December 2004/$4

AIR FORCE MAGAZINE

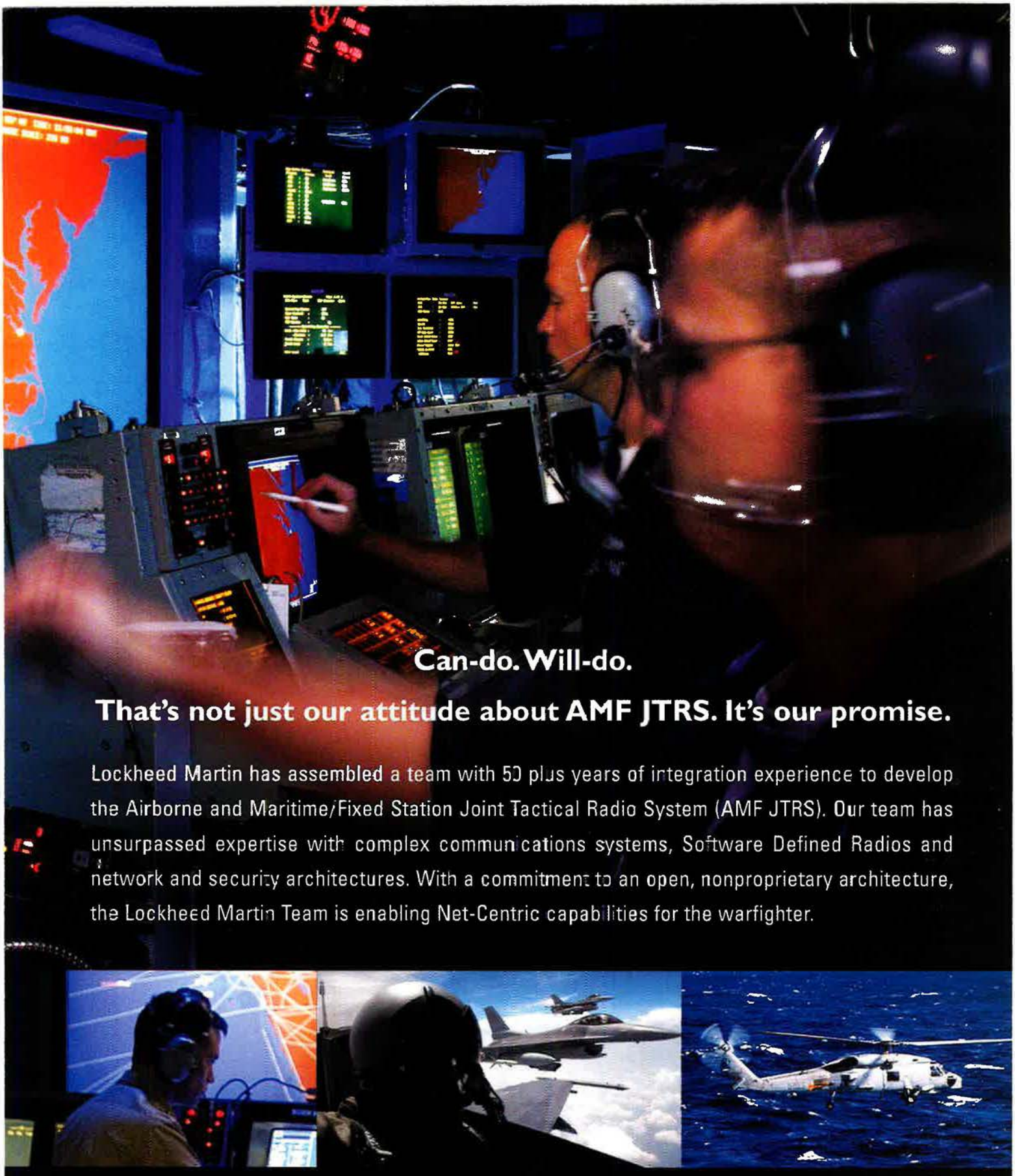
JOURNAL OF THE AIR FORCE ASSOCIATION

Impossible Odds in SAM-7 Alley
The Heroism of Steven L. Bennett

The New Way of Electron War

Air Warfare in Transition

Reconnaissance in Force



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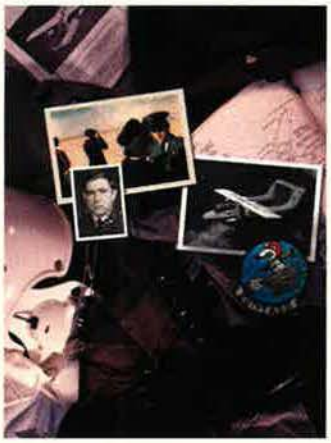

About the cover: Artifacts from the Vietnam War include images of Steven Bennett, Medal of Honor recipient. See "Impossible Odds in SAM-7 Alley," p. 52. Photo montage by Paul Kennedy. Pinning ceremony photo courtesy Angela Bennett.

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Editorial

By Robert S. Dudney, Editor in Chief

Weathering the QDR

NEXT month marks the end of President George W. Bush's first term—four years which unexpectedly turned into a period of near-continuous overseas warfare. As we look back, it is startling to see how much air and space power contributed to US success in those combat operations.

The swift toppling of the Taliban in Afghanistan and of Saddam Hussein in Iraq, plus gains against al Qaeda and other terrorists around the world, are attributable largely to our dominance in air and space. Land and sea forces were indispensable, yet air and space power proved to be pre-eminent in the conventional battlespace.

All of this should suggest heavy support for air and space in DOD's next Quadrennial Defense Review (QDR), launched on Nov. 4. The Air Force, however, has cause to be wary. Big defense reviews in 1993 and 1997 led to deep cuts in its forces. The 2001 QDR brought more scrutiny (though no reductions).

A QDR is an in-depth look at US strategy, forces, and policies. Each newly elected (or re-elected) president produces for Congress a QDR report. The report of QDR 2005 isn't due until next fall, but it is clear DOD wants to reshape the armed forces to mesh with the Bush Administration's new global realignment plan.

This realignment logically should enhance the standing of airpower. USAF's worldwide strike and mobility capabilities will become critical after 60,000 to 70,000 overseas-based US forces return to home bases, from which they will have to deploy in order to reach combat zones.

There are, however, questions about whether support will hold up throughout the long QDR grind. Previous reviews degenerated into budget drills, with each service looking more or less to its own interest.

All of the services face money problems. Under Bush, the defense budget has enjoyed robust growth and will reach $402 billion next year (not counting many billions to fund combat operations). Even so, the surge can't go on too much longer.

The Congressional Budget Office foresees a federal deficit of $422 billion this year, $348 billion next year, and $300 billion for the rest of the decade. That, plus looming bills for social programs, will have a dampening effect on military spending.

According to Air Force Gen. Charles F. Wald, deputy commander of US European Command, the "real issue" will be deciding the "proper mix" of various forces, given limited funds.

The fiscal problem is compounded by another uncertainty, which is more conceptual in nature.

In the upcoming defense review, the Air Force could face a "perfect storm" of pressures.

According to the *Washington Post,* DOD officials are taking a close look at a new, long-term strategy that shifts spending and personnel away from main conventional power to build smaller and more specialized forces for fighting guerrilla wars, terrorism, and other unconventional threats.

The proposal, presented last August to Secretary of Defense Donald H. Rumsfeld, embraced a long-term reorientation of defense funds away from aircraft, warships, and the like toward special operations forces, mobility, communications, and intelligence. It holds that US forces today face no serious "traditional" military foe and should focus on dealing with three other kinds of threats—catastrophic, disruptive, and irregular. This, they say, argues for maintaining a smaller "high-end" force.

The idea of getting smaller has already occurred to Air Force leaders, who believe that this will free up money to help pay for critical modernization programs.

Stealth, precision, and space technologies make it possible for USAF simultaneously to get smaller and more powerful. Lt. Gen. Duncan J. McNabb, formerly deputy chief of staff for plans and programs, said the service will "focus on capability" and not "the number of tails you have."

One USAF study looks at reducing the fighter force by up to 25 percent over the next 20 years by retiring older F-16s and F-15s and cutting planned purchases of F-35 fighters.

There is a limit, however, to how small the conventional force can get, said Wald. Moreover, he said, "I think it would be wise to cover our bases at the higher end of the spectrum."

In the debate over the proper balance, the F/A-22 fighter is certain to get heavy attention. The Raptor is expensive. USAF is on record as saying it needs 381 of the stealthy aircraft, the centerpiece of future air warfare concepts. Others argue that the Air Force could get by with fewer.

Scrutiny will fall not only on the F/A-22. The Air Force also has on the books plans for increased investments in unmanned aerial vehicles, ISR systems, long-range strike, airlifters, tankers, and space capabilities.

On top of pressures generated by the QDR, the Air Force will be affected by other major studies. The Pentagon is now or soon will be engaged in a new Mobility Capability Study, an Operational Availability Study, and a major Base Realignment and Closure study.

McNabb once said the Air Force faced what could be described as a "perfect storm"—a precise convergence of financial and other pressures that could bring new opportunities but also force hard choices.

The test for the Air Force in the year 2005 will be figuring out how to deal with these disparate pressures and still maintain a balanced force that can be sustained over the coming decades. The goal is to position USAF to obtain the resources sufficient to meet the nation's requirement for air and space power.

If the record of the past four years of combat operations is any guide—and it is—that objective should be at the top of everyone's lists. ■

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Letters

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More Airlift, Please

"The Airlift Gap" *[October, p. 34]* highlights one of the most serious potential strategic vulnerabilities confronting the United States. Demand is up and likely will stay high. The ongoing war on terrorism, the global rebasing of US forces, and Secretary Rumsfeld's new defense strategy will ensure this. At the same time, as Mr. Tirpak points out, there are too few airlifters, too many of the ones currently in the force are old, and the tankers that support them are wearing out. Changes in commercial aviation could reduce the value of the CRAF [Civil Reserve Air Fleet] program.

Although the airlifter fleet is not in imminent danger of collapse, there is no practical alternative to the expansion and modernization of the airlift fleet and associated capabilities, particularly the tankers. DOD has stretched its sealift capability as far as it can go. The Maritime Pre-positioning Force (Future) may provide new capabilities for rapid support of forces ashore, but that force is probably two decades away. The key to the US global defense posture and strategy is its airlift capabilities.

As the article points out, DOD needs to do three things, beginning right now. First, it needs to expand the buy of C-17s to at least 222, the number validated by the MRS-05. The real number is probably even higher. Second, it needs to upgrade the C-5s. Finally, it needs to initiate a tanker replacement program. While it may be true that the KC-135 fleet can be maintained for some time to come, its continued operation can only be achieved by paying constantly increasing maintenance costs. Moreover, to wait much longer to begin a replacement program is to risk the catastrophic collapse of the tanker fleet when palliative measures no longer suffice to keep these aging aircraft in the air.

Daniel Goure
The Lexington Institute
Arlington, Va.

Air Mobility Command (or MAC or MATS) is still operating in the same basic format that it has operated in for more than 30 years. Any transformation or innovation that has occurred has been on the strategic or tactical sides of Air Force operations. AMC needs to fully consider alternative solutions for acquiring new airlifters/tankers. The use of privatized services should be a top consideration.

No other set of weapon systems in DOD has the potential of saving tens of billions of dollars by being acquired new in a privatized method and operated privately for the military. The Air Force once considered the commercial purchase of C-17s to be put into the CRAF, but that program has been placed on hold. Why not reinstate it? If not, then let's raise taxes to pay for everything, since we are in a war.

Joseph E. Lohndorf
Elk Grove Village, Ill.

Bernie Fisher's Heroism

Thanks for your October story, "Into the Valley of Fire" *[p. 48]*. In my 74 years, including over 22 in USAF, I have met many outstanding people. None surpass Bernard Fisher.

I do not remember him just for being awarded the Medal of Honor, but for his actions after the award ceremony in Washington, D.C. He was a real hero of the highest order. While Fisher was at the White House, the governor of Idaho offered to send his own plane to pick up Fisher and his family and take them to Idaho for a hero's welcome. Bernie declined because he had previously committed to take the Boy Scout troop at his home base in Germany on a campout the coming weekend.

I was privileged to fly him, his wife, and kids on a helicopter sightseeing tour of the nation's capital before taking them to Andrews AFB, Md., for their flight back to Germany.

Lt. Col. Edward G. Quinlan,
USAF (Ret.)
Wareham, Mass.

Myers, Fisher, Lucas, Hague, and Vazquez—they make me proud to be an American. We are so fortunate to have men like these as part of our heritage. Thanks for focusing on this small part of the Vietnam conflict. More stories such as these would be appreciated, and we know there are more.

John Doolittle
Bodega Bay, Calif.

The Douglas A-1E Skyraider made its combat debut in Korea, as its first flight was in March 1945. It was simply too late for World War II.

Steven P. McNicoll
De Pere, Wis.

■ *Mr. McNicoll is correct. The Navy submitted a production order for 600 aircraft in May 1945, just before the war ended, but the aircraft did not see actual combat service until the Korean War.*—THE EDITORS

Keesler's Legacy

My letter is in reference to your article "So Far, So Good" *[October, p. 60]*. I went through technical training at Keesler AFB, Miss., in 1952-53. In trading tales with some of the men whom I shared Keesler experiences with over 50 years ago, [similarities] after we left USAF became apparent. All of us had gone on to use the GI Bill to get science degrees at colleges and universities; all had been employed by top technical corporations, progressing to management positions (one even has an advanced corporate design center named after him), and some, although in their 70s, are still professionally active.

What makes this story interesting is that we all have agreed that we

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were not "good" students until joining the Air Force. My e-mail buddies and I state unanimously that we learned good study habits and a lasting love of and fascination with science and technology at Keesler. Those ingrained habits stood us in good stead when we were faced with college engineering courses after our Air Force service had ended.

The technical training that USAF provided at Keesler and other USAF training command bases in the 1950s was superb. It not only built a coterie of fine technicians to maintain the military technology of the era, it also gave a whole bunch of young men and women the initial impetus and knowledge they needed to succeed in a postenlistment environment.

Alan Mowbray
Luquillo, Puerto Rico

Before the Flying Fortress?

I enjoyed the article about the B-17. *[See "When the Fortress Went Down," October, p. 78.]* I was surprised that the B-15 was not mentioned. During the time that the B-17 was at the 2nd Bomb Group in 1939 at Langley, the B-15 was also there. I have always been under the impression the B-15 led to the B-17.

I was at Langley at the time, and the pilot who flew the B-15 and the B-17 was Gen. Caleb Haynes. He was a colonel at that time. He made the South American flights proving the range and endurance of four-engine types. In February 1942, right after Pearl Harbor, Colonel Haynes put together a group of B-24, B-17, and C-47 aircraft and went to the China-Burma-India Theater. I was a crew member on his B-24D. I have always admired General Haynes. He was the type of officer who made the Air Force what it is today, a good pilot and a great guy to be around.

Jim Shannon
Houston

■ *Boeing did apply some aerodynamic features of both the XB-15 (still in design itself at the time) and the Model 247 transport to its design of the B-17. The B-17 made its first flight in July 1935, while the XB-15 did not fly until October 1937.—THE EDITORS*

The Original "Patches"

The original "Patches" was C-33 #073, assigned to the 19th Transport Squadron, Hickam Field, Hawaii. *[See "Pieces of History: Patches," October, p. 88.]* The C-33 sustained more than 100 bullet holes during the Dec. 7, 1941, attack on Hawaii. The holes were patched, the name Patches was painted on the nose, and it was returned to service, only to crash and burn after striking another aircraft while taking off from Honolulu on June 21, 1942. I know, because Patches was my assigned aircraft as radio man and I was aboard on that fateful June day.

Jesse E. McSwain
Arlington, Va.

About Those Aces

So the age of aces is over? Go figure. Maybe the age of manned fighters is over, and we just haven't realized it yet. *(See "The Missing Aces," September, p. 80.)*

The next guy to make five kills may be sitting at a computer console controlling a UCAV. And, if our leaders don't wake up, it could be five USAF pilots.

Jim Evans
Omaha, Neb.

Are there any records kept of the number of planes shot down by bomber crew enlisted personnel? It would seem that with the number of attacks made on Eighth Air Force planes by German fighters, there would be gunners on some of those planes who scored enough kills to rank with fighter aces.

Such enlisted aces would not be limited to the European Theater. Issue No. 10 of the 40th Bomb Group's "Memories" tells the story of a B-29 on a photo recon mission on Oct. 24, 1944. This single B-29 was attacked by an estimated 30 to 40 fighters and, in a three-hour gun battle, was credited with shooting down nine and damaging two. The gunner John L. Jensen who wrote the account of this confrontation feels that the count should have been 11 shot down and at least four or five more damaged.

It would seem appropriate that ace-equivalent credit should be given to bomber crew gunners. If there are archives that record this form of credit to gunners, it would make interesting reading. If not, archives and almanac tables should be amended to include these actions together with appropriate credits.

William A. Rooney
Wilmette, Ill.

■ *According to the Air Force Historical Research Agency, gunners on bombers destroyed many enemy aircraft, but the Army Air Forces quickly abandoned the attempt to systematically award them aerial victory credits because the average bomber had 10 machine guns and six gunnery positions, and the average bomber formation contained many aircraft. If a formation shot down an enemy airplane, witnesses could not determine exactly which bomber, much less which gunner, destroyed the airplane.*—THE EDITORS

Thank you for the great article. However, the heat-seeking, air-to-air missiles used in the Vietnam conflict were the AIM-4 Falcon and the AIM-9 Sidewinder, not the AIM-7 Sparrow, which is a radar-guided missile. All F-16s are equipped with 20 mm cannon (M-61A1), not a 30 mm weapon. (A centerline ECM pod, not a 30 mm pod, is depicted in the painting.)

Keoki O. Dahl,
Aberdeen, Wash.

■ *Mr. Dahl is correct on both counts.*—THE EDITORS

Find a New Message

I was saddened to read that the ROTC unit at the University of Massachusetts-Amherst is scheduled to close in 2007 because of low participation. *[See "Aerospace World: "Seven ROTC Units To Close," October, p. 19.]* I received my commission there in 1964 and remember it as a vibrant, well attended program. This was at a time when the student population at UMass-Amherst was significantly smaller than it is today. Even during the anti-Vietnam War protests on campus, the detachment continued to commission sufficient numbers of officers. I find it difficult to believe that the demographics of the area have changed so much that there are no longer sufficient numbers of students. Maybe our message needs to change in order to connect with the contemporary student.

Col. Bernard S. Harland,
USAF (Ret.)
Satellite Beach, Fla.

■ *The ROTC detachment at the University of Massachusetts-Amherst is among five units granted two-year reprieves. USAF plans further evaluation. (See "Aerospace World: Five ROTC Units Escape Axe," p. 15.)*—THE EDITORS

It's Called Mutiny

Air National Guard Lt. Col. Patrick Foley is totally off base with regard to his views on how senior military leadership should have reacted to the meddling by President Johnson and Secretary of Defense McNamara with rules of engagement and targets in

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To educate the public about the critical role of aerospace power in the defense of our nation.

To advocate aerospace power and a strong national defense.

To support the United States Air Force and the Air Force family.

Vietnam. *[See "Letters: Views of the Vietnam War," October, p. 4.]*

The action Colonel Patrick advocated is known as (de facto) mutiny, an act that would have caused irreparable damage to our military and nation. The correct and traditional way to change such an undesirable circumstance is called "an election." This American custom has always been rightly supported and defended by the armed forces of the United States.

MSgt. W.D. McCombs,
USAF (Ret.)
Kenton, Ohio

History is never as easy as it seems, nor are one's actions. Colonel Foley's remarks about resignation for principle [offers] an option that is always open. Don't expect anything to come of resigning except your complete loss of benefits (and years lost from your life, along with employment problems).

As for the Vietnam War, the late Lyndon Baines Johnson had a record of outright cashiering (voiding commissions) of officers who publicly berated his international policies and aims, and his assistants had a record of spoiling their civilian lives afterwards.

James A.F. Compton
La Mesa, Calif.

The Quote Is OK

The letter from Charles P. Nicholson Jr., which appeared in the October issue's "Letters" on p. 7, states his disappointment that on the World War II Memorial the phrase "So help us God" has been omitted from President Roosevelt's quote. That is not quite correct. This same comment went around on the Internet.

I have read the complete text of the President's speech, which can be found on the Internet, and it clearly shows that the quote on the memorial is a correct quote of a paragraph in the middle of the speech. The President's words "So help us God" can be found farther along, near the end of his speech. They do not directly follow the words used on the memorial.

Lt. Col. Henry R. Kramer,
USAF (Ret.)
London, Ky.

On the Vietnam War Almanac

The C-130s of the 315th Air Division—four wings from Tachikawa, Naha, CCK, and Mactan—provided the majority of the in-country airlift into and out of Tan Son Nhut and Cam Rahn Bay and took losses from enemy fire [and suffered] wing cracks and flap jack screw wear. While they were not organizations of the 7th/13th Air Forces, they were under operational control of the 834th Air Division while in-country.

We were hard put to obtain logistics support, as we were officially not supposed to be there. We were fortunate to have the RAM Team to support the battle damaged aircraft. I believe the out of country airlift effort deserves recognition.

Lt. Col Robert E. Webber,
USAF (Ret.)
Carmichael, Calif.

I disagree with the chronology. The 100th Strategic Reconnaissance Wing continued to fly Buffalo Hunter sorties long after the Aug. 15, 1973, last US combat mission. I believe our last mission was flown within hours, if not days, of the fall of Saigon.

Dave Matthews
Fairborn, Ohio

Your charts indicate there were no fighters at Da Nang in 1972. The 366th TFW was there with all three squadrons until around November when they left en masse.

Scott Griffin
Yuma, Ariz.

■ *The chart provides data from a 1995 paper by Col. Perry Lamy at the Air War College. Other sources do indicate a small number of F-4s were still flying out of Da Nang in 1972.—* THE EDITORS

The following event should have been included in the chronology. In the spring 1967, the largest airborne operation since World War II took place with III Corps. The departure base was Bien Hoa and consisted of several thousand paratroopers and many C-130s. The drop area was north of Tay Ninh and Black Mountain near the Cambodian border. The event was significant because of the size, uniqueness, and dependence on USAF.

Lt. Col. David A. Bush,
USAF (Ret.)
Mesa, Ariz.

Corrections

On p. 79 of the October article "When the Fortress Went Down," a production error led to deletion of part of the word "cockpit."

In the November issue, "Senior Staff Changes" (p. 21) lists a nomination for Bruce A. Wright to be general. Our source was incorrect. Wright was renominated for lieutenant general in a new position.

The Keeper File

Nitze's "Bludgeon"

This once-classified paper was a major milestone—perhaps the major milestone—in postwar US defense planning. Better known as "NSC-68," it provided the intellectual basis for what became a vast military buildup to counter communist aggression.

President Truman had been shocked by the Berlin blockade and Soviet domination of Eastern Europe. In late 1949, he faced two more stunners—Soviet explosion of an atomic weapon and Mao Zedong's communist conquest of China.

NSC-68's purpose, said Secretary of State Dean G. Acheson, was to "bludgeon the mass mind" of government to respond. The author, Paul H. Nitze, was a Cold War legend (obituary, p. 17). He painted a grim picture of the threat and was vindicated on June 25, 1950, when communist forces attacked South Korea.

"United States Objectives and Programs for National Security"

Paul H. Nitze
Report to the President,
Washington, D.C., April 7, 1950

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

The Soviet Union is developing the military capacity to support its design for world domination. The Soviet Union actually possesses armed forces far in excess of those necessary to defend its national territory. These armed forces are probably not yet considered by the Soviet Union to be sufficient to initiate a war which would involve the United States. This excessive strength, coupled now with an atomic capability, provides the Soviet Union with great coercive power for use in time of peace in furtherance of its objectives and serves as a deterrent to the victims of its aggression from taking any action in opposition to its tactics which would risk war.

Should a major war occur in 1950, the Soviet Union and its satellites are considered by the Joint Chiefs of Staff to be in a sufficiently advanced state of preparation immediately to undertake and carry out the following campaigns.

a. To overrun Western Europe, with the possible exception of the Iberian and Scandinavian Peninsulas; to drive toward the oil-bearing areas of the Near and Middle East; and to consolidate communist gains in the Far East;

b. To launch air attacks against the British Isles and air and sea attacks against the lines of communications of the Western powers in the Atlantic and the Pacific;

c. To attack selected targets with atomic weapons, now including the likelihood of such attacks against targets in Alaska, Canada, and the United States. Alternatively, this capability, coupled with other actions open to the Soviet Union, might deny the United Kingdom as an effective base of operations for allied forces. It also should be possible for the Soviet Union to prevent any allied "Normandy" type amphibious operations intended to force a re-entry into the continent of Europe.

After the Soviet Union completed its initial campaigns and consolidated its positions in the Western European area, it could simultaneously conduct:

a. Full-scale air and limited sea operations against the British Isles;

b. Invasions of the Iberian and Scandinavian Peninsulas;

c. Further operations in the Near and Middle East, continued air operations against the North American continent, and air and sea operations against Atlantic and Pacific lines of communication; and

d. Diversionary attacks in other areas. ...

The Soviet Union now has aircraft able to deliver the atomic bomb. Our intelligence estimates assign to the Soviet Union an atomic bomber capability already in excess of that needed to deliver available bombs. We have at present no evaluated estimate regarding the Soviet accuracy of delivery on target. It is believed that the Soviets cannot deliver their bombs on target with a degree of accuracy comparable to ours, but a planning estimate might well place it at 40 to 60 percent of bombs sortied. For planning purposes, therefore, the date the Soviets possess an atomic stockpile of 200 bombs would be a critical date for the United States, for the delivery of 100 atomic bombs on targets in the United States would seriously damage this country.

At the time the Soviet Union has a substantial atomic stockpile, and if it is assumed that it will strike a strong surprise blow, and if it is assumed further that its atomic attacks will be met with no more effective defense opposition than the United States and its allies have programmed, results of those attacks could include:

a. Laying waste the British Isles and thus depriving the Western powers of their use as a base;

b. Destruction of the vital centers and of the communications of Western Europe, thus precluding effective defense by the Western powers; and

c. Delivering devastating attacks on certain vital centers of the United States and Canada.

The possession by the Soviet Union of a thermonuclear capability in addition to this substantial atomic stockpile would result in tremendously increased damage. ■

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By John A. Tirpak, Executive Editor

Defense Program Needs Funds; More Druyun Fallout; a European Tanker? ....

CBO Finds Defense Program Underfunded

The Pentagon's program over the next 18 years will require hundreds of billions of dollars more than planned to man, train, and equip the force, according to the Congressional Budget Office.

CBO projects that if greater funds are not appropriated in the future, the military would have to shrink, both in personnel and equipment.

In an update of a 2003 report, the CBO said that the Pentagon's future years defense program (FYDP) calls for a rise in annual spending from $402 billion in 2005 to $455 billion in 2009 but that the actual cost of programs in that year would probably be about $498 billion. That would leave a cumulative, five-year deficit of more than $220 billion. (All figures were expressed in Fiscal 2005 dollars.)

In "The Long-Term Implications of Current Defense Plans: Summary Update for Fiscal Year 2005," CBO forecast that the annual defense bill will continue to grow during the decade that follows the FYDP. If the Pentagon manages everything brilliantly and costs don't sharply rise, it will cost an average of $485 billion a year for the US military in the decade from 2010 to 2022. Historical trends and a profusion of programs whose costs aren't yet nailed down, however, suggest the real figure could go as high as $553 billion a year between 2010 and 2022—without adding any more new programs.

According to CBO, the Pentagon's estimates were low to begin with, but in the last year, new big-ticket programs have been added to the mix without commensurate increases in the budget. For example, Air Force projects such as the E-10A airborne battle command post and two new interim strike aircraft have been added to the plan, Congress has just ordered procurement of a new aerial tanker, and further purchases of C-17 airlifters beyond the 180 now under contract seem likely. Moreover, cost projections on the joint service F-35 fighter have risen $11 billion in just the last year, suggesting program costs will remain, at best, uncertain.

All of the overall figures cited count toward personnel, health care, investment in new systems, and operations and maintenance costs, but don't include the cost of the war in Iraq and other contingencies. Both the Pentagon and CBO expect combat operations costs to be paid for by annual supplemental appropriations.

Health care and personnel costs will drive the largest portion of defense spending over the FYDP and beyond. While investment in new equipment and technology would rise during the FYDP, it would actually drop a bit by late 2022 as system modernization comes to a conclusion.

"The demand for new investment resources—mainly to develop and buy new equipment—would rise from $145 billion in 2005 to a peak of $191 billion in 2013 and then decline to $165 billion by 2022," the CBO reported.

During the next 18 years, the Air Force would consume the largest portion of investment, owing to its need to replace a large number of aged aircraft.

DOD photo by USMC Sgt. Donald Bohanner

Rumsfeld addresses troops. Their costs are rising.

The Air Force's cycle of modernization—dedicating a decade or so of investment sequentially to bombers, then airlift, then fighters—was thrown out of whack by the "procurement holiday" of the 1990s. Aircraft of all types except trainers will have to be procured at the end of this decade and the first half of the next. USAF will have to concurrently acquire the F/A-22, the F-35, the C-17, new tankers, the E-10, and possibly one or two new "interim" long-range strike platforms, in addition to new helicopters and special operations craft.

At the same time that CBO declared the spending plan is short of actual needs, it noted that, even at higher levels of spending, defense outlays as a percentage of the Gross Domestic Product won't increase and may decline.

The share of GDP allocated to defense spending "declined from an average of six percent in the 1980s to four percent in the 1990s," the CBO noted.

"If current plans were carried out, defense spending would drop to 3.2 percent of GDP by 2009 and 2.8 percent by 2022, ... assuming that GDP grew at the long-term rates projected by the CBO. With cost risk included, defense spending might equal 3.2 percent of GDP in 2022."

The Druyun Fallout Continues

The Air Force is trying to decide how to proceed in a number of high-profile programs thrown into turmoil by the admission of wrongdoing by former senior service acquisition official Darleen A. Druyun.

Druyun on Oct. 1 was sentenced to a federal prison term for showing favoritism to Boeing in several contracts. (See "Washington Watch: Druyun's Downfall," November, p. 10.) She admitted handing to Boeing the C-130 Avionics Modernization Program contract that it might not have earned. She also admitted favoring Boeing in a proposed 767 tanker lease, a C-17 contract dispute, and a NATO E-3 Airborne Warning and Control System aircraft upgrade.

Lockheed Martin, originally favored to win the C-130 job, and BAE Systems, which also lost out on the project,

filed protests with the Air Force. Lockheed asked the Air Force to declare a default action on the C-130 AMP as well as several other major programs that went to Boeing. Lockheed and BAE want USAF to reopen these programs to competition and bar Boeing from bidding on them.

Besides the AMP contract, Lockheed cited several other suspect programs, including the Small Diameter Bomb and two classified intelligence projects. The AMP and the SDB are worth $4 billion and $2 billion in development work, respectively. No value was assigned to the classified projects.

The Air Force said that, "based on Ms. Druyun's admissions," it has asked the Pentagon inspector general to review the C-130 AMP and the C-17 matters. A USAF spokesman did not say when the service expects a resolution to those investigations.

However, the spokesman said USAF would also refer the cases directly to the Government Accountability Office, since the service is "confident" that no matter what it decides, there will be appeals. Since any appeal goes to GAO, said the spokesman, "it will expedite matters for all if GAO is involved from the beginning." The Air Force wants to ensure there is "transparency and fairness" in its resolution of these matters, said the spokesman.

"We want no doubts as to the integrity of this process," he said.

Boeing's former chief financial officer, Michael M. Sears, had been charged with conspiring with Druyun to discuss her future employment with the company while she was still serving with the Air Force. Such discussions are illegal and carry conflict-of-interest penalties. His case was pending in early November.

Meanwhile, Air Force officials said the service is evaluating Boeing contracts "on a case by case basis."

The Air Force has also asked Michael W. Wynne, the acting undersecretary of defense for acquisition, technology, and logistics, to review any contracting activity by Druyun that he believes needs further review.

With respect to the C-130 AMP, the Air Force is considering three options: canceling the program and launching a new competition; refunding the losing companies their expenses in bidding for the work, or diverting chunks of Boeing's AMP work to them as subcontractors.

The Air Force believes that any of the alternatives is a choice of evils. It will be, at the least, a huge management headache for the Air Force and could result in spending quite a lot of money it doesn't have to spare.

The protest rules called for the Air Force to choose a remedy and offer it to the nonselected companies by late November.

The Air Force is renegotiating the AWACS deal, based on the findings of the Pentagon inspector general. Druyun admitted that she permitted Boeing to charge a fee that was $100 million higher than it should have been.

USAF has asked the Office of the Secretary of Defense to review the changes the service made to its acquisition process since the departure of Druyun in 2002. The Air Force also asked OSD to convene a review board to determine whether changes are sufficient to prevent a similar situation in the future.

USAF photo by SSgt. Marc Barnes

Tainted? USAF is reviewing C-17 and C-130 contracts.

A Possible European Ingredient

Delays in decisions about recapitalizing the Air Force's tanker fleet and confusion over Congressional language may have opened the door to the European Aeronautic Defence and Space Co. (EADS).

Boeing won the contract in 2002. If the work is to be competed, the only other available source is EADS, the parent company of the European-built Airbus. EADS would like to sell the Air Force the KC-330, a derivative of its A-330 airliner. When the tanker lease issue came up three years ago, the Air Force decided that Airbus was not qualified to compete because it couldn't offer a USAF-style boom refueling probe. The company has since been working on a boom-style probe that it says will work with USAF aircraft.

EADS photo

Another competition? EADS wants to sell A-330 as tanker.

Although Defense Secretary Donald H. Rumsfeld had planned to settle the tanker issue right after the November elections, final decisions likely won't come until this month at the earliest. Rumsfeld wanted to look at two studies before he made a call on the tanker plan. Those studies—an Air Force analysis of alternatives and a draft of the Joint Staff's Mobility Capability Study—were due to Rumsfeld in early November.

In addition, Congress has not made clear what it wants the Pentagon to do about tankers. The Fiscal 2005 defense authorization bill included $95 million to start procurement, but it barred the Pentagon from spending any money on leases, which Congress had previously approved. It also stripped Boeing of a $6 billion contract to maintain new tankers and ordered a competition for this work.

The bill did not clearly specify a requirement for a new competition. (See "Aerospace World: Tanker Lease Is Dead," November, p. 14.) Key Senators insisted one should be held. House members, however, were adamant that the language specified the contract would go to Boeing.

A service spokesman acknowledged in November that the Air Force had not received definitive guidance on how to proceed.

EADS has said it might spend $600 million to set up US production facilities if it gets assurances of a deal to supply at least 100 aircraft. It has made the argument that both the A-330 and the Boeing KC-767 are "international airplanes," with major subassemblies and parts made around the world, and that the KC-767 would not be significantly more "American made" than the EADS aircraft.

Boeing disagrees.

EADS has set up a Web site (www.usatanker.com) to pitch the idea of an EADS tanker. It is looking to partner with a US prime contractor to offer the KC-330, but both Lockheed Martin and Northrop Grumman have said they're not interested.

EADS company officials don't think they have a shot at getting a contract to replace all of USAF's aged KC-135s, but they do think they could get a chunk of the work. The Air Force has contemplated holding annual competitions, in which the two big companies compete for some share of tanker buys. In the "great engine war" in the 1980s and 1990s, Pratt & Whitney and General Electric battled yearly for work on fighter engines.

The plan has attracted a number of Air Force advocates. Air Mobility Command officials, for example, have said they like the idea because acquisition of two different airframes would guard against a single-type failure.

Gen. Gregory S. Martin, chief of Air Force Materiel Command, suggested such a move when he commanded US Air Forces in Europe. Under Martin's plan, Airbus could compete for a share of any tanker purchase in exchange for NATO partners buying the C-17 airlifters instead of the European-proposed A400M. According to Martin, developing the A400M would waste scarce NATO funds, since there really aren't enough customers for two such aircraft.

"It would be win-win," Martin told *Air Force* Magazine, in that NATO would get affordable airlift, the US would get low prices on tankers, and everyone would get to build something.

New Joint Commands Need Support

While the Pentagon's creation of new joint commands to better integrate how the services fight is a step in the right direction, the Defense Science Board believes full support for those organizations may be lacking.

In the final report of the DSB Task Force on Enabling Joint Force Capabilities, Phase II, the group said it was time for the Defense Department to provide "full support" to US Joint Forces Command, US Transportation Command, US Special Operations Command, and especially US Strategic Command. By full support, the DSB meant that the Pentagon must provide them the policy, doctrine, and resources that will give them the bureaucratic heft and authority to carry out their new missions.

In some cases that could mean taking responsibilities and authority away from other organizations.

In the case of JFCOM, task force co-chairs USAF Gen. Larry D. Welch (Ret.) and Robert Hermann urged the Pentagon to re-examine "the magnitude and scope of the portfolio of missions" assigned to the organization to see if they are "executable" within JFCOM's capabilities. They also want to ensure that the tasks necessary to enable joint forces capabilities "receive the needed attention."

Additional manpower for the new joint organizations is necessary if they are to succeed in knitting the services together effectively, Welch and Hermann wrote.

"Since this is among the most important needs of the department, it is not a burden to be avoided," they wrote.

The task force said it believes that the new joint commands "can meet the formidable challenges in organization and implementation flowing from these newly assigned missions," provided they get "a modest additional level of resources" and "adequate guidance, authority, and support."

The task force said Operations Enduring Freedom and Iraqi Freedom provided a number of key lessons regarding joint operations. They include:

—Services need to be truly integrated, which it defined as "a step well beyond deconflicting joint forces."

—Forces need to operate in a variety of places simultaneously or in a "distributed" manner, rather than forming a single, "contiguous" front.

—Parallel, or near simultaneous, warfare in many dimensions, rather than sequential air, land, and sea campaigns, is the wave of the future.

—Knowledge and agility improve survivability more than armor.

—Focused logistical support, without a huge forward footprint (so-called just-in-case logistics), keeps the force light on its feet and able to swing fast to new locations as the battle unfolds.

—Integrating special operations forces with conventional ground troops and fire support from all the services magnifies combat power.

—Effects-based operations, rather than "input-based" operations and relying on battle damage assessments, should be emphasized.

USAF pohoto by SSgt. Aaron D. Allmon II

USAF and the Army joined forces on Joint STARS. DSB urges more stellar consolidations.

The task force also underlined a "need for further progress" in several areas. These are:

—The ability to rapidly seize control of a crisis and set the conditions for their resolution—what the task force called "strategic agility."

—Faster, deeper, and more comprehensive knowledge of the battlefield, including the adversary's "capabilities, culture, and attitudes."

—Better management of intelligence-surveillance-reconnaissance assets, to provide improved knowledge for commanders at all levels.

—Creating the means to accomplish net-centric operations, where many players in widely separated venues can collaboratively plan and execute missions at all levels of combat.

—The ability to draw on fire support from whatever service is best placed and suited to deliver it when demanded.

—"Retail" logistics that can keep up with fast-moving forces. ■

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Aerospace World

By Adam J. Hebert, Senior Editor

Roche Resigns

Air Force Secretary James G. Roche announced his resignation Nov. 16. Roche said his plans called for him to depart Jan. 20 or sooner, depending on whether a successor was confirmed. Roche, who became SECAF on June 1, 2001, had said he would depart from his post at the end of Bush's first term.

Roche led the Air Force through a historic period of change, marked by the 9/11 attacks and wars in Afghanistan and Iraq. Gen. John P. Jumper, Chief of Staff, said Roche had an "unrelenting resolve to adapt our force" and had "guaranteed America's Air Force remains the greatest in the world."

The end of Roche's term was marked by controversies: the Air Force Academy sexual assault scandal; clashes with Sen. John McCain (R-Ariz.) over a proposed lease of new tanker aircraft; and former acquisition official Darleen Druyun's admission of illegally favoring Boeing for new contracts.

Officials said that a key factor in Roche's decision was his belief that his departure would free up Air Force nominations that Congress had placed on hold.

USAF photo by Capt. Sonny Kim

TSgt. Paul Okon removes a panel on a USAF C-130 engine damaged recently by enemy ground fire in Iraq. Within 72 hours, an Air Force maintenance recovery team had replaced the engine and made other repairs.

Airman Dies in Afghanistan

A1C Jesse M. Samek, 21, of Rogers, Ark., died Oct. 21 from injuries he received when the HH-60 Pave Hawk helicopter in which he was flying crashed during a medical evacuation mission in Afghanistan.

Two other crew members were injured, one critically. Their names were not released. The helicopter crew and an Afghan civilian who was being evacuated were taken to a medical facility in Afghanistan.

According to a Defense Department news release, the accident was not the result of hostile fire, but further details required an investigation.

Samek was a flight engineer deployed from the 66th Rescue Squadron, based at Nellis AFB, Nev.

USAF Flies More Safely in 2004

The Air Force was still finalizing data, but as of Nov. 9, its Class A mishap rate for Fiscal 2004 was 1.07 per 100,000 flying hours, making it one of the safest flying years despite the continued high operations tempo. The 2004 rate dropped nearly 23 percent compared to the 2003 rate of 1.39.

A Class A mishap is one which causes a death, permanent disability, loss of an aircraft, or more than $1 million in damage. USAF had 26 Class A mishaps in 2004 vs. 31 in 2003.

Defense Secretary Donald H. Rumsfeld last year challenged each service to cut its overall number of mishaps in half by 2005.

Air Combat Command officials on Oct. 19 announced that ACC had reduced its rate of flight mishaps by 58 percent. In 2004, the command had only five Class A mishaps, yielding a rate of 1.34 and making 2004 the safest flying year in command history, according to an ACC news release. In Fiscal 2003, ACC experienced 12 Class A flight mishaps, for a rate of 3.23 per 100,000 flying hours.

First C-5 Enters RERP

The first production C-5B airlifter entered into the reliability enhancement and re-engining program, following completion of its avionics

Draft Rejected by 402-2 Vote

Lawmakers soundly rejected a bill to reinstate the military draft by a 402-2 vote in October. The bill, H.R. 163, had been brought to a vote by Republican lawmakers in an attempt to quell rampant speculation that a draft was secretly being planned.

The same week, President Bush said, "We will not have a draft so long as I am President of the United States."

After the vote, Rep. Duncan Hunter (R-Calif.) said, "This bill was brought to the House floor today to expose the biggest hoax ... of the year. The rumor of a secret plan to reinstate the draft has been running like wildfire through the Internet, [and] there is no 'secret plan.' "

USAF photo by Sue Sapp

A member of the 653rd Combat Logistics Support Squadron, Robins AFB, Ga., goes after corrosion on an F-100 Super Sabre, one of several vintage aircraft undergoing refurbishment for The Museum of Aviation at Robins.

modernization program modification by a Lockheed Martin field team at Dover AFB, Del.

Lockheed said RERP work began Oct. 22 at its facility in Marietta, Ga.

The massive airlifter will receive new engines and other improvements. RERP is expected to significantly improve the reliability of the Galaxy fleet, while reducing operating costs.

Bush Signs 2005 Defense Bill

President Bush on Oct. 28 signed into law the Fiscal 2005 defense authorization act. The legislation authorizes $447.2 billion covering DOD and Department of Energy national security programs.

The bill largely tracks with the Administration's request for major Air Force programs, authorizing, for example, the full contingent of 24 F/A-22 Raptors at a cost of $4.1 billion. The bill also authorizes $275 million for B-2 improvement and $30 million in R&D for a next generation bomber.

Lawmakers did reduce research and development funding by $260 million (including $134 million from the USAF budget) for the F-35 Joint Strike Fighter program. Legislators said the Administration request had been "early to need."

The bill also put an end to USAF's plan to lease KC-767 tankers from Boeing. (See "Aerospace World: Tanker Lease Is Dead," November, p. 14.)

Another notable stipulation was an end strength increase for the Army (30,000 soldiers over five years) and Marine Corps (9,000 marines over five years). There was no comparable legislation to increase end strength for the Air Force or Navy. ("Action in Congress: SBP Reform Tops Personnel Gains," p. 22, contains details of the bill's quality of life issues.)

Lawmakers Stop F-117 Plan

The Fiscal 2005 defense authorization bill explicitly prohibits the Air Force from retiring any of its 52 F-117 stealth fighters. USAF had planned to retire 10 Nighthawks, to free up funds to pay for combat improvements to the remaining F-117s and other systems.

Sens. Pete V. Domenici (R-N.M.) and Jeff Bingaman (D-N.M.) joined forces to push an amendment that curtailed USAF plans.

Gen. Hal M. Hornburg, commander of Air Combat Command, told reporters in February that the F-117s have always been used in small numbers, and the time seemed right for a "capabilities trade-off."

The Air Force has used this same approach with the B-1B fleet, saving money that enabled it to improve the bomber's performance and mission capable rate. By retiring 10 F-117s, the service expected to save about $75 million over five years.

According to Domenici, the retirement would have eliminated 38 enlisted and nine officer positions at Holloman AFB, N.M., home base for the F-117s.

Five ROTC Units Escape Axe

Five of the seven Air Force Reserve Officer Training Corps detachments previously scheduled to close in 2007 have been granted two-year reprieves, the Air Force announced Oct. 1. (See "Aerospace World: Seven ROTC Units To Close," October, p. 19.)

The AFROTC detachments at the

Demobilization May Strain McChord

Airlift officials at McChord AFB, Wash., are expecting a surge in their already high operating tempo when two Air Force Reserve Command squadrons at the base demobilize in February. They have each served on active duty for two years and, by law, must deactivate.

Roughly 240 Reservists of the 97th and 728th Airlift Squadrons have been on active duty status for the past two years, serving as pilots and loadmasters on active duty C-17s.

"We'll just have to pick up the slack," said Maj. Mike Madsen, an active duty C-17 pilot with the 62nd Airlift Wing at McChord. "We have no other choice."

The AFRC squadrons provided McChord with 42 additional aircrews, 18 of which have been "on the road at all times," according to an Oct. 15 news release. The Reserve crews have flown 40 percent of the base's airlift missions.

A third AFRC squadron at McChord, the 313th AS, has supplied volunteers for many of the base's C-17 missions. Yet, officials say, the 313th volunteers are not sufficient to replace the activated units.

McChord will develop creative plans to address the upcoming crew shortages. According to Lt. Col. Steve Vautrain, vice commander of the 446th Operations Group, smart scheduling will become a necessity.

The Air Force may look to civilian charter aircraft to move cargo to airfields close to Afghanistan and Iraq. This would enable shorter C-17 flights from staging areas, which would in turn allow Air Mobility Command to staff the C-17 flights with standard three-person crews—instead of the five-person teams commonly used today for long-duration missions.

"If we can stop using augmented crews, we can multiply the number of crews we have," Vautrain said.

The pace of operations for Air Mobility Command has been high since the 9/11 terrorist attacks. Operations in Afghanistan and Iraq have kept the command busy, and airlift requirements are not expected to abate anytime soon. Gen. John W. Handy, AMC commander, told lawmakers in March that the command has a "significant gap" in its ability to meet wartime needs.

USAF photo by SrA. Nicole Spence

CMSAF Gerald Murray (left), wearing the latest test BDU on a recent visit to Southwest Asia, gets help with a microphone from TSgt. Paul Hughes (right) and CMSgt. James Roy.

Stepping Out of the Blue

After a six-month wear test, Air Force officials have decided to reject the primarily blue, tiger-striped battle dress uniform (BDU). The announcement came shortly before top USAF leaders demonstrated a new test BDU during a Nov. 4 visit to Southwest Asia.

The new BDU features a mix of tan, blue, and green, with a pixilated tiger-striped pattern. The overall effect is more subdued than the controversial, distinctly blue version.

According to a USAF news release, the new pattern is still Air Force-unique, though it more closely resembles the new Marine Corps BDU pattern than the first version.

Officials said airmen approved of most features of the first test BDU. Namely, they liked the fit and ease of maintenance. The color and pattern got a thumbs down.

According to SMSgt. Jacqueline Dean, the USAF uniform board superintendent, that positive response to the wear of the new BDU prompted senior leaders to reduce the necessary test period for the new color scheme.

Officials expect a final decision by early next year.

University of Massachusetts-Amherst, New Jersey Institute of Technology, University of Memphis, University of Cincinnati, and Wilkes University in Pennsylvania will undergo further evaluation through 2009. During that time period, AFROTC and university officials will try to "increase cadet enrollment and improve officer production," stated the USAF announcement.

According to Defense Department standards, ROTC units at four-year institutions should graduate 15 officers per year to remain viable. Other factors that would influence any decision include cost to maintain a unit, quality of support from the university, grade point averages of the ROTC graduates, and whether the unit produces officers in "hard-to-recruit" categories, such as minorities and high-tech graduates.

Overall, Air Force ROTC enrollment has increased more than 40 percent since 2001, but more than half the growth has come from just 17 percent of the detachments.

The AFROTC detachments at the University of Akron, Ohio, and Grambling State University, La., will close in 2005 as previously announced.

One Space System Operational ...

Air Force Space Command recently announced that a military counterspace system is now operational. The Counter Communications System can use a ground-based antenna to temporarily jam enemy communications satellites. It is the first offensive counterspace system available to the United States.

CounterComm, which became operational in September, is controlled by the 76th Space Control Squadron at Peterson AFB, Colo. As USAF's first offensive and defensive counterspace squadron, the 76th's mission is to guarantee space superiority for theater campaigns.

Lt. Col. Todd W. Gossett, squadron commander, told *Air Force* Magazine in October that the 76th can deploy its offensive counterspace capabilities to meet the needs of warfighting commanders—but has not yet done so operationally.

... While Another Is Cut

Air Force Space Command officials also announced in October that a longer-term space control effort—the Counter Surveillance Reconnaissance System—had been canceled. It was being designed to temporarily

Senior Staff Changes

RETIREMENTS: Lt. Gen. Robert R. **Dierker,** Maj. Gen. Theodore W. **Lay II.**

CHANGES: Brig. Gen. Dana H. **Born,** from Permanent Professor, Department of Behavioral Sciences, USAFA, Colorado Springs, Colo., to Dean of Faculty, USAFA, Colorado Springs, Colo. ... Lt. Gen. (sel.) William M. **Fraser III,** from Dir., Ops., AETC, Randolph AFB, Tex., to Spec. Asst. to Cmdr., AFC2ISR Center, Langley AFB, Va. ... Brig. Gen. Charles V. **Ickes II,** from Chief Operating Officer, ANG, Arlington, Va., to Dep. Dir., ANG, Arlington, Va. ... Maj. Gen. Marvin S. **Mayes,** from C/S, Alabama ANG, Montgomery, Ala., to Cmdr., 1st AF, ACC, Tyndall AFB, Fla. ... Maj. Gen. Craig R. **McKinley,** from Cmdr., 1st AF, ACC, Tyndall AFB, Fla., to Dir., Mobilization & Reserve Component Affairs, EUCOM, Stuttgart-Vaihingen, Germany.

SENIOR EXECUTIVE SERVICE CHANGES: Alan K. **Bentley,** to Dir., Prgm. Analysis & Financial Mgmt., TRANSCOM, Scott AFB, Ill. ... Roger S. **Correll,** to Dir., Contracting Directorate, Ogden ALC, AFMC, Hill AFB, Utah ... Mark D. **Johnson,** to Dir., Log. Mgmt., Oklahoma City ALC, AFMC, Tinker AFB, Okla. ... M. Scott **Reynolds,** to Dep. Dir., Maintenance & Log., ACC, Langley AFB, Va. ... J. Steven **Rogers,** to Dep. General Counsel (Env. & Instl.), Office of the General Counsel, Pentagon ... Sharon B. **Seymour,** to Prgm. Mgr., Natl. Security Personnel SPO, DCS, Personnel, Pentagon. ■

block enemy imagery satellites and was to have been operational in 2009.

The Air Force released a statement following an October conference in Omaha, Neb., that explained the program had lost out to higher-priority initiatives during the Air Force's internal planning for the Fiscal 2006 budget.

At a briefing with reporters, Gen. Lance W. Lord, AFSPC commander, would not discuss who had made the decision to cut the program.

The mission, according to Lord, is still critical. He predicted a reevaluation of CSRS, leading to development of the type of capability it forecast—an offensive system with "reversible effects."

Navy Flies Global Hawk

The Navy on Oct. 6 flew the first of two Global Hawk unmanned aerial vehicles the sea service is using to test and refine its maritime surveillance capabilities. The four-hour flight began in Palmdale and ended at Edwards Air Force Base, both in California.

The Global Hawk Maritime Demonstration program is "intended to develop maritime UAV tactics and operating procedures," to be applied to future Navy UAV systems, stated a Naval Air Systems Command (NAVAIR) news release.

The Iraq Story Continues

Casualties

By Oct. 25, a total of 1,103 Americans had died in support of Operation Iraqi Freedom. The fatalities included 1,100 troops and three Defense Department civilians.

Of those casualties, 845 Americans were killed by enemy action, including the three DOD civilians. The other 258 troops died in noncombat incidents, such as accidents.

Four Dead in Green Zone Blasts

A pair of Oct. 14 explosions in Baghdad's heavily defended "Green Zone" killed four US contractors, employed to provide diplomatic security for the State Department. The attacks were the first explosions to originate in the Green Zone, which is home to the new Iraqi government and most US officials in Baghdad. Access into the Green Zone is heavily regulated, and it was not immediately clear how the explosives were brought in.

The four dead were employees of DynCorp, and two other company employees were injured in the attacks. A State Department news release about the attacks said, "The DynCorp victims of this outrageous terrorist attack were valued members of the State Department family. ... These brave men died in service to their country."

US, Iraqi Forces Retake Samarra

A two-day battle successfully defeated the terrorist insurgency in the city of Samarra, 60 miles north of Baghdad, officials reported Oct. 3. The insurgency in the city was put down as an initial step toward securing insurgent-controlled areas before Iraq holds national elections.

"Insurgencies have a tendency to wax and wane," said National Security Advisor Condoleezza Rice on CNN, but the results in Samarra were encouraging. "The really good news out of this is that the Iraqi forces have fought alongside American forces and ... [have] done well," she said.

US and Iraqi forces are attempting to defeat insurgents in as many areas as possible, to ensure maximum safe participation in the upcoming elections.

Paul H. Nitze, Cold War Strategist (1907-2004)

Former defense official Paul H. Nitze died Oct. 19 at his home in Washington, D.C. Nitze had a lengthy and prominent national security career. He was the State Department's director of policy planning at the dawn of the Cold War, Navy Secretary, deputy defense secretary, and finally principal arms control negotiator for President Reagan.

The DOD announcement of his death noted, "For more than 40 years, Nitze was one of the chief architects of US policy toward the Soviet Union." Nitze was the principal author of National Security Council directive 68, which in 1950 laid out the United States' Cold War strategy for defeating the Soviet Union. (See "The Keeper File: Nitze's 'Bludgeon,' " p. 8.)

At the time, Nitze was head of the State Department's policy planning staff under Dean G. Acheson. NSC-68 called for defense through a sustained buildup of US military power to counter the Soviet threat. The document served as a counterpoint to George Kennan's theory of "soft" containment. Nitze's thinking provided the blueprint for US defense strategy after the outbreak of the Korean War.

More than 20 years later, in the early 1970s, Nitze became disillusioned with the Democratic Party's post-Vietnam views on defense and foreign policy issues, which he saw as too dovish. It was at this time that he helped form the Committee on the Present Danger, which played a key role in stopping the SALT II arms agreement with the Soviets and building a consensus for a defense buildup.

Nitze's efforts helped eventually pave the way for the election of Ronald Reagan. Nitze then served as President Reagan's chief negotiator for the Intermediate-Range Nuclear Forces (INF) Treaty with the Soviet Union.

Commenting on his passing, Defense Secretary Donald H. Rumsfeld said Nitze was the "architect of the strategy that defended America and the Free World through the decades-long struggle against the Soviet empire."

The Navy Global Hawks are specially configured with new radar modes for "detecting and identifying ships at sea," as well as other mission-specific modifications, according to NAVAIR. The demonstration Global Hawks will be based at NAS Patuxent River, Md., beginning next summer.

Battlelab Changes Name

The Air Force's Air and Space Expeditionary Force (AEF) Battlelab has been redesignated the Air Warfare Battlelab to better reflect the lab's mission since its realignment in 2003 under the Air Warfare Center at Nellis AFB, Nev., said service officials.

The change also reflects the shift of mobility and deployment aspects to the Air Mobility Battlelab, said Col. Ernest Parrott, the Air Warfare Battlelab commander.

"The mission is still innovation to improve the combat effectiveness of our warfighters," Parrott said. The emphasis, he said, will shift toward "offensive capability, which equates to more bombs on target."

The Air Warfare Battlelab, one of the six original labs created by the Air Force, was established at Mountain

Home AFB, Idaho, in 1997. The other original labs are Battle Management, Command and Control, Unmanned Aerial Vehicle, Space, Information Warfare, and Force Protection. The Air Mobility Battlelab was added in 2002.

Ranchers Win Round

A federal appeals court in New Orleans in mid-October ordered the Air Force to perform an additional environmental impact study (EIS) to address the concerns of ranchers living under a Southwest bomber training range. Last year, a federal judge in Texas had ruled in favor of the Air Force.

The issue concerns low-level training flights over large sections of west Texas and southeast New Mexico.

For the time being, the new ruling does not prevent the Air Force from flying any training missions.

The Air Force earlier this year also prevailed in a separate lawsuit in the

USAF Aids Peaceful Elections in Afghanistan

Historic October elections in Afghanistan went smoothly, thanks in large part to Air Force and other DOD forces. US troops provided protection, ensuring stability during the Oct. 9 vote that ended more than 25 years of regime turmoil in the country.

"Effective preventive and pre-emptive action" by DOD forces "precluded what otherwise was going to be potentially a very bloody day," said Zalmay Khalilzad, US ambassador to Afghanistan. "The Taliban and al Qaeda [had] declared war on this election," he said at an Oct. 15 Pentagon briefing.

Active duty and reserve airmen operating out of Bagram Air Base, near the capital city of Kabul, helped provide election day security. According to an Oct. 18 Air Force news release, members of the 81st Expeditionary Fighter Squadron worked around the clock, providing air cover in the days leading up to the election.

The airmen came from Spangdahlem AB, Germany, and NAS JRB New Orleans to form the "rainbow" 81st EFS, melding two A-10 squadrons.

"The reservist and active duty mix here has well exceeded my expectations," said the unit's commander, Lt. Col. John Cherrey.

News Notes

By Tamar A. Mehuron, Associate Editor

■ DOD has "paused" its anthrax vaccination program, officials said Oct. 27. The department must review an injunction issued by a US district court that cited problems with FDA procedure in issuing a final rule on the effectiveness of the vaccine against airborne anthrax. The court maintained FDA should have held an additional public comment period before issuing the rule late last year.

■ Two USAF F-16s, for the first time, simultaneously dropped two 500-pound Joint Direct Attack Munitions (GBU-38) in combat, successfully demolishing a single two-story building. The nighttime mission struck a terrorist meeting place, with minimal collateral damage, USAF officials said Oct. 4. The mission was conducted primarily by Air National Guardsmen from Alabama, Illinois, and Wisconsin.

■ In a ceremony Oct. 14, the Air Force changed the name of its lead official museum, located at Wright-Patterson AFB, Ohio, from the US Air Force Museum to the National Museum of the US Air Force. At the ceremony, Gen. John P. Jumper, Chief of Staff, called the museum a "national treasure." The new name places the museum on a level with peer organizations, all of which incorporate national within their names, said museum officials.

■ Veterans should ignore an Internet e-mail message warning them to get their military paper records from the National Personnel Records Center in St. Louis before they are destroyed. Officials at the National Archives and Records Administration said there is no move to destroy those records, contrary to the Internet claim. NARA is digitizing some records for preservation and reference because frequent handling wears out paper copies. "The idea is to preserve [the records], not destroy them," asserted Susan Cooper, NARA spokeswoman.

■ Lockheed Martin officials told reporters in October that an A-10 armed with the precision guided Joint Direct Attack Munition and the Wind-Corrected Munitions Dispenser is scheduled to fly in December, according to *Defense Daily*. Upgrades also include digital cockpit displays and data link integration. First delivery of the aircraft is late 2005 to an Air National Guard unit.

■ In anticipation of the C-141 Starlifter's retirement in 2006, Air Force Reserve Command officials closed the C-141 schoolhouse Oct. 14 at Wright-Patterson AFB, Ohio. It was run by AFRC's 445th Airlift Wing, which is slated to get C-5 aircraft in October 2005.

■ The last class of Peacekeeper ICBM operators graduated Oct. 15 at Vandenberg AFB, Calif. Peacekeepers are slated for deactivation by September 2005. After the 400th Missile Squadron at F.E. Warren AFB, Wyo., deactivates, the six missileers will receive upgrade training and move to a Minuteman ICBM unit.

■ The Air National Guard on Oct. 1 took over operation of NORAD's regional air operations center at Elmendorf AFB, Alaska, from the active duty 611th Air Control Squadron. Officials said that Guardsmen had been working with the 611th for several years in anticipation of the changeover to an all-Guard operation under ANG's new 176th Air Control Squadron.

■ SI International, Colorado Springs, Colo., received a $610 million contract for advisory and assistance services and engineering and technical services to Air Force Space Command, Peterson, AFB, Colo. Work is to be completed by October 2009.

■ An Air Force accident investigation report released Sept. 30 concluded that crew error caused an MQ-1L Predator unmanned aerial vehicle to crash June 14 during a training mission at Indian Springs AFAF, Nev. An instructor pilot waited too long to correct a student pilot's poor landing approach. The approach exhibited high-sink rates, poor airspeed, poor aim-point control, and poor runway

10th Circuit Court of Appeals (Denver). That lawsuit was brought by New Mexico ranchers. (See "Aerospace World: USAF Wins Range Dispute," March, p. 14.)

The Texas ranchers argue that USAF's Realistic Bomber Training Initiative (RBTI), which features low-altitude training monitored by high-tech ground stations primarily for B-1Bs based at Dyess AFB, Tex., causes a host of environmental and other problems that the Air Force did not address in its initial EIS.

The ranchers filed the suit against the RBTI routes in 2001. They successfully blocked a similar proposed training route for German Air Force training conducted from Holloman AFB, N.M.

In mid-October, the Air Force had not decided whether to appeal the new ruling.

Russia Merges Fighter Companies

Two well-known Russian military aircraft manufacturers—Irkut, maker of Sukhoi fighters, and MiG—will

US, South Korea Detail Troop Movement

The United States and South Korea in October announced details of the mutually agreed-upon drawdown of US forces on the Korean Peninsula. A phased withdrawal of 12,500 troops is to be completed in 2008.

The moves began with the redeployment of the 2nd Brigade Combat Team to Iraq earlier this year. According to the Oct. 6 announcement, roughly 5,000 troops connected to the 2nd BCT will not be returning to South Korea when their time in Iraq is completed. There was no announcement as to their final destination.

The second phase, in 2005-06, will pull an additional 5,000 combat, combat support, and combat service units out of Korea.

Finally, the US will redeploy roughly 2,500 support personnel in 2007-08.

Officials emphasize that the moves are part of a larger plan to increase South Korean security, and negotiators were mindful of "perceptions regarding a potential security gap."

Increased capability will come partly through an $11 billion investment in the US military forces in South Korea and partly by shifting the 25,000 US troops who will remain in South Korea into more defensible positions farther from the border with North Korea. (See "Aerospace World: Korean Realignment Approved," October, p. 26.)

The US also "will maintain a multiple launch rocket system battalion and associated counterfire assets on the peninsula" and "make adjustments as appropriate" to its stocks of pre-positioned equipment in South Korea, the announcement read.

alignment. A late abort caused the rear stabilizers to hit the ground, and the UAV crashed immediately. USAF estimated damage at $4.2 million.

■ USAF awarded a contract that could total up to $173 million to the Entwistle Co., Hudson, Mass., to provide a mobile aircraft and ground fuel delivery system. Work is to be completed by September 2009.

■ USAF will move all Predator UAV operational and support functions to Indian Springs AFAF, Nev., beginning late next year, according to *Inside the Air Force*. The 15th and 17th Reconnaissance Squadrons and the Predator Operations Center are operating out of Nellis AFB, Nev., because Indian Springs lacked the communications capability to handle ongoing combat operations. USAF plans to spend up to $200 million to improve the communications infrastructure at Indian Springs, now host to the UAV Battlelab, which moved there from Eglin AFB, Fla. Officials said space was a concern at Nellis, which conducts advanced training, tactics development, and weapons testing.

■ The National Geospatial-Intelligence Agency in September awarded ORBIMAGE, Inc., Dulles, Va., a four-year agreement valued at up to $500 million, to ensure the US government priority access to high-resolution commercial satellite imagery.

■ At the end of September, USAF selection board officials approved 1,482 majors out of 7,331 line and Biomedical Science Corps officers considered for promotion to lieutenant colonel. That is a selection rate of 20 percent.

■ Air Force Research Laboratory scientists achieved a successful first flight with a joined-wing technology demonstrator Sept. 22 at Wright-Patterson AFB, Ohio. The SensorCraft vehicle will combine the aerial and ground surveillance capabilities of E-3 Sentry Airborne Warning and Control System battle management aircraft and the E-8 Joint STARS ground surveillance aircraft.

■ Two Russian military satellites were placed into orbit Sept. 23 by a Kosmos-3M rocket launched from Plesetsk, according to ITAR-TASS news agency. The satellites can be tasked for telecommunications, ocean surveillance, and tracking ballistic missile launches.

■ Air Force Junior ROTC wants retirees to serve as aerospace science instructors for 200 new units scheduled to open from 2005 through 2007. Airmen from all career fields who have retired in the last five years, and those who plan to retire in the next two years, can apply. For more information, call AFJROTC toll-free at 866-235-7682, ext. 35275 or 35300, or check the Web site at www.afoats.af.mil, then choose the AFJROTC link.

■ Lockheed Martin on Oct. 11 delivered the turret assembly for the Airborne Laser aircraft to Edwards AFB, Calif. The assembly completes the Beam Control/Fire Control system designed to direct and shoot the high-energy laser against a ballistic missile while the missile is still in boost phase flight. In a related development, a Missile Defense Agency official announced Oct. 13 that a problem with too much moisture in the iodine chemical used in the ABL's kill laser had been resolved with a new batch of iodine. Tests with the new iodine were successful.

■ USAF fell short of its health professions recruiting goal in Fiscal 2004 by 17 percent. It had recruited 767 doctors, nurses, and dentists by Sept. 30, but that was shy of its goal of 923 medical personnel.

■ SrA. Ahmad al-Halabi, formerly a translator at Guantanamo Bay, Cuba, was found guilty—but not of espionage—in a trial that ended Sept. 23 at Travis AFB, Calif. As the case developed and evidence was reviewed, the Air Force reduced the charges to failure to obey a general order by photographing the Camp Delta facility and moving classified information; making a false official statement in denying taking the photos; and wrongfully and willfully keeping classified documents. His sentence included demotion and a bad-conduct discharge.

■ Russian President Vladimir Putin Oct. 16 signed an agreement to create a permanent Russian military base in 2005 at Aini Airfield outside of Dushanbe, Tajikistan, reported the Interfax-Military News Agency. The base will house as many as 20 military aircraft and helicopters.

New Space Badge To Replace "Pocket Rocket"

Air Force Space Command has decided to replace the existing space and missile functional badge and the "pocket rocket" missile operator's badge with a single, new badge.

"Just as pilots wear the same badge whether they fly fighters, bombers, tankers, or transports—all very distinct and different missions—our space professionals should wear the same badge," said Gen. Lance W. Lord, AFSPC commander.

The new badge will be worn by enlisted and officer space and missile operators, as well as space-field scientists, engineers, and acquisition officials.

Lord, a former ICBM operator, said the various badges currently worn in the command are a reminder that the space community is not yet identifiable as a coherent team. He said that the qualification process will be "rigorous." Award will require performance in addition to completion of training.

Officials on the planning team that created the new insignia said that previous AFSPC leaders had noted the discrepancy with separate space and missile insignia, but there was resistance to giving up the missileer's badge. Lord's status as a missileer gives the change more credibility, officials said.

The new badge was unveiled Oct. 7 at the Strategic Space 2004 Convention in Omaha, Neb., the home of US Strategic Command.

SSgt. Colin Loring, the badge designer, later told *Air Force* Magazine that he submitted several preliminary ideas to Lord, including one very similar to the final design but with the "thrusts" on one side only. This gave the badge the appearance of a comet.

Lord liked that basic concept, Loring said, but the comet shape was deemed "too radical" and was modified to add thrusts on the other side as well.

The AFSPC commander said the basic badge design has been approved by the Air Force's top leadership, but it will be several months before it becomes available for wear.

merge, a Russian government official announced Oct. 1, ending months of speculation.

Earlier this year, Irkut became the first Russian aircraft company to go public. The MiG Corp. is government-owned, as is Sukhoi, Tupolev, and Ilyushin.

Russian officials believe the merger of Irkut and MiG will create a globally competitive aircraft company. It may presage the consolidation of all five aircraft companies under an umbrella organization officials have called the Unified Aircraft-Building Corp.

USAF Opens New Space Institute

Air Force Space Command on Oct. 1 established the National Security Space Institute in Colorado Springs, Colo. The institute will serve as the Defense Department's focal point for space education and training.

NSSI, which will report directly to AFSPC, absorbs the Space Operations School previously run by the Space Warfare Center at Schriever AFB, Colo. The institute will train roughly 2,500 students per year, said Lt. Col. Ed Fienga of AFSPC's space professional management office.

Fewer than 60 percent of the attendees will be airmen; the rest will come from the other armed services, the National Reconnaissance Office, NASA, and other national agencies. According to a news release, NSSI will later incorporate space courses taught in other DOD schools, where appropriate, to eliminate redundancy.

AFSPC Commander Gen. Lance W. Lord said that NSSI will integrate space education and training, ensuring "optimum opportunities for the advancement of space systems knowledge." He added that he expects it to "ultimately enhance mission effectiveness."

NSSI courses will address space system capabilities, limitations, vulnerabilities and use; space system acquisition; and space warfighting tactics and planning.

Air Force Takes Over Navy Fence

The Air Force on Oct. 1 formally assumed control of the Naval Space Surveillance System, commonly known as the Navy Fence. Now designated the Air Force Fence, it will continue to be operated from Dahlgren, Va., at the home of Naval Network and Space Operations Command.

The Fence consists of a series of nine antenna sites spaced across the southern United States that provide space situational awareness. The Fence reveals what satellites are passing over the contiguous United States and when they pass.

Air Force Space Command officials at Peterson AFB, Colo., said the Fence's transition to the Air Force was operationally seamless. (See "Securing the Space Arena," July, p. 30.) The main issues with the changeover involve the switch of more than 100 civilians and contractors currently employed by the Navy to the Air Force.

The Fence is now operated by the 20th Space Control Squadron's Det. 1, located at Dahlgren. The detachment reports to the 21st Space Wing at Peterson AFB, Colo. ■

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Action in Congress

By Tom Philpott, Contributing Editor

SBP Reform Approved; Other Defense Bill Pluses; Boost to Retiree COLA; Employer Tax Credits ....

SBP Reform Tops Personnel Gains

The biggest plum in the Fiscal 2005 National Defense Authorization Act passed by Congress in mid-October is a sharp rise over several years in Survivor Benefit Plan (SBP) annuities for 270,000 beneficiaries age 62 and older. The bill also contains an array of other improvements to military pay and benefits.

The new law directs a four-step phaseout of what critics call the "widow's tax," a drop in benefits when most surviving spouses first become eligible for Social Security. Payments at 62 typically fall from 55 percent of covered retired pay down to as low as 35 percent. Under a provision in the 2005 bill, that drop will be erased with an increase to 40 percent next October, to 45 percent in April 2006, to 50 percent a year later, and to 55 percent in April 2008.

Retirees who pay special premiums for an SBP supplement to protect their survivors from any drop in benefits at 62 saw those higher premiums stop Oct. 28, the day President Bush signed the NDAA. Supplemental SBP coverage, however, will continue at least until the age-62 offset ends in 2008.

House-Senate conferees rejected a Senate plan to phase out the age-62 reduction over 10 years, but they did accept the Senate provision that will discourage current retirees from enrolling in the improved SBP. During a year-long open season, to begin next October, retirees who had declined SBP will be able to "buy in" to the plan, but they must pay all missed premiums plus interest from the time they last turned down coverage. House members had pushed for a far smaller penalty for delayed enrollment.

Here are other personnel highlights of the defense authorization act for Fiscal 2005 (H.R. 4200):

- **Pay Raise.** A 3.5 percent increase in basic pay Jan. 1, 2005, for active duty and reserve members.
- **BAH Raise.** The last in a series of above-average increases in Basic Allowance for Housing to close a long-standing gap between Stateside housing allowances and average off-base rental costs. Individual BAH raises will vary by pay grade, dependency status, and assignment area.
- **Full CR for 100 Percent Disabled.** Almost 15,000 retirees with 20 or more years of service and disability ratings of 100 percent will see their military retired pay fully restored on Jan. 1. The law, in effect, accelerates for this group alone removal of a century-old ban on concurrent receipt of both military retirement and disability compensation. The Congressional Budget Office estimates the 10-year cost for funding this measure at just over $900 million.

Last year, Congress voted a 10-year phaseout of the CR ban for retirees with disabilities rated 50 percent or higher. That longer phaseout schedule remains in effect for 20-year retirees with disabilities of 50 to 90 percent, including those drawing compensation at the 100 percent rate because they are deemed "unemployable."

- **Reserve Education Benefits.** National Guard and Reserve members mobilized for at least 90 days are in line for better education benefits. Currently, reservists under contract to serve six years in a drill status receive education benefits of $288 a month for 36 months.

Under the new law, reservists activated since Sept. 11, 2001, will receive increased education benefits—$402, $602, or $803 a month for 36 months if the reservist remains on continuous active duty service for at least 90 days, one year, or two years, respectively. The legislation stipulates that benefits will be raised annually to keep pace with inflation. Reservists can use both old and new benefits but are limited to a total of 48 months of education payments.

The typical mobilized reservist will see education benefits rise by about 50 percent under the plan, which was pushed by the Bush Administration.

- **Transition Tricare.** The new law makes permanent last year's temporary authority to provide 180 days of Tricare coverage to reserve component members and their families, after the reservist returns from mobilization, to ease the return to civilian life.
- **Drilling Reserve Tricare.** Following deactivation, reservists can buy additional Tricare Standard coverage if they are willing to pay premiums set at 28 percent of program costs and if they remain in the drilling Guard or Reserve. Members can buy a year's worth of coverage for every 90 days of mobilization.
- **Deactivation Physicals.** The services are directed to give reservists complete medical physicals before deactivation to identify and treat service-related injuries or ailments.
- **Reserve Disability, SBP Awards.** The legislation provides a formula that is more fair in setting disability retirement payments for reservists injured while on active duty and also for setting survivor benefits for families of reservists who die on active duty.

This change, pushed by defense officials, affects members who entered service on or after Sept. 8, 1980, and therefore fall under what's called a High-3 retirement formula. High-3 annuities are calculated using a member's highest three years of basic pay on active duty. For mobilized reservists, calculating three years of active service requires a look back many years to when basic pay was far below current rates. That can dampen significantly the size of a reservist's disability retirement pay when compared to that provided to active duty colleagues.

The new law directs that reserve disability retirements awarded on or after enactment of the Fiscal 2005 NDAA be computed using the high 36 months of basic pay as though members had served the last three years on active duty. This will only apply to reservists who are retired for disability on or after Oct. 28, the day the bill became law.

The favorable change to High-3 calculations also affects SBP for survivors of reservists who die on active duty and extends back to Sept. 10, 2001. The hitch there is that most surviving spouses forfeit SBP any-

way to accept tax-free Dependency and Indemnity Compensation from the Department of Veterans Affairs. There is a small population of survivors who can gain from the High-3 formula change, those whose spouses died on active duty on or after Nov. 24, 2003. On that date, the law provided that a service Secretary could elect "child only" SBP on behalf of the spouse even though there was an eligible surviving spouse. As a result, when a member dies on active duty, the spouse can receive DIC payments and the child can receive an SBP annuity. Child-only SBP is not subject to offset from DIC, so these payments could rise as a result of the High-3 change.

■ **Academy Disabled.** Compensation paid to military academy students was redefined as "basic pay," so that midshipmen or cadets who suffer disabilities at an academy can be entitled to disability retirement or separation pay.

■ **Housing Money.** The 2005 bill eliminates the $850 million ceiling on the total value of contracts and investments allowed under the military housing privatization program. Lifting the cap clears the way for DOD to secure 50,000 more units in 2005.

■ **BRAC Round.** The final NDAA drops a House provision that would have delayed for two years next year's round of base realignment and closure actions.

Retiree COLA Increases

Military and federal civilian retirees, Social Security recipients, survivor benefit annuitants, and veterans drawing disability compensation will see a 2.7 percent raise effective Dec. 1. Payments will begin in January 2005.

The cost-of-living allowance (COLA) reflects inflation over the past year for a market basket of goods and services. The government uses the Consumer Price Index for Urban Wage Earners and Clerical Workers to measure average prices paid during the third quarter of 2003 against the average price paid during the third quarter of 2004.

The difference supports the largest government COLA in four years. In January 2001, government entitlements rose by 3.5 percent.

Employer Tax Credits, Almost

By threatening to block passage of a $137 billion corporate tax bill, Sen. Mary Landrieu (D-La.) in late October won Senate approval of tax credits for civilian employers who volunteer to make up pay losses suffered by workers who mobilize with the Guard or Reserve. Landrieu said 41 percent of reservists deployed to Iraq and Afghanistan suffer a pay loss.

Under her legislation, those private sector employers whose reservist workers are activated longer than six months would get tax breaks for closing a gap between civilian salaries and military pay. The tax credits would be worth 50 percent of wages paid to an activated employee, though total credits could not exceed $15,000 ($30,000 in wage disparity). Small businesses would get another $6,000 in tax credits for each temporary employee hired to replace their mobilized workers.

As part of a Senate compromise, Landrieu pulled her provision from the corporate tax bill and combined it with the House-passed Guardsmen and Reservists Financial Relief Act (H.R. 1779), introduced by Rep. Bob Beauprez (R-Colo.). However, because the Senate made changes to the Beauprez measure, which would allow mobilized members to make penalty-free withdrawals from individual retirement accounts if mobilized six months or more, it must go back to the House for another vote.

There was no indication whether the new vote would take place this year or next.

Senate Promises Action

The Senate Banking Committee has promised action next year to stop companies from using misleading or abusive sales tactics on military bases. Such practices have led some service members—typically young ones—to purchase high-priced securities and questionable life insurance products.

The House in early October passed a preventive measure, dubbed the Military Personnel Financial Services Protection Act (H.R. 5011); however, the Senate ran out of time to consider companion legislation this year. (See "Action in Congress: 'Too Offensive,' " November, p. 23.) It is on the banking committee agenda for 2005, said Andrew Gray, committee spokesman.

Meanwhile, Sen. Richard C. Shelby (R-Ala.), committee chairman, and ranking Democrat Paul S. Sarbanes (Md.) have asked the Government Accountability Office and the Securities and Exchange Commission to review on-base investment marketing practices.

"We are going to do our part to ensure that military persons have access to the best financial products and are protected from abuse," said Gray. "Once we have a clear picture of the problem, we will be able to move quickly. This is a priority for us."

The House bill, sponsored by Rep. Max Burns (R-Ga.), likely will need to be passed again by the new Congress. It would ban the sale of contractual-plan mutual funds and insurance packages pitched as investments, mandate that state insurance laws be enforced on military property, require agents selling insurance on base to inform clients of alternative low-cost government-subsidized insurance, and establish a DOD-wide registry of insurance agents barred from bases for abusive practices.

Sens. Hillary Rodham Clinton (D-N.Y.), Michael B. Enzi (R-Wyo.), Chuck Hagel (R-Neb.), and Charles E. Schumer (D-N.Y.) introduced an identical bill in the Senate. ■

AP photo/Charles Dharapak

Landrieu explains the math.

Verbatim

By John T. Correll, Contributing Editor

Smarter Is Better

"In this century, we are shifting away from the tendency to equate sheer numbers of things—tanks, troops, bombs, etc.—with capability. If a commander has a smart bomb that is so precise that it can do the work of eight dumb bombs, for example, the fact that his inventory is reduced from 10 dumb bombs to five smart bombs does not mean his capability has been reduced. Indeed, his capability has been significantly increased."***—Secretary of Defense Donald H. Rumsfeld, Senate Armed Services Committee, Sept. 23.***

Archbishop Criticizes War

"Everyone can see that [military action] did not lead to a safer world, either inside or outside Iraq."***—Archbishop Giovanni Lajolo, secretary of the Holy See's relations with states, speech to UN General Assembly, Sept. 29.***

Safety First

"Last year, we witnessed the tragic death of 22 colleagues in Baghdad. We do not wish to witness the same again. ... We cannot condone the deployment of UN staff to Iraq in view of the unprecedented high level of risk to the safety and security of staff."***—Letter to Secretary-General Kofi A. Annan from unions representing UN employees,*** **Los Angeles Times,** ***Oct. 7.***

News to Him

"The only place I read about that is on the Internet and in newspapers. I never read about it in a Pentagon memo."***—Gen. Richard B. Myers, Chairman of the Joint Chiefs of Staff, on rumors of a return of the military draft,*** **Missoula** ***(Mont.)*** **Missoulian,** ***Oct. 6.***

The Magic of Intelligence

"It requires seven consecutive miracles for NSA to get communication out there from the global telecommunications network and bring it back and get it in front of an analyst who can turn those beeps and bleeps into something that is useful for American safety and security."***—Lt. Gen. Michael V. Hayden, director of the National Security Agency,*** **New York Times,** ***Oct. 14.***

Basic Fact

"There is only one side for sensible and decent people to be on in this conflict."***—British Prime Minister Tony Blair about the Iraq War,*** **New York Times,** ***Sept. 20.***

If the Other Side Wins

"Amid the losses, amid the ugliness, the car bombings, the task is to remain steadfast. Consider the kind of world we would have if the extremists were to prevail."***—Rumsfeld, speech to Council on Foreign Relations, Oct. 4.***

Reviving Space Based Radar

"We think it is absolutely necessary to have a Space Based Radar. I firmly believe that we need to continue this."***—Gen. John P. Jumper, Air Force Chief of Staff,*** **Aerospace Daily & Defense Report,** ***Oct. 8.***

Helping Taiwan Hampers Peace

"We are firmly opposed to the sales of weapons by any foreign country to Taiwan, which is a part of China, because we don't think it is in the interest of our peaceful efforts towards the resolution of the Taiwan question."***—Chinese Foreign Minister Li Zhaoxing,*** **Washington Times,** ***Oct. 1.***

At Ease

"In the Army, it means relax but listen. In the Navy, it means go do what you were doing. So you say, 'At ease,' and half the people walk away."***—Army Capt. Tom Oakley on crossed communications with sailors and airmen coming to the Army under Operation Blue to Green, Associated Press, Sept. 28.***

Nuclear Threat to Homeland

"A potential nuclear attack on the United States has not received the attention it warrants or the resources it requires. A nuclear attack on our nation would produce unparalled devastation and suffering here. It is estimated a 12.5-kiloton nuclear weapon—which could fit in a small crate—used against New York City could kill 250,000 innocent people; another 700,000 could suffer from radiation sickness."***—Rep. Curt Weldon (R-Pa.), vice chairman of the House Armed Services Committee and member of the Select Committee on Homeland Security, signed op-ed column,*** **Washington Times,** ***Sept. 23.***

High-Tech Questions

"It's harder to justify high-tech weapons when we seem unable to defeat an adversary fighting with low-tech weapons and relatively primitive insurgent tactics."***—Loren B. Thompson, Lexington Institute,*** **New York Times,** ***Oct. 1.***

Pointed Reference

"Those who seek to bestow legitimacy must themselves embody it; and those who invoke international law must themselves submit to it."***—Annan, speech to UN General Assembly, Sept. 21.***

The Reign in Spain

"This is in no way an insult nor a sign of contempt toward the United States," [but Spain is] "no longer subordinated and kneeling" [before Washington].***—Jose Bono, defense minister in Spain's new socialist government, after dropping US troops from list of those invited to march in national holiday parade,*** **International Herald Tribune,** ***Oct. 6.***

Bremer Cites Mistakes

"We paid a big price for not stopping it because it established an atmosphere of lawlessness. We never had enough troops on the ground."***—Paul L. Bremer, who headed the US provisional government in Iraq for 14 months, on the looting and on the size of the force, speech to Council of Insurance Agents and Brokers, Oct. 4.***

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The Air Force and Navy will share the load.
Even stealth aircraft will need protection.

The New Way War

By John A. Tirpak, Executive Editor

Photo illustration by Guy Aceto

The 40-year-old B-52 is going to take on a new role: standoff jamming. The BUFF will retain all its attack capabilities, but will carry new wingtip jamming pods, shown in this artist's conception. The first ones will be ready in 2009.

# of Electron

THE United States Air Force, after a long absence, has gone back to the business of airborne electronic attack (AEA).

For more than a decade, the US Navy has been the sole proprietor for that mission—generating electronic protection for US combat aircraft flying in enemy airspace. Navy airborne electronic attack aircraft and pilots have handled virtually all jamming work.

Now, the Air Force and Navy are moving toward a more balanced effort. They have prepared a division-of-labor scheme in which the two services will share overall responsibility.

The plan divides the AEA mission into four major parts:

- Standoff jamming—the disruption of enemy communications from a distance—goes to the Air Force.
- Escort jamming, assigned to the Navy, features jammer aircraft that fly as part of a strike package.
- Self-protection, or the use of onboard-generated signals to throw off the guidance of surface-to-air missiles, will be provided by each service.
- "Stand-in" jamming, or extremely close-in disruption of radars, hinges on two systems, one Air Force and one joint.

The shift is gaining momentum. The services expect soon to get a green light from the Joint Requirements Oversight Council—the top overseer of operational concepts and mission needs. Specific program approvals could emerge this month.

Under the new plan, the Air Force and Navy will pursue systems that will carry out various pieces of the AEA mission in an integrated and overlapping way.

Heightened Threat

The plan also makes the two services dependent upon each other for critical elements of their electronic protection. This will be an essential future element, inasmuch as air defenses have proliferated and are becoming more sophisticated.

In fact, the prospective threat shapes up as being so great that even stealth aircraft usually will get jamming support.

The plan envisions a wide array of advanced hardware. With few exceptions, each system is either still on the drawing boards or entails a substantial modification of an existing system. The first of the new capabilities won't arrive for five years.

Three years ago, USAF and the Navy conducted an analysis of alternatives in light of the looming retirement of the Navy's EA-6B Prowler, an escort jamming airplane in service for 30 years. Plans call for it to phase out by 2012.

The Air Force, which retired its F-4G Wild Weasel in 1996 and its EF-111 Raven electronic warfare aircraft in 1998, leans heavily on the Prowler's capabilities. Air Force

Photo by Ted Carlson

The EC-130 Compass Call will continue with its communications jamming role and possibly take on some other chores of airborne electronic attack. Upgrades now under way will yield new capabilities in two years.

crews fly on Prowlers; 24 USAF flight personnel are assigned to Prowler units.

The analysis of alternatives delivered a large menu of possible options (see "Next Steps in Electronic Attack," June 2002, p. 48), but the Pentagon leadership was critical of the overall results as being too "platform-centric."

The Pentagon subsequently was chided by the Electronic Warfare Working Group on Capitol Hill. Legislators in this group claimed that DOD was not moving rapidly enough to develop a coherent plan for AEA and had evinced "chronic neglect" of the mission area.

Stephen A. Cambone, undersecretary of defense for intelligence, told defense reporters last year that electronic warfare was not "No. 1 on everybody's list" of Pentagon priorities. (See "Washington Watch: EW Plans Not a Priority," January, p. 8.)

At that point, the Air Force and Navy began focusing on the effects they wanted to achieve with AEA, rather than the means by which they would accomplish the mission. They branched out the definition of electronic warfare and expanded the realm of systems that could assist in the mission.

Lt. Col. Edward Cabrera, chief of the Air Staff's Electronic Warfare and Survivability Division, said the new goal is to develop "a system of systems that will serve all services' needs." He said that the four parts of jamming—from standoff to stand-in—"encompass the entire spectrum of where we expect to engage."

The four mission areas complement each other, he said, and with some overlap. However, he added, "if you're missing one, then you're going to be particularly vulnerable in that area."

Operations in these four realms will also be coordinated by the new E-10A airborne battle management aircraft, which will serve as a link between a ground-based air operations center and the rapidly shifting air battle.

Standoff Jamming

For the standoff mission, the Air Force will take the lead. It will depend on its EC-130 Compass Call aircraft for jamming of enemy voice communications, as well as some signals intelligence and jamming functions that are included in upcoming budgets but are classified. The Compass Call will get new "glass cockpit" operator stations and new pods with greater radiating capability.

Also in the standoff range—still outside enemy air defenses—will be the B-52 standoff jammer. This is a standard B-52H with upgraded electronics, featuring two outboard wing pods which will carry a suite of powerful jamming gear. The large pods—each potentially as much as 40 feet long—will be able to generate as much power as six Prowlers. Each will weigh about 5,000 pounds, the same weight as a full external fuel tank.

Although initially dubbed EB-52s, the aircraft have been rechristened B-52 SOJ or just B-52J because they will retain their full bombing capability. No new crew members will be needed.

The Air Force expects ultimately to fit 76 B-52Hs with the ability to carry the EW pods, of which it plans to produce 36 two-pod sets.

In an April letter to Capitol Hill committees overseeing defense, Air Force Secretary James G. Roche reported the B-52 SOJ will satisfy the service's standoff jamming needs and bolster the air and space expeditionary force concept "by minimizing creation of another low-density, high-demand asset."

The EA-6B has consistently been labeled as an LD/HD.

The B-52 also offers the advantage of long range, extended loiter time, "rapid employability," and its full complement of strike capability, even while taking on the SOJ mission, Roche wrote.

Scott Oathut, who manages bomber programs for Boeing, told reporters in July that the company by 2009 could have four of the aircraft equipped and ready to receive the pods. By 2012, the Air Force could have six B-52s converted to SOJs. By 2013, 16 aircraft would be available for the mission.

The pods would also increase in capability. The first "spiral" of pods would be able to jam known, fixed radar and emitter sites. The pods produced during the second spiral, in 2012, would be able to perform "reactive" jamming against pop-up targets. For the second-spiral jammers, the B-52 SOJ will need more power. "Supplemental power generation will be added to the aircraft," a Boeing spokesman reported.

All the SOJ capabilities depend on the B-52 fleet receiving the avionics midlife improvement, already being tested.

The Air Force has forecast spending roughly $1.4 billion through 2012 to buy the SOJ capability for the B-52. For that amount, it would get 16 aircraft modified and 12 pod sets. More modifications and pod

purchases would be funded with additional, outyear monies.

Escort Jamming

Through 2011, the Navy EA-6B will perform escort jamming. Meantime, there will be improvements to its jamming suite. Beginning in 2009, though, the 120 Prowlers will begin retiring, to be replaced by the EA-18G Growler, a modestly altered F/A-18F two-seat strike aircraft which retains full conventional combat capability. The G model will feature some changed internal structure and avionics and will carry wing pods not unlike those now carried by the four-seat EA-6B.

The Navy, which will not receive a stealth aircraft of its own until 2012, has already received approval to build EA-18Gs, and in fact assembly of the first such aircraft began this summer. The service plans to acquire only 90 EA-18Gs, rather than replacing all 120 EA-6Bs, because by that time it will have reduced the overall number of combat aircraft in its inventory. Since the Growler is a two-seat airplane, no Air Force crews are expected to be detached to fly it.

As the Prowlers begin to phase out, the B-52 SOJ will take over some of the escort mission from long range, flying behind a strike package, detecting and jamming enemy radars, and cuing strike elements on where to shoot their antiradar missiles.

Self-Protection

For the self-protection element of the AEA network, the Air Force and Navy will depend on the inherent—and classified—capabilities of the stealthy F/A-22 and F-35, both of which eventually will carry active electronically scanned array radars, or AESAs. These radars, which will represent a huge advance over today's systems, will be able to detect and discretely jam specific ground-based air defense radars without necessarily sacrificing the stealthiness of the aircraft. This is due to the fact that AESAs can direct a powerful beam of radar in a specific direction without too much energy radiating sideways—what's called a "low probability of intercept" or "low side lobes" feature.

While it's true that any emissions will announce the presence of a stealthy aircraft, Cabrera said that all applications of EW will be highly "scenario dependent." Different elements of the AEA portfolio will be called upon in different situations, and only in the most taxing circumstances would all aspects be involved.

It is expected that the F/A-22 and F-35 will both have enough onboard power that, coupled with their AESA radars, they may be able to directionally "fry" a specific radar that pops up along their route to the target.

The Air Force will operate both the F/A-22 and F-35. The Navy and Marine Corps will operate versions of the F-35 only. The Marines opted out of the F/A-18E/F program, due to affordability, and thus will not buy any EA-18Gs either. However, Marine aviation officials have said they would like to keep their options open regarding the purchase of an EW-dedicated variant of the F-35 in the far future. Lockheed Martin, which will build the F-35, has done very preliminary design work on a two-seat EF-35 that would serve this mission.

Another element of AEA will be the availability of self-protection jamming pods like the ALQ-131. These pods, which are typically used just prior to entering a target area, are meant to throw off radar-guided surface-to-air missiles. However, the pods will not be enough to protect Air Force fighters in the future. In the Balkans war in 1999, for example, the Serbs employed cell phones and other nontraditional methods to provide targeting information for their SAM systems, which claimed an F-117 stealth fighter early in the conflict.

Stand-In Jamming

Finally, for the "stand-in" role—almost directly over enemy radars—two systems will be involved. One is the Miniature Air-Launched Decoy Jammer. This missile-sized system will behave and appear on radar like an attack aircraft, fooling the enemy into turning on radars that reveal its positions. Over the target, the miniature jammer would be able to radiate intense jamming to disable acquisition and tracking radars. As the MALD-J is still in the early stages of definition, Cabrera said USAF hasn't decided whether the vehicle will have to be stealthy, the frequencies in which it will work, or whether it might carry a warhead for a lethal attack on a radar site.

The Air Force is planning to budget about $660 million through Fiscal 2012 for MALD-J. The program started out in 1996 as a Defense Advanced Research Projects Agency concept demonstration, but the Air Force went back to the drawing board when cost and performance didn't meet expectations. Raytheon won a second competition for the system and has an $88 million development contract. The MALD is to be able to fly at 35,000 feet for

Boeing photo

The EA-18G Growler, a variant of the Navy's Super Hornet, will replace the EA-6B Prowler. Expected to enter service in 2009, the Growler will carry wingtip EW pods like the Prowler.

up to 45 minutes. First flight is expected next year.

"It's basically a small, dispensable UAV that would then fly a preprogrammed track and, at the designated time and place, produce a jamming effect," Cabrera said.

The other stand-in platform will be the Joint Unmanned Combat Aerial System, or J-UCAS. This vehicle, too, has yet to be defined, but would probably carry both jamming systems as well as kinetic munitions for a lethal attack.

Gen. John P. Jumper, Air Force Chief of Staff, said in September that experience has shown that unmanned vehicles have proved not to be cheap and disposable but expensive and that the J-UCAS will likely be a vehicle the service will want to recover after every mission.

The MALD-J is not a bridge to the J-UCAS, Cabrera noted, explaining that the two systems are expected to work collaboratively in the stand-in jamming role. MALD-J will probably be available sooner.

The Air Force considers the B-52 SOJ and the MALD-J to be "urgent" requirements, but is not rushing to deploy them because the Navy has promised to provide full escort jamming through 2009. The first spiral of B-52 SOJs should be available before the EA-6B support is withdrawn.

Cabrera said the goal now is to "change the mind-set of those folks who think of AEA or EW as turning the pod on and off."

AP photo

While the US has dawdled over developing and fielding new aircraft, surface-to-air missile technology has moved forward. Sophisticated SAMs such as this SA-12 have proliferated. Jamming will be needed to defeat this threat.

The purpose of having an integrated AEA system of systems is that it "will allow us to attack nontraditional target sets," he said and added that it will work against more than SAMS—for instance "cellular systems, network systems, any kind of adversary system that uses the electromagnetic spectrum."

Suppression of enemy air defenses, a mission performed by the F-16CJ, will also continue, but that mission area is considered "offensive counterair" and not airborne electronic attack. Cabrera said, however, that SEAD will be incorporated into the overall AEA "flight plan."

Seeking Integration

The AEA strategy is aimed at integration of all elements to provide both better capability and to prevent new problems, Cabrera noted.

With so many AEA systems involved in an air campaign, for instance, "unless you have a deconfliction plan or overall strategy, you end up potentially countering yourself" and creating the opportunity for fratricide.

When the Air Force retired the EF-111, it did so as a cost-saving measure. There was also the explanation, voiced by service leaders at the time, that a future force composed of mostly stealthy aircraft would have a diminished need for jamming. A decade after that decision, though, things have changed, Cabrera reported.

"The difference between now and 10 years ago ... is the advancement of the threat," he said. "There's been a significant increase in threat capability in terms of range, ... detection, ... launch ranges of missiles, and those sorts of things."

Since 1988, potential adversaries have had to take into account that the US had stealth aircraft it could employ with great effect, and they have taken steps to reduce their risk.

"Obviously, adversaries don't stand still and continue to develop their systems," Cabrera said. "We can't stand still, either. So the airborne electronic attack [plan] is our vision to help miti-

USAF photo by Steve Wallace

The F/A-22 (shown here) and the F-35 will have active electronically scanned array radars. The services are looking into the possibilities for self-protection jamming with AESAs.

gate that increased risk caused by that advancing and emerging threat. ... You have to continually counter it."

Jamming will also increase the options for stealth aircraft. Over years of explaining the value of stealth, the Air Force has typically shown a series of interlocked circles on a map, depicting the overlapping ranges of an enemy's search, acquisition, and tracking radars. Stealth aircraft reduce enemy sensor detection ranges, shrink the circles, eliminate the overlap areas, and create "corridors" where they can pass through, undetected.

Pop-Up Threats

However, those corridors will also be known to the enemy, who may deploy pop-up radars and SAMs along those routes to defeat stealth aircraft. Jammers in the area will help to further reduce detection ranges and leave the enemy guessing as to which corridors the stealth aircraft will use to penetrate to their targets.

In addition, USAF plans to obtain a mostly stealth force by the end of this decade have been frustrated by developmental and funding delays. For the foreseeable future, a good portion of the Air Force's strike assets will continue to be nonstealthy "legacy" platforms that will depend on AEA systems for their very survival.

"The reality is, we're going to have legacy platforms mixed with our stealth platforms for many years to come," Cabrera noted. "And so, we have to have a system than can protect both."

Gen. Hal M. Hornburg, outgoing head of Air Combat Command, said recently that there is also great promise in other forms of electronic warfare, notably in information operations.

Speaking with defense reporters in June, Hornburg said the Air Force needs to "aggressively pursue other ways to get into the electronic attack business," because electronic attack is just one dimension of information operations.

"It can be a necessary part of any nonkinetic operation. I think this nation and our military need to look at nonkinetics as the way ahead as much as developing kinetic applications for warfare." The capabilities to create effects without destroying something in the process "intrigue me deeply," Hornburg said.

Staff photo by Guy Aceto

The Air Force got out of the escort jamming business when it retired its EF-111s. Many of the EF-111 crews transferred to other systems. Here, an EF-111 flies with an F-16C.

"I look forward to the day where we can convince a surface-to-air missile that it's a Maytag in a rinse cycle, make it irrelevant to combat." Hornburg is excited by the possibility that an "advancing phalanx of enemy armor" would stop in its tracks because a space or airborne system told the vehicles to turn off their engines.

The Air Force is often criticized as having surrendered much of its AEA expertise when it phased out the EF-111 and the F-4G. These complaints stem from the fact that the service stopped training electronic warfare officers in 1993 and didn't reopen the pipeline until 1996. Then, the EW school produced no EW specialists for a grand total of four years.

David Kratz, a former Air Force EW practitioner and now program manager for Northrop Grumman's advanced electronic warfare systems, told reporters in September that "the Air Force has acknowledged that it had a big brain drain as far as electronic warfare knowledge" over the past six to eight years.

"They're trying now to bring more electronic warfare expertise back into the Air Force. ... They're doing a fairly good job of calling what's left together to decide what they're going to do," Kratz said.

Cabrera agreed that the Air Force probably had "a wake-up call back in the late '90s when we realized, after the F-4G and EF-111 had gone away" that the threat continued "to evolve." Cabrera said an EW summit in 2000, called by then-Chief of Staff Gen. Michael E. Ryan, allowed the Air Force to gauge its needs "on where we were and where we needed to be. And there was a lot of activity generated from that summit." It helped drive the analysis of alternatives, he noted.

Lt. Col. Wayne Shaw, electronic warfare chief of the Information Superiority Division of the Air Staff, said the perceived brain drain isn't as bad as it seems, however.

Shaw noted that EW-trained crews from the F-4G and the EF-111 went on to fly F-15Es, F-16CJs, Compass Call, EA-6B, and other platforms. They "provided real value" to those mission areas by virtue of their EW experience, and many of them have stuck with the Air Force, he said. Their expertise will be useful as USAF gets back into the game in a big way.

Cabrera agreed that there's "still quite a bit of expertise out there."

He said that 2005 will be "a banner year" for the AEA mission, because the service will have a much better "understanding [of] the funding that we actually have that will define for us how far we can go with the development and integration of these systems."

By the fall of 2005, "we'll have a much better idea of the funding lines. Then we can start building a timeline." Right now, he added, "we're still defining capabilities." ■

A new Fleet Viability Board is keeping tabs on the oldest air fleet in USAF history.

Checking Up on Old

By Adam J. Hebert, Senior Editor

A YEAR or so ago, Air Force leaders were struggling to determine how to deal with problems caused by aging aircraft. The fleet was, on average, older than at any time in history. Gen. John P. Jumper, Chief of Staff, said the Air Force faced "issues that we have never had to deal with before."

Among them, he said, were corrosion, skin weakness, frayed electrical wiring, and unanticipated component failures.

With KC-135 tankers in depot, he noted, "you can peel the skin layers apart, and powder comes out the middle." F-15 fighters were operating under flight restrictions imposed after failures in which tails actually snapped off the aircraft.

In the case of the A-10, the Air Force was finding more structural defects than anyone expected. Time spent repairing the attack aircraft ballooned.

The need for modernization was so urgent, said Jumper last February, that "it is difficult to set priorities." He added, "All of this comes together to make us question how we judge the airworthiness of our aircraft."

Compounding the problem was the fact that USAF had no independent and systematic way to judge the health of these aged aircraft. It needed a way

Aircraft

Staff photo by Guy Aceto

USAF photo by Michael Dey

Until recently, the Air Force lacked a systematic way to evaluate the fleet-wide health of aged aircraft. The Fleet Viability Board changes that and will give USAF an unbiased appraisal of the health of aircraft such as these elderly B-52s.

to evaluate return on investment—to determine whether it made sense to keep repairing old aircraft or dump them and procure brand-new ones.

Part of the answer, announced Jumper, was creation of an "airworthiness" board "to verify and to certify" that aged aircraft could and should remain in use. Today, the Air Force's out-of-production fleets are still a problem, but the service now has a system in place to determine what to do about it.

Fleet Viability Board

The airworthiness board is now called the Fleet Viability Board (FVB), and its work has already had a major impact on how the Air Force looks at aged aircraft. The existence of an independent board means USAF leaders receive recommendations free of bias.

The board assesses aged aircraft without bowing to pressure from competing views. Warfighting commanders might want to keep a system in service because it is too important to live without. Conversely, maintainers at the depots may believe that an aircraft is no longer worth the time and money required to keep it flying.

The board idea was suggested by James G. Roche, Secretary of the Air Force. Roche, who is a retired Navy captain, was inspired by the example of the Navy's Board of Inspection and Survey. As Roche told Congress, he wanted to provide a "dedicated set of professionals who will develop objective criteria for retiring aircraft from the operational fleet."

Until then, there had been no unbiased way to look at the overall health of a fleet. "While there have been some ad hoc fleet studies in the past, they centered on some narrow issues," such as the cost of corrosion in a specific aircraft, said Col. Francis P. Crowley, FVB director at Wright-Patterson AFB, Ohio.

The old system was no longer tenable. Brig. Gen. P. David Gillett Jr., USAF maintenance director on the Air Staff, warned, "We are in uncharted waters" with respect to the age of aircraft, and it is harder than ever to predict the effects of this age. He said that maintenance demands have steadily grown because of increasing structural, wiring, and mechanical failures attributable to maturity.

Over all, Gillett said, aircraft maintenance hours per flying hour have increased by 31 percent since 1991, and the cost per flying hour has risen 13 percent since 1999. "We are still able to perform when called upon, but at increasing cost," he said. Crowley said that the new board is "more comprehensive in scope because we assess the availability of a fleet," the health of subsystems, and the continued cost of ownership.

If the FVB determines that an aircraft, as currently configured, will not meet requirements in the future, the board will declare that aircraft not viable, "unless the Air Force funds additional upgrades," Crowley said. This is what happened with the board's first completed assessment.

The FVB took on the C-5A Galaxy airlift aircraft as its first order of business this year. By July the board had reached two conclusions—first, that the C-5A, the oldest of the C-5 fleet, is worth keeping in service, provided it receives a series of upgrades, and, second, that the C-5A, even with these upgrades, will never be as effective as the Air Force would like it to be.

After analyzing the C-5A, the board turned its attention to a set of older KC-135Es, tankers that posed a safety risk in flight. The board is now evaluating the health of the entire Stratotanker fleet.

Next will come a hard look at the Air Force's fleet of A-10 attack aircraft. Future studies will focus on older F-16s (Blocks 10 and 15) and the B-52H bomber.

Officials explained that aircraft are selected for a viability review based on many factors. These include how near a system is to the end of its expected service life, its mission capable rates, number of maintenance hours required per flying hour, and its cannibalization rate.

Gillett said "structural integrity" is the most critical factor in determining viability assessment priorities.

The FVB has no decision-making power on its own. It gives recommendations to Jumper and Roche, who use the suggestions for making force structure and modernization decisions. The board looks at cost, aircraft availability, and "operational health" as the leading indicators of a fleet's long-term viability.

Assessments project snapshots of an aircraft's operational cost and overall health six, 14, and 25 years into the future. The board noted that it "leaves consideration of force structure or operational impact to the Air Force corporate structure."

C-5A: $22 Billion Needed

The FVB's C-5A assessment looked at the 60 A-models scheduled to remain in service. (Ignored were 14

others slated to retire by the end of 2005.)

The aircraft were built in the 1968-73 period, and the FVB report noted that, in the 1970s, they had "abysmal" mission capable rates of about 40 percent. Reliability has slowly but steadily increased to an MC rate of about 55 percent today. In contrast, the Air Force's C-5Bs, which are half as old as the A models, posted MC rates better than 72 percent in 2002 and 2003. The C-5A is never expected to achieve that level of reliability.

Over the next 25 years, the Air Force may spend more than $22 billion (calculated in 2000 dollars) to support the C-5A, the report noted. The board deemed this investment worthwhile and issued some surprising findings.

For instance, it said that the C-5A operations and support costs, though the highest for all transport aircraft, "are not out of line with other large aircraft."

The C-5A performs a valuable mission, and there is a shortage of airlift capability, but, if the planned avionics and engine upgrades do not take place, "the cost of maintenance will continue to accelerate, and reliability ... will continue to degrade," the board determined.

Corrosion and airframe fatigue will not become factors in the long-term health of the C-5A for at least another 25 years, in the view of the FVB. "We did not see the structural issues on the C-5A most people expected us to find on an aging fleet," Crowley said.

USAF photo by Sue Sapp

The first order of business was a look at the C-5A. The FVB determined that the C-5A is worth keeping in service, but only if it receives a series of engine and avionics upgrades.

The Air Force will have a better understanding of the aircraft's structural health once it completes a C-5A teardown and analysis at Warner Robins Air Logistics Center in Georgia. During the teardown, officials are looking at engine pylon attachments, bulkheads, and other components in a search for unexpected structural problems. The teardown analysis should be complete at the end of 2005.

If the C-5A receives planned avionics and engine improvements—and a second avionics upgrade around 2020—it will remain viable through at least 2029, when it would reach 45,000 flight hours, the board determined. Without these upgrades, explained one official, it makes the most sense to simply retire the aircraft and get the needed lift capability some other way.

Planned C-5A improvements include an avionics modernization program (AMP) and a reliability enhancement and re-engining program (RERP). These two efforts will bring "significant improvement" in reliability, maintainability, and capability, according to the FVB.

AMP and RERP will "mostly" solve mission limitations, the board's final report said.

"Even with the substantial benefits of these modifications, the fleet will fall short of mission capability and availability goals throughout the remaining life of the system," said the board.

The Air Force's target MC rate for the C-5A is 75 percent. "We were surprised to discover that, while these modifications will be quite beneficial, the C-5A's mission capable rate will never achieve" that 75 percent goal, Crowley told *Air Force* Magazine.

The board projects that the AMP and RERP will gradually improve C-5A reliability to a 60 percent MC rate in 2013. The rate will eventually peak at 71 percent in 2020. Without AMP and RERP, "the aircraft will not meet planned Global

USAF photo by SSgt. Chrissy Fitzgerald

Structural integrity and operational availability are key factors in determining which aircraft will be evaluated. Here, SSgt. Donovan Osborne, 57th Aircraft Maintenance Sq., Nellis AFB, Nev., checks for cracks in an F-15E engine.

USAF photo by SrA. Joshua Strang

As a safety precaution, USAF recently grounded 29 KC-135Es with old engine struts. The FVB is now looking at the entire KC-135 fleet. KC-135Rs, such as this one, are expected to be in better shape.

Air Traffic Management emissions or noise requirements," which would limit where the Galaxys can be flown, said Crowley.

Engines Are Key

Most future reliability and performance improvements are contingent upon the re-engining program. The C-5A's existing TF39 engines "will not provide the necessary performance to meet future GATM climb and cruise performance [or] emission compliance requirements," the C-5A report stated. Propulsion system dependability and performance will vastly improve as RERP is implemented, the board determined.

First, a "windfall" of TF39 engines will become available as those engines come off of C-5Bs, beginning in 2006. Later, the A models should also receive "more reliable, maintainable, and better performing" engines, starting in 2013.

Many re-engining details remain uncertain. The Air Force sent out the first C-5B for RERP modifications just this October, and that aircraft is not scheduled to fly with its new power plants for a year. And the number of C-5s to be re-engined has not been determined. US Transportation Command is currently conducting a new mobility requirements study.

The avionics upgrade yields a much smaller reliability improvement, but is operationally critical. C-5A avionics are "incapable of meeting current and future GATM requirements" and offer "little to no growth capability," the report stated. Without AMP, mission restrictions are likely, and even with the modernization, an additional "tech refresh" will be needed around 2020.

The board noted that these estimates are, ultimately, projections. If the estimates are conservative, the fleet could exceed the 75 percent MC rate goal from Fiscal 2018 through 2029. If, however, the estimates are optimistic, "this will greatly exasperate an already poor availability position," the board wrote.

Gen. John W. Handy, commander of US Transportation Command and Air Mobility Command, found the FVB's C-5A review useful but perhaps misdirected. Handy told defense reporters in July that he would have preferred an "as-is" assessment.

"To me, the determination of viability is to take a baseline weapon system and say it's viable over time, without modification," Handy said. "You can sustain almost anything over time if you spend enough money to keep it viable. ... They answered the question, but I'm not sure the question was stated correctly," he said.

Gillett said the board's recommendation was that the C-5A modifications are worth performing. In the case of the C-5A, the board found AMP and RERP will result in flat cost growth and improved availabil-

In Some Areas, Encouraging Signs

Not all trends related to the Air Force's aged aircraft issues are negative, said Brig. Gen. P. David Gillett Jr., USAF director of maintenance at the Pentagon.

The deputy chief of staff for installations and logistics recently launched the Expeditionary Logistics for the 21st Century (eLog21) initiative to ensure the logistics community can meet future combat needs.

ELog21 lays out goals that will not be easy to meet with the Air Force supporting a fleet of aircraft that gets older every year. ELog21 calls for improving weapons system availability by 20 percent (over the next three years), with "no real cost growth."

This will be achieved by incorporating corporate business practices and leveraging new technology, a fact sheet explains.

Gillett conceded that the eLog21 goals are highly ambitious, but added that the Air Force's depots have recently made tremendous strides in dealing with older systems. Last year, the depots showed a financial surplus at the end of the year for the first time in recent memory, he said, and there are other reasons to be optimistic.

Process improvements at the depots have helped get older aircraft through their maintenance cycles faster. C-5 "flow time" through the depots has improved significantly in recent years, Gillett said in an interview, and the service has met a commitment it made several years ago to fully fund spare parts inventories.

ity. The board therefore declared the C-5A "viable"—with the upgrades.

It is now up to USAF's corporate leadership and the warfighting commanders to decide if they agree.

Gillett said the board would declare an aircraft "not viable" if major upgrades would still result in an aircraft with declining mission capable rates, poor performance, or "inability to meet mission requirements."

Handy noted that AMC can compare upgraded C-5As with "other ways to get the job done," but making long-term predictions about aged aircraft can be unsettling.

"It's the 'ifs' that really worry me in there," he said of the report. "We have not executed the AMP mod on schedule. We're not on schedule with the RERP. ... [This is] the reality of the budgeting process and competing demands."

USAF photo by MSgt. Val Gempis

The FVB will soon evaluate the A-10. Structural improvements are planned, but the number of airframes to be retained is unknown. Here, mechanics with the 51st Maintenance Sq., Osan AB, South Korea, look for damage.

KC-135E: Unsafe Corrosion

In September, the Air Force announced that Handy had ordered that 29 KC-135Es be "removed from the flying schedule."

These Stratotankers were among 30 the FVB had inspected, tail by tail, to validate a no-fly recommendation from the KC-135 System Program Office. When the viability board concurred, and briefed Handy on its findings, he ordered 29 with corroded engine mounts to stay on the ground.

By Oct. 1, officials said, it was decided that the 29 troublesome tankers would not be permitted to fly again until their corroded engine pylon support struts were repaired. "This decision is based on flight safety considerations," officials said in a release.

Crowley explained, "The most significant finding from the KC-135E special assessment is that the thermal heating and corrosion damage to the engine pylon support struts on unrepaired aircraft is more severe" than previously thought.

Gillett said these 30 KC-135s were "originally programmed for retirement" in 2005 and had not received upgrades along with the KC-135Es scheduled to remain in service. (One of the 30 had already received strut repairs, in conjunction with other maintenance, and was judged still safe to fly.) The aircraft cannot be retired for the time being because Congress has prohibited the Air Force from doing so until the details of a new tanker acquisition plan are worked out.

Crowley said the "special assessment" of the 30 tankers will be used to "kick start" the full KC-135 review, which should be completed in April 2005. The full review will look at all 546 aircraft in the KC-135 fleet—including remaining Es and newer R models.

The FVB follows a standing review process, but particulars of each aircraft require assessments with "considerable fine-tuning," Crowley said. For example, the engine-mount struts that were the primary concern on the first 30 KC-135Es are not expected to be a problem for KC-135Rs, which have newer engines and struts.

A-10s and Beyond

After the tankers, the FVB will turn its attention to the A-10 Warthog, an aircraft that has been heavily tasked in both Afghanistan and Iraq.

"I would not want to retire any of these airplanes if they weren't approaching a service life issue, because we need them," said Gen. Hal M. Hornburg, Air Combat Command chief.

However, Hornburg predicted that it will simply be too difficult for the Air Force to keep all A-10s in service. This is an aged aircraft problem, not a financial problem, he said.

The A-10, which first flew in 1975, is currently undergoing a service life extension program to replace deteriorating wing skins and other structural components. The A-10 fleet will also receive a precision engagement upgrade, to allow it to carry precision weapons.

Speaking to reporters in September, Hornburg said ACC "will probably still want to retire some [A-10s] because it won't be worthwhile to modernize airplanes that ... [are] just about to go off the end of the cliff with respect to their service life. In other words, at some point, with any airplane, you cross a line of diminishing returns."

The FVB will identify that point of diminishing marginal returns. The board will assess ACC's service life estimates and determine if there are technological breakthroughs that can "extend the service life or whether the service life needs to come back to the left," Hornburg said.

After the A-10, two other aircraft with long-term structural issues are on the FVB's docket.

Older F-16s are now completing the Falcon Star structural upgrade program, but the fighters are subject to extreme airframe stress every time they go into combat or on realistic training missions. The B-52, meanwhile, is thought to have a solid airframe, but the aged bomber is expected to remain in service for decades, and many of its parts have long been out of production. ■

ANG F-16s, equipped with an aerial reconnaissance system, provide a unique and important USAF capability.

RECONNAISSANCE

IN FORCE

Photography by Paul Kennedy, SSgt. Aaron D. Allmon II, and MSgt. Glenn Wilkewitz

USAF photo by MSgt. Glenn Wilkewitz

A Michigan Air National Guard F-16C, equipped with the Theater Airborne Reconnaissance System pod, patrols the sky above Iraq.

Last February, the 107th Fighter Squadron, Selfridge ANGB, Mich., became the first F-16 unit to be based in Iraq and the first to employ the Theater Airborne Reconnaissance System (TARS) and Litening advanced targeting pods in combat. The only other USAF F-16 unit to carry "recce" pods is the 192nd Fighter Wing of the Virginia Air National Guard.

In 1995, the Air Force equipped the 192nd F-16s with a portable reconnaissance pod. By April 1996, the ANG unit was rated mission capable in its new armed recce role and had deployed to Aviano AB, Italy, to fly patrols over Bosnia.

USAF photo by SSgt. Aaron D. Allmon II

USAF photos by MSgt. Glenn Wilkewitz

Above, an F-16 from the 192nd FW, Richmond Airport, Va., flies over Iraq.

At left and below, Capt. Ronald Schaupeter, 107th FS, conducts preflight checks during deployment in Iraq.

Officials of the 107th said they had had an abundance of volunteers for the deployment to Iraq, making it unnecessary to mobilize anyone. While in Iraq, the 107th flew some 800 sorties, logging 3,000 flying hours—about a year's worth of normal flying in only three months.

Above, another 107th FS F-16 prepares to land in Iraq. The unit flew out of Kirkuk Air Base.

Photos by Paul Kennedy

The decision to put a reconnaissance pod on the F-16 came in the mid-1990s. When USAF retired its RF-4C, it planned to end the manned recce program altogether. Instead, it decided to try altering portable recce pods for use on the F-16, which then could serve as an armed reconnaissance platform.

USAF selected ANG's 192nd Fighter Wing to test the concept. Soon, the 192nd had fitted electro-optical pods on unit F-16s and deployed to Italy.

The concept worked well. After testing it with the 192nd, USAF began developing a new recce system and tasked the Michigan ANG's 107th Fighter Squadron to add reconnaissance to its mission.

At top and above, MSgt. Keith Joyce of the 192nd FW checks out a new TARS pod. At left, stored pods are kept ready for use.

At right, Lt. Col. Steve Swetnam, the 192nd's chief of intelligence, processes TARS imagery on the squadron ground station.

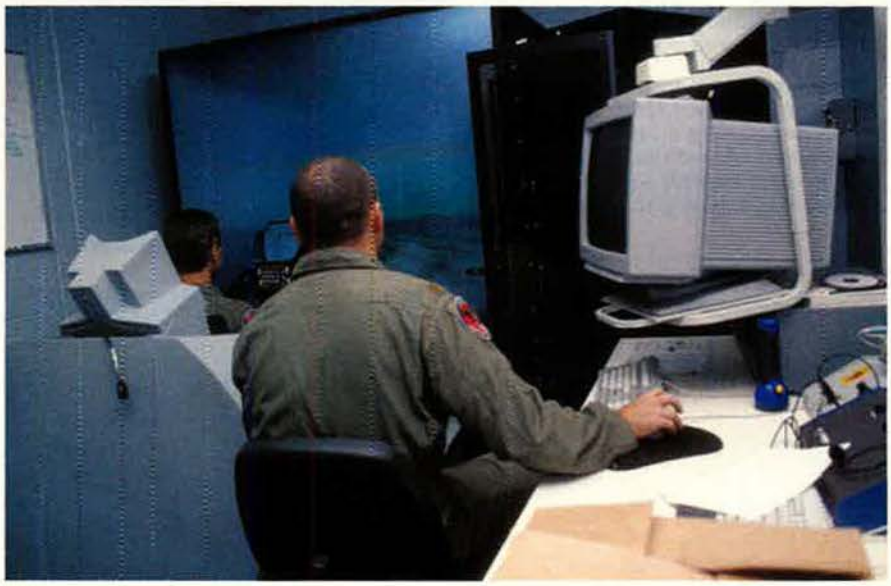
TARS pods were developed in 1998 and declared operational in 2000. TARS was built as an interim system, but 192nd FW officials say it may be around for some time. In fact, USAF is considering major improvements to the system.

TARS collects intelligence from the battlefield in daytime, below the weather.

Photos by Paul Kennedy

For both squadrons, planning and attention to detail are key. At left, Maj. Bill Butz of the 192nd FW develops his flight plan. Below, unit members keep the work flowing at the 192nd duty desk.

Pilots keep sharp with simulator training. At right, 192nd pilots Maj. Dave Nardi (left, in the cockpit) and Maj. Rick Gingue go to work in a unit training device used primarily for part-task training. ANG recently upgraded the simulator with a targeting pod and other capabilities.



Photos by Paul Kennedy

Above, maintenance personnel work on a fighter in a 192nd FW hangar in Virginia.

Maintenance personnel are critical to both units. The heavy flying schedule in Southwest Asia required more than normal maintenance. The desert conditions posed another challenge—keeping sand from causing damage to parts.

The 107th and 192nd maintainers have been rewriting field maintenance guidelines for the new recce and targeting systems.

Above, SSgt. Jennifer Ely gets into her work, performing an engine inlet inspection on the Virginia flight line. At far left, crew chief MSgt. Floyd Brown checks out an F-16 cockpit.

At right, a 107th FS F-16 is prepared to take off on a sortie over Iraq, loaded for its dual role of armed reconnaissance.

In addition to TARS, the two units employ the new Litening advanced targeting and navigation system that provides precision strike capability.

With the combination of the TARS and Litening systems, the F-16 can fly close air support while it is gathering battle damage assessment data or current battlefield intelligence. Images are processed within 30 minutes of landing. However Lt. Col. Glenn Schmidt, 107th FS commander, said TARS in 2005 would gain data-link capability for real-time assessment.

USAF photo by MSgt. Glenn Wilkewitz

Photos by Paul Kennedy

At left, Lt. Col. Keith Wark of the 192nd FW checks over his F-16 before a training sortie. His right hand rests on a Litening II pod.

Below, Wark writes some notes as crew chief SSgt. Bryan Reynolds makes an adjustment to the aircraft.

Above, Wark performs the walkaround, his last check of the aircraft before takeoff.

Photo by Paul Kennedy

USAF photos by MSgt. Glenn Wilkewitz

Above, a 192nd Fighter Wing F-16 takes off from its home base in Virginia on a training flight.

At right and below, pilots from Michigan's 107th Fighter Squadron conduct preflight checks before launching on combat sorties in Iraq.

Below, right, a 107th F-16 flies over Iraq.

Both ANG units anticipate a hectic pace of operations for some time to come. ■

Complex combinations of aircraft, sensors, and data links bring dramatic change in combat employment.

Air Warfare in Transition

By Rebecca Grant

AIR warfare tactics are on the verge of what many believe will turn out to be a far-reaching revolution.

Unlike past generations of airmen, today's pilots are not advancing the tactical art purely on the basis of acquiring newer and better platforms. The factors driving the transformation are more profound than mere hardware.

The latest great leaps forward are being built on complex combinations of aircraft, sensors, data links, and other elements. Information passed through an airborne network will form the heart of future tactical operations.

Stealth and precision—the technologies that exerted the most impact on air tactics in the 1990s—will be enhanced, augmented, and, at times, overshadowed by technologies ranging from programmable waveforms to Internet protocols.

USAF has now entered a period of transition. The concept of the airborne network is evolving from voice-based command and control (C2)—at the tactical or operational level—to a more complex network of data shared in many forms with many users.

The key development to watch is the airborne network's sophistication—that is, format, processing power, membership, and speed of response.

The first signs of change came during NATO's Operation Allied Force in the Balkans in 1999. Selective tactical uses of data links and collaborative analysis built a rough network between the combined air operations center (CAOC) in Italy and airborne C2 and strike aircraft.

Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom in Iraq pioneered a more extensive use of airborne networks to distribute sensor information, share tactical messages, and exert command and control over forces.

The May 2003 end of the major combat operations in Iraq led the Air Force Chief of Staff, Gen. John P. Jumper, to observe, "We've learned the value of things such as networking." The power of nearly all major strike platforms—from B-2 bombers to A-10 attack aircraft—was multiplied by fresh intelligence-surveillance-reconnaissance (ISR) data or updated CAOC communications and tracking.

Network Neighborhoods

Though the OIF experience was a leap forward, it was a distinctly patchwork approach. The OIF battlespace was filled with "network neighborhoods," said Air Force Lt. Gen. Ronald E. Keys, the deputy chief of staff for air and space operations.

"We had Predator putting video in the AC-130," he said. "We had people with laptops putting coordinates up in B-52s to drop JDAM [Joint Direct Attack Munitions]." These "little neighborhoods," as Keys called them,

were networks consisting of a limited number of platforms.

Brilliantly functional in places and with certain platforms, it was far from the comprehensive, versatile network that is now envisioned for the future.

In OIF, the "networking was crude," Jumper has noted. "It was machine-to-machine interfaces, but it was crude. Our kids did it on the chat networks at the speed of typing, not the speed of light."

A year-and-a-half later, there are platforms and network elements on the horizon that are capable of transforming the tactics of air warfare.

Leading the way are new platforms—such as the F/A-22 stealth fighter and F-35 strike fighter—and major upgrades that permit so-called legacy platforms (such as tankers) to adapt to their new roles.

The Raptor "will be the best sensor on the battlefield for net-centric operations," reported Lt. Gen. William T. Hobbins, deputy chief of staff for warfighting integration at the Pentagon.

It has the tremendous advantage of having been developed with the computing power, data links, and sensor fusion to qualify it as a network-centric platform.

In addition, powerful air combat simulations already have given program personnel and Raptor pilots the ability to feel out the F/A-22's capabilities. When the F/A-22 achieves initial operational capability in December 2005, the pilots manning the first squadron will already be familiar with numerous air combat simulation results pointing the way to new tactics.

Likewise, the Joint Strike Fighter will bring its own self-forming tactical network capability when it is fielded in quantity after 2010.

Both platforms also incorporate advanced sensors that will enhance the quality of targeting information by improving both range and resolution.

Two Fighter Roles

The most revolutionary developments may come as the new fighters take on the role of highly survivable forward nodes of an airborne network. In that role, the fighters will act as strike platforms, but they will also survey and reconnoiter the battlespace at great depths.

Strike control and sensor information will pass through the main sinews of the future network: data links.

USAF photo by Steve Wallace

The F/A-22 is one of the new weapon systems that will transform air warfare tactics. USAF officials believe it will be the "best sensor on the battlefield" for net-centric operations.

Several legacy platforms, equipped with upgraded links, already have made stronger connections to the network and play new roles.

Expeditionary operations forced a focus on the tankers, given that they are always present in the airspace for both rapid deployment and combat operations. When the first KC-135 equipped with the Roll-on Beyond Line of Sight Enhancement (known as ROBE) appeared in late 2002, Maj. Gen. Robert F. Behler, then commander of the Air Force C4ISR Center, remarked, "We now have network-centric connectivity for our warfighters."

The move to a "smart tanker" node was the product of a classified program already in progress, but it was pushed hard after Sept. 11 to rapidly improve USAF network-centric warfare capabilities. Step one was to fit this prototype smart tanker with Link 16 antennae to form a beyond line of sight radio relay from the tanker to other aircraft and onward to air operations centers.

The ROBE tankers show how platforms are now performing a double function: fulfilling existing, autonomous missions (such as air refueling) and contributing to the formation of airborne networks. For the tanker crew, Link 16 allows them to track aircraft in the area instead of relying solely on an airborne early warning system to keep them posted. Situation awareness—in this case, who needs gas, and where they are—lets the tanker crew operate more efficiently.

The F/A-22 will take this double-duty concept to an even more sophisticated level with its intra-flight data link. The IFDL connects F/A-22s to other F/A-22s by means of low wattage, low-probability-of-intercept transmissions, which form a continuous network.

The information that flows through this link can include fuel state, weapons status, and other data which give each pilot a status picture of others in the flight, all under voice radio silence. Individual pilots can operate more autonomously and without radio calls. F/A-22s in a flight can extend their sensor and information relay coverage and make rapid tactical decisions about which aircraft will attack which targets.

Other fighters, from the F-15 to the Swedish Gripen, have used a form of IFDL, but the F/A-22 link will break new ground.

"I have seen these links in our simulators," said Hobbins. "When I compare the F-15C or F-15E [to the F/A-22], there is a huge leap."

More Data Links

The F/A-22 will also be equipped with Link 16 (both transmit and receive) in the future. Current Pentagon plans call for all combat aircraft to be Link 16-equipped by the year 2010. Data links on platforms form

the basis for an airborne network that can be generated anywhere aircraft operate.

The wider Link 16 airborne network will deliver a powerful advance over current capabilities.

"A lot of our airplanes had not been link-equipped before, and so we're moving toward more Link 16 equipment" along with other links such as SADL, the situation awareness data link, noted Hobbins. "They're all very clean tactical ... systems to get limited amounts of data through."

But new technologies offer more. Despite the push to integrate Link 16 on more platforms, those responsible for future architectures are already well aware of its limits and the need to bring onboard the technologies to absorb and supersede the current data link network.

As Hobbins said, "We see that these tactical data link systems have an eventual throughput limit, they have some legacy problems, they have some tribal language issues that point us toward working toward airborne networking."

OSD C3ISR official Michael S. Frankel was even more blunt. Link 16 "has got to go," Frankel told a network-centric operations conference in 2003. "It's a club that costs you $500,000 to join and two weeks to set up."

Link 16 may be something of a newcomer to air warfare, but its technology is seen by some as old and it has limitations. It has to be set up well in advance and bandwidth is limited. The functional concept behind it is changing, too. Link 16 is a push function—pumping data continuously to pierce a high-jamming environment. Hobbins described today's airborne network as a push architecture due to the nature of the data links.

In contrast, Hobbins envisioned the future network as a push and pull architecture. "That means it's going to permit sharing of information based on needs and requests for information," he said.

The next architecture will be similar to today's Web-based operations "where we're actually out there searching for information," Hobbins explained. Two essentials for the next architecture will be migrating to a common Internet protocol language and "a bigger pipe" of bandwidth "to harness the power brought about by commercial developments" in data operations.

The goal is still setting up the right tactical battlespace networks but more quickly and with more throughput.

Link 16 will then be absorbed into a new kind of network structured around components of the Joint Tactical Radio System (JTRS), which will deliver radios capable of using up to 30 wavelengths. One will be a wideband waveform, home to TTNT—the Tactical Targeting Network Technology. Developed in part by the Defense Advanced Research Projects Agency, TTNT is a way to form up a network between aircraft and other nodes in a matter of seconds. It's an on-demand system that can connect aircraft from about 100 to 300 miles apart and propel data at 10 megabits/second. "You'll get a dial tone in less than five seconds," Air Force Maj. Steve Waller recently told *Aviation Today*. TTNT could connect both air-to-air and air-to-ground users.

"We like TTNT [as a variant of the wideband network waveform] because it has the ability to move through a lot of frequencies very quickly and the ability to move information very quickly across the network and actually service many platforms in a much broader area," said Hobbins. In theory, hundreds of users could join the TTNT. Joint Expeditionary Force Experiment (JEFX) 2004 tested TTNT, "and it worked very, very well. We were able to move voice, imagery, chat, all at the same time over a wideband network that was just really exciting to see," Hobbins said.

Faster Flow

Secure voice, chat, and imagery proved their value in dynamic targeting situations during Operation Iraqi Freedom. A faster flow will have a direct tactical impact, including quicker and more comprehensive updates of target information and greater situation awareness across the battlespace.

A system like TTNT will help make it possible to form spontaneous networks among large groups or selected participants.

The tactical benefits make it well worthwhile to commit substantial resources to improving current capabilities and fielding future airborne networks. Yet there are significant challenges ahead, too.

Capacity is one of them. "We have to put our machinery and our applications on a bandwidth diet," warned Hobbins.

Security is another. Protecting the network through security measures and information assurance is also vital. Adversary intrusion into the networks has the potential to seriously distort or disrupt operations. "We're always concerned with that," acknowledged Hobbins. "And that's why we do a lot of encryption, and that's why we have network support operations centers that are able to

USAF photo by SSgt. Aaron D. Allmon II

Since its combat debut in Operation Desert Storm, the E-8 Joint STARS helped advance technology that is leading to ever more complex data-sharing capability among ISR platforms, strike aircraft, and operations centers.

detect adversaries trying to get into our information network." Part of the strategy is to instantly advise people if their network is at risk," Hobbins said. Also, "we've got to jump around on frequencies—you can't just stay on one and become predictable. We have got to protect our systems."

Obstacles aside, the future airborne network will offer up a diverse array of tools to the primary customers: aircrews executing missions.

Tactics—Beyond

"Throughout history, soldiers, sailors, marines, and airmen have learned one extremely valuable lesson relative to engagement with an opposing force," former USAF Chief of Staff Ronald R. Fogleman said in 1995. "That is, if you can analyze, act, and assess faster than your opponent, you will win."

Analysis and assessment eventually lead to action. Networks do not win wars. Success in combat ultimately depends on how airmen use the network to enhance tactics for weapons employment and other missions.

The tactical benefits of connectivity begin with a basic luxury: sharing a digital image or picture of the area of interest. One high payoff area is close air support. Traditional close air support procedures centered on whether or not the controller and the pilot preparing to bomb or strafe could convince each other that they were looking at the same thing. The old ideal was to have the pilot's eyes on the target, the controller's eyes on the target, and the controller's eyes on the pilot's aircraft. Formal distinctions made allowances for less than ideal conditions such as the controller not seeing the aircraft or rules of engagement permitting the pilot to drop on relayed coordinates.

Sharing digital images from cockpit to cockpit or ground controller to cockpit changes the tactics. "If I am working close air support, for instance, and I'm looking at a picture on the ground, and talking to a battlefield airman on the ground, it would be nice if he and I were looking at the same picture and he could in effect create this John Madden effect," said Hobbins. He was referring to the NFL commentator and ex-coach's habit of redrawing football plays over an image of the field with a yellow electronic grease pencil to explain what went right or wrong.

USAF photo by MSgt. Keith Reed

Communications technicians, such as SSgt. Karen Riley and SrA. Jaime Pagan (shown in Iraq), are key to ensuring the new network way of war. Keeping the network running and secure is vital.

Hobbins gave an example from a recently completed phase of Joint Expeditionary Force Experiment 2004. He and Jumper were at Nellis AFB, Nev., standing in a parking lot surrounded by cars, while "15 miles away we had an A-10 with a LANTIRN pod looking at us." The A-10's job was to spot the two generals.

"You can see the parking lot, you can see the sea of cars, but can you see where we are? By both of us looking at the same picture, you could in fact talk the A-10 pilot's sensor to where we needed to talk him to, without creating a lengthy explanation," Hobbins said. That degree of refinement could open up a whole new realm of targeting, vastly different even from the OIF experience of targeting by numbered subcomponents of a kill box grid.

Synchronicity

Sharing a real-time picture synchronizes controller and pilot, but in other cases, knowing how fresh the information is can be essential to the mission, even in a world of near-instantaneous transmission. Take the key issue of the rate at which information is updated. What looks like a common operating picture from the command center may mask a time lag. If the command center's snapshot is even a few minutes out of date, friendly forces may have moved into areas that look clear.

Hobbins singled out blue force tracking as an example. "If you look at blue force tracking, you've got to worry about the latency effect there," he said. "Seven minutes from the time I hit one target to the time I get an update on it might be good enough in some situations, but if I'm about ready to attack a target, that's clearly unacceptable. I need something more in the seconds range," he said.

The ultimate prize is a tactical blending across the whole joint force. Take, for example, the task of rapid targeting. "Say we have a time-sensitive target that's been nominated," said Hobbins, "and we want to know, given the information that's put out [on the net], who can attack that target in what period of time." Hobbins foresees a time when all joint force components in the battlespace are linked on a network where they share positional and tracking information in real time. Sharing information allows the components to come online and say, "I can kill that target in five minutes. Or the Air Force might come along and say 'I could kill that target in 17 seconds' because I just happen to know, real time, that I have an asset airborne with the right weapon over the target in a very short period of time that can kill that target."

Correspondingly, the command center might review the kill op-

The F-35 Joint Strike Fighter, like the F/A-22, will come to the force ready to contribute to the new airborne network, serving as a strike platform and providing great amounts of battlespace data.

tions and make a decision to wait on the strike, holding off until a platform with a lower collateral damage weapon is available, for example.

The point is that the shared, assured network erases the old battlefield buffers and control measures. No longer is it necessary to draw lines and fix operating areas to assign responsibility and deconflict fires. In return, the joint force commander gets maximum effect from the force. Analysis, action, and assessment feed back into the network, updating the battlespace awareness of all players, from soldier to pilot to component commander and streamlining the efficiency of execution.

Too Much Information?

When does a "wealth of information" become an "overload"?

Some philosophies espouse "power to the edge," defined as the place where an organization interacts with its operating environment. Peer-to-peer interaction is one example. In air combat, that might mean the four F/A-22 pilots in a data-linked flight, for example.

Vice Adm. Thomas R. Wilson, a retired director of the Defense Intelligence Agency, sounded a warning to *Jane's Defence Weekly* in 2002. Wilson's view was "power to the edge—I think that is fine, ... but it better have a system of analysts in it to interpret all the data that is available and turn that into value-added information and into what I would call intelligence."

In the cockpit, keeping the focus on value-added information, not a data glut, is even more critical.

Hobbins expressed it this way: "We have to reduce the amount of information that we force on the warrior at the end of the information chain. Having been a fighter pilot, I can tell you that load of information that comes in when you're surrounded by a bunch of sensors in the cockpit needs to be put together in such a manner that I can make an informed decision." The best way to deliver "combat information," as Hobbins termed it, is to deliver to the pilot a sensor picture of what the pilot needs to do. An image is ideal, and that is exactly what the fused cockpit sensors of the upcoming F/A-22 and JSF will do.

Not all of the benefits go to the aircrews. Those in the CAOC are already applying the advantages of networking to uniquely operational-level problems of air warfare. Networking collaboration has already helped with operational-level concerns such as predicting when weather patterns will alter battlespace conditions. "We have gotten better at being able to depict where weather will impact our sensors said Hobbins, adding that it is now possible to "reschedule sensors"to avoid weather conflicts for the particular sensor in use.

The gold standard is instantly updated combat information—where a network of archived information blends with instant blue and red force positions, instant bomb damage assessment, and rapid resource allocation.

In the revolution ahead, it is important to remember that the drive of tactical requirements—gleaned from tests, experiments, and, most of all, from wartime experience—will spur technological development. New tactics and new technologies meet on a two-way street. For example, one of the early purposes of the F/A-22 intra-flight data link was to improve the percentage of pilots making air-to-air kills. That tactical impulse spurred technology development that is now driving multiple tactical uses far beyond the original scope.

Most of the promising technological developments can be traced to tactical requirements. Nothing shows this better than the JEFX series. "From JEFX, we've pushed a lot of things to the warfighter because they were things that he said he needed," Hobbins said. "From 1998 to present, 32 of 78 initiatives that we tried [at a JEFX], we've actually put in the field."

With data links still being fielded and Internet protocols wide open to debate, much remains to be done before the future architectures become familiar tactical tools. But the Air Force is on the right path. "I'm really optimistic about where we're going," said Hobbins. "I do believe that technology will get us to where we want to go, which I believe is the self-forming, self-healing global information grid in the long term. Quite frankly, you could look out to the 2020 time frame and say hopefully we'll be there by then, and I believe technology will move us even faster, and we'll have great elements of this airborne network by the 2014 time frame." ■

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No pilot had ever survived an OV-10 ditching, but unless Steve Bennett tried it, his backseater would have no chance.

Impossible Odds in

By John T. Correll

In the spring of 1972, the North Vietnamese made a radical change in strategy. After years of insurgency-style warfare, they decided to try for a knockout blow against South Vietnam with a conventional military attack on a massive scale.

The "Easter Offensive," as it was called, began March 30. Some 125,000 troops and hundreds of tanks invaded South Vietnam on three fronts.

One fork of the attack came directly across the Demilitarized Zone into Quang Tri Province. The other two thrusts of the offensive—from Laos against the Central Highlands and out of Cambodia into the area northwest of Saigon—sought to cut South Vietnam in two.

The invasion force was well-equipped. Over the preceding year, the Soviet Union and China had been shipping to North Vietnam large numbers of tanks, long-range artillery, and other weapons. Among the new items was the heat-seeking, shoulder-fired SA-7 Strela antiaircraft missile, which was enormously effective against low-flying aircraft.

The Easter Offensive was planned by North Vietnam's top military leader, Gen. Vo Nguyen Giap, who believed that the South Vietnamese forces would be too weak to hold and that the political situation back home would limit the US response.

"Vietnamization," the process of turning the war over to South Vietnam, had begun in 1969. Eighty percent of the US forces were gone. The Vietnamese Air Force was flying 70 percent of the air combat operations.

Initially, the South Vietnamese were swept back by the onslaught. In-theater air forces gave them as much support as they could. Soon, other USAF units redeployed to Southeast Asia. Giap had more trouble than he had expected from Air Force and Navy fighters and B-52 bombers. The United States also resumed the bombing of North Vietnam, halted four years previously.

Nevertheless, Quang Tri City, the provincial capital, fell May 1, and Giap turned his attention toward Hue, the ancient imperial capital of Vietnam, 30 miles farther south.

Wherever the invasion force went, it was accompanied by mobile air defenses—23 mm and 37 mm antiaircraft guns mounted on rubber-tired trailers—as well as the SA-7s.

In the course of resisting the invasion, the US Air Force by June had lost 77 aircraft, including 34 F-4 fighters. The North Vietnamese were beginning to withdraw from some positions, but they still held most of the area immediately south of the DMZ.

On June 28, South Vietnamese ground forces, under an aggressive new commander, launched a coun-

Capt. Steven Bennett volunteered for forward air control duty in Vietnam, piloting an OV-10 Bronco. For his valor on June 29, 1972, he posthumously was awarded the Medal of Honor.

Background photo by Paul Kennedy


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SAM-7 Alley

Photo via Angela Bennett

Wife Linda pins pilot wings on Bennett after his graduation from undergraduate pilot training at Webb AFB, Tex. Years later, facilities and even a ship would be named in Bennett's honor.

terattack to retake Quang Tri City and keep the enemy out of Hue.

Two From Texas

The counterattack on Quang Tri was supported by US Air Force and Navy fighters and by Navy warships in the Tonkin Gulf. The firepower of these aircraft and ships was directed by forward air controllers (FAC) from the 20th Tactical Air Support Squadron, flying single-engine O-2s and twin-engine OV-10s from Da Nang.

On June 29, the second day of the counteroffensive, an OV-10 flown by Air Force Capt. Steven L. Bennett had been working through the afternoon in the area south and east of Quang Tri City.

Bennett, 26, was born in Texas but grew up in Lafayette, La. He was commissioned via ROTC in 1968 at the University of Southwestern Louisiana. After pilot training, he had flown B-52s as a copilot at Fairchild AFB, Wash. He also had pulled five months of temporary duty in B-52s at U Tapao in Thailand. After that, he volunteered for a combat tour in OV-10s and had arrived at Da Nang in April 1972.

Bennett's partner in the backseat of the OV-10 on June 29 was Capt. Michael B. Brown, a Marine Corps airborne artillery observer and also a Texan. Brown, a company commander stationed in Hawaii, had volunteered for a 90-day tour in Vietnam spotting for naval gunners from the backseat of an OV-10. Air Force FACs were not trained in directing the fire of naval guns.

The two had flown together several times before on artillery adjustment missions. They had separate call signs. Bennett's was "Covey 87." Brown was "Wolfman 45."

They took off from Da Nang at about 3 p.m. During the time they were airborne, Brown had been directing fire from the destroyer USS *R.B. Anderson* and the cruiser USS *Newport News,* which were about a mile offshore in the Tonkin Gulf. Bennett and Brown had also worked two close air support strikes by Navy fighters.

It was almost time to return to base, but their relief was late taking off from Da Nang, so Bennett and Brown stayed a little longer.

The area in which they were flying that afternoon had been fought over many times before. French military forces, who took heavy casualties here in the 1950s, called the stretch of Route 1 between Quang Tri and Hue the "Street Without Joy." US airmen called it "SAM-7 Alley."

SA-7s were thick on the ground there, and they had taken a deadly toll on low-flying airplanes. The SA-7 could be carried by one man. It was similar to the US Redeye. It was fired from the shoulder like a bazooka, and its warhead homed on any source of heat, such as an aircraft engine.

Pilots could outrun or outmaneuver the SA-7—if they saw it in time. At low altitudes, that was seldom possible.

"Before the SA-7, the FACs mostly flew at 1,500 to 4,500 feet," said William J. Begert, who, in 1972, was a captain and an O-2 pilot at Da Nang. "After the SA-7, it was 9,500 feet minimum. You could sneak an O-2 down to 6,500, but not an OV-10, because the bigger engines on OV-10 generated more heat."

The FACs sometimes carried flares on their wings and could fire them as decoys when they saw a SA-7 launch. "The problem was reaction time," Begert said. "You seldom got the flare off before the missile had passed."

A SAM From Behind

About 6 p.m., Bennett and Brown got an emergency call from "Harmony X-ray," a US Marine Corps ground artillery spotter with a platoon of South Vietnamese marines a few miles east of Quang Tri City.

The platoon consisted of about two dozen troops. They were at the fork of a creek, with several hundred North Vietnamese Army regulars advancing toward them. The NVA force was supported by big 130 mm guns, firing from 12 miles to the north at Dong Ha, as well as by smaller artillery closer by.

Without help, the South Vietnamese marines would soon be overrun.

Bennett called for tactical air support, but no fighters were available. The guns from *Anderson* and *Newport News* were not a solution, either.

"The ships were about a mile offshore, and the friendlies were between the bad guys and the ships," Brown said. "Naval gunfire shoots flat, and it has a long spread on impact. There was about a 50-50 chance they'd hit the friendlies."

Bennett decided to attack with the OV-10's four 7.62 mm guns. That meant he would have to descend from a relatively safe altitude and put his aircraft within range of SA-7s and small-arms fire. Because of the risk, Bennett was required to call for permission first. He did and got approval to go ahead.

Apart from its employment as a FAC aircraft, the OV-10 was rated for a light ground attack role. Its machine guns were loaded with 500 rounds each. The guns were mounted in the aircraft's sponsons, stubby

wings that stuck out like a seal's flippers from the lower fuselage.

Bennett put the OV-10 into a power dive. The NVA force had been gathering in the trees along the creek bank. As Bennett roared by, the fire from his guns scattered the enemy concentration.

After four strafing passes, the NVA began to retreat, leaving many dead and wounded behind. The OV-10 had taken a few hits in the fuselage from small-arms fire but nothing serious. Bennett decided to continue the attack to keep the NVA from regrouping and to allow the South Vietnamese to move to a more tenable position.

Bennett swept along the creek for a fifth time and pulled out to the northeast. He was at 2,000 feet, banking to turn left, when the SA-7 hit from behind. Neither Bennett nor Brown saw it.

The missile hit the left engine and exploded. The aircraft reeled from the impact. Shrapnel tore holes in the canopy. Much of the left engine was gone. The left landing gear was hanging down like a lame leg, and they were afire.

Bennett needed to jettison the reserve fuel tank and the remaining smoke rockets as soon as he could, but there were South Vietnamese troops everywhere below. He headed for the Tonkin Gulf, hoping to get there and drop the stores before the fire reached the fuel.

As they went, Brown radioed their Mayday to declare the emergency.

An Air Force OV-10 pilot fires a smoke marking rocket at a target in Vietnam in 1969. The Bronco pilot's primary task was to serve as a FAC, but the aircraft also had light ground attack capability.

Over the Gulf, Bennett safely dropped the fuel tank and rocket pods.

The OV-10 was still flyable on one engine, although it could not gain altitude. They turned south, flying at 600 feet. Unless Bennett could reach a friendly airfield for an emergency landing, he and Brown would have to either eject or ditch the airplane in the Gulf of Tonkin.

Every OV-10 pilot knew the danger of ditching. The aircraft had superb visibility because of the "greenhouse"-style expanses of plexiglass canopy in front and on the sides, but that came at the cost of structural strength. It was common knowledge, often discussed in the squadron, that no pilot had ever survived an OV-10 ditching. The cockpit always broke up on impact.

Another OV-10 pilot, escorting Bennett's aircraft, warned him to eject as the wing was in danger of exploding.

No Other Way

They began preparations to eject. As they did, Brown looked over his shoulder at the spot where his parachute should have been. "What I saw was a hole, about a foot square, from the rocket blast and bits of my parachute shredded up and down the cargo bay," Brown said. "I told Steve I couldn't jump."

Bennett would not eject alone. That would have left Brown in an airplane without a pilot. Besides, the backseater had to eject first. If not, he would be burned severely by the rocket motors on the pilot's ejection seat as it went out.

Momentarily, there was hope. The fire subsided. Da Nang—the nearest runway that could be foamed down—was only 25 minutes away and they had the fuel to get there. Then, just north of Hue, the fire fanned up again and started to spread. The aircraft was dangerously close to exploding.

They couldn't make it to Da Nang. Bennett couldn't eject without killing Brown. That left only one choice: to crash-land in the sea.

Bennett faced a decision, Lt. Col.

A North Vietnamese soldier shoulders an SA-7 portable surface-to-air missile. On a stretch of Route 1 between Quang Tri and Hue, SAMs were so thick that US airmen called it "SAM-7 Alley."

Photo by Bryan Aleksich via Warren Thompson

An OV-10 sits in its revetment in South Vietnam. The superb visibility provided by the huge canopy came at a price: a reduction in structural strength. Every Bronco pilot knew no one had ever ditched in the water and survived.

Gabriel A. Kardong, 20th TASS commander, later wrote in recommending Bennett for the Medal of Honor. "He knew that if he saved his own life by ejecting from his aircraft, Captain Brown would face certain death," said Kardong. "On the other hand, he realized that if he ditched the aircraft, his odds for survival were slim, due to the characteristics of the aircraft, but Captain Brown could survive. Captain Bennett made the decision to ditch and thereby made the ultimate sacrifice."

He decided to ditch about a mile off a strip of sand called "Wunder Beach." Upon touchdown, the dangling landing gear dug in hard.

"When the aircraft struck water, the damaged and extended left landing gear caused the aircraft to swerve left and flip wing over wing and come to rest in a nose down and inverted position, almost totally submerged," Brown said in a statement attached to the Medal of Honor recommendation.

"After a struggle with my harnesses, I managed to escape to the surface where I took a few deep breaths of air and attempted to dive below the surface in search of the pilot who had not surfaced. Exhaustion and ingestion of fuel and water prevented me from descending below water more than a few feet. I was shortly rescued by an orbiting naval helicopter and taken to the USS *Tripoli* for treatment."

Of Bennett, Brown said, "His personal disregard for his own life surely saved mine when he elected not to eject ... and save himself in order that I might survive."

Bennett's body was recovered the next day. The front cockpit had broken up on impact with the water, and it had been impossible for him to get out. He was taken home to Lafayette, where he is buried.

North Vietnam's Easter Offensive, battered by airpower, stalled. The South Vietnamese retook Quang Tri City on Sept. 16, 1972. The invasion having failed, Giap was forced to withdraw on all three fronts. It was a costly excursion for North Vietnam, with 100,000 or more of its troops killed and at least half of its tanks and large-caliber artillery pieces having been lost.

South Vietnam continued to exist—for a while.

Medal of Honor

The Medal of Honor was awarded posthumously to Steven L. Bennett on Aug. 8, 1974. It was presented in Washington to his wife, Linda, and their daughter Angela, two-and-a-half years old, by Vice President Gerald R. Ford in the name of Congress. (Ford made the presentation because President Nixon announced his resignation that day. Ford was sworn in as President the next day, Aug. 9, 1974.)

The citation accompanying the Medal of Honor recognized "Captain Bennett's unparalleled concern

On Aug. 8, 1974, Vice President Ford presented the Medal of Honor to Bennett's wife, Linda, and young daughter, Angela. Ford was sworn in the next day as President.

for his companion, extraordinary heroism, and intrepidity above and beyond the call of duty, at the cost of his life."

Since then, there have been other honors. Navy Sealift Command named a ship MV *Steven L. Bennett*. Palestine, Tex., where Bennett was born, dedicated the city athletic center to him. Among other facilities named for or dedicated to Bennett were the ROTC building at the University of Southwestern Louisiana, the gymnasium at Kelly AFB, Tex., and a cafeteria at Webb AFB, Tex.

In 1987, the *Dallas Morning News* published an article about Bennett, and Mike Brown—then living near Dallas—saw it. He called the newspaper, which put him in touch with Linda Bennett, who was then living in Fort Worth. Brown made contact with Linda and Angela, who was then a high school student, and has been a friend of the family ever since.

As she grew older, Angela learned more details about her father.

"He was known as the 'Ox' in high school for his abilities as a football player," she said. "He was short and stocky, but good luck knocking him over!"

His build did not fit well with the Air Force's height and weight charts. "He was so stocky that the doctors used to apologize to him when they told him he had to lose weight due to regulations," Angela said. "My mother said there were many times when he ate lettuce leaves, and that was it."

Bennett was still on his initial tour of active duty when he died, but he probably would have stayed in the Air Force for a career. "According to my mother, daddy would have been a lifer," Angela said. "He would have stayed in as long as they let him fly."

Angela and Jake

In the 1990s, Angela Bennett—then in her mid-20s, married, and mother of a two-year-old son—decided to seek out people who could help her know her father better.

"I found tons of people," she said. "I found all but three of his Webb Air Force Base pilot training class, to the point that I was able to get them in touch with each other and they decided to have a reunion. ...

OV-10 Bronco Association members surround Bennett's daughter, Angela, and her son, Jake. Among members shown are Bennett's backseater, Mike Brown (third from left), and Tom Kemp, AFA Secretary (back, third from right).

Then I found 10 or so of his buddies from Da Nang. I found maybe five classmates from his high school and even one teacher. ... I'd say it got pretty close to 100 people by the time I was done."

Mostly, they remembered Bennett as a man they were proud to have known. "Daddy was described to me as being someone who would have died helping an old lady cross the road if he would have survived Vietnam," Angela said.

Small things also made an impression. "They all remember that he had a cowlick on his forehead that just drove him nuts," Angela said. "Little things like that are what I have been told. The stories I have heard make him more real to me."

Angela Bennett found Jim Carlton, who was commander of the OV-10s in the 20th Tactical Air Support Squadron and who helped write the Medal of Honor recommendation for her father. She also met Begert, the O-2 pilot from Da Nang, who, along with Bennett, was part of a group that played bridge almost every night. Begert (who recently retired as the four-star commander of Pacific Air Forces) was with Angela at the Navy ceremony naming the MV *Steven L. Bennett*.

Angela Bennett is a life member of the OV-10 Bronco Association and attends the Bronco Fests that are held each year. She often sees Brown, who lives in Richardson, Tex., about 20 minutes away from her home in Lewisville. Brown has attended many of the dedications with her and is a member of the OV-10 Bronco Association. "He has become a wonderful friend and someone whom I feel close to even if we don't talk all the time," she said.

"Every year on 29 June, I find a quiet place and thank Steve for his sacrifice and say a prayer for him," Brown said recently.

Angela's son, Jake, now 10 years old, also goes to the Bronco Fests and other events. "Jake is very interested and loves planes and air shows," she said. "He likes to hear about my dad. ... He attends as many of the dedications as he can. ... He fully understands this is a legacy he will need to honor and carry on for as long as people will listen."

All that she has learned has given Angela Bennett a definite perspective on the loss of her father and how she remembers him.

"Many who lost family members in the war are bitter or resentful," she said. "While I would love nothing more than to have had my father all those years, I am not bitter because I know he died doing what he believed in and what he felt was necessary for others. ... He was a wonderful man, and I am proud to be his daughter." ■

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

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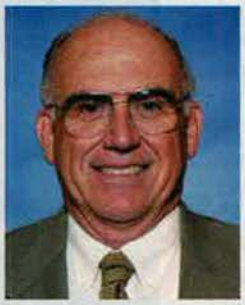

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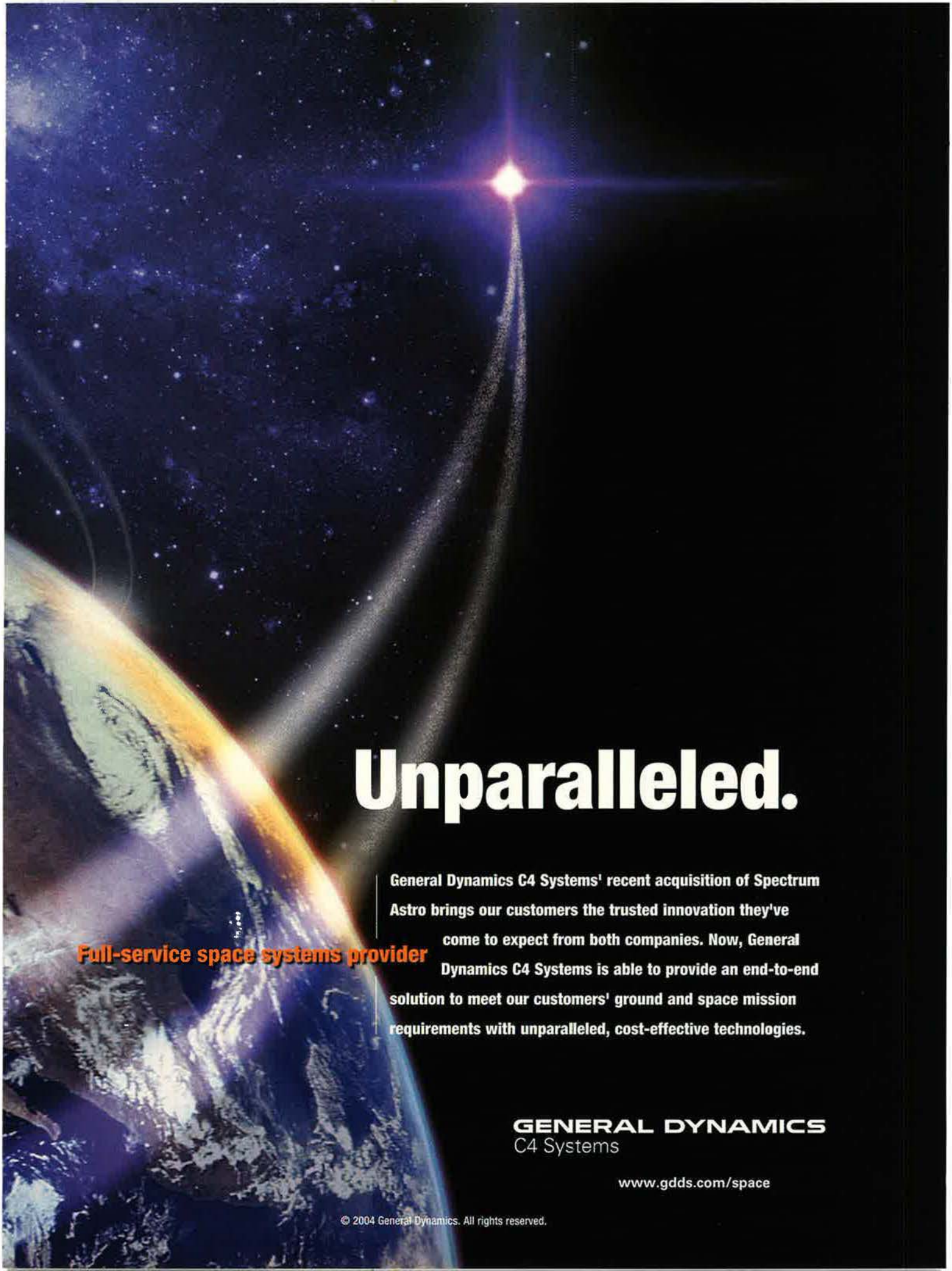
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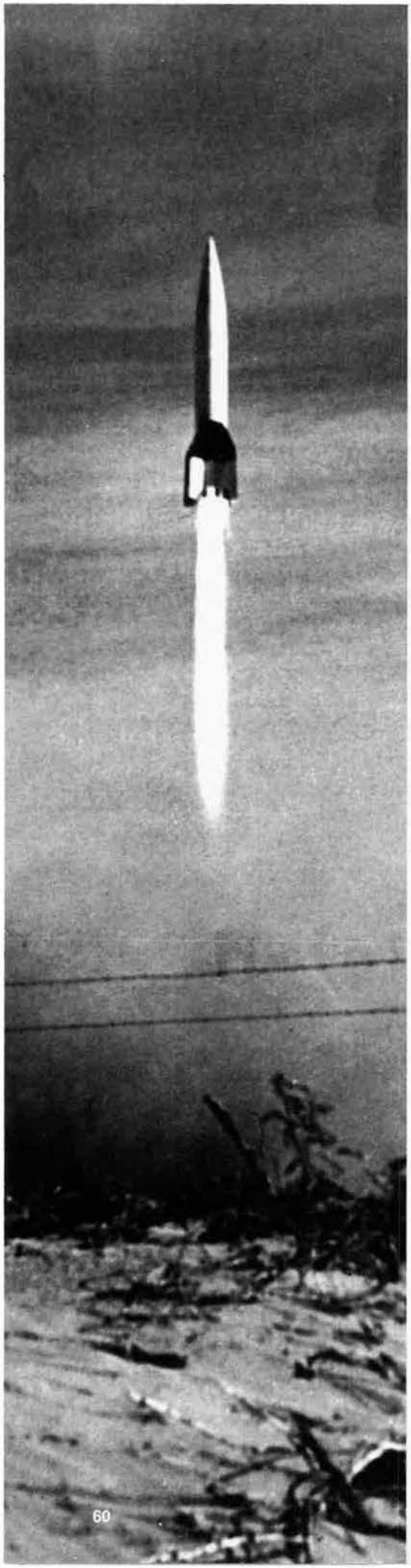
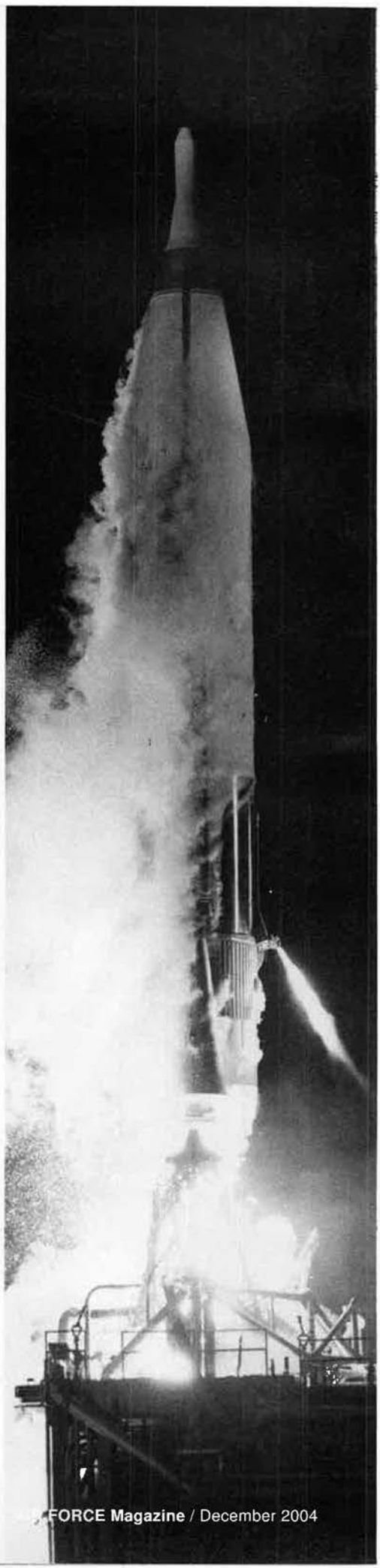


Air Force control of the mission has never been—and is not today—totally secure.

A Short History of Military Space

By Benjamin S. Lambeth



At left, a V-2 is launched from White Sands Missile Range, N.M. At right, an early Atlas missile lifts off from the USAF Missile Test Center, Patrick AFB, Fla. Far right, a Titan IV with an inertial upper stage is launched from Cape Canaveral AFS, Fla.

LeMay, shown at left as vice chief of staff, with Air Force Secretary James Douglas and Gens. Thomas White and Nathan Twining, pushed for AAF then USAF to lead satellite development as a matter of "strategic aviation."

on improving its aircraft forces. The slump lasted well into the 1950s.

In the mid-1950s, USAF still lacked an accepted space mission and found itself beset by powerful Army and Navy efforts to dominate the medium. The Naval Research Laboratory, having initiated a satellite effort in 1945, was managing the civilian Vanguard satellite program. The Army Ballistic Missile Agency in Huntsville, Ala., was insisting that the Army possessed the greatest wherewithal for pursuing military space applications. Army officials claimed space was merely "the high ground," the taking of which was a traditional Army mission.

Army, Navy Successes

Three months after the successful launching of Sputnik in October 1957, the Army's Explorer 1 became the first US satellite to achieve orbit. That and the Navy's subsequent success with Vanguard gave those services operational and bureaucratic advantages in the space arena.

At Congressional hearings, each service was given an opportunity to state its case. So were the Department of Defense, National Advisory Committee for Aeronautics, and Atomic Energy Commission. Each sought to persuade the Eisenhower Administration and Congress of its special claim to the space mission.

At the end of 1958, USAF decided to launch a full-court press for control of military space. Gen. Bernard A. Schriever played a pivotal role by arguing that the Air Force's near monopoly in managing and operating the nation's military space systems demonstrated that it should acquire even greater responsibilities.

Ultimately, thanks in large part to Schriever's determined effort, the Air Force emerged from the post-Sputnik interservice struggle over space with the lion's share of the mission. Soon, Congress increased the Air Force's space funding by a factor of 120, from $2.2 million to $249.7 million.

With the advent of the Kennedy Administration in 1961, the Air Force reached another important milestone.

Presidential science advisor Jerome B. Wiesner issued a new report that assailed the Pentagon's "fractionated military space program" and called for a single manager of DOD's diverse systems and activities. Wiesner maintained that the Air Force was the logical choice to do so, given that it was already providing 90 percent of the space-related resources and support for the other services and defense agencies.

Two months later, President Kennedy approved a Pentagon directive giving the Air Force responsibility for the bulk of the space effort. USAF became the lead space service and, as such, the de facto executive agent for military space.

In that directive, Secretary of Defense Robert S. McNamara formally designated the Air Force as the military service for space R&D, mandating that any exceptions to that rule had to be authorized by him personally. That directive largely foreclosed service wrangling over space in the Kennedy years.

In the meantime, the highly classified Corona satellite reconnaissance program was finally hitting pay dirt after failing 14 straight times. On Aug. 18, 1960, a Corona satellite snapped the world's first image of Soviet territory from space. On Aug. 19, USAF Capt. Harold E. Mitchell, flying a modified C-119J, used two trailing wire hooks to snag a descending Corona capsule over the Pacific.

Gen. Thomas White (left), USAF Chief of Staff (1957-61), said in 1958 that space was a continuation of the vertical dimension, meaning it was Air Force territory. Above, he talks with Lt. Gen. Thomas Power.

THE idea that space is a natural extension of the vertical dimension—and thus an Air Force birthright—has been a part of USAF folklore for so long that most airmen accept it uncritically. Nothing, however, could be further from the truth.

Even a cursory review of Air Force involvement in space shows that the service has been engaged in a continuous struggle with the other branches and various political interests for control of military space.

Today's Air Force planners would do well to recall the history of that struggle. It is a cautionary tale, one that shows the folly of presuming that space should somehow be viewed as a natural Air Force inheritance, never to be challenged again.

The first post-World War II manifestation of interest in military space came not from the US Army Air Forces (AAF), as one might have expected, but from the Navy. A group of US naval officers had been conducting a satellite feasibility study, and, in early 1946, they sought to carve out for the Navy a leading role in military satellite development.

Those early postwar years also saw the "green" Army—that is, the nonflying part of the service—seeking a niche in space. Through its Operation Paperclip, the Army brought some 130 German rocket scientists to White Sands, N.M., along with some 100 V-2 rockets and reams of technical data from the German missile and launch facility at Peenemunde. Before long, Army spokesmen began characterizing rockets as a natural extension of artillery.

In reaction, AAF leaders moved with dispatch to challenge the space pretensions of the other services.

LeMay's View

For one thing, AAF's deputy chief of staff for research and development, then-Maj. Gen. Curtis E. LeMay, declined the Navy's request for the AAF to participate in its satellite initiative. Moreover, LeMay insisted that satellite development should be handed over to the Army Air Forces, on the grounds that satellites represented an extension of strategic airpower.

LeMay turned to AAF's newly established Project RAND. He wanted to tap RAND's then-unmatched scientific and engineering talent for a crash inquiry into the prospects of orbiting an Earth satellite. Within three weeks, RAND had produced its now-famous study of a "world-circling spaceship." That study eventually became widely recognized as the world's first comprehensive satellite feasibility assessment.

Armed with the RAND report, LeMay argued strenuously for AAF's primacy in satellite research and development and sought control over any future US military effort to develop a satellite. He claimed that any such satellite was "a matter of strategic aviation," the AAF's "natural responsibility."

Once the Air Force gained independence from the Army in 1947, its leading generals pressed harder to be assigned control of any future military satellite and missile development.

Even so, the new armed service was at first hesitant to actually undertake the development of missiles and satellites for strategic use. Interest in satellites, rockets, and space launch capabilities was overshadowed by the service's commitment to heavy bombers and "air-breathing," nonballistic missiles.

The Air Force followed the recommendations of its new Scientific Advisory Board and focused almost exclusively on the development of intra-atmospheric aircraft and jet propulsion systems that promised great near-term combat potential.

In 1950, however, the Truman Administration, in a key decision, gave the Air Force formal responsibility for developing long-range strategic missiles and short-range theater missiles. Using that decision, USAF outmaneuvered the Army, which wanted to extend the range of its Redstone missile beyond 200 miles.

Thereafter, development of land-based strategic missiles would be an exclusive Air Force preserve.

Air Force satellite and ballistic missile programs faced practical problems, however. Some continued to harbor doubts about their military value. An economic downturn brought austerity to the defense program.

Forced to choose between manned aircraft or missiles and satellites, the Air Force elected to concentrate

Some pressed to have the Corona program, the U-2 spyplane program, and the Satellite and Missile Observation System (SAMOS) handed over to a civilian defense agency. Instead, the Air Force's Office of Missile and Satellite Systems was redesignated the National Reconnaissance Office and was headed by the undersecretary of the Air Force.

Thanks to that move, the Air Force was able to retain at least nominal ownership of Corona, although its assignment to the civilian Air Force secretariat and the subordination of its tasking to the Director of Central Intelligence effectively cut the uniformed Air Force out of Corona's day-to-day affairs.

Gen. Bernard Schriever in 1958 said that USAF, as the largest stakeholder in space systems and operations, should get even greater responsibilities. His efforts energized lawmakers to grant USAF additional space funding.

Operational Space

For the first decade or so of military space, those who created space systems were devoted principally to the mission of nuclear deterrence. That was to change dramatically. It became clear by the mid-1970s that fielded military space assets offered great potential to the conventional warfighting community.

The first glimmer of an effort to bring space into the mainstream came in the mid-1960s, when then-Col. Robert T. Marsh suggested that a space directorate be established within the Air Staff. Marsh also saw a need for a separate space directorate within Air Force Systems Command (AFSC). He briefed these suggestions in 1965 to the Air Force's Chief of Staff, Gen. John P. McConnell, who quickly approved them.

For the most part, however, the Air Force's assorted space activities remained more a focus of R&D and acquisition activity than a day-to-day concern of Air Force operators. USAF showed little interest in space operations as a core institutional goal.

Then, in 1977, Gen. David C. Jones, Air Force Chief of Staff, issued a major space policy letter portraying development of space weapons and concepts as a key USAF responsibility. Later in Jones' tenure as Chief, the Air Staff prepared a study of future space objectives. It repeated a 1958 statement by then-Chief of Staff Gen. Thomas D. White that space was but a continuation of the vertical dimension.

That study further maintained that the Air Force deserved to manage all US military space activities because it possessed both a rich history of working in space and a near monopoly on space technology expertise.

Even before Jones' move, some had taken key steps toward creation of a separate Air Force Space Command. Its proponents clearly understood air and space to be separate and distinct operating mediums and recognized that the Air Force's space and space-related operational functions warranted an organizational home of their own.

Example: Gen. W.L. "Bill" Creech, commander of Tactical Air Command, freely acknowledged that the Air Force's embryonic F-15-launched antisatellite (ASAT) demonstrator weapon entailed a space-specific mission application that did not properly belong in TAC, even though the ASAT was to be carried by a TAC-operated fighter. Creech was happy to see TAC relieved of that duty.

Rap on Systems Command

Indeed, Creech and Marsh (by then, the four-star commander of AFSC) were working to convince fellow commanders that the time had come to have a dedicated operational command for space to take over from Systems Command. Eventually, all commanders came on board. This included the head of Strategic Air Command, despite SAC's initial concern that a new space command would infringe on its prerogatives regarding space warning systems.

Air Force Systems Command came to be viewed as doing things of an operational nature in space that it had no business doing. Such activity, according to commanders, made no more sense than having Systems Command's Aeronautical Systems Division running Air Force fighter wings or Electronic Systems Division developing concepts of operations for the E-3 Airborne Warning and Control System.

The establishment of Air Force Space Command in 1982 and the unified US Space Command in 1985 was directly traceable to that logic. As Air Force Space Command's first commander, Gen. James V. Hartinger, remarked several years later, "We were looking at space with a different perspective. Space is a place, like the land, the sea, or the air. It's a theater of operations, and it was just a matter of time until we treated it as such."

On Nov. 19, 1983, Air Force Space Command assumed stewardship of the Space Plan, the first Air Force-endorsed concept since the early 1960s. This plan for the first time defined the four now-familiar military space mission areas of space support, force enhancement, space control, and force application. Its genesis was in the continued organizational tension between Systems Command and Space Command on the key question of who had principal responsibility for space.

Gen. David Jones (left), Chief of Staff (1974-78), here with Gen. George Brown, JCS Chairman, issued a major space policy letter in 1977 that set development of space weapons and concepts as a central Air Force mission.

This issue was forced into the open in 1987 when the Secretary of the Air Force, Edward C. Aldridge Jr., released a white paper on space policy and leadership. It noted that the defense establishment believed that USAF "only grudgingly supported space activities." The paper further charged that USAF had failed to "exhibit a sense of institutional purpose or responsibility toward space" and relegated space to a distant fourth priority behind bomber, fighter, and mobility activities.

Other services, sensing weakness, were quick to roll in on the Air Force. Outside challenges to USAF's stewardship of space resurfaced. In a clear bid to exploit USAF vulnerability, the Army and Navy produced independent space "master plans."

The Air Force countered by laying out explicit goals, starting with the declaration of a new policy reasserting USAF's claim to be "lead" service for space, while conceding that this did not imply an "exclusive" Air Force role.

That task was taken up in the single most important USAF space document to date—the report of the so-called Blue Ribbon Panel on Space Roles and Missions, commissioned in 1988 by the Chief of Staff, Gen. Larry D. Welch.

Welch wanted the panel to address the full spectrum of military space concerns. The panel was aware that the service for 30 years had been at the forefront of military space activity and provided three-fourths of the Pentagon's space budget. Still, the panel zeroed in hard on the Air Force's alleged ambivalence toward the space mission. It concluded that the Air Force leadership's declared commitment to the space mission was in no way universally shared by rank and file members.

In its final report, the Blue Ribbon Panel called for the Air Force to have the principal but not exclusive role as the DOD agent for military space. It also advocated a deliberate USAF pursuit of capabilities for performing warfighting functions in and from space. It recommended that Air Force Space Command continue to be the central advocate, operator, and manager for military space support (launch and operation of satellites) and that US Space Command return to Air Force Space Command peacetime control of Air Force space assets.

In February 1989, the Air Staff issued an implementation plan, stating that "the Air Force is and will be responsible for the global employment of military power above the Earth's surface." It directed Air Force Space Command to develop a space roadmap to update the Space Plan by integrating all Air Force space activities and tying the latter to warfighter needs, national strategy, and the four specified mission areas of space support, force enhancement, space control, and force application.

Equal to Airpower

The plan further anticipated that "space power" would eventually become as important as airpower in future warfare and declared that the Air Force must accordingly orient its thinking and activities toward preparing "for the evolution of space power from combat support to the full spectrum of military capabilities."

In October 1990, Systems Command finally turned over its launch centers, ranges, bases, and Delta II and Atlas E launch missions, with provision for the remaining Atlas II, Titan II, and Titan IV missions to be handed over in due course.

The struggle wasn't over, however. In January 2001, the Congressionally mandated Space Commission recommended some major organizational realignments of the military space program. In May 2001, Secretary of Defense Donald H. Rumsfeld designated the Air Force to be the DOD executive agent for space.

However, the commission's work raised the issue of—and perhaps laid the groundwork for—creation of a separate "Space Corps" within the Air Force and possibly an independent space service in the not-too-distant future.

At the moment, the commission reported, "the disadvantages ... outweigh the advantages."

Still, the panel members said they could foresee the day when the commander of Air Force Space Command becomes head of Space Corps and would "join the deliberations of the Joint Chiefs of Staff when space-related issues are on the agenda." They also saw the prospect of a Space Department "if future conditions support that step more quickly than appears likely from the commission's vantage point today." ■

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USAF photos by SSgt. Stacy Pearsall

In Iraq, a new type of expeditionary medic provides care around the clock.

AFTERM*A*S*H

The EMEDS concept is based on four-person teams that deploy rapidly to in-patient field hospitals, like the one shown above and right at Baghdad Airport.

By Bruce D. Callander

WHEN the UN's Baghdad offices were car bombed in August 2003, a quick-reacting Air Force medical group was among the first to reach the scene. The gruesome attack claimed the lives of 22 persons, but USAF surgeons and staff saved many others. Such feats have taken place numerous times in violence-wracked Iraq.

This was the product of a new type of medical concept called EMEDS, for Expeditionary Medical Support. Unlike the acronym MASH (Mobile Army Surgical Hospital), the term EMEDS may not ever make it to the silver screen, but it is becoming as well-known to today's forces as MASH units were to Korean War troops.

As of last April, say Air Force officials, USAF's expeditionary medics have treated more than 171,000 casualties, comprising those injured in combat and those suffering from noncombat injuries and disease. There are EMEDS operating in Iraq and 11 other countries.

EMEDS is a concept by which the Air Force Medical Service provides health care to US forces in a deployed environment. It is a building-block approach and is modular in nature.

"That allows you to plug and play different elements as necessary, depending on the health care requirements at a given location," said Capt. Michael Bruhn, chief of ground medical unit type code management at Air Combat Command, Langley AFB, Va.

The EMEDS program is managed largely from the ACC command surgeon's office, which is responsible for all of the Air Force's ground-deployable medical assets.

High Marks

In Congressional testimony, Lt. Gen. George P. Taylor Jr., Air Force surgeon general, gave the EMEDS units high marks for their work in Afghanistan and Iraq. Taylor credited lessons learned in Afghanistan with proving the modular approach. By the time of the war in Iraq, the six-year-long conversion of the Air Force's "large footprint" field medical facilities into small, rapidly

deployable EMEDS units was complete.

Said Taylor, "Our performance in Iraq validates [the claim] that the EMEDS concept works. It saves lives."

The EMEDS approach began to emerge after Operation Desert Storm in 1991. In that war, Air Force officials discerned a need to get medical services closer to the combat zone than had been possible at that time.

In those days, explained Bruhn, the Air Force standard medical configuration was the 25-bed air transportable hospital, which was a far more elaborate setup. It confronted Air Force medical officials with many problems.

Moving that hospital required the loading of about 55 pallets and sustained use of three C-17 transports. By contrast, EMEDS can be loaded on only 25 pallets and transported for the most part on a single C-17 aircraft.

USAF photo by Amn. Alexis Lloyd

A mobile field surgical team operates on a patient in Southwest Asia. A five-member MFST carries medical supplies and equipment sufficient for 10 surgeries.

USAF photo by SSgt. Stacy Pearsall

USAF medics in Iraq respond to a simulated mortar attack. As US and allied troops battle insurgents, EMEDS teams in Southwest Asia practice for a variety of emergencies.

"Before, we had an extremely large footprint and would go in with an extremely heavy capability," said Bruhn. In the interim, he noted, "we created a lighter, leaner yet more efficient deployable medical capability."

Airlift requirements are critical because of the many demands on this capability. To get space on a transport, medical equipment and personnel must compete with combat troops.

Logistics wasn't the only problem that the old concept generated for the Air Force. It was also inflexible. USAF could not take anything less than a full facility to the front.

"The air transportable hospital was not tailorable," said Bruhn. "It could not be modularized, as the EMEDS is now. ... That made it difficult to get to the warfighter."

He said that the EMEDS construct has different scaleable modules.

First Responders

The first two EMEDS "building blocks" are the preventive aerospace medical (PAM) teams and mobile field surgical teams (MFSTs). According to Taylor, the PAM teams are "first-in, last-out" medics, who "are inserted with the very first troops and are capable of providing health care, on location, before the first tent stake is in the ground."

A PAM team can include an aerospace medicine physician, bioenvironmental engineer, public health officer, and an independent duty medical technician. The team's primary role, said Bruhn, is to work "preventive medicine issues, from occupational health to water sampling to food sources to disease factors." The physician and technician also provide primary and emergency medical care.

Following closely behind a PAM team is an MFST with five team members, each carrying a 70-pound, specially equipped backpack of medical and surgical equipment. The MFST comprises a general surgeon, orthopedic surgeon, emergency medical physician, an anesthesia provider, and an operating room nurse or technician. These five surgical team members, said Taylor, can perform up to 10 emergency, life-or-limb-saving surgeries with the materials they carry on their backs.

The next module, called EMEDS Basic, adds 17 more personnel, including medical, surgical, and dental. This element brings enough tents and supplies to support four in-patient beds. It would be used to support a small air base.

For a somewhat larger base, USAF can lay in what is called "EMEDS Plus 10." This expands EMEDS Basic and provides additional personnel and another 10 beds to support the air base.

The largest model is EMEDS Plus 25, with additional beds and the medical capabilities that would go with them.

"We lay in the amount of medical capacity necessary to support the population," said Bruhn. "That is totally different from what we used previously, when we had one big hospital that would go for everything."

The EMEDS concept has helped the Air Force to not only shrink deployed hospital facilities but also slim down and smooth out the vital records-keeping function. Storage space that once required several large filing cabinets now is provided by a single laptop computer.

This is what the Air Force calls GEMS, for Global Expeditionary Medical System. According to Bruhn, GEMS is an electronic patient record system that collects and sorts all kinds of patient information. It is used to track an entire theater's injury scenarios and other medical problems. The data are used for medical surveillance and are fed into a larger Defense Department system.

While EMEDS ground units provide the first-line care, they do not accompany patients on air evacuation missions. Another part of the EMEDS capability—aeromedical evacuation with a different complement of medical personnel—takes over to move the more serious cases to larger facilities. USAF also has updated its medevac system.

USAF photo by SSgt. Stacy Pearsall

The new EMEDS concept features a reduced logistics footprint. As a result, the airlift required to transport this medical facility to Iraq was cut by more than half.

Streamlining Medevac

Taylor said the service has seen a "significant advancement" in the ability to take advantage of so-called "back-haul" aircraft.

Recently developed patient support pallets (PSPs) make it easy to transform any USAF mobility aircraft into an aeromedical evacuation platform. A PSP is a collection of specially packed medical equipment units that can be installed in cargo and transport aircraft within minutes.

USAF has deployed 41 of these special pallets to strategic locations around the world.

Taylor told lawmakers last spring that an Air Force medevac team used one of the PSPs to convert a Greek aircraft "within an hour" into a critical-care transport to take a five-year-old "deathly ill" Iraqi girl to Greece to receive care.

Similarly, he said, USAF can quickly convert a "plane that just landed to deliver weapons" to one that can transport critically wounded airmen, soldiers, sailors, and marines.

As one medic put it, "If it flies, and we have elbow room, we can do our thing."

Taylor said that development and deployment of PSPs "has tremendously accelerated the aeromedical evacuation process." Previously, patients might have to "wait days for a designated C-9 or C-141 aeromedical evacuation mission to pass through their area," he said.

"We are the only country in the world that can do this on a regular and sustained basis for our military personnel," said Taylor.

The Air Force considers the EMEDS construct to span the range of functions, from its first response preventive and surgical teams through aeromedical evacuation. As Bruhn

USAF photo by TSgt. Rob Jensen

The modular system comprises three EMEDS packages. The amount of equipment and number of personnel are tailored to the size of the population they must support. This USAF EMEDS module is located at Balad AB, Iraq.

USAF photo by TSgt. Jim Varhegyi

Theater medical units hand off the most serious casualties to EMEDS aeromedical evacuation teams for transport to larger medical facilities. Above, a Reserve medevac team delivers a wounded troop to a US military hospital.

explained, "If you look at it as an overall medical response of the Air Force, we have the ability to treat patients from the point of entry through the air evac system to a higher echelon of care."

The New NBC Threat

EMEDS also is prepared to meet dire threats. Taylor told a Senate panel that, shortly before the start of combat operations in Iraq, USAF added its EMEDS Supplemental NBC (nuclear, biological, and chemical) Treatment Modules.

Each module, loaded on a pallet, contained 25 ventilators and medical supplies to care for 100 radiological, biological, or chemical casualties.

Even as these pallets provided the tools to treat NBC casualties, EMEDS' "hardened" tents and infrastructure offered a protective shelter in which medics could carry on their work.

Each of these shelters can be equipped with special liners and air-handling equipment that overpressurizes the interior. Clean, filtered air is pushed in, and contaminated air is kept out. Protected water distribution systems work the same way; they make sure that the EMEDS team has safe, potable water even in contaminated environments.

"So, when our patients come into an EMEDS that is collectively protected," said Bruhn, "there is an assurance that they will be safe inside these tents to be treated."

EMEDS would also play a major role in protecting troops in the field. Bruhn said, "We have specific antidote capabilities that deployed members are required to take, and they are used if they feel that they are in an environment where they have been exposed to some kind of an agent."

EMEDS teams are made up of many types of specialists, said Maj. Gen. Barbara C. Brannon, assistant surgeon general for nursing services and medical force development.

According to Brannon, the wars in Afghanistan and Iraq saw deployments of 725 nurses and 1,603 medical technicians within a total of 24 EMEDS units. Five of these deployed units have been equipped with chemical and biological protection to counter potential threats.

In one year, six nurses were deployed as EMEDS commanders in charge of deployed wing medical facilities in such places as Saudi Arabia, Romania, the United Arab Emirates, Bahrain, and Diego Garcia.

Many of the medics are reservists, though you could not distinguish them from active duty members. "They train the same way," said Bruhn. "They attend the same courses. Certain courses they attend are certified the same way the active duty courses are, and we all deploy, so, when you are in the field, there is no way to determine whether this is a Guard or Reserve or an active duty person."

Staying Sharp

EMEDS training entails in-house courses and cooperative arrangements with civilian institutions. "Air Force medics could not succeed in our expeditionary deployments without targeted training to ensure clinical currency," said Brannon.

A Readiness Skills Verification Program helps keep personnel trained in needed wartime skills.

Centers for Sustainment of Trauma and Readiness Skills (C-STARS) programs allow the Air Force to partner with civilian academic centers to immerse nurses, medical technicians, and physicians in all phases of trauma care. This takes place at three locations: the Shock-Trauma Center in Baltimore, University of Cincinnati Medical Center, and Saint Louis University Hospital in St. Louis.

While it moves to make medical facilities smaller and more maneuverable, the Air Force also is exploiting new developments to make them more effective. Taylor specifically noted the development of modern, high-technology medical equipment.

"During operations in Iraq," he said, "we have relied on technical marvels [such as] a laptop-sized ultrasound machine, a ventilator unit the size of a football, and a chemistry analyzer that, during Desert Storm, required its own tent; now it fits into the palm of your hand. Our people are saving lives with these technologies around the globe."

Bruhn noted other examples: a new mobile oxygen-generation system and self-contained water distribution system. They are designed to travel light and move into war zones in time to treat the first battle casualties.

The primary job of the Expeditionary Medical Support operation is to keep Air Force troops healthy and provide treatment when they are sick or wounded. EMEDS, as Bruhn sums it up, allows the Air Force to do this "on time, efficiently, and with a small footprint." ■

Bruce D. Callander is a contributing editor of Air Force *Magazine. He served tours of active duty during World War II and the Korean War and was editor of* Air Force Times *from 1972 to 1986. His most recent article for* Air Force *Magazine, "Poles Apart," appeared in the November issue.*

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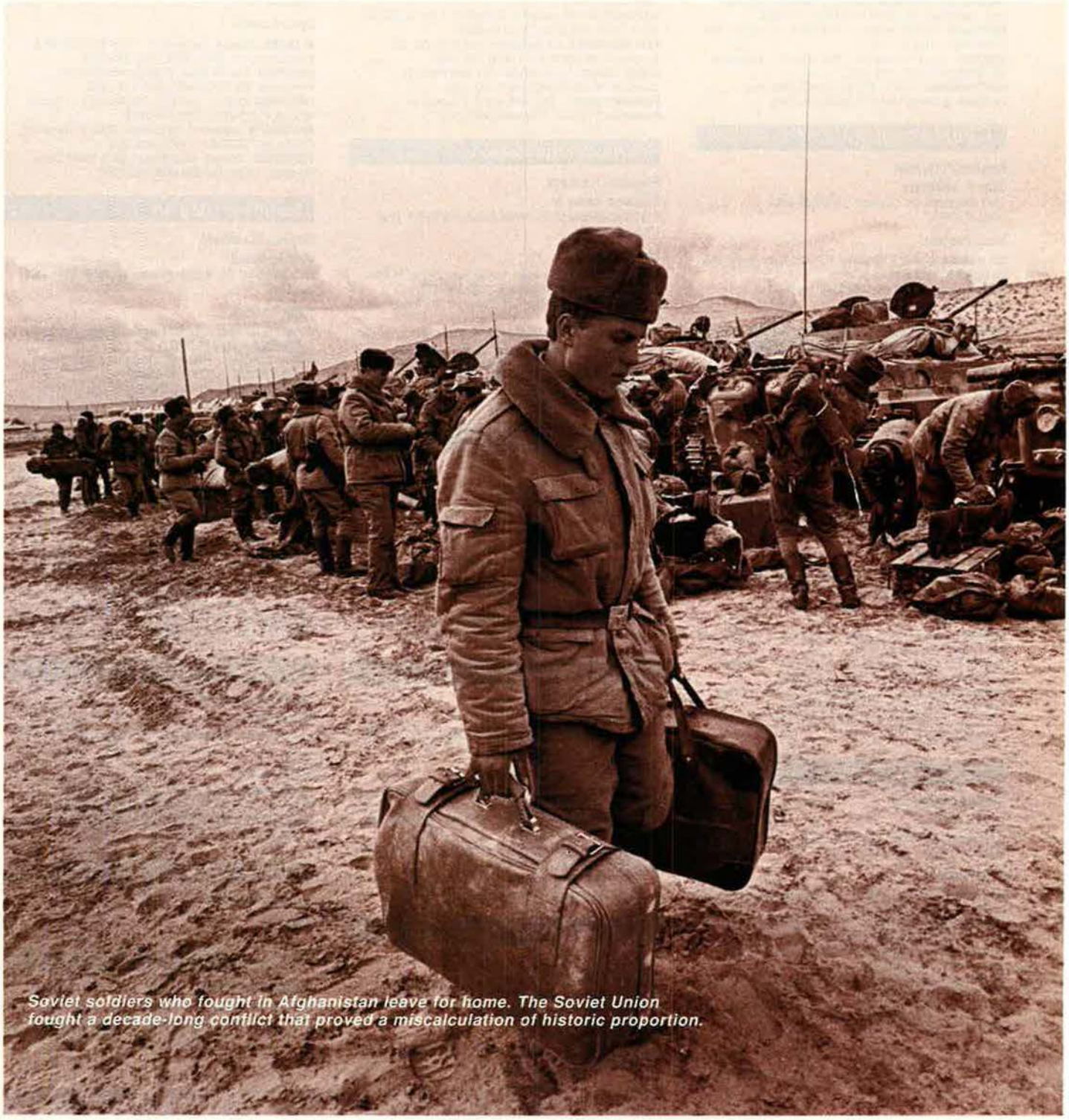
Moscow's Fatal

The thunderous collapse of the **Soviet Union** can be traced to the invasion of **Afghanistan** 25 years ago.



Soviet soldiers who fought in Afghanistan leave for home. The Soviet Union fought a decade-long conflict that proved a miscalculation of historic proportion.

Corbis photo by Sergei Karpukhin

Military Adventure

By Walter J. Boyne

On Sept. 12, 1979, the president of Afghanistan, Nur Mohammad Taraki, was deposed and then murdered. Hafizullah Amin, a communist and a Soviet puppet who led the coup, replaced Taraki and set about trying to quell an anti-Soviet Muslim revolt.

In this, Amin was no more successful than Taraki, and Moscow before long was seeking a more radical solution.

Within months, a worried Kremlin had launched an outright invasion of Afghanistan. It marked the first direct use of Soviet military power outside of Eastern Europe since World War II.

The attack, set in motion 25 years ago this month, led to what some call "the Soviet Vietnam," but that does not convey the magnitude of the disaster that befell the USSR. Vietnam, after all, did not destroy America, but Afghanistan did cause the collapse of the Soviet Union.

In 1979, Soviet power seemed to be at its peak. With a huge force of multiwarhead ICBMs, Moscow matched or exceeded the US in overall strategic nuclear might. The 3.6 million-strong Soviet forces enjoyed numerical superiority in conventional forces.

Politically, the Soviet Union seemed stable. Moreover, America's exit from Vietnam seemed to mark the start of a long-term retrenchment of US power around the world.

Soviet leaders, in short, saw little risk in its Afghanistan adventure.

The Red Army invasion force secretly began mobilizing in October 1979. Airborne battalions arrived at Bagram Air Base that December. These units moved to cover the vital Salang Pass, the invasion route of the Soviet Red Army's 360th and 375th Motor Rifle Divisions.

In mid-December, a well-timed and well-executed military airlift, using some 280 aircraft, transported crack, combat-ready Soviet troops to Kabul. Once in Kabul, Soviet forces moved out swiftly, seizing key targets, and on Dec. 25, the city was declared secure.

The Kremlin, however, had not played its final card. On Dec. 27, an elite Soviet Spetsnaz unit raided the president's Darulaman Palace with orders to kill Amin and every living soul with him. The unit, commanded by Lt. Gen. Viktor Paputin, did just that.

In Amin's place, the Soviets installed another puppet, Babrak Karmal, as the new head of government. Other units crossed the border and fanned out to occupy air bases and cities.

The new regime immediately launched a pro-Muslim charm offensive and moved to blame all previous problems on the former rulers. Russia's leaders hoped that these measures and a potent Soviet occupation force would guarantee peace on the USSR's highly sensitive southern border.

It was, of course, a miscalculation of historic proportion.

Over the next 10 years, a curious, three-sided conflict unfolded in Afghanistan. One side comprised Soviet conventional forces, which were strong, well-equipped, and well-trained—but for a war in Europe, not Afghanistan. A second side centered on the armed forces of the Soviet-backed Kabul regime. The Afghan Army suffered from internal divisions and dislike of the invaders, who were also their main patrons. On the third side was the fractious Afghan resistance, united only in its allegiance to Islam and its hatred of any imposed outside influence.

Estimates of the strength of the Afghan resistance ranged from 90,000 up to 700,000 in the 10 years of the

war, but of these only a small portion was effective in modern guerrilla war or was even in the field at any time.

The war ebbed and flowed through the years, but it was increased Western support of the Afghans—including introduction of shoulder-fired anti-aircraft weapons such as the SA-7 and the Stinger—that forced the Red Army to pack up and leave.

AP photo by David Stewart-Smith

An Afghan guerrilla readies a Stinger heat-seeking missile. The mujahedeen used such weapons to bring down helicopters and low-flying airplanes that had become central in the Soviet battle plans.

Early Advances, 1980-82

At the onset of the conflict, the Soviets expected the army of the Kabul regime to make large-scale sweeps against resistance forces, with the Soviets supplementing the domestic efforts. This did not work out, for desertions seriously weakened the ill-trained and ill-motivated Afghan Army. When asked to fire on demonstrators, its soldiers often declined and defected to the resistance.

This lack of loyalty was shown at every level of the Kabul regime's forces, including even the supposedly elite Afghan pilots flying Soviet-built MiG-21s. On one occasion, an entire squadron of MiG-21s was destroyed when their pilots blew them up and fled to fight on the ground with the mujahedeen.

The first shock to Soviet sensibilities came when it was discovered that the men of their motorized rifle divisions were poorly trained. Ominously, 70 percent of divisional strength was composed of reservists with Muslim backgrounds.

Soviet troop strength grew from an initial 40,000 to about 120,000 at its peak and, to its immense misfortune, was made up largely of conscripts.

Initially, the Soviet Union responded to a series of strikes and demonstrations in Afghan cities with a display of military power, conducting ground sweeps using mechanized forces backed up by airpower.

Unfortunately for Moscow, it lacked light infantry to accompany the armor, placing it at an extreme disadvantage in the rugged terrain in which the guerillas operated.

In another echo of Vietnam, the native Afghan opposition studied Soviet tactics and learned how to isolate, attack, and destroy individual units. Moscow's reaction was to employ more airpower, particularly the effective Hind attack helicopter, which ultimately became the symbol both of Soviet oppression and defeat.

Some conventional weapons, such as surface-to-air missiles and heavy artillery, were found not to be useful for fighting counterinsurgency warfare and were withdrawn. In their place, additional heliborne ground forces were brought in.

Soviet casualties were unacceptably high. By time the Soviets withdrew in 1989, they admitted to up to 15,000 killed. This figure has been questioned by a number of sources, including the Russian military. Other observers contend that the number was actually between 40,000 and 50,000, of the some 550,000 personnel who served in the country.

The Soviets discovered that big ground offensives were largely exercises in futility, bringing heavy casualties and no perceptible long-term gain. The other side of the coin was that despite the large number of casualties being inflicted on the en-

Corbis photo by Reza

Tajik leader Ahmed Shah Massoud played a key role in driving out the Red Army, but he later tangled with the Taliban. He was killed Sept. 9, 2001, by suicide terrorists loyal to Osama bin Laden.

emy, this had relatively little effect on the resistance.

Trying to Adapt, 1983-85

The Soviets were continually adding variations to their theme of combined-arms warfare and the use of political means. In the Panjshir Valley, some 70 miles northeast of Kabul, a year-long truce was struck with the local Tajik leader, Ahmed Shah Massoud. The truce proved of more value to Massoud than to the Soviets, for he continued to conduct operations in other areas, gathering greater influence.

New Soviet offensive tactics included the depopulation of areas where the resistance was most effective and the concurrent destruction of the agricultural basis for their existence. Depopulation featured mass killings and the flight of inhabitants to cities or across the border to Pakistan or Iran. Some five million Afghans were driven out of the country.

The Red Army employed brutal "hammer and anvil" tactics. Soviet tank columns were the hammer, and armed outposts were the anvil. Typically, Soviet troops would move along major roads, with heavy support by aircraft and helicopter gunships.

The Red Army suffered from the typical soldier's apparent inability—or reluctance—to scout effectively. The high ground was often occupied by mujahedeen, who watched for chances to launch successful ambushes. They would let major armed Soviet forces pass unmolested and then concentrate their attacks on the inevitable follow-up resupply columns.

Over time, Soviet tactics improved, and mechanized forces would make a quick rush from base to base after a heavy artillery bombardment had prepared the way, with support from helicopter gunships and fighters. Yet the one unalterable fact was that the Soviets could control only a small part of the countryside.

Soviet forces attempted to hold their position by establishing garrisons in key areas and then sustaining them with supplies, reinforcements, and rescue columns.

By 1984, the Soviet military had greatly increased its reliance on airpower. Air bases were either built or improved at principal cities. In total, there were seven bases with all-weather capability and runways suitable for jet aircraft. All of the basics of airpower—radar, command systems, surface-to-air missile defense systems—were brought in.

In 1985, Mikhail Gorbachev became the new Soviet leader, replacing a long line of increasingly decrepit party bosses. The new man, for at least his first months in office, evidently believed victory still could be achieved. By 1986, however, Gorbachev had reversed course, con-

Soviet Airpower in Afghanistan

The Soviet Air Force, unlike the Army, followed a policy of rotating air units through Afghanistan on a six- to nine-month tour basis. Often only part of the unit would deploy, with the remainder of the regiment staying at its permanent base.

The Soviet Union used helicopters as its primary air weapon. As many as 650 were fielded. They were lavishly employed, sometimes in massed formations reminiscent of the Sturmovik attacks of World War II.

The Mi-24 Hind gunship was effective, and the versatile Mi-17 Hip was used to bring troops in and out of the combat zones. A heavily armed and armored version of the Hip was used as an attack helicopter. Official Soviet sources indicate that 333 helicopters were lost.

When the war began, the MiG-21 Fishbed was the most important fighter-bomber, a role for which it was not particularly effective in the mountainous terrain of Afghanistan. The Sukhoi Su-17 Fitter was more successful at close air support. Smaller numbers of the Su-25 Frogfoot—the Soviet equivalent of the A-10 Warthog—Su-24 Fencer, and MiG-23 Flogger served after 1984.

Beyond providing close air support, fighter-bombers were used in new roles by the Soviets in their attempts to depopulate areas of Afghanistan and destroy its agricultural base. Farmhouses, outbuildings, livestock, and even crops were attacked.

When the fighter-bombers were used as reprisal weapons for terrorist attacks, they would level a village. Ground troops would follow up to kill any survivors of the air attack and also demolish anything of value the fighter-bombers missed.

About 118 fighter-bombers were lost during the war.

Heavy strike aircraft—mostly Tu-16 Badgers and Tu-22M Backfires—carpet bombed villages and strongholds, especially in the Panjshir Valley dominated by tribal leader Ahmed Shah Massoud.

In 1984, a force of 36 Badgers mounted up to 40 strikes per day, indicating that the aircraft enjoyed a relatively high in-commission rate and good turnaround capability, despite several fatal crashes.

The air war in Afghanistan had some unusual aspects. Ten aircraft of the Afghan Air Force defected to Pakistan. There was combat between Pakistani F-16s and both Afghan and Soviet jet aircraft, with the Pakistanis scoring 10 victories but losing one F-16 to fratricide.

AP photo by Alexander Sekretarev

Soviet soldiers scan the Afghan terrain in April 1988. What has become known as "the Soviet Vietnam" proved more disastrous for the Soviet Union than the Vietnam War did for the United States.

AP photo by Liu Heung Shing

Soviet Army tanks in May 1988 head out of Afghanistan. More than 500,000 served there. At least 15,000, and possibly as many as 50,000, were killed during the decade-long conflict.

cluding that victory was not possible and that Soviet forces should withdraw.

The Cookie Crumbles, 1986-87

The Kremlin gave the weak Kabul government a new master in May 1986. President Karmal was abruptly replaced with Maj. Gen. Mohammad Najibullah. Najibullah was an adept statesman, able to be moderate in his demands and in his offers of cooperation, despite his background as head of the Afghan secret service, but his regime was never considered legitimate.

Resistance forces loyal to Massoud now began to demonstrate a flexibility and tenacity previously lacking. For its part, the Soviet Union, particularly its special forces, performed more effectively, but a new era was at hand.

In August 1986, resistance forces around Kabul began to make extensive use of the SA-7 surface-to-air missile, which had been fired in limited numbers since 1980. Then, on Sept. 26, 1986, in Nangarhar Province, the Soviets received reports that the Afghan guerrillas, using heat-seeking, man-portable Stinger SAMs, had shot down three of four Soviet helicopters flying in formation.

From this point on, Soviet aircraft losses increased sharply, resulting in a change in Soviet helicopter and fighter-bomber tactics that diminished their effectiveness. These events bolstered Soviet desires to get out of Afghanistan.

Moscow increased its effort to end the conflict by increasing economic, political, and military pressure on Pakistan to stop the flow of supplies to the resistance forces. Najibullah effected the adoption of a new constitution in December 1986, and local elections were held.

The decisive factor, however, was the performance of the American Stinger missile, which racked up a stunning 68 percent success rate. Some claimed they accounted for the shootdown of more than 150 Soviet aircraft of all types. That number likely was exaggerated, but there is no doubt that the Stinger forced Soviet pilots to use new tactics and extensive countermeasures, which reduced the effectiveness of Soviet airpower.

Without the air weapon, neither Soviet forces nor their Afghan allies could conduct successful operations. Several severe communist defeats caused the Soviets to consolidate their forces into larger garrisons, placing the increasingly restive Kabul regime forces more at risk.

Belly Up, 1988-89

It didn't take long for Gorbachev to launch the effort to get the Red Army out of the quagmire of tremendous expense and horrendous casualties. A key enabling factor was the Geneva Accords in Afghanistan agreed upon in 1985. The premise was that, once the foreign (that is, American) threat to Afghanistan came to an end, Soviet forces could leave.

By early 1988, relations between Afghanistan and Pakistan had changed to the point that Moscow could claim Pakistan was no longer supporting the Afghan resistance. Gorbachev could claim that original Soviet goals had been fulfilled and that Moscow could begin withdrawing its forces. That withdrawal was completed on Feb. 15, 1989.

Soviet withdrawal did not mean the end of Soviet support for the communist regime in Kabul. Nor did it mean peace. Soviet supplies continued to flood into the country, allowing the now isolated Kabul regime to survive another three bitter years of fighting. Pakistan and the US continued to arm the Afghan mujahedeen, but new postwar political situations took priority.

Soviet airpower featured technically advanced systems and brave, well-trained pilots. The Kremlin's ground forces were also well-equipped, though they lacked experience and leadership and could not adapt to the terrain and weather of Afghanistan. In the end, they could not overcome the fanatical resistance equipped with the Stinger.

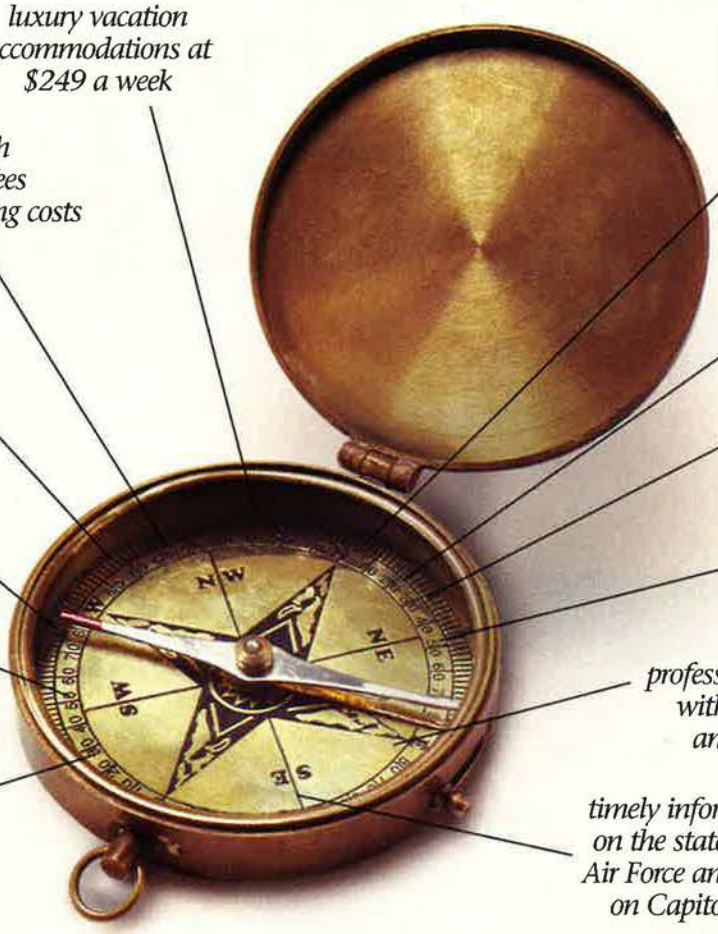
Soviet forces surely learned many lessons while at war in Afghanistan. All, however, were overwhelmed in the early months of 1991 by the demonstration of awesome American military power in Operation Desert Storm.

The consecutive shocks of defeat in Afghanistan and the startling display of US technological superiority in the Gulf War were probably the two key factors that pushed the Soviet Union over the political cliff.

On Dec. 26, 1991, some 12 years after the invasion, the Soviet Union expired. It went out not with a bang, as many had expected, but with a whimper. ■

Walter J. Boyne, former director of the National Air and Space Museum, is a retired Air Force colonel and author. He has written more than 600 articles about aviation topics and published 40 books. The most recent of these is The Influence of Air Power on History. *His most recent article for* Air Force Magazine, *"The Rocket Men," appeared in the September issue.*

Where Can You Get...



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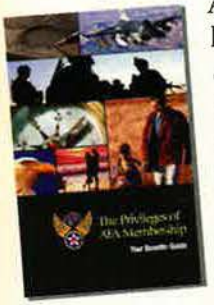

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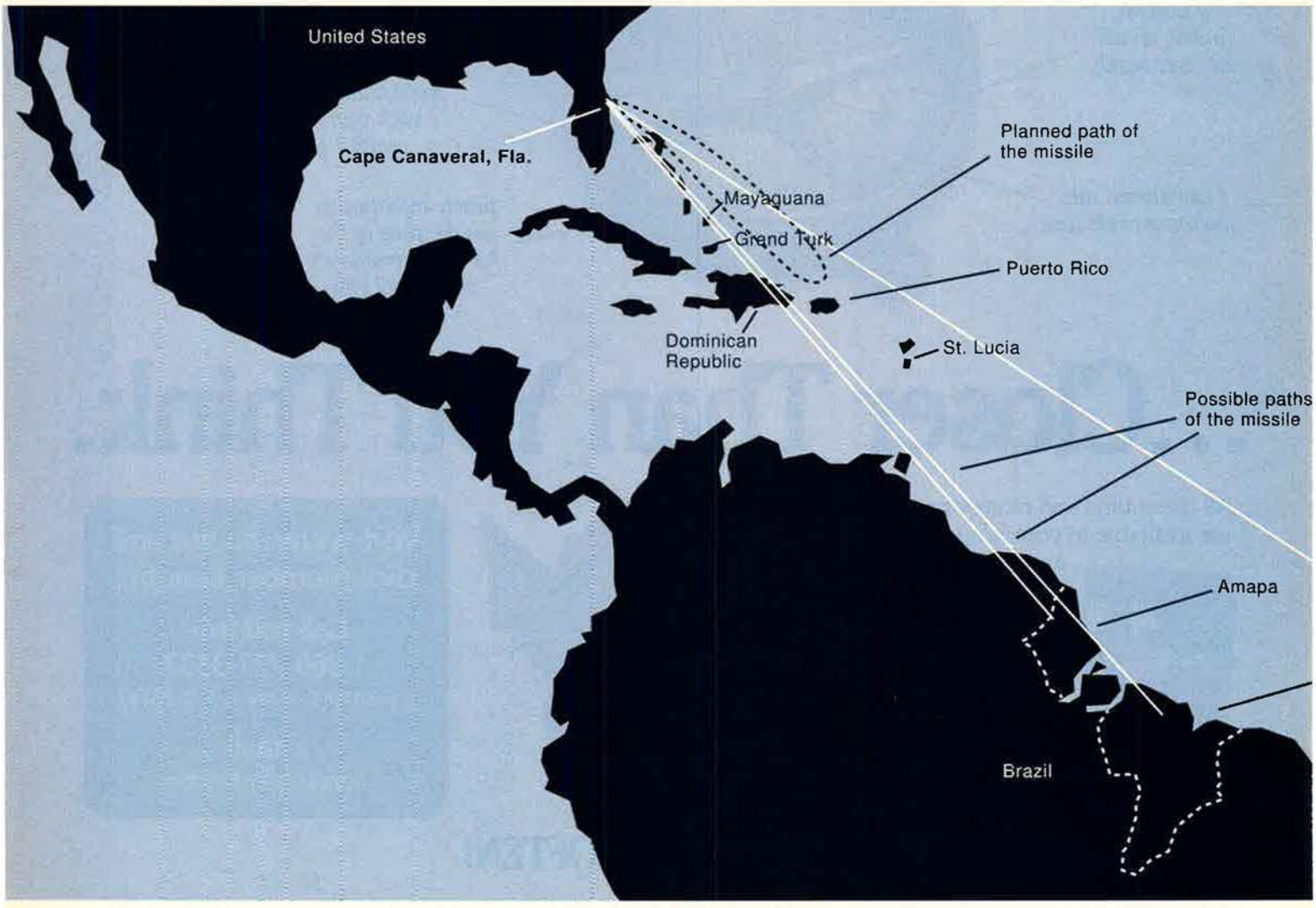
Nearly 50 years ago, a big red aircraft made an unexpected landing in the Amazon.

The Day They Lost the Snark

By J.P. Anderson

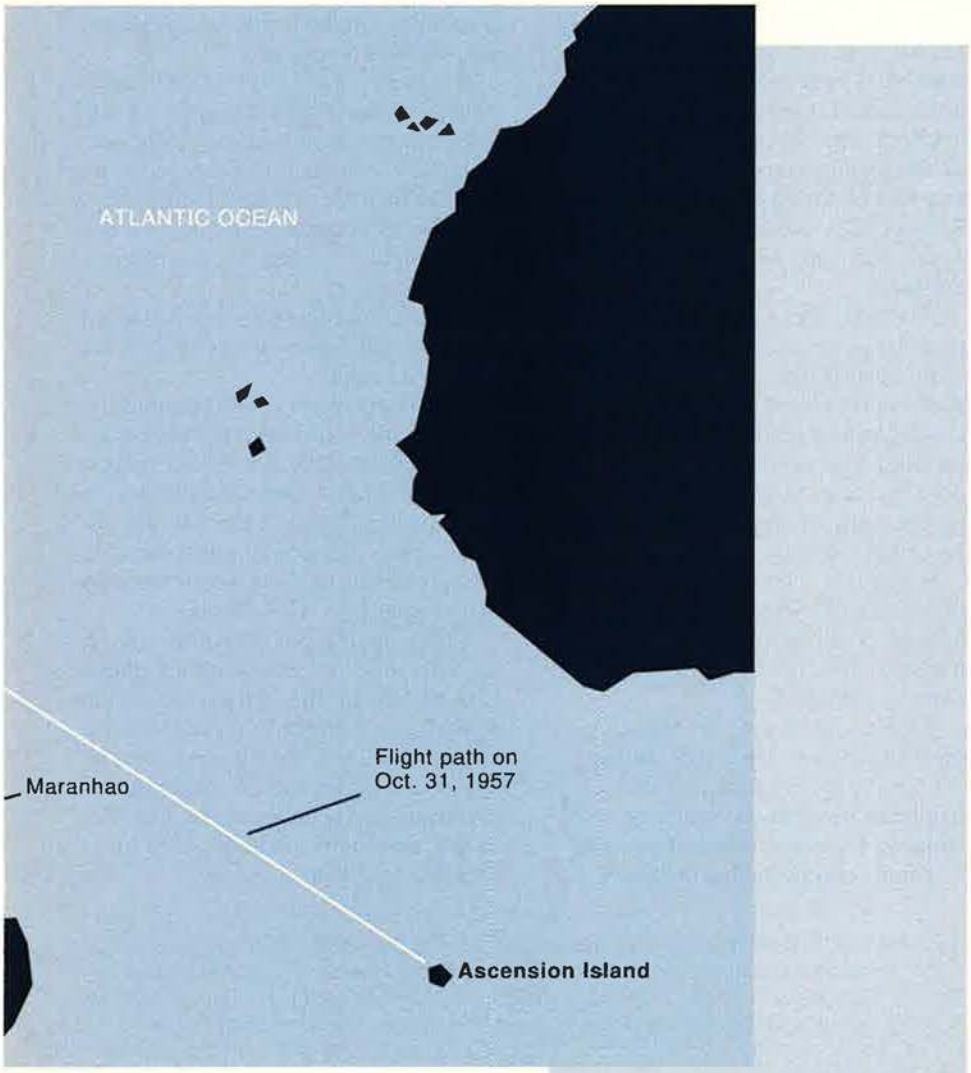


THE Snark may not have distinguished itself in its first 61 test flights, but No. 62 certainly was one for the books.

It came during the Cold War 1950s. The Northrop Aircraft B-62 (later SM-62) Snark, an unmanned, nuclear-capable aircraft, was America's first long-range cruise missile. The huge (48,000-pound) aircraft was launched from a mobile platform by two boosters and then was powered by a jet engine. Strategic Air Command pressed for its deployment.

However, Snark testing, which started in New Mexico and moved to Cape Canaveral Missile Test Annex, Fla., was bedeviled with problems. In its first launch at the Cape, the test Snark crashed after only 15 seconds of flight; its drag chute deployed prematurely. The next to go up rejected steering commands five minutes into flight, went out of control, and was destroyed.

Technicians ready an SM-62 Snark cruise missile at Cape Canaveral Missile Test Annex, Fla. The Snark was to fly to Puerto Rico and return. Instead it vanished after it was last seen off Venezuela.



In 1954 and 1955, Northrop launched 11 "recoverable" Snark A and B models. It actually recovered zero.

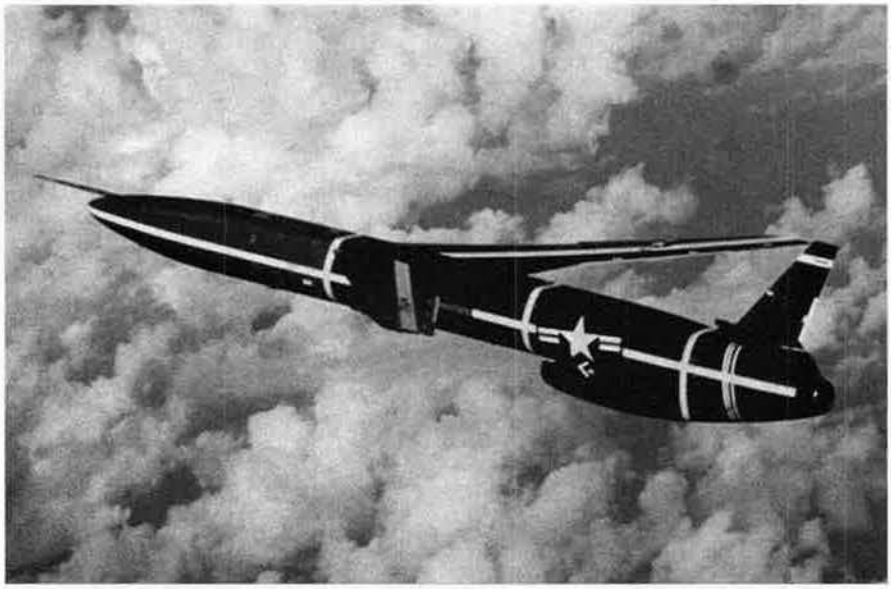
Snark C models were deliberately flown into the Atlantic waters. Failures and deliberate "dumps" caused workers at the Eastern Test Range to refer to the area as "Snark-infested waters."

The D model was used to evaluate the Mk 1 inertial guidance system. The first three flights were programmed to fly a southeasterly course, turn around over Grand Turk Island (Atlantic Missile Range Station 7), and come back. This they did. The third Snark D, equipped with skids, even landed on a Cape runway.

Then came the fourth flight in the guidance test series.

This particular Snark—Northrop No. N-3309, USAF tail No. 53-8172—was launched Dec. 5, 1956, from Launch Complex 1. Its mission was to fly to the area around Puerto Rico, make a turn, and come back.

The Snark took off and set a course toward Puerto Rico. Technicians minding the telemetry said they were



USAF developed the unmanned, nuclear-capable Snark as an interim weapon while it worked on ballistic missiles. The first Snark went on alert in Maine in 1960. After the runaway, USAF added a second power bus to ensure control.

receiving a signal until the Snark dipped over the horizon. Then, tracking radars picked up the flight.

Runaway Snark

However, a problem developed. The radars showed that the Snark had begun to drift to the right off the proper flight path. The rate of error was eight miles for each 100 miles of flight.

That wasn't the only problem. Soon, the wayward Snark began refusing commands that were sent in an effort to get it back on course.

By the time the Snark reached Mayaguana Island in the Bahamas (Range Station 6), the problem was obvious. Station 6's range safety officer was told to terminate the flight. Destruct signals, however, had no effect. The vehicle continued on its cruise into the Caribbean.

Island radars at Station 7 (Grand Turk), Station 8 (the Dominican Republic), Station 9 (Puerto Rico), and Station 10 (St. Lucia) were told to track the runaway Snark. Stations 7, 9, and 10 did acquire track, but the commands had no effect.

Officials at the Air Force Missile Test Center contacted Ramey AFB, Puerto Rico, asking that USAF scramble fighters. By the time they got airborne, it was too late to catch it.

Realizing that the vehicle could crash anywhere south of Puerto Rico, AFMTC officials alerted the State Department, whose reaction is not recorded.

Station 10 was the last to have a radar track. It would be the last to have a crack at the Snark.

In the central control building, USAF had installed four operating consoles—one for the USAF station commander (also the range safety officer), one for the station manager of the prime contractor, Pan American World Airways, one for the RCA Service Co. instrumentation manager, and one for the Snark field engineer.

Not long after *l'affaire* Snark, Station 10 personnel regaled a visitor with descriptions of the scene that day. As they told it, all four technicians formed a kind of "conga line" and marched around the range safety console, each stopping to take a desperate stab at the destruct signals. Nothing worked.

When last seen, the Snark was off the coast of Venezuela, flying a southeasterly course toward the vast expanse of Brazil's Amazon jungle. It simply vanished.

Where did it go? Evidently, no one knows for sure. (A definitive account may exist, but, if it does, it has been beyond the reach of a reasonably long and diligent search.)

There are reports that the Snark was found by a farmer in Brazil in the early 1980s. (See "Pieces of History: The Cruise of the Snark," May, p. 176.)

Another report held that the missing Snark was found by a group of hunters in the state of Maranhao, in northeast Brazil, and that a local television station aired footage of the find.

One assumes the Snark carried enough fuel not only for a 1,900-mile Cape Canaveral-Puerto Rico round-trip but also for one extra hour of flight—enough to cover about 550 miles. This was routinely done to allow flight-test officials to compensate for wind or to check responsiveness to commands before landing.

Thus, the Snark's maximum range would be about 2,450 miles.

Into Amapa?

If so, the Snark would not have had enough legs to reach Maranhao, which is 2,800 miles from the Cape. It would have been able to reach only the Brazilian state of Amapa (see map), on the border with French Guiana and Suriname.

Records show that USAF conducted a postflight analysis of the event. It reported that the flight-termination system failed because the missile bus-bar voltage dropped below the minimum needed to switch the destruct system to emergency battery power.

Later-model Snarks were equipped with a second power bus to prevent similar escapes.

The Snark went on to become the first US intercontinental-range missile when, on Oct. 31, 1957, it flew from Florida to Ascension Island in the South Atlantic. On March 18, 1960, the 702nd Strategic Missile Wing placed the first Snark on alert at Presque Isle AFB, Maine.

Unfortunately for fans of the Snark, ballistic missile technology advanced rapidly. Both the Atlas and Titan ICBMs went operational in the early 1960s, and the Snark was deactivated soon thereafter. Though the program has been dead for four decades, one Snark, at least, lives on as a little Cold War mystery. ■

J.P. Anderson, formerly a CIA communications officer, joined RCA Service Co. in 1956, serving as a contractor on the Atlantic Missile Range, Project Mercury, Project Gemini, and Project Apollo. In 1979, he returned to the Air Force Eastern Test Range as a communications engineer. He is now a volunteer at the Air Force Space and Missile Museum at Cape Canaveral. This is his first article for Air Force *Magazine.*

To quote Hugh Knerr, "Sometimes it is necessary to violently rock the boat to dislodge the rats."

Knerr the Crusader

By Herman S. Wolk

Maj. Hugh Knerr, shown standing in front of a B-1 Keystone bomber. Knerr was one of America's most influential airmen, yet he remains all but unknown.

MAJ. Gen. Hugh J. Knerr should be remembered as one of America's most important and influential airmen, and yet he is a relative unknown in comparison with World War II contemporaries—Arnold, Spaatz, Andrews, and Eaker, to name a few.

Knerr was a gifted airman, brilliant logistician, and near-genius at devising organizational fixes. He was also stubborn and very much his own man. Partly because of these attributes, his career was sidetracked several times.

Knerr was an early and outspoken advocate of creating an independent Air Force. In fact, he was one of a handful of airmen who kept alive the theories of air warfare propounded by Gen. William "Billy" Mitchell. He also played a key role in organizing and building up GHQ Air Force, the forebear of today's service.

In World War II, though, he made his major mark in logistics work. It was a field of airpower that was as misunderstood as it was critical to combat success.

Knerr's serious career began in 1925, when he was sent to the Air Service Tactical School at Langley Field, Va. There, Knerr found to his disappointment that the tactical school gave short shrift to ground attack and emphasized pursuit as "the basic weapon for the air."

Bombardment aviation, he noted, "was capable of destroying the enemy's means of resistance at the source on the ground, rather than after we got into the air." In this, Knerr saw great combat potential. "When you take an enemy's bullets and beans away from him," said Knerr, "his airplanes become impotent."

He also emphasized the crucial importance of maintenance and supply to combat operations.

Tactical School Years

Knerr's tenure at the tactical school was tempestuous. He argued with faculty members, and his devotion to his own views got him in trouble. For example, a spate of aircraft incidents at Langley prompted Knerr to write a report challenging the school's sloppy maintenance. As a result, said Knerr, he was "placed under arrest pending the outcome of an investigation." The arrest, in his view, was

intended to teach him "the advisability of not sounding off in the face of entrenched authority."

Knerr was a strong devotee of Billy Mitchell, whose acid critiques of Army and Navy actions in the 1920s landed him in a court-martial. "Mitchell's courage in castigating the fumbling leadership in the Army and Navy," said Knerr, "was like a breath of fresh air in a stuffy room."

During the period 1927-30, Knerr commanded the 2nd Bomb Group at Langley, one of only three combat groups in the Army Air Corps. The entire Air Corps comprised fewer than 1,000 officers and about 8,700 enlisted men.

Knerr recognized that the 2nd Bomb Group consisted of extraordinarily competent airmen. However, it lacked leadership, discipline, and enthusiasm. Knerr's solution was to inaugurate a new training program, one that "left everyone too tired to get into trouble on the weekends."

He worked his airmen hard, pioneering the development of bomber formations that established a basis for tactics employed in World War II. In addition to developing formation flying, Knerr was one of the first airmen to emphasize and develop military transport.

Knerr also thought about basic requirements for bomber aircraft. In 1927-28, he had formulated a concept for an advanced bomber that could carry a 1,000-pound bomb load at 10,000 feet with a speed of at least 150 mph. In 1930, heading for the field service unit at Materiel Division, Wright Field, Ohio, he further refined these bombardment concepts.

Knerr, the chief of the field service section in the period 1932-35, played an important role in repairing and modifying aircraft for airmail operations. In early 1934, Air Corps support of the airmail flights, ordered by President Franklin Roosevelt, proved to be far less than successful. Hampered by poor navigation equipment and terrible winter weather, the Air Corps suffered a host of crashes and 12 fatalities.

To revitalize the public image of the Air Corps, the War Department in the summer of 1934 approved a major flight of long-range aircraft to Alaska. Lt. Col. Henry H. "Hap" Arnold was appointed flight commander, with Knerr as his executive officer. Knerr's job was to get 10 new Martin B-10 bombers ready for flight, which he did with his usual intensity.

Knerr found the Air Service Tactical School at Langley AFB, Va., disappointing in its single-minded devotion to air pursuit. He agreed with Billy Mitchell that bombers could destroy an enemy's means of resistance.

In July 1934, the B-10s flew from Washington, D.C., to Alaska and, by the end of the return flight, each of the airplanes had logged some 18,000 miles. Arnold won his second Mackay Trophy for the flight, but angered senior naval officers, who saw it as an infringement upon the Navy's coastal defense mission.

Strained Relations

It also strained Knerr's relations with Arnold, who was awarded the Distinguished Flying Cross for leading the flight, while other flight members went unrewarded.

Meanwhile, Roosevelt had directed formation of a board under former Secretary of War Newton D. Baker to consider the question of control of military aviation, an issue of long-standing controversy within the War Department. The issue was simply this: With aviation technology advancing rapidly, who should control the military air weapon?

Air Corps officers such as Maj. Carl A. "Tooey" Spaatz argued that airmen knew best how to organize and employ aircraft. Knerr, by then a lieutenant colonel, added that Army airmen required their own promotion list and the opportunity to present their requirements directly to Congress, without going through the filter of the War Department General Staff.

Turning down the idea of a Department of Aviation, the Baker Board in 1934 recommended establishment of a GHQ Air Force, to operate the Army's strike aircraft to support ground forces and defend the coasts. The Office of the Chief of Air Corps would control personnel, supply, and the budget.

Brig. Gen. Frank M. Andrews was appointed commanding general of GHQ Air Force, with headquarters at Langley Field. Andrews, who while at the Tactical School at Langley in the late 1920s came to know and respect Knerr, now picked him as his chief of staff. Among others Andrews tapped for his staff were Henry B.S. Burwell, Follett Bradley, George C. Kenney, and Joseph T. McNarney.

Under Andrews, GHQ Air Force blossomed into what has been called "the nation's first air force." Knerr, now a colonel, played a major role in this. Andrews and Knerr promoted the new B-17 bomber—only 13 were allocated to GHQ Air Force—as the basic air weapon.

However, Maj. Gen. Oscar Westover, Chief of the Air Corps, kept control of GHQ Air Force's entire logistics and support budget. Knerr commented that "this was like giving a youngster an automobile but leaving the keys with his mother."

Although Knerr plunged deeply into the business of building this air force, his advocacy of the B-17 fell on deaf ears at the War Department. "The Army," he stated, "feared we would cut heavily into their budget." The

Navy, he noted, "viewed with alarm our invasion of their domain."

War Department leaders continued to view support for Army ground forces as the main mission of the Air Corps. According to Maj. Gen. Stanley D. Embick, War Department deputy chief of staff: "If the equipment to be provided for the Air Corps be that best adapted to carry out the specific functions appropriately assigned to it under joint action, there would appear to be no need for the B-17."

Mitchell's Chair

Knerr and Andrews, however, would not stop badgering the War Department for a larger bomber force. The result was the breakup of Andrews' staff. In 1938, Knerr was demoted to lieutenant colonel and exiled to Ft. Sam Houston, Tex. Kenney, Bradley, and McNarney were also sacked.

At Ft. Sam Houston, Knerr found himself assigned to the exact office once occupied by Mitchell. "A photograph of Lt. Col. Billy Mitchell, on the wall in back of my desk, made me feel highly honored to be his successor," said Knerr.

(Later, Andrews himself was demoted to colonel and sent to the same office at Ft. Sam Houston, where he languished until Gen. George C. Marshall, War Department Chief of Staff, brought him to the General Staff in Washington.)

To relieve his boredom, Knerr published *The Student Pilot's Primer*, which went through several printings and was used as a basic text in high schools and colleges.

Knerr had to get 10 new Martin B-10 bombers ready for the 1934 Washington-to-Alaska flight. Leader Hap Arnold receives a key to Fairbanks in the above photo, which also includes Knerr (fifth from left) among other crew members.

Frustrated by being put out to pasture, Knerr retired in March 1939, convinced that as a civilian he could more effectively influence public opinion on the subjects of airpower and the need for an independent air force. "Sometimes it is necessary," he emphasized, "to violently rock the boat to dislodge the rats."

After retiring, he signed on to work for Sperry Gyroscope, accepted speaking engagements around the country, and published articles on the nation's lack of military preparedness. He drew special attention to the lack of airpower. Knerr had only harsh words for the Navy, claiming it was overly dependent on battleships.

Following Japan's attack on Pearl Harbor and America's entry into war, Knerr's forays became progressively strident. The War Department, specifically Maj. Gen. Joseph McNarney, asked Knerr to cease his public commentary.

In the midst of this angry standoff, the Army Air Forces recognized that Knerr, airman and crack logistician, could make a major contribution to its wartime operations. In October 1942, Knerr was recalled to active duty. Arnold directed him to make recommendations on how AAF logistics could be more effectively organized. Based on Knerr's proposals, Arnold closed his logistics depot near National Airport in Washington, D.C., and concentrated the function in Air Service Command in Dayton, Ohio.

Arnold in 1943 directed Knerr to assess the air logistical setup in Britain. In the UK for two years under Maj. Gen. Ira C. Eaker and then under Spaatz, Knerr applied his logistics genius to major problems confronting the Eighth Air Force bombing campaign over Western Europe.

As commander of Eighth Air Force Service Command, Knerr established more depots and insti-

Knerr (far right) eliminated a logistics nightmare for Eighth Air Force commander Gen. Carl "Tooey" Spaatz (center). With them at this World War II strategy session are Maj. Gens. Hoyt Vandenberg (standing) and Ralph Royce.

tuted assembly-line procedures to reduce the backlog of airplanes and equipment requiring repair. He also organized better accounting methods, and by the end of 1943, he reported that "we were providing more aircraft ready to fly than there were crews to man them."

Arnold was impressed with Knerr's operation and even agreed not to send trained depot units—which had not worked well—but rather to let Knerr provide on-the-job training.

In early 1944, Spaatz appointed Knerr—by now a major general—to an additional position as deputy commander for administration of US Strategic Air Forces in Europe. According to Knerr, he assured Spaatz that he could handle this dual responsibility, whereupon Spaatz emphasized that "he was ready to sink or swim" with Knerr's performance.

After the war, Knerr pushed for a separate air arm and was a key player in developing the structure of the newly independent Air Force. He retired, for the second time, in 1949, but continued to promote airpower.

Praise From Arnold

As it turned out, Spaatz need not have worried. The D-Day invasion of Europe succeeded in no small measure because of the effectiveness of the air logistics supporting the massive movement of men and materiel.

"The contributions of your command," Arnold wrote Knerr, "represent one of the greatest ever to be made in the history of aviation."

In the postwar years, during the battle for a separate Air Force, Knerr once more jumped into the fray, returning to his signature barbs when referring to the other services.

"Each was intent on being top dog in the defense establishment," he noted, "but cooperative in discouraging the creation of a US Air Force—not unusual in big families. The Pentagon housed a big family but far from a happy one. The Army appeared to me to have the rule of a fussy old grandmother, the Navy that of a pompous grandfather, and the Air Force, a redheaded brat feeling his oats."

Knerr played a major role in structuring the headquarters of the newly established United States Air Force. The problem was that during the war the Air Staff in AAF headquarters was unable to make decisions quickly enough.

Spaatz, succeeding Arnold as AAF commander in February 1946, directed Knerr, now secretary-general of the advisory Air Board, to come up with recommendations for a new headquarters organization.

The Air Board emphasized that present Air Staff operations remained unsatisfactory "in speed and efficiency to fight the next war." Knerr advocated the deputy chief of staff system that worked so well in the UK during the war, and he was supported by Lt. Gen. Nathan F. Twining, heading Air Materiel Command, and Maj. Gen. Muir S. Fairchild, Air University commander.

In the deputy structure, according to Knerr, "undivided responsibility and authority can be fixed at every level. The next higher or lower commander can put his finger on the individual due for praise or censure without tracing the buck through the pinball mechanism of a staff."

At Knerr's urging, Fairchild directed a study at Air University that called for three deputy chiefs of staff: personnel and administration; materiel and logistics; and plans and operations. The major objective was to reduce the commanding general's workload. Spaatz, relying on the work conducted by Knerr and the Air Board and by Fairchild and Air University, directed that the Air Force implement the deputy organization.

With establishment of the United States Air Force in September 1947, USAF headquarters, under Spaatz, Chief of Staff, and Gen. Hoyt S. Vandenberg, vice chief of staff, featured three deputy chiefs of staff: materiel, operations, and personnel and administration.

Although the Air Board remained in an advisory role to Spaatz, during 1947-48 it considered many crucial issues facing the new service. Its recommendations on a host of personnel and organizational issues formed a broad framework upon which the Air Force was able to build during the early years of independence.

Following his service on the Air Board, Hugh Knerr closed his long career in 1948-49 as Air Force inspector general.

Knerr passed away on Nov. 1, 1971. The Air Force's official biography said this of him:

"Hugh Knerr's great technical knowledge, his command flying experience, his loyalty to his organization, and his dogged determination made him an officer that the Air Force's top leaders—Generals Andrews, Arnold, and Spaatz—depended on in building and running the air arm of the turbulent '30s and the wartime '40s." ■

Herman S. Wolk is senior historian in the Air Force Historical Research Agency's Washington, D.C., operating location. He is the author of The Struggle for Air Force Independence, 1943–1947 *(1997) and* Fulcrum of Power (2003). *His most recent article for* Air Force *Magazine, "The Twentieth Against Japan," appeared in the April issue.*

AFA/AEF National Report

afa-aef@afa.org

By Frances McKenney, Assistant Managing Editor

The Mission

Stephen P. "Pat" Condon, Air Force Association Chairman of the Board, and Robert E. Largent, the newly elected National President, opened the annual combined meeting for region and state presidents by declaring the AFA mission in three words: Educate, advocate, and support.

"Keep that mission foremost in your mind," Condon said. "Everything that we do must be aimed at one of those elements."

(The complete AFA mission statement appears in the association directory, p. 7.)

For 2004-05, there are five new region presidents and 26 new state presidents. They were among the 39 officials who attended the two-day orientation and training meeting for field leaders, held in Arlington, Va.

During information sessions, Condon covered future plans and directions for the association, while Largent addressed the leadership challenges facing AFA.

In other presentations, staff members from AFA departments and the Air Force Memorial Foundation described the functions of their sections, and Joseph E. Sutter and Craig E. Allen, past and current chairmen of AFA's Strategic Planning Committee, presented a workshop on creating field activity plans to support AFA's Strategic Plan.

That plan, along with AFA's Statement of Policy and its Top Issues, forms the association's roadmap for the coming year, Condon reminded the field leaders. All three documents are on the AFA Web site.

In addition to information on AFA, the annual meeting gave field leaders an opportunity to learn from one another. "There's an unbelievable amount of experience in this room," Largent said, "so take advantage of it."

C4ISR Summit

More than a thousand government and industry representatives attended the **Paul Revere Chapter's** third summit on C4ISR integration, held in Danvers, Mass., in October.

Staff photo by Guy Aceto

AFA Board Chairman Pat Condon describes the AFA mission to field leaders attending the annual meeting for region and state presidents. See "The Mission," this page.

USAF Chief of Staff Gen. John P. Jumper was the gala banquet's speaker, and Gen. Gregory S. Martin, head of Air Force Materiel Command, delivered the keynote address.

The two-day forum offered five panels on the technical and program challenges to enterprise-wide C4ISR, beginning with the topic of effects-based operations. Air Force ISR director Maj. Gen. Ronald F. Sams headed a later group covering non-

AFA In Action

The Air Force Association works closely with lawmakers on Capitol Hill, bringing to their attention issues of importance to the Air Force and its people.

A Victory for SBP Recipients and Families

After 12 years of hard work on the part of AFA leadership, staff, and members, the so-called "widow's tax" has finally been overcome. (See "Action in Congress: SBP Reform Tops List of Personnel Gains," p. 22.)

At the grassroots level over the past several months, more than 8,000 e-mails supporting phaseout of this measure were sent to members of Congress through the AFA Web site. Association officials made numerous trips to the Hill to meet with lawmakers and attend hearings and press conferences, pressing the case at every opportunity.

To all of the AFA members worldwide who made a trip to Capitol Hill, spoke with their Congressional representatives, made a phone call, sent an e-mail or a letter, your persistence paid off. Acting in unison, you made a difference.

traditional ISR, strategies for information sharing, and multienterprise integration. Maj. Gen. Tommy F. Crawford, commander of the Air Force C2ISR Center, led the afternoon session on network operations, focusing on warfighter information and networks and information assurance.

The summit's second day—billed as Joint Day—featured Lt. Gen. William T. Hobbins, USAF deputy chief of staff for warfighting integration; Lt. Gen. Steven W. Boutelle, the Army's chief information officer; and luncheon speaker Marine Corps Gen. James E. Cartwright, head of US Strategic Command.

Returning to moderate the Industry Panel for a second year was Dave Shingledecker, a Raytheon business development vice president. His colleagues presented the business case for collaboration, standards for net-centricity, right-sizing communications, and a follow up on recommendations from last year's gathering.

Ninth Air Force Commander Lt. Gen. Walter E. Buchanan III presented one of two special briefings conducted at the summit. Lt. Gen. Bruce Carlson, 8th Air Force commander, delivered the other. He spoke on lessons learned from the latest joint warfighting exercise—Joint Expeditionary Force Experiment 04—which took place in July.

Along with an opportunity to network with military and industry leaders, the summit included a technology expo, with 20,000 square feet of industry and government displays.

Recruited by Doolittle

When did you join AFA?

Jan M. Laitos has been a member for such a long time that the legendary Jimmy Doolittle—founder of AFA and its first president—personally invited him to join the association. That's one of the anecdotes Laitos shared with members of the **Rushmore Chapter (S.D.)** when he spoke at their luncheon in September.

In the five decades since he was "recruited," Laitos has served several times as state and chapter president and has received many AFA national-level awards. He is now a national director emeritus. His remarks to the audience of active duty personnel from Ellsworth Air Force Base and members of the local Black Hills community drew on his background of 30 years of military service that ranged from World War II to his retirement from active duty in 1970.

SSgt. Larry J. Sigman, the chapter's aerospace education VP, said Laitos also plugged AFA's "clout in Washington and its many benefits to members."

Maj. Anthony W. Buenger Jr., chapter president, drove home that point in his closing comments, asking the audience, "If it weren't for the active members of the Air Force Association to accomplish the much-needed AFA mission, then who else would do it?"

Double Anniversary in LA

For the Space and Missile Systems Center at Los Angeles AFB, Calif., it was a Golden Anniversary. For the **Gen. B.A. Schriever Los Angeles Chapter,** it marked 30 years.

Together, the two organizations celebrated these milestones at the annual "Salute to Air Force Space and Missile Systems Center." The

At a Kaiserslautern, Germany, cemetery in September, Lufbery-Campbell Chapter members tended to the gravesites of children of American service members. Some 400 children were buried there between 1952 and 1971. MSgt. Michael Burnham, chapter president, is at far left, second row.

formal affair in late June commemorated 50 years since Western Development Division—which evolved into SMC—was established in Inglewood, Calif., under then-Brig. Gen. Bernard A. Schriever. It also highlighted the chapter's three decades of hosting this banquet, where SMC's outstanding performers receive honors.

Peter B. Teets, undersecretary of the Air Force, delivered the keynote address to an audience of more than 450. The many special guests included CMSgt. James H. Travis, a chapter member who is SMC's top enlisted airman, and retired Gen. Bernard P. Randolph, former SMC vice commander, who was designated an AEF Schriever Fellow that evening.

Gen. Lance W. Lord, commander of Air Force Space Command, received the 2004 General Bernard A. Schriever Award for outstanding leadership and contributions to US military space activities.

Schriever Chapter Chairman Sebastian F. Coglitore, Chapter President Wayne R. Kauffman, and SMC Commander Lt. Gen. Brian A. Arnold presented the awards.

Among them were: Outstanding Unit of the Year, which went to the Directorate of Launch Programs, headed by Col. Michael Dunn; Outstanding Company Grade Officers, Capt. Shawna Doherty and 1st Lt. Chad Brodel; Outstanding Field Grade Officer, Lt. Col. Juan Echeverry; Outstanding NCO, TSgt. John Delobel; and Outstanding Airman of the Year, SrA. (now SSgt.) Karen Curry.

More AFA/AEF News

■ A survivor of the World War II Bataan Death March was guest speaker at a recent meeting of the **Pasadena Chapter (Calif.).** Francis Barker was a newly commissioned US Army second lieutenant in the Philippines on Dec. 7, 1941. He was among 70,000 Americans and Filipinos forced by the Japanese to march some 50 miles from the Bataan Peninsula to a prison camp in the north. Barker was a POW for more than three years in the Philippines, Korea, and Japan. He also survived the sinking of *Oryoku Maru,* one of the ships used by the Japanese to transport POWs from the Philippines to Japan in late 1944. After the war, Barker went on to become a vice president of Union Oil. ■

Reunions

reunions@afa.org

21st Troop Carrier Sq. Sept. 21, 2005, in San Diego. **Contact:** Jean Mansur, 8 Leffler Hill Rd., Flemington, NJ 08822-2608.

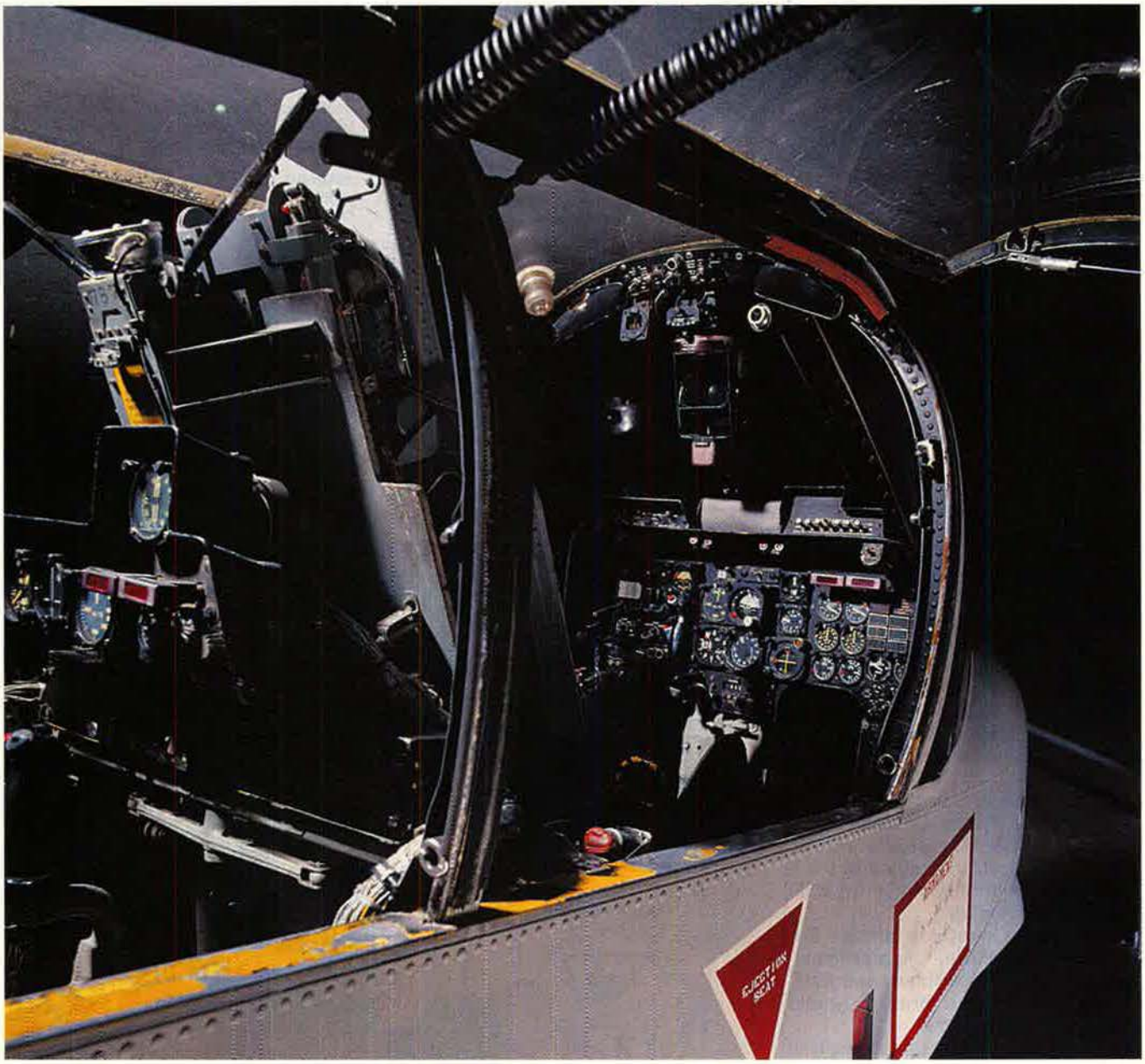
494th BG, Seventh AF (WWII). May 11-15, 2005, at the Radisson Inn in Colorado Springs, CO. **Contacts:** Marshall Keller, 7412-A Vassar Dr. E., West Bloomfield, MI 48322 (phone or fax: 248-626-3684) or Gilbert Rohde, 10589 Ronald Ln., Northglenn, CO 80234 (303-452-5078). ■

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.

Pieces of History

Photography by Paul Kennedy

Bronco's View



Here is the "office" of the forward air controller in the OV-10 used so successfully in the Vietnam War. This Bronco, on display at the National Museum of the United States Air Force in Dayton, Ohio, is one of 157 OV-10s delivered to the Air Force before production ended in 1969. The first OV-10 arrived in Vietnam in July 1968. In that war, the airborne FAC became critical, aiding US and allied ground troops. FACs maintained constant surveillance over an area and, when needed, called in air strikes, marked target zones with smoke or rockets, and flew low to provide battlefield assessment. OV-10 FACs showed great courage during the war. It was such a display of valor that led to the posthumous award of the Medal of Honor for USAF Capt. Steven L. Bennett. Read about Bennett in "Impossible Odds in SAM-7 Alley," p. 52.

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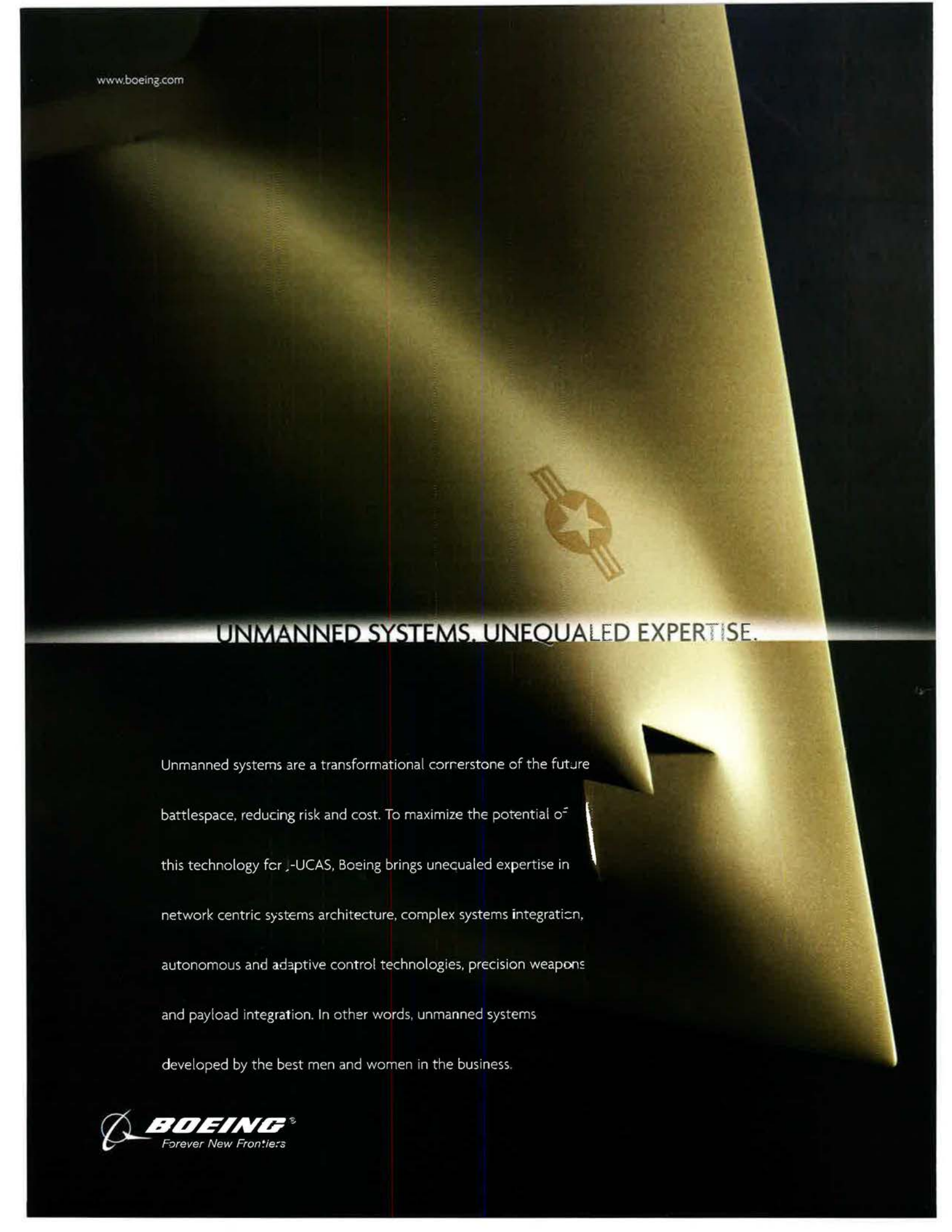
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