo category as sausage balloons.”

Chennault even quarreled with those who supported his basic claim that bombers needed fighter escorts. He insisted that fighter aircraft should not be forced to stick predictably at the side of bombers—the orthodox view—but rather be allowed to range far ahead and destroy enemy aircraft.

Time proved Chennault right. He neither forgot nor forgave those airmen who had given short shrift to pursuit aviation.

In his memoir, *Way of a Fighter*, he blamed the bomber radicals for the “deaths of thousands of American boys who had been indoctrinated with the absolutely false theory that a bomber needs no protection from hostile fighters.” He specifically blasted George, Walker, and Hansell for their work on air war plans. As Chennault charged, “Many a B-17 crew had to go down in flames under the gun and rockets of Luftwaffe fighters.”

He pointed out that Walker was killed in an unescorted B-17 over Rabaul, Papua New Guinea, and that Hansell once lost five of the six B-17s in a formation attacking St. Nazaire, France. “When the P-51s finally escorted B-17s all the way to Berlin,” Chennault jabbed, “the original AAF planners must have been almost as amazed as Hermann Goering”—the head of the German Luftwaffe.



China dedicated factory space for the rebuilding of Curtiss P-40s for the Flying Tigers. Similar aid was extended to Fourteenth Air Force.

In World War II, fighters were critical from the start, and US forces suffered for entering the war with second-tier fighters that demanded every drop of a pilot’s skill. Chennault was exposed to the same air exercises and school debates as his colleagues. Yet he managed through his practical focus on tactics and his unwavering belief in air supremacy to chart a straighter course through the technological and doctrinal perils of interwar airpower.

His 1930–35 work had contributed much to airpower development. However, after Chennault retired in 1937 for medical and personal reasons, he got the chance to prove himself as a commander by putting his ideas to the test of combat.

Chennault in China

From 1937 through 1945, Chennault’s focus was keeping some level of air supremacy over China. He hired on first as a pursuit tactics teacher for China’s small new air force and as an air policy advisor to Generalissimo and Madame Chiang Kai-shek. At Chiang’s suggestion, he persuaded President Roosevelt in 1941 to back a group of American volunteers. Chennault later rejoined the Army Air Forces as a general in charge of the guerilla air warfare of Fourteenth Air Force.

The American Volunteer Group idea came from Chiang’s frustration with the Chinese air force’s inability to defend his cities and from Chen-

nault’s itch to take advantage of weak spots in Japanese tactics. At first Chennault thought it wouldn’t work. But after spending several months in Washington, the American worked out a plan for a whole new air war in China. Chennault’s original idea for the AVG was to use skilled tactics to inflict on Japanese air formations losses heavy enough “to cripple their entire China bombing program.” A Chinese air-warning net would give his fighters time to shift forces to meet the threat wherever it developed. “The American fighter group would function as a highly mobile aerial fire department, with the added advantage of knowing in advance where the next blaze would flare,” he wrote.

In late 1940, Chennault, Madame Chiang, and her brother, the influential Chinese financier T.V. Soong, charmed Secretary of State Cordell Hull, Treasury Secretary Henry Morgenthau Jr., and Navy Secretary Frank Knox into making one part of the plan become reality. Chennault would get his fighter group. Enthusiasm in the Cabinet trumped opposition from Hap Arnold and Navy air baron Adm. Jack Towers. Roosevelt swung his support behind the group and by early January 1941, Chennault had a deal to acquire 100 British P-40s and man them with pilots and maintenance personnel recruited from the Army and Navy.

The volunteers signed on for a one-year contract at triple pay, plus the bait of \$500 extra for every Japa-



Conditions for the Flying Tigers were spartan and resources were scarce. Above, P-40s cocked and ready to go from a typical Chinese airstrip.

nese airplane a pilot destroyed. Roosevelt and Knox gave the group's transport ship an escort of two Navy cruisers to see them across the Pacific.

Chennault's Way

Chennault ran the AVG his way. He abandoned rigid military discipline for his group of 300—pilots and ground crew. On the ground, they set rules and meted out punishments by group vote. He told his volunteers a fighter pilot “needs to have complete belief in himself and in his ability to handle anything that walks, swims, flies, or wears skirts.”

In the air, Chennault was teacher, coach, and dictator. “Their flying records were not impressive,” he said of his 110 pilot recruits. They ranged in age from 21 to 43, and only a dozen met Chennault's preferred requirements for experience and familiarity with the P-40. Chennault gave them each 72 hours of classroom lectures on flying and fighter tactics, beginning each morning at 6 a.m. After “kindergarten,” pilots flew and flew, logging not less than 60 hours of air instruction.

Chennault gave them “a running commentary” over the radio while his secretary took notes for the critique session after every dogfight. When long landings in the “hot” P-40 caused problems, Chennault drew a line one-third of the way down the runway and fined pilots \$50 if their wheels touched down beyond it.

Most of all, Chennault shared with



Flying Tigers pose for a wartime photo. Standing are Tom Haywood (left) and Arvid Olson. Sitting (left to right) are R.T. Smith, Ken Jernstedt, Robert Prescott, C.H. Laughlin, and William Reed.

them what he had learned about Japanese fighter tactics. Speed and diving power were the key. Chennault did not want the less agile but rugged P-40s trying to turn with the Japanese airplanes or getting into a tail-chase dogfight that the Americans would surely lose. “Close your range, fire, and dive away,” he ordered.

RAF units in Burma scoffed at these tactics. In response, Chennault maintained that British training was “excellent against German and Italian equipment but suicide against the [aerobatic Japanese].” The P-40 pilots were taught to engage, break

off, and re-engage, tactics that kept AVG losses low.

With Chinese (and British) forces in a losing struggle, the AVG's role was mainly to deny Japan complete air superiority and disrupt and destroy their air operations whenever possible. Chennault's tactics pitted surprise and opportunity against the rigid air discipline of the Japanese in order to disrupt and harass their numerically superior formations.

Hit Hard, Break Clean

The AVG won its worldwide fame in the defense of Rangoon, Burma, from December 1941 to late February 1942. During the peak of the action, Chennault kept two of the three AVG squadrons in China and rotated one to Rangoon to help the

British as Burma began to fall to Japan. He told his pilots, “Fight in pairs. Make every bullet count. Never try to get all the Japanese in one pass. Hit hard, break clean, and get position for another pass. Never worry about what's going to happen next, or it will happen to you. Keep looking around. You can lick the Japanese without getting hurt if you use your heads and are careful.”

In the final battles of late February 1942, the Rangoon AVG squadron dwindled from nine to six operational aircraft, fighting each day, before the last airplanes and a transport pulled back to China. In 10

weeks, the AVG had between five and 20 airplanes serviceable each day. They met 31 separate Japanese raids, which often numbered 100 or more aircraft, and bagged 217 enemy airplanes with 43 probables, with a loss of 16 P-40s and five pilots. In comparison, the RAF tallied 74 kills, 33 probables, and 22 aircraft lost in the battles. Chennault's switch in tactics and intensity of training paid off for his pilots.

The AVG's other remarkable achievement was fighting a defensive air war on a shoestring. Chennault's organizations were the ultimate in bare-base operations. He was proud of it and later wrote, "It was this ability to shift my combat operations 650 miles in an afternoon and 1,000 miles in 24 hours that kept the Japanese off balance for four bloody years and prevented them from landing a counterpunch with their numerically superior strength that might easily have put my always meager forces out of business."

The AVG suffered constantly from lack of supplies and was saved only by outstanding maintenance personnel who could put their P-40s back in the air. Conditions took their toll. By the spring of 1942, the pilots were in near revolt at being asked to fly low-level missions with little hope of supplies and parts to enable them to have a real impact. Combat fatigue was also a factor. With America now in the war, Washington recognized the need for a broader air effort in the China-Burma-India theater and saw the AVG as the core.

Festering Problem

The AVG officially merged into the Army Air Forces on July 4, 1942. Chennault himself had tried several times from 1938 to 1940 to return to active duty, but each time, either the Air Corps did not want him or he did not want their terms. The return to the Army was the right thing overall, but the specifics created a "festering problem that threatened to deprive China of her only effective air defense," Chennault complained.



Photo by R.T. Smith via Robert F. Dorr

After years of cobbling together a nearly miraculous set of victories under hard conditions, the AVG in 1942 officially merged into the AAF. However, it remained under the leadership of Chennault.

Ultimately, Chennault stayed in charge as a brigadier general but was outranked by his hated former instructor Clayton Bissell. Chennault was furious when Bissell came to China in March 1942 to arrange landing sites for the Doolittle Raiders and failed to tell Chennault about it. Chennault maintained that with the extensive Chinese early warning system, more of the Doolittle Raiders could have been talked down on friendly fields, if only he had been allowed to help.

The AVG was a tremendous morale boost and proof that the Japanese could be beaten in the air. Roosevelt's willingness to back Chennault strengthened ties with the other key member of the Big Four. "We didn't come over here for patriotic reasons," wrote Frank Schiel, one of the volunteers, "but it worked out that we did our country a great service."

Chennault's service was not over. He continued as Fourteenth Air Force commander and kept up his skill at fighting the defensive guerilla air war. He helped keep supply lines open and fought a long delaying action against a major Japanese drive

in 1944 as Tokyo attempted to secure a line of communication through China in the face of strangled shipping lanes and defeats in the Central and Southwest Pacific.

Chennault's difficult relationship with his commander, Gen. Joseph W. Stilwell, was so well-known that it was covered in *Time* magazine. He got along much better with Stilwell's replacement, Maj. Gen. Albert C. Wedemeyer, but could not overcome the continuing friction with his AAF superiors. Chennault had hoped to see the end of the war but was replaced in his command and resigned his commission shortly before V-J Day.

For all the difficulties, Chennault's wartime command set him apart as one of few American airmen to successfully run a defensive air operation over vast territory. In later years, Chennault remained a strong supporter of Nationalist China and of the Generalissimo and, especially, Madame Chiang. He helped found an air transport service that later became the CIA's Air America and of course, his AVG band launched the Flying Tiger freight airlines. Until his death, he spoke out on the need for support to Free China and he frequently criticized US foreign policies in the East. Chennault was irascible and opinionated to the end, but his skill as an innovator and his achievements in war made him one of the true visionaries of American airpower. ■

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SOUTH CAROLINA (Charleston, Clemson, Columbia, Myrtle Beach, Sumter): **Roger Rucker**, 112 Mallard Pt., Lexington, SC 29072-9784 (phone 803-359-5565).

SOUTH DAKOTA (Rapid City, Sioux Falls): **Ronald W. Mielke**, 4833 Sunflower Trail, Sioux Falls, SD 57108 (phone 605-339-1023).

TENNESSEE (Chattanooga, Knoxville, Memphis, Nashville, Tullahoma): **Joseph E. Sutter**, 5413 Shenandoah Dr., Knoxville, TN 37909-1822 (phone 423-588-4013).

TEXAS (Abilene, Amarillo, Austin, Big Spring, College Station, Commerce, Dallas, Del Rio, Denton, Fort Worth, Harlingen, Houston, Kerrville, San Angelo, San Antonio, Wichita Falls): **Dennis Mathis**, P.O. Box 8244, Greenville, TX 75404-8244 (phone 903-455-8170).

UTAH (Clearfield, Ogden, Salt Lake City): **Brad Sutton**, 5221 West Rendezvous Rd., Mountain Green, UT 84050-9741 (phone 801-721-7225).

VERMONT (Burlington): **Dick Strifert**, 4099 McDowell Rd., Danville, VT 05828 (phone 802-338-3127).

VIRGINIA (Alexandria, Charlottesville, Danville, Langley AFB, McLean, Norfolk, Petersburg, Richmond, Roanoke, Winchester): **Bill Anderson**, 3500 Monacan Dr., Charlottesville, VA 22901-1030 (phone 804-295-9011).

WASHINGTON (Seattle, Spokane, Tacoma): **Tom Hansen**, 8117 75th St. S.W., Lakewood, WA 98498-4819 (phone 253-984-0437).

WEST VIRGINIA (Charleston, Fairmont): **Samuel Rich**, P.O. Box 444, White Sulphur Springs, WV 24986 (phone 304-536-4131).

WISCONSIN (Madison, Milwaukee, General Mitchell IAP/ARS): **Chuck Marotske**, 5406 Somerset Ln. S., Greenfield, WI 53221-3247 (phone 414-325-9272).

WYOMING (Cheyenne): **Stephan Pappas**, 2617 E. Lincolnway, Ste. A, Cheyenne, WY 82001 (phone 307-637-5227).

Books

Compiled by Chequita Wood, Editorial Associate

American Jihad: The Terrorists Living Among Us. Steven Emerson. The Free Press, New York, NY (800-323-7445). 261 pages. \$26.00.



NATO After 2000: The Future of the Euro-Atlantic Alliance. John Borawski and Thomas-Durell Young. Praeger Publishers, Westport, CT (800-225-5800). 161 pages. \$54.95.



US and Asia Statistical Handbook 2001-2002. Paolo Pasicolan. The Heritage Foundation, Washington, DC (800-544-4843). 131 pages. \$9.50.



Attack of the Airacobras: Soviet Aces, American P-39s, and the Air War Against Germany. Dmitry Loza. University Press of Kansas, Lawrence, KS (785-864-4155). 369 pages. \$34.95.



Peace and War: The Arab-Israeli Military Balance Enters the 21st Century. Anthony H. Cordesman. Praeger Publishers, Westport, CT (800-225-5800). 709 pages. \$99.00.



Victory Roll!: The American Fighter Pilot and Aircraft in World War II. William Wolf. Schiffer Publishing, Ltd., Atglen, PA (610-593-1777). 464 pages. \$59.95.

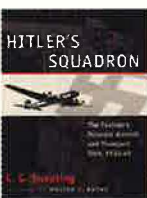
B-2 Spirit in Action: Aircraft No. 178. James Goodall. Squadron/Sig-nal Publications, Carrollton, TX (800-527-7427). 49 pages. \$9.95.



R-2800: Pratt & Whitney's Dependable Masterpiece. Graham White. Society of Automotive Engineers, Warrendale, PA (877-606-7323). 718 pages. \$49.00.



War Wings: The United States and Chinese Military Aviation, 1929-1949. Guangqiu Xu. Greenwood Press, Westport, CT (800-225-5800). 250 pages. \$64.95.



Hitler's Squadron: The Fuehrer's Personal Aircraft and Transport Unit, 1933-45. C.G. Sweeting. Brassey's, Inc., Dulles, VA (800-775-2518). 184 pages. \$31.95.



Right Backed by Might: The International Air Force Concept. Roger Beaumont. Praeger Publishers, Westport, CT (800-225-5800). 201 pages. \$64.00.

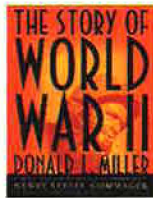


Wings of Our Own: Heroes, Happenings, and History of Air Force Spouses. P.K. Johnson. Order from: Wingspan Publications, Alexandria, VA (703-212-005). 224 pages. \$16.95.

The Kennedy Tapes: Inside the White House During the Cuban Missile Crisis. Ernest R. May and Philip D. Zelikow, eds. W.W. Norton & Co., Inc., New York, NY (800-233-4830). 514 pages. \$17.95.



The Story of World War II. Donald L. Miller. Simon & Schuster, New York, NY (800-223-2348). 704 pages. \$35.00.



Wings, Women, and War: Soviet Airwomen in World War II Combat. Reina Pennington. University Press of Kansas, Lawrence, KS (785-864-4155). 304 pages. \$29.95.



Lucrative Targets: The US Air Force in the Kuwaiti Theater of Operations. Perry D. Jamieson. GPO, Washington, DC (866-512-1800). 247 pages. \$35.00.



Sun Tzu and the Art of Modern Warfare. Mark McNeilly. Oxford University Press, New York, NY (800-445-9714). 304 pages. \$27.50.



Yellowjackets!: The 361st Fighter Group in World War II. Paul B. Cora. Schiffer Publishing, Ltd., Atglen, PA (610-593-1777). 152 pages. \$39.95.

By Frances McKenney, Assistant Managing Editor

Pitsenbarger Award

SrA. Joanna C. Edmundson received a Pitsenbarger Award from the Aerospace Education Foundation at a Community College of the Air Force graduation at Randolph AFB, Tex.

"I would like to thank you for your generous gift," she wrote to Jack C. Price, AEF chairman of the board.

A medical services technician with the 12th Medical Group at the Texas base, Edmundson graduated from CCAF in November with an associate degree in allied health sciences—and an AEF Pitsenbarger Award.

Formerly called Eagle Grants, the awards were renamed last September for A1C William H. Pitsenbarger. He received the Medal of Honor posthumously for his actions during the Vietnam War. The \$400 Pitsenbarger Awards go to selected top USAF enlisted active duty, Air National Guard, and Air Force Reserve Command CCAF graduates who plan to pursue a bachelor's degree.

In the 2000–01 academic year, AEF granted 290 Pitsenbarger Awards to active duty CCAF graduates and 16 to reserve personnel.

Last September, AEF expanded the program to increase the number of awards available for CCAF graduates in the reserves. Previously,



USAF photo by Ron Hall

Officials pose for a photo at a banquet hosted by the Nation's Capitol (D.C.) Chapter in December honoring the new Chairman of the Joint Chiefs of Staff, USAF Gen. Richard Myers, and the new Air Force Chief of Staff, Gen. John Jumper. From the left are: Thomas McKee, AFA National Chairman of the Board, Myers, Jumper, and William McGuth, president of the chapter.

graduates of the top 11 ANG and top eight AFRC CCAF graduate-producing organizations qualified to receive the awards. AEF now also funds one Pitsenbarger Award for every 33 graduates from the remaining ANG and AFRC CCAF organizations.

CAP Over New York

The **Burlington (Vt.) Chapter** built its January meeting around the presentation of a national-level Air National Guard airmanship award to ANG Lt. Col. Scott D. Baldwin. But to be present for the occasion, Baldwin first had to ask another Vermont Guardsman to take his place on Combat Air Patrol over New York City.

A part-time Guardsman and investment broker in civilian life, Baldwin has been part of the 158th Fighter Wing's CAP since 1:30 p.m. Sept. 11, reported Dick Strifert, chapter president. Baldwin told the chapter members that being among the first on CAP over the metropolitan area was eerie. Not a car seemed to be moving in the most populous city in the US, and there was only one other aircraft—the other F-16 on CAP—in the sky.

Strifert said the 158th, based at Burlington Airport, Vt., is responsible for 12 hours of CAP each day over New York.

Baldwin received the Maj. Gen. Earl T. Ricks Award for his emer-

AFA Conventions

May 3–4	Tennessee State Convention, Chattanooga, Tenn.
May 3–5	New Jersey State Convention, Cape May, N.J.
May 10–11	South Carolina State Convention, Sumter, S.C.
May 17–19	Mississippi State Convention, Columbus, Miss.
June 8	North Carolina State Convention, Wilmington, N.C.
June 14–16	New York State Convention, Owego, N.Y.
June 28–29	Oklahoma State Convention, Altus, Okla.
July 19–21	Florida State Convention, Cape Canaveral, Fla.
July 26–27	Texas State Convention, San Antonio
Aug. 2–3	California State Convention, Vandenberg AFB, Calif.
Aug. 17	Georgia State Convention, Savannah, Ga.
Aug. 18	Massachusetts State Convention, Worcester, Mass.
Aug. 23–24	Colorado State Convention, Denver
Sept. 15–18	AFA National Convention, Washington, D.C.
Sept. 21	New Hampshire State Convention, Manchester, N.H.

gency landing of an F-16C. According to the citation, the incident began when Baldwin lost throttle control at 11,000 feet. He used moderate to high G turns to prevent excessive acceleration and timed a flame-out so that he landed 1,000 feet down the runway. Stifert said the chapter members were interested in hearing about this feat probably because it reminded them of their own harrowing experiences in World War II and the Korean War.

Recovery

New York State President Timothy G. Vaughan and former state president Barry H. Griffith were originally scheduled to speak to the **Chautauqua (N.Y.) Chapter** members as the incoming and outgoing state AFA leaders.

Then the September terrorist attacks took place. So at the chapter's November gathering, they spoke instead about their roles in Operation Noble Eagle and in the rescue and recovery efforts at the World Trade Center.

Vaughan, an ANG lieutenant colonel, described the operations of the 107th Air Refueling Wing (ANG) at Niagara Falls, N.Y. He is the wing's operations officer.

Griffith is an ANG major in logistics plans for the 107th and spent 30 days in New York City. He ran the respirator program during the first two weeks, distributing the equipment to firemen and policemen on the night shift. During the second two weeks, he was officer in charge of security for the military contingent camped at Grand Central Station.

Vaughan and Griffith are both from the **L.D. Bell-Niagara Frontier (N.Y.) Chapter**.

The Post-Sept. 11 World

Maj. Gen. Daniel M. Dick was guest speaker for the December meeting of the **Langley (Va.) Chapter**. Dick is director for requirements and integration, Joint Forces Command, at Norfolk, Va.

In his presentation, he covered the changing homeland security role of JFCOM since Sept. 11. According to Gary L. Shanafelt, chapter past president, Dick told the audience that the command now has a homeland security directorate. (It is headed by Army Maj. Gen. Edward Soriano.)

Dick spoke about the civil support office JFCOM had in place before the terrorist attacks, its role in coordinating military forces to assist federal agencies during disasters, and the command's capabilities and future challenges.

A Pearl Harbor Legend: P-36 to F-22



Lockheed photo by John Rossino

2nd Lt. Phillip M. Rasmussen was one of the few US pilots to get airborne during the Japanese early morning attack on Pearl Harbor. Still in his pajamas, he took off in a P-36 from Wheeler Field and shot down a Zero over Kaneohe Bay.

Last November, the retired colonel—this time attired in an aloha shirt—“flew” an F-22 cockpit demonstrator at Lockheed Martin’s Marietta, Ga., facility.

Watching the Pearl Harbor legend in action were (clockwise from left) David McLelland Jr. (with pointer), F-22 engineer; Robert Murphy, a former fighter pilot; Keith Bilyeu, F-22 business development representative; Jeffrey Rhodes from Lockheed public relations; and Lockheed test pilot Paul Metz. Rasmussen and Murphy belong to the Florida Highlands Chapter. McLelland, Bilyeu, and Rhodes are Dobbins (Ga.) Chapter members.

On a Theme

In the wake of the Sept. 11 terrorist attacks, **Cochise (Ariz.) Chapter** President David Sanderson III had in mind the increased responsibilities of law enforcement officials when he planned the lineup of chapter guest speakers.

The first speaker called in was Richard Ward, a retired US customs agent from the southern Arizona area. He described his work, including some of the frustrations and dilemmas faced by law enforcement officials.

The roster of upcoming speakers includes a local FBI agent, an immigration officer, a Drug Enforcement Agency agent, and a representative involved in nearby Ft. Huachuca's tethered aerostat balloon-borne radar system.

The aerostat system comprises several helium-filled, blimp-shaped balloons tethered in locations along the US southern border. Data from their radar payload are sent to March ARB, Calif., and to NORAD, among other locations. The US Customs Service established this system to help stem illegal drug trafficking. The Ft. Huachuca site was built in 1986 and, Sanderson said, is staffed by USAF personnel. USAF is executive agent for the DOD-managed program.

Visiting the Vets

When the **Ute-Rocky Mountain (Utah) Chapter** members made their annual visit to the Veterans Affairs hospital in Salt Lake City in mid-December, it was hard to tell who was the bigger hit with the patients—Santa or the children who had tagged

AFA/AEF National Report

along. SMSgt. William Smith, chapter Vice President, had brought his 11-year-old daughter, Krystal, and her friend Kelly Miller, also 11, and his five-year-old niece Tiffany Nelson.

The hospital's patients don't often get to see children and enjoyed chatting with them, explained Chapter President Gary Strack. As for Santa, several patients who received disposable cameras as gifts from the chapter used them immediately to snap his photo. (Santa was Hill AFB, Utah, employee Bob Dansie, who will be presented with an AFA membership as thanks.)

Other chapter members who joined Strack and Smith for the visit were Deborah L. Boe, chapter secretary; Dennis J. Guymon, membership VP; and Community Partners Richard Flackman and James J. Ray.

They presented 60 patients with pairs of socks, with one functioning as a Christmas stocking filled with several small gifts, including those one-time-use cameras. Strack said the recipients "were really excited."

The chapter also donated 30 pairs of reading glasses, which one patient particularly welcomed. He told Strack that he'd been unable to fill out forms



Pat Condon, an AFA national director, runs with the Olympic flame through Pocatello, Idaho, in January. Condon (accompanied by an escort on right) is from the Northern Utah Chapter. He was selected to run a .2-mile segment as a way to honor those who died in the September terrorist attack on the Pentagon. He served on active duty there 1989-93. The Olympic flame relay began Dec. 4 in Atlanta and passed through 250 cities before reaching Salt Lake City on Feb. 8.

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because he hadn't been able to see well enough.

Commemoration With Roses

On Dec. 7, the **Francis S. Gabreski, Nassau Mitchel, and Queens Chapters** in New York sponsored the dropping of roses by vintage aircraft around the waters of the Statue of Liberty. The annual event marks the remembrance of the Pearl Harbor attack.

Rep. Steve J. Israel (D-N.Y.) and Rep. Felix J. Grucci Jr. (R-N.Y.) attended the ceremony that was held at the American Airpower Museum in Farmingdale, N.Y., before the aircraft took off. William G. Stratemeier Jr., an AFA national director, served as master of ceremony. Other AFA attendees among the huge crowd included Fred Di Fabio, downstate VP, and Alphonse Parise, Gabreski Chapter president.

This year, two dozen roses were added to the 60 American Beauties—one for each anniversary—to honor those killed in the Sept. 11 attacks. The dropping of the roses was started in 1970 by a Pearl Harbor survivor.

CAP Educator
The Genesee Valley (N.Y.) Chap-

ter recently presented an AEF-funded Civil Air Patrol Educator Grant to Charles Miller of the CAP squadron in Perry, N.Y.

On hand for the squadron's annual awards ceremony were Chapter President Joe Pow; Kenneth P. Beaman, treasurer; Kent W. Hemphill, aerospace education VP; Al Richter, government relations VP; and Charles M. Bruton.

Hemphill said the squadron would use the \$250 grant for computer simulation software that would introduce the cadets to piloting light aircraft.

AEF has provided nearly \$70,000 in aerospace education grants to CAP units since 1996. CAP headquarters manages the \$250 grants, which are to be used for aerospace education-related items and activities.

More AFA/AEF News

■ AFA National Chairman of the Board Thomas J. McKee presented the AFA Academic Achievement Award to ANG MSgt. Roberta L. Sparks at the Senior NCO Academy graduation ceremony at Maxwell AFB, Ala., in December. Sparks is now first sergeant at the 169th Medical Squadron, McEntire ANG, S.C. She said that each time she re-



At a commander's call, Eric Taylor (back row center), New Hampshire state president, presented memberships in the Brig. Gen. Harrison R. Thyng (N.H.) Chapter to the 2001 Outstanding Airmen from the 157th Air Refueling Wing (ANG), Portsmouth, N.H. Recipients were (front row, left to right) SrA. Robert Rojek, MSgt. Brenda Blonigen, TSgt. Melissa Chick, and MSgt. Anthony Manix. CMSgts. William Houghton and Ronald Nadeau (back row left to right) also attended the ceremony.

ceived a perfect score on a test at the academy, she was motivated to try even harder. In addition to presenting the award to Sparks, McKee

for the first time gave a presentation to the SNCOA class. He spoke on how AFA works with Capitol Hill.

■ As it has for the past six years, the **Eagle (Pa.) Chapter** ran an AFA booth at the Pennsylvania Farm Show in Harrisburg, Pa., in January. Edmund J. Gagliardi, chapter treasurer, and Edna M. Gagliardi, chapter secretary, opened the booth every morning at 8 a.m. during the show's five-day run and manned it until early afternoon. Other chapter members who helped keep the booth open until 6 p.m. were Raymond J. Restagno, chapter president; Anthony Bellavia Jr., chapter VP; Donald R. McCallin, chapter VP for aerospace education; Cy Rosito, veterans affairs VP; and Raymond Marisco, membership VP.

■ Retired Lt. Col. Robert C. Vaughan, an AFA national director in the 1970s, died Oct. 7. He was 82 years old. He served for more than 30 years on active duty and in the reserve, beginning with 12 years of active duty in the Army Air Corps in November 1940. He was an AFA charter member and held numerous AFA offices, including state president of Illinois and California.

Have AFA/AEF News?

Contributions to "AFA/AEF National Report" should be sent to *Air Force Magazine*, 1501 Lee Highway, Arlington, VA 22209-1198. Phone: (703) 247-5828. Fax: (703) 247-5855. E-mail: afa-aef@afa.org. ■

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5th AF, Hq and Hq Sq, 314th Composite Wg (WWII) and 5th Bomb Command (Korea). Sept. 11–15 in St. Charles, MO. **Contact:** Louis Buddo, Box 270362, St. Louis, MO 63127 (314-487-8128).

5th/108th Station Hospital (WWII), Fifth AF. Sept. 11–15 in St. Charles, MO. **Contact:** Jeff Seabock, PO Box 3635, Hickory, NC 28603 (828-324-6464).

10th Tactical Recon Wg, Spangdahlem AB, Germany (1953–59), all supporting units. Sept. 6–8 in Schertz, TX. **Contact:** Jerry Graham, 409 Maple Dr., Schertz, TX 78154 (210-658-5962) (NODAKTWOINTX@WORLDNET.ATT.NET).

12th Tactical Fighter Wg, 12th BG, 12th Fighter Tng Wg. June 18–23 in Tampa, FL. **Contact:** Wilbur Anderson (919-736-3711) (wanderson6@nc.rr.com).

22nd Military Airlift Sq. April 19–21 at Travis AFB, CA. **Contact:** Jack Bostick (707-425-3895).

31st Fighter Officers Assn. Oct. 19–21 in Phoenix. **Contact:** Rocky Eubank, 10515 River Plantation Dr., Austin, TX 78747 (512-282-1077) (rockyeub@aol.com).

36th Tactical Fighter Wg. Aug. 19–23 in Bitburg, Germany. **Contacts:** George Acree (410-647-9511) (acree5@home.com) or Lydie Hengen (lydielux@aol.com).

80th Service Gp (WWII), Fifth AF. Sept. 11–15 in St. Charles, MO. **Contact:** Virgil Staples, 725 16th St., West Des Moines, IA 50265 (515-225-8454).

84th ATS/MAS Sq. May 16–17 at the Holiday Inn in Fairfield, CA. **Contact:** John Burnett, 579 Leisure Town Rd., Vacaville, CA 95687 (Jnburnet@cwnet.com).

86th Fighter–Bomber Gp Assn (WWII). Sept. 10–12 in Niagara Falls, NY. **Contact:** Sid Howard, 211 Brownstone Dr., LaHabra, CA 90631-7397 (714-992-2504).

90th BG Assn, Western Division. May 15–18 in Spokane, WA. **Contact:** William Bomicino (805-929-2286).

303rd ARRS, Long Beach and March AFBs, CA (1956–83). April 19–21 at the Primadonna Casino Resort in Primm, NV. **Contact:** Herb Spencer, 303 ARRS Association, PO Box 8339, Green Valley Lake, CA 92341-8339 (909-867-3061).

303rd ARS. Oct. 1–5 in Bossier City, LA. **Contact:** Bill Young (318-746-3637) (byoung@shreve.net).

308th BW, Hunter AFB, GA. April 26–27 in Savannah, GA. **Contacts:** Roy Harris (407-859-3871) or Pat Gennaro (407-859-3871).

317th Troop Carrier Gp Hq, 40th and 41st TCS, Fifth AAF (WWII). Sept. 25–29 in Washington, D.C. **Contact:** Vince Krobath, 22 Lantana Dr., St. Louis, MO 63123 (314-842-2484).

321st BW, Pinecastle and McCoy AFBs, FL (1954–64). May 2–4 in Orlando, FL. **Contact:** R.W. Cribley, 5341 Lake Jessamine Dr., Orlando, FL 32839 (407-855-3007).

405th Signal Co, 5th AF. Sept 11–15 in St. Charles, MO. **Contact:** Phil Treacy, 2230 Petersburg Ave., Eastpointe, MI 48021-2682 (810-775-5238).

435th Tactical Control Wg, including affiliated units from WWII, Korea, and Vietnam. April 19–21 in Cocoa Beach, FL. **Contact:** Carl Gulbrandsen, 12470 S.W. 188th Ter., Miami, FL 33177 (305-238-0408) (cgulbran@bellsouth.net).

475th FG. May 9–12 at the Sheraton Music City Hotel in Nashville, TN. **Contacts:** Marvin O. Rose, 585 Open Range Rd., Crossville, TN 38555 (931-484-7107) or P.J. Dahl (813-265-1133).

502nd Tactical Control Gp (Korea), 5th AF. Sept. 11–15 in St. Charles, MO. **Contact:** Fred Gorsek, 445 S. State, Greenvew, IL 62642 (217-968-5411).

511th AC&W Gp, including the 613th, 847th, 848th AC&W Sqs, and the 39th AD. Sept. 5–8 at the Radisson Hotel in Charleston, SC. **Contact:** Don Simmons, 704 S. Grove Rd., Richardson, TX 75081 (972-231-6518) (dona7112@iadfw.net).

AACS Alumni Assn, all eras. Sept 26–29 at the Marriott Hotel in Dayton, OH. **Contact:** Mac Maginnis (253-474-8128) (Cmagin4375@aol.com).

Aeromedical Evacuation Assn (1942–present), May 8–12 in Myrtle Beach, SC. **Contact:** Wayne Everingham, AMEA, PO Box 1221, Sacramento, CA 95812-1221 (916-369-7955) (everwa@jps.net).

Air Rescue Assn. Oct. 3–6 in Atlanta. **Contacts:** ARA, PO Box 300945, Fern Park, FL 32730-0945 or John Flournoy (505-821-1145) (Jflournoy2@comcast.net).

Air Transport Command Assn (WWII). May 23–25 in Colorado Springs, CO. **Contact:** Rick Ravitts (815-229-1122).

Air Weather Assn. Sept. 19–22 at the Marriott in Dayton, OH. **Contact:** Clifford Kern, 1879 Cole Rd., Aromas, CA 95004-9681 (831-726-1660) (Clifforddkern@cs.com).

C-123s, Southeast Asia (1960s), aircrew and ground support personnel. May 20–24 at the Peppermill Hotel Casino in Reno, NV. **Contact:** Al Brezinsky, 5216 Stone Crest Dr., Weed, CA 96094 (530-938-1671).

Class 52-C, Craig AFB, AL; Bryan AFB, TX; and Williams AFB, AZ. May 10 at the village Le Nebbio in Corsica, France. **Contact:** Laurence Bassery (011-33-0442958618) (lbassery@vtfvacanes.com).

Doolittle Raiders. April 17–21 in Columbia, SC. **Contact:** (803-788-6837) (www.DoolittleRaidersReunion.com).

EC-47 personnel, Southeast Asia (1966–74). May 10–12 at the Air Force Museum in Dayton, OH. **Contact:** J.C. Wheeler (jc@ec47.com).

Flying Tigers of the 14th AF Assn (WWII), veterans of the American Volunteer Gp (1941–42), the China Air Task Force (1942–43), and

14th AF (1943–45). May 23–26 in Arlington, VA. **Contact:** Robert M. Lee, 717 19th St. S., Arlington, VA 22202-2704 (703-920-8384).

Ground Launched Cruise Missile veterans. May 25 in Tucson, AZ. **Contact:** GLCM Historical Foundation, 8987 E. Tanque Verde Rd., #309, PMB 141, Tucson, AZ 85749 (glcmhf@gci-net.com).

Laon AB, France, former military personnel, dependents, and teachers. June 12–16 at the Holiday Inn Select in Irving, TX. **Contact:** Tom Laseter (972-255-5141) (tlaseter@wt.net).

Pilot Class 55-V. Aug. 20–23 in Madison, WI. **Contact:** Richard Murray, 1421 Wyldewood Dr., Madison, WI 53704 (608-244-3359) (greenbush4@aol.com).

Pilot Tng Class 52-C. May 19–23 in South Lake Tahoe, CA. **Contact:** Warren Hunt, 33 West Hidden Ridge Rd., Sequim, WA 98382 (360-683-4874) (whunt@olympen.com).

Ploesti veterans, including 44th, 93rd, 98th, 376th, and 389th BGs. July 31–Aug. 3, 2003, in Salt Lake City. **Contact:** Kent Jaquith, 760 Knight Hill Rd., Zillah, WA 98953 (509-865-2481).

Ramey AFB Historical Assn. March 5–10 in Aguadilla, PR. **Contact:** Carlos M. Ruiz, PO Box 565, Aguada, PR 00602 (787-868-2794).

Women's Overseas Service League. June 7–10 at the Silver Legacy Resort Casino in Reno, NV. **Contacts:** Georgia Boyd, 2552 Williams St., San Leandro, CA 94577-3151 (510-357-3787) or Geraldine Condon, 1516 11th Ave., San Francisco, CA 94122-3615 (415-681-7852).

Seeking former members of the **432nd TRW**, Udorn RTAB, Thailand, for a reunion. **Contact:** Scott Smith, 1001 Back Bay, West River, MD 20778 (800-468-3539) (UDORN432TRW@msn.com).

Seeking former permanent party members of the **3650th Basic Military Tng Wg**, Sampson AFB, NY (1950–56), for a reunion. **Contact:** C. Phillips, SAFB Veterans Assn., PO Box 331, Williamsville, NY 14231 (phone: 716-633-1119 or fax: 716-633-9118) (chip34@aol.com).

Seeking former **Clark AB, Philippines, Police Red Patches** for a reunion this summer. **Contact:** Bill Bourquin (714-779-2338) (bourq1@wans.net).

Seeking former **Convair** mission support pilots (Ellington, James Connally, or Harlingen AFBs, TX, or Mather AFB, CA) for a reunion. **Contacts:** Charles Rice, 4742 Kempsville Greens Pk., Virginia Beach, VA 23462 (chastrey@msn.com) or Shad Shaddox, 222 Greycliff Dr., San Antonio, TX 78233 (Elshad@aol.com). ■

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.



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About the 21st Century Legacy of Flight

The Aerospace Education Foundation established the 21st Century Legacy of Flight Wings Club in 2000 to recognize sustained annual contributions made by individuals and in 2001 added Education Partners to the program to recognize sustained giving by AFA chapter, state, and regional organizations. These sustained giving programs help provide the funds necessary for AEF to maintain its educational outreach programs.

Names of Wings Club members and Education Partners and years of successive contributions will be recorded permanently in the 21st Century Legacy of Flight Log Book.

To participate in the Wings Club: e-mail AEF at AEFSTAFF@AEF.ORG; call our customer service representative at 800-291-8480; visit our Web site at WWW.AEF.ORG.

* Indicates previous AEF Life Members.

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Pieces of History

Photography by Paul Kennedy

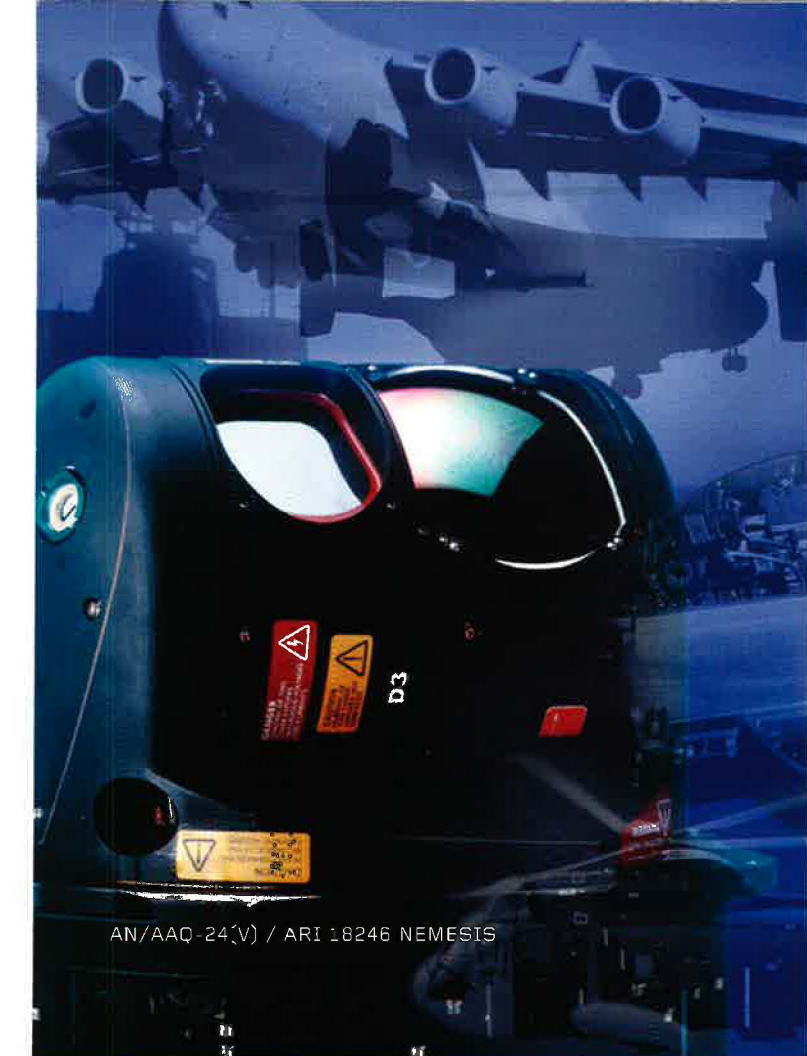
The Edge of the Envelope



Among experimental X-planes, the X-15 was famous. Shown here in a head-on view is X-15 No. 2, displayed at the US Air Force Museum. It was one of the three built by North American Aviation, Inc. First powered flight for the X-15 took place Sept. 17, 1959. The three aircraft were designed to gather basic research data on temperature, stability and control, and physiological problems

at high altitudes and speeds. Dropped from a B-52 mothership at about 45,000 feet, they set some unofficial records: a speed of 4,520 mph and an altitude of 354,200 feet. Several pilots attained the astronaut rating flying the X-15s. Information from these flights—which ended in 1968—helped the development of the US manned spaceflight program.

Courtesy US Air Force Museum, Wright-Patterson AFB, Ohio



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