July 2000/$3

AIR FORCE MAGAZINE

JOURNAL OF THE AIR FORCE ASSOCIATION

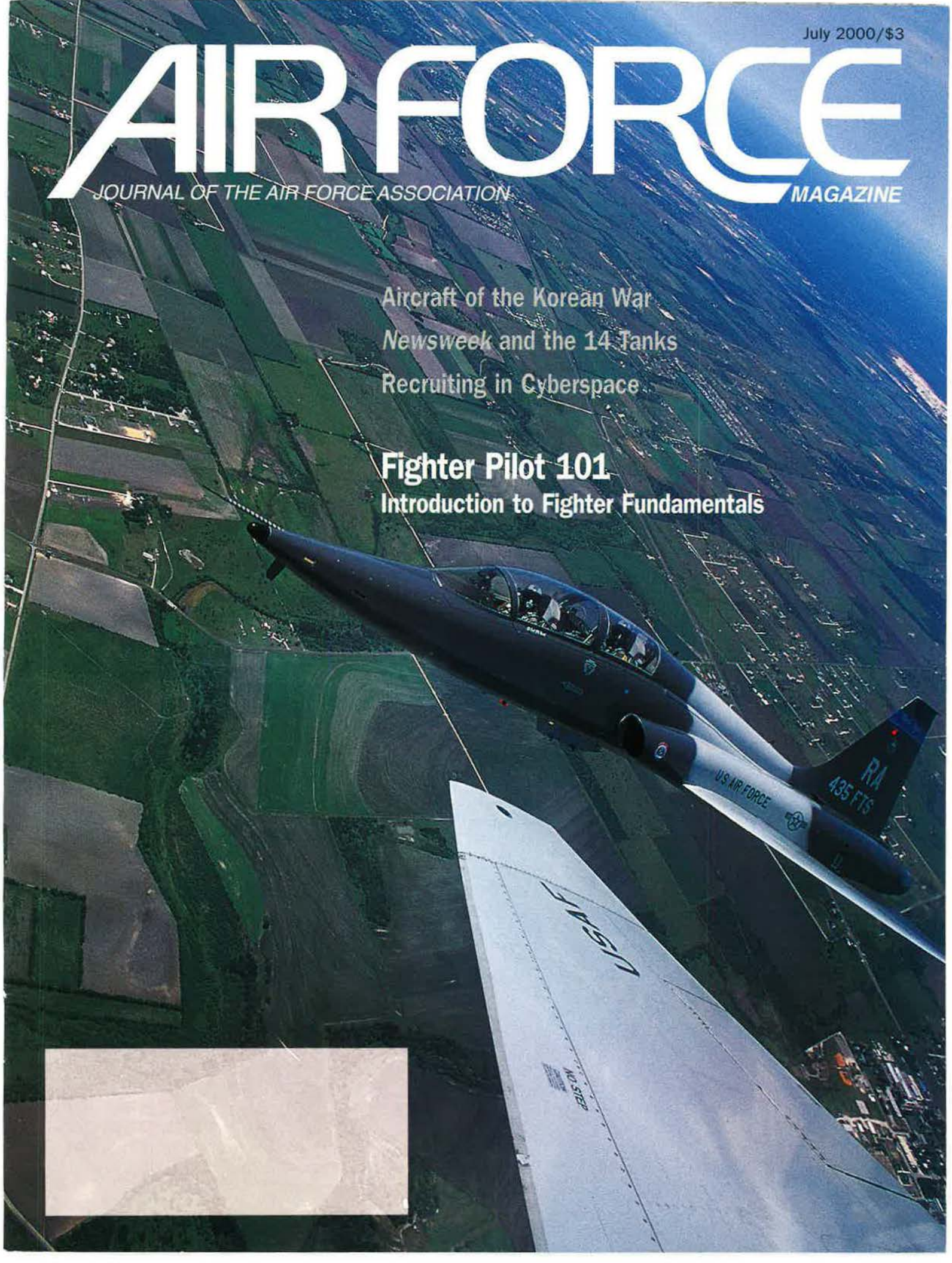
Aircraft of the Korean War

Newsweek and the 14 Tanks

Recruiting in Cyberspace

Fighter Pilot 101

Introduction to Fighter Fundamentals

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July 2000, Vol. 83, No. 7

AIR FORCE MAGAZINE

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About the cover: In flight near San Antonio, an AT-38 from the 435th Flying Training Squadron is on the way to air-to-air combat training. See "Fighter Pilot 101," p. 46. Staff photo by Guy Aceto.

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Editorial

By John T. Correll, Editor in Chief

Aerospace Power Meets the QDR

THIS summer, we observe the 50th anniversary of the start of the Korean War. As we look back at the armed forces of 1950, it is startling to see how much airpower has evolved since then—and how much the land power and sea power of today resemble themselves a half century ago.

The US position as the world's preeminent military power is attributable mainly to its superiority in air and space. Our land forces are better than the armies of other nations, but that is not the big difference between our capability and theirs. From the Persian Gulf War in 1991 to the Kosovo campaign in 1999, aerospace power has been the dominant element in armed conflict.

That ought to bear heavily on the next Quadrennial Defense Review, which is already under way. However, neither the first QDR in 1997 nor any of the other alphabet soup defense reviews of the 1990s gave more than nominal recognition to the dominance of aerospace power. The last QDR, in fact, cut the Air Force deeper than it did the other services.

The forthcoming QDR report is not due to Congress until September 2001, but the Joint Staff and the services began work on it several months ago. The watchword this time around will be the "transformation" of the armed forces from their Cold War configurations to serve the changing needs of a new century.

That would seemingly stand the Air Force in good stead. In April, the Congressionally chartered Hart–Rudman Commission on National Security said that US armed forces of the future "must be characterized by stealth, speed, range, accuracy, lethality, agility, sustainability, reliability—and be supported by superior intelligence." The list fits the Air Force like a glove.

But how much will transformation really count when the review gets rolling? There is a strong chance this QDR will deteriorate—as the last one did—to a budget exercise and an interservice scramble for shares of the funding.

Almost immediately, transformation runs into a financial brick wall. The services have been told to "transform within their means." In other words, they should not expect any additional money.

At their present budget levels, the services cannot meet the assigned yardstick of fighting two regional conflicts more or less simultaneously.

There is less enthusiasm in the Pentagon than you might think for "transformation."

They are stretched and stressed by expanded peacetime operations. They have fallen behind in force modernization. They are constantly on the scout for more funding.

By calling on the services to transform themselves, the QDR creates more pressure—and provides an opportunity—for them to seek a transfusion from somebody else's budget. At least one service has made just such a move.

The problems are not entirely fiscal, though. There is less enthusiasm in the Pentagon for transformation than you might believe from listening to statements made for public consumption.

About 10 years ago, planners behind the scenes began talking about a "Revolution in Military Affairs." The attrition model of warfare, with the bloody clash of force on force, is no longer inevitable. Change is possible by a combination of stealth, long range precision strike, and information technologies.

This is not to say technology can do it all by itself, but rather that the burden in warfare has shifted. In many instances, we may be able to achieve our strategic objectives, or come closer to achieving them, without piling up large numbers of casualties on the ground.

As "Joint Vision 2010" put it four years ago, "We will be increasingly able to accomplish the effects of mass—the necessary concentration of combat power at the decisive time and place—with less need to mass forces physically than in the past."

Such thoughts do not set well with those who have a vested interest in the massing of forces. In recent years, therefore, we have seen a continuing attack on technology and airpower. The theme, pushed in the internal and trade press and sometimes picked up by the popular media, is that technology is undependable, airpower is overrated, and that it is somehow cowardly to avoid casualties.

We are supposed to believe, for example, that the decisive element in the Gulf War was the 100-hour ground action and that NATO was successful in Operation Allied Force last year because of the implied threat of ground power—which was not engaged—instead of the 78-day air campaign.

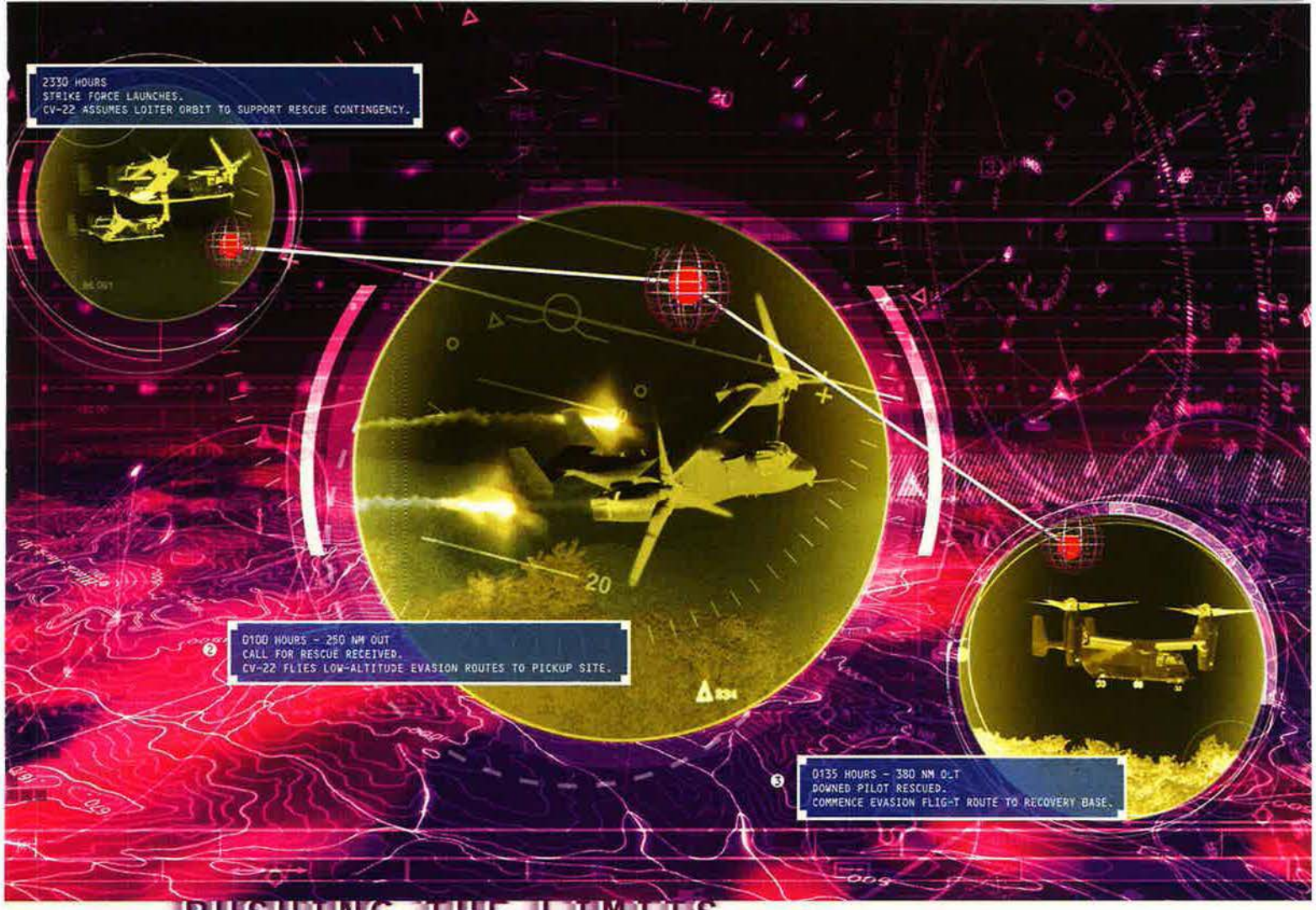
The test of the 2001 QDR will be how it deals with these ungainly issues, and the financial questions may be easier than the conceptual ones.

In 1997, there was little resistance to the QDR stipulation that the defense budget would not increase. Although the services and the Joint Staff had done the workup, the Office of the Secretary of Defense had final say, and the QDR was a policy document of an Administration that was proposing reductions to the defense budget every year.

The next QDR report will be signed out by a new Administration, and this time the services may take a stronger position on fiscal guidance they know to be unworkable and unwise.

The other barrier is the more difficult one.

After everyone gives transformation their best shot, the distinctive military advantage of the United States is still going to lie with its aerospace forces. And that will be hard—perhaps impossible—for some of the key players in the QDR to swallow. ■



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Letters

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About the Almanac

Lt. Oakley G. Kelly, Army Air Service, was co-awarded the Mackay Trophy in 1922 and 1923 with Lt. John Macready. *[See "The Mackay Trophy," May, p. 132.]* You have incorrectly identified Kelly as C.G. vice O or Oakley. He was my uncle, and I'm sure he would appreciate the correction.

Lt. Col. Kenneth D. Oliver,
USAF (Ret.)
Mary Esther, Fla.

■ *The error will be corrected. We also notified the National Aeronautic Association to correct their listing.—THE EDITORS*

"USAF Leaders Through the Years" *[p. 46]* brought back a sad memory for me. I was the assistant crew chief on [the] T-39 [of] Lt. Gen. George B. Simler [Air Training Command commander, 1970–72] at Randolph [AFB, Tex.] and was on duty at the time of his and Captain Gillespie's fatal T-38 crash on Sept. 9, 1972. [Simler] had just been promoted to full general. [The] aircraft crashed on takeoff. When I saw that date [in the May issue] it hit me like a ton of bricks. He was a hell of a man and a general—this coming from an, at the time, 18–19-year-old airman first class. I'll never forget him.

Rodney Bell
Ex–Phantom Phixer
Baton Rouge, La.

Your 2000 USAF Almanac issue omitted the Air Force band program. The bands are an important asset for Air Force promotion and cultural life.

The Air Force has 13 premier bands. The top band is the Air Force Band based in Washington, D.C. Twelve others are based around the world, from Europe, across the continental US, to the Far East. These bands perform music in a variety of genres ranging from classical Sousa–style band music, instrumental ensembles, and choral music to pop and rock. In addition to normal ceremonial duties and concert appearances, they produce professional-quality recordings of their work for distribution within the Air Force and for public affairs use.

Bands have been an integral part of US military life for over 200 years. The Air Force bands are continuing that tradition. The people in the Air Force band program are talented, well-trained, and highly polished musicians. They deserve to be recognized for their hard work.

Virgil H. Soule
Frederick, Md.

My [commanding officer] was Lt. Col. Winton W. Marshall [retired as a lieutenant general in 1977] in late 1953 and 1954 [at] the 15th Fighter–Interceptor Squadron, [Air Defense Command], at Davis–Monthan AFB, Ariz. He was the best of the best, and I hate to think of him not getting full credit for it. I know he was an ace in World War II and Korea. *[See "Air Force Magazine's Guide to Aces and Heroes," p. 75.]* I've even seen this mentioned at the Air Force Museum in Dayton, Ohio. At this point in time we need recognition of all our heroes.

John F. Hannon
Chicago

■ *Maj. Winton W. Marshall is listed as an ace in our Korean War list on p. 77. (The rank is as of the time he gained ace status.) However, he is not listed as an ace for World War II in our source, which is* Air Force Victory Credits: World War I, World War II, Korea, and Vietnam, *compiled by USAF's Historical Research Center, or in his official USAF biography.—THE EDITORS*

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

Your statistics for the civilian workforce by grade are off one line. *[See "The Civilian Force," p. 55.]* The statistics from grade GS-2 through GS-16 should be GS-1 through GS-15.

The civilian workforce is often subject to criticism for being overgraded, and changing your figures to the correct grade level now reduces the average civilian General Schedule grade from the GS-10.5 level to the GS-9.5 level. Sure wish all reductions were that easy.

Dan O'Neil,
Civilian Personnel Specialist
Tinker AFB, Okla.

■ *We rechecked the data provided by USAF—it's correct—THE EDITORS*

Under the C-130H heading on p. 151 *["Gallery of USAF Weapons"],* it is stated that C-130H "delivery began in July 1974." Delivery began by 1966. Three of the first 10 H models were, in fact, also modified for air snatch satellite recovery as noted earlier in the listing for six JC-130B aircraft in 1961. (It is not noted that a total of 12 B aircraft were eventually modified to JC-130Bs, with the three Hs. A grand total of 15 C-130 aerial recovery aircraft were operational by 1966.)

The serial numbers of the three H models modified for aerial recovery are 64-14954, 64-14857, and 64-14858. I was a member of the crew that took delivery of 64-14858 at Warner Robbins AFB [Ga.] after [the aircraft's] modification to aerial recovery configuration in 1966 and have a 1967 photo of it on my study wall, with the large 6593rd Test Squadron #14 and serial number clearly evident on the aircraft.

Col. Harlan L. Gurney,
USAF (Ret.)
Lompoc, Calif.

■ *The delivery date noted—July 1974 (some sources list April 1975)—is for the basic C-130H deliveries to USAF. The C-130H was first ordered by foreign militaries; the first three went to New Zealand in 1965. You are right that HC-130Hs were delivered to USAF earlier. USAF placed*

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Letters

an initial order in 1963, the first one flew in 1964, and the first was delivered in 1965. However, while the gallery does contain some historical data, its primary function is to describe current systems.—THE EDITORS

The Kosovo ROEs

[In response to] the partial quote of [Sen.] John McCain [*"Verbatim: Bombing Innocent Civilians," May, p. 135],* had the Commander in Chief during the early days of Vietnam permitted Rules of Engagement similar to those in Kosovo and permitted the military forces he committed to battle to fight the war to win, the "wrong guys" would not have won; the war would have been over much sooner; there would have been far less casualties on both sides; and McCain would not have spent five-and-a-half years in the Hanoi Hilton.

Col. Byron Lee Schatzley,
USAF (Ret.)
Beavercreek, Ohio

The Impressionists Won

The dilemma of the proposed Air Force Memorial is that of the distance between those whose artistic vision is rooted in realism and those whose artistic vision is rooted in impressionism. The impressionists have won! We have a circle with broad appeal, so great in breadth, that few will embrace it. In seeking to appeal to everyone it only meagerly inspires.

The response Col. Branford J. McAllister, USAF (Ret.) *["Letters: The Memorial Issue Continues," May, p. 11],* received from the memorial office is bureaucratic pablum. The language is that of a politically and artistically correct committee. What a shame.

The Air Force Memorial needs a trip back to the drawing board of the common airman. The present design is that of well-meaning elitists. This is the test. One can look at the Iwo Jima inspired memorial (a slice of history) and few words are needed to explain it. How different the proposed Air Force Memorial. It needs a [technical order].

Maj. Gary L. O'Day Sr.,
USAF (Ret.)
Hawkins, Tex.

Colonels [Phil] Handley [USAF (Ret.)] and McAllister have eloquently expressed many of the same thoughts that I have had. It fails to evoke any feeling of wonder or awe, except to wonder what it is. I find the drawings far too abstract for many Air Force people, let alone others who have had little or no contact or knowledge of the Air Force. Handley's recommendation of a design that would capture the real essence of the Air Force's history is inspiring. That he can so well describe such a design using only words suggests that there is a design that can be both breathtaking and uplifting to its viewers. It doesn't even have to be what Handley suggests to be better suited to the task than the current design.

Perhaps before we invest any more money, time, and effort in this project, we should poll Air Force people, past and present, for their opinions on this design. I believe there is a surprising number who do not support the current design, and while we can't please everybody, we should please a significant portion of the target population. I don't believe we have done that with the current plan.

CMSgt. Randy C. Holt,
USAF (Ret.)
Janesville, Wis.

You're Right, But

I agree with [Maj. Bob] Colella *["Letters: GIs Don't Earn Enough," May, p. 5]* on two points: The military is a dangerous profession, and we don't pay our service members enough. I did disagree, however, with his attempts to strengthen his position by diminishing the contributions of our country's public safety professionals. Many police officers, especially those in larger cities, face life and death situations almost daily and for many years at a time. And although not subject to deployment overseas, they do routinely face many hours of overtime to cope with contingencies.

Anyone taking the time to do the research will find that in the past decade (or two, for that matter) deaths of firefighters and police officers in the line of duty far exceed the deaths of military personnel due to hostile action.

The real danger today is that we have become too efficient at waging war. There is already an expectation on the part of much of the public that wars can be fought at no cost in terms of lives. Before we know it, more and more Americans will cease to view the military as a dangerous occupation. No matter how effective our weapons become or how good we get at using them, we must always keep in mind the possibility of suffering significant losses of our own.

Capt. Anthony E. Wessel
Tinker AFB, Okla.

Memories

The "Flashback" *["Yes, that's a boat under there," May, p. 114]* picture of

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that B-17 brought back memories. In the summer of 1952, I was part of a gaggle of F-86 pilots told to deposit our machines in France and stay with them for a couple of years. This called for hopping over the same route used by the old-timers in World War II: from Goose Bay [Canada], to Bluie West One in Greenland, Iceland, and then Scotland.

But before driving off over the water, we were introduced to the "Duckbut"[sic]—the same venerable B-17 you pictured. The idea was that if you were silly enough to bail out in those frigid waters, this weird flying beast would come over you and drop this enormous life boat right on your head. All you had to do was climb in, start the motor, and sail to Bermuda for R&R. Besides waiting for us to crash, these Duckbuts had another important mission. They would station themselves at the halfway point on each leg and send out a low frequency signal that we could home in on to assure ourselves we had at least got to the halfway mark.

At the briefing the B-17 crews groaned with envy at our new toys. Why don't you swoop down as you pass and give us a fly by, they suggested. My section of four planned it for the Greenland to Iceland leg.

Well, the reason our bunch of F-86s spent 10 days at Bluie West One before dashing off on the next leg was that the F86-E, with its small drop tanks, needed a 50-knot tailwind just to reach Iceland and taxi in without flaming out. And not being very bright, it was only after we had done the swoop and dash past our ogling fans on the Duckbut and had climbed back to our 35,000-foot cruising altitude did we notice that the fuel totalisers were reading lots lower than we wanted them to be.

All four of us were happy we did not have to make a go-around at Keflavik, but there were moments before when I was hoping that Duckbut was just a little closer to where I was.

George Fulford
Mill Valley, Calif.

The boat was 22 feet long and had twin inboard Packard engines. I was 18 at the time and was assigned to the 5th Air Rescue Squadron at Westover Field, Mass. We had a collection of planes, all painted with yellow and black bands. I was a flight engineer on three different planes. We had two B-17Es (with boats), two C-82 Packets (Flying Boxcars), two OA-10s (PBY to the Navy guys), and a C-47. We also had an L-13 (STOL), L-5, and an assortment of Bell and Sikorsky helicopters (fitted with outboard stretcher cases). My main duty was crew chief and flight engineer on a C-82. Our job was to disassemble a helicopter, load it into the Boxcar, and ferry it to where it was needed.

John Taczak
Delmont, Pa.

Corrections

In the May issue, the US Air Forces in Europe wiring diagram on p. 100 should not include the 5th Allied Tactical Air Force at Vicenza, Italy, or the 6th ATAF at Izmir, Turkey. These units were disestablished under the new NATO military command structure that took effect in late 1999.

Also in May, in the "Gallery of USAF Weapons" on p. 152, the commentary on the T-3 Firefly is in error. USAF investigators found that the T-3 crashes that led to six deaths were probably caused by pilot error; they did not directly cite unplanned engine stoppages as the cause in those fatal crashes.

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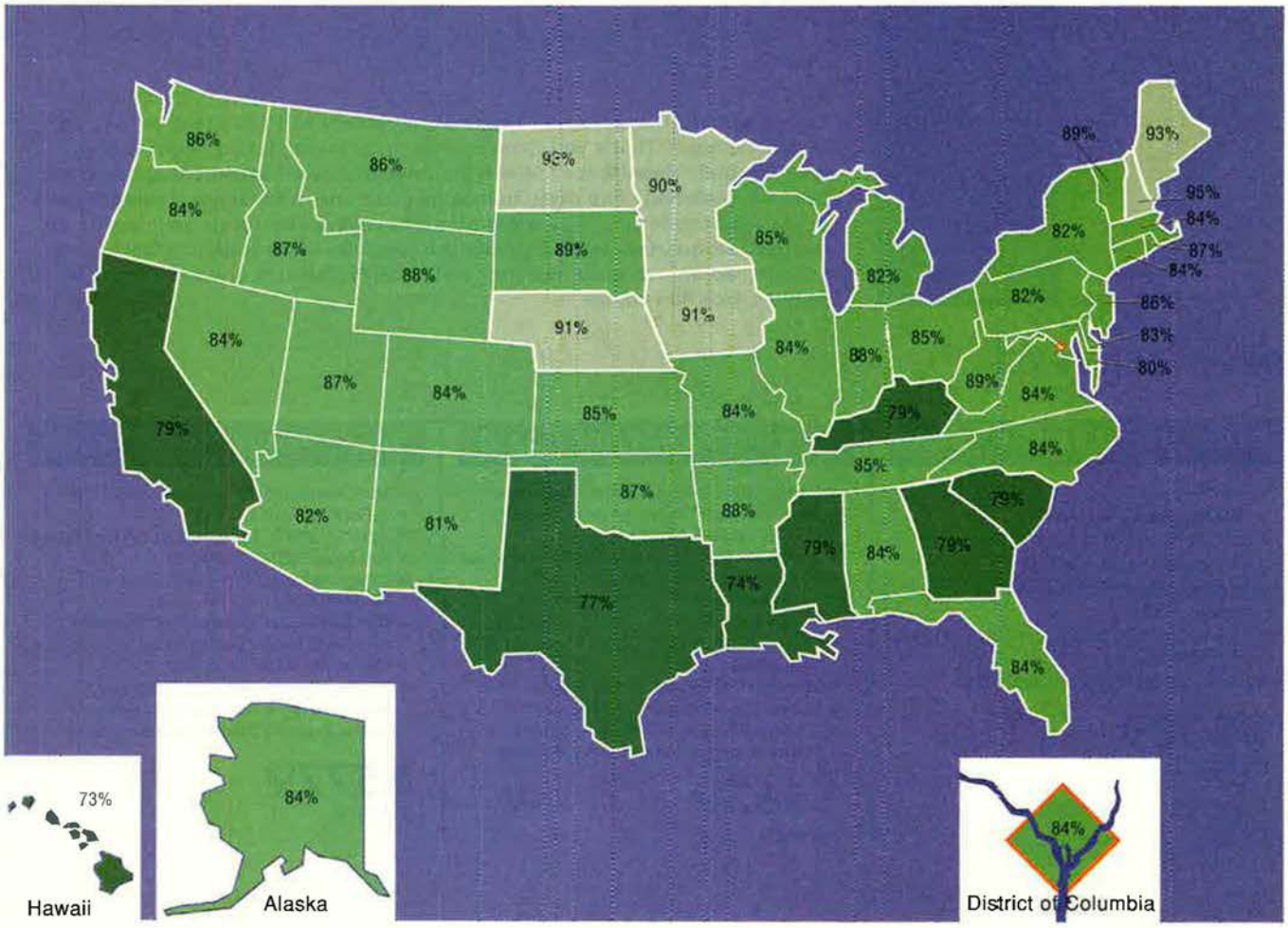
The Chart Page

By Tamar A. Mehuron, Associate Editor

Fade-Out in Draft Registration

Selective Service Report Card, State by State



Source: Selective Service System.

The Selective Service announced May 17 that one in five young American males has failed to register for the draft, as required by law. The trend is sharply down. The compliance rate—93 percent in 1990—has dropped to 83 percent. The law requires men living inside the US and US territories to register within 30 days of their 18th birthday. They are not being conscripted; the names are kept handy in case a national emergency should require a draft. The nation hasn't seen an actual draft call since 1973. For more, see "Draft Registration Goes Into Nosedive" in "Aerospace World," p. 13.

Aerospace World

By Peter Grier

Space Commission Kicks Off

An independent commission on June 5 officially embarked on a six-month examination of ways to enhance US military space power.

The new panel is called the Commission to Assess United States National Security Space Management and Organization. Its members are charged with proposing ways to increase space's contribution to US military power and with reviewing new ways to organize the military space effort.

"This commission will play an important role in ensuring that our forces are properly structured to gain maximum benefit from ... space operations," said Rep. Floyd Spence (R–S.C.), the chairman of the House Armed Services Committee.

Chairing the Congressional commission will be Donald Rumsfeld, former Secretary of Defense (1975–77). The members had the approval of Republicans and Democrats on defense committees.

The commission's retired military members:

- Gen. Howell Estes III, USAF (Ret.), former commander in chief, US Space Command, and commander, Air Force Space Command.
- Gen. Ronald Fogleman, USAF (Ret.), former USAF Chief of Staff.
- Gen. Charles Horner, USAF (Ret.), former commander in chief, USSPACECOM, and commander, AFSPC.
- Adm. David Jeremiah, USN (Ret.), former vice chairman of the Joint Chiefs of Staff.
- Gen. Thomas Moorman Jr., USAF (Ret.), former USAF vice chief of staff and commander, AFSPC.
- Gen. Glenn Otis, US Army (Ret.), former commanding general, Army Training and Doctrine Command.
- Lt. Gen. Jay Garner, US Army (Ret.), former commanding general, Army Space and Strategic Defense Command.

The commission's civilian members:

- Duane Andrews, former assistant secretary of defense for command, control, communications, and intelligence.
- Robert Davis, former deputy undersecretary of defense for space.
- William Graham, former chairman of DoD's Ballistic Missile Defense Advisory Committee.
- Douglas Necessary, former professional staff member, House Armed Services Committee.
- Malcom Wallop (R–Wyo.), former United States Senator.

Cohen Seeks Food Stamp Equity

Defense Department officials say that fewer members of the US military are on food stamps than they had previously thought—but that number might be going up if Secretary of Defense William S. Cohen has his way.

Cohen is proposing to rectify a long-standing equity issue regarding housing allowances in a manner that would likely increase military eligibility for the US government's food assistance programs.

"We'd like to see a situation where no service members are on food stamps, but we also want to make sure that any benefit that is available to our citizens is also available to our service members," said Cohen on April 30.

DoD officials had been assuming that about 12,000 active duty service personnel use food stamps. A recent survey, however, has lowered that estimate to 6,300.

Systematically targeted pay raises might eventually lower this number further or even eliminate military personnel use of food stamps entirely, said Cohen.

But in the meantime, DoD officials would like to change food stamp eligibility rules by eliminating the counting of monthly cash housing allowances as income. Right now the value of on-base quarters is not counted as income—meaning that a service member living on base earns less than an off-base peer, as far as the food stamp program is concerned, and thus is more likely to qualify for assistance.

The change would make some military members "poorer" to the US government and thus could make more personnel eligible for the program. The alternative—putting a dollar value on base living—might deprive some families of a food stamp benefit they now use.

"We want to achieve equity with people who are living off base and those who are living on," said Cohen. "But we don't want to achieve equity by [going to] those who have a benefit and taking it away from them."

Ending military usage of food stamps would be a complex undertaking, notes a recent Congressional Research Service report.

For one thing, experts do not agree on the scope of the problem. While DoD now estimates that 6,300 military personnel use food stamps, a Congressional General Accounting Office study holds that 13,500 active duty members received food stamps at some point in the 12-month period ending in September 1999.

Conversely, the US Department of Agriculture estimated in 1997 that only 3,000 households with a military member received food stamps, notes CRS.

Neither do various agencies agree on a solution. Raising pay for food stamp eligible personnel in grades E-5 and below by $180 per month, as Sen. John McCain (R–Ariz.) has proposed in legislation, might not solve the problem and could raise new military income equity issues, notes CRS.

It could also be expensive.

"Proposals to reduce or eliminate service member eligibility for the food stamp program remain controversial," concludes CRS. "The disagreement raises questions as to the purpose of military pay, the effects of the present situation on morale, and the financial costs of a policy response, among other things."

A-10 Accident Report Blames Weather

Spatial disorientation—caused by flying at night in bad weather—contributed "substantially" to the Jan. 20 crash of an A-10A near Gowen ANGB, Boise Air Terminal, Idaho, according to an accident report released May 23 by Air Combat Command.

The pilot, Maj. Mark Moynihan of

Congressional Roundup

The House on May 18 passed a $309 billion Fiscal 2001 defense authorization bill. The legislation would approve $4.6 billion more in military spending than the Clinton Administration had requested.

Members of the armed services would receive a 3.7 percent across-the-board pay raise, under terms of the House legislation. It would also accelerate the Administration's plan to increase military housing allowances and allow uniformed personnel to participate in the government's 401(k)–style retirement savings plan.

The House also adopted an amendment offered by Rep. Gene Taylor (D–Miss.) that would allow military retirees age 65 and over to obtain health care in military hospitals and clinics and have Medicare reimburse the Pentagon for 95 percent of the cost. In essence, the amendment would take the current Medicare Subvention pilot program and expand it nationwide.

Much of the $4.6 billion added to the Fiscal 2001 authorization bill by the House would increase military procurement budgets.

Air combat programs, however, would see relatively minor changes. The bill authorizes $3.9 billion for the F-22 program, though restrictions placed on the airplane's proceeding into production that Congress approved last year would remain in place. It earmarks $872 million—$15 million more than requested—for the Joint Strike Fighter. It includes $2.6 billion for 39 F/A-18 Super Hornets, a reduction of three aircraft.

Plans called for the full Senate in June to take up its own version of the authorization bill. As reported out of the Senate Armed Services Committee on May 10, the legislation closely mirrors the dollar figures of its House counterpart.

It, too, would add over $4 billion to the Administration's budget request, with much of the money spread out over existing procurement programs.

At a press conference following markup, members of the Senate panel focused on their plan to slow down the development of the Joint Strike Fighter. Their bill would cut $600 million from the aircraft's Engineering and Manufacturing Development phase and add $424 million to the demonstration/validation phase.

"Very briefly, we're not going to have a TFX program on my watch," said Sen. John Warner (R–Va.), the chairman of the committee. Warner was referring to the troubled Vietnam–era program in which versions of a single aircraft were to serve both the Air Force and Navy. The Navy dropped the TFX as soon as it was permitted to do so, but the Air Force version eventually matured into the F-111, one of the hardiest and most effective fighter–bombers ever.

the 190th Fighter Squadron, 124th Wing (ANG), was killed in the crash.

Accident investigators were not able to pinpoint the cause of the crash to their complete satisfaction. Evidence did point to a number of factors, however.

Investigators reported that they suspect severe spatial disorientation, possibly aggravated "by cockpit distractions affecting Moynihan's navigation, lighting, and radio equipment," as the primary reason for the accident.

The probable display of incorrect data on the main attitude director indicator—due to possible malfunction or pilot distrust of the information—may also have made the disorientation worse.

New Nuclear Arms Review In Store?

The Senate Armed Services Committee wants DoD, in consultation with the Department of Energy, to conduct another comprehensive nuclear posture review, its first since the early days of the Clinton Administration.

Panel members inserted into the Fiscal 2001 defense authorization bill a provision ordering the assessment. The most recent review was conducted by then–Defense Secretary Les Aspin in 1993–94.

"The committee believes that a new nuclear posture review is overdue and should be completed in the near future," reads the committee report on the legislation.

The panel said review topics should include the role of nuclear forces in US military strategy; policy requirements for the US to maintain a safe, reliable, and credible nuclear deterrent; the relationship between nuclear policy and arms control objectives; the numbers of nuclear delivery systems needed to carry out the policy; and the number of warheads required.

The review's report is due in December 2001.

Hill Panel Wants Hard Look at Strategic Modernization

In its preparation of the defense bill, the Senate Armed Services Committee also included a provision that calls upon DoD, again in consultation with DoE, to produce a plan for the long-term sustainment and modernization of US strategic forces.

The most recent US programs to produce land-based missiles, sea-based missiles, and heavy bombers were authorized during the Reagan Administration. The US has produced no nuclear weapons since the early 1990s. Over the past decade, the Pentagon has focused on maintaining and upgrading existing forces.

This plan, to be delivered to Congress no later than April 15, 2001, should address the issue of follow-on replacements for the Minuteman III, Trident II, and B-2, said the committee.

"The committee expects that the plan would look beyond current efforts to modernize existing systems and lay out a comprehensive vision for the maintenance of deterrent forces," said the legislative report.

Ralston Assumes Post of SACEUR

Air Force Gen. Joseph W. Ralston on May 3 took over as the Supreme Allied Commander Europe, the head of all NATO forces, at a ceremony at NATO military headquarters in Mons, Belgium.

Ralston replaces Gen. Wesley K. Clark, the Army officer who led the alliance in Operation Allied Force, NATO's first war. Clark repeatedly clashed with his political superiors over the war's pacing and targets.

Clark said Ralston will need to plan for a tremendous alliance workload, which includes keeping the peace in Bosnia and Kosovo. Clark also told reporters April 27 that NATO needs a new strategy for the proper way to apply force in the post–Cold War environment.

The ascension to NATO's top military post represents something of a redemption for Ralston, who most recently served as deputy to the Chairman of the Joint Chiefs of Staff, Army Gen. Henry H. Shelton.

Three years ago, Ralston was in line to become Chairman himself, but his nomination was thwarted by political fallout during the media-spotlighted case of Lt. Kelly Flinn, a female USAF pilot who faced a court-martial for improper fraternization, lying, and failure to obey a direct order. As Ralston became ensnared in charges about his own private life, he withdrew his name from consideration.

Ralston, instead, served a second term as the JCS vice chairman. Now, he becomes the first Air Force officer in nearly 40 years to serve in the

SACEUR post. The last to do so was Gen. Lauris Norstad in the period 1956 to 1962.

US Had Secret ATO on Kosovo First Night

On the first night of the Kosovo air war, US aircraft flew under two Air Tasking Orders—a coalition ATO shared with allies, and a secret US–only ATO for stealthy F-117s and B-2s and other high-value warplanes.

The reason for the dual approach? Some US officials were worried about their allies' loose lips.

Said USAF Lt. Gen. Michael C. Short, the NATO forces air commander in Allied Force: "We had some folks in the US military chain of command that were so concerned about our allies' ability to keep a secret that, on the first night of the war, we ran a US–only ATO and a coalition ATO." Short recalled the situation at an early May conference in Washington sponsored by the American Institute of Aeronautics and Astronautics and reported by *Inside the Pentagon.* "It took us a while to convince senior leadership that we're all in this fight together."

The dual–ATO approach nearly came to grief, said Short, when a Turkish airborne early warning aircraft spotted unidentified aircraft departing Hungary and considered ordering an attack. The airplanes were US F-117s and their escorts.

Similarly, a British officer wanted to know why certain missile dumps were not being struck in the war's early hours. The air commander had to ask the officer to "trust him"—period.

"Certainly there are some issues of US technology that we need to protect, but these are flight-planning issues, these are employment, these have nothing to do with the ATO," he said.

Kolligian Trophy Goes to Allied Force Pilot

USAF Capt. Ripley E. Woodard, from Spangdahlem AB, Germany, has been named the 1999 winner of the Koren Kolligian Jr. Trophy, which recognizes an aircrew member who exhibits extraordinary skill in minimizing or averting an aircraft accident.

Woodard, an A-10 pilot temporarily deployed to Aviano AB, Italy, was flying a combat mission in Operation Allied Force when his Warthog suffered a double engine failure.

The Air Force pilot, using only his turn and slip indicator to control bank angle, successfully restarted both engines after losing 23,000 feet in altitude. He then returned safely to base.

Joint Chiefs Reject 1,500-Warhead Limit

In May 23 Congressional testimony, members of the Joint Chiefs of Staff expressed opposition to Moscow's proposal to cut US and Russian nuclear arsenals to 1,500 warheads each.

The US military is currently studying the effect on national security of dropping to a 2,500-to-2,000-warhead level. A smaller arsenal is, in analytic terms, uncharted territory, said the Chiefs.

"We would not feel comfortable [doing that], short of a comprehensive review of the strategy," Army Gen. Henry Shelton, JCS Chairman, told the Senate Armed Services Committee.

Under the 1993 START II treaty, the US and Russia have agreed to a deployed warhead limit of 3,000 to 3,500 by 2007. The Administration remains pledged to seek a START III pact that would reduce that number to between 2,000 to 2,500 or so.

Burdened by the costs of strategic weapons, Moscow would like to take arms control even further. Even START II levels will cost Russia's government $26 billion to maintain over the next 10 years, according to Alexei Arbatov, deputy chairman of the Russian parliament defense committee.

Russian leaders have said they want a START III with a 1,500-weapon limit. However, public opposition from the nation's military leaders now

Draft Registration Goes into Nosedive

Following a decade of steadily declining compliance with draft registration laws, nearly 20 percent of young American men now are failing to properly sign up, as required by law. (See "The Chart Page," p. 10.)

Those who do not register are risking everything from ineligibility for student loans and government jobs to fines and jail time. Yet few of the scofflaws are even aware that the requirement exists, noted the Selective Service Administration in its May release of its first state-by-state registration scorecard.

"Our research has consistently shown that the biggest barrier to young men's compliance is a simple lack of awareness," said Selective Service Director Gil Coronado. "It's tragic to see young men potentially missing out on future opportunities because they just do not know they are required to register."

The military draft itself was abolished in 1973 and has never been revived. Draft registration, however, was brought back in 1980 by President Carter, partially as a political response to the Soviet invasion of Afghanistan.

Federal law now requires all young men living in the United States, whether citizens, immigrants, or noncitizen residents, to register with the government within 30 days of their 18th birthday. Failure to do so is a felony punishable by up to five years in jail and a fine of $250,000—although since 1985 no one has been prosecuted for registration violations.

Registration is a prerequisite for many government benefits. Yet fewer and fewer young men are signing up these days. For men born in 1980 who are now 19 or 20 years old, the compliance rate is about 83 percent, according to Selective Service officials.

Compliance has been falling about 1 percent per year, they note.

"To make sure that any draft is as fair and as equitable as possible, we've got to make sure we reach everyone," said Lewis C. Brodsky, Selective Service director of public and Congressional affairs. "And it's difficult to know who you're not reaching."

Officials say that they suspect high school dropouts and immigrants are not registering in large numbers. Two states with large immigrant populations, Texas and California, are among the states with the lowest registration percentage, at 77 and 79 percent, respectively.

Northern states with few immigrants are among those with the highest registration penetration. In New Hampshire, 95 percent of young men comply with registration requirements. In Maine the number is 93 percent.

But others point out that some states with high immigrant percentages in their population, such as Florida, do relatively well in the registration ratings. The Selective Service's biggest problem, they say, is that fewer and fewer young Americans are even aware that their military has not always been all-volunteer.

"The idea of registering for the draft, I suppose, is lost . . . with increased distance from the actual use of the draft," said Jerry Bachman, a social psychologist at the University of Michigan who has studied registration issues.

In general, registration compliance rates were highest in the New England and the upper Midwest. Hawaii was last, with a 73 percent registration rate.

Six Southern states also earned only a C from Selective Service officials—somewhat surprising in light of the propensity of Southerners to enlist in the armed forces.

Whatever the reasons, the falling registration rate risks "inadvertently creating a permanent underclass of men" ineligible by law from many government benefits, noted Selective Service director Coronado.

"World Ready" and Its Friends

USAF's leaders were said to be looking for alternatives to "World Ready," a proposed "identity" tag line USAF has considered using to replace "Aim High" as a recruiting slogan. World Ready had not generated much enthusiasm. However, reports Elaine Grossman in the May 18 edition of *Inside the Pentagon,* other tag lines were considered, and most were rejected. They included:

The Power Within
Is It In You?
Are You Ready?
High-Tech Warriors
What's Next?
Masters of Time and Space
Power Source
Feel the Force
A Smarter Way
Go to the Next Level
Above and Beyond
A Higher Calling
First
Anywhere, Anytime
The Power of Freedom
We Thread the Needle

Air Force leaders eliminated many of the above contenders and came up with others to produce a short list of 10 phrases:

World Ready
Above and Beyond
Like No Other
World Ready. Proven Strong.
Strong. Proven. Ready.
Force of the Future
Aerospace Nation
Own the Future
Flight Path to Tomorrow
Freedom's Force

makes it difficult for President Clinton to pursue such a low figure, if he is so inclined.

That could make it harder to get Russians to agree to alter the 1972 ABM Treaty to allow for limited missile defenses. Some arms experts had foreseen a grand bargain whereby the US would agree to the Russians' preferred limits in exchange for greater freedom to pursue defensive options.

F-22 To Stay in Georgia

In early May Lockheed Martin reportedly stated that it will keep final assembly of the F-22 Raptor at its Marietta, Ga., plant, rather than move the work to Fort Worth, Tex.

The move had been possible, and an intriguing possibility, ever since the consolidation of the defense industry brought the Marietta and Fort Worth lines together under Lockheed in 1993.

Lockheed in Fort Worth builds the F-22 midfuselage. Subcontractor Boeing makes the tail and wings. Marietta makes noses and cockpits and then integrates the pieces.

Georgia politicians fought to keep the final assembly work in their state, and in the end a financial analysis showed that it would cost upward of $500 million to consolidate F-22 fabrication under one roof.

Vietnam–Era Fliers Buried in Arlington

A military honor guard on May 25 laid to rest the recently discovered remains of Maj. Thomas H. Amos, a USAF F-4 pilot, and Capt. Mason I. Burnham, his navigator, killed when their F-4 plunged into a Laotian forest near the Ho Chi Minh Trail on April 20, 1972.

Amos and Burnham were assigned to the 366th Tactical Fighter Wing, based at Da Nang in South Vietnam. They were flying a night escort mission with an AC-130 gunship when they abruptly ceased radio contact. Witnesses saw a fireball, with no parachutes.

In 1989, two Vietnamese looking for incense wood stumbled on the wreckage in a remote part of Quang Nam–Da Nang province. The US Air Force interviewed the pair four years later and began recovery efforts at the crash site in 1994.

The difficult terrain made recovery work slow. The discovery of unexploded ordnance caused authorities to halt the search in June 1998. By then, however, searchers had recovered enough bone fragments and other items to positively identify Amos and Burnham.

They also recovered the men's dog tags. Burnham's tags were returned to his daughter, Kim Heddinger, last summer. She has worn them almost every day since, "because he wore them next to his heart when he was killed," she told an interviewer in her hometown of Eugene, Ore.

Era Ends at Kelly

Kelly AFB, Tex., marked the end of an era April 28 with the completion of its last depot workload.

Kelly first served as a government depot in 1921 and its workers have overhauled countless aircraft, engines, and other major items. The base was ordered shut in a 1995 Base Closure and Realignment Commission decision.

Since last fall only the Power Systems Division had been performing government maintenance operations at Kelly's San Antonio Air Logistics Center. The Power Systems workload, which includes secondary power systems, gas turbine engines, air turbine starters for propulsion engines, and auxiliary power units, will now be transferred to Hill AFB, Utah.

FBI Reopens Probe of CIA's Deutch

The Justice Department and the FBI in early May reopened a criminal investigation into the question of whether John Deutch, the former CIA director, mishandled classified material by keeping it on unsecured computers in his home.

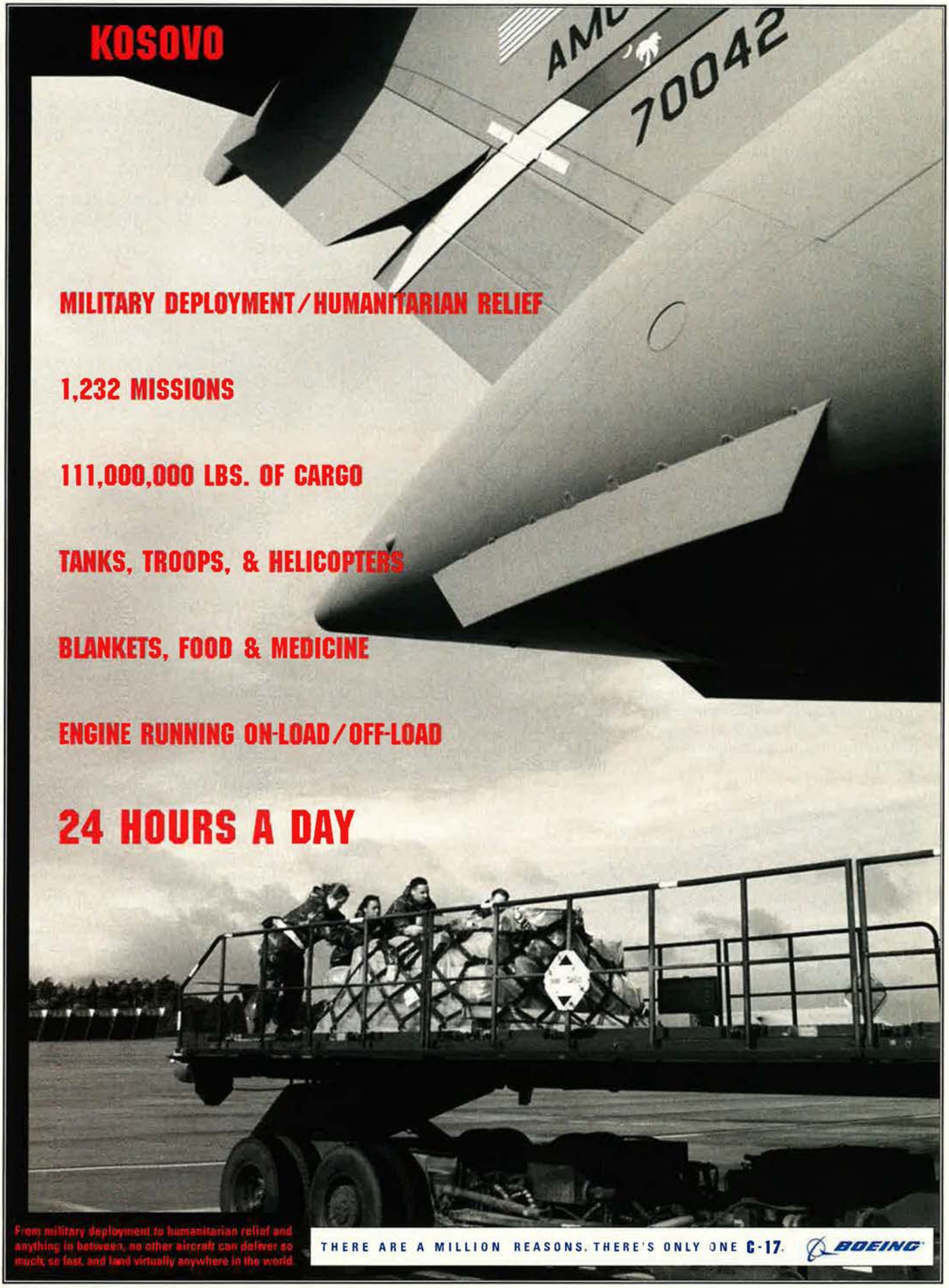
Attorney General Janet Reno had earlier declined to press a case against Deutch. She ordered an internal review of that decision in February, following criticism that the former CIA head had received lenient treatment, while former national lab scientist Wen Ho Lee was prosecuted for similar infractions.

The resumption of the criminal investigation is a result of that Justice Department internal review.

A separate report by the President's Foreign Intelligence Advisory Board was sharply critical of senior CIA officials who declined to pursue Deutch aggressively following the discovery of his security infractions.

Among the officials who came in for criticism in the PFIAB report, which was sent to President Clinton in early May, are former CIA Executive Director Nora Slatkin and former General Counsel Michael O'Neil. Both had been brought to the CIA by Deutch in the first place and had worked closely with him.

Deutch has apologized for his security lapses. Among the material kept on computers at his home were journals detailing his own activities and memos he wrote and meant for the eyes of the President.


KOSOVO
70042
MILITARY DEPLOYMENT/HUMANITARIAN RELIEF
1,232 MISSIONS
111,000,000 LBS. OF CARGO
TANKS, TROOPS, & HELICOPTERS
BLANKETS, FOOD & MEDICINE
ENGINE RUNNING ON-LOAD/OFF-LOAD
24 HOURS A DAY
From military deployment to humanitarian relief and anything in between, no other aircraft can deliver so much, so fast, and land virtually anywhere in the world.
THERE ARE A MILLION REASONS. THERE'S ONLY ONE C-17.
BOEING

Kelly's C-5 workload had previously been moved to Robins AFB, Ga. Its propulsion workload has been handed to a public–private team of Tinker AFB, Okla., and Lockheed, which will continue to operate at what will now be known as Kelly USA.

USAF Rejects Boeing Offer for More C-17s

Air Force officials on May 2 said they have rejected Boeing's offer to build 60 more C-17s as too expensive. The terms of the unsolicited proposal were also somewhat unclear, said officials.

The *St. Louis Post–Dispatch* reported the details of the rejected offer.

Boeing insisted that the offer, with its guaranteed price of $149 million per aircraft, would save the service substantial sums. Company officials said that they would submit a new proposal if the Air Force is at least interested in proceeding.

"We're ready for the Air Force to sit down and talk," Boeing spokesman Larry Whitley told the *Post–Dispatch.*

Boeing is currently building 120 C-17s for the Air Force, with the last scheduled delivery date in 2004. The batch of 60 would have been in addition to this planned fleet.

Boeing made its new offer in March of last year. It included enhancements to the aircraft, including a 15 percent increase in range, in addition to the guaranteed $149 million price tag. Current C-17s are rolling off the production line at about $25 million more apiece.

Eugene Zuckert, 1911–2000

Eugene M. Zuckert, who served as Secretary of the Air Force from January 1961 to September 1965, died of pneumonia June 5 in Washington, D.C. He was 88.

His association with the air arm actually began in the early 1940s when Gen. H.H. "Hap" Arnold recruited him at Harvard Business School to develop statistical controls and train Army Air Forces officers. He instructed more than 3,000 officers.

After World War II, Zuckert was tapped by fellow Yale alumnus Stuart Symington, then assistant secretary of war for air, to be his special assistant. When the Air Force became a separate service, Zuckert was named assistant secretary for management. In that role he helped craft the first joint budget in 1950 and helped develop the fiscal control system used by all three services.

In an interview for *Air Force* Magazine published in June 1998, Zuckert recalled his greatest accomplishment as Air Force Secretary was "setting up Project Forecast, the study of the technology that was coming up." But when asked what he did best, he said, "I hung in there. I blunted the effect of [Secretary of Defense Robert] McNamara on the Air Force as much as I could."

He served in numerous other government positions, including two years on the Atomic Energy Commission, on corporate boards, and helped found a law practice in Washington, D.C.

Stronger C-5s? Or More C-17s?

An ongoing analysis of alternatives to proposed C-5 upgrades might end up recommending the purchase of additional C-17s, according to the Chairman of the Joint Chiefs.

"Right now, the intuition says that probably C-17s would be the right answer, but I defer on making a recommendation until we finish the analysis," Army Gen. Henry Shelton told a Senate hearing April 26.

Air Force active, Guard, and Reserve inventories contain about 125 of the giant Galaxys, which are based principally on 1960s technologies. The fleet was bought in two large batches, one (the C-5As) starting in the late 1960s and the other (the C-5Bs) in the mid-1980s.

The Air Force has planned C-5A modernizations as a way of improving the aircraft's reliability. Its current mission capability rate hovers at around 60 percent.

But the service has "some tremendous challenges with the C-5 Alpha right now," Shelton told the Senate Appropriations Committee's defense subcommittee.

"I Love You" Bug Bit Classified Systems

Defense Department officials are rethinking computer security procedures in the wake of the May 4 attack of the infamous "Love Bug" virus.

Despite initial reports to the contrary, the virus infected four classified e-mail systems at several different defense agencies, Pentagon spokesman Ken Bacon said May 5. Meanwhile, the bug romped through unclassified DoD systems. Bacon himself received 40 copies of the Love program.

"The good news is that it was quickly detected and quickly isolated, and the impact on the systems was very, very minimal," said Bacon. "The bad news is that it got in at all."

Responding to the virus was a tremendous task for Pentagon computer security officials. It took several days for them to get it under control.

"Some DoD machines required complete software reloads to overcome the extent of the damage," said a General Accounting Office statement submitted to Congress on May 10.

Some classified systems are con-

USAF photo by Larry McTighe

NASCAR has signed up to aid military recruiting efforts. Here, the Air Force stock car, which made its racing debut May 28 driven by Dale Jarrett, makes a pit stop. It placed fifth in the Coca Cola 600 at Lowes Motor Speedway, Charlotte, N.C., before 225,000 spectators.

nected to the Internet, which could explain how the virus found its way into secret networks. Security officials suspect that someone may also have transferred a disc from an unclassified computer to a classified one.

In subsequent weeks at least 13 variants of the virus have attacked DoD computers. Officials say that, if nothing else, the experience is teaching them valuable lessons in computer security coordination.

Airborne Laser Passes Critical Design Review

The Airborne Laser successfully passed a Critical Design Review in the last week in April, meaning the system can now proceed into integration, fabrication, and testing.

The three-day CDR was conducted in Seattle by Boeing, Lockheed Martin, TRW, and the Air Force. They examined whether the ABL program has been effective in meeting service mission requirements, has been on cost and schedule, and has been successful in reducing program risk, among other things.

"The CDR is a celebration of three-and-one-half years of high-intensity design and risk reduction," said Paul Shennum, Boeing vice president and ABL program director. "It represents a culmination of innovation and intuition. We have a design that is robust and one in which we're very confident."

The ABL effort is developing a high-energy chemical oxygen–iodine laser that will be carried on a 747-derivative aircraft and be capable of shooting down theater ballistic missiles hundreds of miles from their launch site.

As of mid-spring, the ABL team was still working on the assumption that the first live intercept test of the system will occur in 2003. Proposed reductions in the ABL budget, however, mean that date could well slip to 2005, or perhaps even later.

Lawmakers Tell USAF to Emphasize S&T

The Senate Armed Services Committee is disappointed with what it sees as Air Force inattention to Science and Technology—so it has asked the service to develop and submit for lawmaker approval an S&T master plan.

Both the Army and Navy have already produced formal Science and Technology outlines that attempt to link current investment to long-term goals, the panel noted in its report on the Fiscal 2001 defense authorization bill.

"The committee remains concerned that the Air Force has made deep cuts to some programs without undertaking a comprehensive planning process to ascertain its long-term technology needs," the committee report said.

The Air Force for 2001 requested a total of $1.3 billion, broken down as $206 million for basic research, $590 million for applied research, and $495 million for advanced research.

Both the Senate panel and its House counterpart were dissatisfied with the size of this request. The House panel, in its report, expressed concern that the lack of investment could lead to erosion in US air superiority.

"Air Force modernization investments still reflect a much higher priority on near-term modernization and sustainment of legacy systems than on sustaining adequate levels of investment in S&T," charged the House report.

The Air Force Research Laboratory reportedly has already produced a comprehensive service S&T plan that outlines Air Force investments and S&T intentions through 2005. However, at this point it has not been circulated to Congress.

JSF Faces Possible Slowdown

All the big defense bills working their way through the Congressional budget process in late spring called for slowing down the Joint Strike Fighter program to some degree.

The Senate's version of the Fiscal 2001 defense appropriations bill, for instance, would add $20 million to the JSF program to extend the airplane's demonstration and validation phase through June 2001.

The Senate defense authorization bill would shift funds from the Engineering and Manufacturing Development phase of the JSF into a beefed-up dem/val effort.

House defense panels have made similar changes. Lawmakers say they are worried about the airplane's technology progress—and, in particular, problems in the JSF propulsion system

"We believe the schedule cannot be met, frankly, to get to EMD," said Sen. Rick Santorum (R–Pa.), chairman of the Senate Armed Services Committee's airland forces subcommittee, at a May 10 press conference.

The JSF's Pratt & Whitney F119 power plant is itself proceeding on schedule. Senators said they were concerned about the adaptation of the engine into the short-takeoff-and-landing version of the fighter that would power the Marine Corps and British Royal Navy variants.

Lawmakers are also worried about the prospects for the JSF's acquisition strategy. The Senate defense appropriations subcommittee has gone so far as to attach language to its annual legislation that would attempt to ensure that the JSF remains a "winner take all" competition.

In recent months defense officials have been studying whether restructuring the program to share work in some manner between Boeing and Lockheed Martin would better preserve the nation's fighter aircraft defense industrial base.

McCaffrey, Hersh Do Gulf War Battle

The Army on May 15 announced that it would not reopen an investigation of the circumstances surrounding an attack launched at the end of the Gulf War by forces under the command of Gen. Barry R. McCaffrey, despite new allegations of malfeasance lodged in a magazine report.

An article in *The New Yorker,* written by reporter Seymour M. Hersh, quoted some Army officers who questioned whether McCaffrey provoked the battle and then pressed it to the limit, despite a lack of effective or organized resistance. Hersh also alleged that units of the 24th Infantry Division under McCaffrey's command fired into a group of unarmed Iraqi prisoners in the waning days of the war.

The Battle of Rumaila, which occurred near the southern Iraqi town of that name on March 2, two days after a cease-fire went into effect, has long been controversial. With the publication of the Hersh article, the Army confirmed that, after the war, the battle had been the subject of comprehensive investigations by the Army Criminal Investigation Division and the service Inspector General.

The probes were launched in the immediate postwar months, following an anonymous complaint from within McCaffrey's command, said the Army. In the end, investigators exonerated McCaffrey, who is now the Clinton Administration's top drug-fighting official.

Two retired Army generals, quoted in the article to have made critical comments about McCaffrey and the Rumaila battle, have since issued statements saying that they were quoted out of context and expressing dismay over the tone and thrust of the piece. *New Yorker* editor David Remnick, in reply, has noted that the officers' comments were double-checked with them prior to publication.

Funds for Old Fighters Still Flowing

Budget deals struck this spring ensure that the Air Force will still be buying F-15s and F-16s for some years to come.

On May 3, service officials agreed to a deal with Boeing that will provide for production of three F-15s for $70 million apiece, with an option to purchase two more, according to the *St. Louis Post–Dispatch*. Cash for the deal comes from $275 million Congress appropriated for the current fiscal year.

Differences over the per-unit price slowed agreement on the Fiscal 2000 F-15s. Missouri legislators, who have long pushed to keep the St. Louis F-15 line open at least until the F-22 enters full-rate production, were instrumental in breaking the deadlock.

Meanwhile, the House Armed Services Committee added $150 million to the Administration's 2001 budget for two more F-15s. The F-16 also garnered HASC support: The panel increased the advanced procurement budget for the F-16 by $24 million.

The Senate Appropriations Committee, for its part, added $183 million to the budget for six new F-16s, and $69 million for Air National Guard F-16 engine upgrades.

Current Air Force plans include purchase of at least 19 more F-16s, beginning in Fiscal 2003.

USAF Resumes F-22 Flights

The Air Force on June 6 announced it had resumed F-22 flight testing with aircraft 4002. USAF had suspended test flights May 9 after it found tiny cracks in cockpit canopies.

The hairline cracks were less than an inch long and occurred in a lower area where 140 bolts attach a 190-pound transparency to the canopy frame, officials said. Preliminary findings indicate that there are two likely root causes. One is "higher than expected stresses induced during manufacturing, assembly, and installation operations of the transparency and canopy assembly." The second is "degraded material due to a chemical reaction in the transparency material, polycarbonate."

The grounding came at a time when the pace of the F-22 testing program is becoming important to the program's future. The Air Force and key lawmakers are already negotiating legislation that would allow service officials to release $2.5 billion in Raptor production funds even if some of the testing criteria previously established by Congress are not met, Air Force Secretary F. Whitten Peters said in early May.

"We are working with Congressional leaders to develop contingency plans in case all calendar year 2000 program criteria are not completed by December," Peters wrote in a statement released in response to an inquiry from *Defense Week*.

Rep. Jerry Lewis (R–Calif.), chairman of the House Appropriations Committee's defense subcommittee, already turned thumbs-down on this request, however. Lewis and others have warned the Air Force that there will be no relaxation of the test requirements.

However, in early June, the director of the F-22 test force, Col. C.D. Moore, stated that the canopy cracking would not impact completion of test objectives by year's end.

"This is no different than other developmental subsystem challenges that we have had in the past," Moore said.

Senior Staff Changes

RETIREMENTS: Hugh C. **Cameron,** Phillip J. **Ford,** Francis C. **Gideon Jr.,** Michael C. **Short.**

NOMINATIONS: To be **Lieutenant General:** John D. **Hopper Jr.,** Raymond P. **Huot.**

PROMOTION: To **Brigadier General:** Robert E. **Lytle.**

CHANGES: Maj. Gen. Paul L. **Bielowicz,** from Cmdr., San Antonio ALC, AFMC, Kelly AFB, Tex., to Dir., Log., AFMC, Wright–Patterson AFB, Ohio ... Maj. Gen. Robert J. **Boots,** from Chief, Office of Defense Cooperation to Turkey, EUCOM, Ankara, Turkey, to Cmdr., Air Mobility Warfare Ctr., AMC, Ft. Dix, N.J. ... Brig. Gen. (sel.) John J. **Catton Jr.,** from IG, PACAF, Hickam AFB, Hawaii, to Cmdr., 53rd Wg., Air Warfare Ctr., Eglin AFB, Fla. ... Brig. Gen. (sel.) David E. **Clary,** from C/S, STRATCOM, Offutt AFB, Neb., to Cmdr., 51st FW, PACAF, Osan AB, South Korea ... Brig. Gen. (sel.) Dan R. **Goodrich,** from IG, AETC, Randolph AFB, Tex., to Dep. Dir., ISR, DCS, Air & Space Ops., USAF, Pentagon ... Brig. Gen. (sel.) Gilbert R. **Hawk,** from Cmdr., AF Comm. Agency, Scott AFB, Ill., to Dir., C^4 Sys., TRANSCOM, Scott AFB, Ill. ... Brig. Gen. William F. **Hodgkins,** from Dep. Cmdr., Canadian NORAD Region, Winnipeg, Canada, to Cmdr., 325th FW, AETC, Tyndall AFB, Fla. ... Maj. Gen. (sel.) Michael C. **McMahan,** from Dir., Manpower & Orgn., DCS, P&P, USAF, Pentagon, to Dir., Personnel Force Mgmt., DCS, Personnel, USAF, Pentagon ... Brig. Gen. Robert M. **Murdock,** from Vice Cmdr., San Antonio ALC, AFMC, Kelly AFB, Tex., to Cmdr., San Antonio ALC, AFMC, Kelly AFB, Tex. ... Brig. Gen. (sel.) Gary L. **North,** from Cmdr., 8th FW, PACAF, Kunsan AB, South Korea, to Cmdr., 18th Wg., PACAF, Kadena AB, Japan ... Brig. Gen. (sel.) Allen G. **Peck,** from Asst. Dir., Aerospace Ops., ACC, Langley AFB, Va., to Cmdr., 363rd Air Expeditionary Wg., ACC, Prince Sultan AB, Saudi Arabia ... Brig. Gen. (sel.) Michael W. **Peterson,** from Dir., Comm. & Info., USAFE, Ramstein AB, Germany, to Dir., Comm. & Info. Sys., ACC, Langley AFB, Va. ... Brig. Gen. Quentin L. **Peterson,** from Dir., Trnsp., DCS, Instl. & Log., USAF, Pentagon, to Vice Cmdr., 15th AF, AMC, Travis AFB, Calif. ... Brig. Gen. (sel.) Teresa M. **Peterson,** from Cmdr., 14th FTW, AETC, Columbus AFB, Miss., to Dir., Trnsp., DCS, Instl. & Log., USAF, Pentagon ... Brig. Gen. Douglas J. **Richardson,** from Cmdr., 53rd Wg., Air Warfare Ctr., Eglin AFB, Fla., to Cmdr., SWC, AFSPC, Schriever AFB, Colo. ... Brig. Gen. Klaus O. **Schafer,** from Command Surgeon, ACC, Langley AFB, Va., to Dir., Medical Readiness, Bolling AFB, D.C. ... Brig. Gen. (sel.) Darryl A. **Scott,** from Dir., Contracting, AFMC, Wright–Patterson AFB, Ohio, to Dep. Asst. Secy., Contracting, Asst. SECAF for Acq., Rosslyn, Va. ... Brig. Gen. (sel.) William L. **Shelton,** from Chief, Space Superiority Div., DCS, P&P, USAF, Pentagon, to Dir., Manpower & Orgn., DCS, P&P, USAF, Pentagon ... Brig. Gen. Stanley A. **Sieg,** from Dir., Log., AFMC, Wright–Patterson AFB, Ohio, to Dir., Contracting, AFMC, Wright–Patterson AFB, Ohio ... Maj. Gen. (sel.) Charles N. **Simpson,** from Cmdr., 363rd Air Expeditionary Wg., ACC, Prince Sultan AB, Saudia Arabia, to Dir., P&P, EUCOM, Stuttgart–Vaihingen, Germany ... Brig. Gen. Lawrence H. **Stevenson,** from Cmdr., 12th FTW, AETC, Randolph AFB, Tex., to Dir., P&P, AETC, Randolph AFB, Tex. ... Brig. Gen. George P. **Taylor Jr.,** from Command Surgeon, USAFE, Ramstein AFB, Germany, to Command Surgeon, ACC, Langley AFB, Va. ... Brig. Gen. Frederick D. **Van Valkenburg Jr.,** from Chief, Jt. Plans & Ops. Section, SHAPE, NATO, Brussels, Belgium, to Dep. Cmdr., 16th AF, USAFE, Vicenza, Italy... Maj. Gen. Charles J. **Wax,** from Dir., P&P, EUCOM, Stuttgart–Vaihingen, Germany, to Cmdr., AAFES, Dallas. ■

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Task Force Hawk and Its "Bum Rap"

Gen. Montgomery C. Meigs, commanding general of US Army Europe, appeared May 24 before the Defense Writers Group in Washington, D.C. The discussion at one point turned to Task Force Hawk, the deployment to Albania during Allied Force of Army AH-64 Apache attack helicopters, which were never used. Meigs provided a defense of the deployment, which was heavily criticized during and after the war.

"Task Force Hawk ... got a bum rap, quite frankly. ... [T]he bum rap was, 'It was 24 helicopters, and—isn't it a laugher?—it took three weeks to get there.'

"First of all, Task Force Hawk was a totally unprecedented operation. ... What the CINC [Army Gen. Wesley Clark, the NATO Commander in Chief] asked us to do was take out of a conventional corps this sort of deep-strike capability. A deep-strike capability is an aviation capability that goes over the front line of troops, deep into the enemy area, and attacks their second echelon. It's usually in the context of an entire corps on the ground, which is two or three divisions, like you saw in Desert Storm. ...

"[T]he corps was engaged in supporting the [Allied Force] effort. The corps intel cell was supporting Jim Ellis [Adm. James O. Ellis Jr., Allied Forces Southern Europe CINC] and doing a bunch of other things. We had people from gunnery. So what we had to do was pull this headquarters and fighting element out of the guts of the corps, reshape it, and move it in about two days. The movement took about two days to initiate.

"[W]hat we're talking about here is not 24 helicopters. What we're talking about here is a large headquarters element, which includes command and control, a very robust intelligence capability, and the headquarters that manages the aviation assets when they move around and go deep, and all of the links to the joint world.

"We're talking about a mechanized battalion. Remember, we were going to put this thing, naked, into Albania, 80 kilometers from a Yugoslavian army in Podgorica, which we had already bombed. So, you know, you were not going to just set those guys down there without any force protection. ...

"[W]hen you do a deep strike, you move fuel assets right out close to where you're going to go into the enemy sector, so you have max fuel. A FARP, we call it—a Forward Area Refueling Position. When you put a FARP up next to the Serb areas in the mountains, you aren't going to put them up there all by themselves. You have to secure them. And we had to invent a CSAR [Combat Search and Rescue] sort of as we went along.

"So you're talking about what is, in essence, about half a division's worth of stuff, you know? Forty-eight helicopters, because we were going to send the whole regiment; that's attack birds. Another 24 birds were arranged from medevac to command and control to the Chinooks for moving the FARPs around—because, you know, moving those fuel bladders around, you can't use a small helicopter for that.

"Then you had the corps CP [Command Post], the corps deep operations cell, the aviation brigade headquarters, the ACE [Analysis and Control Element]—which is a 250-man intelligence organization that had to go and do all of that kind of deep looking, figuring out where the enemy was moving around—and all the cooks and supply people. You're talking about 5,000 people. ...

"I was prohibited by law from spending one dollar of appropriated funds for anything [with respect to] Kosovo. I was prevented from leaning forward in the harness until the 2nd of April. On the 26th of April, that 5,000-man force was in Albania and ready to fight. Half a division's worth. All moved by air. All moved into an airfield that previously had a capability for one wide-body at a time, in daylight only. The Air Force moved heaven and earth to get us down there, and they should get some kudos for that. ...

"This was some really fine work. And, unfortunately, it just got lost in the shuffle. So, it's very frustrating to us. We had these people doing something that had never been done before—and meeting the CINC's standard. We met his 'be-ready-to-fight' timeline.

"No one understood that the Apache is a VFR [Visual Flight Rules] airplane. The Apache can't fly in bad weather. It's a two-day flight to the Balkans. They took off on Day 1, flew to France, flew to Italy, and couldn't get across 'the Boot' because of the weather. So they had to wait two to four days to get across the Boot.

"They flew to Brindisi, and the Italians said, 'You can't load up the missiles because, you know, there's a safety problem,' and we said, 'Look, we're not going into Albania without being uploaded.' Plus, the French took the place on the airfield where the Apaches were supposed to go, and they said, 'We're not leaving until Paris says so.' It took six days to get Paris to move them. So there was no way to get them in. ...

"I'm just telling you, this very 'clean' three-day flight was encumbered by a couple of things over which we had absolutely no control, but I don't want to beat that to death."

Index to Advertisers

News Notes

■ Air Force Space Command won top honors in the Readiness Challenge VII competition, which wrapped up May 5 at Tyndall AFB, Fla. The week-long biennial event features civil engineer, services, and chaplain service competitors demonstrating their ability to set up and maintain support operations under bare-base wartime field conditions.

■ On May 8 the Air Force successfully launched a Titan IVB—its 29th Titan IV rocket—after three consecutive Titan failures from Cape Canaveral AFS, Fla. The launch placed a critically needed Defense Support Program warning satellite in orbit. A Titan IVB launch last year stranded a DSP satellite in a useless orbit. The

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USAF photo by Lewis Mitchell

"This is so cool." Nicholas Roper gives a thumbs-up from the cockpit of an F-15 at Edwards AFB, Calif. Earlier he had experienced the view from an F-16. Operations and maintenance personnel at Edwards fulfilled this dream in May for the 15-year-old, who has cystic fibrosis, which currently has no cure.

first successful Titan IVB launch following a stand-down after the launch failures at the Cape occurred from Vandenberg AFB, Calif., May 22.

■ *Oh, Hard Luck,* a B-1B from the 7th Bomb Wing at Dyess AFB, Tex., on May 9 became the first Lancer to surpass 5,000 flight hours. The entire B-1 fleet has flown 339,000 hours since the first one, *The Star of Abilene,* was delivered to Dyess on June 29, 1985.

■ The Air Force is now opening its doors to more former members of the Army, Navy, Marine Corps, and Coast Guard. Until recently, such ex-military personnel could only join the Air Force if they held specialties in a narrow series of career fields. A new authorization welcomes all with compatible career fields into the aerospace service.

■ On May 1, the White House announced that it has discontinued the intentional degradation of Global Positioning System satellite signals available to the public. The end of this so-called "selective availability" of the GPS signal will increase the accuracy available to civilian users up to tenfold, said Air Force Space Command officials.

■ On April 14 and 15, the Global Hawk unmanned aerial vehicle set a new world endurance record for jet-powered unmanned aircraft. On a flight from Edwards AFB, Calif., a Global Hawk reached 65,100 feet and stayed aloft for 31.5 hours. The previous record, 26 years old, was 28.2 hours and was set by a Compass Cope-R remotely piloted vehicle.

■ Lockheed Martin settled a strike with machinists at its Fort Worth, Tex., facility on April 26. The machinists union, with 2,300 members, is the largest at the Texas facility, which produces F-16s and major portions of the F-22.

■ Boeing's Joint Strike Fighter team has successfully completed the first phase of engine runs for its X-32A concept demonstrator aircraft. The uneventful operation of the engine in the aircraft confirmed all performance predictions and moves the X-32A closer to its first flight, expected some time this summer.

■ Air Force Lt. Col. Glyn Bolasky, commander of the 41st Electronic Combat Squadron, was honored this spring for his heroism in helping stop a bank robbery 20 years ago. As a deputy in the Riverside County, Calif., sheriff's department, Bolasky was the first officer on the scene at a Norco, Calif., bank robbery in 1980. Bolasky received a sheriff's Gold Heart and Medal of Courage for shooting and killing one of the five heavily armed robbery suspects after he himself had been shot five times. These awards were not available at the time of the incident.

■ The Air Force will increase promotion opportunities for line colonels to 55 percent for the Calendar Year 2000 Line Colonel Board which meets July 17. This is a 5 percent increase above the 50 percent rate that has been in place since 1992 and means there will be approximately 62 more promotion quotas for the July board.

■ On April 13 Deputy Defense Secretary Rudy de Leon told the Senate Armed Services Committee that government agencies are collaborating in a major study of the long-term health effects of the anthrax vaccine used by the Department of Defense. The Centers for Disease Control and Prevention in Atlanta is heading the $20 million, multiyear effort.

■ On April 24 the eight US service members who died during the 1980 attempt to rescue 53 Americans being held hostage in Iran were honored at a No Greater Love 20th Anniversary Remembrance Ceremony in Arlington National Cemetery. No Greater Love is a nonprofit organization that provides annual programs to remember those who died in service to their country or in acts of terrorism.

■ Air Force Space Command on April 28 honored Gen. James V. Hartinger, USAF (Ret.), by renaming the command's headquarters building at Peterson AFB, Colo. It is now called the Hartinger Building. Hartinger was commander in chief of North American Aerospace Defense Command, 1980–84, and was the first commander of Air Force Space Command, 1982–84.

■ White skulls trailing yellow flames, plus the inscription "Banshees," will soon be appearing on the tails of the T-37s of the 80th Flying Training Wing's 89th Flying Training Squadron at Sheppard AFB, Tex. The art is reminiscent of insignia painted on noses of P-40 Curtiss Warhawks of the unit's forerunner, the 89th Pursuit Squadron, during its World War II service in the China–Burma–India theater.

■ Air Force officials approved reopening the 6,000-foot runway at Arnold AFB, Tenn. The move is meant to allow the customers of the Arnold Engineering Development Center to fly their hardware directly to the center for testing.

■ On April 21, the day before Earth Day, President Clinton signed an executive order directing the Department of Defense and other government agencies to reduce the petroleum consumption of their vehicle fleets by 20 percent from 1999 levels by the end of Fiscal 2005.

■ Air Force Capt. Kevin O'Rourke recently won the Barchi Prize and Graduate Research Award of the Military Operations Research Society. O'Rourke was honored for developing a computer program to calculate the most efficient route for unmanned reconnaissance aircraft. ■

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"F^2T^2EA" is shorthand for the operational goal the Air Force will pursue into the 21st century.

Find, Fix, Track, Target, Engage, Assess

By John A. Tirpak, Senior Editor

The Air Force is moving toward pervasive Intelligence, Surveillance, and Reconnaissance, meaning uninterrupted watching of areas of interest. The Global Hawk drone can stay high over a hot spot for 24 hours, its sensors glued to the target.

In October 1996, Gen. Ronald R. Fogleman, the Air Force Chief of Staff, appeared before an Air Force Association symposium, and there he issued an arresting statement. "In the first quarter of the 21st century," Fogleman declared, "it will become possible to find, fix or track, and target anything that moves on the surface of the Earth."

The comment was widely repeated. Over time, it became something of an unofficial Air Force slogan and later was amended to include "engage" and "assess," words describing action on a target and determination of the effects obtained. The statement—F^2T^2EA—proved to be both a prophecy and a challenge to Air Force budgeteers and technologists to focus on bringing about change.

As the Air Force readied a new vision statement—global vigilance, reach, and power—the service showed that, in a sense, Fogleman's prophecy had already come true. The full weight of US Intelligence, Surveillance, and Reconnaissance systems can be focused onto a particular area, and anything of significance within it can be found. The coordinates of the item in question or its vector can be determined and relayed to an aircraft ready to do something about it, according to current Chief of Staff Gen. Michael E. Ryan. This action would range from something as benign as humanitarian relief all the way up to

Staff photo by Guy Aceto

Satellites that provide imagery and electronic surveillance play a huge role in finding targets. The concept of reachback demands that they also be able to pass huge volumes of data back and forth from sensor to analyst to shooter.

delivery of a precision guided weapon. Afterward, USAF can determine the effect of its actions.

A Decade of Work?

However, Ryan and other senior Air Force leaders and thinkers maintain that the total realization of the "Find, Fix" concept will take at least another decade. It will also require the networking and linking together of all the military's sensor and intelligence systems as well as the transfer of many of them from airplanes to satellites.

Gen. John P. Jumper, head of Air Combat Command, said that F^2T^2EA should be "our bumper sticker ... going into this century." USAF's performance in the Balkans last year, he added, "verifies all of that," and "it describes what I think we ought to be aiming for."

Jumper said the Balkans operation showed that the tools USAF needed to meet the Find, Fix challenge already have been fielded (see box, p. 29) and that the task that now confronts the Air Force is to connect its myriad sensors, develop an automatic means of judging what the sensors find out, and streamline the steps needed to act on the information.

"Technologically, I don't think there are any miracles required," Jumper said. "There is ... more capability than we think now and less to do to make the rest of it come true than we think is necessary."

Find

In Jumper's view, the key element is "find"—the act of rapidly locating targets. "It's where we're working the hardest, and that's in this real-time business," he said.

During Allied Force, he noted, U-2s en route to reconnaissance targets in Kosovo could be redirected to scan a different hot spot. The imagery they collected was beamed back to Beale AFB, Calif., for analysis and forwarded electronically to the Combined Air Operations Center in Vicenza, Italy. There, a decision on whether to strike a newly found target could be made and data about it passed to aircraft orbiting near the target area.

Such a process could sometimes be run through in as little as 12 minutes, but Jumper told an AFA symposium in February that the goal is "single-digit minutes" from the scan order to bombs on target.

Jumper pointed out that this procedure is "not something we practice enough in peacetime" but that "we are going to make that, now, a mainstay of our tactical planning and execution."

USAF photo by SSgt. John E. Lasky

U-2s flying over the Balkans could be switched to new reconnaissance targets en route. Rapid retargeting will be crucial to finding and destroying deadly pop-up targets such as mobile ballistic and surface-to-air missiles.

Brig. Gen. David A. Deptula was, until recently, the commander of Operation Northern Watch and is the author of seminal Air Force monographs on parallel warfare and strategic control. He declined to give any specifics about how he employed the Find, Fix concept in retaliatory strikes against Iraq for transgressions of the no-fly rules. However, he did say, "We can bring [ISR] resources to bear to do very well in a particular area. Now, the challenge is to broaden that specialized capability and make it the norm, not the exception."

Ryan said advancing technology is adding greater depth to ISR capabilities. He observed that today's sensors operate in many different wavelengths and frequencies. Soon, however, the Air Force will be able to "meld" them together and, in a few years, develop computer algorithms that "merge the information in a way that things just leap out at you."

Ryan went on to say, "If you could take a satellite photograph, meld it with an Elint [electronic intelligence] hit, meld it with a Predator video, put that on top of a multispectral, high-altitude flyover with a SAR [Synthetic Aperture Radar] picture, ... that would enable you to see" the true nature of what's on the ground. It would eliminate—or at least drastically reduce—the identification problem, added the Chief.

Ryan explained that the technology focus for the Air Force right now is to obtain that networking capability. The Link 16 data-sharing system and Joint Tactical Information Distribution System are projects "we have been talking about ... for years," said Ryan. "It's now time for JTIDS to get on our aircraft in a big way, ... so we can do something about what we find out there."

Ryan has Air Force Research Laboratory working "very heavily" on what are called "multispectral capabilities"—the capacity of a system small enough to fit on a fighter aircraft or even on a missile to see in many different frequencies at once and automatically determine what it's looking at. He calls this initiative TUT, for Things Under Trees.

Such technologies are classified but almost certainly involve varying types of imaging infrared and millimeter wave, extremely high frequency radars that can distinguish between wood and metal or between an empty fuel storage tank and a full one, for example. Ryan said such systems will allow operators to "see tanks whether they're camouflaged or not. And I think we're not too far from that."

Fix or Track

The term "fix" means making an accurate determination of location. The fix portion of what is sometimes called the "kill chain" can be conducted in a number of ways. Items of interest can be imaged and the pictures compared with earlier images, which include landmarks whose location is precisely known. This permits the establishment of a precise geo-location of a given target. In a featureless environment such as a desert, an aircraft or ground troop can help establish position through use of Global Positioning System satellites.

The Air Force has opened a big push to equip nearly all of its ground-attack weapons with GPS capability, so precise target coordinates are essential. Laser designators wielded by launch aircraft, Unmanned Aerial Vehicles in the area, or ground troops can target for laser-guided bombs.

Air Combat Command officials said they have a concept of operations on how to approach the Find, Fix requirement. One official said the notional term for the strategy is "Wolfpack ISR." He explained, "We like the term Wolfpack ISR because we think it describes that process pretty well. ... You've got a lot of wolves out there hounding the target. A lot of times the alpha wolf is going to go in and make the kill, but he's working collaboratively with all the other wolves ... to keep on top of the target until they can do something about it."

Target

At ACC, officials are working to develop a function, called "time-critical targeting," which would be a key element of the Air Operations Center. Intelligence analysts in this area would be charged with finding and directing strike aircraft against pop-up targets such as Scud missile launchers and mobile surface-to-air missile launchers, an ACC official said.

These analysts will be equipped with "predictive tools" that can help them anticipate where the targets will pop up, and with other tools to quickly task whatever sensor is best positioned to investigate them.

An initial operational capability for the time-critical targeting capability is planned for the fall of 2002, but initial versions of the software will be put into wargames at Nellis AFB, Nev., this summer, an ACC official said. There, this software will become part of a new Dynamic Battle Control Center. The center is designed to help train decision-makers to deal with air employment issues that are larger than simply "managing the Air Tasking Order." As

USAF photo by MSgt. Steven M. Turner

The synergy between manned and unmanned aircraft—like this A-10 and Predator drone—was demonstrated in the Balkans and will be a hallmark of things to come. ACC envisions wolfpack tactics, hounding the target until the kill.

tricks and lessons are learned, the software will be constantly upgraded in a "spiral" fashion.

"We're not where we want to be in terms of time-critical targeting, yet," said Deptula, a veteran combat operator who is heading Air Force preparations for the next Quadrennial Defense Review.

In Northern Watch, explained Deptula, he was favored with "flexible and adaptable" rules of engagement which did not demand tit-for-tat strikes against specific offending radar sites; he could, rather, strike targets that could be viewed as part of a generalized Iraqi military capability.

Jumper admonished commanders not to confuse process with product. "In the ISR world ... we paid most homage to the collection process," said the general. "That collection process turned out not to be very agile when we tried to shift it into the targeting cycle, especially the rapid targeting cycle."

He went on, "We will have conquered this problem when we understand that no target ever died in the collection process. It only dies in the targeting process. We don't pop the cork when the image arrives. We pop the cork when the target is dead."

An ACC official involved in time-critical targeting said he believes it will take until around 2010 to get to the Fogleman goal. However, he said, "We're putting some pieces together now" that will bring the Air Force much closer to achieving Find, Fix capability in "the next couple of years."

He said that the effort will continue "to shave minutes off the process."

Engage

"The engagement piece has always been our strong suit," Jumper asserted. "Our tactical proficiency is unmatched. If we know where the target is, we have things that will get that target." He said USAF has the means to "pluck that [a target in the center of a city] out fairly well," and "we're getting better at the deeply buried stuff," such as command bunkers and other facilities underground.

Jumper wants to turn the Air Operations Center into a weapon system in its own right and believes it will be the key element in the Find, Fix concept. "It's the ability to bring decision-quality data before decision-makers," he said.

DoD photo

Pop the cork: This Serb tank was caught in the open and destroyed. For harder targets—what Ryan calls "Things Under Trees"—multispectral sensors will be used to create cockpit and AOC displays in which concealed items pop out.

He noted that air component commanders today have a situation roughly analogous to fighter pilots of the 1960s: They have many different sensors giving them information about the threats around them but have to synthesize that knowledge in their heads to come up with a plan of action.

A future AOC, Jumper envisions, will pull together sensor data from many different platforms, overlay it, and create a comprehensive digital picture of the battlespace where every threat is clearly visible and the commander can focus on how best to use his forces and coordinate with others.

A computer program will "get you to the 90th percentile of certainty" about the best way to package forces, which weapons to use, and how, when, and where to orchestrate refuelings and other types of missions, Jumper asserted. It will then query the planner with the question, "Do you want to do this or not?"

When the joint forces air component commander arrives in the morning, said Jumper, "he punches 'enter' on the computer, and he watches the whole thing [the aircraft in the ATO] fly out in 10-times speed. ... He is now making decisions on the efficiency of the force, on the effectiveness of the force, instead of hearing a verbal description of a plan that [he] can't visualize."

Jumper pointed out, "Not all targets are things that you kill. Some of them ... are targets that you save," and the "engage" portion of the Fogleman catchphrase may mean delivering rations to stranded refugees as easily as it might mean putting precision ordnance on a tank.

The ACC concept is heavy on joint prosecution of time-critical targets, since every minute counts.

"Time-critical targeting is a joint mission area," the ACC official said. "No one component is going to own everything. We're going to have to work collaboratively ... and within a coalition in some cases ... to do this effectively."

All that counts, he said, is finding the fastest, most reliable way to kill the target. He added that there are only a certain number of truly time-critical targets in a theater, but, as the capability is developed, it may later expand and thus permit greater across-the-board flexibility.

"We're going to start with the most important targets," the official explained. "Our initial instinct is, we're not going to try to eat the whole elephant" at once but consume it "one leg at time."

Assess

Jumper acknowledged that assessment, seeing if the desired results have been achieved, requires more knowledgeable analysis.

Unmanned Aerial Vehicles and the nose-mounted cameras on many new

munitions have greatly added to the assessment piece of the chain, a USAF weapons expert explained.

"The process of finding out if you got what you were going after starts when the tape goes fuzzy," he said, referring to the moment of impact recorded on videotapes of imagery relayed back from optically guided munitions or from aircraft gun cameras.

"You look at the tape and you can see, first, if you were in the right ballpark and then if you hit the right bleacher in that ballpark." In the case of laser-guided bombs, which are guided by a cursor on a video display, the explosion itself is recorded. Having that information to start with can speed the process of tasking satellites, manned reconnaissance airplanes, or UAVs to look for the damage done and help commanders decide if the target is dead or must be restruck, the expert said.

In the case of UAVs orbiting nearby, the target assessment can sometimes be made in real time, thus vastly shortening the time required to decide on whether a restrike is necessary.

Subsequent imagery is examined to determine whether there is any activity at the site, whether there were secondary explosions, or whether key structures were collapsed. In the case of bunkers, tapes and images are scrutinized to see if the explosion vented from an air shaft.

The assessment process can be extensive. In Allied Force, a full count of Serb armored vehicles and artillery destroyed by NATO aircraft required on-site visits from experts to determine whether an actual vehicle or decoy was struck and whether damaged hulks had been dragged away by the Serbs.

A greater number of satellites or sensor platforms with "longer dwell time" over the target area would drastically reduce such ambiguity, an ACC official said.

Extreme Vigilance

Deptula noted that today's systems, such as the E-3 Airborne Warning and Control System aircraft and the E-8 Joint STARS radar aircraft, yield only "transitory" depth of knowledge and only in a designated place and time. Still on the horizon is what he calls "pervasive ISR" that would keep watch over large parts of the world—even "quiet" spots—and automatically note changes in activity that should be brought to the attention of decision-makers.

"I'm a big advocate of working toward ... pervasive ISR," said Deptula. "Generally, we focus our ISR assets on the basis of other intelligence directing us" to watch a particular area of interest. "We focus them [ISR assets], and we observe and we try to detect and track." The better approach, he said, would be "to have the capability to observe all the time, and identify patterns of routine, and then if there is ... a deviation from the routine, then we focus on that difference. ... So you're not out there searching for information; you have the information already. It now becomes an analysis challenge."

Such a global-watch capability would be "well into the future" but is exactly the "kind of system and capability we need to be planning to obtain." He added that such a 24-hours-a-day, watching-all-the-time requirement "very quickly takes you to a space-based system."

The Discoverer II program, for example, is an effort to develop a space-based radar capable of spotting moving targets on the ground. It would be like having a space-based Joint STARS but with the ability to remain on station indefinitely.

Secretary of the Air Force F. Whitten Peters, at a recent Pentagon briefing, said, "We will never build enough JSTARS" to observe all the things that regional commanders in chief need to keep watch over.

Deptula said it's too early to estimate costs, but his guess is that "if you took the entire lifetime program cost of AWACS and JSTARS, Rivet Joint, EP-3s, Guardrails, and all the joint airborne reconnaissance and surveillance systems that we have out there, a space-based system would ultimately be more cost-effective."

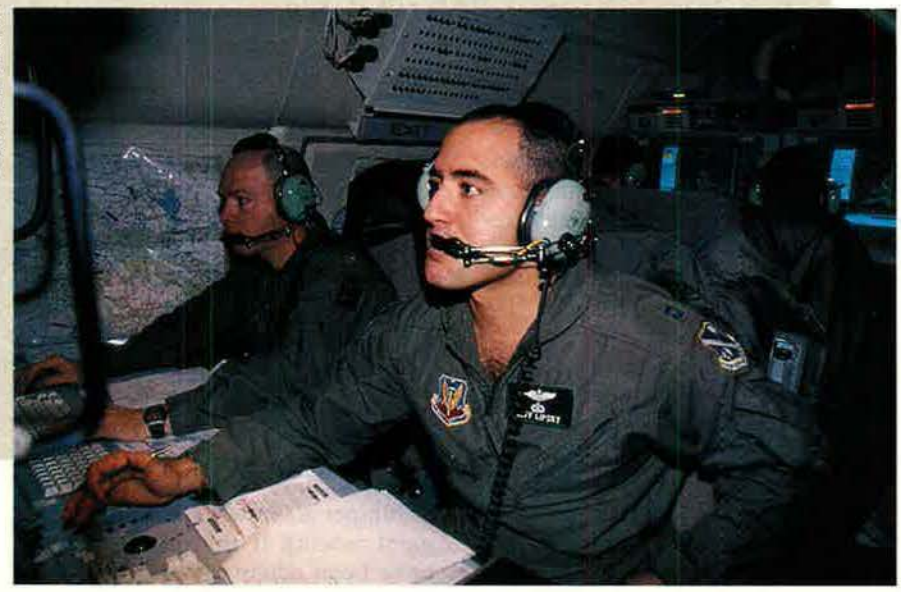
Resisting Temptation

Some critics have warned that the development of increasing detail in ISR information will tempt decision-makers at highest levels to indulge in micromanagement of a future war. Ryan said he is "not worried" about that happening. "I don't see that" as a future problem, he said. Rather, better information will simply "give them better insight, ... better granularity of information about what's really going on. ... I think this is for the better."

Jumper contended that the torrent of detail that will become available in a few years "begs for enough automation" to quickly answer the questions of greatest concern to political leaders. These systems would automatically assess issues such as potential for collateral damage, the ratio of risk to reward, and the like.

Jumper envisions political leaders agonizing less over targets and having fewer unanswered questions about the pros and cons of any par-

Staff photo by Guy Aceto



Joint STARS detects moving targets on the ground in an area the size of southern Iraq. All regional commanders want one, but there are never enough to go around. Space-based versions could sharply reduce the expeditionary footprint.

Staff photo by Guy Aceto

Constant upgrades have kept AWACS an indispensable element of any air operation for more than 20 years. Merging the AWACS, Joint STARS, U-2, and UAV data through sensor fusion promises unprecedented situation awareness.

ticular mission. With less delay in convincing leaders that a target is worthwhile, the battle plan can be more quickly and logically executed, he said.

It is vital, Jumper said, for political leaders to have their questions answered before missions are planned and launched, to avoid situations where strike packages already en route to their targets must be recalled or broken up. This happened on a number of occasions in Allied Force.

"We need to minimize turbulence at the engaged-force level," Jumper said. Missions were carefully timed and sequenced to ensure that everyone in the striking force had "the best possible chance of survival." The veto of a target at the 11th hour "causes an enormous amount of anxiety ... and introduces a dynamic that every military person understands and seeks to avoid." The scrubbed target, for example, might have been first in a chain of targets to be hit and sparing it could expose later strikers to a threat they'd planned on being destroyed.

Jumper asserted that commanders "have to be persuasive" with political leaders "and draw red lines and boundaries" around missions already under way to prevent the "tactical level interference" that could disrupt a planned mission.

Conversely, Jumper does not believe that an abundance of detailed information will make field commanders dependent on it and unwilling to act without it. Airmen are "trained to deal with uncertainty," he noted, in everything from weather and defenses to communications, so "uncertainty is a way of life."

"I don't think we'll ever have perfect information," Ryan observed, noting there will always be "some question about whether you ought to go or not go, move now, or wait." Moreover, he said, "What we must be careful of is that we don't have corrupted information" due to computer attacks or other information warfare. "All commanders should have a fair amount of skepticism about the data they get," he added.

Such tension has always been a part of warfare, he said, and he does not anticipate that the availability of many kinds of data will hamstring commanders always wanting one more piece of assurance. ■

A Survey of Today's ISR Platforms

E-3C Airborne Warning and Control System (AWACS): Can keep track of hundreds of aircraft flying in an area equivalent to the New York City–Boston air traffic control region.

E-8C Joint Surveillance Target Attack Radar System (Joint STARS): A joint program with the Army that provides detection of moving and stationary targets on the ground in an area as large as southern Iraq, as well as slow-moving rotary and fixed-wing aircraft and theater missile defense targets.

EA-6B: A joint Navy–Air Force electronic warfare aircraft that not only can jam enemy radars but can collect information about their location and operating parameters.

EP-3: A Navy P-3 Orion specially modified to collect electronic intelligence.

RC-12 Guardrail: An Army turboprop aircraft configured for collecting battlefield electronic and communications intelligence.

RC-135 Rivet Joint: Collects electronic intelligence on an adversary's radars, communications, and other systems.

RQ-1A Predator: An Unmanned Aerial Vehicle remotely piloted at medium altitudes to obtain detailed video imagery of enemy vehicles. At least one Predator was modified during Operation Allied Force to carry a laser target designator.

RQ-4A Global Hawk: Now in development, Global Hawk is a large UAV that will be able to provide image collection while maintaining station over an area of interest for many hours at a time.

Satellites: Several classified spacecraft can provide detailed imagery, in many wavelengths, of ground targets. The Lacrosse satellite, for example, can generate detailed images of the ground through cloud cover with its Synthetic Aperture Radar.

U-2: An Air Force high-flying reconnaissance aircraft that collects digital imagery in several wavelengths. The imagery can be transmitted to the aircraft's home base of Beale AFB, Calif., and analyzed while the mission is still under way.

The Long Deployment

The Air Force arrived in Saudi Arabia in 1990. Who thought it would still be there 10 years later?

THEY have become the unmistakable signs that Saddam Hussein is about to rattle the West's cage once again, and they can be as subtle as the silent flicker of a distant surface-to-air missile launch or as startling as the scream of an F-16 fighter's threat warning system.

On May 2—a day like any other in the no-fly zone over southern Iraq—Air Force pilots saw plenty of these signs. With no warning, Iraqi air defense batteries launched their deadly missiles and opened up with anti-aircraft fire directed at the patrolling Western aircraft. In response, a coalition strike package led by USAF F-16s pounded the offending Iraqi sites with precision weapons. Then, their work done, all aircraft returned safely to base.

May 2 was just another duty day in the Persian Gulf—Day 3,556, to be precise. Southern Watch began officially on Aug. 26, 1992, but USAF units by then had already been operating in the Gulf for some two years. Southern Watch was the successor to Desert Shield, Desert Storm, and Desert Calm, the aftermath of the war that had been fought in response to Saddam Hussein's 1990 invasion of Kuwait. The first USAF contingent arrived in Saudi Arabia on Aug. 8, 1990—10 years ago next month.

To the surprise of almost everyone, what was supposed to have been a brief stay in a harsh land has turned into one of the longest and most difficult deployments in Air Force history.

The mission increasingly resembles a low-level war with no end in sight. Air Force pilots—along with coalition partners—have flown more than 200,000 sorties as part of Southern Watch. That number exceeds the total flown during Desert Storm (though the latter took place under far more hazardous circumstances). In the past year, Central Command Air Forces has supplied 35 percent of the total air assets but has flown 68 percent of the total sorties.

Out of Mind

Meanwhile, combat engagements between Iraqi air defense units and US and allied aircraft have become so routine that they rarely rate a mention anymore in major US newspapers.

Since December 1998, coalition pilots in the southern zone have endured about 500 such provocations

By James Kitfield

Storm damage. *In the Gulf War, a coalition smart bomb punched out this bunker used by Iraqi forces occupying Kuwait. Nearly a decade later USAF forces use it as a storage site for C-130 aircraft parts.*

from Iraq's air defense units. Central Command, which manages Southern Watch, reports that, in the same period, Iraqi aircraft violated restrictions of the southern no-fly zone more than 150 times, often in attempts to lure allied aircraft into "SAM–bushes" further north.

"It is kind of a surreal mission, because a lot of people back home don't seem to be aware of what we're doing," remarked a USAF officer with a hand in Southern Watch. "The concern you sometimes hear from aircrews is that they don't understand, from a policy standpoint, where this mission is heading."

Despite the relative lack of US media attention, Southern Watch has had a profound impact on the Air Force. (A corresponding mission, Operation Northern Watch, is headquartered at Incirlik AB, Turkey, and is managed by European Command. The aircraft of Northern Watch patrol Iraqi airspace north of the 36th parallel. EUCOM and CENTCOM coordinate their no-fly operations via use of a special "hotline" communications link.)

For one thing, the demands of this decade-long desert deployment provided major impetus for the Air Force's decision to reorganize itself into 10 Aerospace Expeditionary Forces capable of handling regular, extended but temporary deployments.

The Southern Watch mission contributed significantly to a breathtaking pace of operations, causing major readiness problems throughout the Air Force. In May, an Air Force official said that one-third of Air Force combat units are now not fully ready for war—largely as a result of manning and spare parts shortages—the lowest readiness level in 15 years. To many, a large part of the problem comes from "the Sandbox."

The Southern Watch requirement for combat-ready forces has spurred equipment upgrades and modernization in the Air National Guard and Air Force Reserve Command, which are now supplying 10 percent of USAF's deployed Aerospace Expeditionary Forces. In 1999 the Air National Guard contributed KC-135 tanker aircraft, C-130 airlifters, an HC-130 refueler aircraft—as well as 17 fighter aircraft—to Southern and Northern Watch. Under the new 15-month AEF cycle, the Air Guard will commit over 25,000 airmen.

Southern Watch Mission

✔ To plan and, if directed, conduct air campaign against Iraqi targets as a means of compelling Iraq to comply with UN Security Council Resolution 687, which calls for UN inspections of Iraqi weapons-making potential.

✔ To enforce the no-fly zone south of 33 degrees north in Iraq, in support of UNSCR 688, demanding Iraqi leader Saddam Hussein end his suppression of the Iraqi civilian population.

✔ To enforce a no-drive zone south of 32 degrees north in Iraq in support of UNSCR 949 to prevent enhancement of Iraqi military capabilities in southern Iraq.

There Is an Upside

The frequent combat engagements and real-world nature of the Southern Watch mission have contributed to the rise of a combat-seasoned and experienced Air Force—a rare development in peacetime.

"You know, for an extended period after Vietnam, there were a lot of airmen who never even had the opportunity to drop a live bomb," said Brig. Gen. Hugh C. Cameron, deputy commander of CENTAF, headquartered at Shaw AFB, S.C. "Starting with Desert Storm and working for nearly a decade on Southern Watch, we now have a lot of combat veterans who have been shot at and who have put real ordnance on a real target during real-world missions."

The general went on, "There are tremendous benefits associated with that experience. I think Southern Watch was also instrumental in changing the Air Force's view of how it conducts business. You've seen that in our efforts to develop an expeditionary mind-set much like the US Marine Corps."

The southern no-fly zone came into being in 1992 as a result of United Nations efforts to protect Iraq's Shiite Muslim minority in the south. The so-called "Marsh Arabs," who inhabit the delta of the Euphrates River at the southern end of Iraq,

USAF photo by SrA. Greg L. Davis

***Workhorse.** F-16CJs armed with HARM missiles play a key role in no-fly zone enforcement. Here, an F-16CJ from Prince Sultan AB in Saudi Arabia refuels before returning to its Southern Watch patrol mission.*

had mounted a postwar rebellion against Saddam and thus had come under ferocious Iraqi air attack. The UN agreed to block Iraqi military flights south of 32 degrees north, and airpower was the chosen instrument.

Lt. Gen. Michael A. Nelson, then commander of CENTAF, deployed with his staff to Riyadh, Saudi Arabia, and took command of Joint Task Force–Southwest Asia, which ran this operation, soon named Southern Watch. USAF deployed additional aircraft to bring the number of aircraft up to 70 and deployed personnel to about 4,000. Nelson and most of his staff left in November 1992, but Southern Watch continued.

The Southern Watch zone (the northern boundary was changed several years ago; it is now 33 degrees north, which extends to the outskirts of Baghdad) is patrolled by aircraft from bases in Saudi Arabia and other locations in Southwest Asia and from US Navy aircraft carriers in the Persian Gulf. CENTAF deployed an Air Operations Center to Saudi Arabia to plan and execute daily flight operations for US aircraft assigned throughout the area.

Since their inception, the two no-fly missions have evolved into twin pillars of the US strategy of containing Saddam Hussein and severely limiting the operational maneuvering room of his military forces. "The no-fly zones are a necessary measure to contain Saddam Hussein's aggression against the people of Iraq and the region," said Alina L. Romanowski, deputy assistant secretary of defense for Near Eastern and South Asian affairs, in testimony before a House committee last March.

She went on, "Operations Northern and Southern Watch have ensured that Baghdad is unable to use fixed-wing aircraft and helicopters against the populations of northern and southern Iraq, a limitation that sharply reduces the effectiveness of regime operations. In addition, Southern Watch also ensures that Iraq cannot secretly reinforce or strengthen its military forces in southern Iraq in violation of UN Security Council Resolution 949."

Two Bombings

From the outset, Southern Watch represented a significant strain on the Air Force. CENTAF commits to the operation roughly 6,000 airmen and 120 aircraft, the bulk of them from Air Force units. Soon after the end of the Gulf War, this large American military presence began to generate a political backlash among conservative Muslims in Saudi Arabia. Possibly as a result of an increase in local political tensions, two terrorist bombings were launched against the US presence.

On Nov. 13, 1995, a bomb was detonated in Riyadh at a Saudi National Guard Office used by American trainers. Killed in the attack were five Americans and two Indians. Then on June 25, 1996, a massive truck bomb demolished the Khobar Towers apartment building in Dhahran, killing 19 airmen and wounding 500 other US personnel. The perpetrators never have been publicly identified or captured.

US and Saudi officials responded by redeploying most Air Force and allied personnel to Prince Sultan AB, a desolate and remote installation located near the town of Al Kharj, some 60 miles southeast of Riyadh. According to Air Force officials, the trauma of the bombing and transfer to Prince Sultan reinforced the sense among airmen that Southern Watch is a dangerous mission requiring a completely no-nonsense attitude.

"Thanks to a lot of help from the Saudis in building new apartments at Prince Sultan, we're now out of our tents and enjoying facilities that include a PX, dining facility, gym, and a swimming pool," said Cameron. "That has greatly improved the quality of life for our forces.

Security is the uppermost consideration, however.

"Our location way out in the desert doesn't lend itself to people getting off base and touring around," remarked Cameron. "That atmosphere of an expeditionary base reinforces an attitude that this is a very serious, real-world mission. That works against any of our people getting complacent, whether it's the aircrews or our security forces."

Southern Watch has been a prototype of the kind of continuous deployment to expeditionary bases that increasingly has taxed Air Force personnel and resources.

Air Force men and women assigned to Southern Watch found themselves separated from their home bases and families for unpredictable and extended periods each year. Bases back in the United States were often left short of required personnel. With so many of the most experienced pilots and frontline aircraft deployed to Southwest Asia, home-station training suffered.

Because such deployments were considered temporary contingencies, it was difficult to bring in reserve forces that required advanced warning and scheduling of operations. Smaller units with specialized capabilities in very high demand for real-world missions—surveillance and reconnaissance, combat search and

DoD photo by SrA. Sean Worrell

Aftershock. ***The June 1996 bombing of Khobar Towers killed 19, wounded hundreds, and forever changed the US profile in Saudi Arabia. USAF moved all units to the desert air base, and force protection became high priority.***

rescue, electronic countermeasures, suppression of enemy air defenses—were stretched to the breaking point.

The AEFs In Action

USAF responded by reorganizing its operations to become an Expeditionary Aerospace Force. Active, Guard, and Reserve forces were reorganized into 10 deployable AEFs designed to be employed two at a time for 90 days over a 15-month rotational cycle. Not surprisingly, when the first two new AEFs began their cycles on Oct. 1, 1999, AEF 1 was assigned to support Southern Watch.

Central Command officials say that AEF rotation has helped inject an extra measure of predictability and cohesion into Southern Watch.

"Besides helping the Air Force to develop a more expeditionary mindset, the AEF is building a team concept into these deployments," said Cameron. "Before, with base support functions, especially, you had a lot of individuals coming from different bases. With the AEF, those people will train together in advance as a unit, get to know one another, and thus be better prepared to fall in on a remote location and get on with business."

However, many deployed forces still must come from the US–based wings of 9th Air Force. For this reason, officials claim, manning shortages persist.

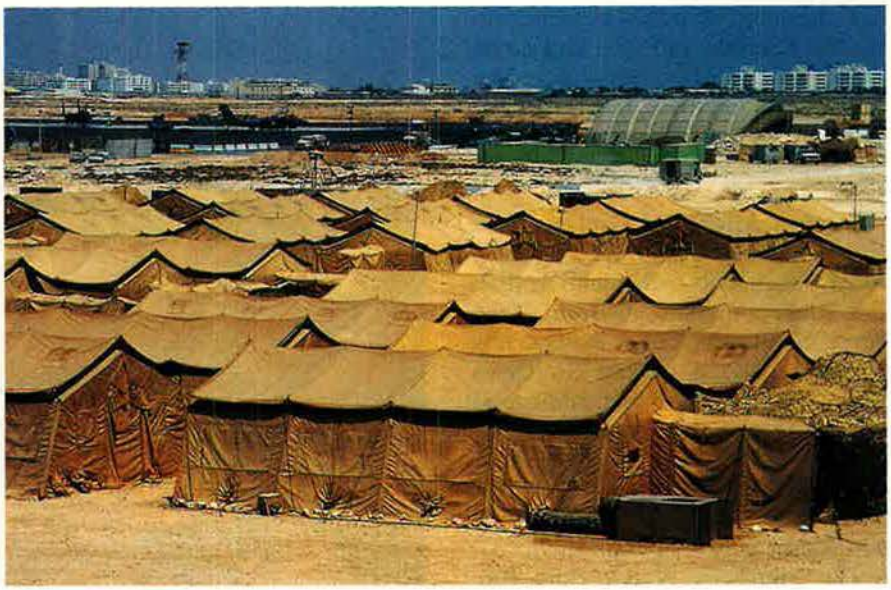
"I only have so many civil engineers, military police, and public affairs people, and when they are assigned to Southern Watch, I take it out of my hide," Cameron noted. "Yet the demands at this base don't go away. The AEF concept has [instilled] a whole new discipline in how we analyze our manpower requirements for Southern Watch. We're constantly asking ourselves, how many people do we really need over there? We know the answer will have a direct impact on our operations tempo back at home base."

The forward deployed forces of Southern Watch have seen their share of action over the past eight years. For example, on Oct. 14, 1994, a newly assertive Iraq began moving ground forces toward Kuwait. President Clinton ordered an immediate response. Within days, CENTAF's new commander, Lt. Gen. John P. Jumper, and most of his key staff members had deployed to Riyadh, where Jumper took command of JTF–SWA.

Soon, at Jumper's direction, the Air Force had embarked on Operation Vigilant Warrior, which saw the rapid expansion of CENTAF air assets to more than 170 aircraft and 6,500 personnel. Iraq soon recalled its troops and the crisis passed, but the US decided to retain in the theater some 120 aircraft and 5,000 USAF personnel. Moreover, in the wake of the crisis, Kuwait for the first time permitted the Air Force to permanently station fighter aircraft on its soil. A squadron of A-10 attack aircraft bedded down at Al Jaber AB in Kuwait City.

Many, in retrospect, have said that Vigilant Warrior was a precursor to today's AEFs. The concept was taken up, studied, and refined over the next several years.

In October 1995, as a result of Iraqi threats, Jumper once more became concerned. Specifically he was worried about CENTAF's inability to deliver a full complement of airpower against a Gulf aggressor should there be no US aircraft carrier on station in the area. (Carriers



Staff photo by Guy Aceto

Nomads. *Tent cities (such as this one in Doha, Qatar, used by an AEF in 1996) were early signs that the Air Force was shedding its garrison-based past in favor of an expeditionary future.*

USAF photo by TSgt. James D. Mossman

Up Close. *An F-117 ground crew at Al Jaber AB, Kuwait, prepares for another day's operations. The stealth aircraft have made frequent visits to the base, situated virtually next door to Iraq.*

did not remain on Gulf station constantly but rotated in and out several times a year.) In response, Jumper developed the concept of a squadron-sized AEF which would be able to deploy to the region on two days' notice.

Late in 1995 came the first deployment, AEF I, consisting of 18 aircraft from the 20th and 347th Fighter Wings, which deployed temporarily to Bahrain. (Roman numerals were used to designate these early concept AEFs.) In March 1996, the Air Force deployed to Jordan its AEF II, consisting of 30 fighters, four tankers, and about 1,000 personnel. Soon, new AEFs were deploying to the region several times a year.

Desert Strike

In late 1996, Southern Watch forces became embroiled in yet another combat action. Saddam Hussein launched his forces into the UN–protected Provide Comfort zone in the north, routing Kurdish rebels in the process. The US responded on Sept. 3, 1996, by launching Operation Desert Strike. B-52 aircraft and warships in the Gulf launched a total of 44 cruise missiles at targets in southern Iraq.

In late 1997, Iraq was harassing UN weapons inspection teams, banning them from Saddam Hussein's "presidential palaces" and other sites. As the Clinton Administration planned a response in early 1998, the question was whether Air Force units based in Saudi Arabia would get permission to launch strikes from Saudi soil.

Saudi Arabia had allowed enforcement of the no-fly zone but was unwilling to let its bases be used for attacks on Iraqi targets. Kuwait gave its approval, and other Gulf states offered help. USAF units in those countries were joined by B-52s sent to Diego Garcia and naval aircraft aboard a second carrier sent to the Gulf region.

Evidently, Saudi Arabia was fully prepared to permit Air Force fighters to strike Iraq from its bases—if Washington was serious about knocking off Saddam. The rulers of the kingdom had come to the conclusion that there would be no serious attack. Saudi concerns were not without merit. The US for years had tried only to "contain" Iraqi aggression with "pinprick" strikes, having no military impact. Indeed, the crisis of early 1998 faded away without the US taking action.

The Iraqi strongman clearly was frustrated at being kept in his "box" by international sanctions, weapons inspections, and no-fly operations. Yet he was determined to continue his clandestine development program for Weapons of Mass Destruction. As a result, he expelled all UN weapons inspectors and, when it was clear the inspectors would not be allowed back into Iraq, Washington and its allies decided to respond.

In December 1998, the coalition launched Desert Fox, a desultory, four-day campaign of strikes from the south against Iraqi targets. DoD officials insisted the mostly Navy airstrikes set back Iraq's ballistic missile programs by one to two years, degraded the infrastructure used to conceal Weapons of Mass Destruction programs, and reduced the Iraqi regime's ability to exercise effec-

A Decade in the Desert

Aug. 2, 1990. Iraqi forces invade Kuwait, threaten Saudi Arabia.

Aug. 8, 1990. First USAF F-15 fighters arrive in Saudi Arabia, initiate Desert Shield.

Oct. 31, 1990. USAF force in Gulf reaches 700 aircraft and 32,000 personnel.

Nov. 8, 1990. President Bush announces plans to greatly expand US forces and to use troops to eject Iraqi forces from Kuwait.

Nov. 29, 1990. UN authorizes use of military force to eject Iraq.

Jan. 17, 1991. Coalition launches massive USAF–led air campaign against Iraqi targets in Iraq and Kuwait.

Feb. 28, 1991. Iraqis give up, coalition suspends operations.

March 1991–August 1992. Desert Calm redeployment of forces to US. Control of USAF elements passes to 4404th Wing (Provisional) at Dhahran, Saudi Arabia.

April 5, 1991. UN authorizes Provide Comfort to protect Iraqi Kurds from Saddam Hussein's forces.

Aug. 26, 1992. UN establishes Southern Watch to protect Shiite Marsh Arabs from Iraqi air attack.

Dec. 27, 1992. In first serious challenge to no-fly enforcement, Iraqi MiG-25 radar locks onto USAF F-16, which quickly shoots down the Iraqi aircraft.

Oct. 14–Dec. 21, 1994. Vigilant Warrior increases US air assets to 170 aircraft and 6,500 troops. Iraq ceases threatening moves toward Kuwait.

October–December 1995. AEF I deployment of 18 aircraft to Bahrain.

March–June 1996. AEF II deployment of 30 fighters, four tankers, and 1,200 troops to Jordan.

June 25, 1996. Bombing of Khobar Towers kills 19 airmen.

June–October 1996. US redeploys forces from Dhahran to remote, high-security Prince Sultan AB at Al Kharj and to Eskan Village near Riyadh.

August–September 1996. Saddam Hussein attacks Kurds in northern Iraq. US responds with Desert Strike—B-52 raids and Navy cruise missile attacks on targets in southern Iraq.

October 1997–May 1998. Iraq harasses UN weapons inspectors, threatens to shoot down USAF reconnaissance aircraft. US deploys more forces to region.

Dec. 16–19, 1998. Desert Fox, a 70-hour air campaign, attempts to punish Saddam Hussein for barring weapon inspectors.

January 1999–July 2000. Increased Iraqi SAM and anti-aircraft artillery attacks on coalition aircraft enforcing Southern Watch.

USAF photo by A1C Denise Bordar

Into the Sandbox. *Capt. Bill Peris, F-15 pilot at Kadena AB, Japan, prepares for a 2000 AEF deployment to Saudi Arabia. The long deployment has drawn in units from around the world.*

tive command and control over its forces.

Belligerent and Militant

The nature of Southern Watch changed dramatically after Desert Fox, with Saddam Hussein adopting a more belligerent and militant attitude toward coalition aircraft.

The Iraqi dictator's behavior leaves little doubt in the minds of Central Command leaders about the threat he continues to pose to the region, or the need to keep him boxed in with Southern and Northern Watch.

Marine Gen. Anthony C. Zinni, CENTCOM commander in chief, recently told Congress: "Iraq has not forgone its missile and WMD programs and continues to resist the reintroduction of United Nations arms inspectors. ... Despite claims that WMD efforts have ceased, Iraq probably is continuing clandestine nuclear research, retains stocks of chemical and biological munitions, and is concealing extended-range Scud missiles, possibly equipped with [chemical or biological weapons] payloads. ... The Iraqi regime's high regard for WMD and long-range missiles is our best indicator that a peaceful regime under Saddam Hussein is unlikely."

There have been near-constant provocations of allied aircraft enforcing Southern Watch in the wake of Desert Fox. In the first month, Iraqi committed more than 70 no-fly-zone violations, involving more than 100 Iraqi aircraft, as well as 20 SAM firings at allied aircraft. Iraq tripled the number of SAM batteries in southern Iraq. In addition, Saddam Hussein reportedly has offered a bounty to any member of his forces who downs an allied aircraft.

"Clearly, he wants to shoot down an American airplane," Zinni stated at a Pentagon briefing following Desert Fox. He added that Saddam may want a Western pilot "to parade in Baghdad."

Zinni continued, "He obviously has not succeeded in convincing Arab leaders in the region to support him. They obviously feel that he's been responsible for everything that's happened. ... He's much more isolated. [An argument] could be made as to whether these [provocations] are becoming acts of desperation."

In response to provocations, US operational commanders in charge of Southern Watch have been given greater flexibility. They can not only defend their forces but also target Iraq's entire air defense system.

CENTCOM officials estimate that, since late 1998, the coalition's aircraft have destroyed some 30 percent of Iraq's air defense network. In 1999, USAF forces dropped roughly 1,200 munitions on Iraqi air defense sites. The combined Southern and Northern Watch Operations, meanwhile, cost an estimated $1.1 billion annually.

"Our operations in the no-fly zones also provide other operational military benefits," said DoD's Romanowski. "Coalition responses have caused a significant degradation of Iraqi air defense capabilities in the zones, a development which will minimize the threat to our forces if more sustained military conflict in Iraq is ever necessary. Furthermore, our control over 60 percent of Iraq's airspace permits us to assess Iraqi military movements and other developments that might threaten Kuwait or Iraq's other neighbors. Enforcement of the no-fly zones thus provides us with critical early warning of any Iraqi aggression toward its neighbors to the north or the south."

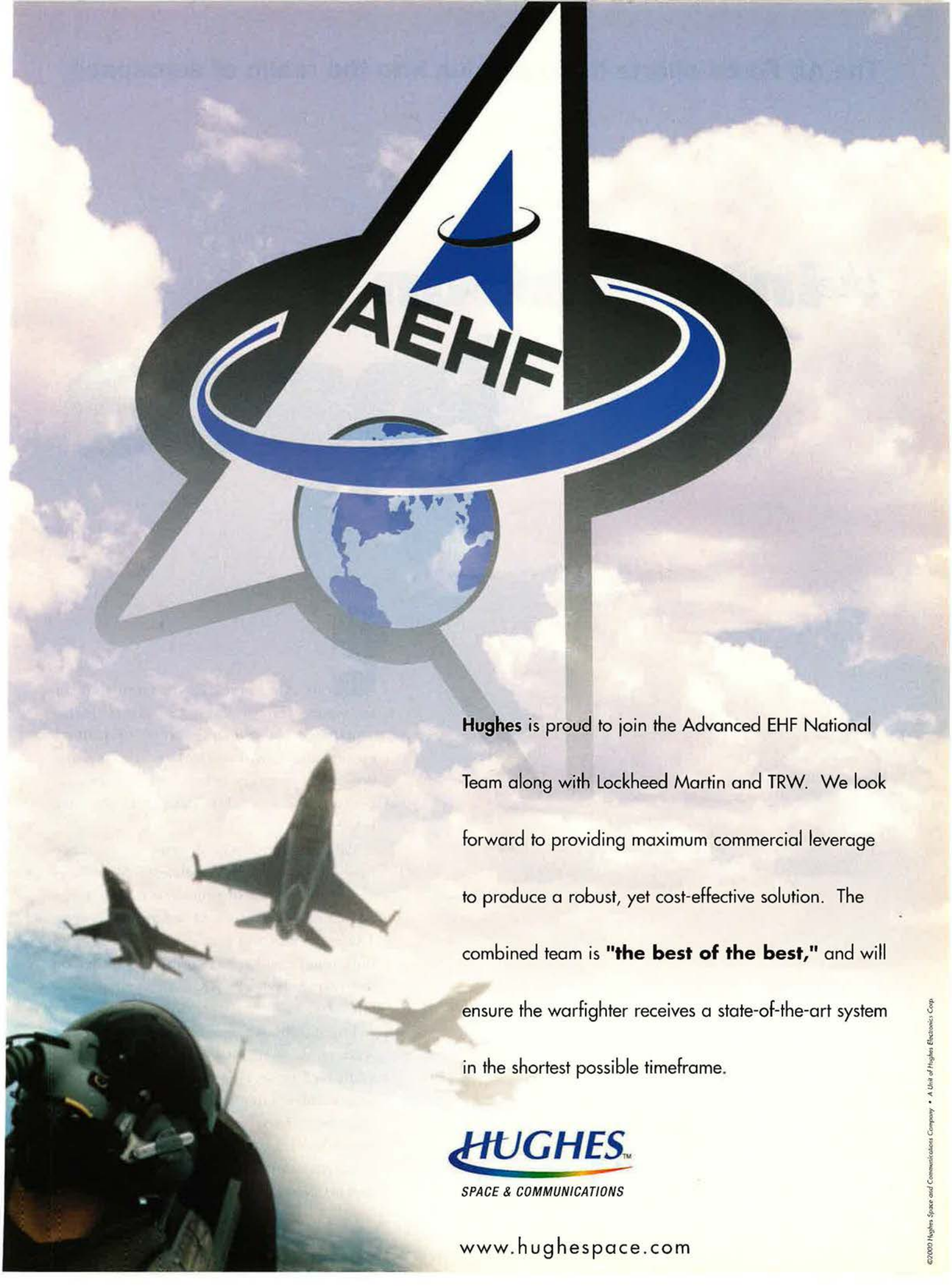
In the meantime, American airmen are left to fly and fight in a remote hot zone. The unique demands and limitations in such a mission color every aspect of Southern Watch operations.

Iraq's state-controlled media contend that the allied bombings have claimed the lives of 290 Iraqi civilians. For their part, CENTAF officials point out that pilots err on the side of caution and will do so again if Saddam Hussein reverts to his familiar tactic of placing air defense sites in civilian areas.

"We constantly emphasize to our forces that this is not World War III but, rather, a UN mission, and we certainly don't want unwarranted civilian casualties," said a CENTAF official. "We're very careful to attack only military targets and avoid civilian casualties, which is showing more concern for the Iraqi people than Saddam typically exhibits."

As for Air Force pilots assigned to Southern Watch, few are complaining—as in past years—that the mission essentially boils down to "boring holes in the sky." Said Cameron, "You certainly don't hear that anymore. Every time our crews go into 'the Box,' they know there's a pretty good chance they'll get shot at. That keeps everyone on their toes." ■

James Kitfield is the defense correspondent for National Journal *in Washington, D.C. His most recent article for* Air Force *Magazine, "The Decline of the Nuclear Stockpile," appeared in the February 2000 issue.*



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The Air Force charts its expansion into the realm of aerospace.

the integration of Air & Space

By John A. Tirpak, Senior Editor

THE Air Force has declared that air and space form a single "seamless operational medium" for the exercise of military power, and it will refocus its training and operating concepts to reflect that view, according to a new white paper on aerospace integration.

This new emphasis on integration, made explicit in the paper, released May 9, is expected to lead to a more efficient force dedicated to mastery of aerospace power. The expectation is that it will focus not on individual combat platforms but rather on delivering desired effects to combat commanders.

Titled "The Aerospace Force: Defending America in the 21st Century," the paper is addressed to serving USAF members. It is also clearly intended to answer outsiders who have been clamoring for a separate space service and critics who feel the Air Force has not been an aggressive steward and proponent of space systems.

The paper puts doctrine behind a functional move that has been discussed and been in progress for several years.

The document notes that USAF today is responsible for providing most of the air and space systems used by the American military and also controls almost 90 percent of Defense Department space-related resources, including personnel, infrastructure, budget, or platforms. Whereas the other services focus on surface combat, the Air Force uniquely is charged with planning revolutionary developments in aerospace.

The paper forecasts that the nation's "reliance on space-based capabilities" will grow, and this will create "an economic and military center of gravity—a vulnerability." When this happens, it will be the Air Force's job to ensure continued access to space systems.

Only Full-Spectrum Force

The paper claimed, "As more spacefaring countries emerge and technology advances, the potential for threats from and in space will increase. Space control will become a required capability of our Air Force." The Air Force is the only service now equipped to provide a full spectrum of capabilities in aerospace.

"'Aerospace' describes the seamless operational medium that encompasses the flight domains of air and space."

The move to an integrated air and space capability within USAF has been under way since Operation Desert Storm in 1991, said the white paper. As space systems have been made more transparent, more of the intelligence and information collected by national means is making its way to the hands of field commanders, demonstrating the merging of the air and space mediums.

The attributes of aerospace power are speed, range, perspective, precision, and three-dimensional maneuver, USAF said. The integration of air and space assets will allow attacks on concealed or mobile targets "with breathtaking speed." The long range of aircraft—or vehicles operating from space—gives USAF global range. The "high ground" will give US commanders the ability to view the enemy's actions "in context" and at extended distances.

The availability of highly accurate space-based navigation and timing systems has already brought about a quantum leap in bombing accuracy, the white paper said, and the ability to maneuver in three dimensions makes it possible to "bypass traditional tactical and operational barriers, and even terrestrial notions of sovereignty to pursue strategic, operational, and tactical objectives."

In the near term, according to the paper, one way USAF is planning to demonstrate its "commitment" to air and space integration is by making acquisition choices based on which systems fit into an integrated structure. In addition, it will field "Aerospace Operations Centers (AOCs) as weapon systems" and "a data fusion system," putting intelligence, surveillance, and reconnaissance information from all sensors into a decision-quality format that "joint force aerospace component commanders" can use to plan battles and revise tactics on the fly.

"'Aerospace power' is the use of lethal and nonlethal means by aerospace forces to achieve strategic, operational, and tactical objectives."

USAF plans to begin cultivating aerospace leaders proficient in tapping the capabilities of aircraft and spacecraft to accomplish military objectives. The service said it wants to provide career broadening opportunities for personnel who want to cross-train in space and air systems and through development of an Air Force–wide "aerospace mind-set."

The paper suggests that those having such experience and training in "how aerospace power contributes to mission accomplishment" will be preferred for promotion and command and that there may be organizational changes to remove distinctions between air and space operators.

Wargames and simulations will be developed to educate USAF personnel on "the use and limitations of our aerospace capabilities." The service counted as one of its significant joint experimentation achievements in 1999 the integration of the space tasking order with the air tasking order.

"The Best Path"

USAF asserted that the "systematic combination of air and space capabilities is the best path for the Air Force to fulfill its national security obligations."

Merging air and space systems and providing a comprehensive view of what's going on will allow leaders to "make resource decisions based on capabilities that produce the desired military effects—regardless of where platforms fly, orbit, or reside."

"Aerospace integration is the best way to advance our warfighting capabilities and continue to fulfill our roles within the joint team."

The document provides a long list of initiatives in space launch, intelligence, surveillance, reconnaissance, lasers, and other technologies, demonstrating the Air Force's commitment to effective management of the US military space effort. USAF plans to be "cooperatively engaged" with other services and ci-

Not Enough, Says Senator Smith

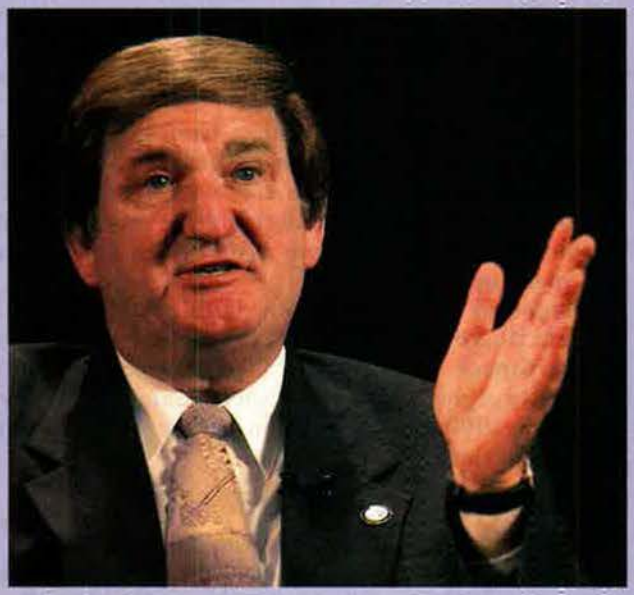
Even as the Air Force seeks speedier integration of air- and space power, critics complain it is dragging its heels.

Prominent among the critics is Sen. Bob Smith (R–N.H.), a member of the Senate Armed Services Committee. In a recent speech in Washington, Smith questioned USAF's commitment to space power and warned he is prepared to seek creation of a separate space force, if USAF doesn't get a move on.

He charged that military interest in space begins and ends with transmittal of information for traditional operations.

"Unfortunately, ... expanding and refining our ability to gather and transmit information has been the Defense Department's principal focus in space," claimed Smith. "The Air Force's space budget is dedicated almost entirely to the maintenance and improvement of information systems, as a means of increasing the effectiveness of existing forces here on Earth."

He went on, "As important as early warning, intelligence, navigation, weather, and communications systems may be, today they are basically dedicated to supporting nonspace forms of power projection. This is not space warfare. It is using space to support air, sea, and land warfare."



AP Photo/Jim Cole

Sen. Bob Smith (R–N.H.)

USAF has concentrated its financial resources on airpower, in Smith's view, and provided only "paltry" sums for development and production of space systems. He said he simply does not perceive any dedication to the task of building space power.

"As I look at the way it is organized, trained, and equipped," argued Smith, "I do not see the Air Force building the material, cultural, and organizational foundations of a service dedicated to space power."

Indeed, he continued, the Air Force in some ways is regressing. "Where are the science and technology investments and the technology demonstrations that the Air Force is currently pursuing in order to build for a future space-power projection capability?" he asked. "Where is the Air Force's space-based missile defense development program? ... Where is the Air Force's military spaceplane program?"

No "warfighting community ... that in any way rivals the parallel air and missile organizations" has emerged within the US Air Force, said Smith, who further claimed, "We will need more than a better space-power culture, and more than money, if we hope to dominate the space frontier."

Specifically, said Smith, the United States must consider the prospect of "dramatically" changing its institutional space arrangements.

"If the Air Force cannot or will not embrace space power," he warned, "we in Congress will have to drag them there, kicking and screaming if necessary, or perhaps establish an entirely new service. Drastic as that sounds, it is an increasingly real option that may be necessary to put this nation on a course toward space power."

"Frankly, I am less concerned with who delivers space power than I am committed to getting it done," he emphasized. "This view is increasingly shared by my colleagues, and frankly all this foot-dragging is making the concept of a Space Force more likely."

There is scant evidence to support this claim. At this point, there appears to be limited support in Congress for such a drastic move. Lawmakers did, however, authorize the creation of a new blue-ribbon commission to study the issue. (See "Aerospace World: Space Commission Kicks Off" on p. 11.)

Smith warned that he will be pressing the issue for a long time.

"Maybe the Air Force will pre-empt any dramatic changes I've suggested by truly becoming the 'Space and Air Force.' " he said, "but space dominance is simply too important to allow any bureaucracy, military department, service mafia, or parochial concern to stand in the way."

vilian agencies in all aspects of space operations, the white paper said. USAF will work to foster "an atmosphere that supports innovation" in space and air systems, both in technology and applications.

In their foreword to the paper, Air Force Secretary F. Whitten Peters and Chief of Staff Gen. Michael E. Ryan note that they consider aerospace integration a "pillar" supporting the new Air Force vision, called global vigilance, reach, and power.

Ryan has said he hopes the aerospace integration initiative will not be confused with the Air Force vision, which will recast the service's core competencies. Ryan has also said that a separate space service would not be able to push space technology any faster than it is now moving and that creating an expensive, separate service bureaucracy would rob funds from the space research initiatives already under way. ■

Air Force Percent of DoD Total

	Air	Space
Personnel	82%	90%
Budget	73%	85%
Assets	75%	86%
Infrastructure	78%	90%

"The Air Force fields the majority of both air ... and space capabilities within the Department of Defense. ... The Air Force is uniquely trained and equipped to maintain aerospace forces and to understand the full range of applications those forces can provide." Air is fixed wing only.

The Air Combat Command commander talks about the realities of modern warfare.

Jumper on Airpower

Gen. John P. Jumper, USAF, is commander of Air Combat Command, headquartered at Langley AFB, Va., and is a former commander of US Air Forces in Europe, from which post he played a key role in Operation Allied Force. He spoke on April 13 to a session of DFI International's Aerospace Power Seminar Series in Washington, D.C. What follows are excerpts of his remarks.

The Air Force at War

"The problem is that we tend to make it [combat] look easy, when it's not. The pilot over Baghdad or over Belgrade—he is not thinking in terms of, 'I'm fighting someone who is not a near peer.' [With] 700 [surface-to-air missiles] launched at us over Serbia, at no time did it cross the mind of the F-16 pilot that he was somehow engaging someone less worthy and that the elements of our superior technology would keep him or her out of harm's way. The F-117 pilots and the B-2 pilots, who, in the middle of the night, [are] flying predetermined routes and altitudes that maximize their stealth profiles, watch the SAMs fly off the rails and come their way, and they trust the technology that has been given to them by this nation. ... The F-16 pilots that we put in there to do close-in, shoot-from-the-hip battle with SA-3s and SA-6s so that the strike forces can get through, engaged in the heart of the SAM envelopes, one vs. one with these SAM operators, and made sure that the forces with the targets that had to be destroyed were able to get through. These duels, if you watch the videotapes, were not trivial duels."

They Call It Cowardice

"There is also the notion that somehow, at 15,000 feet altitude, our airmen were safe. No one in the room can picture standing at parade rest in an open field, 15,000 feet in front of an enemy artillery barrage, but somehow, when that translates into the vertical, it becomes tantamount to an act of cowardice. After all the money that we spent over the years to try [to] overcome our frailties in Vietnam, where AAA took out not only hundreds but thousands of airplanes, ... we took criticism because, somehow, there was something ignoble about not being down among that AAA and that intense small-arms fire that we know would have cost us a lot of airplanes. A laser bomb doesn't care the altitude from which it's dropped, as long as it sees that little laser spot on the ground. And they do—very well. Besides, the restriction wasn't at 15,000 feet. The Forward Air Controllers were down at 5,000 feet doing what they had to do to find those targets."

Battlespace Internet

"We need to be more rapidly responsive. We need to get to the targets when they emerge. This becomes a challenge really to the technology of information. We need to attack, intellectually attack and technologically attack, the seams between the finding, fixing, targeting, tracking, and engagement of targets that emerge on the battlefield. ... We are pursuing in our United States Air Force the idea of a battlespace Internet. It allows the operational commander to reach forward or backward and to have in front of his or her face at all times what I call decision-quality data."

Decision-Quality Data

"Decision-quality data is best illustrated by the contrast of the cockpits of our airplanes today and yesterday. ... Even today in the F-15 and F-16, you have a dial over here, a gauge over there that tells you that you're being threatened by someone. It is picking up a signal of some type, and it is displaying a type of signal. You look at that signal and you say, 'That is a bad airplane. I hear the sound, I look over here on my radar scope, and I think that perhaps that sound is that blip on the scope. I hope it is, but I am not sure.' You correlate this blip with that scope, and there is another sound over here that says there is a threat from the ground—a surface-to-air missile is looking at you. ... So you are correlating this blip with that sound. Where do you think the priority of getting to the target and dropping the bomb was? In our hierarchy of survival needs, it was down there pretty low. Now, the F-22 turns that around for us."

Marvels of the F-22

"In the F-22 cockpit, you have situated in the middle of your screen the profile of your airplane. If there is a bad guy out there, it appears at the top of the scope, and your airplane has a radar fan that comes out and shows your radar range against this particular type of target, taking into account its maneuver and stealth profile, whatever it might be. And you know when you are vulnerable to that guy's radar. On the ground, you see these rings—these rings show the engagement envelopes of the surface-to-air missiles. Those envelopes are sensitive to your stealth profile at the moment, your speed, and your altitude, and what your airplane is capable of doing to limit the size of those rings at any particular moment.

"In your bomb bays you have these smart weapons. Out of the front on the display is an oblate spheroid that comes out and shows you the envelope of that particular weapon. So you take the target, which is represented by a big X on the scope and you put the oblate spheroid over the X and you let the bomb go. It knows how to get there and do the rest of its work. And the rest of the time you are presented with decision-quality data that tells you how to get you and your strike force in and out, in this slalom course you run when engaging or avoiding air targets and avoiding those ground threats. [Meanwhile] your bomb is en route to taking out those vital nodes of command and control or those SA-10s or SA-12s that keep you from doing your job. That is what we can do with today's technology."

"Horizontal Integration"

"It is a fact that our S&T budgets have been going down in the Air Force. We just had an S&T summit with all of the Air Force four stars ... to talk about ways we can reverse that trend. ... In many cases, what we really need is to do the horizontal integration. The idea of this battlespace Internet is to do the horizontal integration that ties together the systems we already have to present this decision-quality information to the operational level. To do this ... is going to take a leap in technology to make sure these real-time bits and bytes of information that soar throughout the sky during these conflicts can get to the right place at the right time."

Meet the New FAC

"The Predator did us great service. During [the Balkan War] we found ourselves having to use the Predator not the way it was intended originally—go out and collect data and imagery, to come back, scour, and find potential targets—but instead to be able to close that loop between target location (because we knew where targets were), to help us solve the collateral damage problem by putting real-time eyes on the target, and to then converse with the airplanes that had bombs they were ready to drop. This is one thing that we had to learn again in the course of battle. We had to make Forward Air Controllers out of what had previously been intelligence collectors, because essentially their role was the role of a Forward Air Controller."

Global Hawk's Promise

"Global Hawk again will come to us as an experimental aircraft—one that is not in its first configuration, completely operationally suitable for those missions that we design it for, the imagery collection and the signal intelligence, etc., but perhaps suitable for other things. I will tell you my vision for the Global Hawk is a little bit broader than what we read about today. It is not only a replacement for the U-2. I think it is also that sort of 'server in the sky' that enables us to have that battlespace Internet idea. It is the thing that relays the signals and the data links around the battlespace so that everyone who needs it can take advantage of that. It is also potentially suitable for even armed capabilities sometime in the future. But to do that we have to develop the Global Hawk to get it in a configuration that has electrical power and the right characteristics to be operationally suitable. ... I believe that we will find a role for the Global Hawk. I am not at liberty to talk about it here today, but I think that we will find a role for it even in its preproduction configuration. I think that Global Hawk will then go on to be both an antenna farm, an aperture farm, and a great [intelligence, surveillance, reconnaissance] platform that will serve all of the joint forces. I have no doubt about that."

UAV Limitations

"There are operational limitations that we have to take into account. The Predator goes 70 knots, and, in a 70-mph wind, I like to say that it can get to the target and come back, but it can't do both. We have to deal with this. If you have an emerging target miles away, it takes some time for the Predator to get there. These are just practical limitations that we have to deal with when we start to deal with UAVs. When things like the Global Hawk deploy for great distances, we have to worry about how we track these things across the

ocean. When they recover in places in the United States or in other people's countries we have to worry whether they are battle damaged or not and what risk we are putting people in the local area in. These are practical considerations. We will overcome all of these things."

Dragging the Decoys

"I am reminded of ... the first night that the B-1s were deployed [in Allied Force]. The B-1s came to us in the Block D/ALE-50 configuration, straight from the test world at Nellis AFB [Nev.]. On the first night, they came down south over the water [Adriatic Sea] in a formation. These were still the test guys flying these things. [The] ALE-50 towed decoys were deployed—and we watched the radars in Montenegro ... track the B-1s as they came down and turned the corner around Macedonia and up through and into Kosovo. We watched the radars, in real time, hand off the targets to the SA-6s, and the SA-6s came up in full-target track and fired their missiles. Those missiles took the ALE-50s off of the back end of the B-1s just like they were designed to do. The B-1s went on and hit their targets."

The B-2 Meets Flex Targeting

"I was trying to get those guys [B-2 pilots] to get into the flex-targeting business. Bomber pilots like to do things in a very preplanned way. I asked Gen. [Richard E.] Hawley, who was the commander of Air Combat Command [during Allied Force] if I could go out to Missouri ... and talk to those B-2 guys personally. He said, 'Yes, go ahead.' I went out there and the young captains and I sat around, and in about three-and-a-half hours we figured out how to do this. On the first night, these guys, with the new process at work, knocked out two SA-3 sites that we had given them only a couple of hours out from the targets."

You Are a Refrigerator ...

"Of course, the world of information warfare is one that is difficult to talk about in any detail. I will tell you that we did more information warfare in this conflict than we have ever done before, and we proved the potential of it. In my view, the future is very bright in this regard. Instead of sitting and talking about great big large pods that bash electrons, we should be talking about microchips that manipulate electrons and get into the heart and soul of systems like the SA-10 or the SA-12 and tell it that it is a refrigerator and not a radar."

In my experience, in any country whose very survival is threatened, access has never been a problem.

"Those are things that we are capable of doing today. That is a world I think that we can get to sooner rather than later. And we need to pursue those things. These are light, lean, and lethal alternatives to many of the things that we do today that take up big spaces on aircraft to bash electrons. But information warfare is one that we are just starting to get our arms around. We pay a lot of attention to it at the strategic level, but I submit that we don't pay nearly enough attention at the operational and the tactical level. We need ways, in my opinion, to get into the command-and-control system, to the surface-to-air-missile systems, and to take those things down in ways that would not require putting a strike force or a HARM missile force to take those things out."

Mobile Targets

"The problem we have with mobile targets is not in finding the mobile targets. We had invested a great deal of money in [getting] Joint STARS and U-2 real-time imagery back to where it can be analyzed, and things like the Predator did a great deal to [help in] locating targets. The question becomes, in the glare of concern about collateral damage, the identification piece, ... especially in the beginning days of the war, when the weather was atrocious. ... Only 25 percent of the time did we have weather that was better than 50 percent cloud coverage.

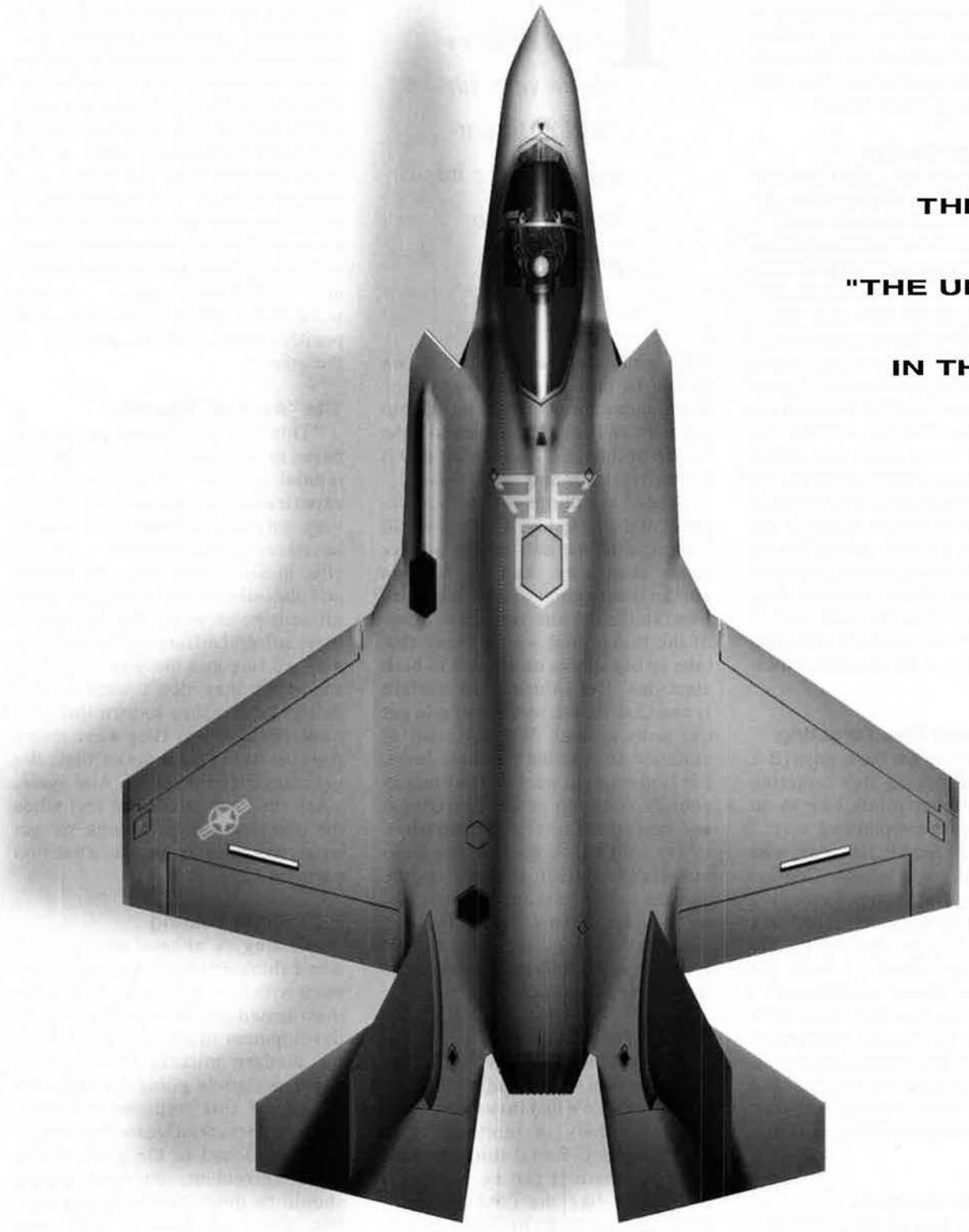
"So as we get started in this coalition warfare, and we are able to see movers on the road, the problem then becomes one of identification out of an abiding concern and correct concern for collateral damage situations where you have over 850,000 displaced persons wandering the same roads. Even if you can, by virtue of our great technology, look at the track and say that that target is a tracked vehicle, that is probably a bad thing, you still are not at liberty to wantonly bomb below and through the clouds, for risk of collateral damage. ... That next step is ... to network those things that can do that positive identification, one way or the other."

The "Access" Question

"This [the question of permanent bases in Southwest Asia] is the perennial question of access. In my experience, in any country whose very survival is threatened, access has never been a problem. ... I'll tell you, in Southwest Asia, the Saudis and the other Gulf states are magnificent hosts to us. But there is a great cultural difference between the way we live and the way they live, and what they don't want is that cultural difference to turn into cultural change, and they have every right to be worried about that. We get magnificent support. And again, when the chips are down and when the stakes are high, I think we get what we need from our coalition partners."

F-22 Flight Testing

"Testing is always necessary. I don't think anybody has any argument with that. I think the F-22 is the most tested airplane at this stage of development in history, and I think the modern miracle of computer-aided design is going to make the testing of this airplane relatively surprise-free, relative to other things that we've had in the past. We've made agreements on what testing should be done, and I support that. We, above all, have to make sure that the American people ... are satisfied and that the Congress is satisfied that we have done what is required to make sure we are putting something out there in the field that justifies the cost. ... I think whatever it takes to do that, the United States Air Force should support it." ■



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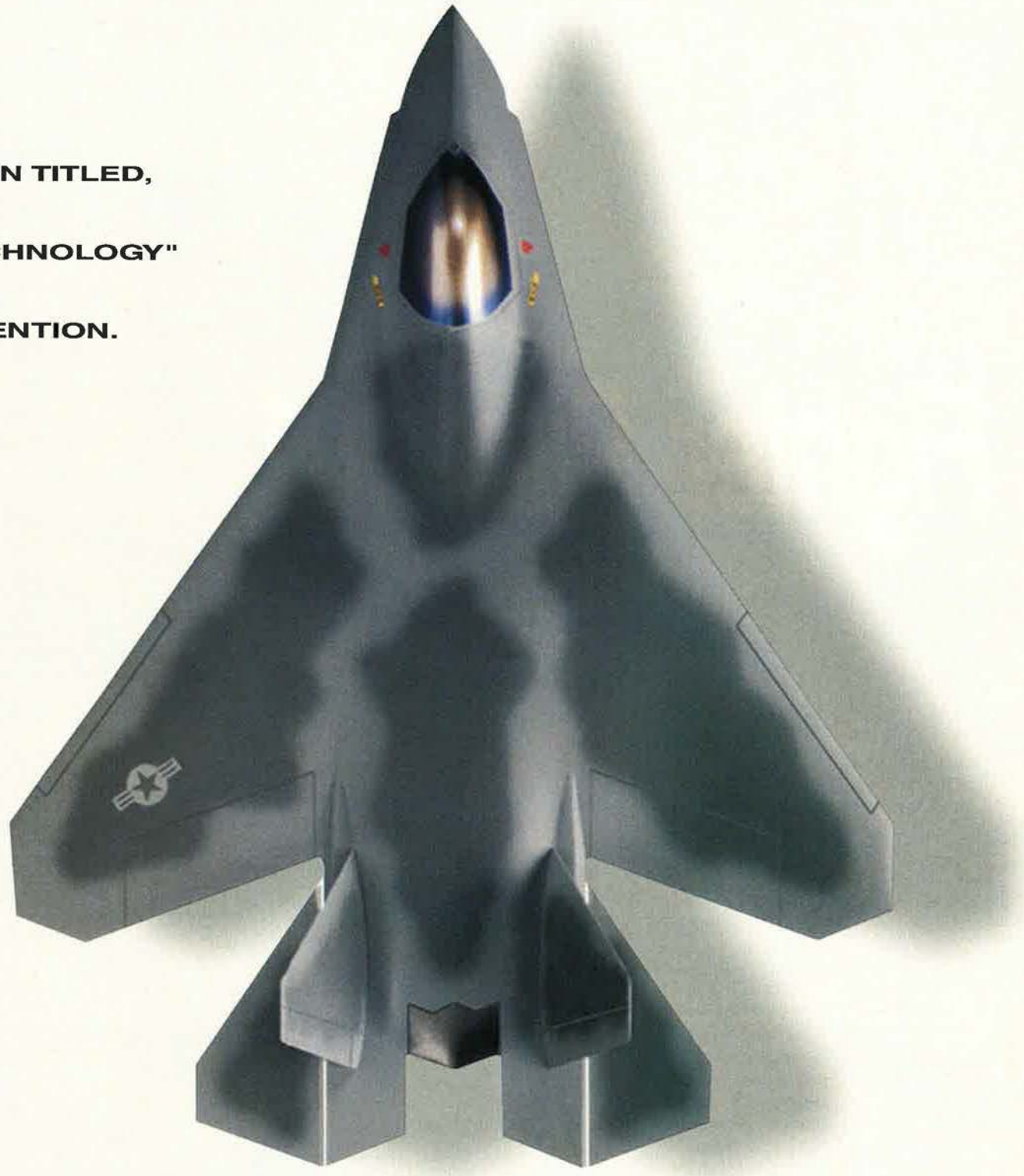

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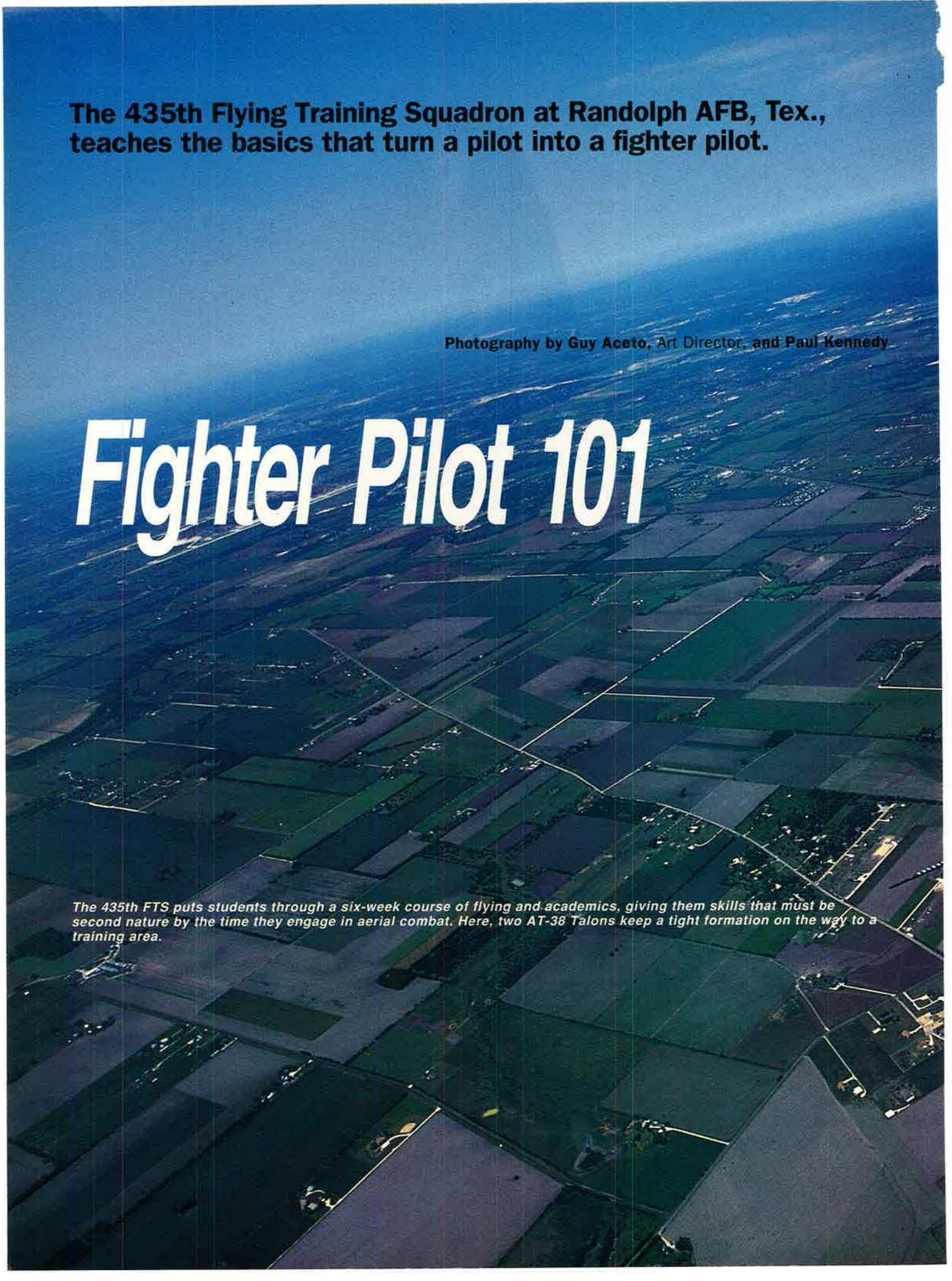
The 435th Flying Training Squadron at Randolph AFB, Tex., teaches the basics that turn a pilot into a fighter pilot.

Photography by Guy Aceto, Art Director, **and Paul Kennedy**

Fighter Pilot 101



The 435th FTS puts students through a six-week course of flying and academics, giving them skills that must be second nature by the time they engage in aerial combat. Here, two AT-38 Talons keep a tight formation on the way to a training area.

Staff photo by Guy Acosta

After completing Specialized Undergraduate Pilot Training, students who are selected to fly fighter aircraft must first master some basic skills via Introduction to Fighter Fundamentals. Currently two Air Education and Training Command squadrons—the 435th FTS at Randolph AFB, Tex., and the 49th FTS at Columbus AFB, Miss.—teach IFF. Air Force *Magazine spent time with the 435th FTS for this pictorial.*

At right, with Randolph's landmark "Taj Mahal" in the background, students and instructors from the 435th step to their jets for the first class of the day.

Photo by Paul Kennedy

Photo by Paul Kennedy

At left, a contractor employee performs crew chief duties, helping to strap a student into an AT-38. Below, an IFF student and instructor are ready to go.

IFF also provides some training for Weapons Systems Officers who will fly the backseat in F-15Es.

Staff photo by Guy Aceto

Today's sortie features high-aspect basic fighter maneuvers with one fighter vs. one fighter. The object is not to learn to employ the AT-38 in combat but to practice and understand maneuvers and countermaneuvers that fighters have in common. As the student moves through the curriculum, sorties will advance to multiple aircraft engagements.

IFF has five training tracks: three for US pilots (air-to-air, dual role, and air-to-ground); one for WSOs; and another for international students. Though all the pilots experience 18 to 19 sorties, different training tracks mean that those bound for F-16 or A-10 units, for example, get a little more time at air-to-ground sorties than those heading for F-15s and an air superiority role.

Staff photo by Guy Aceto

Staff photos by Guy Aceto

The flying pace is fast and furious, with at least three sets of sorties a day. Above, a student and instructor are on the way to the range. Once there, the formation spreads out, and two aircraft position themselves for the exercise. A couple of "g awareness" turns prepare them for the sustained four to six g's they'll pull during the sortie.

Fight's on! The engagements are quick. After a couple of turns—and if the student has the right reactions to the situation—the instructors terminate the fight and set it up again. Repetition is the key to understanding the dynamics of "the merge." That is the point where opposing aircraft are within visual range and begin combat flight maneuvers.

The AT-38 Talon's range and fuel consumption on these kinds of sorties limit them to about an hour. But it's an hour full of twists and turns. The horizon is rarely horizontal and the learning curve is steep. For fighter pilots to survive in the arena of aerial combat, these maneuvers must become as natural as breathing.

Staff photo by Guy Aceto

The AT-38 is only slightly different from the T-38 the students flew during SUPT. It has a notional gunsight and a centerline hardpoint that the ground crew below is using to attach an SUU-20 bomb dispenser. The weapons pod contains as many as six small blue practice bombs that produce white smoke on contact with the ground.

After the sortie comes the debrief. Student and instructor carefully go over the engagement. Using tapes from the AT-38's gunsight, they reconstruct events, noting what the student did well and what needs work. At right, Capt. Joel Cook uses models to illustrate a point to his student.

The 435th FTS has about 40 AT-38 Instructor Pilots assigned or attached to the unit. In addition to producing new fighter pilots, the 435th FTS also conducts Upgrade IP training.

Photos by Paul Kennedy

The squadron's life support shop maintains gear for both instructors and students. At left, TSgt. Philip Benjamin, NCOIC 435th Life Support, covers some details with his troops (l–r) Amn. Andrew Miller, SrA. Vincent Davis, SrA. Raymond Hoyt. SSgt. David Charbonneau, and SrA. Robert Bouchard. The flight suits of Davis, Charbonneau, and Bouchard signify that they have attained the higher five and seven skill levels.

What is life support? Its title is the clue—without the shop's hard work the pilots don't go. Life support personnel maintain and provide equipment like helmets, oxygen, and parachutes, as well as survival gear.

Staff photos by Guy Aceto

Before IFF there was Lead-In Fighter Training, which was conducted by Tactical Air Command, primarily at Holloman AFB, N.M., by a 435th FTS predecessor, the 435th Tactical Fighter Training Squadron. The program was restructured in the early 1990s and transferred to Air Training Command about the time ATC was redesignated AETC.

The lineage of the 435th starts in October 1943 when it was activated as the 435th Fighter Squadron at Glendale, Calif. The 435th, under various designations, saw action as a fighter unit in the European theater of World War II and in Southeast Asia during the Vietnam War.

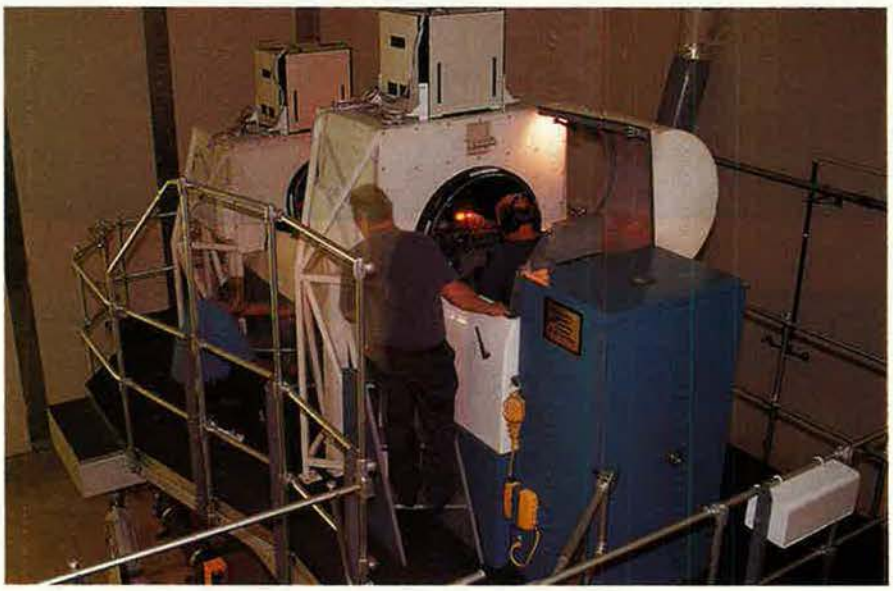
The 435th FTS—known as the "Black Eagles"—was activated in May 1998 at Randolph, where it occupies three prefabs. Above, the temporary buildings and camouflage netting on the deck facing the flight line give the unit a deployed look—a situation its students will soon become accustomed to.

Photos by Paul Kennedy

In Fiscal 1999, 131 students entered IFF and UIP and 121 graduated. Although there were no women in this particular class, their presence is not unusual since the Air Force began training them in fighters in July 1993.

Thirty-six training days of IFF include about 70 hours of academics, covering topics such as physiology as well as basic fighter maneuvers and surface attack.

Student pilots spend 18 to 19 hours flying actual sorties and many additional hours flying the simulator. At right, 2nd Lt. Brett Comer looks over his mission card before a sim flight. Long hours spent "in the box" translate into a better grasp of basic fighter and combat maneuvers. Mastering those basics is key to progressing to operational aircraft.



Many instructors here are contractors—most former military pilots—with hundreds of hours in the Talon. The Air Force IPs, too, have loads of flying hours, plus combat time. Until Desert Storm, Air Force pilots who flew in combat could only be found in the senior ranks that flew in Southeast Asia. It is not unusual today to find younger Air Force pilots who have real-world combat flying time. Current IFF instructors include veterans from the Gulf War, Allied Force, and a pilot who shot down an Iraqi MiG violating the Northern Watch no-fly zone. The knowledge they can impart directly to today's crop of fighter pilots is invaluable. They also serve as a reminder to students to take their training very seriously.

Staff photos by Guy Aceto

Above, an AT-38 with 435th FTS markings takes time for a photo over downtown San Antonio on the way back to Randolph. The F in their unit name is for "Flying," but to the 435th personnel, it really stands for "Fighter."

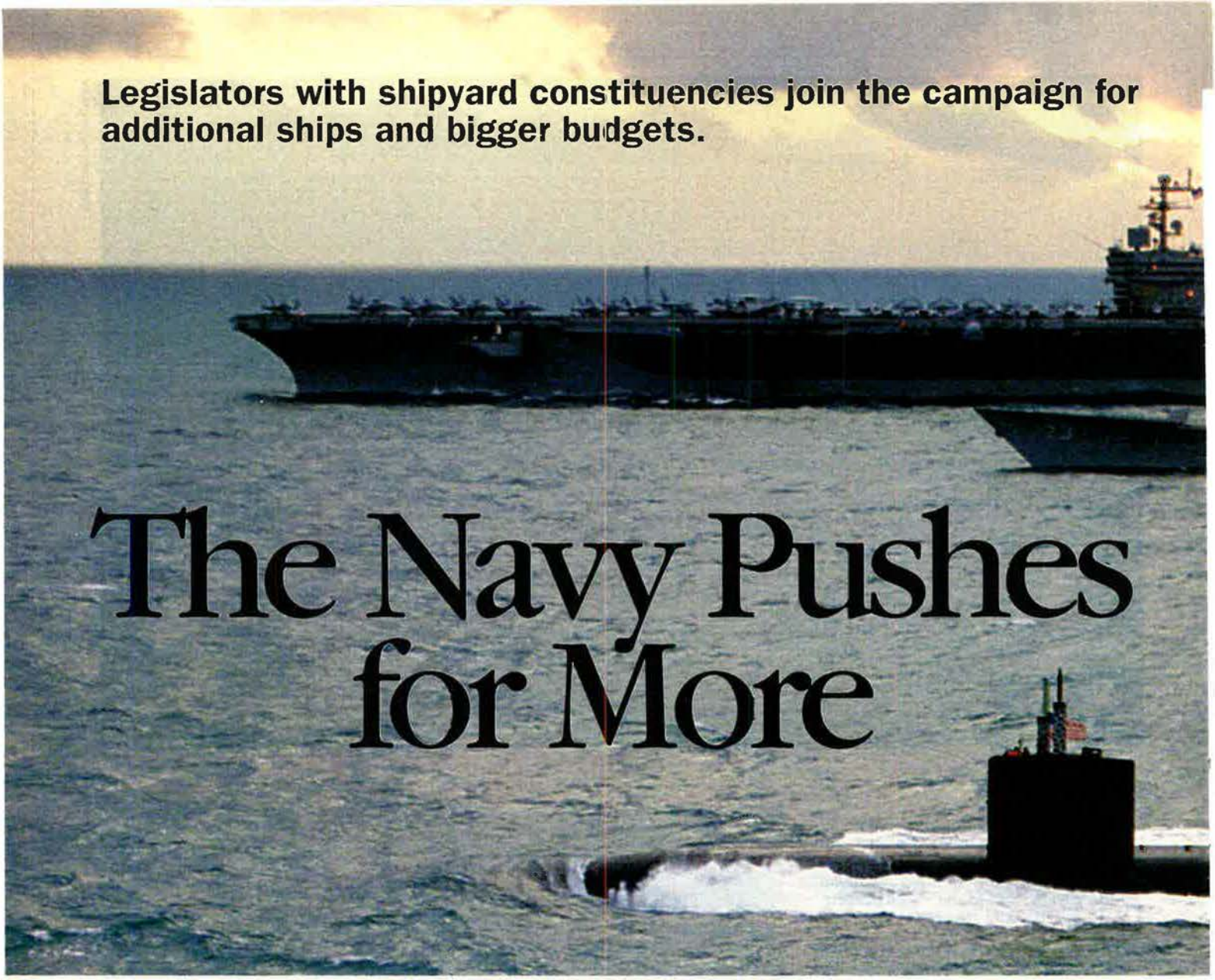
Plans call for the IFF program to move to Moody AFB, Ga., in Fiscal 2001, but no specific dates have been set.

Photo by Paul Kennedy

Another change coming for IFF is the introduction of an AT-38 upgrade. The Air Force began testing the T-38C at Columbus last year for both SUPT and IFF use. The upgrade will bring the fighter into the glass-cockpit age and provide capability to simulate aerial gunnery and missile attacks using either an F-16 or generic head-up display.

No matter where the program calls home, the IFF mission will remain the same: Prepare tomorrow's fighter pilots by training them in the concepts, tactics, and maneuvers they will need to survive in a fight. IFF improves airmanship and develops the confidence, discipline, and unique mind-set an Air Force fighter pilot needs to accomplish the mission. ■

Legislators with shipyard constituencies join the campaign for additional ships and bigger budgets.



The Navy Pushes for More

When Ronald Reagan was President, his military expansion built the Navy to some 600 ships. Today, as the aircraft carrier USS *Ronald Reagan* takes shape in a Virginia shipyard, the fleet comprises 315 ships and is likely to be smaller by the time *Reagan* enters service in 2003. It is the smallest US Navy since 1933, a fact noted frequently by the Navy and its backers in Congress.

Since the end of the Cold War, as defense spending declined, the Navy has been retiring older ships faster than it has built new ones such as *Reagan*, a 90,000-ton Nimitz–class carrier under construction at Newport News Shipbuilding. Under Reagan, the Navy ordered an average of 19 new ships per year. Since President Clinton took office, orders have averaged six ships per year.

Now, pro–Navy lawmakers on defense committees insist the service must buy more carriers, submarines, cruisers, destroyers, and other ships over the next decade if the nation is to meet its national security needs. They are joined by many Navy officials, who have begun openly calling into question the official ship levels that were set for their service only three years ago. Some warn that the Navy already is short of submarines for intelligence missions and cargo ships to transport troops and equipment overseas.

"A Crisis Now"

The state of mind of the Navy's political backers on Capitol Hill was captured in a recent comment by Sen. Chuck Robb (D–Va.), whose state is home to the sprawling Newport News Shipbuilding complex. "It's legitimate to describe this as a crisis now," warned Robb.

That is a controversial claim, to say the least. Not all or even most defense experts think the Navy is in such dire straits. Given the demise of the Soviet Union—and with it, the once huge and modern Soviet Navy—some question the necessity of, for example, large numbers of hunter–killer submarines designed primarily for war at sea with the Soviet fleet.

Ivan Eland, director of defense policy studies at the Cato Institute has claimed, "The nuclear attack submarine force remains too large. ... The number of submarines could be cut to 25 modern boats, while still fielding the best force in the world."

Critics argue that the pressure to build more ships comes from the

US Navy photo by PH2 Matthew J. Magee

By Chuck McCutcheon

Carrier USS **Nimitz**, *cruiser USS* **Port Royal**, *and submarine USS* **Annapolis** *steam in formation in the northern Persian Gulf. Navy's latest budget plan contained $10.7 billion for eight warships.*

Navy's desire to get its share of future defense budgets and, with it, more force structure. They maintain that the Navy is simply positioning itself to compete more effectively with the other armed services, especially in light of the Pentagon's ongoing Quadrennial Defense Review. Results of QDR 2001 will be announced early next year, and there will be a change of administrations at about the same time.

In its most recent posture statement, the Navy Department's leadership telegraphed its intentions. It said:

"The Navy and Marine Corps continue to meet commitments primarily by drawing upon forward deployed 'rotational' forces rather than requiring additional deployments of units that have just returned from or are beginning to work up for deployment. We have been able to do this mainly by demanding more from our people and equipment. But this cannot go on indefinitely.

"As we approach the next Quadrennial Defense Review, the Navy and Marine Corps will make the point that our force levels need to remain balanced with usage expected in the future security environment. ... Already, there is growing evidence that our forces are stretched. ... The 1997 QDR stated that a fleet of slightly more than 300 ships was sufficient for near-term requirements and was within an acceptable level of risk. Three years of high-tempo operations, however, suggest that this amount should be reviewed in the next QDR."

Within the last year, at least three categories of ships within the 300-ship plan have emerged as specific candidates for increased force-level goals—attack submarines, surface combatants, and amphibious ships.

So far, debate among lawmakers has centered on whether to build more warships rather than on the question of whether the US Navy has a sound strategy for deploying them around the world. As the critics see it, Congress should take a hard look at the naval mission before agreeing to substantial increases in shipbuilding and naval aircraft procurement.

Those who want a larger Navy argue that modern warships allow Washington to back up its diplomacy and project power to remote waters, as it has done in recent years in the Persian Gulf, Taiwan Strait, and Adriatic. Critics who challenge that view say it ignores the fact that the open-ocean threat has essentially vanished. No longer does the Navy face the daunt-

US Navy photo by PH2 Christian Eskelund

The fleet is changing as modern Arleigh Burke–class Aegis destroyers (such as USS McFaul, shown here) enter service. Some call for a significant increase in these and other surface combatants.

ing task of protecting sea lines of communications, conducting full-scale anti-submarine warfare, or taking the fight into the teeth of Soviet power on the rim of Eurasia.

Expeditionary Competitors

Moreover, note the skeptics, naval forces have played a supportive role in US military conflicts of the last decade, from Desert Storm onward—with the exception of Desert Fox in late 1998. Furthermore, they point out that the Navy and Marine Corps no longer form the only expeditionary military force. The Air Force has developed its own fast-deploying Aerospace Expeditionary Forces and reshaped its fleet of long-range bombers to conduct conventional operations, they observe.

Some in the Navy frankly acknowledge their concern about additional service claims to the "presence" mission. One of them is Navy Capt. Sam J. Tangredi, senior military fellow of the QDR 2001 working group at the National Defense University. "Having disparaged the need for naval forward presence, ... the Air Force now has discovered that its Aerospace Expeditionary Forces provide forward presence," Tangredi wrote in the May issue of US Naval Institute's *Proceedings*. "[O]ur sister services are jumping on the forward presence bandwagon, diluting the argument for a strong naval forward presence structure with requests for such forces of their own."

As such arguments ring across Washington, however, the Navy's fleet continues to be heavily utilized at sea. Because of such frequent utilization, and because naval technology is changing rapidly, Navy officials, naval experts, and lawmakers say that it makes more sense to build new ships than to keep old ones around past their prime. Some lawmakers—particularly those whose districts have shipyards that depend on Navy contracts—are pushing the service to become more aggressive about its needs.

One case in point: Rep. Duncan Hunter (R–Calif.), the chairman of the House Armed Services Committee's military procurement subcommittee, represents a San Diego area district that is home to about a third of the 3,700 workers at National Steel and Shipbuilding Co., one of the "big six" US shipyards that build all major Navy vessels. The shipyards have survived in an era of reduced defense spending through a blend of consolidation, creative cost-cutting such as sharing projects, and the continued support of Congress.

At a Feb. 29 hearing on shipbuilding, Hunter bluntly told senior Navy officials, "We've gotten almost to the point where you gentlemen need to be pounding the tables with your leadership and with the Commander in Chief, and I think we in Congress should be doing exactly the same thing."

Given the demands on the federal budget and public complacency about the military's size and shape, those who favor a larger Navy acknowledge that the odds are against success. "Is Congress institutionally, as a whole, ready to support the kind of shipbuilding program that I believe we need to have?" Robb asked at a March 8 forum of shipbuilding and industry officials. "I would say no, regrettably."

The Administration's Fiscal 2001 budget proposal to the Congress contained a request for $10.7 billion to build eight new ships. Sought in the package were three destroyers equipped with the Aegis air defense system for coordinating radar and missiles, two amphibious ships, an aircraft carrier, one attack submarine, and one support ship.

The Navy also said it would like to have—but did not fund—a $1.2 billion helicopter carrier to be built by Litton Industries in Pascagoula, Miss., hometown of Senate Majority Leader Trent Lott. It would be the eighth such ship Litton has built, if Congress provides the money to pay for it. The ship is designed to carry 1,800 Marines and their helicopters. Although critics say the carrier's inclusion is intended merely to appease a powerful Republican, Navy Secretary Richard Danzig has said the ship was planned for the Fiscal 2005 budget, and buying it sooner would be a reasonable decision if the money is available.

Friends in High Places

Lott, the son of a shipyard worker, has long been one of the industry's most reliable allies. Although he has sought to ensure that Litton—Mississippi's largest private employer—receives enough orders to keep it afloat, he warns that he alone cannot build a broader base of Congressional and public support for the Navy.

"Is word [about the Navy's decline] getting out? Not sufficiently," Lott said in a recent interview. "Armed Services Committee members know it. The people in the Navy and industry know it. But the general populace doesn't know it, and they don't care unless they're told, 'We don't have the ships to go into harm's way to protect our national interest.' "

Lott said the current debate should not focus merely on ensuring that American naval yards get enough work to maintain an industrial base. At stake, he argued, is the Navy's future. "At some point you have to decide, are we going to have a sufficient Navy or not?" he said. "It's not just about building more ships in my hometown, which I'm for, obviously. It's that they [ships of today's fleet] are getting antiquated."

Robb, a member of the Senate Armed Services sea power subcommittee, said that shipbuilding should be near the top of the next President's national security agenda, because of the time it takes to design and build new vessels.

Not even the Secretary of the Navy will sign up totally to that point of view. Danzig actually has been playing down talk about a major, immediate increase in shipbuilding. Although he would like to see increases, he contends that the Navy's fleet has not yet reached critical age. Because the Reagan Administration's defense buildup pumped so much money into the Navy, Danzig notes, many active ships still have more than a decade of service left.

Time Is "Not Right Now"

Danzig told the House Armed Services Committee on March 22, "The time for me to build and replace those ships is not right now; it is ... further out. And what I ought to be doing at the moment is taking advantage, in my view, of the youth of the Navy to invest heavily in the research and development that I've emphasized, ... so that I can build better ships more cheaply in the time ahead."

The final report of the 1997 Quadrennial Defense Review—DoD's most recent determination of military missions and needs—called for maintaining a fleet of slightly more than 300 ships. The review recommended retaining most of the existing armed forces, missions, and strategies and for maintaining the power to fight and win two widely separated regional conflicts even if they were to break out at more or less the same time.

The review said that, to maintain an adequate presence in the western Pacific, Arabian Sea, and Mediterranean Sea, the Navy would have to maintain a battle force of 12 big-deck aircraft carriers (one used primarily for training) and 12 helicopter carriers. It also called for reducing the planned number of surface warships from 128 to 116 and the number of attack submarines from 73 to 50 during the period 1997–2003. The remainder of the fleet would comprise smaller combatants and support ships such as oilers.

Things have changed, however. During the past year, some senior Navy officials have said that the 300-ship fleet would not be adequate to meet the service's commitments. Instead, they say, the American Navy needs a force of about 360 ships.

Current Navy plans call for building 39 new ships over the five-year period 2001–05. With the average life span of a ship at around 30 to 35 years, Danzig said that, to maintain a 300-ship fleet, Congress must authorize a "build rate" of 8.6 ships a year. Industry officials and lawmakers contend the rate should be as high as 12 ships a year. Otherwise, they say, the fleet risks dropping below 300 after 2010, when the large numbers of ships built in the 1970s and 1980s begin to hit retirement age and are put into mothballs.

"The 300-ship Navy is a threshold below which we cannot go if we desire to retain superpower status," remarked Senate Armed Services Committee Chairman John W. Warner, the Virginia Republican and a former Navy Secretary.

Ronald O'Rourke, a Congressional Research Service defense specialist, claims that, if the current build rate is maintained over the next 35 years, the Navy will wind up with a fleet of just 263 ships. He said that such drops can easily be avoided if a decision to build more ships is made sooner rather than later. "This is like a crop duster that's moving along the field, and there's a barn down there ... and you're too low to get over it right," O'Rourke said. "You can do it two ways: You can sort of ease up gradually so that you clear the barn without straining the airplane, or you can wait until later and then pull back on the stick and hope that the plane climbs at a rate that's sufficient to get over the barn."

Now, Navy advocates are preparing to make a case for a major increase in shipbuilding. At Robb's urging, Congress wrote into law last year a requirement for the Navy to report on its ship needs through 2030. A late-stage draft version of the report called for building back to a steady state of 360 "or more" ships—a goal that would require spending as much as $19 billion a year to build 11 ships annually.

According to the Navy draft, this new 360-ship fleet would include:

- 15 big-deck carriers
- 14 helicopter carriers
- 68 nuclear-powered attack submarines
- 134 surface combatants—cruisers and destroyers
- 40 combat logistics ships, such as fleet oilers, assault ships, and sealift vessels
- 16 mine warfare ships

The report was due to be sent to Capitol Hill in February but was held up for months. Robb said he suspected the Navy failed to deliver it because it was embarrassed by the discrepancy between the number of ships it currently was seeking and the much-higher totals in its report. "They [senior Navy leaders] don't have good answers to any of the questions that go beyond 2010," said Robb.

No "Dramatic Breakpoint"

Danzig, however, claimed that coming up with a conclusive study has proved to be difficult. The Navy Secretary told the House Armed Services Committee March 22 that, as much as he would like to see a larger Navy, he does not believe reaching the 360-ship level is the answer to the problems facing his service.

"I wouldn't ... say that there's some dramatic breakpoint, some magic number that, when we get there, we have arrived at nirvana and, short of that, we're in some kind of purgatory," said the Secretary of the Navy.

The budget problem that confronts the Navy affects all military services. Overseas missions have increased, types of missions have changed, and, although Congress has added money to Clinton's defense budget request each year since Republicans took control in 1995, harsh fiscal pressure prevents the majority party from adding more.

Danzig has claimed that the Navy is taking on new missions. For example, noted Danzig, it is "remarkable" that Tomahawk missiles were fired in 1998 from naval vessels toward suspected terrorist sites in Af-

US Navy photo by PH2 Alan D. Monyelle

USS* Jefferson City, *nuclear-powered submarine of the Los Angeles–class, enters Apra Harbor, Guam. QDR said the Navy could make do with 50 attack boats. Others cite a need for much high number.

ghanistan and Sudan. "Afghanistan is not your classic naval power," Danzig told reporters Feb. 12. And the Navy is currently developing sophisticated, accurate long-range weapons—missiles, aerial bombs, and guided munitions—to allow it to fight even farther inland from the sea. But some critics say that such weapons do not replace having troops on the ground or bombers and fighters in the air.

In particular, the Navy's attack submarines have been in demand for an expanding range of intelligence missions, such as eavesdropping and reconnaissance, as well as supporting counterdrug operations in the Caribbean.

O'Rourke said the post–Cold War downturn in the number of submarines began sooner and was proportionately deeper than for most other types of Navy ships. He said catching up with the backlog and maintaining adequate future levels pose a particularly formidable challenge. And now, Navy officials are warning that the submarine fleet is becoming overtaxed. Rear Adm. Al Konetzni, commander of submarine forces in the Pacific, said he lacks enough submarines to take part in essential engagement exercises with US allies in the region.

The number of attack submarines has dropped from 93 in 1990 to 56 today. Although the 1997 QDR plan proposed a goal of 50 attack submarines, a Joint Chiefs of Staff study released in February concluded that the Navy actually would need to maintain a minimum fleet of 55 submarines in 2015 and 62 in 2025.

Supporters of increased shipbuilding have seized on those numbers to say the situation warrants building two new, SSN 774 Virginia–class submarines every year. At present, plans call for building one per year. The Virginia–class subs are designed to replace Los Angeles–class boats that are approaching retirement, but at a lower cost than the Seawolf class, of which just three are being built. The Navy plans to spend about $64 billion over the next 18 years to acquire 30 boats of the Virginia class.

Pressure on Congress

Some claim that, because submarines take so long to build and can only be constructed at two of the six major shipyards—Newport News Shipbuilding in Virginia and Electric Boat in Connecticut—by a relatively small pool of skilled workers, the situation warrants quick attention by Congress.

Proponents of a big naval buildup are scrambling to generate support on Capitol Hill. The American Shipbuilding Association, a Washington, D.C., group representing the six major shipyards, has joined forces with the Navy League of the United States to start a "Sea Power Ambassadors" program of 300 retired Navy and Marine Corps officers to do grassroots lobbying about ship shortfalls. In February, the groups persuaded the House of Representatives in Iowa—a state more than 700 miles from the nearest ocean—to pass a resolution asking Congress to authorize at least 10 Navy ships a year.

Shipbuilding industry officials say that such symbolic actions are far from enough. Unlike the aerospace industry, which is widely dispersed throughout the United States, the shipbuilding industry is concentrated mainly in the six major shipyards. And while other military-related industries can augment their defense contracts with commercial work, the US shipbuilding industry has lost much of its market share to Europe, Japan, China, and South Korea, where lower labor costs and generous government subsidies have enabled shipbuilders there to produce the vast majority of the world's cruise ships, tankers, and freighters.

Supporters of increased shipbuilding say they must persistently plead their case with Congress and the public. "Now is the time to start," Robb told shipbuilders at the March forum. "We have a period, and it does not go on forever, where we can start putting money in the bank, ... [but] it's going to take a great deal of education on the part of many of you here."

Danzig, for his part, took a more measured view of the Navy's prospects. "When you look at futures, everybody generates different visions. Even the fabled '600-ship Navy' [of the Reagan years] was nothing but a vision. They never actually got to that number. Different people have very different expectations about what the world might look like in terms of 2025 and 2030 and therefore about how big a Navy they'd have. There are many people who would like to see a 360–Navy. ... There are many people who think the Navy will stay at 305 ships or 300 ships. However, I don't think there are many people who think the Navy will fall below it." ■

Chuck McCutcheon, a reporter based in Washington, D.C., covers national defense and foreign affairs for Congressional Quarterly Weekly. *This is his first article for* Air Force *Magazine.*

The "Cover-Up" story made news all over. The problem was that it wasn't so.

Newsweek and the 14 Tanks

By Stephen P. Aubin

USAF photo

MEAT members check out a damaged tank in Kosovo. Their job, according to deputy team leader Lt. Col. Michael Duvall, was not to account for successful strikes but to investigate what equipment remained.

If you were to believe *Newsweek* magazine, NATO aircraft in Operation Allied Force only managed to destroy 14 tanks, 18 armored personnel carriers, and 20 artillery pieces in some 2,000 actual strike missions flown over Kosovo.

In its May 15 edition, *Newsweek* proclaimed a "Kosovo Cover-Up," billed by a promotional strip on the cover of the magazine as "The Truth About the Air War." According to authors John Barry and Evan Thomas, the US Air Force had "suppressed" an after-action report that conflicted starkly with the strike assessment that was released by Army Gen. Wesley K. Clark, Supreme Allied Commander Europe, last September.

A number of other publications picked up the revelation and piled on. As first copies of *Newsweek* hit the street May 7, the *New York Post* called the story a "bombshell." On May 9, the *Cleveland Plain Dealer* charged the Pentagon with "Flights of Fibbery." A day later, the Charleston, S.C., *Post and Courier* took the Defense Department to task for "ex-

A Choice of Numbers: Serb Equipment Successfully Struck in Kosovo

	Tanks	Armored Personnel Carriers	Artillery
NATO assessment	93	153	389
Serb claims	13	6	27
Newsweek claims	14	18	20

travagant claims." The *International Herald Tribune* on May 11 thundered, "After NATO's Lies About Kosovo, It's Time To Come Clean." By May 12, the *New York Daily News* had weighed in, headlining the "costly scandal."

On the broadcast side, "NBC Nightly News"—supplied with an early copy of the *Newsweek* story—was first out of the blocks with a May 7 report that uncritically presented the *Newsweek* claims, supported by a sound bite from co-author Thomas.

On "ABC World News Tonight" on May 8, Peter Jennings said it had been "learned," with no mention of *Newsweek* as his source, that the Pentagon damage reports had been wrong. This, he pontificated, was "real confirmation" that "the first casualty of war is often the truth." Perhaps Jennings should have said that the first casualties of journalism today frequently are truth and context. Unfortunately for ABC and other news organizations that jumped on this story, *Newsweek's* reporting does not hold up.

Back Into "The Valley"

Not since CNN's Tailwind fiasco—the mangled "Valley of Death" exposé that ignored inconvenient facts and insisted the US military had used nerve gas in Vietnam—has so much assertion about a military operation been based on so little evidence.

Newsweek's "Cover-Up" thesis rested primarily on the so-called suppressed report, the existence of which initially was a mystery to Air Force officials closest to the Kosovo campaign analysis. In a May 8 session with Pentagon news correspondents, Air Force Brig. Gen. John Corley, who headed the studies and analysis team for US Air Forces in Europe, said he knew of "absolutely no report, no study that has been suppressed."

It would later be determined that Barry and Thomas had obtained a working draft, labeled "NATO Confidential," compiled by an element of the Munitions Effectiveness Assessment Team, or MEAT. The draft was entitled "Operation Allied Force: Munitions Effectiveness Assessment, Vol. II: Mobile Targets." It was dated Aug. 3, 1999, and contained data collected in July 1999 by the MEAT working group assigned to work on mobile targets.

The MEAT study comprised two parts—Vol. I and Vol. II. Both dealt exclusively with strikes in Kosovo, but they analyzed two different strike categories. Vol. I focused on fixed targets and is not germane to this controversy. Vol. II focused on mobile targets, the heart of the controversy. Raw data in Vol. I and Vol. II were later correlated with findings from other sources and fed into NATO's "Kosovo Strike Assessment" and the US Air Force's "Air War Over Serbia" study.

The documents with the raw data were classified, but they were not, as Barry and Thomas said, "buried by top military officers and Pentagon officials." Those who had access to both working drafts—Vol. I and Vol. II—included not only the Air Force but also the Army, Navy, and General Accounting Office, a Congressional watchdog agency. Some information, including photographs and imagery from Vol. II, was publicly released by Clark in his Sept. 16 news conference.

The MEAT charter was to collect data on the ground for the purpose of studying the effectiveness of the munitions used during the campaign. For example, in the case of a bomb that was supposed to penetrate so many feet and explode, the team wanted to know if the fuze worked properly and how many feet of concrete were penetrated.

"Our job was not to account for successful strikes," said Lt. Col. Michael Duvall, who was the MEAT's deputy team leader. In a May 22 interview with *Air Force* Magazine, Duvall said, "Our job was to investigate what equipment was remaining from those strikes."

The Key Word

The key word is "remaining." After all, Serb mobile targets had been struck at different times during 78 days of air warfare. By early July 1999, when members of MEAT walked the ground and flew in helicopters looking for equipment, some strike sites were being visited for the first time in three months. The freshest of the sites was four weeks old.

By the time MEAT investigators arrived, Serb forces had taken away whatever equipment was serviceable or salvageable, including tanks, armored personnel carriers, and artillery. What the team found in the "tank" category was 14 tanks plus 12 self-propelled artillery vehicles, which look like tanks and would have been reported as tanks in pilot mission reports. Those 26 "tanks" suffered catastrophic destruction and were abandoned by the Serbs.

What is clear is that the Serbs had plenty of time to remove and repair any equipment sustaining less drastic damage.

The MEAT ground survey was only one piece of the bomb damage assessment. As Corley explained, the process began with the pilots' initial mission reports—1,955 of them. Since it is easy to be mistaken in the heat of combat, none of the pilot mission reports was automatically taken at face value. Before a strike was counted as a success, the results had to be corroborated by at least one other source. According to the Air Force, of the strikes eventually confirmed as successful, 55 percent were confirmed by one additional source and 45 percent were corroborated by two or more additional sources.

Beyond surveying the ground in Kosovo, the team went on to use other pieces of evidence such as national images, exploited U-2 aircraft film, unmanned aerial vehicles, interviews with the forward air controllers, and so on, Corley said. "Ultimately we combined all of those elements ... to come up with a full and accurate accounting of what really had or had not been successfully struck."

Corley had 200 people working 24-hours-a-day for nine weeks before Clark briefed the international news media in September. By then, the team had documented successful strikes on 93 tanks, 153 armored personnel carriers, and 389 artillery pieces. If anything, Corley's team was conservative in its approach. In the tank category alone, another 60 tanks were probably successfully struck, but that could not be confirmed by the tough NATO–USAF methodology.

Not surprisingly, these results disclosed in September scaled back the initial bomb damage assessments that previously had been announced by NATO and the Pentagon. (In June 1999, the Pentagon, responding to media demand for numbers, gave a

USAF photo

Some tanks suffered catastrophic damage, but the Serbs had time to remove and repair much of the less damaged equipment. Consequently, the ground study was only one piece of the bomb damage assessment.

tentative estimate of 120 tanks, 220 armored personnel carriers, and 450 artillery pieces destroyed.)

Newsweek was not the first to assert that NATO missed the bulk of its ground targets. That distinction belongs to Michael Evans, defense editor of *The Times* of London, whose dispatch from Pristina, Kosovo, dated June 24, 1999, was headlined, "NATO Dropped Thousands of Bombs on Dummy Roads, Bridges, and Soldiers ... and Hit Only 13 Real Serb Tanks."

An Unimpeachable Source?

Evans's source for the 13 tanks can be traced to Serbia's 3rd Army commander, Lt. Gen. Nebojsa Pavkovic, who made the claim on June 16. But, as Clark pointed out in his Sept. 16 press conference, Pavkovic also claimed that Yugoslav air defense units shot down 47 NATO airplanes and four helicopters.

When the *Newsweek* article appeared, Evans picked up the chase again with gusto. In a May 11 article in *The Times*, he tied the "leaked report" cited by *Newsweek* to testimony before the House of Commons Defense Committee by Gen. Michael Jackson, a British officer who gained international attention after refusing an order from Clark to block Russian forces seeking to occupy the airport in Pristina. Jackson, Evans wrote, "confirmed yesterday that the reported destruction of large numbers of Serb tanks by NATO bombers in Kosovo was exaggerated."

However, Evans reported only part of what Jackson had said. According to a raw, unedited transcript provided on request to the Air Force Association by the Defense Committee, but which had not yet been publicly released, Jackson stated, "I think it is a matter of record that the actual damage done is rather less than was once estimated to have been done. We can play with the numbers forever. I am not privy to the information on which the numbers have been assembled. Certainly, when we entered Kosovo we did not have to clear away hundreds of burned out tank hulks."

From that, Evans and *The Times* drew the headline, "General Admits NATO Exaggerated Bombing Success."

What "Terror Bombing"?

Unfortunately, *Newsweek's* article was not just about strike assessment numbers. Barry and Thomas also missed the basic context of the bombing campaign. Early in their exposé, they confused what turned out to be unprecedented precision in a limited bombing campaign—an exercise Clark now describes as "coercive diplomacy"—with "terror-bombing civilians," adding that "the surgical strike remains a mirage."

Newsweek also repeated the accusation the Air Force was flying too high at 15,000 feet altitude and used elaborate "How It Works" graphics to illustrate the point.

In reality, Gen. John P. Jumper, who was commander of USAFE during Operation Allied Force, said there was nothing "ignoble" or ineffective about flying at 15,000 feet. At a seminar in Washington on April 13, he said that today's technology makes it possible to avoid the hail of antiaircraft artillery that downed thousands of airplanes in Vietnam. "At 15,000 feet, a laser bomb doesn't care [about] the altitude from which it's dropped, as long as it sees that little laser spot on the ground. And they do very well." Jumper also said there was no categorical restriction to flying at 15,000 feet. Forward air controllers, for example, regularly flew much lower when necessary.

In the end, however, aircraft altitudes and the number of tanks destroyed were not the measure of success in the Kosovo air campaign. What mattered was the combined effects from the military, political, economic, and diplomatic actions taken by NATO. Aerospace power alone did not win the Kosovo military campaign, but it was the dominant feature of NATO's exercise in coercive diplomacy, and it did provide NATO's leaders with a range of options that would have been hard to imagine as recently as the Gulf War.

As for the tanks and armored personnel carriers, the Air Force had given *Newsweek* correspondent Barry a special interview with Corley and access to his documentation.

Corley's team had pored over the ground survey data, classified imagery, cockpit videos, mission reports, human intelligence, and information from other sources.

Barry and Thomas chose to disregard that data and go instead with MEAT's working draft of mobile target findings, backed up by innuendo from unnamed NATO sources, an unnamed CIA official, and an unnamed Pentagon source. ■

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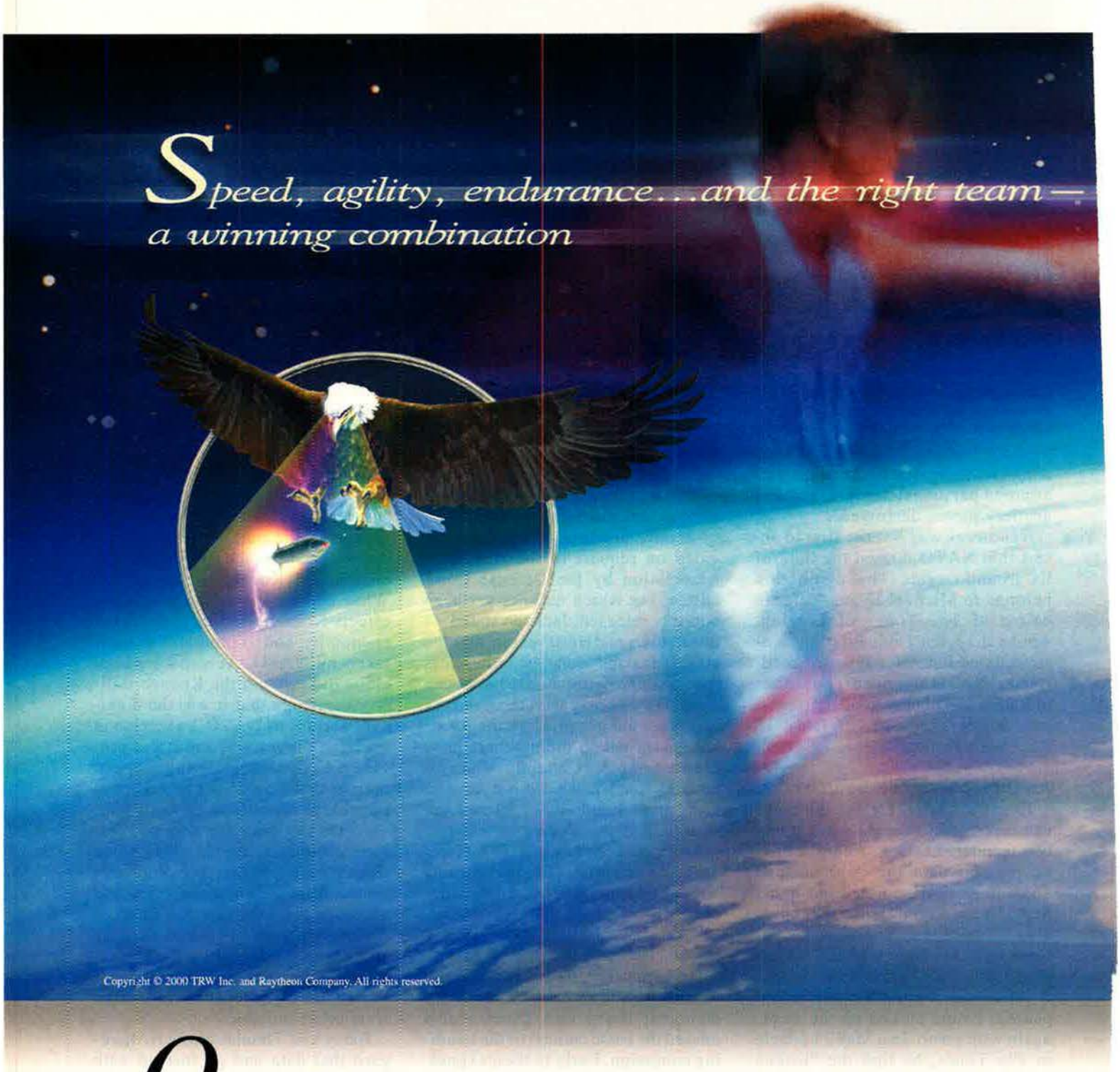

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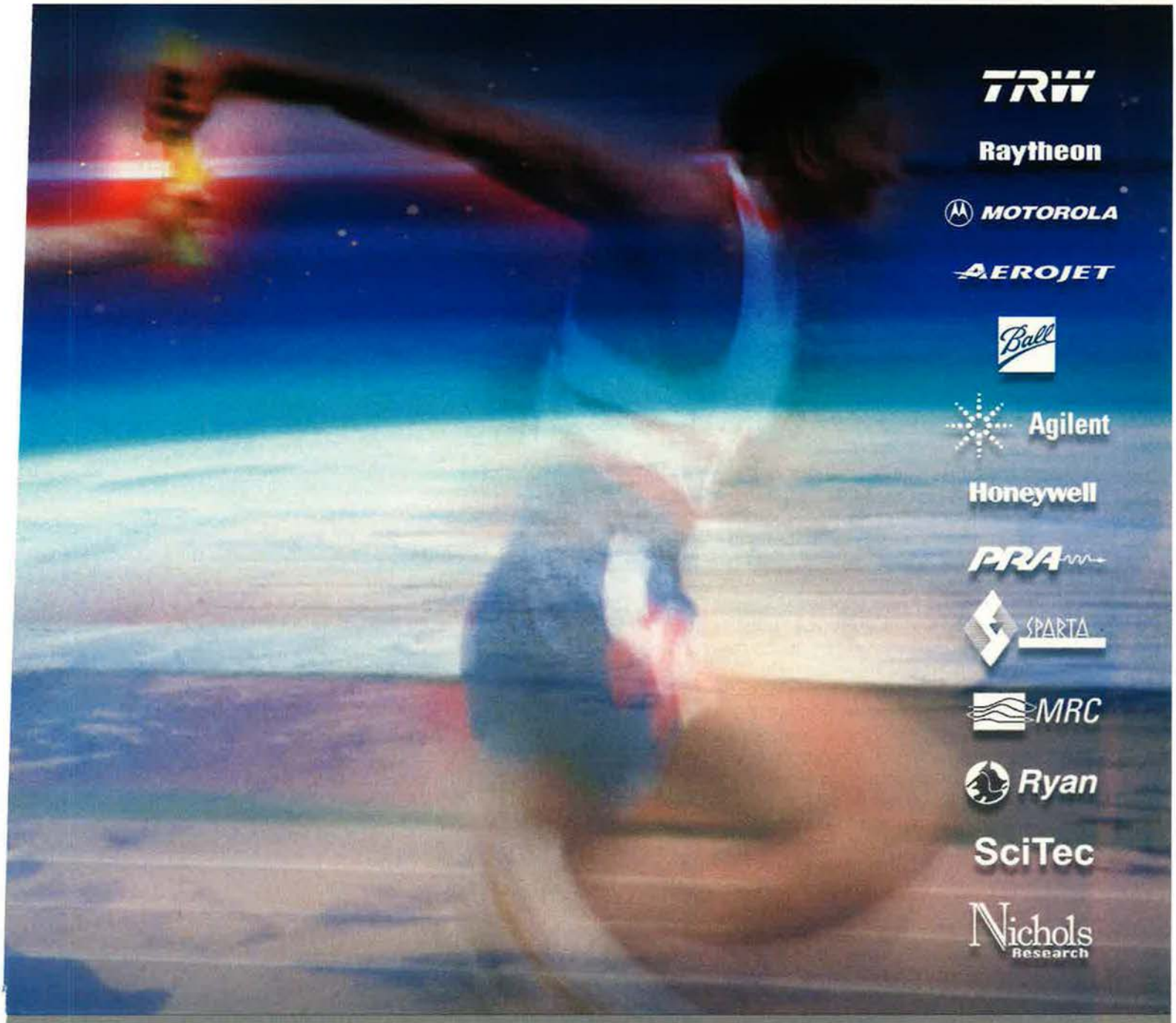

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These were the fighters, bombers, transports, and other airplanes that fought the "Forgotten War" 50 years ago.

Air Force Aircraft of the Korean War

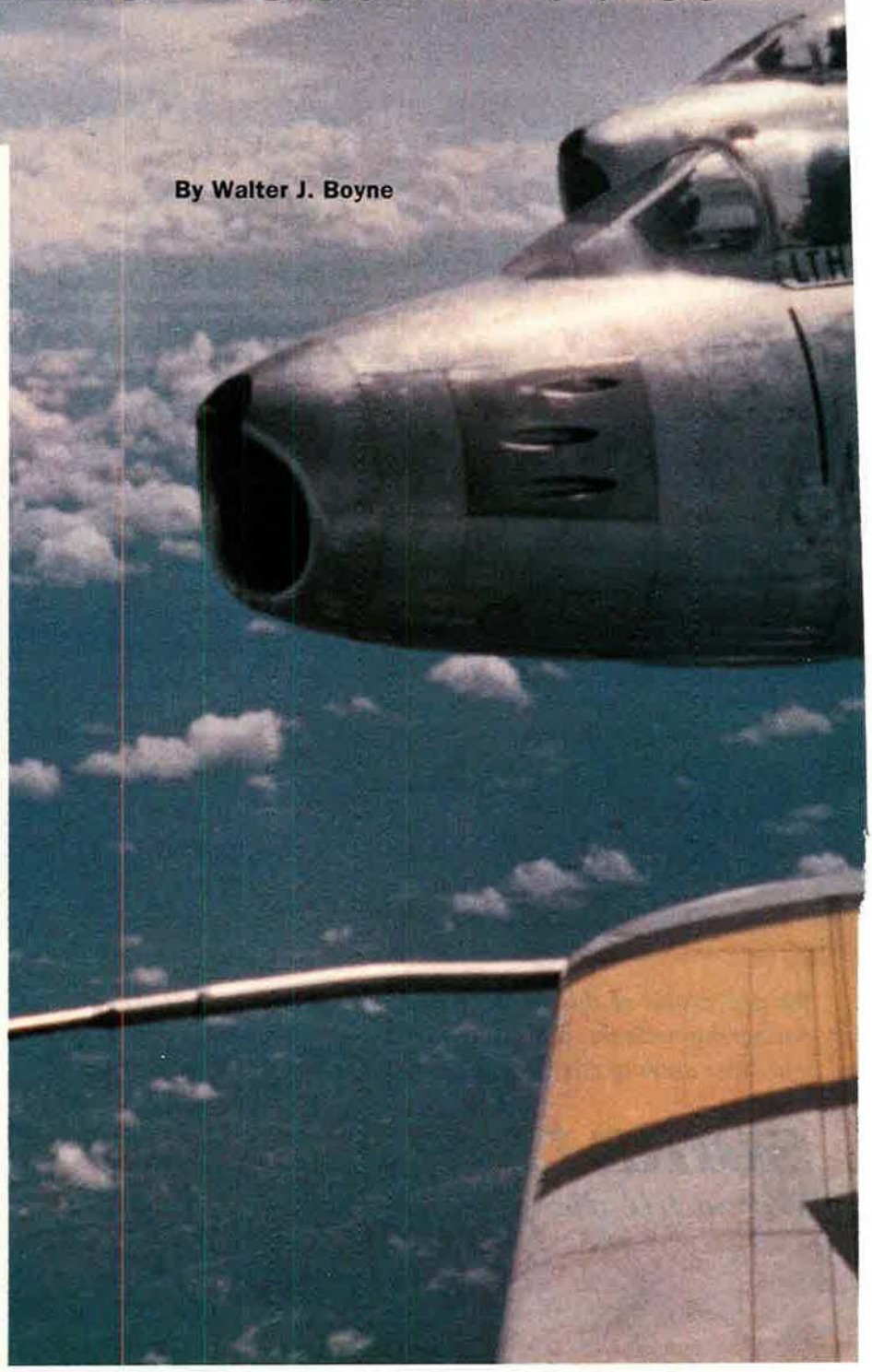
By Walter J. Boyne

THE Korean War that was just starting to unfold 50 years ago became the scene for some notable airpower firsts—and lasts.

Korea was the first shooting war for the newly independent US Air Force. The war saw the first large-scale combat use of jet aircraft. Within months of the war's outbreak on June 25, 1950, Korea produced the first-ever jet-to-jet combat. The US military got its first taste of combat against Soviet aircraft, Soviet tactics, and, on some occasions, Soviet pilots.

On the other side of the coin, Korea marked the end of the line for prop-driven combat aircraft—in USAF, at any rate. The Korean War was the last (and only) time large numbers of piston-engine and jet-engine aircraft shared the wartime skies. It was the last US major war without at least some space support.

More generally, Korea marked either the beginning or the end for some famous and significant USAF airplanes. What follows is an accounting of some of the war's most important machines.



F-86 Sabres

Fighter

F-51 Mustang. North American. The single-seat Mustang was first flown in 1940 and considered by many to have been the premier piston-engine fighter of World War II, when it was known as the P-51. It was especially valuable in Korea because it could operate from rough South Korean airfields. The Mustang was used primarily for close support of ground forces, until the aircraft type was withdrawn from combat in 1953. Powered by a 1,695-hp, liquid-cooled, Packard–built Rolls Royce Merlin power plant, the F-51 proved itself to be a capable ground attack and, as the F-6/RF-51D, reconnaissance aircraft.

Photo by Charles Scofield via Warren Thompson

F-84 Thunderjet

Photo by Evans Stephens via Warren Thompson

F-80C Shooting Star

F-80 Shooting Star. Lockheed. The Shooting Star was USAF's first operational jet fighter, making its first flight on Jan. 8, 1944. It operated extensively in Korea in the ground attack role—primarily for low-level rocket, bomb, and napalm attacks on fixed targets—and as the RF-80 reconnaissance airplane. On Nov. 8, 1950, an F-80C flown by USAF Lt. Russell J. Brown shot down a Russian–built MiG-15 in the world's first jet-to-jet air battle. Powered by a 4,600-pound static thrust Allison J33 engine, the F-80 did remarkable work at a variety of tasks in Korea.

F-82 Twin Mustang. North American. The Japan–based F-82s were among the first USAF aircraft to operate over Korea. The first three North Korean airplanes destroyed by US forces were shot down by F-82s on June 27, 1950. Called the Twin Mustang, the F-82 appeared to be two halves of an F-51 joined together with a wing center section and horizontal stabilizer. The aircraft first flew in 1945. It was intended for use as an ultra-long-range escort fighter and a night fighter. The F-82s were powered by two 1,600-hp Allison V-1710 engines. Used initially for counterair and ground attack work, their importance as night fighters caused them to be withdrawn for defense purposes un-

Fighter Specifications

	Span	Length	Height	Gr. Wt.	Speed	Range	Ceiling
F-51	37 ft 0 in	32 ft 3 in	12 ft 2 in	11,600 lb	437 mph	950 miles	41,900 ft
F-80	39 ft 11 in	34 ft 6 in	11 ft 4 in	16,856 lb	580 mph	1,380 miles	42,750 ft
F-82	51 ft 7 in	42 ft 2 in	13 ft 10 in	25,891 lb	461 mph	2,250 miles	38,900 ft
F-84	36 ft 5 in	38 ft 5 in	12 ft 7 in	23,525 lb	540 mph	1,500 miles	40,500 ft
F-86	37 ft 1 in	37 ft 6 in	14 ft 8 in	16,357 lb	672 mph	785 miles	48,300 ft
F-94	38 ft 11 in	40 ft 1 in	12 ft 8 in	16,844 lb	606 mph	905 miles	48,000 ft

til a shortage of spare parts made it necessary to retire them from combat.

F-84 Thunderjet. Republic. The F-84, first flown on Feb. 28, 1946, arrived in Korea in December 1950. Initially assigned to B-29 escort duties, the F-84s soon gained fame in ground attack operations. Powered by 5,000-pound static thrust Allison J35 engines, the F-84's heavily laden takeoffs from Korean airfields were sometimes augmented by the use of strap-on jet bottles, a process known as JATO—Jet-Assisted Takeoff. F-84s were used to attack enemy airfields and even large targets like irrigation dams. The F-84 gained renown for daily attacks with bombs, rockets, and napalm on enemy railroads, bridges, supply depots, and troop concentrations. While unable to cope with the MiG-15 at high altitude, they were more effective at medium or low altitudes and scored several kills. RF-84s were used for reconnaissance.

F-86 Sabre. North American. The F-86 incorporated much German research into its design, employing a 35-degree swept wing and automatic leading edge slots. Flown for the first time in October 1947, the Sabre survived many initial teething problems to become the premier USAF fighter of the Korean War. By the end of hostilities, it had shot down 792 MiGs, with a loss of only 76 Sabres—a victory ratio of 10-to-1. The first models to see combat, the F-86A, were powered by a 5,270-pound static thrust General Electric J47 engine. Later models of the F-86 were more powerful and used both for air-to-air and ground support. The RF-86 was used for reconnaissance.

Photo by John Henderson via Warren Thompson

F-94B

F-94A/B. Lockheed. An offshoot of the T-33, which was in turn a development of the F-80, the F-94 was a two-place all-weather interceptor first flown in 1949. The power plant was an Allison J33 of 6,000 pounds thrust in afterburner—and it was the first US production jet equipped with afterburner. Because it carried a highly secret airborne radar system, the F-94s were at first not permitted to fly deep into enemy territory. Ironically, the F-94 radar was not very effective on night missions against MiGs. The major task of the F-94 was to protect Korean air bases against enemy intruders. (The F-94C, which was not used in Korea, was called Starfire; subsequently, the name has been applied to all F-94s.)

Bomber

B-26 Invader. Douglas. Originally designated the A-26 Invader, the basic airplane first flew on July 10, 1942. It was redesignated B-26 Invader in 1948. A protracted development period kept it out of combat until 1944. Its performance during the war was exceptional, but after the war it was gradually retired. The B-26 Invaders in Japan proved to be invaluable in the night interdiction role, and it fell to the B-26 to fly the first and the last bombing missions of the Korean War. Powered by Pratt & Whitney R-2800 engines, the Invaders flew some 60,000 sorties and were credited with the destruction of 38,500 vehicles, 3,700 railway

Photo by John Syphrit via Warren Thompson

B-26 Invader

Photo by Louis Branch via Warren Thompson

B-29 Superfortress

cars, and 406 locomotives. The bombers were also used for reconnaissance, as RB-26s.

B-29 Superfortress. Boeing. The Superfortress first flew on Sept. 21, 1942, and contributed much to the victory over Japan. It was recalled to service for the Korean War, with many aircraft being plucked from storage and refurbished. Powered by four Wright Cyclone R-3350 engines, the B-29s were effective as day bombers until the MiG-15 appeared. Thereafter, it was confined to night bombing against strategic and tactical targets. B-29s flew on all but 21 days of the 37-month war. In some 21,000 sorties they dropped 167,000 tons of bombs and claimed 16 MiGs and 17 other fighters shot down. At least 16 B-29s were shot down over North Korea, and as many as 48 were lost in crash landings or written off because of heavy damage after returning to base. The bombers were also used as reconnaissance, weather, and rescue aircraft.

B-45 Tornado. North American. The Tornado was the first USAF four-jet bomber, making its first flight on March 17, 1947. North American built a total of 142, including 10 long-range B-45Cs with wingtip fuel tanks and 33 RB-45s configured for high-altitude photo-reconnaissance. Though the B-45 was available for combat in Korea, it was the RB-45 reconnaissance version that was used. First flown in April 1950, the RB-45 was powered by four General Electric J47 jet engines of about 6,000 pounds static thrust. The Tornados carried out risky night reconnaissance missions over North Korea. Only a small number were available, and while they were not adequately supported, they did yeoman work.

Bomber Specifications

	Span	Length	Height	Gr. Wt.	Speed	Range	Ceiling
B-26	70 ft 0 in	50 ft 0 in	18 ft 6 in	35,000 lb	355 mph	1,400 miles	22,100 ft
B-29	141 ft 3 in	99 ft 0 in	29 ft 7 in	137,500 lb	364 mph	4,200 miles	32,000 ft
B-45	96 ft 0 in	75 ft 11 in	25 ft 2 in	110,721 lb	570 mph	2,530 miles	40,250 ft

Transport

C-46 Commando. Curtiss. A derivative of a commercial passenger transport, the Commando's prototype first flew on March 26, 1940. The Commando was a radical departure from previous Curtiss transport designs and would perform exceptionally well in "the Hump" supply operation during World War II. The C-46, which had two Pratt & Whitney 2,000-hp engines, was operated both by USAF and by civil operators in the Korean War. It lived on to serve again in the Vietnam War.

C-47 Skytrain. Douglas. Officially known as Skytrain but affectionately referred to as "Gooney Bird,"

Photo by Ward Odenwald via Warren Thompson

C-46 Commando

Transport Specifications

	Span	Length	Height	Gr. Wt.	Speed	Range	Ceiling
C-46	108 ft 1 in	76 ft 4 in	21 ft 9 in	56,000 lb	269 mph	1,200 miles	27,600 ft
C-47	95 ft 6 in	63 ft 9 in	17 ft 0 in	26,000 lb	230 mph	1,600 miles	24,000 ft
C-54	117 ft 6 in	93 ft 10 in	27 ft 6 in	62,000 lb	265 mph	3,900 miles	22,000 ft
C-119	109 ft 3 in	86 ft 6 in	26 ft 6 in	72,700 lb	281 mph	1,630 miles	21,580 ft

the C-47 served as well in Korea as it had during World War II and as it would do again in Southeast Asia. During the Korean War, the C-47s hauled supplies, dropped paratroopers, evacuated the wounded, and pumped out flares to light the way for night bombing attacks. First flown as the DST (Douglas Sleeper Transport) on Dec. 17, 1935, and produced by the thousands during World War II, the C-47 was powered by two 1,200-hp Pratt & Whitney R-1830 engines. It was and is a classic aircraft.

Photo by Ernie Banks via Warren Thompson

C-54 Skymaster

C-54 Skymaster. Douglas. Originally designed in the 1930s as the DC-4A passenger transport, the C-54 was quickly adopted in World War II for military use. It served brilliantly in that war, as it did in the 1948–49 Berlin Airlift. A C-54 was the first USAF aircraft destroyed in the Korean War; one of the transports on the ground at Kimpo Airfield was strafed by North Korean aircraft on June 25, 1950. The C-54 was powered by four 1,290-hp Pratt & Whitney R-2000 engines and was a Military Air Transport Service workhorse throughout the war.

Photo by Bob Groszer via Warren Thompson

C-119 Flying Boxcar

C-119 Flying Boxcar. Fairchild. The C-119 Flying Boxcar (officially called C-119 Packet) was used extensively in the Korean War. It was a development of the earlier C-82 Packet and was recognizable by its distinctive twin-boom podded fuselage layout. The C-119 first flew in November 1947 and was powered by the new and trouble-prone Pratt & Whitney R-4360 in some versions and the Wright R-3350 in others. Despite logistics problems that kept monthly flying time averages low, the C-119 worked well in Korea, dropping supplies, paratroopers, and outsize equipment. The latter included artillery, vehicles, and two-ton bridge spans.

Reconnaissance/Observation

USAF–deployed reconnaissance versions of the B-26, B-29, B-45, F-51, F-80, F-84, and F-86 were all previously noted.

AT-6 Texan. North American. The famed Texan trainer found a new life in Korea as a forward air control aircraft. To meet an urgent operational need for close air support of ground forces, the Texans flew "mosquito" missions, spotting enemy troops and guns and marking them with smoke rockets for USAF fighter attack. The T-6s performed invaluable work.

RB-17 Flying Fortress. Boeing. The venerable Boeing B-17 was adapted for photographic mapping, reconnaissance, and, as the SB-17, rescue work. First flown on July 28, 1935, the B-17 went on to become a workhorse of World War II. Powered by four Wright Cyclone R-1820 engines of 1,200 hp, the RB-17 operated in the Korean theater for three months in 1950 before being replaced.

Photo by Harold L. Taylor via Warren Thompson

AT-6 Texan

Recce/Observation Specifications

	Span	Length	Height	Gr. Wt.	Speed	Range	Ceiling
AT-6	42 ft 0 in	29 ft 0 in	11 ft 9 in	5,155 lb	210 mph	630 miles	24,200 ft
RB-17	103 ft 9 in	74 ft 4 in	19 ft 1 in	65,500 lb	287 mph	2,000 miles	35,600 ft
RB-36	230 ft 0 in	162 ft 1 in	46 ft 8 in	328,000 lb	381 mph	8,000 miles	42,500 ft
RB-50	141 ft 3 in	99 ft 0 in	32 ft 8 in	170,000 lb	385 mph	4,650 miles	37,000 ft

Photo by Joe Lanahan via Warren Thompson

RF-80 Shooting Star

RB-36 Peacemaker. Convair. The huge six-engine Peacemaker was also used for strategic reconnaissance. Like the RB-50A, the RB-36 operated out of Yokota with the 91st Strategic Reconnaissance Squadron. The XB-36 prototype was first flown on Aug. 8, 1946, and was powered by six Pratt & Whitney R-4360 engines.

RB-50 Superfortress. Boeing. An uprated version of the B-29, the RB-50 was used for strategic reconnaissance during the Korean conflict. It operated out of Yokota AB, Japan, and was assigned to USAF's 91st Strategic Reconnaissance Squadron. The B-50B, the version converted to reconnaissance status, was first flown on Jan. 14, 1949. It was powered by four Pratt & Whitney R-4360 engines. ■

Walter J. Boyne, former director of the National Air and Space Museum in Washington, is a retired Air Force colonel and author. He has written more than 400 articles about aviation topics and 29 books, the most recent of which is Beyond the Horizons: The Lockheed Story. *His most recent article for* Air Force *Magazine, "The Forgotten War," appeared in the June 2000 issue.*

In their search for volunteers, the armed forces turn to the Internet.

Recruiting in CYBERSPACE

By Richard J. Newman

IT'S THE most impressive batch of recruiters the Air Force could hope to assemble. Brett is a dashing fighter pilot. Lia is his match, flying helicopters. Broc is the wisecracking mechanic who can fix an aircraft in a flash—while the enemy is closing in. Then there's Sanchez, the quiet professional, who's trained to parachute into hostile territory, eliminate the enemy, and rescue any friendlies who may be in trouble.

Don't look for this marketing dream team in an Air Force recruiting station, though. They're the stars of "Stealth Force," a sort of adventure series that runs on airforce.com, the principal Web site for people interested in an Air Force career. If they succeed at their mission, these online characters could help the Air Force finally come to grips with its most severe recruiting crunch in decades.

The United States military for four straight years has failed to attract enough recruits to fill the ranks. In a search for solutions, the armed services are turning to—what else?—the Internet. The campaign plan goes well beyond typical corporate recruiting efforts such as listing jobs on the employment sites hotjobs.com and monster.com. Military online recruiters hope that "branding" campaigns—using online games, puzzles, e-dramas, and other interactive offerings—will sell kids on the military long before they are old enough to enlist.

"A lot of these kids don't even know we exist," says TSgt. Chuck Marshall, the Air Force's interactive recruiting chief. "We want to have such a fun and interesting Web site that kids will talk about it at school and talk about it with their friends."

Stealth Force is designed for teenagers aged 13 through 17, with the hope that it will put the Air Force in mind once they approach high school graduation. Another site, called Air Force Link Jr. (af.mil/aflinkjr/), aims to attract the attention of kids even earlier, at the ages of six through 12. That site, launched last year, features about a dozen games and puzzles—including a word search with clues like "radar" and "sonic"—an online "coloring book" in which kids can dandy up the Air Force's forthcoming F-22 fighter, and a picture game that calls on the players to identify cryptic-looking images such as a close-up of a B-2 bomber canopy.

Classic Cliff-Hangers

Stealth Force, which debuted last November, features a core group of characters who are assigned to a secret Air Force unit. Its vaguely defined job: "Defend the nation against Rebel harm." Each adventure (all of which are set in 2010) comprises several episodes that are updated monthly and end in classic cliff-hanger style. Will Brett evade the "sonic detonator" fired by an enemy jet? Will Lia be able to maneuver the rescue chopper into a tiny canyon?

Each episode is a noninteractive "flash movie." Optional games at the same site carry on the basic theme of the series. In "Jungle Maneuvers," for instance, players would get to help Sanchez, the rescue specialist, run like Pacman through a maze of trees and gather up first-aid kits and energy packs that help keep his strength up—and earn points for the player. In another game, players would race against a clock to select the right tools and parts to fix the engine of the downed helicopter.

The Air Force hopes that lots of flash technology allowing fluid motion on the screen will help set its site apart from the pack, and there is a pack. "We're trying to distinguish ourselves from the other services," says Jonathan Skaines, the art director for Dallas–based Sixty Foot Spider, USAF's Internet development agency. "We want to brand the high-tech image."

Even though the Stealth Force games are fairly simplistic, they do hold a decisive edge over the competition. So far, the only other military-sponsored online game is a primitive effort on www.navyjobs.com called "The Mission."

The Mission, says the Navy, targets Net surfers 15 and under. The player represents a Navy fighter pilot on the aircraft carrier USS *Truman*. Across the screen flashes a message that some SEALs need air support. As the player follows the game prompts, he is led to different stations on the carrier. The object is to acquaint players with the kinds of things that take place on a big-deck carrier, other than launches of high-tech aircraft and their pilots into the wild blue. There are brief encounters, for instance, with a tactical action officer who gets the air support operation up and running and an aviation storekeeper who provides equipment for aircraft. Each offers a testimonial about how exciting it is to be in the Navy. Yet all of the displays are static, and the game has no voices, just boxes with written dialogue.

In a Nutshell

Finally, two F/A-18 fighters are airborne, and the game reaches its climactic moment. The player gets to click on a button that fires a missile at two enemy fighters. When he does this, the bogeys suddenly peel away, intimidated by the Navy fighters. One of the dialogue boxes sums up the meaning of it all: "I guess those two don't want to test their fate against the highly trained Navy pilots."

The services' online games are new and targeted at teens still too young to enlist, so the Pentagon has no data to indicate whether or not they actually will help strengthen the Pentagon's recruiting performance. Military officials see hopeful signs. In January, the most recent month for which figures are available, the Stealth Force site got more than 85,000 hits, up from some 49,000 in the previous month. In January, a focus group was asked about Stealth Force, and about half of the participants said they would bookmark the site. Three-fourths said they would recommend it to a friend.

Overall, airforce.com each month produces names of about 5,000 persons who ask for more information about joining the Air Force and meet the service's age and educational requirements. Those names are passed on to field recruiters, who then follow the usual procedure for wooing the prospect into the service.

Overall, airforce.com each month produces names of about 5,000 persons.

Those leads might prove to go a long way toward making up for stubborn recruiting shortfalls over the last two years. In 1999, the Air Force wanted to recruit 33,800 new members. It fell short by more than 1,700. This year, the service is aiming for

34,000 enlistees, but it projects it will come up 1,000 short of the goal. Actual USAF end strength is several thousand spaces below the authorized level.

"I am very concerned," says Carol A. DiBattiste, the undersecretary of the Air Force and a central figure in USAF's get-back-on-track recruiting effort. "We've declared a wartime mentality."

gram," says Ed Burke of Andersen Consulting, a firm hired by the Pentagon last year to help straighten out military recruiting.

Cold Calls and Malls

Burke maintains that imaginative Internet recruiting promises to be more effective than traditional reliance on 20,000 noncommissioned officers making cold calls, approaching teenaged prospects in malls, and otherwise hunting down the more than 100,000 men and women needed every year.

cated new online tools offer promise of dramatic advances. The Air Force, Army, and Navy recruiting officials all are developing online games that could feature multiple players and complex character development that help determine the player's interests and capabilities. It is the desire for this kind of information that consumes many hours of recruiting time each day.

Internet recruiting could make it easier to categorize potential recruits by interest and demographic profile.

Recruiting problems aren't unique to the Air Force. All services are affected. The end of the 1990s military drawdown and the roaring economy have forced all of the military services to work harder to fill the ranks. Working against them is the fact that teenagers show less and less interest in joining the armed forces. Each year, the Pentagon conducts a study to determine the propensity of young Americans to serve. In 1989, at the close of the Cold War, such a propensity could be found in 17 percent of males aged 16 through 21. One decade later, that figure had fallen to only 12 percent.

Still, the Air Force's recruiting problems have lasted longer and cut deeper, compared to the other services. The Navy, for example, came up short in 1998 by 7,000 recruits and barely met its end strength last year. The Army and Marine Corps, similarly, enjoyed recent success meeting numerical end strength requirements. One underlying problem may be that the likely Air Force recruit—someone interested in a technical career and with strong academic achievement—is precisely the kind of young person in great demand in the superheated US economy. The Air Force has declared that it will not lower standards to increase numbers.

The services still cannot determine how many actual enlistments have come from Internet leads. That fact highlights one of the Pentagon's biggest recruiting weaknesses—inability to measure the extent to which something does or does not work.

"They have trouble figuring out what's effective with the whole pro-

Internet recruiting could make it easier to categorize potential recruits by interest and demographic profile and even capture e-mail addresses for future recruiting calls.

There are worries, however, about aggressive data mining. "We don't want to overpressure people into thinking they have to sign up now," says Skaines. "We're not going to be overbearing on recruiting."

The other services seem to agree with that approach. Visitors to goarmy.com, for instance, can join chat rooms to ask recruiters about life in the Army without ever giving their real names.

Most recruiting experts doubt that faceless online encounters will ever supplant the no-nonsense sergeant calling to sell young men and women on military service. And the Air Force isn't relying solely on Internet gimmicks to bridge the recruiting gap. The Air Force hopes that, by the end of 2000, it will have expanded its "sales force" to 2,000 recruiters, up from about 900 last November.

Two recent recruiting "summits" produced more than 100 number-raising initiatives. Among them: increased spending on new advertising and bonuses for persons to enter certain fields. One new deal offers eligible recruits up to $10,000 to repay college loans. Congress may also provide some relief. The 2001 defense budget request includes funds to continue incremental pay increases.

Still, say officials, the sophisti-

The Navy is developing a game modeled on EverQuest, the popular fantasy game in which players make decisions that affect the skills and traits of their characters. At one level, explains Lt. Cmdr. Nick Dodge, director of electronic recruiting for the Navy, a player will decide what kind of Navy job he wants. If he becomes a mechanic, but his interests indicate he should be a warehouseman, he will lose "strength points." Then the player will go through an aptitude evaluation. Along the way, he will move from basic recruit to supervisor, responsible for running an engine shop or parts facility or some other department during a military operation.

"This is what kids today are interested in," says Dodge. "It's not necessarily blowing stuff up. It's using your intellect to solve problems."

Can the military keep such young people entertained? Will the mundane aspects of military life be a turnoff? While Stealth Force may be attracting lots of eyeballs, its creators admit that most people in the Air Force lead lives that are far less exciting than those lived by Brett, Lia, Broc, and Sanchez.

"We understand it [the online image of service life] is not a realistic kind of situation," says Skaines. "If it were realistic, it would probably be boring." ■

Richard J. Newman is the Washington–based defense correspondent and senior editor for US News & World Report. *His most recent articles for* Air Force *Magazine, "Silver Stars" and "Reachback," appeared in the June 2000 issue.*

In a new study, the Congressional Budget Office estimates the cost of an anti-missile system that is bigger and more robust than the Clinton Administration version.

The CBO's Missile Defense

What follows is an excerpt from "Budgetary and Technical Implications of the Administration's Plan for National Missile Defense," published in April by the Congressional Budget Office. CBO undertook the study, in part, to evaluate the probable cost of a three-phase program to defend the US against a ballistic missile attack. Primary authors were Geoffrey Forden and Raymond Hall.

The Administration's planned program for National Missile Defense is designed to defend the entire United States from attack by a relatively small number of incoming ballistic missiles. Those missiles could contain nuclear, biological, or chemical weapons capable of killing thousands or even millions of people. Much of the public debate about NMD has centered on how pressing the threat is or whether the method chosen—hitting an incoming missile with an interceptor missile and destroying both of them through the force of the impact (so-called hit to kill)—is technologically feasible. Those are important questions. But other issues also become important if the President decides to deploy a National Missile Defense, issues such as the cost of the system, the number of flight tests planned, the relative shortness of the development schedule, and the possible reactions of other nations. ...

The Administration's plan for NMD gives policy-makers the flexibility of deploying the system in three phases, each with different capabilities. The Administration could choose to deploy all three sequentially or halt deployment after any one of them. The first phase, known as Expanded Capability 1, would cost nearly $30 billion, CBO estimates. That figure includes one-time costs and operating costs through Fiscal Year 2015. ... Continuing on to the second stage, Capability 2, would cost an additional $6 billion, for a total of nearly $36 billion, CBO estimates. Achieving Capability 3, the most extensive and sophisticated stage of NMD deployment, would add more than $13 billion to the costs of Capability 2.

Thus, costs for the entire system would total nearly $49 billion through 2015, in CBO's view. ... Those CBO estimates do not include the costs of space-based sensors for NMD because the sensors would be used for other missions as well, and their costs are included in separate Air Force programs. CBO's estimates attempt to strike a balance between overestimating and underestimating potential NMD costs. ...

The Administration's current plan for National Missile Defense shows Expanded Capability 1 possibly being deployed at the end of Fiscal Year 2007, Capability 2 at the end of 2010, and Capability 3 at the end of 2011. However, the Administration's current Future Years Defense Program, which runs through 2005, does not include significant funds for those later phases. To begin funding the Capability 2 system after 2005 and still meet the target deployment date of late 2010, CBO estimates, would require annual spending that would

surpass $3 billion in 2006 and 2007 (see Fig. 1). Moreover, that estimate assumes that the Administration decides not to proceed with Capability 3. If it also attempted to acquire Capability 3 by late 2011—as well as Capability 2 along the way—annual spending would have to exceed $6 billion in 2007 and 2008. ...

The Administration's NMD system is designed to shoot down ICBMs as they travel through space. When an enemy missile is launched, the NMD system must detect it, accurately predict where it will be during the 30 or so minutes it will be in flight, determine which of the objects sailing through space toward the United States is the actual missile (as opposed to decoys designed to confuse sensors), and finally send a computer-guided interceptor to collide with the missile's warhead. To accomplish those tasks, NMD depends on a globe-spanning system of satellites, radars, communications systems, and battle-management computers to launch and direct interceptors.

Administration's Plan

Expanded Capability 1

The Administration's plan for developing NMD calls for the first stage, Expanded Capability 1, to be fully deployed by the end of Fiscal Year 2007 (see Fig. 2). That stage is intended to defend the entire United States from attack by several tens of ICBMs that employ simple countermeasures. Because of the perceived urgency of the threat, Expanded Capability 1 will be preceded two years earlier by a "threshold" deployment of 20 interceptors located in central Alaska (see Fig. 3). That deployment also requires constructing a high-resolution X-band radar and upgrading several existing early warning radars. Moving to the full Expanded Capability 1 will involve increasing the number of interceptors in Alaska to 100.

The current system of US space-based early warning satellites (the Defense Support Program) and its replacement (the high-orbit satellites of the Space Based Infrared System, or SBIRS–high) play an important

Contrary Views

"The CBO report and our [DoD] estimates are a comparison between apples and golden apples. The CBO looks at a much more robust system than we have costed out at this stage. We're looking at a system of 100 interceptors ... at one site. The CBO is looking at a larger system—250 interceptors at two sites. All our estimates deal with a smaller system, 100 interceptors at one site at this stage, and we have not made cost estimates of what a larger system would be. CBO has made those estimates. The Defense Department estimates and the CBO estimates go out over a long period of time, 20 years. And these estimates, of course, reflect not only the cost of building a system that hasn't even been completely developed and tested and proven yet, but it also covers two decades of inflation that we can't predict. So, I think everybody trying to figure out these figures and compare them has to be aware of the risks involved and the judgment factors that enter into any sort of cost estimate." **—Pentagon spokesman Kenneth H. Bacon, April 25 DoD news briefing.**

"We have always been concerned about price tags. We're also concerned that our country have an adequate defense system. So we'll take a very close look at this report and assess it in the context of, 'Is it a legitimate report? Are these legitimate figures? And are there alternatives ... to the ones that we've studied?' " **—Sen. Larry E. Craig (R–Idaho), a leading supporter of National Missile Defense, quoted in April 26 *Washington Post*.**

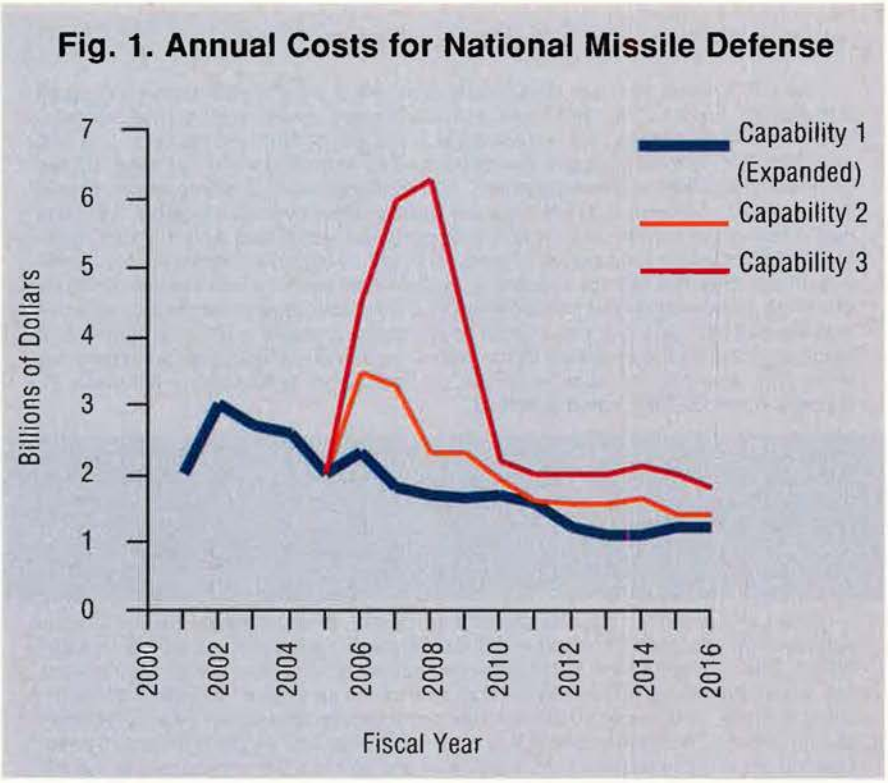
"[The CBO paper] ... asserts the total price tag, over 15 years, for the Clinton Administration's ground-based missile defense system could be as high as $60 billion. The fact is that the CBO figure include[s] projected costs for upgrades to the initial system that the Administration has yet to define, let alone propose. What is more, ... the costs CBO anticipates would be spread out over 15 years—during which time defense budgets may total as much as $4.5 trillion. Consequently, even if the current CBO estimates are correct, the annual outlay for this expanded (but still "limited") National Missile Defense system would be less than 1 percent of then-year budgets. At that rate, a missile defense capable of sparing even a single American city from attack by missile-delivered weapons of mass destruction, to say nothing of perhaps all of them, would be cheap at twice the CBO's price." **—Center for Security Policy, a major advocate for NMD, in an April 27 briefing paper.**

"What we have costed out so far is a 100-interceptor force based in Alaska, with X-band radars, expanded early warning radars, [and] a battle management command-and-control system. And that is, over the life cycle, ... from 1991 to 2026, in Fiscal Year 1999 dollars, about $36 billion. ... Now, [that number] is different from the Congressional Budget Office numbers—which we don't take particular issue with, except what they costed out was a 250-interceptor force at two different locations. It was a different cost comparison, and we simply have not done the cost comparison as they have. We have only costed out the first phase of the program. ... We do not [have an estimate for the broader system with two sites and 250 interceptors]." **—Pentagon spokesman Rear Adm. Craig Quigley, April 27 DoD news briefing.**

"[Critics] complain of prices ranging from $30 billion to $60 billion for the NMD program. ... These numbers are much too high. The Pentagon says it actually will cost $12.7 billion [through 2005]. ... But what about the CBO figure of nearly $60 billion? It seems that the CBO and the Defense Department are in close agreement on the cost of the planned program to deploy 100 interceptors at a site in Alaska. But the CBO then estimates the cost of constructing and operating two ground-based sites with 250 interceptors and adds $10.6 billion for the planned 24 low-altitude satellites. ... So the CBO and the Pentagon are comparing apples and oranges." **—James Hackett, defense official in Nixon and Reagan Administrations, April 27 *Wall Street Journal*.**

"The CBO study is immediately suspect because it was requested by two Democrats [Sen. Carl Levin (D–Mich.) and Sen. Frank Lautenberg (D–N.J.)] who are opposed to National Missile Defense. ... I've got big problems with the [CBO's] numbers. They were estimates. They were guess-timates. They were not scored in any way. They go far beyond the amounts that anyone else has come up with. ... I think this is the result of a couple of Democrats who're tryng to spin a report against building a defense. ... I've got to hold a hearing on this. We'll call the CBO analysts, put them under oath, and ask them how they arrived at these numbers. Then maybe we'll find out. These numbers were so far off. Somebody's giving them bad assumptions, or they're making bad assumptions themselves. ... Even if, for the sake of argument, you assume the cost figures are right, how much is Philadelphia worth? Or Los Angeles? Is it worth only $10 billion? Or $25 billion? Or is it worth spending whatever it takes? That's another whole issue." **—Rep. Curt Weldon (R–Pa.), chairman of the House Armed Services Committee's military research and development subcommittee, May 18 *Air Force* Magazine interview.**

Fig. 1. Annual Costs for National Missile Defense



role for Expanded Capability 1. They will provide the initial warning that an enemy missile has been launched as well as a relatively crude estimate of its trajectory. That information will be used to tell the X-band and upgraded early warning radars where to search for the incoming missile. (DSP satellites cannot direct missile defenses, however, because they do not provide sufficiently high-quality tracking information. SBIRS–high is also not likely to be able to supply good enough tracking data to direct NMD's interceptors.)

Capability 2

The next stage of National Missile Defense, known as Capability 2, builds on Capability 1 and is designed to cope with more complex countermeasures, but at the price of being able to handle only a few incoming missiles. Current plans call for Capability 2 to be deployed completely by the end of 2010. To achieve the increased abilities of Capability 2, the system would add three more X-band radars at various sites around the world and more facilities to communicate with interceptors in flight.

Most important, the system would draw on 24 SBIRS satellites in Low Earth Orbit (known as SBIRS–low). Those satellites will track not only missiles under powered flight (as DSP and SBIRS–high satellites will) but also missiles that are gliding through space and thus are not giving off the bright light associated with powered flight. The number of deployed interceptors and the hardware of those interceptors would not change under Capability 2, according to current plans.

By the time it was deployed, Capability 2 would have the full benefit of both SBIRS–high and SBIRS–low satellites. According to the Administration's plan, SBIRS–high would continue, under Capability 2, to supply early warning information to the National Missile Defense system as well as to the rest of the US strategic forces. Those satellites' preliminary estimate of an incoming missile's trajectory would be passed to both the ground-based radars and the SBIRS–low satellites. Most likely, SBIRS–low satellites would spot the incoming missile's warhead and any countermeasures the missile released before ground-based radars could.

If all went according to plan, at least two SBIRS–low satellites would focus on the approaching warhead and determine a more precise path for it. The earlier a precise determination of an incoming warhead's path is made, the sooner the first salvo of interceptors can be fired. SBIRS–low would also record valuable information about the amount of heat given off by the object, which could prove helpful in distinguishing a warhead from decoys.

Although SBIRS–low is intended to continuously buttress the National Missile Defense system, it will also support theater missile defenses (systems designed to defend areas outside the United States from relatively short-range missiles). Both the precise tracking of SBIRS–low and its ability to distinguish warheads from decoys should significantly aid theater missile defenses. Unlike NMD, however, those defenses are limited in both the area they protect and the length of time for which they are designed to be deployed.

Capability 3

The final level of NMD deployment is Capability 3, which includes all of the assets of Capability 2 plus 150 additional interceptors, more radars, another communications facility, and improved software for each of the systems' components. This stage would combine the capabilities of the two earlier stages by defending the country from several tens of incoming missiles with complex countermeasures.

Some of the additional interceptors would be stationed at a second site, currently planned for Grand Forks, N.D. That would improve the system's coverage of the United States by placing interceptors closer to the East Coast. From there, they could attack warheads originating in the Middle East at farther distances from the United States—and thus earlier in the warheads' flight—than interceptors based in Alaska could. ...

Costs of the Plan

Expanded Capability 1

Acquiring the Expanded Capability 1 system would cost about $20.9 billion, CBO estimates. Including operations through 2015—if the NMD system stayed at that capability level for that long—would bring total costs to $29.5 billion. Annual operating costs after 2015 would total $600 million (in 2000 dollars).

CBO's estimate for Expanded

Capability 1 is $3.9 billion more than the Administration's estimate for the same period because of different assumptions about procurement of NMD components, construction, and operations.

Differing estimates for procurement arise for two reasons. First, CBO believes that in addition to the 100 deployed interceptors, the system would need 82 additional interceptors to use in testing and to replace ones lost in accidents or engagements. The Administration puts the number of additional interceptors at 47. However, CBO's larger figure is more consistent with the experience of previous missile programs. ...

Second, CBO's estimates for procurement are higher because they assume that the Expanded Capability 1 system will experience cost growth comparable to that of both analogous strategic systems (such as the Air Force's Minuteman and Peacekeeper missiles and the Navy's Trident missile) and various tactical systems (such as the Air Force's Advanced Medium-Range Air-to-Air Missile, the Navy's Standard missile, and the Army's Patriot missile). ... (Because the Administration's estimate includes about 5 percent for cost growth, CBO's estimate reflects an increase of about 15 percentage points.)

In the area of construction, CBO estimates that building the necessary facilities would cost some $1.5 billion—or $1 billion more than the Administration estimates. Those construction costs cover the X-band radar site, command and communications facilities, 100 missile silos, access roads, housing for personnel, and other infrastructure support. CBO's estimate is based primarily on the cost of constructing the Safeguard missile defense site at Grand Forks, N.D., in the early 1970s (about $1.5 billion in today's dollars). It also takes into account similar expenses for land-based ICBMs and planning factors from DoD about relative construction costs in different areas of the country.

CBO expects that operating the Expanded Capability 1 system would cost a total of about $8.5 billion through 2015, which is some $1.5 billion more than the Administration estimates for the same period. All of the difference results from CBO's assumption that 30 operational tests will have to be conducted over the first five years rather than the 10 tests that the Administration now plans.

Eventually, operations costs for Expanded Capability 1 will reach a steady-state level of about $600 million a year (in 2000 dollars). Steady-state operations have three main components: day-to-day costs to run the equipment and keep it ready and to staff the command and communications facilities (a total of about $100 million per year); costs for an operational integration program, which would continually upgrade the NMD system to incorporate new technologies ($300 million per year); and the cost to conduct operational tests (about $200 million per year).

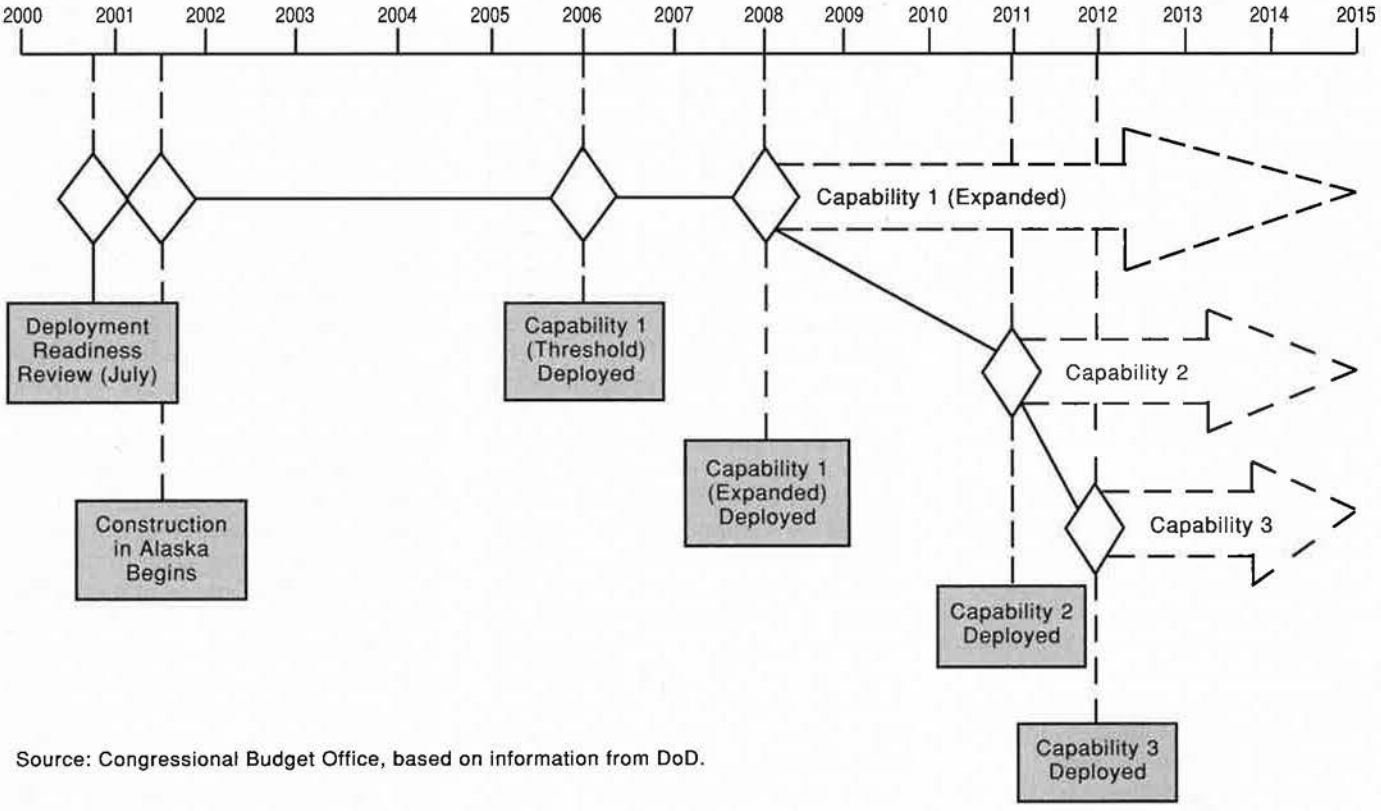
Those costs are based on information provided to CBO by the Ballistic Missile Defense Organization.

Capability 2

Although the Administration's plan for NMD indicates possibly upgrading Expanded Capability 1 to

Fig. 2. Proposed Timeline for National Missile Defense

(By fiscal year)



Source: Congressional Budget Office, based on information from DoD.

Fig. 3. Number of Components Deployed at Each Stage of NMD

Component	Capability 1 (Threshold)	Capability 1 (Expanded)	Capability 2	Capability 3
Interceptors	20	100	100	250
Launch sites	1	1	1	2
X-band radars	1	1	4	9
Upgraded early warning radars	5	5	5	6
Interceptor communications facilities	3	3	4	5
Memorandum:				
Early warning satellites (SBIRS–high)	2	4	5	5
Warhead-tracking satellites (SBIRS–low)	0	6	24	24
Deployment date (fiscal years)	2005	2007	2010	2011

Source: Congressional Budget Office, based on information from DoD.

Note: SBIRS = Space Based Infrared System.

a more sophisticated Capability 2 system by the end of 2010, the Administration has not estimated the costs associated with that stage of deployment.

However, it has specified what the Capability 2 architecture would consist of as well as the areas in which most of the improvements would be made. Based on that information, CBO estimates that upgrading Expanded Capability 1 to Capability 2 would cost $6.1 billion—for a total cost of $35.6 billion for that level of National Missile Defense.

Although the number of deployed interceptors would remain the same, improving the ability of the Expanded Capability 1 system to handle complex threats (specifically, ballistic missiles with sophisticated countermeasures) would add more than $2 billion to the cost of the interceptors. (The exact technical details of moving from Expanded Capability 1 to Capability 2 have not been announced. ...) Moreover, a further 19 interceptors would be needed for integrated flight tests and operational tests, at a cost of slightly more than $0.3 billion, bringing the total increase in interceptor costs to about $2.4 billion.

DoD has indicated that the hardware for the high-resolution X-band radar and the upgraded early warning radars would not need improvement for Capability 2.

But buying three more X-band radars would cost about $1.3 billion, and constructing radar platforms and domes would cost another $0.3 billion ($100 million per radar).

Additional flights to test the upgrades made for Capability 2 would cost about $0.7 billion, CBO estimates. That figure includes seven additional integrated flight tests during 2008 or 2009 (at a cost of about $80 million each) and engineering support. In addition, CBO estimates, 12 more operational tests—which occur after a system has been deployed—would be needed between 2012 through 2014, at a total cost of about $1 billion. Those tests would allow for a rate of six operational tests per year during the first five years of Capability 2's operations.

Finally, moving to Capability 2 would increase the day-to-day operations costs for National Missile Defense by nearly $100 million a year (to support the three additional X-band radars), or a total of about $0.5 billion. Annual operating costs after 2015 would total $0.7 billion (in 2000 dollars).

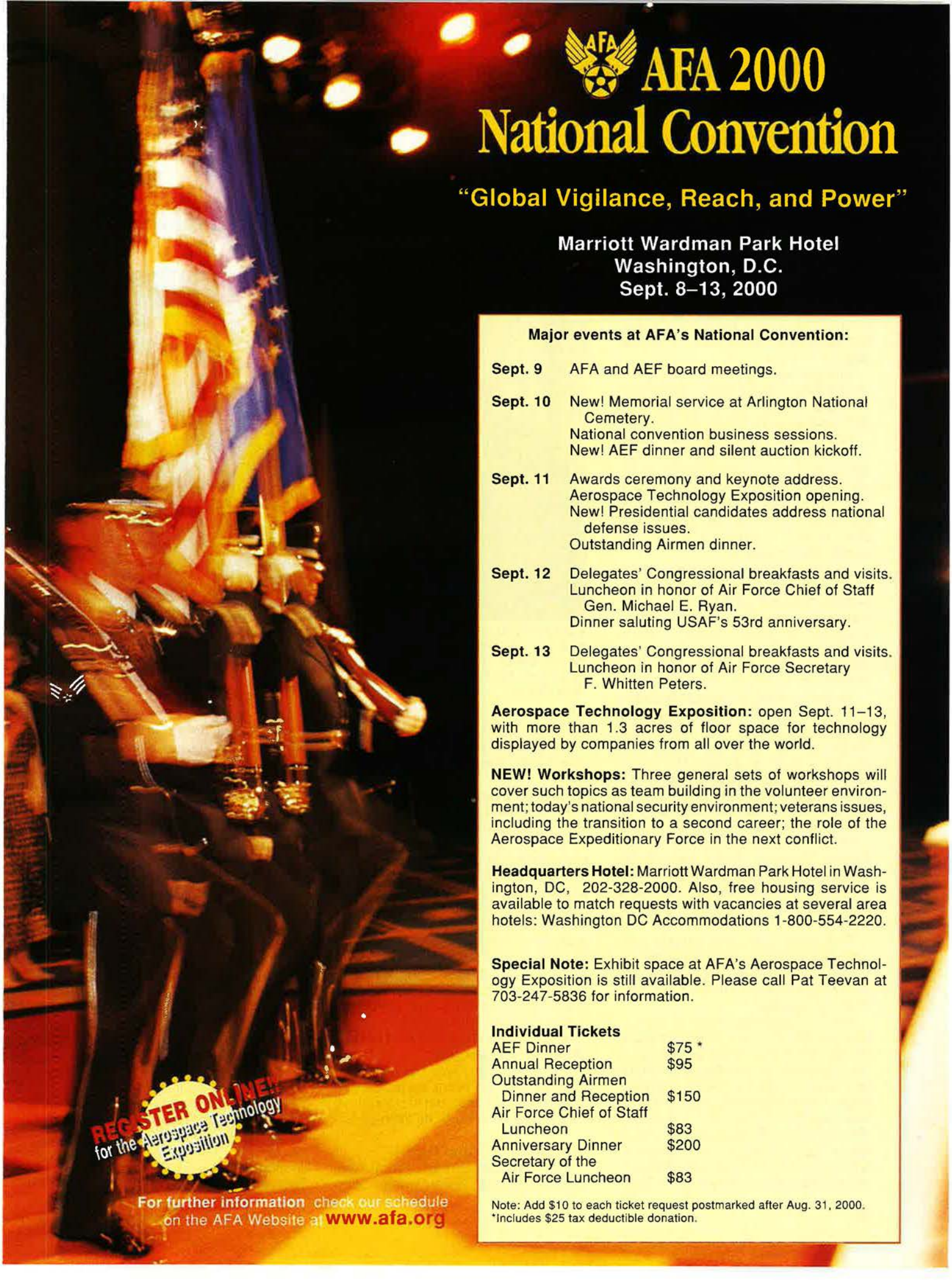
The effectiveness of the Capability 2 system depends on the deployment of the SBIRS–low satellites, which, according to the Air Force, will provide the NMD system with 24-hour coverage of global threats. As mentioned earlier, CBO's estimates for National Missile Defense do not include the costs of those satellites, even though they are essential to Capability 2's success. Those costs would total nearly $10.6 billion through 2015, CBO estimates—$4.2 billion for research and development, $2.7 billion for purchase of the initial 24 SBIRS–low satellites (about $100 million apiece), $1.1 billion for operations (about $5 million a year per satellite), and $2.7 billion for purchase of replacement satellites (assuming each satellite has an average mission life of about eight years). If SBIRS–low was unavailable for any reason, Capability 2 could be achieved by using faster interceptors, deploying more forward-based radars, and developing more capable "kill vehicles" (the part of the interceptor that hits the incoming warhead). None of those changes or additions are currently planned.

Capability 3

The Administration's plan for Capability 3 of NMD calls for deploying 125 additional interceptors (with Capability 2 sophistication) by 2011, probably in Grand Forks, N.D. It also calls for adding 25 interceptors to the site in Alaska, for a combined deployment of 250 interceptors. CBO estimates that moving from Capability 2 to Capability 3 would cost more than $13.3 billion through 2015—or a total of $48.8 billion for that level of National Missile Defense.

The additional costs would come from several areas. CBO estimates that purchasing 150 more deployed interceptors and 30 more spares would cost about $3.3 billion (nearly $18 million each). Buying five additional X-band radars, stationed both in the United States and abroad, would cost a total of about $2.2 billion. Constructing the radars' platforms and domes would cost another $0.5 billion. In addition, buying an upgraded early warning radar and deploying it in Asia would cost about $0.4 billion, and building the command and communications facilities would cost about $1.4 billion. Other construction costs at Grand Forks would total about $1.6 billion (equivalent to the Alaskan site).

Adding a second site to the NMD system would increase the costs of both day-to-day operations and operational integration. CBO estimates that daily operations at Grand Forks would cost a total of about $1 billion through 2015, or an average of about $200 million a year. Operational integration at that site would start in 2008 and would total about $2.9 billion. Those estimates for day-to-day operations and operational integration are comparable to the costs at the Alaskan site. Annual operating costs after 2015 would total about $1.1 billion (in 2000 dollars). ■



AFA 2000 National Convention

"Global Vigilance, Reach, and Power"

Marriott Wardman Park Hotel
Washington, D.C.
Sept. 8–13, 2000

Major events at AFA's National Convention:

Sept. 9 AFA and AEF board meetings.

Sept. 10 New! Memorial service at Arlington National Cemetery.
National convention business sessions.
New! AEF dinner and silent auction kickoff.

Sept. 11 Awards ceremony and keynote address.
Aerospace Technology Exposition opening.
New! Presidential candidates address national defense issues.
Outstanding Airmen dinner.

Sept. 12 Delegates' Congressional breakfasts and visits.
Luncheon in honor of Air Force Chief of Staff Gen. Michael E. Ryan.
Dinner saluting USAF's 53rd anniversary.

Sept. 13 Delegates' Congressional breakfasts and visits.
Luncheon in honor of Air Force Secretary F. Whitten Peters.

Aerospace Technology Exposition: open Sept. 11–13, with more than 1.3 acres of floor space for technology displayed by companies from all over the world.

NEW! Workshops: Three general sets of workshops will cover such topics as team building in the volunteer environment; today's national security environment; veterans issues, including the transition to a second career; the role of the Aerospace Expeditionary Force in the next conflict.

Headquarters Hotel: Marriott Wardman Park Hotel in Washington, DC, 202-328-2000. Also, free housing service is available to match requests with vacancies at several area hotels: Washington DC Accommodations 1-800-554-2220.

Special Note: Exhibit space at AFA's Aerospace Technology Exposition is still available. Please call Pat Teevan at 703-247-5836 for information.

Individual Tickets

AEF Dinner	$75 *
Annual Reception	$95
Outstanding Airmen Dinner and Reception	$150
Air Force Chief of Staff Luncheon	$83
Anniversary Dinner	$200
Secretary of the Air Force Luncheon	$83

Note: Add $10 to each ticket request postmarked after Aug. 31, 2000.
*Includes $25 tax deductible donation.

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AFA/AEF National Report

By Frances McKenney, Assistant Managing Editor

AFA Reception Remembers Korean War

A huge black-and-white photo blow-up, showing a young Sam Johnson—now a US Representative from Texas—as an F-86 pilot in Korea, served as the focal point for a Capitol Hill reception in May.

Sponsored by the Air Force Office of Legislative Liaison and the Air Force Association, the event observed the 50th anniversary of the Korean War.

Now in his fifth term in the House, Johnson's Air Force career spanned 29 years, until his retirement in 1979. He flew 62 combat missions in Korea. During the Vietnam War, his F-4 was shot down over North Vietnam, and he was a prisoner of war for almost seven years.

The storyboard on Johnson and the room's other three-sided information panels detailing USAF's role in the war were researched by Air Force Historian Richard P. Hallion and the Air Force History Support Office, including Herman S. Wolk, a frequent contributor to *Air Force* Magazine.

As the number of military veterans in Congress declines, educating elected representatives and their staffs about Air Force issues has become a major objective of these Capitol Hill receptions, held four times a year. The gatherings also give AFA leaders an opportunity to speak informally to members of Congress and to such USAF officials as Secretary of the Air Force F. Whitten Peters, who was on hand for the entire reception.

"This is all about face to face," said AFA National President Thomas J. McKee.

The more than 300 guests also included 12 Congressional Representatives, USAF Chief of Staff Michael E. Ryan, and Vice Chief of Staff Gen. John W. Handy.

HASC Chairman Rep. Floyd D. Spence (R–S.C.) and Rep. Charles B. Rangel (D–N.Y.), ranking member of the House Ways and Means Committee, were joined by HASC members Reps. Steve Buyer (R–Ind.), Van Hilleary (R–Tenn.), Steven T. Kuykendall (R–Calif.), Ciro D. Rodriguez (D–Tex.), Gene Taylor (D–Miss.), and Robert A. Underwood (D–Guam). Other Representatives present were Howard Coble (R–N.C.), Collin Peterson (D–Minn.), Christopher Shays (R–Conn.), and Charles W. Stenholm (D–Tex.).

Photo by Susan Kennedy

A Capitol Hill reception hosted by USAF's Legislative Liaison and AFA gave AFA National President Thomas McKee (right) an opportunity to talk with House Armed Services Committee member Rep. Van Hilleary (R–Tenn.) and Brig. Gen. Paul Hankins, director of USAF's new Recruiting and Retention Task Force.

An AEF Editorial

An editorial by AEF President Jack C. Price appeared in the May issue of *In Flight USA,* a monthly magazine distributed at high-traffic airports throughout the US and also available online at www.inflightusa.com.

The editorial described the history of AEF and its educational outreach programs, scholarships and grants, publications, and Eaker Institute symposia.

"The Aerospace Education Foundation helps inform the American public and our future leaders about science, technology, and our national defense," Price wrote.

According to *In Flight USA,* the publication reaches more than 123,000 readers each month and more than 10 million others through its Web site.

"Legends" In Your Town

Public Broadcasting System television stations in several major cities have signed up to air "Legends of Airpower," the series of military aviators' biographies. The series was originally underwritten partially by AEF and produced by Three Roads Communications of Arlington, Va., with help from AFA.

The cities include Atlanta, Boston, Chicago, Dallas, Houston, Los Angeles, New York, Philadelphia, and San Francisco. These cities represent 150 to 175 potential TV stations. Other locations that might still consider airing the program include Cincinnati, Cleveland, Detroit, San Antonio, Seattle, Hartford, Conn., and the Long Island area of New York.

AEF has partially underwritten distribution of the 13-part series on PBS and receives credit for it at the beginning and end of each program.

"Legends of Airpower" covers the lives of "Hap" Arnold, Randy "Duke" Cunningham, Benjamin O. Davis Jr., Jimmy Doolittle, Russell E. Dougherty, "Gabby" Gabreski, John Glenn, Charles A. Horner, Curtis E. LeMay, Billy Mitchell, Bernard A. Schriever, Jimmy Stewart, and Chuck Yeager.

Cunningham, who as a Navy pilot was the first fighter ace of the Vietnam War and today is a fifth-term Republican US Congressman from California, wrote to Legends executive producer Russ Hodge to thank him for producing the series. "It is films like yours that help to ensure that our country never forgets about those who dedicated and gave their lives to protect our cherished freedoms," he said.

Photo by Susan Kennedy

At the reception held at the Rayburn House Office Building, USAF Chief of Staff Gen. Michael Ryan discusses Air Force issues with Rep. Steven Kuykendall (R–Calif.) of the House Armed Services Committee.

Evening in Fort Worth

The **Fort Worth (Tex.) Chapter** held its black-tie event, "An Evening in Fort Worth," with Air Force Chief of Staff Gen. Michael E. Ryan as keynote speaker.

Addressing an audience of more than 300 guests, Ryan described USAF's decline in end strength and increase in operations tempo and the need for modernization.

A highlight of the evening was the presentation to Ryan of a painting by aviation artist K. Price Randel. Commissioned by Lockheed Martin Aeronautics, the painting was presented at a predinner reception by Dain Hancock, Lockheed Martin executive vice president. Randel himself signed prints of the painting afterward for the guests.

Ryan also received a certificate proclaiming him an honorary citizen of Fort Worth. The chapter's newsletter reported, "This was a particularly special moment for the general since he is a Texan by birth and spent much of his youth in Fort Worth as a military dependent." Ryan's father, Gen. John D. Ryan, Air Force Chief of Staff from 1969 to 1973, had been stationed at Carswell AFB in the 1960s.

Special guests at the gala included Thomas J. Kemp, Texoma Region president; L.B. "Buck" Webber, national director; and C.N. "Buster" Horlen, state president.

David A. Dietsch, chapter president, noted that more than a dozen chapter members pitched in to organize this annual event, carried out with sponsorship from several key defense contractors, including Bell Helicopter Textron, Northrop Grumman, and Raytheon. Proceeds from this annual gala fund the chapter's aerospace education activities.

Page One

Enid (Okla.) Chapter Secretary Oscar Curtis was the focus of the full-page, color cover photo for a section called "Community" in the *Enid News and Eagle* newspaper in March.

"Aim for the Sky," the headline proclaimed. "Oscar Curtis forges strong ties between community, Vance."

Inside, an article explained that Curtis, 81, "put Enid's chapter on the map with a host of national recognition awards from the top brass in Washington, D.C." The article reported that the chapter has 235 Community Partners and noted that Curtis began the program in Enid in 1982 to raise

Doolittle Stamp

AFA and the Aerospace Education Foundation have joined those who seek to have a commemorative stamp issued by the US Postal Service to honor the late Gen. Jimmy Doolittle.

The Doolittle Raiders—surviving members of the group who accompanied Doolittle on the first airstrike against the Japanese homeland in April 1942—signed a petition at their 58th reunion, held in Utah in April, to kick off the drive to have a postage stamp issued in honor of their leader.

A World War II hero, Doolittle compiled an impressive list of aviation firsts: the first to pilot an aircraft from coast to coast in less than 24 hours; the first to take off, fly a level course, and land an aircraft using instruments only; and the first to win both the Bendix (1931) and Thompson (1932) racing trophies, to name a few accomplishments. He was also one of AFA's 12 founders and its first National President (1946–47).

Those who would like to join in the effort to have a Jimmy Doolittle stamp issued may send a petition, postcard, or letter to the Citizens' Stamp Advisory Committee, c/o Stamp Management, US Postal Service, 475 L'Enfant Plaza SW, Room 4474E, Washington, DC 20260-2437.

USAF photo by Bud Hancock

AFA National President McKee presents the Academic Achievement Award to SMSgt. Marc Ramos, 317th Maintenance Squadron, Dyess AFB, Tex., at the Senior NCO Academy graduation in Montgomery, Ala., in April.

funds for scholarships and recognition efforts for Vance AFB personnel. (In a letter to AFA, Curtis added that he had personally signed up 130 of those Community Partners.)

"The Air Force Association got some good publicity in our community," he wrote.

Honoring SNCO Graduates

CMSAF Jim Finch and four former Chief Master Sergeants of the Air Force joined AFA National President McKee at graduation ceremonies for USAF Senior NCO Academy's Class 00-C in Montgomery, Ala., in April.

McKee presented the AFA Academic Achievement award to distinguished graduate SMSgt. Marc Ramos (see photo above).

The former top enlisted leaders were CMSAFs James M. McCoy, who served in the position from 1979 to 1981, Sam E. Parish (1983–86), James C. Binnicker (1986–90), and Eric W. Benken (1996–99).

Gary Powers Honored

The **David J. Price/Beale (Calif.) Chapter** participated in a weekend of events at Beale AFB, Calif., that honored Francis Gary Powers, the Air Force U-2 pilot downed May 1, 1960, over the former Soviet Union and imprisoned for two years. (At the time, Powers was assigned to the Central Intelligence Agency.)

Brig. Gen. Kevin P. Chilton, 9th Reconnaissance Wing commander and a chapter member, presented a Distinguished Flying Cross to the Powers family. They also accepted a Prisoner of War Medal and the National Defense Service Medal on behalf of Powers, who had been exchanged for a Russian spy in 1962.

Twelve chapter members also attended a formal banquet honoring the Powers family. AFA notables on hand included Rich Taubinger, region president (Far West Region), and James H. Estep, California state president.

Tops in Tacoma

The **McChord (Wash.) Chapter** honored 11 superior performers at its annual awards dinner at the McChord AFB Consolidated Club in April.

The honorees were 1st Lt. Amanda K. Jennings, MSgt. Rocky D. Dunlap, MSgt. Richard J. Rafferty, TSgt. Robert J. Nichols, SSgt. Michel J. Edwards, and Jonathan T. Harris, who is a chapter member and a civilian employee at the 62nd Airlift Wing. The chapter and its Community Partners awarded them savings bonds and vouchers for complimentary dinners.

The winners were selected from among top-notch airmen nominated by McChord's four major units, and a chapter committee had "an excruciating experience" in narrowing down the field, said Kenneth J. St. John, chapter vice president for communications.

Receiving $400 scholarship awards were AFJROTC cadets Robert C. Chinneth, Ozena McClendon, Minnie Solonen, and Mario Gallegos. Civil Air Patrol cadet Irene Hermanspann accepted a $300 check earmarked for flying time for her unit.

Among the banquet audience of about 80 were I. Fred Rosenfelder, national director and Washington state president; O. Thomas Hansen, chapter president; Jack A. Asby, vice president; Glenda J. Smith, secretary; and Gordon L. Wohlfeil, treasurer.

Iowa State Convention

AFA chapters in the "Hawkeye

AFA National President McKee (from left), Patricia McKee, Gen. Joseph Ralston, Dede Dougherty Ralston, Barbara Dougherty, and Russell Dougherty, national director emeritus, pause for a photo at a reception in Germany after the May 2 US European Command change of command ceremony. Ralston became the first USAF officer to serve as commander in chief of EUCOM and NATO Supreme Allied Commander Europe in nearly 40 years.

State" gathered in Marion, Iowa, for the state convention, hosted by the **Lancer Chapter** in April.

Held at the clubhouse of a local golf course, the convention featured John J. Politi, national director, as the main speaker and Charles H. Church Jr., national treasurer. Politi stressed the grassroots nature of AFA and urged members to make a greater effort in informing the public about its mission.

Other distinguished visitors were Terri Politi, Missouri state president, and Judy K. Church, Missouri state treasurer.

Carl B. Zimmerman, from the **Northeast Iowa Chapter,** took home the Member of the Year award, in recognition of his service as Iowa's first state president and participation in state and regional meetings and the National Convention. His chapter also received the Chapter of the Year award.

The conventioneers voted to donate $100 to the Air Force Memorial.

Mentors

With help from a chapter matching grant from AEF, the **Wright Memorial (Ohio) Chapter** donated $1,080 to support a mentoring program in the Dayton, Ohio, school district.

The program involved transporting fifth-graders from Lincoln Elementary School to Wright–Patterson AFB, where the youngsters met with their mentors and also toured base facilities. On one recent visit, for example, the students visited the 445th Aeromedical Staging Squadron's regional training facility for emergency medical technicians.

Until the chapter and AEF stepped in, however, the mentoring program was in danger of being discontinued because the school district was cutting funds for transporting the students to the base.

The timely donation funded monthly trips to the base throughout the school year.

In April, the Wright Memorial Chapter donated two video cassette recorders to patients of the Dayton Veterans Affairs Medical Center. Daniel E. Kelleher, chapter president, and George W. Simons, chapter vice president for veterans affairs, made the presentation to hospital officials.

Education Recognition

About 150 guests turned out for the **Central Florida Chapter's** 13th annual Education Recognition Luncheon in Orlando, Fla., in April.

Guest speaker Barbara Walters–Phillips spoke on "Whatever You Can Dream, You Can Accomplish." As a math, science, and social studies teacher at Glenridge Middle School in Winter Park, Fla., in 1995, Walters–Phillips had won AEF's Christa McAuliffe Memorial Award for Teachers.

At the luncheon, she joined John T. Brock, chapter executive vice president, in presenting 22 students and 26 teachers with certificates and one-year memberships to AFA. In addition, the top three students received AFA citations and $100 savings bonds, and the top three educators received citations and $300 savings bonds.

Chapter member Bruce C. Jones was event chairman and master of ceremonies.

In March, the Central Florida Chapter members held an Air Force Scholarship Opportunities Program for more than 100 students and parents who wanted to learn about the US Air Force Academy and AFROTC programs.

Chapter Executive VP Brock and chapter member Robert E. Ceruti, who is a former professor of aerospace studies at the University of Central Florida, spoke briefly about AFA and AFROTC, respectively. Later, Maj. Dale Martin, regional director of admissions, Lt. Willie Brown, and two

New Membership Directory In The Works

Production of the 2001 edition of the *Air Force Association Membership Directory* is under way.

The new directory will be the most comprehensive source of information ever compiled on AFA's more than 155,000 members. The Bernard C. Harris Publishing Co., which developed previous AFA directories, has begun the research phase on this one by mailing questionnaires to all AFA members.

The association shares members' concerns about privacy and confidentiality. The Harris Co. will not use member names or addresses for any reason other than the directory. The directory cannot be used for mailing lists, and only current members will be able to buy it—the information will not be available to the general public.

Only AFA members who complete the questionnaire, or otherwise give permission, will be included in the directory.

AFA Conventions

June 30–July 1	**Oklahoma State Convention,** Altus, Okla.
July 7–8	**Louisiana State Convention,** Shreveport, La.
July 14–16	**Minnesota–North Dakota State Convention,** Minneapolis
July 21–23	**Pennsylvania State Convention,** Pittsburgh
July 21–23	**Texas State Convention,** Dallas
July 28–30	**Florida State Convention,** Homestead ARB, Fla.
Aug. 4–6	**Alabama State Convention,** Birmingham, Ala.
Aug. 11–13	**Georgia State Convention,** Robins AFB, Ga.
Aug. 11–13	**Indiana State Convention,** Indianapolis
Aug. 18–19	**Colorado State Convention,** Aurora, Colo.
Aug. 18–20	**Virginia State Convention,** Roanoke, Va.
Aug. 25–26	**Illinois State Convention,** Springfield, Ill.
Sept. 8–13	**AFA National Convention,** Washington
Sept. 16–17	**Delaware State Convention,** Dover, Del.
Sept. 29–Oct. 1	**New Hampshire State Convention,** Portsmouth, N.H.

AFROTC cadets gave extensive presentations and answered questions on AFROTC programs.

Information on the academy and the educational, physical, and leadership requirements necessary to gain an appointment was presented by Maj. Sandra Keeter, with four other Air Force officers on hand to provide additional admissions information. Five cadets talked to the audience about life at the academy.

Richard A. Ortega, state vice president for aerospace education, served as master of ceremonies for the annual event, now in its fourth year.

Space Day in Colorado Springs

The fourth annual worldwide Space Day celebration began in Washington at the National Air and Space Museum on May 4 and included a live, interactive broadcast on the Internet and the sharing of student projects about the challenges of living and working in space.

Events on a local level included activities like the one Joan Sell, **Colorado Springs/Lance Sijan (Colo.) Chapter** president, and Fritz Burkhart, vice president for aerospace education, attended at West Middle School in Colorado Springs.

The school put together a space expo, and students and teachers gathered outdoors on a field to launch more than 50 model rockets.

Out on the field, Burkhart presented a Teacher of the Year award from the chapter to teacher Ranganath Weiner, who built a space shuttle simulator from old NASA parts. It was dedicated by the local mayor as part of the Space Day events. Weiner was also designated a Scott Associate Fellow, with a $50 donation made in his name from the chapter to AEF.

Supporting the Community

Community College of the Air Force spring graduation ceremonies at Luke AFB, Ariz., in May included presentation of two Eagle Grant awards by Harry Bailey, **Frank Luke Chapter** president.

TSgt. Richard Borough, from the 362nd Training Squadron, and SrA. Susan Walker, of the 56th Medical Support Squadron, received the $400 AEF Eagle Grants and an AEF certificate of achievement.

Also this spring, Bailey joined Bob Handley, chapter vice president for veterans affairs, and John Adams, vice president for government relations, as AFA representatives at AFJROTC awards presentations at several local high schools. AFA awards went to Charles Coles of Agua Fria High School in Avondale, Joe Estrada of Cactus High School in Glendale, James Hodges from Deer Valley High School, also in Glendale, and Corena Tamayo from Peoria High School in Peoria. The chapter donated $100 to each school.

In April, the chapter showed support for the community by hosting its annual fund-raising golf tournament. They raised $1,600 for a Luke AFB youth program and the Boys and Girls Clubs of Glendale.

"Visions" Makes a Difference

A class of fourth-graders at Sacred Heart of Jesus Elementary School sent a sheaf of letters and drawings to **Mile High (Colo.) Chapter's** Robert G. Stein, an AEF trustee, thanking him for the *USA Today* newspapers they receive as part of the joint *USA Today*/AEF "Visions of Exploration" program.

On a letter decorated with her drawings of rosebuds, student Alison J. Grady wrote, "I look forward to every Thursday because we get to read the *USA Today*. Thank you for making a difference in my life."

According to a recent update provided to AEF leaders, 1,056 classrooms participated in the Visions program in the 1999–2000 school year.

Jubilee Medal Presentation

The **Francis S. Gabreski, Nassau Mitchel,** and **Queens (N.Y.) chapters** conducted their eighth Jubilee of Liberty Medal ceremony in April.

The medal honors veterans who took part in the Normandy invasion of France in June 1944 and was authorized by the Normandy government in 1991. The tricounty New York chapters periodically make formal presentations of the medal to Normandy veterans who weren't able to travel to France in 1994 to receive them.

Brig. Gen. F. Randall Starbuck, vice commander of 21st Air Force at McGuire AFB, N.J., and a member of the **Thomas B. McGuire Jr. Chapter,** delivered the keynote address to an audience of more than 160 people.

National Director William G. Stratemeier Jr. served as master of ceremonies for the event.

Each of the 25 Normandy invasion veterans received a medal and certificate from the French government and a certificate from Nassau County, N.Y. In addition, Alphonse Parise from the Gabreski Chapter, Fred Di Fabio from the Nassau Mitchel Chapter, and Edward W. Keil from the Queens Chapter presented the veterans with AFA certificates of appreciation.

Conclave in San Diego

AFA National President McKee and AEF President Price attended the Arnold Air Society and Silver Wings annual national conclave in San Diego in April. On hand to accept AFA and AEF awards were Cols. Carter Borland, James Mann, and Robert J. Kraynik, who is an AFA presidential advisor; Justin T. Golart, AAS national commander; Joseph L. Endler III, Silver Wings national president; and cadets Bethany M. Titus and Timothy A. Monroe. Other award recipients named were Col. Wolfgang Gesch, Lt. Col. Richard W. Davis, and cadets Nicholas H. Martin and Jennifer J. McBrayer.

Martin later received his award at a Colorado State University AFROTC ceremony. **Long's Peak (Colo.) Chapter** President Thomas Miller made the presentation.

AEF announced its $1,000 Silver Wings Scholarship recipients at the

conclave: Christina M. Comm, Rhonda Cubitt, Faiza Hassan, Amy E. Price, and Sweta Shah.

The **Maj. Gen. Oris B. Johnson (La.) Chapter** received the James McDonnell Award at the conclave, recognizing the chapter's support for Louisiana State University's Silver Wings unit. "We have worked to support the students at LSU in the Air Force ROTC and Silver Wings organization because we believe in the youth of our nation," said Chapter President Thomas H. Normile.

More AFA/AEF News

■ The **Thunderbird (Nev.) Chapter** saluted MSgt. Darlene Robertson at its annual Honor the Honor Guard Luncheon. According to the chapter, Robertson had been among the first women selected to become part of the USAF Honor Guard. Until recently, Robertson was with the 99th Services Squadron as the noncommissioned officer in charge and superintendent of the honor guard at Nellis AFB, Nev.

■ The setting might have been the St. Petersburg, Fla., yacht club, but the topic was the Air Force when Col. Richard S. "Steve" MacIsaac addressed a noontime meeting of the **Gen. Nathan F. Twining (Fla.) Chapter** in April. Special assistant to the commander of the 6th Air Refueling Wing at MacDill AFB, Fla., MacIsaac spoke about Operation Allied Force, covering the conduct of the air war and particularly how the NATO participants worked together.

■ **Total Force (Pa.) Chapter** Secretary Patricia Accetta and Treasurer Marion J. Conti attended an AFJROTC ball and banquet in March to present the Outstanding Sophomore Cadet award to cadet Jeff Oleniacz. The cadet's aerospace science instructor is chapter member and retired Maj. Frederick O. Schott.

■ 1st Lt. David Edwards, test and evaluation engineering team member at the Airborne Laser System Program Office at Kirtland AFB, N.M., was guest speaker at the **Phoenix Sky Harbor (Ariz.) Chapter's** April dinner meeting at a Mesa, Ariz., resort. Twenty chapter members and guests listened to his presentation on the ABL, a modified Boeing 747 fitted with a laser for attacking theater-range ballistic missiles near their launch areas.

■ In Irvine, Calif., the **Orange County/Gen. Curtis E. LeMay Chapter** participated in the April meeting of the World Affairs Council of Orange County. Donn Hall, chapter president, Richard C. Baynes, vice president and secretary, and Dick Calta, vice president of programs, were among the chapter members who listened to a presentation by Lt. Gen. Ronald T. Kadish, director of the Ballistic Missile Defense Organization. ■

Unit Reunions

reunions@afa.org

4th Emergency Rescue Sq Assn, AAF, southwest Pacific. Sept. 20–24, 2000, in Minneapolis. **Contact:** Chet Gunn, 237 Franklin St., Reading, MA 01867-1030 (781-944-6616).

7th Ferrying Gp (WWII). Aug. 24–27, 2000, in Great Falls, MT. **Contact:** B.E. McMahon, 1200 32nd St. S. #63, Great Falls, MT 59405-5340 (406-771-0437).

9th AF Assn. Sept. 28–30, 2000, at The Ridgeway Inn in Memphis, TN. **Contact:** Fern Mann, 135 Riverwalk Pl., Memphis, TN 38103-0846 (phone: 901-578-5333 or fax: 901-578-9999).

27th Fighter–Bomber Gp. Oct. 11–15, 2000, at the Embassy Suites Chevy Chase Pavilion in Washington, DC. **Contact:** Irwin Lebow, 30 Hampshire Ln., Boynton Beach, FL 33436 (phone: 561-738-1134 or fax: 561-738-0154).

28th ATS (WWII), LSS, MATS, MAC, North Africa, Sicily, Italy, and Hill AFB, Utah. Sept. 1–3, 2000, at the Marriott Hotel in Odgen, UT. **Contact:** Jim Thurell, 5460 S. 150 E. #41, Odgen, UT 84405 (801-475-9690).

37th FS Assn (WWII) and current 37th Training Sq. Oct. 6–8, 2000, in Midland, TX. **Contact:** Frank Gallup, PO Box 415, Sunapee, NH 03782.

40th Troop Carrier Sq, Germany (1950s). Oct. 19–22, 2000, at the Adam's Mark Columbus in Columbus, OH. **Contacts:** Dave Garwood, 1967 Jervis Rd., Columbus, OH 43221-2727 or Chris Georgeff, 660 Parkedge Dr., Gahanna, OH 43230-2192.

43rd BG Assn. Aug. 28–Sept. 3, 2000, at the Hyatt Regency San Antonio in San Antonio. **Contact:** Max M. Axelsen, 8406 Dorsetshire St., San Antonio, TX 78250-2414 (210-681-4581).

47th BW, RAF Sculthorpe, UK (1952–62). Sept. 29–Oct. 2, 2000, at the Holiday Inn Select DFW South in Irving, TX. **Contact:** Charles R. Palmer, 8430 Ryoaks Pl., Anchorage, AK 99504-2253 (907-332-0296) (crpalmer@dotplanet.net).

48th TFW. Sept. 24–28, 2000, at the Golden Nugget Hotel and Casino in Las Vegas. **Contact:** Herk Herculson, 1810 Nuevo Rd., Henderson, NV 89014 (702-458-4173) (herk@lvcm.com).

49th FS, 14th FG. Oct. 6–8, 2000, in Midland, TX. **Contact:** Sheril D. Huff, 3200 Chetwood Dr., Del City, OK 73115-1933 (405-677-2683).

50th Fighter–Bomber Wg, Clovis AFB, N.M., 1953 through Hahn AB, Germany, 1958. Sept. 28–Oct. 1, 2000, at the Radisson Inn in Colorado Springs, CO. **Contact:** George Macpherson, 7336 Whitley Dr., Colorado Springs, CO 80920 (719-598-5401) (gmacpher@concentric.net).

87/512th FIS Assn. Sept. 14–16, 2000, at the Radisson Inn in Colorado Springs, CO. **Contact:** Ed Carroll, 7860 Black Forest Rd., Colorado Springs, CO 80908 (719-495-3768) (GMA7860@aol.com).

90th BS (LNI), Korea. Oct. 5–8, 2000, in Slidell, LA. **Contact:** Bob Nelson, 296 Moonraker Dr., Slidell, LA 70458 (phone: 504-649-1230 or fax: 504-649-1230) (rnelson648@aol.com).

92nd BG, Eighth AF; 92nd BW, SAC; 92nd ARW, AMC; and 325th BS, ACC (Whiteman AFB, MO). Oct. 12–17, 2000, at the Marriott Airport in St. Louis. **Contact:** Irv Baum, 3935 Young Ave., Napa, CA 94558-2654 (phone: 707-258-8806 or fax: 707-258-1289) (marirv92bg@aol.com).

93rd TCS, 439th TCG (WWII). Sept. 13–17, 2000, at the Best Western Merry Manor Inn in South Portland, ME. **Contact:** Tom Morris, 456 St. George's Ct., Satellite Beach, FL 32937-3840 (321-773-6960) (tomruth3@aol.com).

97th BW, Smoky Hill AFB, KS, and Biggs AFB, TX (1946–59). Sept. 28–30, 2000, in Sacramento, CA. **Contacts:** Ray Smith, 9537 Golden Dr., Orangevale, CA 95662 (916) 988-6240 or Dick Jones, 105 Galaxy Way, Lompoc, CA 93436 (805-733-1819) (jamjones@impulse.net).

122nd Fighter–Bomber–Observation Sq. Sept. 8–10, 2000, in New Orleans. **Contact:** Scott Bommer, 188 Pleasant Ridge Dr., Belle Chasse, LA 70037.

303rd ARRS, Long Beach and March AFBs, CA (1956–83). Oct. 6–8, 2000, at the Primadonna Resort and Casino in Primm, NV. **Contact:** Herb Spencer, 303rd ARRS Assn, PO Box 8339, Green Valley Lake, CA 92341-8339 (909-867-3061).

308th BW (SAC). Oct. 9–12, 2000, at the Sea Crest Oceanfront Resort and Conference Center in North Falmouth, MA. **Contact:** Tom Garvey (508-540-8460) (t1t2grv@aol.com).

317th TCG, Hq and 41st TCS, Fifth AF (WWII). Oct. 5–8, 2000, in St. Louis. **Contact:** Vince Krobath, 22 Lantana Dr., St. Louis, MO 63123 (314-842-2484).

364th FG, Eighth AF, Honington, UK (WWII). Oct. 18–21, 2000, at the Ramada Inn in Shreveport, LA. **Contact:** Dan Leftwich, 6630 Caldero Ct., Dayton, OH 45415 (937-890-3641).

384th ARS, Westover AFB, MA (1955–66). Sept. 11–14, 2000, at the Short Stay US Navy Outdoor Recreation Area in Moncks Corner, SC. **Contact:** Ken Godstrey, 12018 Maycheck Ln., Bowie, MD 20715-1551 (301-464-1150) (godstrey@erols.com).

386th BG (WWII) and associated units. Sept. 14–17, 2000, at the Holiday Inn Greentree Central in Pittsburgh. **Contact:** Skip Young, 5594 Buring Ct., Fort Meyers, FL 33919 (941-482-5059).

454th BS, 323rd BG, Ninth AF (WWII). Oct. 4–8, 2000, at the Clarion Hotel Airport in Tucson. **Contact:** Joe Havrilla, 1208 Margaret St., Munhall, PA 15120-2048 (412-461-6373).

455th BS, 323rd BG, Ninth AF (WWII). Sept 30–Oct. 4, 2000, at the Sheraton Uptown Albuquerque Hotel in Albuquerque, NM. **Contact:** Russ Hall, 8711 Los Arboles Ave. NE, Albuquerque, NM 87112-1025 (ruanhall@aol.com).

480th TFS. Sept. 28–Oct. 1, 2000, at the Sahara Las Vegas Hotel and Casino in Las Vegas. **Contact:** J.D. Lyles, 1000 Hollowbluff Ave., North Las Vegas, NV 89031 (702-399-6452) (aggie78@sprintmail.com).

Unit Reunions

580th, 581st, and 582nd Air Resupply and Communications Wgs. Sept. 14–17, 2000, at the US Air Force Museum in Dayton, OH. **Contact:** Ray Banks (623-935-4551) (rbank@uswestmail.net) (www.arcassn.org).

735th AC&W Sq, Mechra Bel Ksiri, Morocco (1952–60). Sept. 10–12, 2000, at the Radisson Inn in Colorado Springs, CO. **Contact:** Chuck McWhorter, 17130 Saddlewood Rd., Monument, CO 80132 (719-488-3569) (mcwhorter23@juno.com).

1461st AAF Base ATC, Watson Lake, Yukon, Canada (WWII). July 26–28, 2000, at Wright-Patterson AFB, OH. **Contacts:** Kenneth N. Haley, 8516 Edney Ridge Dr., Cordova, TN 38018 (901-372-2153) (knhaley@cs.com) or Robert Lock, 256 Eaton Ave., Eaton, OH 45320 (937-456-9062).

AACS/AFCS/AFCC personnel. Sept. 28–Oct. 1, 2000, in Colorado Springs, CO. **Contact:** Mac Maginnis, 6032 S. Bell St., Tacoma, WA 98408-7412 (253-474-8128) (cmagin4375@aol.com).

Air Force Women Officers Associated. Sept. 6–11, 2000, in San Antonio. **Contact:** Sue Wright (phone or fax: 210-653-1161).

Air Weather Assn. Sept. 20–24, 2000, at the Imperial Palace Hotel and Casino in Las Vegas. **Contact:** Clifford D. Kern, 1879 Cole Rd., Aromas, CA 95004-9681 (831-726-1660) (cliffordkern@cs.com) (www.airweaassn.org).

Assn of Former OSI Special Agents. Sept. 6–10, 2000, at the Regal Cincinnati Hotel in Cincinnati. **Contact:** Walt Carey, 1665 Grange Hall Rd., Beavercreek, OH 45432 (937-426-8095) (wcarey@erinet.net) (www.afosisaconv2000.com).

Big Safari. Sept. 14–16, 2000, at the DFW Hyatt (West Tower) in Dallas. **Contact:** John Reynolds, 4448 W. Beach Dr., Greenville, TX 75402 (903-883-2080 or 903-457-4990 on Monday) (jreynolds@903internet.com) (www.903internet.com/~kibbeb/index.html).

CBI Hump Pilots Assn. Sept. 5–10, 2000, at the Regal Cincinnati Hotel in Cincinnati. **Contact:** Jan Theis, PO Box 458, Poplar Bluff, MO 63902 (phone or fax: 573-785-2420).

Flying Tigers of 14th AF Assn. Oct. 11–14, 2000, at the Radisson Hotel Charleston in Charleston, SC. **Contacts:** Arthur Cobert, 3404 Waterway Blvd., Isle of Palms, SC 29451 (843-886-6180) or Clifford Long, 1833 Page Pl., Malvern, PA 19355 (phone: 610-296-5988 or fax: 610-296-0259).

Pilot Training Class 53-C. Sept. 27–29, 2001, in Washington, DC. **Contact:** Class 53-C, 7741-A S. Curtice Dr., Littleton, CO 80120 (303-797-0420) (kce7741@aol.com).

Pilot Class 55-E, all bases. Oct. 10–12, 2000, at the Holiday Inn Boardwalk Casino in Las Vegas. **Contact:** Jim Shannon, 2749 Heritage Ct., Las Vegas, NV 89121 (702-431-6714).

RAF Bovingdon Assn, all military and civilians who served at RAF Bovingdon, UK (1949–62). Sept. 21–24, 2000, at The Williamsburg Hospitality House in Williamsburg, VA. **Contact:** Don Tenpas, 141 Pasture Rd., Poquoson, VA 23662 (757-868-9698).

SHAEF/ETOUSA Veterans Assn (WWII). Sept. 8–11, 2000, at The Fairmont New Orleans in New Orleans. **Contacts:** Don Thriffiley, 7340 Dundee St., New Orleans, LA 70126 (phone or fax: 504-241-3065) (donshaef@netzero.net) or Alan F. Reeves, 2301 Broadway St., San Francisco, CA 94115-1286 (phone or fax: 415-921-8322) (afreeves@webtv.net).

Society of Wild Weasels. Aug. 24–27, 2000, at the Rio Suite Hotel & Casino in Las Vegas. **Contacts:** George Acree (410-647-9511) (geoace@toad.net) or Jack Redmond (702-458-3277) (jbredrat@aol.com).

Women in the Air Force. Sept. 6–11, 2000, in Nashville, TN. **Contact:** Robie Robertson, 208 Harding Rd., Paris, TN 38242 (901-644-2133).

Seeking members of the **3rd Shoran Beacon Sq,** Rothwesten and Bremerhaven, Germany (1953–57), for a possible September reunion. **Contact:** Todd Appleton, 6170 Highway 51 N., Horn Lake, MS 38637 (601-393-5898). ■

Bulletin Board

bulletin@afa.org

Seeking information on **Maj. Wilbur A. Skaar,** of Chippewa Falls, WI, a FAC and B-52 pilot from Ellsworth AFB, SD, killed in Vietnam, May 17, 1968. **Contact:** Vic Skaar, 6130 Eisner Dr., Las Vegas, NV 89131-2303 (702-645-9108) (vbskaar@juno.com).

Seeking information on **Carl Reed or Reid** of Philadelphia, a warrant officer in the Royal Air Force in 1944 and probably associated with the Second Tactical AF. Also seeking any organization that recorded the names of Americans who served in the **RAF** during WWII. **Contact:** Robert Barnes, Kalamazoo Aviation History Museum, 3101 East Milham Rd., Kalamazoo, MI 49002-1700.

Seeking the children of **Lt. Col. Francis J. (Frank) and Bonnie Marshall** of Lake Lure, NC. **Contact:** Paul E. Stebelton, 47755 Rawhide Rd., Aguanga, CA 92536 (909-767-0668) (stebby@earthlink.net).

Seeking **Laura Clift** of Joplin, MO, who enlisted in USAF in 1976 and may have been stationed at Holloman AFB, NM, 1976–78. **Contact:** D.J. Cahill, #40905 Morey, MB #467, Buckeye, AZ 85326.

Seeking original oil paintings and prints by aviation artist **William J. "Bill" Reynolds. Contact:** Nancy A. Collura, University of South Carolina Sumter, 200 Miller Rd., Sumter, SC 29150 (803-938-3733) (nacollur@uscsumter.edu).

For a project, seeking Almanac issues of ***Air Force*** **Magazine** from 1958 to 2000 (1958–69 September issues and 1970–2000 May issues). **Contact:** Billy D.Williams, 115 Colonial Rd., Warner Robins, GA 31088 (home: 912-329-0507 or work: 912-926-7676) (billyd427@aol.com).

Seeking information on the 441st BS, 320th BG, in Italy, November 1944, and on **Lt. William Evans,** a B-26 navigator. **Contact:** Gary or Joan Spurgat, 42 Cross Point Rd., Edgecomb, ME 04556 (207-882-9844).

Seeking former or retired Air Force member **James L. Brumit** of Lodonia, TX, who has two sisters, Martha Elizabeth and Rose Marie, and was a ward of the Sunshine Orphanage Home in Dallas in 1934, until custody was given to Lt. Leon Sharon, Randolph Field, TX. **Contacts:** Martha Elizabeth Massey, 708 W. 65th St., Odessa, TX 79764-2765 (915-368-7168) or Elizabeth Ann Skaggs (915-362-2354).

Seeking any **Class 43-F graduate,** Pampa, TX, interested in yearbook and class picture of 43-F Basic at Enid AFB, OK. **Contact:** Richard H. Rudolph, 3413 N. Glenhaven Dr., Midwest City, OK 73110-3711.

Seeking students and faculty of **AFIT Graduate Logistics School** class of February 1971. **Contact:** Mike McCarthy (562-633-5668) (sokar@earthlink.net).

Seeking back issues of ***Air Force*** **Magazine** from the beginning through the 1990s. **Contact:** John Ford, 3630 S. Barrington Ave., Los Angeles, CA 90066 (310-397-6745) (johnandsue@loop.com).

Seeking **Forrest S. Clark** of the 44th BG. **Contact:** David A. Greene (dg392@aol.com).

Seeking alumni of **AFROTC Dets. 206, 207, and 435,** 1948 to present, from St. Louis University, SIU-Edwardsville, Washington University, and other satellite schools. **Contact:** 2nd Lt. Joshua Pope (915-696-3128) (joshua.pope@dyess.af.mil) (www.slu.edu/organizations/airrotc).

For display, seeking **uniforms** and service history of their owners. Specifically interested in officer and enlisted McPeak–style blue uniforms and officer's informal black dress uniforms. **Contact:** R. Snow, 129 Tando Way, Covington, KY 41017 (606-356-1421).

Seeking members of **Cadet Class 50-D,** Randolph and Reese AFBs, TX. **Contact:** Edwin Hatton, 1911 Clover Rd., Mishawaka, IN 46545 (phone: 219-254-1405 or fax: 219-254-0910).

Seeking **Brig. Gen. and Mrs. William "Bill" Clinch. Contact:** Ed Stansbury (727-584-8543).

Seeking information on aircraft from Alaska that intercepted Russian aircraft. Also seeking information on aircraft intercepted by the **36th TFW,** Bitburg AB, Germany, 1973–79, and information on the **35th TFW** during the Gulf War, specifically medals awarded to those who served. **Contact:** Greg Lebeau (gllebeau@netscape.net).

Seeking **MSgt. Donna Jean (Keys) Bottoms** stationed at Altus AFB, OK, 1974–77. **Contact:** James Horne (jameshorne@webtv.net).

Seeking graduates of **Pilot Training Class 51-G,** Craig AFB, AL; Reese AFB, TX; Williams AFB, AZ; and Vance AFB, OK. **Contact:** Alex Pisciotta Jr., 720 Old Oak Ridge, San Marcos, CA 92069 (760-744-3005) (amfalex@inetworld.net). ■

If you need information on an individual, unit, or aircraft, or want to collect, donate, or trade USAF–related items, write to "Bulletin Board," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Items submitted by AFA members have first priority; others will run on a space-available basis. If an item has not run within six months, the sender should resubmit an updated version. Letters must be signed. Items or services for sale, or otherwise intended to bring in money, and photographs will not be used or returned. We reserve the right to condense notices.

Pieces of History

Photography by Paul Kennedy

All in a Day's Work

Memorabilia courtesy Museum of Aviation, Warner Robins, Ga.

Ever before the US entered World War II, aviation pioneers Jacqueline Cochran and Nancy Love began pushing for the inclusion of female pilots in the armed forces. This museum display features a mannequin wearing the uniform of Women Airforce Service Pilots member Evelyn G. Howren and highlights the contributions of female pilots to the war effort. As WASPs, they ferried aircraft—such as the P-47 Thunderbolt shown here (with a maintenance mannequin) with the markings of the 350th Fighter Group in the UK—towed targets, and served as test pilots and instructors, among various flying duties. The organization was deactivated in December 1944. WASPs were Civil Service employees during the war and didn't gain veteran status until the late 1970s.

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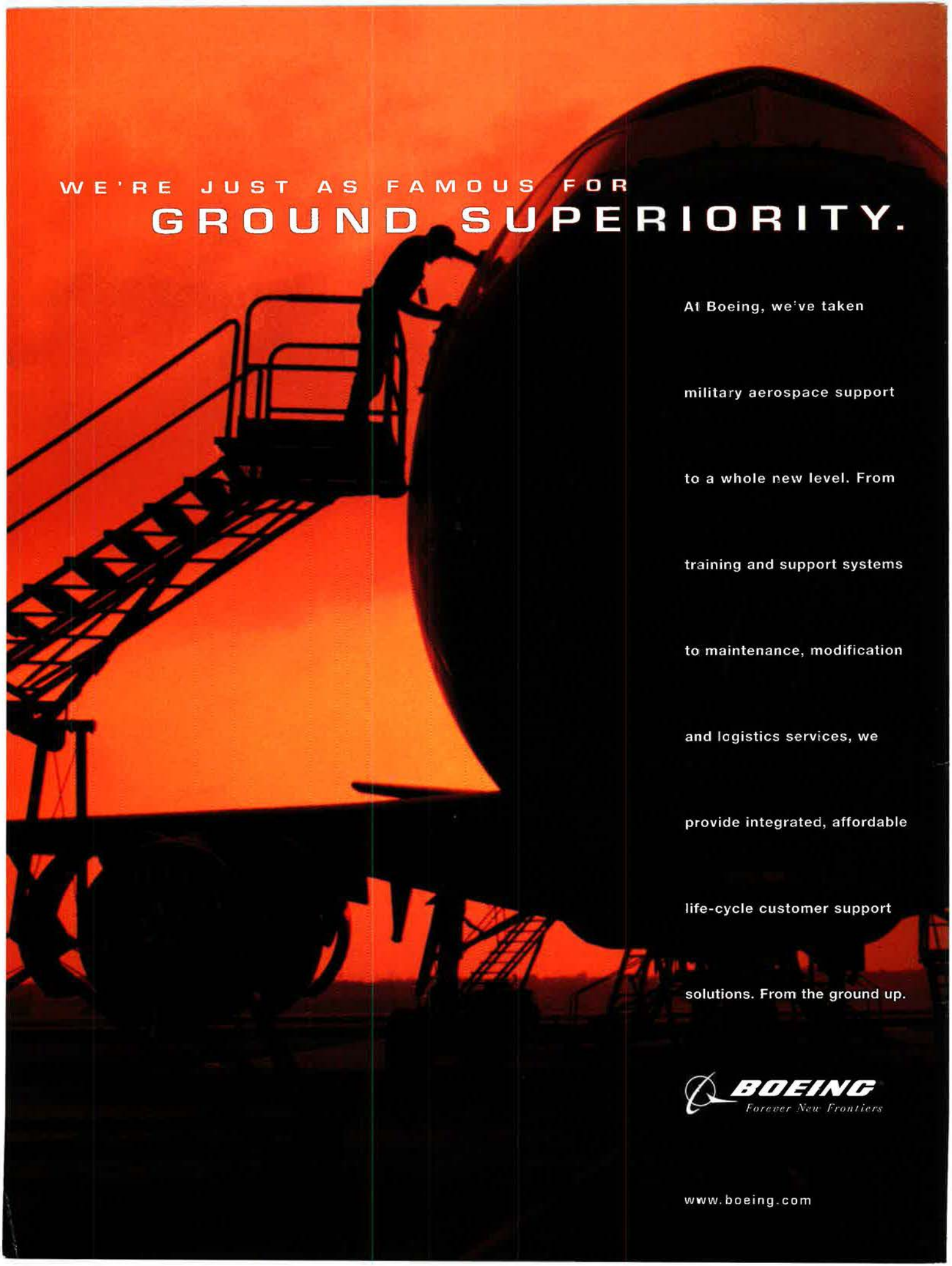
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