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AIR FORCE

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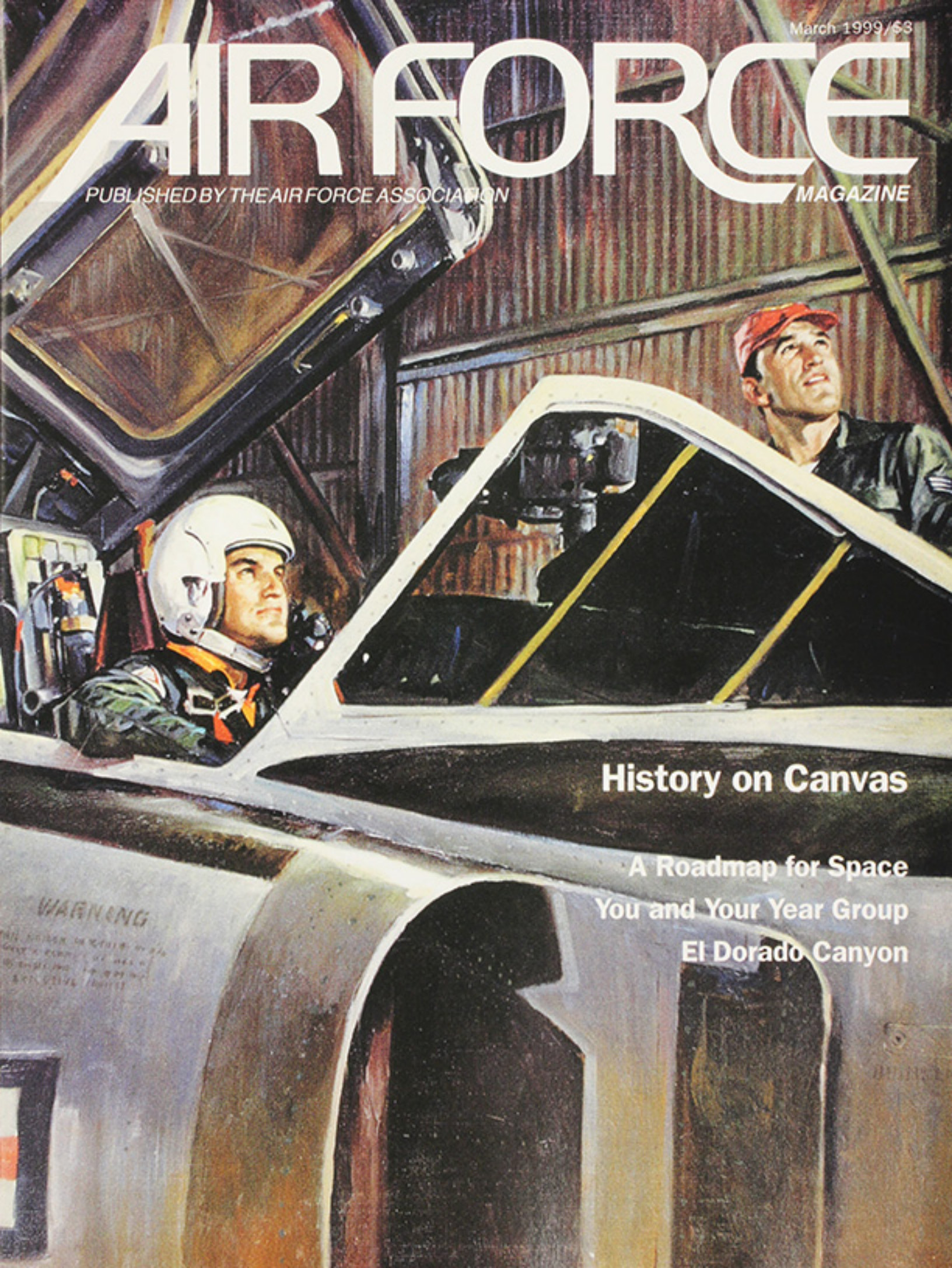
MAGAZINE

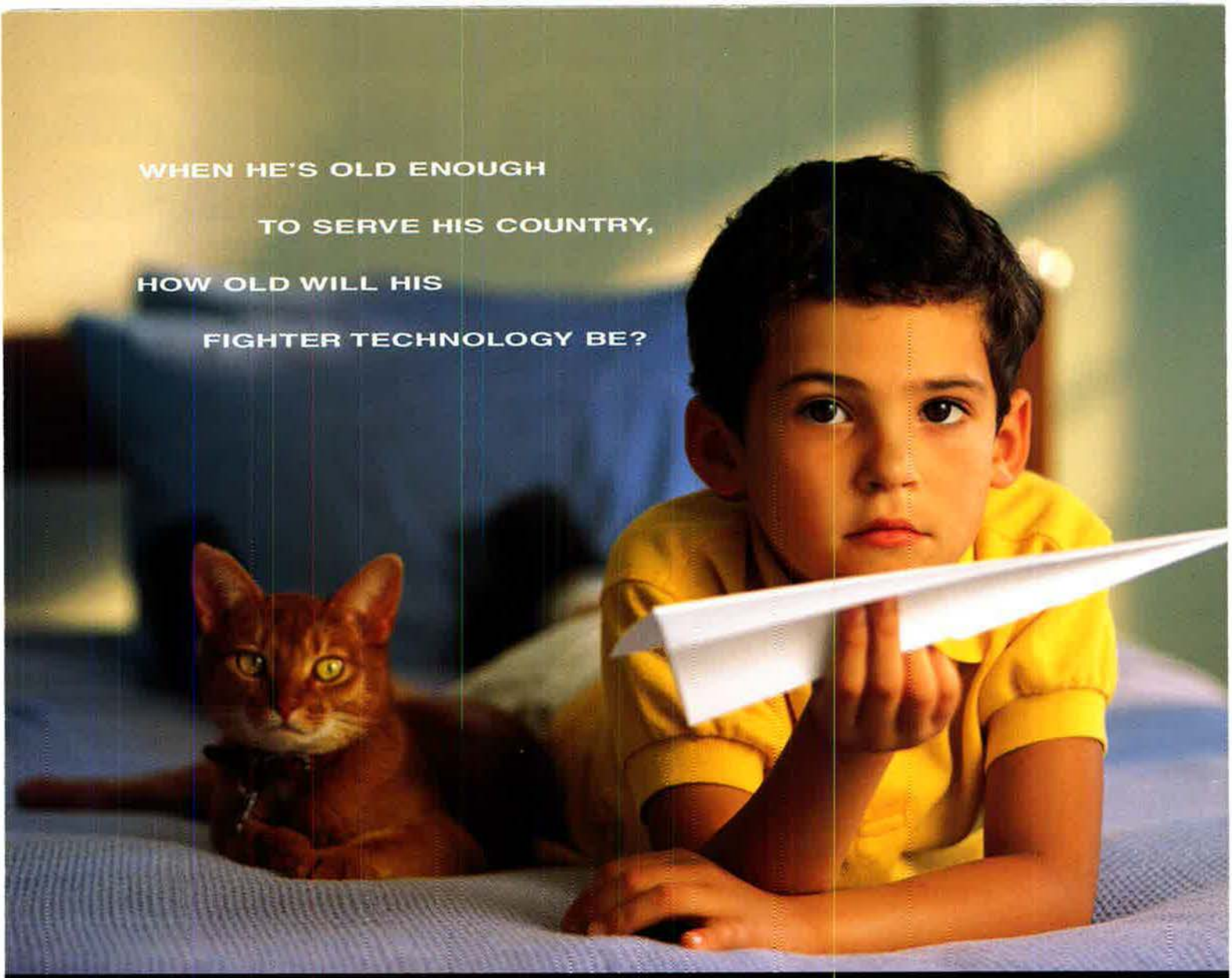


History on Canvas

A Roadmap for Space

You and Your Year Group

El Dorado Canyon



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March 1999, Vol. 82, No. 3

AIR FORCE MAGAZINE

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About the cover: Reynold Brown's "Green Light—Go," along with thousands of other works, comprise the extraordinary USAF Art Collection. See "History on Canvas," p. 48.

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Editorial

By John T. Correll, Editor in Chief

What the Budget Does—and Doesn't

In his radio address to the nation Jan. 2, President Clinton announced his proposal for an increase in next year's budget of more than $12 billion for defense readiness and modernization. The White House said it was the first increment of a $110 billion increase to be spread over six years.

News reports touted it as the biggest jump since the Reagan era. Stan Crock, writing in the *Washington Post*, called it "a defense-spending spree." A dozen liberal Democrats, led by Rep. Barney Frank (D–Mass.), held a press conference to warn that the President was plunging the nation into "an arms race with itself."

Congressional oversight committees took a different view. As it turns out, the actual addition to the Fiscal 2000 defense budget is around $4 billion—not $12 billion—and a considerable part of the increase over the longer term is attributable to what Rep. Floyd Spence (R–S.C.), chairman of the House Armed Services Committee, calls "questionable assumptions and gimmicks." Furthermore, Spence says, the increase projected between now and 2005 falls about $70 billion short of requirements.

It is true that this is the biggest increase since the Reagan era, but that does not say much. Defense spending has been cut every year since 1985. It is also true that this budget, details of which were revealed Feb. 1, would relieve two problems that bear on declining personnel retention rates.

The proposal provides for a 4.4 percent raise in military pay, which had fallen far behind compensation in the private sector. It would also restore the traditional military retirement program, which was the No. 1 retention incentive before it fell victim to economizing measures in 1986. The service chiefs had declared these programs to be their top priorities.

Unfortunately, there is more to the story.

In testimony to Congress last September, the chiefs finally acknowledged that the armed forces were in financial trouble. They said that their unfunded requirements for readiness and long-delayed force modernization—not counting any personnel program costs—came to $17.7 billion a year: $5 billion for the Army, $6 billion for the Navy, $5 billion for the Air Force, and $1.7 billion for the Marine Corps. They stood by those numbers at House and Senate Armed Services Committee hearings in January.

Much of the increase hangs on various gimmicks, adjustments, and assumptions.

The cost of closing the pay gap and restoring the retirement system is estimated at $7.8 billion a year, which would bring the unfunded total to $25.5 billion annually, or $153 billion over the course of the six-year budget plan.

Examination of the budget numbers for next year shows why Spence and others in Congress are upset. Of the nominal $12.6 billion increase—which is well short of the requirement stated by the chiefs—only $4.1 billion is additional funding. The rest is from internal realignments of the defense budget and assumptions that the rate of inflation and the cost of fuel will remain low.

The increase is further offset by a budgeting change in which $1.8 billion for operations in Bosnia is incorporated into the regular defense program rather than being handled, as it was previously, as emergency funding.

The $268.2 billion in defense budget authority for next year is more than the President intended to request, but when inflation and the various assumptions and adjustments are considered, the real increase melts away. After inflation, the projected total for next year is below the level of this year's program by half a percentage point.

Of the nominal $110 billion increase between now and 2005, the actual addition is $84.3 billion, and the biggest part of that is not due until well after the turn of the century. It is, in effect, an IOU written on a future administration.

Nevertheless, the budget proposal could be a political success. Stephen Rosenfeld of the *Washington Post* says the President's action is a "realistic middle course," that makes defense a non-issue and satisfies all except the "big defense spenders." Objections voiced by the liberals reinforce the perception that the Administration has moved out boldly on defense.

The sad fact is that unfunded defense requirements go beyond the readiness shortfall numbers stated by the chiefs last fall. In October, Secretary of Defense William Cohen told the Senate that the level of risk associated with the nation's ability to carry out the national military strategy is "moderate to high."

Under questioning by the Senate in January, Army Gen. Hugh Shelton, Chairman of the Joint Chiefs of Staff, who had spoken emphatically in support of the President's proposal, said the net effect was to stop the decline in readiness so that "the nose of the airplane comes back up."

The new budget does not address a number of major and urgent requirements, such as the multibillion dollar cost of new capabilities in space, which conventional wisdom regards as affordable within the present limits only by massive diversions from other elements of the already strained Air Force budget.

The defense budget shortfall is real, and it is serious. The significance of the President's proposal is that the shortfall will not be as bad as it would have been otherwise. The most harmful outcome of it may be that the nation is led to believe that the substance of the problem has been solved, and that is far from the case. ■

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Letters

Aerospace—Is It?

I read with interest your editorial on "The Integration of Aerospace" in the January issue *[p. 2].* While I am not an opponent of aerospace integration per se, I do feel that the air and space communities in the Air Force (and DoD at large) have strengths that could be lost if these two unique mediums are combined in the concept of a "seamless aerospace" regime.

You ask in your editorial how relevant the point is that air and space are different. I would submit that they are significantly different from the strategic, operational, and tactical levels. We should be able to embrace these differences if we are going to be able to take full advantage of both mediums:

Strategic context: The concept of "aerospace" in a strategic sense blurs the boundary between air and space, jeopardizing our ability to use space forces to provide global military support. While international custom and bilateral treaties (such as START) allow overflight by space systems (even for military missions), international law specifically prohibits all overflight by air forces (civil or military) unless a nation allows that overflight. This means that a nation cannot prohibit a military space system from overflying its territory, while it can (and often does) prohibit overflight by aircraft. Combining air and space might impose restrictions which would jeopardize US abilities to deploy and operate forces by undermining unlimited access from space.

Operational employment: Space forces are always forward deployed and do not fit well into the Air Force's expeditionary force concept. Air forces are well-suited to this concept, as they can deploy rapidly to new operating areas when needed and then return to CONUS to reduce cost, stress on personnel, and the need for permanent overseas bases. Space forces, on the other hand, are currently very difficult to deploy to their operating area but, once deployed, pose little or no cost, [or] stress on personnel (who remain in CONUS), or [need] bases on foreign soil. A focus on an "aerospace" force structure will either force space systems into an expeditionary mode, resulting in operational concepts such as "launch on demand" and a focus on regional (vice global) support that could be both expensive and inefficient, or result in an internal split between two parts of the aerospace "whole."

Tactical employment: Air and space forces are diametrically opposed with respect to the concept of mass. Air doctrine stresses the need to concentrate airpower on objectives to ensure mission success, while space forces need to disperse in constellations to provide global, timely support to terrestrial forces. This means that an aerospace force could not have a coherent tactical doctrine without forcing either air or space operations into an inappropriate mode of employment.

We must also consider the fact that ground and sea operations must be integrated with space (and air, and each other, for that matter). As you said in your editorial, all services depend on space, so it is presumptuous to say that space power must not be separate from airpower. Such an exclusive pairing will make the integration of space with other forces—a necessity for modern military operations and not one always associated with airpower—that much harder.

Your assertion that "national policy precludes force application with weapons from space" is also suspect. The 1996 National Space Policy directs DoD to "maintain a capability to execute" the mission area of force application, and Congressional Research Service analysis indicates the policy is "permissive with regard to space-based weapons" in this area. My own extensive research on this subject has not indicated any explicit general prohibition of force application with weapons from space (except for weapons of mass destruction), although such a "militarization of space" may not be popular with either Congress or the international community. Please remember that force application includes but is not limited to missile defense, so the Anti-Ballistic Missile Treaty (which does currently prohibit space-based ABM systems) does not apply to all force application capabilities.

Finally, I argue with your assertion that "it is inevitable that air superiority and space superiority will eventually merge." While the air forces used to support military objectives are uniquely military, the trend for space forces is toward non-military systems—witness the explosion in the military use of commercial communications and remote sensing systems as well as the "civilianization" of the nation's weather satellites. While the air superiority problem will become one of stealth, maneuverability, and precision weaponry, space superiority will move toward diplomacy, negotiation, and the control of data (vice systems).

This is not to say that air and space should not be integrated. However, the reasons above indicate that space forces are sufficiently unique to warrant a return to the concept that air and space are separate and different. In my opinion the Air Force should focus on "integration" and not on "aerospace" to ensure the best employment of both air and space forces.

Lt. Col. William P. Doyle Jr., USAF
Springfield, Va.

I am in full concurrence with the view expressed by [the] January editorial. I am disappointed, however, that it is a topic needing discussion.

Organizations are given specific orders to accomplish objectives. The various pertinent commanders are

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not, or at least should not be, concerned about peripheral elements of the tasking, for in a real-world situation, hesitation can mean sacrificing mission accomplishment. In the words of James Schlesinger: "In combat, a belated response means casualties or an overrun position." The one who blinks first loses.

Regarding the aerospace (or air and space, or atmosphere and space, or troposphere, ozonosphere, ionosphere, exosphere, and space) issue, shouldn't the real emphasis be coordination of resources toward mission accomplishment? After all, every component of the US armed services relies on satellite technology (GPS, communications, reconnaissance, etc.) for mission support. Future military obligations will continue to rely on these resources, only to a greater extent, further graying the lines of ownership and responsibility.

It is ironic that Sen. [Bob] Smith, who declared, "Space dominance is simply too important to allow any bureaucracy, military department, service mafia, parochial concern to stand in the way," proposes the solution of creating a separate space service, thereby creating the bureaucracies, interservice rivalries, and additional politics inherent to such an endeavor. In an Air Force that is facing challenges such as the feasibility of the nation's two–Major Theater War strategy, force structure, modernization, Global Engagement Operations, and member benefits [and] retention, doesn't the leadership community have bigger fish to fry (and missions to fly)?

2d Lt. Joshua M. Flatley,
Nevada Air National Guard
Reno, Nev.

I am disappointed with the [January] editorial column. The article sounded a ringing endorsement for the Air Force's decision to reject the idea that air and space are different operating media and that an aerospace doctrine better suits the Air Force's needs. The arguments supporting the change sound to me like uninspired rhetoric and dogma from years gone by. AFA's decision to fall in line with this reversal ignores the enormous differences in aircraft and spacecraft; air operations and space operations; and airpower and space power.

The decision to claim a doctrinal franchise on space power seems more like an effort to maintain control of the total obligation authority for space programs and not a serious commitment to space. I am afraid the Air Force may be pursuing a short-sighted strategy which will eventually call into question its stewardship of the nation's military space power. Senator Smith regularly questions whether the Air Force has demonstrated an adequate understanding of space issues and challenged DoD to form a separate space service. The Air Force's unwillingness to recognize space as a separate medium offers a compelling argument that it does not understand the opportunities offered by space power or possess the commitment to field robust space forces. This could ultimately cause what the Air Force fears most: the formation of a separate space service.

Maj. Robert D. Newberry,
USAF
Alexandria, Va.

Global Engagement

John T. Correll's piece, "On Course for Global Engagement" *[January, p. 22],* was right on target. The Global Engagement concept and the recently completed wargame at the Air Force Wargaming Institute, highlight the decisive nature of airpower. Airpower has a vital role to play across the entire spectrum of conflict—from humanitarian activities to conducting major theater war. However, when airpower advocates articulate such a notion it often raises the hackles of our ground brethren—hence the never-ending debate between aerospace power and the role of soldiers and Marines on the ground.

But there is an element of airpower that continues to be ignored by both sides of the debate.

Since the end of the Cold War we have only fired in anger a handful of times, but our participation in unconventional operations (humanitarian and peace operations, diplomatic missions, counterterrorism, counterdrug, and others) has increased dramatically. The only military force involved in nearly every one of these operations, either supporting other forces or being supported themselves, is air mobility. When America chooses to respond quickly to a crisis with combat power, food, medicine, or diplomats, air mobility (large and small transports, aerial refuelers and aeromedical evacuation aircraft) is the force of choice. In 1997, air mobility forces went to every nation of the world but five—and three of those did not have runways! Air Force transports were being prepared for deployment to Honduras and Nicaragua within hours of the recent flooding crises in those two countries. Our ability to blunt Saddam Hussein's intention of occupying Saudi Arabia was made possible by the decisive application of

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combat power—delivered primarily by air mobility forces. President Clinton's trip to China last year required the support of over 300 air mobility sorties. His trip to Africa was even more demanding.

Airpower has many faces, across the entire spectrum of conflict. And since we have fewer forces stationed abroad, adversaries that are leaner and more mobile than before, and unconventional operations going on daily, around the world, it only makes sense that airpower, the nation's true expeditionary force, be called first.

My Army and Marine Corps friends, while accepting the doctrinal concept of combined arms, fail to practically embrace the notion that the air arm may be the primary instrument of force and ground and naval forces may be secondary or even tertiary. It is hard to take a backseat when you have been driving for so long.

Keith Hutcheson
Vice President, USAF Programs
VII, Inc.
Vienna, Va.

Views of Desert One

[Otto] Kreisher's recap of the Desert One mission is for the most part factual, thanks to his reliance on [James H.] Kyle's book, *The Guts to Try,* and on the Holloway Commission report. *[See "Desert One," January, p. 60.]* However, his characterization of the USAF Special Operations participants as "supposedly elite" and [as having] "plummeted in quality since Vietnam" requires comment.

At the time of the mission and preparation in 1979–80, I was commander of the 8th Special Operations Squadron at Hurlburt Field [Fla.], which supplied four aircrews to fly No. 1 (an MC-130) and Nos. 4, 5, and 6 (EC-130s) on the Desert One mission. I served as one of the three pilots on the lead MC-130 that night and have lectured on the Desert One mission extensively. I also contributed significantly to Kyle's book.

One fact needs to be corrected. Night 1 of the two-night mission had to be totally clandestine for mission success, which dictated low level and using as few aircraft as possible. Rather than use air refueling inbound and outbound, as Kreisher states, we purposefully overgrossed the six C-130s with fuel by as much as 40,000 pounds to eliminate the need for tankers and the climb to refueling altitude.

Kreisher correctly states that the quantity of USAF special operators had plummeted since Vietnam—but the quality was still there among the few of us in the business in 1979. Prior to the crisis, Night Vision Goggles were declared unsafe for fixed-wing flight operations.

But soon after the embassy fell, the joint task force commander, [Army] Maj. Gen. [James] Vaught, directed us to use NVGs to develop the tactics and procedures to insert and extract forces and to seize airfields in total darkness.

Over the 5.5 months between the embassy seizure and Desert One, MC-130 crews from the Hurlburt and Okinawa squadrons flew nightly missions using aircrew innovation and hard work with Rangers, Delta operators, helos, fuel handlers, and combat controllers to carry out his directive, resulting in a quantum leap in capability. The increase in capability would have slowly evolved over 10 to 15 years but, because of the crisis, we did it in 5.5 months. The Joint Chiefs of Staff Chairman and the Tactical Air Command commander both visited Hurlburt and gave us the green light to respond to Vaught's challenge, free of interference from intermediate staff supervision. We accomplished our goal with no mishaps until on the ground in the Iranian desert.

And the C-130 crews got everyone still alive out of the desert before sunrise and, in the case of one EC-130, on three engines.

Were the crews less than elite? On the inbound leg, we had to penetrate Iranian radar coverage along the southern coast and mountain range undetected. How do you do this with three EC-130s, at night, 40,000 pounds over gross, not equipped with Terrain Following Radar?

You use a tight four-ship diamond formation with a TFR–equipped MC-130 as lead, and the formation goes in very low over the water then terrain-follows through the mountains undetected. You cannot do this with "supposedly elite" aircrews as Kreisher states—they were the cream of the crop among C-130 crews, and it was my great honor and privilege to command them. The mission failed, but special ops got much better as a result, as evidenced by Grenada, Panama, etc.

Col. Roland D. Guidry,
USAF (Ret.)
Destin, Fla.

Although I found "Desert One" to be well-written and informative, I would like someone to step up to an assessment of the mission with an extraction of the Sea Stallions and an insertion of the USAF Aerospace and Recovery Service's nine each HH-53H Pave Low weapon system. I am sure the outcome would have had a significantly different ending.

Maj. Gen. Cornelius "Nute" Nugteren,
USAF (Ret.)
Warner Robins, Ga.

As an Air Force HH-3E Jolly Green helicopter pilot who has flown night combat missions I ask you to please publish this as an apology to the helicopter pilots who gave their all on the Iranian rescue mission.

I've read Kyle's book and spoken to him at length about the mission when he visited his alma mater, Kansas State University, to speak to my ROTC cadets. The "guts to try" came from a message scribbled on a case of cold beer sent to the survivors as they licked their wounds on a desert island in the Arab Emirates. It was sent by British aircraft controllers and read, "To you all, from us all, for having the guts to try." That's an entirely different message than the one that Kreisher's article attributes to Kyle.

The Holloway Report clearly identifies the fault in the training: The helicopter crews never had a chance to debrief the training exercises with the ground units and C-130 crews. Those "hot wash" sessions are where weaknesses in the plan should and usually are resolved before the next practice. The helicopter crews were also changed halfway through the training. But the obvious question has always been: Why weren't air refuelable Air Force helicopters and crews used in the first place? The answer to that question has been avoided for years because Headquarters Air Force evidently didn't want that part of the mission. At that point in time no Air Force helicopter pilot had been promoted to general and only one has since. But he led the Air Force Pave Low helicopters into Iraq with the Army Apaches that cleared the anti-aircraft installations before the F-117s went in. Why hasn't *Air Force* Magazine seen fit to publish that story? I've seen it only twice, in *Popular Mechanics* and at the George Bush Library at Texas A&M.

I have known the Air Force is dominated by fixed-wing pilots since 1967 when my operations officer told me there was no future for helicopter-only pilots in USAF. I went to Vietnam anyway and served 28.5 years proudly, productively, and fighting for

the helicopter missions funding and staffing all the way. [I]nstrument proficiency and air refueling qualification, combined with the courage of those Marine pilots, would have made this mission a success. Don't imply a lack of courage, Otto, you weren't there; and Kyle never flew at less than a 100 feet AGL under instrument conditions, or he would have used Guard to tell his critical assets they could climb above the "haboob."

Col. John B. McTasney,
USAF (Ret.)
Carmichael, Calif.

■ Air Force *Magazine published "Apache Attack," by Richard Mackenzie in October 1991, p. 54, covering Task Force Normandy, with its "handpicked crews of Army Apaches and Air Force MH-53J Pave Low electronic warfare helicopters," in detail.—THE EDITORS*

The disaster at Desert One was a hot topic of conversation among those of us who flew HH-53s when it happened. Our main questions have never been adequately answered, other than to say interservice rivalries dictated the wrong helicopters and, perhaps, pilots. The right helicopter to use for the raid was the rescue HH-53. Three things made it preferable: Engine Particle Separators, which in simple terms were large filters over the engine inlets which reduced damage from flying debris and dirt; air refuel[ing capability], which made it unnecessary to land for fuel; and a Doppler inertial system, which when properly used could provide navigation.

As for the argument that Air Force pilots couldn't operate off ships, we (Air Force) did very nicely flying HH-53s off Navy ships during the Saigon evacuation, thank you, a much more chaotic environment.

Ancillary strong points were the rescue HH-53's increased protective armor, crews trained in long-range operations (air refueling), and pararescuemen/gunners as an integral part of the crew. The biggest mistake however, was the decision not to fly the helicopters regularly prior to the mission. The H-53, any model, requires a lot of skilled maintenance. But it must be routinely flown to keep all systems, especially those with hydraulic seals, operational. I've heard they didn't fly routinely to avoid alerting Soviet satellites and ship intelligence collectors of the impending operation. I doubt it would have mattered.

So, we're left with the first question: Was it interservice rivalries that dictated the force composition and perhaps doomed the mission from inception?

Lt. Col. Charles D. Brown,
USAF (Ret.)
Former Jolly Green
Roseville, Calif.

The big error in my estimation was not so much the failure to use rescue HH-53s, but the failure to use rescue H-53 expertise and personnel. We were the only organization in the world, at that time, with an established track record of successful long-range combat helicopter operations, using—guess what?—the HH-53.

Think thousands of precautionary orbits over northern Laos and North Vietnam, some of which ended in successful, deep, rescue missions during 1968–73. Think Son Tay. The prisoners may not have been there, but [HH-53 rescue crews] sure as hell were—Jolly Greens, with our special forces and pararescue knife fighters on board [and] on time, on target, and tactically effective. Check the record.

As for Desert One, there were sound reasons not to deploy the rescue HH-53 assets at Eglin AFB, Fla., [RAF] Woodbridge [UK], Kadena AB, Okinawa, or Hill AFB, Utah. The absence of aircraft on the flight line and folks on base would have been immediately apparent to anyone with eyes and a reporting system, like the Ayatollah's secret service and its Soviet friends. But there was a solution.

As I understand it, Navy RH-53s (mine sweepers) had all the internal plumbing for the air refueling system. All you needed to make them air refueling capable was a probe kit, which Sikorsky could have easily and quickly provided. The RH birds could have easily been retrofitted in the carrier hanger bay: It's no big deal and Navy maintenance is good! I speak from [Operation] Frequent Wind experience. If worse came to worst we could have quietly cannibalized rescue HH-53s. The only other necessary ingredient was air refueling qualified H-53 crews, which Air Rescue Service had in abundance. It would have been easy to siphon off a few here and a few there without being obvious.

As for the EPSs, the birds used in the attempt had them, but for reasons that escape me to this day, whoever was in charge ordered them removed at the last minute—to save weight, all 150 pounds each. The problem wasn't weight; the problem was FOD landing on unprepared desert [landing zones].

Apparently those in charge followed the Marine custom of stripping the helicopters of all nonessential equip-

ment before a particularly critical combat mission, and the EPSs, or "sand shields" as they were called in press reports, were deemed nonessential. They no doubt are for overwater operations, but no one who has hovered an H-53 over desert terrain, at least no one in his or her right mind, would have considered them nonessential for the task at hand. For the non-initiate, the H-53 has a powerful downwash, capable of lifting rocks the size of a child's fist off the ground and throwing them in random directions, and a much smaller stone thrown into an unprotected engine inlet will instantly FOD out an engine—that is, destroy it from foreign object damage. The point of the EPSs wasn't to protect the compressor and turbine blades from sand erosion, though that was, and is, a useful collateral benefit; it was to protect them from FOD.

Interservice rivalries? I have no doubt that the Marines who attempted the Iranian rescue mission were men of principle and courage and, in their own tactical environment, thoroughly competent. That, however, was not enough.

Someone, like someone very high in the Air Force chain of command, should have asked the question, "Who has done this kind of thing before?" and, having found the answer to that question, Air Rescue Service, should have gone looking for answers. They did not, and the results speak for themselves.

To be sure, the cobbled-together plan, if it can be dignified with that term, bears all the hallmarks of interservice rivalry, but the real problem was a lack of tactical knowledge at the top, which is forgivable, and an inability or unwillingness to recognize the deficiency and seek out the informed sources that could have rectified it, and that is not.

Lt. Col. John F. Guilmartin Jr.,
USAF (Ret.)
Columbus, Ohio

"Desert One" starts with the sentence, "For some, the current political debate over the combat readiness of today's American military stirs memories of a long-ago event that, more than anything else, came to symbolize the disastrously 'hollow' forces of the post–Vietnam era." The author's attempt to relate events that are now almost 20 years old to the current challenges faced in DoD is a "failure" to complete a meaningful article, and it is disgraceful to attach such spectacular descriptions of Operation Eagle Claw to the challenges our military services face today.

[This is] not to say we shouldn't learn from past experiences. Because we all should always be compelled to evaluate our performances to do better the next time.

The article is very good at describing some of the spectacular events that went into Eagle Claw—this was a very complex operation. However, the choice in wording in areas of the article sets the wrong tone and final impression of events. One sentence in particular in the opening casts a terribly ill impression that is carried throughout the article. The sentence is in the third paragraph and states, "That failure would haunt the US military for years and would torment some of the key participants for the rest of their lives." In addition, the next to last section, titled "Failure of Eagle Claw," highlights the poor choice of words used in this article.

At that time (1979–80), our forces were not prepared to deal with desert warfare and the emergence of a new enemy—terrorism. Our military services were tasked to reshape in the immediate wake of the terror of the hostage taking at the US Embassy in Tehran. Those [who] gave the ultimate for the Eagle Claw mission, and those [who] lost their loved ones, should never associate the word "failure" with this tragedy. The events surrounding this operation provided the utmost in reality that allowed our services to be shaped in the future to deal with the newer threats outside of the traditional Cold War threat. The Eagle Claw mission ended in a terrible tragedy—eight brave servicemen lost their lives and five were seriously injured. These casualties highlighted numerous studies that generated future strengths within our services to include the building of new interoperability strength among the services. The fact that a rescue attempt of this magnitude had been secretly planned and staged at that time shocked the world. Eagle Claw represents the assembly of the bravest servicemen I have ever met and, given all the circumstances at that time, was the right choice. To imply this tragedy was a failure isn't considering the bigger picture—lessons learned for a stronger future.

[Army] Col. [Charles] Beckwith and his men represented a new contingency called Delta Force. They benchmarked the name Delta Force for the strength and honor that is idolized to this day. The word "failure" should not be associated with this group nor should that word be read into any part of the Eagle Claw mission or the article.

It is terribly unfortunate [that] the immediate objective of Eagle Claw was not achieved. However, the [irony] of this operation is the experiences it provided make it a huge success, and I am proud to have had the opportunity to serve with those involved in this mission.

Hugh H. Roberts
Oklahoma City, Okla.

"Desert One" was very well done and a good thumbnail sketch of events. However, [the author's] statement that the CIA's presence in Iran was dismantled by the Carter Administration because of its "role in overthrowing governments in Vietnam and Latin America" is profoundly incorrect. This implies the agency could not be trusted and is in complete error on two important levels:

First, under orders from the Carter White House, then–CIA director Adm. Stansfield Turner gutted the agency's human intelligence networks throughout the world in favor of high technology. This was a blanket policy and is well-documented.

Second, any governments overthrown with aid from CIA covert operations were done so under the direct orders of the President of the United States. The coups in Guatemala, Iran, and Chile were by direct orders of President Eisenhower. As for Vietnam, recently released tapes from the Kennedy presidency clearly show not only did the Nov. 1, 1963, coup which toppled the Ngo Dinh Diem presidency of South Vietnam occur with the approval of President Kennedy, the CIA actually opposed it. On a tape produced on Nov. 4, 1963, President Kennedy verbally lists those on his cabinet who backed the coup and those who were opposed. CIA chief John McCone, Robert Kennedy, Robert McNamara, and Gen. Maxwell Taylor, who would later command the US forces in Vietnam, all opposed the coup which cost the life of President Diem and set in motion our full-scale involvement in that war.

When looking at a debacle as profound as Desert One, the preliminary facts are crucial. There is certainly enough that went wrong for all to share, and for all to learn.

Alan R. Wise
Middletown, Ohio

Big 3: Tricare, Pay, and Retention

[In] reference [to] the January article "The New Doctor Is In" *[p. 44]:*

Talk about brainwashed. Dr. Sue Bailey is on a different planet than the rest of us. My wife and I reside in Middleburg, Fla., approximately 15 miles from NAS Jacksonville, Fla. I am 67 years young and have Medicare as primary insurance and FEHBP as secondary. My wife, 64, has FEHBP as primary and Tricare Standard as secondary.

Mention the word Tricare to a provider and almost invariably there is a grimace and a response that they do not file Tricare as secondary. After arguing the point they usually relent, but then, after charging you a co-payment of $10, they forget to file with Tricare. The reason is simple. Tricare's authorized levels [are so low] that little, if anything, is paid on filed claims.

It would appear that providers are doing Tricare a favor by not submitting claims for small amounts. This saves the provider administrative overhead costs while saving Tricare administration and claim satisfaction costs. The one left holding the bag is the patient who pays a co-payment and then tries to recoup his expenses.

My wife and I are in the DEERS program so that we can utilize the military medical benefits. However this is not necessarily so. The article in question mentions the NAS Jacksonville hospital in glowing terms. Our experience and that of our friends is not quite that. The statement "overwhelmingly able to provide space-available care" may be true of Priority 1 (Tricare Prime) patients. It is certainly not true of Priority 3 (non–Tricare Prime) patients.

Many departments have been closed or severely limited to retirees and dependents for years.

Yes, the pharmacy at NAS Jacksonville does an outstanding job, to a point, in handling the tremendous volume of new prescriptions and refills that pour in its doors every day. The method by which prescriptions are filled is state of the art, and there is a drive through for refills. Having said that, I have glaucoma and have used four different eye drops for many years without a prescription change. The NAS Jacksonville pharmacy refuses to carry them because of not enough usage. Popular drugs such as Claritin D and Voltaren pills are not carried, I assume, due to the cost.

The accompanying [letter] "Another View of Tricare" on p. 46 *[January]* depicts the frustrations of many individuals in dealing with the Tricare system. Tricare, while it may make sense in theory, leaves a lot to be desired in practice.

Cutting allowances to a bare minimum, requiring preapproval before surgical procedures even for secondary insurance, and a grave problem in obtaining and retaining providers all need major improvement.

Daniel J. Harkins
Middleburg, Fla.

The article "How Compensation Got Complicated" *[January, p. 39]* once again points out the never ending gaps between the folks in uniform and their civilian counterparts. And you mentioned the retirement incentives. What incentives? Most young active duty officers and enlisted I know today file that incentive next to their future Social Security benefit—another questionable promise.

[Retired Brig.] Gen. Thomas Carpenter's [letter] in "The New Doctor Is In" further illustrated how completely our medical care promises have been abrogated over the years by our leadership. At least Carpenter is pulling in a substantial monthly retirement check with which he can offset his medical problems. What about all the midlevel enlisted out there who don't even have that option?

We should be candid with the new recruits. Tell them, it's a system which carelessly breaks meaningful promises that may not be in their interest but is in the Air Force's interest. And

when they shed the uniform they can go find an HMO, if they have enough money, and if one will accept them.

Hopefully the archaic concept of duty, honor, and country, which drew people like me, will still draw in those marching to a different drum.

Lt. Col. Robert S. Miller,
USAF (Ret.)
Winter Springs, Fla.

I have read your articles on enlisted and officer retention and I have one question. If the aim is to keep mid- [and] upper-level NCOs why not institute a [Selective] Re-enlistment Bonus for those of us over 14 years? There is now an SRB for Zone C. You offer first time enlistees a bonus from $1,000 to $4,000, why not offer a re-enlistment bonus (one time lump sum) to those of us who have passed Zone C? It could be based on your career field and how many years you re-enlist. It would go a long way in saying we are important, too.

TSgt. C. Mims
Cheyenne Mountain AFB,
Colo.

No "Company Line"

My faith in my belief that [Donald H.] Rumsfeld would have made a great President was underscored by his clear analysis and, most pointedly, by his refutation of the "company line" advanced by the Chairman of the Joint Chiefs of Staff regarding the nature of the missile threat to the United States. *[See "Missile Controversies," January, p. 49.]*

One wonders if anyone in leadership is willing to step up and take a stand against self-serving politicians. Recent history is replete with examples of the top brass putting their own career ahead of the interests of the nation and, unfortunately, its young warriors. Not surprisingly, on the rare occasion when one does, he gets "Dugan'd."

One also wonders, yet again, "Where have all the Mitchells gone?"

Col. James F. Clark,
USAFR (Ret.)
Lakewood, Colo.

Flashback and Pieces

The January "Flashback" *[p. 38]* stirred many memories for me. In 1944, a P-75A was delivered to the Air Proving Ground Command at Eglin Field, Fla., for operational suitability tests. I was the project officer and Maj. Harry Bolton, a former [American Volunteer Group] pilot, was the test pilot. It wasn't mentioned in the article, but one of the airplane's wildest innovations was its power plant. Two Allison V-1710 engines had been put together to form a W-3420. Each bank had a drive shaft, one passing by the left side of the pilot and the other to the right side, together turning the counter-rotating propellers.

As one could imagine, the engine had problems, and they were frequent enough to cause Harry and me to discuss the situation privately. We had the same attitude: Despite its scarcity, we agreed that neither of us would take any heroic measures to save the airplane if the engine failed; unless we were certain that we could make one of the many runways on the Eglin reservation, we would bail out. Sadly, Harry couldn't bring himself to do that.

The engine did quit on him one day; there was no runway within reach, but he still tried to save the plane by landing in a cornfield. His considerable skill and experience could not prevent the fatal injuries he suffered. The accident terminated the project at Eglin and hopefully brought proponents of a hybrid airplane to their senses.

Lt. Col. Allen S. Webb,
USAF (Ret.)
Lynn Haven, Fla.

I was pleased to see the photograph and brief narrative on Air Force patches with emphasis on the people [who] collect them. *[See "Pieces," January, p. 80.]* I've collected insignia from all the military services for about 50 years and still find items regularly that I don't have and, in some cases, had no idea even existed. In fact, both the most visible fighter squadrons' patches shown in your photo, I do not yet have.

Emil L. Balusek
Austin, Texas

Look Further

The January issue contains a letter from Lt. Col. J. Russ Currey, USAF (Ret.), [who] basically states his disappointment at the cover photo from November 1998. *[See "Two Views of the Cover," p. 8.]* I have the utmost respect for all veterans and retired military personnel, but I respectfully object to his letter. [F]or him to make the assumptions that he has over one photo is improper and disrespectful to those of us who serve or have served as the Air Force's "soldiers."

I think the colonel has the impression that all security forces personnel, when out in the field, walk around filthy, with dirty weapons, and just don't clean them. It appears by his words that he does not believe the Air Force teaches its security forces members to take care of their weapons. This is not reality, though. Whether during an exercise or real-world situation, if under attack or immediately after a situation which would [require] crawling, rolling, diving, laying, [or] attacking an armed aggressor, does the colonel expect an airman ... to stop what he is doing, immediately after diving for cover or just after repelling an attack or ambushing an enemy, in a dirty environment, and take apart his weapon and start to clean it? If diving for cover to save your life means landing in dirt and dirt getting on your weapon, then it could be considered the right decision.

Did the colonel happen to look at the photos on pgs. 30–34, or speak with any active or retired security forces member? The airmen in the photo on pgs. 30–31 look clean, sharp, and ready for anything, in a field environment. I don't see a speck of dirt on the airman's weapon. Look at the photo on p. 34. These airmen are doing a hot off load, and, again, the airmen's weapons don't appear dirty.

The colonel states that if [the cover photo] were an Army photo, the soldier would be dirty and the weapon clean. I say [that] would be a staged photo.

I am sure the Army and the Marine Corps teach their troops the importance of a serviceable weapon. Let me assure you that all [Air Force] security forces personnel are taught from day one the value and importance of keeping their weapons clean and serviceable. Our lives depend on it. I ask you not to judge a career field over one photo.

TSgt. Anthony J. Sobieski,
USAFR
514th Security Forces Squadron
McGuire AFB, N.J.

No New Memorials

It seems four members of Congress want to put up a memorial for disabled veterans who are still living. *[See "Aerospace World," "News Notes," January, p. 20.]* I really don't care who wants to pay the bill for another memorial, but I wish people would wake up and take notice. We are up to our eyeballs in memorials. Rather than putting our names on a wall, I think Congress could concentrate on making the VA pay the benefits earned and deserved by those who would be recognized.

SSgt. Michael Lusby,
USAF disabled veteran
Arivaca, Ariz.

Aerospace World

By Peter Grier

F-22 Readied for Production

The Air Force on Dec. 28 awarded $668 million in contracts as payment for the first two production F-22 fighters, six engines, and F-22 program support for 1999.

The move is important because it marks the official transition out of research and development for the Air Force's premier next-generation fighter "and gets us into the next phase of the program," said Thomas Burbage, F-22 program manager at prime contractor Lockheed Martin.

The award came after the F-22 program completed a Congressionally mandated flight-hour requirement four days before Thanksgiving.

The two existing flight-test aircraft soared past the 183-flight-hour mark more than a month ahead of schedule, Secretary of Defense William S. Cohen certified to lawmakers. Furthermore, they have performed well during this effort, which represents 4 percent of the planned test program, reported Cohen.

The full contract for the next set of six Raptors is due to be awarded in about a year. While DoD can still cancel the F-22 program if officials feel major problems have developed, such a drastic action would cost several hundred million dollars in cancellation fees.

The F-22 is scheduled to enter service in 2004. It will replace the aging F-15 as America's frontline air superiority fighter.

Russia's Fighter: Stealthy or Not?

On Jan. 12, Russia rolled out its newest fighter, the MFI. Also known as Project 1.42, the MiG–designed aircraft has been in development since 1984. It is meant to be the Russian equivalent to the stealthy USAF F-22.

The MFI heralds "a revolution in the Russian air force," said Defense Minister Igor Sergeyev, according to the Itar–Tass news agency. First flight is expected sometime in the first quarter of 1999, added Sergeyev.

However, the fighter on the runway was not the fighter in question.

AP photo

Under wraps since its development began in the 1980s, a MiG multifunctional fighter, or MFI, was rolled out in January at the Russian air force test center in Zhukovski, Russia. However the aircraft shown was not an MFI with stealth features but the airplane that tests its engines. (See news item below left.)

That fighter does not exist. The Russian designers substituted a more ordinary jet fighter, which has never flown and was built for testing 1.42 engines. It had no stealthy features, according to Russian aerospace experts.

Whether Moscow can afford such a new aircraft, with its estimated $70 million per copy price tag, is open to question. The program has long had money problems. Only taxi tests have been held so far.

Russian media described the aircraft as a single-seat fighter with midfuselage delta wings, all-moving canards, and twin vertical tails in a V configuration. It has some radar-avoidance features, and its engine is purported to be capable of supersonic cruise without afterburner, a key F-22 attribute.

U-2 Shatters World Record

On Dec. 12, a U-2 from the 1st Reconnaissance Squadron, Beale AFB, Calif., shattered a 19-year-old payload-to-altitude world record. The aircraft, flown by instructor pilot Maj. Alan Zwick, carried a weight of 4,400 pounds to just over 66,800 feet—more than 12 miles above the Earth's surface.

The previous record of 28,513 feet was set Feb. 24, 1979, by a Czech pilot flying a Yakovlev 40. Zwick surpassed that mark just 12 minutes into his 1 hour, 55 minute flight.

Verification by a National Aeronautic Association inspector made the record official. Yet for the U-2, reaching such heights is not exactly unheard-of. Zwick said U-2s fly at such altitude several times a day almost every day of the week.

The unit went for a record now because "we just wanted to make it official, ... let the world know we can," said Maj. Doug Dillard, a 1st RS U-2 instructor pilot.

Troops Leave Tents, Move Indoors

Life at Prince Sultan AB in Saudi Arabia took a big step forward recently when commanders officially accepted the new Friendly Forces Housing Complex. The first forces to

live in the new 4,257-bed facility—the 363d Air Expeditionary Wing—will move in during the first quarter of 1999.

The housing facility has been in the works since 1996, when a bomb destroyed the Khobar Towers living quarters at Dhahran, Saudi Arabia, and US and Allied troops living in Saudi Arabia in support of Operation Southern Watch were moved to Prince Sultan AB for their own protection.

Until now, housing at the base has meant tents, with airmen living up to eight in a tent. Showers, meals, and toilets were all at least a stroll away. In the new facility, personnel will live one or two to a room, depending on rank, and share full bathrooms.

The facility is similar to a college dormitory, with shared television and living areas in each apartment. There are three dining halls, a gym, recreation center, library, and pool.

Saudi Arabia paid for the $112 million construction cost. The buildings will remain Saudi property but will be primarily run, guarded, and maintained by US forces.

Peters Outlines Air Force Priorities

The top priority for the Air Force in 1999 will be moving the Expeditionary Aerospace Force concept into a reality, said acting Secretary of the Air Force F. Whitten Peters during a New Year's trip to Southwest Asia and southern Europe.

"I think this is going to be an exciting year where we can make huge progress and really make the Air Force what all of us would like it to be," he said during a Jan. 2 stop at Lajes Field in the Azores, Portugal. "In 1999, basically the priority is to get into EAF, to get the schedule out, to get the units allocated, and to begin the training cycle."

The EAF will be made up of 10 Air Expeditionary Forces. These AEF aircraft packages will respond to missions whenever needed. The plan calls for two to be on alert or deployed for a 90-day cycle, while two others are getting ready to deploy, and six are training and otherwise remaining prepared.

According to Peters, the Air Force is already recruiting EAF trainers with teams to be established in early 1999. To prepare for the beginning of EAF operations at the turn of the year 2000, 5,500 positions have been moved from career fields that don't deploy, to career fields that do.

"We came up with 5,500 because that's roughly what it will take to permanently man all the temporary bases we have all over the world," said Peters. "Our view is if we have those 5,500 people somewhere, then we will cut the amount of work back home."

Expansion of Vet Benefits Proposed

A commission set up by Congress to study the state of veterans benefits proposed a number of new—and expensive—ways of aiding those who have worn the nation's uniform.

Most notable among the ideas of the Congressional Commission on Service Members and Veterans Transition Assistance is a recommendation that the government pay the full cost of sending a vet to any US college that he or she wishes.

The panel also urged that the US pay health care costs for those who have recently separated from the military, and their families, for up to 18 months.

Such proposals are a starting point for making good on old promises to military personnel, said commission members.

"The system is broken and the commission took a 'no holds barred' approach to fixing it," said Anthony J. Principi, panel chairman and a deputy secretary of veterans affairs in the Bush Administration.

Current Montgomery GI bill benefits cover a maximum $528 a month in education costs. This relatively small stipend is one reason only 38 percent of eligible veterans use the benefit, according to panel members.

Their proposal would allow the military to cover the cost of tuition, books, and supplies at any college, plus a $400 monthly stipend. It would eliminate the $1,200 member's contribution to the Montgomery GI bill program and allow veterans' educa-

DoD Gears Up for Missile Defense

The threat of a missile attack on the United States is growing and is now so serious that it warrants the building of national missile defenses, said Secretary of Defense William S. Cohen on Jan. 20.

Pentagon officials say that if technical problems can be overcome they will deploy such a system in 2005. That date represents a two-year slip from the previously announced date of 2003 for a working system.

"We are affirming that there is a threat, and the threat is growing, and that we expect it will pose a danger not only to our troops overseas but also to Americans here at home," said Cohen at a Pentagon news conference.

The announcement—coupled with a $6.6 billion, six-year budget for missile defense programs—represents a shift in the Administration's position, but how large a shift is open to question. Skeptics noted that the Administration did not actually commit for fielding a system.

In the past, Clinton officials have sounded less than enthusiastic about missile defense programs that are the legacy of Ronald Reagan's ambitious Strategic Defense Initiative. Technical problems were insurmountable, some grumbled.

The political calculus changed in recent months as Third World nations forged ahead with missile programs. Last August, officials were shocked when North Korea launched a three-stage rocket, the Taepo Dong 1. The third stage misfired, but if the communist nation develops a successor weapon it would be able to reach Alaska and Hawaii, not to mention US forces in Japan and South Korea.

A study panel headed by former Defense Secretary Donald H. Rumsfeld concluded that US intelligence had underestimated the pace of foreign ballistic missile programs and that the US could be vulnerable to attack within only two years.

The system envisioned by Clinton officials would involve a space-based sensor capable of detecting the hot exhaust of a missile launch. Warning radars on the nation's periphery would track a weapon. A ground-based radar, likely to be located in Alaska, would then target the missile and help guide a ground-launched interceptor to destroy the threat.

Even this relatively limited system would require amendments to the Anti-Ballistic Missile Treaty. The United States has insisted that such defenses would not destabilize the nuclear balance between the US and Russia, as they would not be capable of stopping any concerted Russian attack. But Moscow has long considered the ABM Treaty a cornerstone of today's geostrategic balance and has opposed any changes.

Cohen said withdrawal from the treaty is an open option if Russia balks. The US "has amended the treaty before, and we see no reason why it cannot be amended again," he said.

tional benefits to be transferred to a spouse or child.

The recommendations of the 12-member commission would cost some $400 million in their first year alone and likely escalate rapidly as the number of eligible veterans increased.

Most, but not all, of the panel's ideas are likely to be welcomed by veterans groups. The commission would also limit veterans home loan guarantees to one residence, for instance. It would end wartime benefit eligibility for personnel assigned to the Persian Gulf region.

"Fox" Killed Key Iraqi Officials, Says US

Army Gen. Hugh Shelton, Chairman of the Joint Chiefs of Staff, said the bombs of Operation Desert Fox apparently deprived Saddam Hussein of some of his top talent.

US intelligence indicates the December air raids on Iraq killed key government officials and have left Saddam increasingly desperate, claimed Shelton.

The Chairman told reporters that the losses of key advisors, deaths of as many as 1,600 elite Republican Guard troops and others, and widespread military damage had shaken Saddam.

"When you look at some of the [intelligence] reporting that has come in, [there are] several key individuals [who] were right in the upper structure [who] are no longer available to him, to advise or to lead," Shelton told the Defense Writers Group in Washington, D.C. He declined to elaborate.

USAF photo by SSgt. Scott Reed

SrA. Jennifer Dorn of ACC's 18th Weather Squadron at Ft. Bragg, N.C., checks the dew point at Tuzla AB, Bosnia, in January during a rotation to Operation Joint Forge. In the background a C-130 crew from the Kentucky Air National Guard offloads with its engines running.

Anthrax Vaccine Fires Dispute

Pentagon officials insist that the Pentagon's mandatory anthrax vaccine has proved to be safe. Some Air Force members, however, aren't all that sure.

One airman at Travis AFB, Calif., faces a summary court-martial for refusing orders to receive his anthrax vaccinations, the Air Force said Jan. 22. In addition, eight pilots from Connecticut's Air National Guard 103d Fighter Wing, Bradley IAP, Conn., planned to resign rather than take the six-shot series. The unit, which flies A-10s, was scheduled to deploy to the Persian Gulf.

"It's safe and reliable," Pentagon spokesman Ken Bacon said. "It works and has no side effects." Reporters queried Bacon about the vaccine at a Jan. 21 Pentagon briefing. The anthrax vaccine is mandatory for all service members, active duty, Guard, and Reserve.

The reluctant Travis member, A1C Jeff Bettendorf, of the 815th Air Mobility Squadron, faced a maximum of a reduction in rank to the lowest enlisted rank, forfeiture of two-thirds pay for one month, and 30 days of confinement.

Bacon reported that during exit interviews, six of the eight Connecticut pilots said anthrax was only one of many factors that entered into their decision to resign.

As of Jan. 12, Bacon said, 166,233 service members have received 463,226 shots. This includes the Defense Department's top civilian and military leaders, he added. "All of these people are fine," Bacon said.

USAF photo

SrA. Michael Hael performs maintenance on a mobile generator. His unit, the 607th Combat Communications Squadron at Camp Humphreys, South Korea, provides 7th Air Force and the Combined Forces Air Component Command with a secure tactical communications system and long range radar support for early warning and weapons control.

ANG Tanker Crashes in Germany

An Air National Guard KC-135E tanker assigned to the 141st Air Refueling Wing, Fairchild AFB, Wash., crashed while landing at Geilenkirchen AB, Germany, Jan. 13. All four crew members on board were killed.

USAF photo by TSgt. Lance Cheung

Comm folks stationed in South Korea help children open their birthday presents at a local children's home. From left, SrA. Alicia Bobe, 607th Combat Comm Sq. at Camp Humphreys, and TSgt. Darryl Richter and SSgt. Lisa Rodier, 51st Comm Sq. at Osan AB, visited the home in January. The units' members visit several times a year to deliver presents and make facility improvements.

"This is a tragic loss," said Col. James R. Wynne, 141st commander. "The Guard is such a close-knit extended family that this will certainly send a wave of grief throughout the unit. Our thoughts and prayers go out to their families."

The airplane was on a routine refueling mission as part of a NATO exercise when it crashed. Reports from the scene indicated that the aircraft touched down, then took off again immediately.

The airplane apparently tipped toward the right before hitting the ground, one-quarter mile north of the runway and several hundred feet from the nearest house. No one on the ground was injured, although it took more than 100 Dutch and German firefighters three hours to extinguish the burning airplane.

Air Mobility Command has appointed a safety investigation board to look into the cause of the crash.

C-27s Exit the Inventory

They provided valuable support as recently as the relief efforts in Honduras and other Central American nations in the wake of Hurricane Mitch, but the C-27s have left Howard AFB, Panama, nonetheless. The final seven Spartans of Howard's 310th Airlift Squadron have flown their last mission—to the boneyard.

The Spartans look like small, twin-engine C-130s. They have provided the USAF with a unique short-take-off-and-landing capability that has provided access to numerous dirt and grass fields in the South and Central American regions. They have helped in humanitarian, peacekeeping, and counterdrug missions.

But with the impending closure of Howard—all US installations in Panama will be turned back to the host nation by the turn of the century—they have become excess. A small ceremony on the Howard flight line preceded the departure of the last three C-27s Jan. 12 for the Aerospace Maintenance and Regeneration Center at Davis–Monthan AFB, Ariz.

"I'll always remember landing in the jungles of South America and serving on flights carrying special forces personnel into remote areas, where no other aircraft could go," said TSgt. Larry Manning, a C-27 loadmaster assigned to the 310th. "Serving on, and serving with, the C-27 Spartan has been the highlight of my career."

Last Block 20 B-2 Leaves for Upgrade

The last Block 20 B-2 recently left Whiteman AFB, Mo., for its upgrade to Block 30 status at Northrop Grumman's modification line in Palmdale, Calif.

The bomber—*Spirit of Oklahoma*—was the first Block 20 B-2 delivered.

Block 30 stealth bombers have improved avionics, almost twice the number of radar modes, superior terrain-following ability, and increased survivability. They are also certified for new weapons, such as the Joint Direct Attack Munition, and are more easily deployed.

According to Capt. David Miller, 325th Bomb Squadron maintenance officer, Whiteman's B-2 wing will see increased combat capability because Block 30 airplanes use an improved self-diagnostic system.

"Our flying mission lives and dies

DoD photo by Maj. Mike Pitzer, ANG

Here at Soto Cano AB, Honduras, a C-27A Spartan, operated by the 310th Airlift Squadron, Howard AB, Panama, prepares to take on passengers and cargo following Hurricane Mitch last fall. The last Spartan left Panama for the Air Force boneyard in January. (See news item at left.)

by our ability to quickly and accurately troubleshoot faults," said Miller.

The number of low observable write-ups has been reduced by a factor of five in Block 30 models, added Maj. Michael Andress, 509th Maintenance Squadron maintenance supervisor. Other improvements include fine-tuning the aft deck and rudders. The leading edges of the wings were entirely re-engineered.

First E-mail, Now E-Brakes

An F-16 equipped with electric brakes took to the skies at Edwards AFB, Calif., recently. The flight was the first for an airplane equipped with an "e-brake" system.

The 416th Flight Test Squadron is testing the B.F. Goodrich–designed equipment to gather more information on the feasibility of building future airplanes with e-brakes.

Why replace the tried-and-true hydraulic brakes approach?

"There is a general tendency toward all-electric airplanes," said Project Manager Alan Dykhoff of the 416th. "The e-brake project is just one element."

E-brakes replace hydraulic piston actuators with electric motors and gearing to squeeze brake pads. They are potentially easier to maintain, since ground crews can check them via diagnostic computers, as opposed to the physical disassembly needed by hydraulic parts. Aircraft systems can constantly monitor e-brakes while in the air, meaning a pilot can learn immediately of any brake faults.

Ground tests have already verified e-brake performance during such situations as stopping on a wet runway. Future flights in the test program, which is a cooperative effort between the Air Force Research Lab and B.F. Goodrich, will compare the performance of hydraulic pistons vs. electric motors.

F-15E Accident Report Released

On Jan. 11, Air Combat Command released the accident investigation report on the October crash of a 391st Fighter Squadron F-15E near McDermitt State Airport, Ore., that killed pilot Lt. Col. William E. Morel III and instructor weapons system officer Capt. Jeffrey K. Fahnlander.

At the time of the crash, Morel and Fahnlander were part of a formation flying a night training mission for surface attack tactics. The exercise involved low altitude night reactions to simulator enemy threats.

According to the accident board, the crew became spatially disoriented. During a simulated surface-to-air missile attack, Morel and Fahnlander unknowingly flew their airplane to a nose low position, outside the limits of their terrain-following radar.

The position of the airplane prevented the TFR from arming and providing automatic fly-up protection. Visual cockpit warnings may have been missed by the crew. When the "low altitude" voice warning sounded, it was too late to recover from the steep dive.

AFPC Studies Home Basing

The Air Force Personnel Center wants feedback from service personnel about the possibility of making home basing part of the Expeditionary Aerospace Force concept.

As defined by the AFPC team undertaking the study, "home basing" means that Air Force members with four to six years on active duty would be able to elect a permanent home-base location. While there might be short stays elsewhere for school assignments or other needs, the home base could stay applicable all the way up to retirement.

"During the assignments away from his home base, a member could elect to either take the family along or leave the family in place at the home base," said Maj. James Taylor, head of the AFPC team. "All this makes it much easier for families to build equity in homes, children to stay in the same schools, and spouses to maintain their own jobs and careers."

The survey is now available on AFPC's World Wide Web home page. Participation is voluntary. Results will be used to help determine if home basing would affect force stability.

Personnel with questions can reach Taylor at DSN 487-3127.

New Cash a Help, No Panacea, Say Chiefs

The Clinton Administration's boost in the Pentagon budget will go some way toward solving immediate readiness and procurement problems, said the nation's top military officers in Congressional testimony Jan. 5. However, the increase—a claimed $110 billion over six years—won't fulfill all the armed services' needs, according to the Joint Chiefs.

"We continue to grapple with the competing requirements of current readiness, modernization to ensure future readiness, and providing adequate compensation and quality of life for our people," Army Gen. Hugh Shelton, Chairman of the Joint Chiefs of Staff, told the Senate Armed Services Committee.

The chiefs said they were grateful for the new cash. "I expect the FY [2000] budget will take significant steps in meeting our most critical needs," said Adm. Jay L. Johnson, chief of naval operations.

However, they reiterated that their long-term need is for about $150 billion in extra funds over the next six years—that is, about $40 billion more than Clinton is offering. Anything less, and there will be continued strain in keeping airplanes in the air, ships at sea, and troops in the field. Furthermore, without more money the next generation in weapons, such as the F-22 Raptor, may be unaffordable.

Few were confident that money supposedly allocated in the "out years" would actually materialize.

Air Force Chief of Staff Gen. Michael E. Ryan, for his part, told senators that the readiness condition of his force has declined 15 percent since 1986 and now "is very fragile." Aircraft mission capable rates have declined 10 percent over the last nine years, he said.

"Our cannibalization rate has gone exceedingly high—78 percent higher than it was in 1995—and much of that has occurred very recently," said Ryan.

Furthermore, the service is running into its most sustained personnel problems in years. The Air Force missed its retention goals in 1998, admitted Ryan. That is the first time that has happened since 1981, he said, and it means that meeting next year's goals will be that much harder—the 2000 recruiting quota has been raised 8 percent to induct 33,800 recruits.

The Air Force still estimates that it will be 2,000 pilots short in 2002.

"All our people are looking forward to the actions that we take to provide fair pay and retirement systems," said Ryan.

Senators indicated that the Administration's budget proposal will represent a floor for Pentagon spending, not a ceiling. New panel chairman Sen. John Warner (R) of Virginia said the committee would likely add billions to Clinton's proposed $12 billion hike for Fiscal 2000.

The majority leader, Sen. Trent Lott (R–Miss.), has indicated that he would support an increase as large as $20 billion in 2000.

Warner also said he was worried that the Administration's proposed increase in the defense budget, in the end, will not turn out to be quite as advertised. Much of the "increase," he said, appears to be not new money, but assumed budget savings that will be reapplied to other priorities.

"If the President chooses such a path to address the services' unfunded requirements, calling it risky would be an understatement," said the new panel chief.

FEHBP Test Sites Selected

On Jan. 14, the Department of Defense announced the selection of eight sites for a Congressionally mandated test of using the Federal Employees Health Benefits Program to provide medial care for up to 66,000 retired members of the armed forces and their families.

The sites are: Dover AFB, Del.; Commonwealth of Puerto Rico; Ft. Knox, Ky.; Greensboro/Winston–Salem/High Point, N.C.; Dallas, Texas; Humboldt County, Calif.; Naval Hospital, Camp Pendleton, Calif.; and New Orleans, La.

"The military health system stands firm in our commitment to providing quality health care to all our beneficiaries," said Assistant Secretary of Defense for Health Affairs Dr. Sue Bailey. "This demonstration project, along with several other test programs, such as the Tricare Senior Prime demonstration ... will provide the department with valuable information about the cost and feasibility of several alternative approaches to providing increased health care access for our over-65 population."

Under the new test, retired military personnel can join the FEHBP during the fall 1999 open season. Those eligible include over-65 retirees who are Medicare eligible and their dependents; unremarried former spouses of military members; and dependents of deceased members or former members. Coverage will start in January 2000 and end in December 2002.

Test participants must pay any applicable premiums. During the test, they may not use military treatment facilities for any services.

Congress will receive progress reports on the effort in May 2001 and December 2002.

Certificates to Honor Cold Warriors

The federal government is ready to issue certificates to honor up to 22 million former and current service men and women of the Cold War era for their roles in winning that struggle.

The Army—the executive agent for the program—will start taking applications April 5.

Applicants must use fax or mail to submit supporting documents. The Army has printed 1 million certificates, but no one knows how many will actually be claimed.

Persons are eligible for the recognition certificate if they have military or civilian service with the War, Navy, or Defense Departments between Sept. 2, 1945—the official end of World War II—and Dec. 26, 1991—the date the Soviet Union ceased to exist.

Gay Discharges in Air Force Climb

The Air Force discharged 414 people in 1998 for being homosexual, the service reported Jan. 22. This marked a one-third increase over 1997 and was the highest one-year total since the start of the "don't ask, don't tell" policy in 1993.

Air Force officials said most of those discharged had voluntarily acknowledged they are gay and most were new recruits undergoing basic training at Lackland AFB, Texas.

Of the 414 gay discharges last year, 271 were of trainees at Lackland, according to an Air Force spokesperson. Others were cases in which an investigation was triggered by witness reports of alleged homosexual acts, and in one case two female members were discharged for announced plans of same-sex marriage.

The 414 discharges for homosexuality compare with 309 in 1997. In response to a newspaper report, the Air Force released figures showing that of the 414 discharges in the fiscal year that ended last September, 391 were cases in which service members made statements that the Air Force calls "voluntary admissions" of being homosexual, bisexual, or engaged in homosexual activity.

News Notes

- An F-16 from Luke AFB, Ariz., crashed Jan. 7 shortly after takeoff for a training mission. Both pilots ejected safely, but a motorist suffered minor injuries when one of the airplane's fuel tanks nearly hit his truck.
- On Jan. 12 Secretary of Defense William S. Cohen announced the selection of Army National Guard Maj. Gen. Raymond F. Rees to the position of vice chief, National Guard Bureau.
- The Air Force stopped paying rent on uninhabitable leased housing at Ellsworth AFB, S.D., Jan. 1. The government will use the withheld money to pay for housing repairs.
- An A-10 Thunderbolt II crashed near Ft. Drum, N.Y., Jan. 20 during a night training mission, the Air Force said. The pilot, Capt. Ronald J. Halley, ejected safely and was rescued by an Army Black Hawk helicopter crew. The aircraft belonged to the 104th Fighter Wing of the Massachusetts Air National Guard, Barnes MAP, Mass. An investigation is under way.
- Raytheon has received a $134 million contract from the US Naval Air Systems Command for full rate production of the Joint Standoff Weapon AGM-154A and low rate initial production for the AGM-154B.
- Northrop Grumman has delivered the first of 20 upgraded EA-6B Prowler electronic warfare aircraft to the US Navy. The updated Prowl-

Senior Staff Changes

RETIREMENTS: Maj. Gen. Bryan G. **Hawley,** Brig. Gen. Robert E. **Larned,** Lt. Gen. Normand G. **Lezy.**

NOMINATIONS: To be **Major General:** John R. **Baker,** John D. **Becker,** Robert F. **Behler,** Scott C. **Bergren,** Paul L. **Bie owicz,** Franklin J. **Blaisdell,** Robert P. **Bongiovi,** Carrol H. **Chandler,** Michael M. **Dunn,** Thomas B. **Goslin Jr.,** Lawrence D. **Johnston,** Michael S. **Kudlacz,** Arthur J. **Lichte,** William R. **Looney III,** Stephen R. **Lorenz,** Teed M. **Moseley,** Michael C. **Mushala,** Larry W. **Northington,** Everett G. **Odgers,** William A. **Peck Jr.,** Timothy A. **Peppe,** Richard V. **Reynolds,** Earnest O. **Robbins II,** Randall M. **Schmidt,** Norton A. **Schwartz,** Todd I. **Stewart,** George N. **Williams.**

CHANGES: Brig. Gen. (sel.) Felix **Dupre,** from Cmdr., 33d FW, ACC, Eglin AFB, Fla., to Cmdr., 1st FW, ACC, Langley AFB, Va. ... Brig. Gen. (sel.) Gary R. **Dylewski,** from Cmdr., 1st FW, ACC, Langley AFB, Va., to Cmdr., Space Warfare Center, AFSPC, Schriever AFB, Colo. ... Maj. Gen. Robert C. **Hinson,** from Dir., Ops., AFSPC, Peterson AFB, Colo., to Cmdr., 14th AF, AFSPC, Vandenberg AFB, Calif.

Brig. Gen. Christopher A. **Kelly,** from Cmdr., 97th AMW, AETC, Altus AFB, Okla., to Dep. Dir., Plans & Policy, PACOM, Camp H.M. Smith, Hawaii ... Maj. Gen. (sel.) William R. **Looney III,** from Cmdr., Space Warfare Center, AFSPC, Schriever AFB, Colo., to Dir., Ops., AFSPC, Peterson AFB, Colo. ... Maj. Gen. Gerald F. **Perryman Jr.,** from Cmdr., 14th AF, AFSPC, Vandenberg AFB, Calif., to Cmdr., Aerospace C^2ISR Center, ACC, Langley AFB, Va. ... Brig. Gen. Lee P. **Rodgers,** from Cmdr., 60th Medical Group, AMC, Travis AFB, Calif., to Command Surgeon, AMC, Scott AFB, Ill.

C-17s completed nine direct-delivery missions in late January when they ferried 82d Airborne Division troops from Charleston AFB, S.C., to Ft. Irwin, Calif. The missions simulated combat deployment to a dirt airfield and highlighted the USAF transport's ability to fly nonstop to remote locations, bypassing the need for staging bases.

ers, which are flown by Navy, Air Force, and Marine aircrews, and are receiving a new wing center section and standard depot-level maintenance, are expected to bring the EA-6B fleet to its mandated strength by mid-2000.

■ TSgt. Todd Edeker of the 48th Fighter Wing, RAF Lakenheath, UK, was selected to receive a Personal Commendation from RAF Strike Command for his service to the local community, which included serving as a primary school governor and restoring a local windmill. It was thought to be the first time an American would receive such an award.

■ The Aerospace Command and Control Agency got a new name and new missions Jan. 1. It is now the Aerospace Command and Control and Intelligence, Surveillance, and Reconnaissance Center and is responsible for integrating ISR functions for the Air Force.

■ The new military clothing catalogs from the Army and Air Force Exchange Service are now available worldwide on the Internet at www.aafes.com.

■ MSgt. Robert Wood, Kadena AB, Japan, and Maj. Joni Lee, from Cannon AFB, N.M., have received the Gen. Lew Allen Jr. award for 1998. Named for the former Chief of Staff, the award honors outstanding contributions to Air Force aircraft sortie generation.

■ The Air Force has a new ribbon that recognizes training instructors. The Military Training Instructor Ribbon is awarded upon graduation from MTI technical school. Wear is permanent after a 12-month tour of duty.

■ Two F-15Es from the 335th and 336th Fighter Squadrons at Seymour Johnson AFB, N.C., fired two upgraded AGM-130s during the weapon's first launches by operational aircrews here recently. "The missiles performed flawlessly," said Frank Robbins, director of the Precision Strike Systems Program Office at Eglin AFB, Fla.

■ A Kessler AFB, Miss., six-year-old recently won a $50,000 college scholarship in a national contest. Kristy Hannah, daughter of SSgt. Monica Collins, was a winner in the

USAF photo by MSgt. Keith Reed

MSgt. Mark Wolf (right), a security forces advisor with the 352d Special Operations Group, RAF Mildenhall, UK, won second place in the UK Eastern Region Fencing Tournament in January. Here, he fences with an opponent in the Abbey Gardens at Bury St. Edmunds, UK.

Magic School Bus sweepstakes, a joint venture of Howard Johnson International and Scholastic Entertainment.

■ On Jan. 9, the Department of Defense's Miniature Air-Launched Decoy successfully flew for the first time at Edwards AFB, Calif. The MALD program is an attempt to provide the Air Force with a small, inexpensive air-launched decoy system for suppression of enemy air defenses. MALD stimulates, dilutes, and confuses enemy systems by transmitting radio frequency energy.

■ House Veterans' Affairs Committee Chairman Rep. Bob Stump (R–Ariz.) has introduced legislation which would make sure that only qualified veterans could be buried at Arlington National Cemetery. It would also allow burial of close family members in an eligible veteran's plot. The question of Arlington eligibility has been an issue in recent years, following reports of waivers that have allowed former ambassadors and other officials who would not otherwise meet the military requirements to be interred at the site.

■ Air Education and Training Command has completed the first step to get the Air Force T-3A Firefly back into the air. The command recently received a supplemental type certification for the aircraft from the Federal Aviation Administration's Southwest Region Airplane Certification Office. The T-3A has been suspended from flying since July 1997 due to engine stalls on the ground and in the air.

■ Members of the 819th Rapid Engineer Deployable, Heavy Operations Repair Squadron Engineers from Malmstrom AFB, Mont., and the 820th RED HORSE from Nellis AFB, Nev., joined to build a 75-foot cement causeway across the Tazulath River in El Salvador during a recent deployment. The construction replaces an old footbridge that was washed away last October in Hurricane Mitch.

■ Twelve Air Force bases will serve as test sites as the service prepares to add muscular fitness and flexibility tests to its annual physical fitness assessment. The bases are: Grand Forks AFB, N.D.; Bolling AFB, D.C.; Randolph AFB, Texas; Davis–Monthan AFB, Ariz.; Shaw AFB, S.C.; F.E. Warren AFB, Wyo.; Hickam AFB, Hawaii; Incirlik AB, Turkey; Tinker AFB, Okla.; US Air Force Academy, Colo.; Des Moines IAP, Iowa; and Hurlburt Field, Fla.

■ Lockheed Martin's Joint Strike Fighter avionics team successfully demonstrated its Integrated In-Flight Planner in a full-mission simulation during the third Virtual Strike Warfare Environment exercise. The IIFP reads ground-based threats and plots the aircraft's course through enemy defenses.

■ The US launched an investigation into the Jan. 21 crash of a USAF F-16 fighter in northern Japan. The F-16 crashed in a wooded area of Kamaishi, a city about 88 miles south of Misawa, while on a routine training mission. The pilot ejected and survived. ■

USAF photo by Margo Wright

A series of nylon cords spun into a sheath of netting make up a new method of emergency egress for air traffic controllers atop the 100-foot-tall control tower at Tinker AFB, Okla. Similar escape chutes are in place at Davis–Monthan AFB, Ariz., and Ramstein AB, Germany.

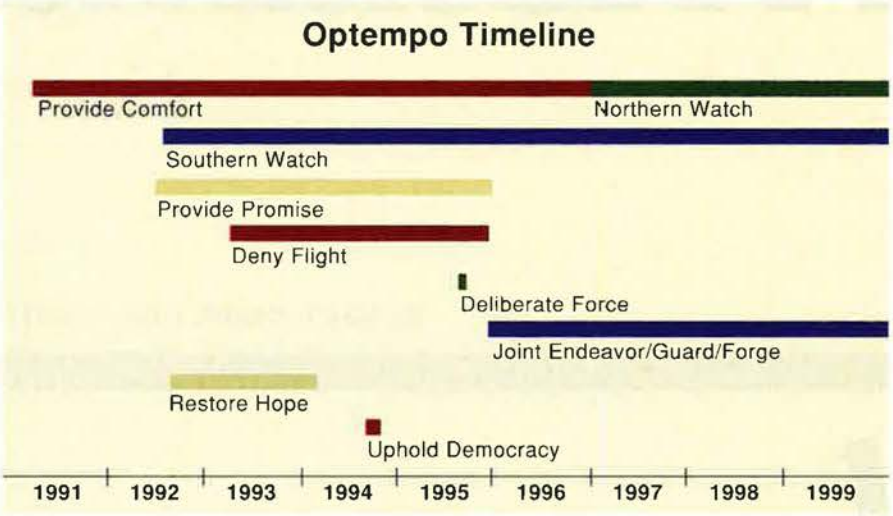
Index to Advertisers

The Chart Page

By Tamar A. Mehuron, Associate Editor

Other Than War

The US has a tradition of using armed forces for humanitarian, peacekeeping, and other noncombat missions but nothing like what has happened in the age of "Military Operations Other Than War." In the 1990s, USAF and the other services have set a blistering pace in MOOTW, popularly called "mootwah." The decade has been characterized by lengthy deployments. The figure at right shows the overlap of operations: USAF dealt with five simultaneously in September of 1993, 1994, and 1995. Three major operations continue today. The figure below shows the variety of aircraft engaged in mootwah. Some units, particularly reconnaissance and security forces, were deployed well over the goal of 120 days a year.



USAF Participation in Recent Operations

Operation (Location)	Mission	Began	Ended	Aircraft Used
Provide Comfort (Turkey, No. Iraq)	Humanitarian, Sanctions	04/05/91	12/31/96	A/OA-10, C-5, C-12, C-21, C-130, C-141, E-3, EC-130, EF-111, F-4, F-15, F-16, F-111, HC-130, KC-10, KC-135, MH-53, RC-135, RF-4
Provide Promise (Bosnia)	Humanitarian	07/02/92	01/04/96	C-5, C-9, C-17, C-130, C-141
Southern Watch (Saudi Arabia, So. Iraq)	Sanctions	08/02/92	Ongoing	B-52, C-21, C-130, E-3, EC-135, EF-111, F-4, F-15, F-16, F-117, HH-60, KC-10, KC-135, M/HC-130, MH-53, RC-135, U-2
Restore Hope (Somalia)	Humanitarian	08/14/92	03/25/94	AC-130, C-5, C-130, C-141, KC-10, KC-135
Deny Flight (Bosnia)	Peacekeeping	04/12/93	12/20/95	AC-130, A/OA-10, C-21, C-130, EC-130, EF-111, F-15, F-16, KC-10, KC-135, M/HC-130, MH-53, RC-135, U-2
Uphold Democracy (Haiti)	Peacekeeping	09/09/94	10/12/94	AC-130, A/OA-10, C-5, C-130, C-141, E-3, EC-130, EC-135, F-15, KC-10, KC-135, RC-135, U-2
Deliberate Force (Bosnia)	Peacekeeping	08/30/95	09/21/95	AC-130, A/OA-10, EC-130, EF-111, F-15, F-16, KC-10, KC-135, M/HC-130, MH-53
Joint Endeavor, Guard, Forge (Bosnia)	Peacekeeping	12/21/95	Ongoing	AC-130, A/OA-10, C-5, C-17, C-141, E-8, EC-130, F-15, F-16, KC-10, KC-135, M/HC-130, MH-53, MH-60, RQ-1 (Predator UAV), U-2
Northern Watch (No. Iraq)	Sanctions	01/01/97	Ongoing	E-3, F-15, F-16, HH-60, KC-135, M/HC-130 (a/o 11/25/98)

Source: USAF Historical Research Agency, Joint Staff History Office, Air Force News Service.

The Air Force looks at what may be possible between now and 2012.

A Roadmap for

By John T. Correll, Editor in Chief

If the Air Force follows the advice of its top science advisors, it could move swiftly toward a stronger position in space in the opening years of the 21st Century.

About a year ago, Dr. Daniel E. Hastings, chief scientist of the Air Force, sketched the options in a report entitled "Doable Space." Building on that, the Air Force Scientific Advisory Board in November produced a detailed "Space Roadmap for the 21st Century Aerospace Force."

The Hastings report identified four "doable" paths. By 2012, it said, the Air Force can:

- Purchase most of its communications, imagery, and launch services as commercial commodities;
- Demonstrate the ability to deliver militarily significant amounts of laser energy through space to targets;
- Integrate its airborne and space-based assets to provide truly comprehensive Intelligence, Surveillance, and Reconnaissance; and
- Move ground-based surveillance functions into space, where they command a far better view, and make satellites more survivable against attack.

The Scientific Advisory Board study was led by Dr. John M. Borky of TRW, vice chairman of the SAB and a major author of the landmark "New World Vistas" study in 1995. The roadmap generated no new operational requirements for space systems. Instead, it concentrated on recommendations to serve the needs laid out in such documents as the Air Force vision statement, "Global Engagement," and the Joint Chiefs of Staff "Joint Vision 2010."

Space

Chart 1: Space Options vs. Time

Source: USAF chief scientist

Mid Term (2012)	Long Term (2020)
Easily Doable	
Lower-cost space launch.	*GMTI–Stealthy.*
More capable Global Positioning System.	*Air Moving Target Indicator (AMTI)–Non-stealthy.*
Kinetic national missile defense.	*Responsive launch, two-stage to orbit.*
Satellite attack warning.	
Prompt global attack.	
Ground Moving Target Indicator (GMTI)–Non-stealthy.	
Hyperspectral imaging.	
Data relay.	
Space-based space surveillance.	
Space maneuver vehicle.	
Doable With Technology Push	
Global energy delivery.	*On-orbit maintenance .*
Integrated intelligence, surveillance, and reconnaissance.	*Responsive launch, single-stage to orbit.*
GMTI–Stealthy.	*AMTI–stealthy.*
AMTI–Non-stealthy.	*Global energy delivery (space-based laser).*
Responsive launch, two-stage to orbit.	

By 2002, the roadmap said, the Air Force can have divested itself—at a considerable savings in cost—of numerous functions that are not essential parts of the Air Force mission and be well along with other programs, such as a new constellation of sensors, including a space-based radar, which might reach initial operational capability around 2008.

However, the roadmap said, current technology is not mature enough to support the demonstration of a space-based laser as early as some advocates—including several leading members of Congress—have urged.

"The study and the study team are not quarreling with the operational utility of this kind of military capability," Borky said. "We think it would be enormous." But, since "we are probably going to get one shot at doing it," it would be a mistake to conduct the demonstration before technology will permit "very high confidence" of success, he said.

The Scientific Advisory Board also urged the Air Force to preserve the option to eventually develop an Aerospace Operations Vehicle.

"One possible outcome of our roadmap is a highly operable vehicle for both space and atmospheric missions at orbital speeds," the SAB said. "With the appropriate payloads, the system would allow a photoreconnaissance mission, delivery of a precision weapon, or other 'surgical' effects delivery anywhere on Earth in something like 45 minutes from the 'go' order."

Lt. Gen. Roger G. DeKok, USAF deputy chief of staff for plans and programs, said, "The studies produced by Drs. Borky and Hastings reinforce our conviction that integrating air and space will, in fact, yield a far more capable instrument of national military power, not just a more effective or efficient version of today's Air Force."

Shift to Commercial Space

A major theme of both studies is that commercial space will loom increasingly large in the Air Force space program. There are three main reasons for this.

First, the overwhelming share of growth in space is by the commercial sector. By 2010, Hastings says, military launches will account for a mere 6 percent of the total. Second, the technology surge in space is being led by the commercial world, which develops new capabilities far better and faster than the government could hope to do on its own. And third, the Air Force can save a great deal of money by relying on the commercial market for many of its needs, including most space launch needs.

The SAB said that commercial space services "will have an aggregate capacity early in the next century that is about 1,000 times that of even the most ambitious MILSATCOM structure," and it urged that the Air Force phase out, as early as it can, "non-core" military satellite communications in favor of commercial services and interoperable user terminals.

The roadmap went considerably further on privatization, though. It recommended that the Air Force divest itself of the Eastern and Western Ranges, which could be operated on a commercial contract and overseen by a suitable civilian agency, such as a National Space Port Authority.

At present, Air Force funding—which covers 90 percent of all launch costs at the two ranges—constitutes a subsidy for all users. In the near future, government launches will account for only 6 percent of total launches, Hastings said. If the Air Force was a customer and tenant rather than operator of the ranges, it could not only concentrate better on its core mission but also save considerable money.

Eventually, the Air Force should rely primarily on commercial launchers for putting payloads into space. "In the long term," the roadmap said, "one or more of the several advanced launch technologies under consideration is likely to make access to space very cheap,

perhaps one-tenth to one-hundredth the cost of today's operations."

New Constellation of Sensors

Today, the SAB said, "Intelligence satellites and airborne platforms provide localized and generally discontinuous sensing, often impeded by weather, terrain, and hostile countermeasures." These systems cannot provide the kind of global awareness prescribed by "Joint Vision 2010."

The roadmap said that the Air Force should commit to a new sensor satellite constellation to complement existing Intelligence, Surveillance, and Reconnaissance platforms in air and space. This constellation would be able to track moving targets on the ground. The primary payload would be a space-based radar, with initial operational capability in about 2008 and full operational capability between 2010 and 2012.

"Joint force commanders, especially in deployed operations, are going to need all-condition, responsive, high quality sensing with the results delivered sensor-to-decider-to-shooter in near real time," Borky said. "A space-based radar system designed primarily for direct support to theater operations could do that, and would be a powerful complement to other sources, such as air-breathing platforms, national intelligence systems, and commercial imagery, each of which has limitations on what it can do directly for a warfighter."

An additional sensor in the constellation would perform hyperspectral imaging, reading the light reflected by objects and seeing thousands of different colors. That capability will be particularly effective in detecting use of chemical or biological agents and in countering camouflage, concealment, and deception tactics.

"You can, for example, find objects hidden under trees," Hastings said. "If sunlight can get through the leaves, you can tell the difference between a leaf and a tank under [the] tree because the light reflected looks different from a hyperspectral image, [although] to us it may not look different."

As the surveillance of space improves, it will become possible to develop what the roadmap called a "recognized space picture." Today, the Intelligence Community produces a "Common Operating Picture," consisting of air, maritime, and ground elements. It gives theater commanders information about what is happening in the theater battlespace in a detailed and current package.

Similar information from space is not included, Borky said, because we do not have the capability to surveil space with "the same timeliness and completeness and fidelity as we surveil the air, ground, and sea."

A large part of the surveillance of space is presently done by aging sensors on the ground. There is some merit in updating these ground stations, but the roadmap said the Air Force "should migrate selected space surveillance functions to space."

An early move might be to modify the low constellation of the Space-Based Infrared System, enabling it to look up and track objects in high orbits as well as carry out its primary mission of missile launch warning, in which SBIRS looks downward.

The roadmap also recommended that the Air Force pursue improvements in the position, navigation, and timing information provided by the Global Positioning System. Since its introduction in the Gulf War, the popularity of GPS has spread like wildfire. It is now used by fishermen and rescue squads in addition to the original military users. Even so, because of the importance of GPS, the Air Force should retain control of it on behalf of the Department of Defense, the roadmap said, but it added that funding contributions from other agencies and sources would be "appropriate."

Lasers Through Space.

The global projection of energy through space to targets was one of the four main thrusts of the Doable Space study, but Hastings stopped short of forecasting a space-based laser. Both his study and the roadmap spoke instead of projecting laser energy *from or through* space, meaning that some or all of the weapons might be located on the ground.

The issue is complicated by the fact that deployment of a space-based laser, a prime use of which would be ballistic missile defense, is presently prohibited by

Chart 2: Growth of Commercial Space Worldwide

Source: Space Roadmap

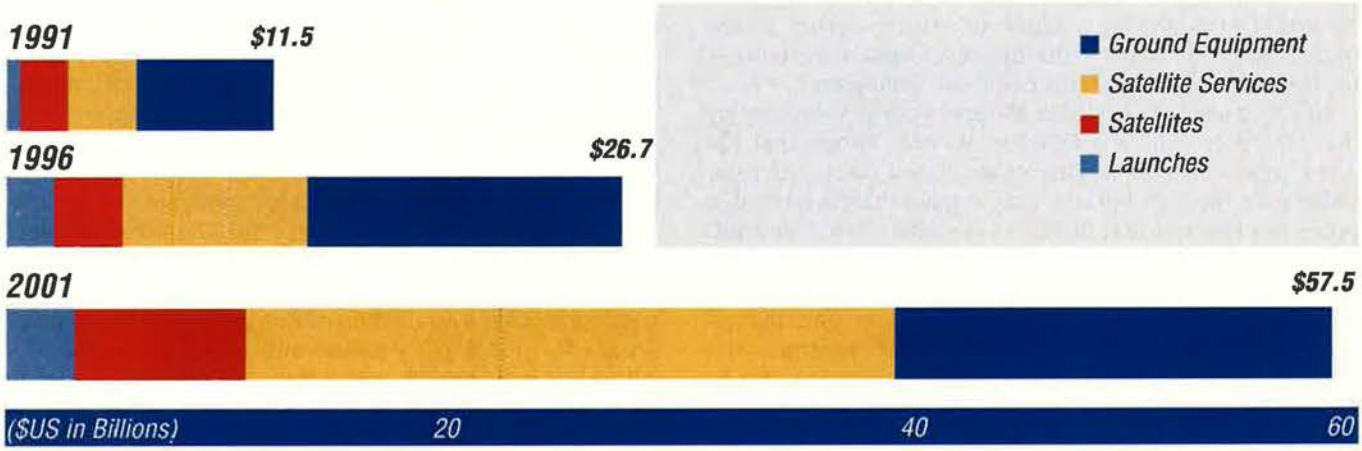
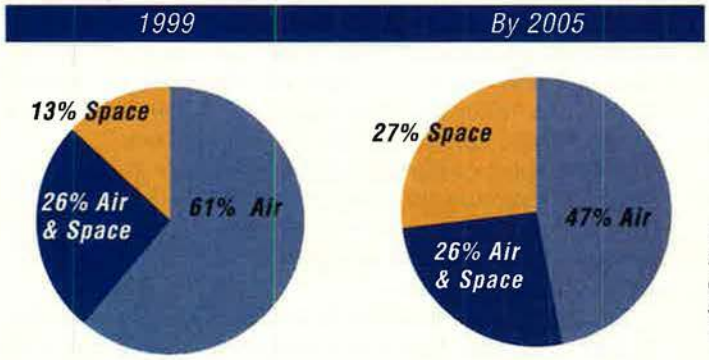


Chart 3: Air Force Technology Funding



The Air Force plans to double the share of science and technology funding allocated to space, hold the share constant for technologies that apply to both air and space, and reduce the percentage for R&D unique to air. Total for the three categories in 1999 is about $1.3 billion.

the Anti-Ballistic Missile Treaty. On the other hand, there is strong support in Congress for the space-based laser, and last year's defense bill called for on-orbit testing of a "readiness demonstrator" by 2005 or very soon thereafter.

The roadmap said that the current technology, a chemical laser system designed in the 1970s, is not mature enough to support such a demonstration and that "fixes" to the existing system will not bring it up to snuff. More work is needed in system engineering and integration, beam and fire control, and other areas. Alternatives to chemical lasers—including electrically powered solid state lasers—should be explored.

The SAB recommended that the Air Force not proceed with the readiness demonstrator test "at this time." The roadmap said technology should be pursued "aggressively" and that it would be advisable to first conduct a ground demonstration program of the laser and decide, around 2003, whether to commit to an on-orbit test.

Borky emphasized that the SAB's reservations are about the current technology, not about the desirability of the system. The roadmap agreed with previous studies that "directed energy from space, whether generated in space or relayed from the air or ground, will be a major weapon capability in the next millennium."

Possibilities of such a system go beyond shooting down ballistic missiles with a laser beam from space.

"A high-energy force projection system could contribute to a wide range of missions, including counterair, space control, and missile defense," the roadmap said. "It could also deliver a range of effects—from active optical sensing modes to disruption of optical systems—to the Earth's surface with exquisite precision."

In December, F. Whitten Peters, acting Secretary of the Air Force, told the Defense Writers Group that the Air Force will not rush the space-based laser program. "Many on the Hill believe that a space-based laser is a piece of cake and that the costs are fairly low," he said. "Our view is that it is a very difficult technical challenge." The deployment of large optics in space "is a technology that just isn't here yet. It is one that is coming, that several different groups are working on." The Air Force believes that it "could reasonably try to deploy something in the 2010 time frame, and we are working on that plan."

The Aerospace Operations Vehicle

The SAB said the Air Force should "preserve the option" to develop an Aerospace Operations Vehicle which could be launched from Earth, fly through space at hypersonic speeds, and perform its mission either from space or by re-entering the atmosphere.

This is a continuation of the concept that has been known variously over the years by such names as "aerospace plane" and "transatmospheric vehicle." These proposals generated a great deal of excitement but fell away because of technology and funding problems.

In some versions, the vehicle would have taken off from Earth under its own power, but the main concept presented in the roadmap is a two-stage-to-orbit system "with a family of upper stages, each compatible with a variety of expendable boosters and with a relatively low-speed reusable first stage."

The Air Force continues to work with NASA to explore a space operations vehicle. NASA has been working on reusable boosters, while the Air Force has concentrated on a several kinds of upper stages, including a "Space Maneuvering Vehicle" for operations on orbit and a "Common Aero Vehicle" for delivery of payloads in the atmosphere.

The AOV concept, the roadmap said, "is one way to achieve highly responsive launch (defined in this study as less than 24 hours to integrate, prepare, and launch a vehicle and payload), creating the possibility for the first time of spacecraft operations with a sortie rate analogous to that of heavy aircraft, depending on the requirements placed on the first stage of a two-stage system."

Both cost and technology point toward expendable launch systems, but the roadmap did not rule out single-stage-to-orbit concepts. The AOV would have to fly about once a week to spread the costs over enough launches to make the expense of a reusable launch vehicle competitive with expendable launchers.

The SAB said the Air Force should continue with its Space Maneuvering Vehicle demonstration, which costs about $35 million a year, to keep its options open. "If the results of technology demonstration and operational analysis are favorable at a decision milestone in about 2002, [the Air Force should] start a follow-on program leading to a first demonstration flight in about 2009 and an operational AOV in about 2015."

How to Fund It?

Depending on what is included in the calculation, the present cost of the Air Force space program is about $7 billion a year (out of an annual budget of about $75 billion). Of that, about $4.1 billion is for "investment" accounts—new systems and procurement—with the rest going for operations and maintenance of existing systems. The roadmap focused on investment spending and projected the current budget level forward for 20 years, adjusted for 2.2 percent projected annual inflation.

The shortfalls in that projection begin almost immediately. The funding in 2001 and beyond does not even cover the present baseline program, much less the initiatives and improvements proposed in the roadmap.

To some extent, though, the roadmap is self-funding. The SAB said that "conservative savings" (roughly $2 billion to $3 billion per year) can be achieved by implementing recommendations in areas of launch and tracking ranges, communications, and satellite operations. The study expressed "high confidence that our recommendations will produce at least this level of cost reduction."

"Aggressive cost reductions" might reduce still more the baseline of the present program, projected out to 2020 and adjusted for inflation, bringing the topline of the space program—the new programs and initiatives as well as the existing program—"back into rough balance with the current top line."

Even those measures do not fund everything in the roadmap, though, and if annual inflation exceeds 2.2 percent, the shortfall gets worse.

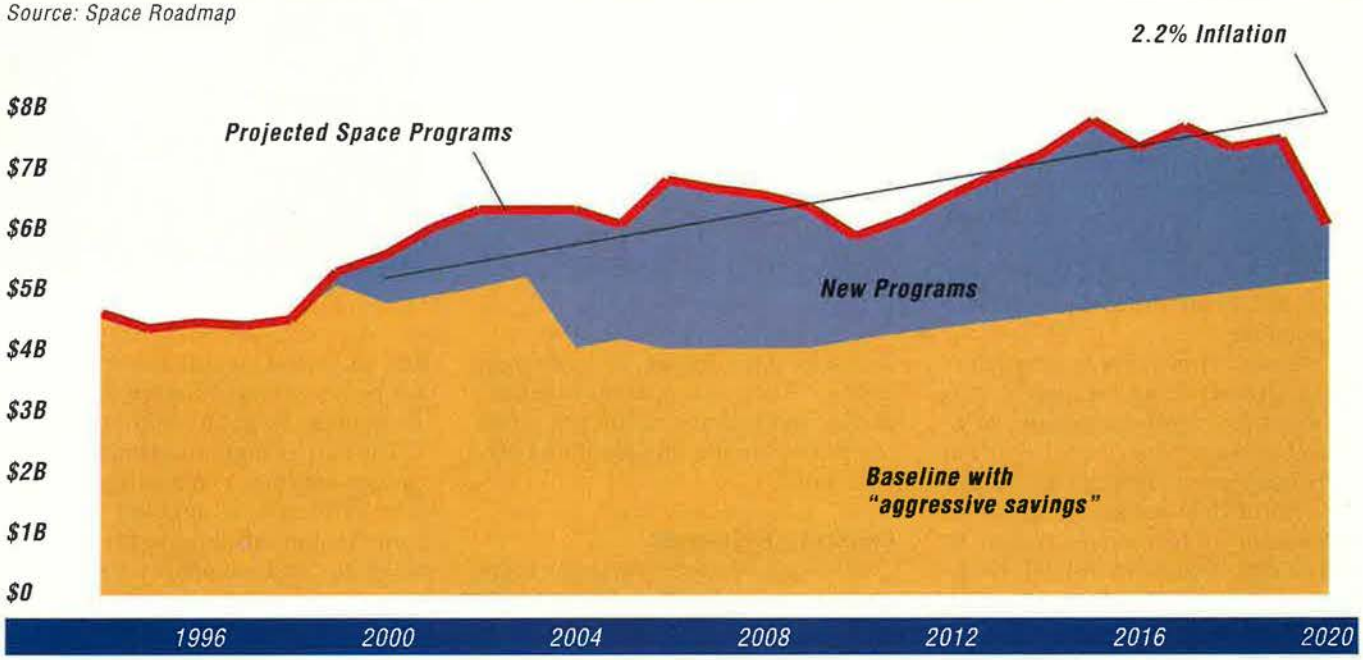
"We recognize that most of the economy measures will have substantial organizational impacts and will meet with resistance," the roadmap said. "In the aggregate, actions such as outsourcing launch and satellite control operations, winding down a number of MILSATCOM systems, and phasing out legacy tracking systems will affect thousands of manpower positions and large fractions of the current budgets of the affected units."

Noting that "the Air Force faces huge budget problems in space (and almost everywhere else) whether this study's recommendations are acted on or not," the SAB said that "there is no way out of this dilemma that does not involve both changing fiscal priorities and divesting large pieces of today's Air Force mission and infrastructure." The SAB said, for example, that "thousands of military manpower authorizations that are now dedicated to support activities in space system and launch operations can be replaced with a far smaller workforce, largely contracted out," and the personnel can be "moved to fill urgent needs elsewhere. This would be consistent with the development of a corps of aerospace warfighters, skilled in all the dimensions of applying spaceborne and airborne instruments of national power."

Reality may mean "breaking the mindset that each program area in the Air Force budget has a 'fair share' percentage which cannot be changed by other than trivial amounts," the roadmap warned. "Total Obligation Authority (TOA) will probably have to be moved into the space area from other programs, at least in some years of high space activity." ■

Chart 4: The Yield From "Aggressive Savings"

Source: Space Roadmap



The space investment account is about $4.1 billion a year. Projected into the next century and adjusted for inflation, that amount would double by 2020. That level, however, will not be enough to fund baseline programs, much less any of the new ones proposed. "Aggressive savings," achieved by implementing strong recommendations proposed by the roadmap, might lower the cost of the baseline programs to about $5 billion in 2020, some $3 billion below the projection without such savings. In many years—and in every year through 2008—there is still a shortfall. If the inflation rate is higher than 2.2 percent, the shortfall gets worse.

The enthusiastic claims of some aircraft carrier proponents frequently defy reality.

The Carrier

By Rebecca Grant

In the 1990s, American aircraft carriers have been busier than ever, engaging mostly in "presence" operations and responses to local crises and flare-ups. "If you don't have that forward deployed presence, you have less of a voice, less of an influence," observed Defense Secretary William S. Cohen.

From an operational perspective, the big-deck aircraft carrier no longer functions mainly as guardian of the high seas. Rather, observed British defense analyst Lawrence Freedman, the carrier has become "most valuable" as a "mobile air base." Since Operation Desert Storm in 1991, the Navy has put its air wings through a major transformation, retiring older, hard-to-maintain aircraft such as the A-6 Intruder and modernizing its F-14 Tomcats and F/A-18C Hornets to carry precision munitions.

The carriers have proven their value, but the claims of some carrier proponents frequently defy reality. Carrier effectiveness, though significant, has been inflated to mythic proportions.

Dramatic film footage of carrier-based aircraft being catapulted into the skies frequently dominates televised coverage of periodic US crises with Iraq, even though that image does not reflect actual composition of the joint US force in the region. In early 1998, Rear Adm. John B. Nathman, commander of Task Force 50 aboard USS *Nimitz* in the Gulf, actually declared, "I attribute the cessation of Iraqi no-fly zone violations to our presence" in the area.

In official statements, the Navy claims that "the carrier battle group, operating in international waters, does not need the permission of host countries for landing or overflight rights." They can operate independently and present "a unique range of options" to the President, the service adds.

Going to Extremes

In its most extreme form, the myth contains a declaration that aircraft carriers can operate effectively without access to land bases, carry out sustained strikes against targets several hundred miles inland, and generate up to four sorties per strike aircraft *per day* if the warship and its air wing shift into a surge mode. This claim gives rise to the notion that advanced stealth aircraft might not be necessary, because the carriers manage to get by without them.

The carrier myth has flourished in budget-conscious Washington. Senior officers are guarded in their remarks, but the defense press often picks up and amplifies backstage debates on issues such as the relative effectiveness of carriers and bombers, forward presence, life cycle costs, and the relative merits of new fighter aircraft. Carrier proponents sometimes trash Air Force airpower.

In the past decade, carrier air wings have become more capable, fueling higher demand for carriers in joint

US Navy photo by PH2 Christopher Hollaway

Myth

operations. Even so, the 1990s have shown that the big-deck carrier is a specialized airpower asset, not a self-sufficient substitute for land-based airpower. Getting to the heart of what carriers can actually do requires an honest assessment of their strengths and weaknesses as airpower assets in joint operations.

The Navy's Maritime Strategy, formally introduced in the early 1980s, called for carriers to strike an assertive, forward-based stance in key waters around the globe, where they would be poised to go immediately on the offensive against Soviet targets and attack Soviet warships. The idea was that, in a war, the Soviet fleet would be pinned down defending its own shores and sea approaches and thus unable to make trouble for US warships in the open ocean, the control of which would be vital to the resupply of allies in Europe and East Asia.

The new strategy caused an increase, from 12 to 15, of the number of deployable groups built around big-deck carriers. Moreover, because the carriers were expected to face attack from waves of Soviet Backfire bombers and cruise missiles, the Navy embarked on a buildup of Ticonderoga–class Aegis air defense cruisers and Arleigh Burke–class destroyers to handle airborne threats. This multibillion dollar expansion was deemed necessary in the face of a massive challenge from Soviet naval forces. Navy officials said the 15-carrier force was the minimum required to meet demands of forward positioning and independent offensive operations in the Pacific, Atlantic, and Mediterranean.

Then, however, came the collapse of the Soviet Union and, with it, the rapid demise of the once fearsome Soviet fleet. The decline has continued in the era of the Russian Federation.

Doctrinal Disaster

Of equal significance was Operation Desert Storm—a doctrinal disaster for the Navy. One who makes that point is Adm. William A. Owens, the now-retired former vice chairman of the Joint Chiefs of Staff. Owens stated: "Little in Desert Storm supported the Maritime Strategy's assumptions and implications. No opposing naval forces challenged us. No waves of enemy aircraft ever attacked the carriers. No submarines threatened the flow of men and materiel across the oceans. The fleet was never forced to fight the open-ocean battles the Navy had been preparing for during the preceding 20 years."

For carrier advocates, Desert Storm constituted a wake-up call. For example, they realized that no naval aircraft was able to drop autonomously designated laser-guided bombs. In addition, a report by the Center for Naval Analyses in Alexandria, Va., pointed out that carrier aircraft flew just 6,297 sorties over land to drop bombs, working out to only about 24 sorties per day per carrier.

The experiences of USS *Theodore Roosevelt,* CVN-71, were representative. CVN-71 arrived on station near Qatar with 20 F/A-18 multirole fighters, 18 A-6 medium bombers, and 18 F-14 fleet defense interceptors. Over 43 days of the war, the F/A-18s averaged only 1.28 sorties per aircraft per day. *Roosevelt* "surged" during a brief ground war in late February 1991. The result: an average of 2.03 sorties per aircraft per day.

After Desert Storm, the Navy quickly recognized that it was time for new thinking. The chief of naval operations, Adm. Frank B. Kelso II, put Navy analysts to work blending the lessons of Desert Storm with an even older Navy tradition of expeditionary warfare. The result was that, in September 1992, the Navy published "... From the Sea," a concise vision of the new roles for naval forces operating forward "in the littoral or 'near land' areas of the world."

The Navy immediately began procurement of precision guided weapons. By the time that USS *Theodore Roosevelt* participated in Operation Deliberate Force in Bosnia in 1995, nearly all of its strike sorties were carried out by precision-weapon-capable F/A-18s. The deck mix had changed, too. The A-6s were gone, leaving 14 F-14s and 37 F/A-18s in the wing.

Along the way, forward presence requirements replaced warfighting requirements as the major factor in the sizing of the carrier force. Former Secretary of Defense Les Aspin in 1993 said, "If we base our carrier needs solely on the regional threats, we could end up with fewer than we need to maintain a strong carrier battle group presence around the world."

Aspin's Bottom–Up Review of 1993 authorized 11 active and one reserve training carrier, but Cohen's Quadrennial Defense Review returned to a requirement for 12 active carriers. Even with the increase, then–Vice Adm. Donald L. Pilling claimed, "With 12 carriers, we can barely meet our overseas commitments."

He maintained 12 carriers couldn't provide 100 percent coverage of the Mediterranean, Persian Gulf, and western Pacific. Covering all three regions full-time "takes 14 or 15 carriers," according to Pilling.

To compensate, the Navy began to "gap" (that is, leave carrier-less) the Med for a few months each year, with occasional gaps in the Persian Gulf. Maintaining two carriers on station at any hub—for example, during a crisis with Iraq—strained the entire fleet, disrupting everything from deployment cycles to ammunition allotments.

Starring Role

By the mid-1990s, carriers had the starring role in a new littoral strategy. The air wings could generate more firepower, and the "requirement" for presence was firmly embedded in Pentagon planning documents.

In early 1997, the chief of naval operations, Adm. Jay L. Johnson, released a new Navy Operational Concept summing up the Navy's capabilities. He said, "Our ability to deliver a wide range of naval firepower and generate very high aircraft sortie rates can have a major impact on the course and outcome of a conflict, especially during the critical early period of a joint campaign, when continental US–based forces are just starting to arrive in theater."

Carrier capabilities had indeed improved, and carriers undeniably have been busy meeting on-station requirements in the Med and Gulf and showing force in events like the Taiwan Strait crisis of 1996. Yet claims of sustainable carrier firepower and high sortie rates were unproven. A carrier's ability to project sustained firepower depended on generating numerous sorties, and claims for high sortie rates are key to the carrier myth.

Several mid-1990s operations in the Balkans provided real-world tests of carrier striking power in a littoral environment. Beginning in April 1993, US naval aviators joined with Air Force and NATO allies to enforce a UN–mandated no-fly zone over Bosnia. Six carrier battle groups eventually took a turn on station in the Adriatic from early 1993 through December 1995.

Bosnian airspace was only about 100 miles from the typical carrier launch site. Even with a benign environment from which to launch, the Navy generated only 8,290 sorties, about 10 percent of the NATO total. The total was exceeded by both the French air force (12,502 sorties) and the Royal Air Force (10,300 sorties) during the same period. For its part, USAF flew 24,153 sorties, 31 percent of NATO's total production.

The limits on littoral operations were again evident in NATO's first actual use of military power—Operation Deliberate Force. Over two weeks in August and September 1995, NATO aircraft conducted a campaign to defend safe areas and degrade Bosnian Serb military effectiveness by striking targets around Sarajevo and throughout Serb–controlled territory in northwest Bosnia.

US naval aviators now had precision guided weapons, a coordination cell in the Combined Air Operations Center, and much improved abilities to receive the CAOC daily air tasking message. Carrier-based aircraft flew 583 attack sorties "feet dry" over Bosnia and another 165 support sorties. Land-based USAF aircraft flew 774 feet dry sorties and 392 support sorties. In addition to USAF's land-based operations, land-based Marine Corps aircraft flew 142 sorties (100 percent of the USMC contribution). The Navy flew a large share of its suppression of enemy air defenses sorties from USAF's Aviano AB, Italy.

The Navy's carrier-based airplanes used precision guided munitions for virtually all missions, far more than had been the case in the Gulf War. The Institute for Defense Analyses,

in a study, noted, "PGMs made up less than 2 percent of the air-to-ground ordnance delivered by naval aircraft during the Gulf War," but "they comprised more than 90 percent of the ordnance these services dropped in Bosnia."

One-Quarter Share

Still, land-based forces surpassed naval contributions in delivery of PGMs. US forces expended 618 PGMs, scoring 374 hits. Of this number USAF aircraft accounted for 249 hits (66.6 percent of the total), the Navy 98 (26.2 percent), and land-based Marine Corps aircraft 27 (7.2 percent). Thus, strikes launched from sea tallied about a quarter of the hits with PGMs.

Deliberate Force comprised 11 days of actual operations. During this period, Navy sea-based strikers flew 583 sorties, meaning that the output of sea-based aviation averaged 53 sorties per day. Because there were a total of 58 strike aircraft on board (36 F/A-18s, 14 F-14s, and eight EA-6Bs), the carrier air wing produced firepower at a rate of 0.9 sorties per aircraft per day.

During that same period, 46 land-based USAF aircraft flew 777 total strike sorties. The Air Force contribution works out to an average of 70 sorties per day or a daily per aircraft sortie rate of 1.5.

The Navy in early 1997 began planning a demonstration of a single carrier's ability to surge sortie production. The clear expectation was that the carrier would make a good showing. Said then–Rear Adm. Dennis V. McGinn, director of the Navy's Air Warfare Division at that time, "A carrier air wing can hold at risk far more aim points than ever before because we can generate more sorties, and each of those sorties is more productive because of the precision joint weapons that they carry."

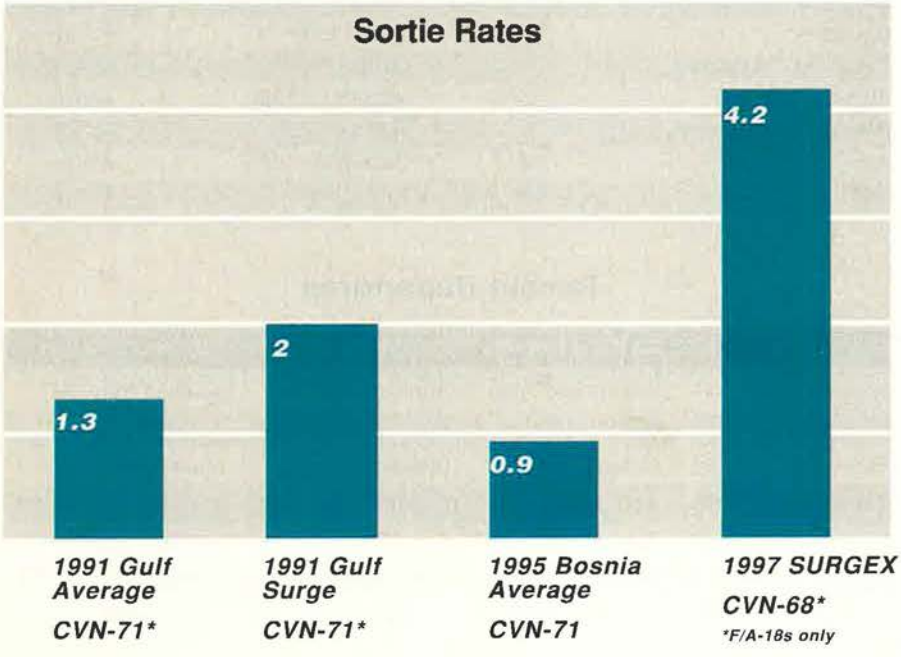
The Navy opened the exercise, called SURGEX, on July 20, 1997. Over 98 hours, carrier *Nimitz* and its air wing, CVW-9, generated 975 fixed-wing sorties. Of this total, 771 were strike sorties, which led to delivery of 1,336 "bombs"—mostly practice BDU-45s—on targets within 200 nautical miles of *Nimitz*. F/A-18 strike fighters flew 79 percent of the strike sorties, posting what on the surface seemed to be a phenomenal sortie rate of 4.2 sorties per aircraft per day.

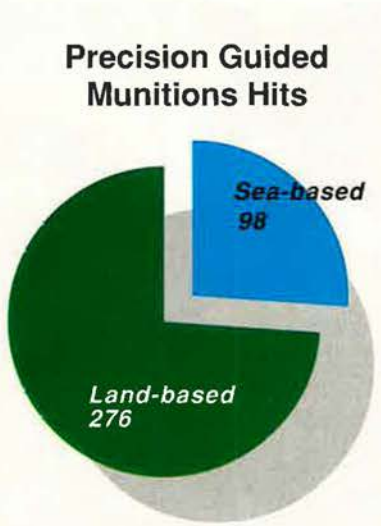
As the Navy told it, this was not just an exercise but also a valid indicator of real-world capabilities. Nathman, commander of the *Nimitz* battle group, claimed as much to a reporter on Oct. 15, 1997, during a Persian Gulf rotation. "If we had to do that again, we could," said Nathman. "We certainly have an excess capacity if [CENTCOM] wanted us to" increase the number of strike sorties.

The SURGEX results, however, depended on several unusual factors, as noted in a study conducted by Dr. Angelyn L. Jewell and Maureen Wigge, experts with the Center for Naval Analyses. When operations began, the aircrews were ready, the aircraft were groomed, and the ordnance was staged, they pointed out. For the pilots, the routine of fly, fly, fly was made possible by the addition of 25 extra pilots to the air wing's normal complement. This augmentation of the aircrews was essential to generation of almost 200 strike sorties per day. Augmentees also formed a strike planning cell, whose work helped reduce the amount of time each aircrew had to spend in mission preparation.

US Navy photo by PH2 Michael W. Pendergrass

Bombs sit ready to be loaded onto aircraft deployed aboard USS* Enterprise *during Operation Desert Fox. The best estimate is that* Enterprise *generated about 50 strike sorties per day.





Nimitz also took on a full load of ordnance and replenished its aviation fuel stores while under way. Not all the strike sorties required refueling, but when they did, USAF KC-135s and USMC KC-130s provided land-based tanking support. S-3s did duty as recovery tankers—topping off jets as they returned to the carrier for landing.

Out of Gas

The exceptional steps weren't lost on the CNA analysts. Even with special preparations and maximum effort, "a carrier and her air wing can maintain high-tempo operations for just so long," reported Jewell and Wigge. The analysts concluded that *Nimitz's* ordnance magazines and aviation fuel would have been depleted after one more day of operations.

The *Nimitz* SURGEX demonstrated the result of a maximum effort from a single carrier under optimum conditions. Placed in context, however, SURGEX results indicate a capability that would fit only a narrow band of potential real-world joint operations. If surging an air wing is America's only strike response in a future crisis, then it means that a theater commander's options are severely limited.

The problems boil down to time and range if a carrier operates by itself. The high sortie rate demonstrated in SURGEX relied on nonstandard conditions such as access to extra pilots and short sortie durations that would be hard to repeat under contingency conditions.

Ironically, the short sortie cycles that SURGEX worked so hard to achieve would pose a major challenge in time of war. According to Jewell and Wigge, the F/A-18C optimum "cycle" from launch to recovery fell between one hour, 15 minutes, and one hour, 20 minutes (without land-based tankers). One-hour cycles pushed the deck crews too hard. But short cycles would limit the combat radius of carrier aircraft, especially those in a heavy bomb-dropping or close air support configuration.

Few Targets

The SURGEX concept postulated carrier aircraft flying one-hour to 1.5-hour sorties and ringing up 200 sorties every 24 hours. With such time requirements, targets more than 200 miles from the carrier would prove to be out of reach. The short sorties reflected a blue-water, ocean-control legacy, not a realistic littoral scenario. In SURGEX, none of *Nimitz's* 771 strike sorties exceeded a 200-mile combat radius. Some critical targets may be that close to a coastline, but the majority probably would not.

Carrier strike aircraft may be free to operate from a deck in international waters, but they depend on land-based support to reach maximum combat effectiveness. As land-based tankers extend the combat radius of strike aircraft, the overall number of sorties and the per-airplane-per-day rates would drop. In the 1990s, no carrier combat strike operations have been launched without the support of USAF land-based tankers.

In joint combat operations, the Joint Force Air Component Commander would need to integrate *Nimitz's* sorties with those of other carriers or of land-based wings. Here, the carrier's heritage of independent operations remains a stumbling block. In the Cold War, Navy tactics called for each carrier to be able to survive and operate on its own. In contingency operations, two carriers that could coordinate their flight operations to sustain longer sorties could well be a better asset for the joint force. The Navy is still working on the communications, doctrine, and procedures for linking carriers.

Today's Carrier Fleet

Ship Name	No.	Commissioned	Status
Kitty Hawk	63	April 1961	Active
Constellation	64	October 1961	Active
Enterprise	65	November 1961	Active
John F. Kennedy	67	September 1968	Active
Nimitz	68	May 1975	Active
Dwight D. Eisenhower	69	October 1977	Active
Carl Vinson	70	March 1982	Active
Theodore Roosevelt	71	October 1986	Active
Abraham Lincoln	72	November 1989	Active
George Washington	73	July 1992	Active
John C. Stennis	74	December 1995	Active
Harry S. Truman	75	July 1998	Active

Recent Departures

Ship Name	No.	Commissioned	Decommissioned	Status
Midway	41	September 1945	April 1992	stricken from list
Coral Sea	43	October 1947	April 1990	sold for scrap
Forrestal	59	October 1955	September 1993	stricken from list
Saratoga	60	April 1956	August 1994	stricken from list
Ranger	61	August 1957	July 1993	inactive reserve
Independence	62	January 1959	September 1998	inactive reserve
America	66	January 1965	August 1996	inactive reserve

The carrier myth came to the fore in February 1998 as the USS *George Washington* and USS *Independence* battle groups waited on station to mount strikes against Iraq. With a combined 102 strike aircraft, they looked set to dominate the action once some of Washington's regional allies put limits on the use of local bases by land-based American fighters.

A diplomatic agreement ended that crisis before hostilities could commence, but later experience showed the constraints that limit the effectiveness of expeditionary naval air operations. In December 1998, Operation Desert Fox was launched against targets in Iraq. It was mostly a Navy show based on the combined power of two big carriers in the Gulf, USS *Enterprise* and, later, USS *Carl Vinson*. However, the attacks focused on a comparatively small set of only about 100 targets. Even at that, the US had to use more than 320 Tomahawk land attack missiles and land-based US and British airpower to meet the CINC's goals.

For *Enterprise*, Operation Desert Fox presented a scenario very different from that which was obtained in SURGEX. Air Wing 3 embarked with about 36 F/A-18s, 10 F-14s, and six EA-6Bs to form the core of its strike capability. Far from operating around the clock, however, strikes came only at night. Targets ranged from an oil refinery near Basra to southern Iraq air defenses and weapons plants near Baghdad. For the carrier, Desert Fox no doubt required sorties much longer than one hour. The best estimate is that CVW-3 logged about 50 strike sorties per day, for a sortie rate of 1.0.

The myth of the carrier conducting independent, high tempo operations masks the real contributions of carriers to joint airpower. Against small target sets like that of Desert Fox, the carrier air wing can conduct defense suppression and generate useful striking power. Still, in the Persian Gulf, carrier aircraft had to fly extended missions, get refueling support, and operate at night only. Moreover, operational-level planning was done by the JFACC on land.

The F/A-18E/F, the "cornerstone of 21st century Navy TACAIR," has front-aspect-only signature reduction. Lack of all-aspect stealth will confine carrier air to the low end of the threat spectrum.

Heavily defended targets like Al Taqqadum and airfields around Baghdad, all well-known Gulf War targets, would probably overtax the range and self-protection capabilities of carrier aircraft. The myth that the carrier can provide effective firepower against all targets without land-based aircraft on scene has no basis in reality.

Still No Stealth

One reason is that the Navy has no operational stealth aircraft in the fleet. Moreover, the Navy seems likely to depend heavily on non-stealthy aircraft for years to come. The Navy will buy a minimum of 548 F/A-18E/F Super Hornets and keep them in the fleet air wings even when the Joint Strike Fighter becomes available. "The Super Hornet is the cornerstone of 21st century Navy TACAIR," said the CNO, Johnson, adding, "My vision for Navy tactical aircraft for power projection on aircraft carriers in the 21st century is a flight deck full of Super Hornets and JSFs."

The Joint Strike Fighter will be a stealthy platform, but the Navy won't start taking delivery until 2010. The long wait for the JSF relegates the Navy to another decade or more without a true all-aspect stealth aircraft. Stealth is a topic that rarely finds its way into public discussions of naval aviation, and for good reason. The Super Hornet is advertised as being survivable because of front-aspect signature reduction, more room for chaff and flares, and a towed decoy, but none claim it can achieve vital all-aspect signature reduction. The lack of all-aspect stealth means carrier strikes will continue to be confined to the lower end of the threat spectrum.

Navy carriers are a valuable tool, but their warfighting contribution must be judged against an airpower standard, not just against a sea-control standard. World War II's fast carrier task forces won their place in history because they conducted sustained operations, and their commanders, like Adms. Raymond A. Spruance and Marc A. Mitscher, were masters of air warfare. Until carriers have an all-aspect stealth aircraft, naval aviators will be unable to perform many critical wartime missions. Navy aircraft are not expected to match the penetration and survivability of the F-117, much less the payload of the B-2. The nation will call on aircraft carriers to take the lead in smaller-scale contingencies, to provide presence in locations like the Taiwan Strait, and to add their capabilities to joint operations. For many of the most critical tasks, however, only land-based aircraft from in-theater bases will do. ■

Rebecca Grant is president of IRIS, a research organization in Arlington, Va. She has worked for RAND Corp., in the Office of Secretary of the Air Force, and for the Chief of Staff of the Air Force. Her most recent article for Air Force *Magazine was "The Radar Game," which appeared in the February 1999 issue.*

Robotic craft called "Uninhabited Combat Air Vehicles" are on the way.

UCAVs Move Toward Feasibility

By John A. Tirpak, Senior Editor

IMPROVING the survivability of its military aircraft has been a top US technological priority for decades. In addition to backing the Air Force's planned acquisition of stealth aircraft, the Pentagon has promoted standoff weapons, seeing them as a way to reduce the exposure of combat airplanes to hostile fire. The idea is to put as much distance as possible between an American pilot and dense defenses encircling high-value targets.

This trend is certain to continue and, at some point, specific types of aircraft likely will be removed from the battle entirely, with a collection of robotic craft taking their places in combat over the target. Current terminology for these systems is "Uninhabited Combat Air Vehicles." They may not only help save the lives of pilots, but also provide more affordable and effective ways to attack certain targets.

Today, the Pentagon and the major US airframe houses are looking at UCAVs as a realistic military option—a kind of system that could serve as a complement to combat airplanes which exist now and likely will continue to serve for decades to come. Both industry and the Pentagon are investing significant amounts of money in UCAV concepts. They say that the technologies that make UCAVs feasible are, for the most part, already available. Success will hinge on whether someone can integrate these technologies into a reliable platform. That will take considerable effort.

In the principal program, the Air Force and the Defense Advanced Research Projects Agency have joined forces to explore use of UCAVs for Suppression of Enemy Air Defenses. This mission, historically one of the

UCAVs might operate as part of a strike package led by manned aircraft, as in this artist's rendition of a Lockheed concept.


P. Benson '97

Photo by Erik Simonsen

No one suggests UCAVs will supplant manned strike aircraft, but USAF has thought about modifying fighters, such as F-16s, for use as UCAVs. However, attention today focuses on pure UCAV models.

most hair-raising and perilous for airmen, often requires close-range attack of an enemy's fully functional surface-to-air missiles and targeting radar, well inside enemy lines.

Small and Stealthy

Officials believe the UCAV shows much potential for SEAD. Without the need to carry a pilot, the UCAV could be smaller and stealthier than a typical fighter, making it harder to detect and shoot down. Such an aircraft could also loiter in an area for extended periods—long beyond the duration of a human pilot—and wait for the enemy to turn on his radar. Being so close, the UCAV would be ready to launch a swift attack. Even if the enemy did get off a lucky missile shot, a UCAV could easily perform escape maneuvers so violent they might kill a human pilot.

Like a fighter aircraft, a UCAV would fly back to base, undergo rapid rearming, and depart to its next target. After the battle, it could be refurbished to be used again and again.

Larry Birckelbaw, DARPA's program manager for the UCAV, explained that the UCAV is an Advanced Technology Demonstration program. Its purpose is to evaluate the available technologies, combine them into an operational concept, and determine if the resulting system could "effectively and affordably address" the SEAD mission, he said.

Although the SEAD UCAV is not an acquisition program, it is geared to proceeding in such a way that, if the technology proves attainable, the Air Force would be able to acquire an operational vehicle in 2010. In the just-concluded first phase of the effort, various aerospace companies offered UCAV vehicle and operational concepts along with their views of what the key technological requirements are and ways in which the development effort should proceed.

The second phase, beginning now, will be a single-contractor, $116 million program. The aim is to build and fly air vehicles that are "not prototypes" but "representative" of the technologies and general layout of an operational UCAV, according to Birckelbaw's deputy, Air Force Lt. Col. Mike Leahy. The vehicles would fly before the end of 2002. If they prove to be successful, an engineering and manufacturing development program focused on an operational machine could get going by 2005.

Leahy asserted that "there are no technological miracles needed" to make a UCAV work. Rather, he said, "The challenge is integration" of diverse components such as the vehicle's command and control system and the "man–machine interface."

The program's goals are "aggressive" for an ATD, said Birckelbaw, and plans call for an aircraft that would come in at "one-third the cost of a JSF," the Joint Strike Fighter now under development for the Air Force, Navy, and Marine Corps. The JSF itself is intended to come in at very low cost by comparison to the cost of earlier fighters—thanks to a large production run, commonality of service variants, modular design, and scrupulous avoidance of unnecessary capabilities.

At one-third the cost of a JSF, the UCAV could have an $11 million price tag, as measured in 1999 dollars.

Even more dramatic would be the reduction in operating and support costs. Unlike fighter airplanes, in which pilots must fly frequently to remain proficient, UCAVs are expected to remain in cold storage for most of their service lives, awaiting the call to action. UCAV operators would maintain proficiency by practicing in a "virtual environment," according to Northrop Grumman UCAV program manager Greg Zwernemann.

"They will train exactly as they would operate in a real conflict," Zwernemann said. He noted that the operator would be using exactly the same software and flight consoles and experience the same visual and aural cues as he would on a real mission. In this way, "we don't accrue operating costs"—such as fuel, spare parts, and depot maintenance.

Dormant Storage

"We are working hard on the issue of dormant storage," to make sure that concept will work, he added. "We are attacking cost on all fronts." It is an example of how the UCAV will mark a profound break with traditional combat aircraft.

Boeing, Northrop Grumman, and Raytheon vied for the UCAV project; Lockheed Martin withdrew from the competition but still maintains a UCAV development team for other anticipated projects, both in the US and overseas.

Armand Chaput, head of Lockheed Martin's UCAV integrated product team, explained that UCAV cost will be pushed down further by a total change in crew ratios. Today, the Air Force maintains a pilot-to-fighter aircraft ratio of about 1.3-to-1. In UCAVs, the ratio will be reversed: one operator will control—"manage" is the preferred term—many UCAVs at once.

"We've simulated up to six UCAVs" being operated simultaneously by a single person, Chaput said. "For certain missions, that's very manageable." This is accomplished because the operator doesn't "hand-fly them," Chaput said. Instead, thanks to a degree of onboard autonomy, and automatic cues taken by the UCAV from various sensor platforms and other sources, it will be "like flying a highly intelligent autopilot."

Where a "higher degree of involvement" by the operator would be required is during the actual weapons-release phase of the mission. On its own, the UCAV will likely be able to take off, fly the approach to target, and return to base, much as today's reconnaissance Unmanned Aerial Vehicles can.

"Man in the loop" would be retained for weapons release at a minimum, and maybe for more of the mission, "depending on the rules of engagement," Birckelbaw said. At this point, no one sees a machine deciding to launch weapons on its own, he added. There will have to be a human involved "to authorize the use of lethal force."

Technologies needed to make UCAVs a reality "have almost nothing to do with airplanes," Chaput said. How to create a low-observable air vehicle is by now well understood; to make UCAVs acceptable to the military will require "robust communication," which is "very jam resistant," Chaput said.

The man–machine interface will require an unprecedented degree of situational awareness, with a highly realistic virtual-reality presentation for the operator, and it will be necessary to sharply reduce the operator's workload so that managing multiple vehicles at once is feasible.

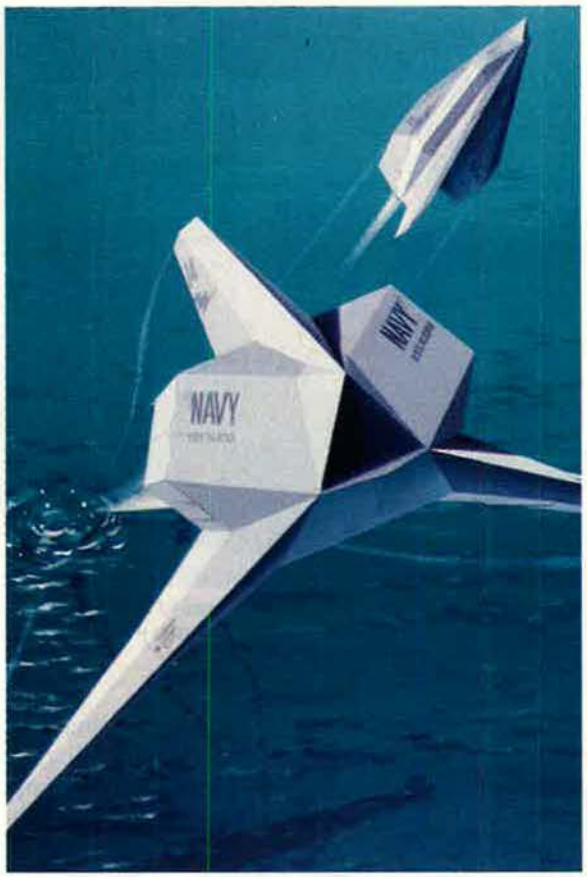
Unlike manned fighters, UCAVs would remain in cold storage for most of their service lives, awaiting a call to action. Pictured here is a Northrop Grumman UAV concept, resembling a small B-2.

"Operators" would maintain proficiency by practicing in a virtual environment. One operator could control and direct many UCAVs.

Who Will Control Them?

Right now, "the technology exists for one or two" unmanned aircraft to be operated by an individual, he noted. The operator station will probably look little like a cockpit and more like an elaborate home computer setup. Moreover, it will not require an extensive ground trailer or base station but will be small enough that UCAVs could be operated from an E-3 AWACS or E-8 Joint STARS console or perhaps even by a pilot or backseater in another combat airplane.

Boeing examined more than 40 configurations to prepare its entry in the DARPA–USAF program, according to company UCAV program manager Rich Alldredge. The shape of the final version was driven by "the weapons available and the laws of physics," he said. All the contractors assumed that, even in 2010, a considerable number of present-day munitions will still be in the USAF inventory, and, as a result, their vehicles were sized to accommodate them; Birckelbaw said the typical UCAV will be about 40 percent the size of today's F-16 or F/A-18. For reasons of stealth, weapons carriage will be internal.



***From the Sea.** Thinkers are churning out inventive concepts, such as a UCAV that can be launched from a submerged submarine.*

The competitors also anticipated, however, that USAF research into smaller munitions will bear fruit within 10 years, leading to much smaller weapons with just as much explosive power as today's big 1000- to 2000-pound bombs. That will simply make their designs "that much more effective," Alldredge said. For missions where stealth is not as critical, external hard points will also be installed, "just like on the JSF and F-22," he added.

He doesn't believe that there will be much cultural opposition to the idea of robotic warplanes after the technology has a chance to prove itself. The Air Force and other services, he said, "are ready to be shown that UCAVs can operate with a high degree of safety and reliability, as part of a strike package." While there may be some who resist the idea of a mission being taken away from pilots and handed over to robots, demonstrations of the technology should allay fears, and Alldredge believes the US military has "an open mind" about any concept "that can be a force multiplier."

No one, he said, is suggesting that UCAVs will supplant the manned strike fleet even within 20 years, though Boeing envisions the use of UCAVs for a variety of missions, including combat air patrol and other missions involving long loiter times.

Acting Air Force Secretary F. Whitten Peters is leery of getting too excited about UCAVs at this stage and maintains that the concept may prove a tougher nut to crack than anyone now expects.

Go Slow

There has been "substantial ... cost growth" on the reconnaissance UAVs—Global Hawk and the recently canceled DarkStar—Peters noted, and "it is proving very difficult to fly these [vehicles] outside of military airspace [through commercial airways with their civilian controllers]. [Global Hawk and DarkStar] have taught us a lot, but there is still a lot more to learn before we go to having UCAVs." The idea of combat robot airplanes is one "where we really ought to go slow."

Birckelbaw acknowledges the problems with DarkStar and Global Hawk, but he maintains that his program is being allowed to watch closely over their shoulder "and those 'lessons learned' are being directly applied" in the SEAD program. "I appreciate the skepticism," he said. "There have been problems with UAVs."

He's most interested in "how to transition" rapidly from a technology demonstrator with proven operational merit to an operational system, Birckelbaw said. The Predator UAV and others have suffered somewhat from their own success in that, once the demonstration concluded, and it was agreed they should be swiftly fielded, there was no organizational apparatus in place for assessing the requirements for, or supplying, spare parts, organic maintenance, or an ongoing training syllabus.

"The airspace issues are genuine," Birckelbaw said, but it's a problem which is also getting attention from the UAV Battlelab, which is "working through that."

"We've worked a lot with the Global Hawk and DarkStar folks to make sure that we understand what's good and bad about those programs," Birckelbaw noted. "We especially are paying attention to ... where the challenges were underestimated."

Leahy said the senior leadership is "starting to realize there's merit here" in taking on a tough problem and fixing it in a new and affordable way. Air Combat Command, which would be the user of any future SEAD UCAV, is "internally skeptical" about the project, because "they don't want to give away a capability" until its replacement is in hand, Leahy said.

Still, ACC is "willing to push and explore it," if the UCAV offers good potential, but the command "definitely has adopted a 'show me' attitude" about UCAVs, he added.

"The hurdles we've had to overcome have been monumental," Leahy went on. Leahy also praised ACC's "willingness to debate" the concept and its refusal to "jump to a conclusion."

Alldredge said he thinks the SEAD project has skipped years of potential dead ends because it is "the best example so far of a technology demonstration program working with the ultimate user." ACC, he said, has offered "invaluable insights" in the concept development studies and steered the project toward what would be most useful. In other projects

where the coordination has not been as tight, "we've missed the mark," Alldredge said.

Birckelbaw also reported that the Navy is keeping an eye on the DARPA–Air Force SEAD project, and there is the expectation that if it proceeds to a full-fledged developmental effort, "before full production, there is an interest in making it a joint program."

Cooling Off

A successful SEAD UCAV project would take lots of heat off the Air Force, which has had no dedicated SEAD platform for seven years. The service was hit with withering criticism from Congress and its own veterans when it phased out the F-4G Wild Weasel dedicated SEAD airplane after the 1991 Gulf War, with no direct successor in mind. Since the F-4G's retirement, the mission has been performed in the Air Force by F-16s employing the High-speed Anti-Radiation Missile with an associated pod. Many have argued that the pod, called the HARM Targeting System, is a valuable asset, but still not as comprehensive as the F-4G's avionics suite, and that USAF should give this critical mission the attention it deserves and a platform of its own.

An artist's conception of the Raytheon craft. UCAVs show much potential for SEAD, being smaller, sleeker, and stealthier than a typical fighter and with a loiter time well beyond the duration of a human pilot.

"I'm absolutely convinced there's a market for UCAVs," Chaput asserted. "It depends on the concept of operations" which the military services settle on, "but we're keeping our options open."

Lockheed's withdrawal from the SEAD UCAV project stemmed in part from the company's belief that the UCAV eventually acquired will have to be more "multimission" than it is envisioned in the DARPA–USAF project. Combat aircraft are so expensive and budgets so tight that "the days of a single-purpose anything have gone away," Chaput asserted. The UCAV of tomorrow, he predicted, will find a niche "somewhere between a manned aircraft and cruise missiles."

He also noted that Operation Desert Fox, the combined US and British action against Iraq in December 1998, involved use of hundreds of cruise missiles—what he surmised is the trend for future such actions—to limit the chance of Iraq downing an American airman.

One industry official speculated that the Navy might more rapidly embrace UCAVs than the Air Force because the Navy "is already comfortable with" the massive use of a non-piloted attack platform—the Tomahawk land attack missile. "The Navy already has a UCAV," the official said of the Tomahawk. "It just doesn't come home."

Ultimately, said Zwernemann, UCAVs "will have to buy their way into the force." As with "anything that's new, there's a period of acceptance," he said, during which judgment is withheld until a new idea proves its merit. "I think UCAVs [will become] an important part of the force structure," he said. ■

The Navy is keeping an eye on the DARPA–Air Force SEAD project and might want to acquire such systems for use aboard warships.

One's place in the chronological pecking order can affect promotions, separations, and earnings.

you & your yeargroup

By Bruce D. Callander

How much does an Air Force member's career depend on his or her being part of a certain year group?

In an ideal world, it would mean little. The Air Force tries to manage its forces less by year groups than by grades and skills so that when a member actually entered service will be less important than how well he or she performs.

In the real world, however, where someone stands in the service's chronological pecking order can be important. It can be a factor in some promotions, affect separation dates, and, under current retirement laws, make a significant difference in lifetime earnings.

Moreover, major changes in the dynamics of the force can also have a different impact on different year groups and leave a lasting imprint on the service itself.

The recent drawdown of forces represents a dramatic case in point.

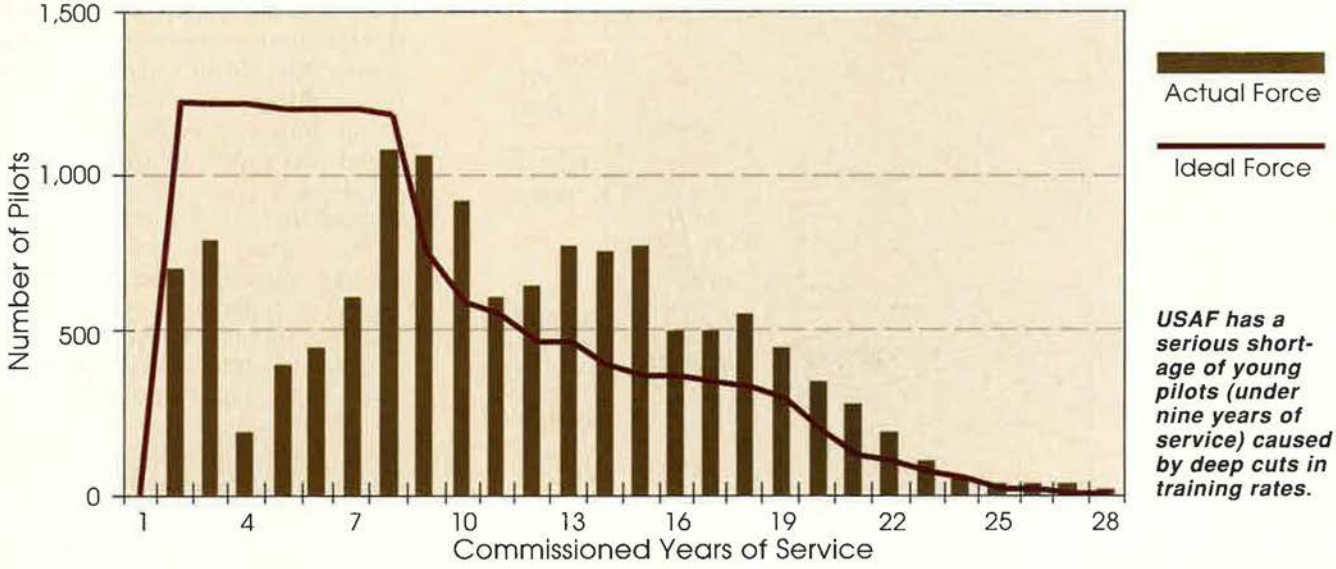
Since the late 1980s, Air Force strength has declined by nearly 40 percent. To thin its ranks, the service cut accessions and accelerated losses. Recruiting dropped to a trickle, and the Air Force offered members incentives to separate or retire early. It lowered pilot training rates, delayed pilot candidate entries into flight schools, and "banked" newly graduated pilots in nonrated jobs to await cockpit openings. Promotions, particularly in the officer ranks, were slowed and the career plans of many members were put on hold.

The Air Force has been studying the effects of this disruption for a while and is aware of what can happen when year groups get out of whack. This article was based on interviews with senior officials in the USAF Office of the Deputy Chief of Staff for Personnel. They included: Lt. Col. John B. Miller, chief, military force structure; Lt. Col. Cheryl L. Dietrick, chief, officer plans; Maj. Vic A. Sowers, chief, enlisted force structure; and Maj. Doug L. Haven, chief, rated force policy, mobility force.

Fig. 1 Total Line Officer "Bathtub"

The recent drawdown left shortages in the 1990–98 officer groups (one to nine years of service) but surpluses elsewhere.

Fig. 2 The Pilot "Bathtub"



USAF has a serious shortage of young pilots (under nine years of service) caused by deep cuts in training rates.

During the recent drawdown, the Air Force tried its best to protect the rated force and, elsewhere, keep involuntary separations to a minimum. Inevitably, however, the actions had serious, sometimes long range impact on the overall force and on members individually.

In the Bathtub

The most telling effect was the creation of shortages in a number of year groups. Known in Air Force jargon as "bathtubs," such shortages continue over the 20-year-long lifespan of the year groups involved and have major consequences for the force as a whole.

During the drawdown, for example, the Air Force cut line officer accessions to about 85 percent of the number it normally would bring in to sustain the future force. At the same time, it stimulated heavier-than-normal losses among younger officers by waiving a year or two of their service commitments. The result is today's line officer bathtub in the 1990 to 1998 year groups. (Fig. 1, p. 38.)

As the cuts eased, USAF moved to reverse the trend. In Fiscal 1997, accessions increased to 100 percent of the sustainment level needed for Fiscal 2003, and few officers were allowed to leave before serving their full commitments. This will raise overall officer manning, but the shortages created earlier continue.

Of all the drawdown's residual effects, the most troubling at present is the bathtub that has developed in pilot skills. (Fig. 2, this page.) Mainly because of deep cuts in training rates, the Air Force was 648 pilots short of its 13,986 requirements in 1998. Without major changes in present trends, the shortage is expected to grow to almost 2,000 by the year 2002.

All traditional indicators suggest there will be no early improvement in this picture. Pilot retention is down 41 percent and likely to continue at that rate or go even lower. The number of fliers taking Aviator Continuation Pay (the bonuses paid to those who agree to serve longer) has dropped 50 percent and approved separations are up 240 percent, resulting in huge spikes of pilot losses at certain year points. (Fig. 3, p. 40.)

Among navigators, manning is mixed but just as troubling. Here, the Air Force has substantial overages in year groups from 1979 through 1989 but sizable shortages in more junior groups. (Fig. 4, p. 41.) As a result, many older navigators have been returned to the cockpit at a point in their careers when they normally would be moving into staff jobs, serving in joint assignments, or enjoying other career-broadening opportunities.

Many now will have to wait until larger numbers of younger navigators are available.

Drawdown and Delay

Certain other drawdown measures affected the advancement of specific officer year groups, reducing promotion opportunity and both delaying boards and the dates when officers pinned on their new ranks.

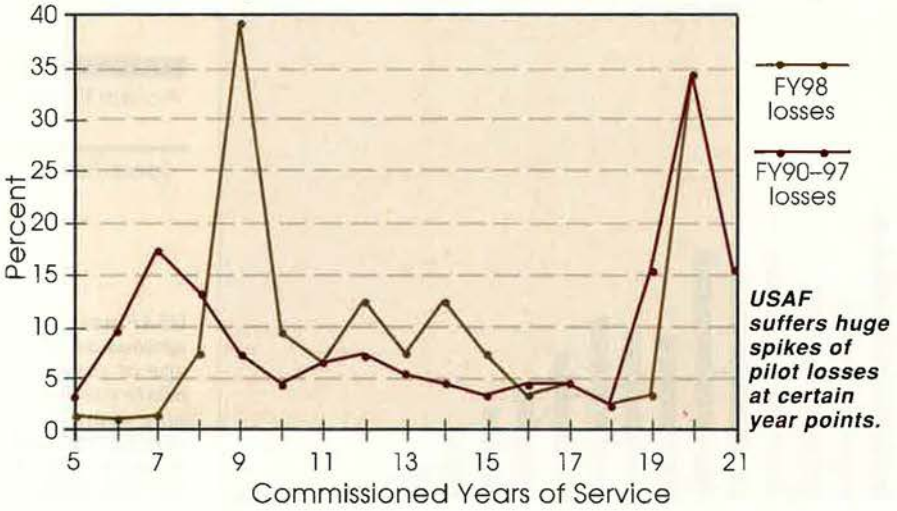
In the 1980 year group, for example, promotion boards to major and lieutenant colonel were delayed a year during the drawdown and the officers' average pin-on phase points were over 12 years to major and 17 to lieutenant colonel. Under the Defense Officer Personnel Management Act (the law governing the services' officer structures) the "window" for major is nine to 11 years and for lieutenant colonel is 15 to 17 years. During the drawdown, promotion opportunities to the field grades also were reduced to DOPMA minimums.

Field grade promotions now are returning to normal. Two years ago, opportunities for major returned to the pre-drawdown rate of 90 percent. In late 1998, the Air Force announced that the 1999 Line Lieutenant Colonels Board, which meets in April, plans to promote at a 75 percent opportunity rate, up from the 70 percent level that has existed since 1991.

Based on force structure projections, the officials also expect pin-on times to improve for all grades. The board schedule for the second half of 1999 includes a colonels board in August instead of December and another lieutenant colonels board in December, besides the one that meets in April.

These improved promotion rates are not entirely due to the end of the drawdown, however. In part, they reflect changes in field grade strength ceilings. In Fiscal 1996 and Fiscal 1997, Congress granted the Air Force temporary grade relief, allowing it more field graders in the inventory to fill requirements and improve management of the officer force.

Fig. 3 Pilot Loss Rate by Year Group



Effective Sept. 1, 1997, the Air Force received permanent grade relief and increased the number of majors by 10 percent and lieutenant colonels by 4 percent.

Currently, the law allows the following approximate field grade percentages (that is, as a percent of the overall officer force): major, 21 percent; lieutenant colonel, 14 percent; and colonel, 5 percent. Without such relief, the impact of the drawdown would have been more lasting.

A more subtle legacy of the drawdown has been a change in members' attitudes about service careers. On the one hand, many became uncertain about their futures as repeated cuts decimated the ranks. On the other hand, as voluntary separations became more common, members came to expect easy approval of requests to waive their active duty service commitments. Commanders became used to OK'ing the voluntary separations generously.

In 1998, the Air Force shifted its focus from force reduction to force shaping, with emphasis on stability, retention, and full careers. The new approach is necessary to sustain the force, officials say, but changing the mind-set of the drawdown years may be difficult. Convincing members that "easy outs" are a thing of the past may not be too difficult, but convincing them that the Air Force is the best answer when they do have the option of leaving could be another matter.

New Initiatives

In this effort, USAF leaders are pinning their hopes on an array of initiatives such as the recently proposed pay raises and retirement improvements. They also hope the new expeditionary force approach will make operations and deployments more predictable, reduce optempo, and give members more stability in their lives. This and measures such as reducing the number of exercises and inspections are expected to ease the stress that has plagued the force in recent years. Other efforts are directed at improving the quality of members' lives.

Such moves should help overall, but it might take more to cure the shortages in some of the most critical year groups. Again, rebuilding the rated force is a major concern. Recently, the Air Force has increased flight training rates, raised the active service commitment for pilot training to 10 years, extended continuation for twice-deferred majors to 24 years, and invited former pilots to apply for voluntary recall.

To slow the hemorrhage of experienced pilots, Congress has authorized higher Aviator Continuation Pay rates. In 1998, The Air Force raised maximum annual ACP payments from $12,000 to $22,000 and, with Congressional approval, began to offer payments for shorter contracts.

In the enlisted force, the Air Force has suffered from shortages in a number of year groups. (Fig. 5, p. 42.) Not all of them can be laid to the drawdown, however, or cured by a return to normal force management.

Here, retention is the growing problem. Last year, the Air Force's goal was to retain 75 percent of its eligible second-term airmen—those members with eight to 12 years of service. Actual retention was only 69 percent. The shortfall apparently stemmed from a number of factors, including job pressures in the force and the lure of a healthy civilian economy.

The long-term effect in the enlisted structure will be minimal, officials say, unless the trend continues and there is a growing shortage of mid-career airmen. For some younger members, the short-range impact actually has been favorable because it has created additional vacancies that have spurred promotions. In the last round of staff sergeant hikes, for example, the Air Force had projected an 18 percent selection rate and the actual rate turned out to be 22.5 percent.

The Air Force has moved to increase enlisted accessions and improve retention. To spur recruiting, it recently expanded six-year-enlistment and enlistment bonus payments to unprecedented levels. To strengthen retention, the Air Force broadened the use of the selective re-enlistment bonus from 45 skills just a few years ago to 107 "non-lateral" specialties today. Non-lateral skills are those which an enlisted member can enter without first having to qualify in other skills.

In order to fix problems of skill imbalance, the Air Force has increased retraining in order to move more personnel into the shortage skills. Officials say they plan to use retraining extensively throughout the next few years as Air Force Specialty Code requirements shift with initiatives such as development of expeditionary forces. As in the past, the Air Force will look aggressively for volunteers before turning to involuntary measures.

Privatization?

Another approach that USAF is studying in both officer and enlisted areas is more privatization of non-government-essential functions. In theory, such contracting could ease the demand for uniformed members, but officials warn that it has limitations. One is the problem of maintaining enough military specialists to meet rotation needs. Civilian contractors may be able to meet the service's stateside needs but not be able to supply employees able to deploy overseas.

In any case, increasing accessions, improving retention, and farming out

some jobs will not solve all of the Air Force's problems. Improving overall manning, by itself, does not fill the shortages in the older, more experienced year groups. These will persist for some time. The best for which the service can hope is to keep from losing more ground by bringing in and retaining members able to fill the gaps.

Again, officer manning is the major concern. The enlisted force is large enough so that many of the imbalances can be handled by retraining, by using enlisted troops temporarily in skill levels above or below the requirements, and by other means. Among officers, however, properly manned year groups are more critical to future planning.

To determine the ideal force structure for a given period, the Air Force uses a model showing how many officers are needed in each grade to sustain field grade levels at a projected end strength, assuming normal promotion phase points, separations, retirements, and other factors.

Among non-rated line officers, the ideal structure in Fiscal 1999 would break out this way:

- 30 percent, O-1 and O-2, 1–4 years of service.
- 38 percent, O-3, 5–11 years of service.
- 15 percent, O-4, 12–16 years of service of service.
- 10 percent, O-5, 17–20 years of service of service.
- 7 percent, O-5 and O-6, 21 or more years of service.

The model is only one tool for managing the force. Grade authorizations, actual onboard strengths, and other factors come into play as managers work out the best mix of members in a given AFSC. Thus, year groups are not the overriding factor to the force itself.

For individual members, however, year groups have a more direct impact. There are, for example, limitations on the ages of recruits and officers entering service. There also are limits on the length of time members may remain in service in specific grades. This means that the members of an incoming "class" start out at roughly the same age and have certain career experiences at about the same time, particularly in their early years.

Up or Out

The service's up-or-out policy is one of the direct influences. It is not directed at specific year groups as such but is related to longevity. Members of a given class must earn certain promotions at about the same times as do their peers in their age group or face separation. The purpose, officials say, is to help USAF maintain reasonable promotion opportunities and provide the right balance of youth and experience. However, the effect is to thin the year groups as they mature.

Airmen and officers alike are affected by laws that limit the percentage that can attain the upper echelons of leadership—that is, officer field grades and enlisted grades E-8 and E-9. Department of Defense policy also limits strength in the NCO grades. Again, the purpose is to maintain a balanced force and steady career flow, but, to a point at least, an individual member's chances of promotion and remaining in service depend on what happens to his or her year group and to preceding groups.

For example, DoD policy on enlisted forces provides that no more than 48.5 percent of enlisted troops can be in the top five grades, staff sergeant through chief master sergeant.

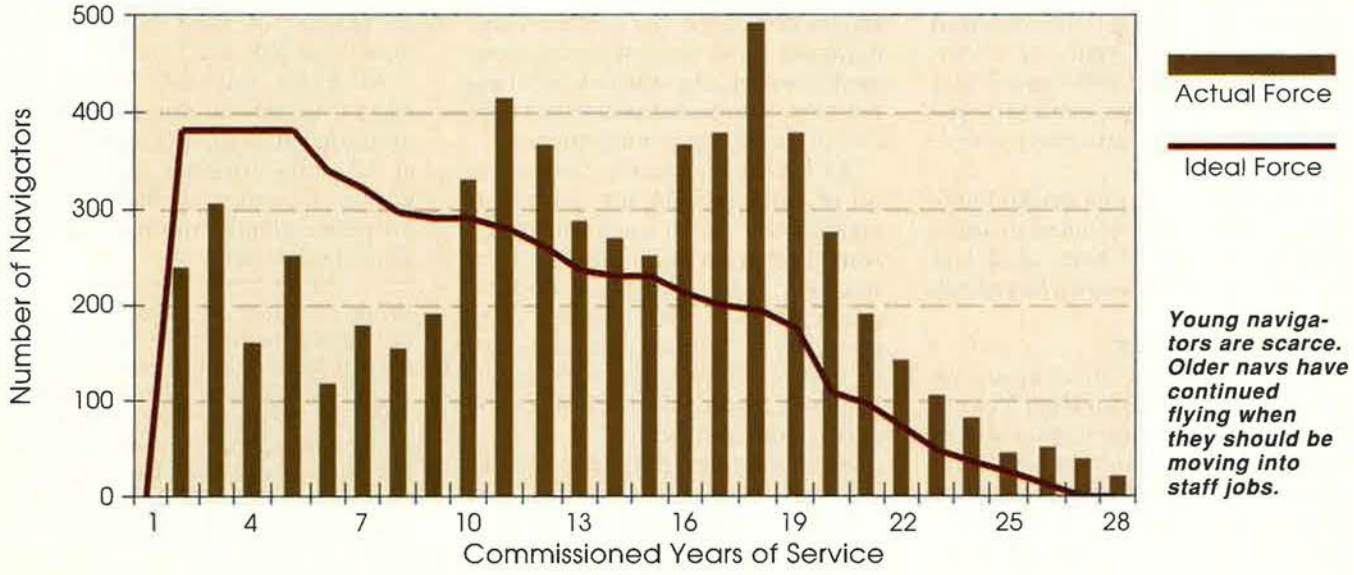
If the policy were applied literally, enlisted troops in younger year groups would be slow to move into the NCO grades, and up-or-out policies would force many out before they made it. In practice, however, the Air Force consistently has exceeded the 48.5 percent ceiling, which was developed before the drawdown was completed, officials say.

USAF now is making a top-to-bottom review of enlisted programs and the requirements of the new Expeditionary Aerospace Force. The officials say that demands for a more experienced NCO force probably will call for increases in some of the top-five authorizations and decreases in others. Plans called for releasing the results in early 1999.

Thus, relief for the enlisted forces, like that for officers, depends at least in part on easing the grade limit that otherwise still would continue to slow careers as it did during the drawdown.

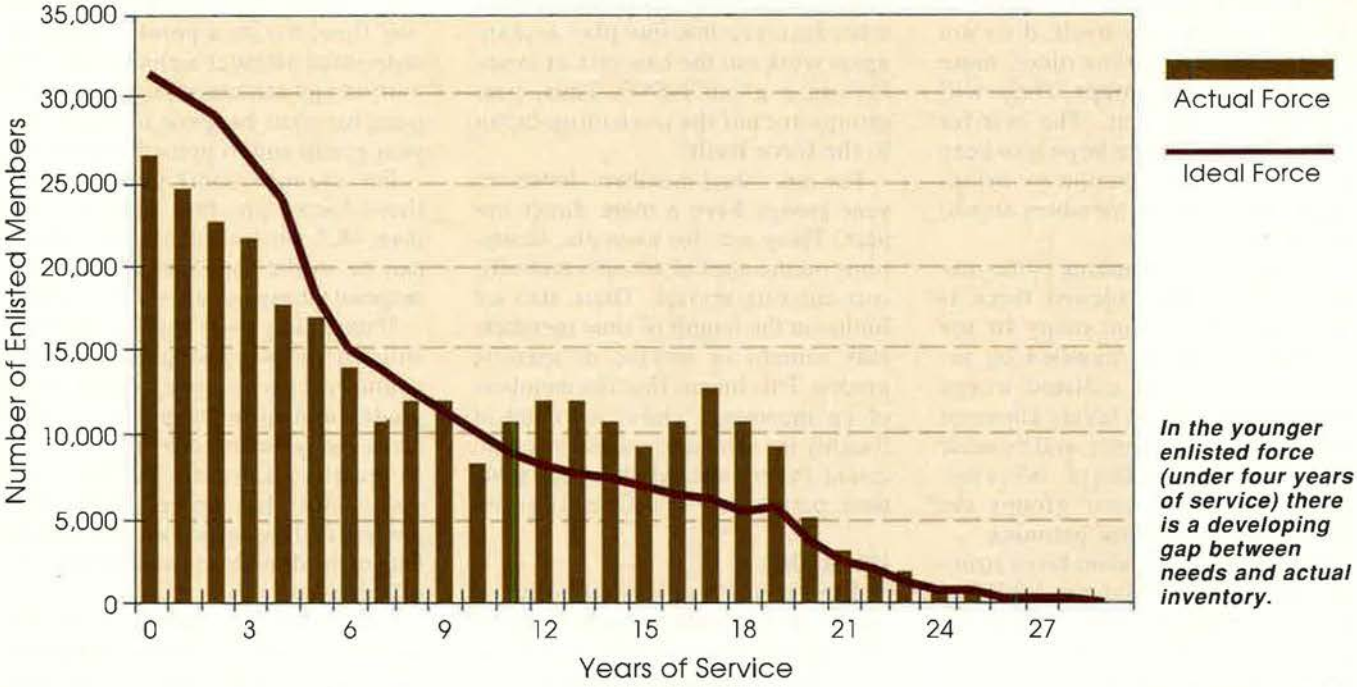
Whatever force structures develop, USAF's main tool for maintaining them will remain the self-adjusting mechanism of the up-or-out policy. As members reach

Fig. 4 The Navigator "Bathtub"



Young navigators are scarce. Older navs have continued flying when they should be moving into staff jobs.

Fig. 5 Total Enlisted "Bathtub"



In the younger enlisted force (under four years of service) there is a developing gap between needs and actual inventory.

certain career points, they are allowed to continue only if they are in or selected for specific grades.

The policy has been fairly consistent on the officer side over the last 10 years, but, during the drawdown, the Air Force made some major deviations from it. It used "selective continuation" to prevent needed personnel from being forced out and allowed some officers to stay until retirement even though they were twice passed over for major or lieutenant colonel.

Continuation of twice-deferred captains was applied to officers in specific skills such as pilots, navigators, and air battle managers. Defense Department guidance also called for continuing twice-deferred majors within six years of retirement, but in Fiscal 1994 and Fiscal 1995 the Air Force offered some twice-deferred majors early retirement instead.

Continuation is a tool the Air Force still considers to accomplish force shaping, but it has been used less often since the drawdown has eased.

Fewer Exceptions

On the enlisted side, up-or-out programs are based on High Year of Tenure limits, meaning that enlisted troops who have not been picked for promotion at specific points may not re-enlist or, if eligible to retire, must retire. In past years, the Air Force offered continuation to some NCOs in critical skills so they could continue beyond their HYT points. During the drawdown, however, it made fewer such exceptions and lowered the HYT points for some grades to speed losses still more. The members of the year groups involved found their careers shortened.

The current HYT points are:

- E-4—10 years
- E-5 and E-6—20 years
- E-7—24 years
- E-8—26 years
- E-9—30 years

These limits have been in effect since 1990, and the Air Force is reviewing them now to see if they still are appropriate. Recent studies have shown that, while the uneven distribution of skills and low retention remain concerns, the enlisted force does not have significant problems in the mix of grade, age, or experience.

As USAF returns to relative stability, officials do not anticipate making any major changes to personnel programs which would place one year group in a more advantageous position than another. They point out that the service takes care to ensure all members can expect equitable treatment and a stable competitive environment.

For example, they say, USAF maintains a stable promotion opportunity by factoring in the size of specific year groups and adjusting promotion phase points accordingly. That way, there is no easy way to identify year groups as being in better or worse positions.

The one area where there is a major difference, however, is that of retirement policy. Service members currently fall under three different retirement programs. Those who joined before Sept. 8, 1980, are eligible to retire at 20 years of service with 50 percent of their final base pay. Those joining on or after that date and through July 31, 1986, will receive 50 percent of the average of their highest three years of base pay. Members who joined on or after Aug. 1, 1986, come under the so-called Redux program and will receive only 40 percent of their average high-three base pay at 20 years.

Air Force and DoD leaders now want Congress to dump the Redux program and restore the 50-percent-at-20-years formula for all year groups. Congress is expected to approve the change in this year's defense legislation. ■

Bruce D. Callander, a regular contributor to Air Force *Magazine, served tours of active duty during World War II and the Korean War. In 1952, he joined* Air Force Times, *serving as editor from 1972 to 1986. His most recent story for* Air Force *Magazine, "How Compensation Got Complicated," appeared in the January 1999 issue.*

Verbatim

Decade of Neglect

"From my perspective ... we have been neglectful of our armed forces throughout this decade of the '90s, a decade of unprecedented prosperity for our nation, a decade [in] which we could have afforded to be much better stewards of these institutions that have served our nation so well through so many crises. ... How many of you drive a 20-year-old car today? Anyone drive a 20-year-old car through the equivalent of an Indianapolis 500 race every day? I didn't think so. But that is what is being asked of those [F-15 pilots] who are enforcing no-fly zones in Iraq, those who today are being fired at by Iraqi surface-to-air missile batteries."

Gen. Richard E. Hawley, commander of Air Combat Command, in a Feb. 1, 1999, address to civic leaders in Houston.

Spence I: Missing Dollars

"The President's defense budget proposal claims to increase defense spending over the next six years by $112 billion, when in reality it only provides $84 billion in increases. Compared to the over $150 billion worth of unfunded requirements identified by the Joint Chiefs of Staff, the President's proposal falls short of the mark by as much as $70 billion.

"Compounding the shortfall problem is the President's decision to resort to a 'grab bag' of questionable assumptions and gimmicks in order to make the budget appear to fit within the spending caps. The services' unfunded requirements are real, while savings associated with optimistic economic assumptions and gimmicks may never be. The President continues to play high stakes poker with our military's future and with the nation's ability to protect and promote its interests around the world. We can and must do better."

Rep. Floyd Spence (R–S.C.), chairman of the House Armed Services Committee, in a Feb. 1, 1999, statement on Fiscal 2000 DoD budget.

Spence II: Speak Up

"Usually, the military has to come to Congress ... [to] ask us for certain things that they think they need to carry out their responsibilities. And usually they've got to convince the Congress of the need for these things, and we go from there. The reverse has been true in recent years. The Congress has found itself in a position of having to try to convince the military to tell us what they need when we found out through other means what we think the needs are. And it makes it difficult, because we have to try, we're talking about budget caps, to raise those, or get money from the surplus or someway. But to be able to do this, we've got to convince, not only the American people but the rest of Congress why we need to do these things. And if we can't get our own military leaders and the Department of Defense to tell us that we need more, it makes our job very difficult, if not impossible."

Spence to members of the Joint Chiefs of Staff in a Jan. 20, 1999, hearing on force readiness.

Swelled Up

"The United States in the post–Cold War world has developed something of a swelled head, in the sense that we think of ourselves as the sole universal power with a responsibility to intervene anywhere, and that the whole world is our protectorate. We don't have the forces ... to intervene everywhere. ... We are not able to control everything, irrespective of the illusions that have developed after the collapse of the Soviet Union."

James R. Schlesinger, former Secretary of Defense, in a Nov. 6, 1998, conference at Georgia Institute of Technology in Atlanta.

The Whole, Not Just Its Parts

"These exchanges have been initiated by Saddam Hussein. This has been a deliberate onset of repeated attacks against our forces. I think, just by following the track since Desert Fox, you realize these are increasing not only in numbers but in intensity, and we've seen, in fact, that the sophistication and the coordination and the experimentation, if you will, on the ways to come at us have increased. This poses a threat to our aircraft, both in the north and the south. We view this threat as centralized and deliberate, and we view the entire air defense system that's being set against us as the objective in any response that we take. And we will defend our pilots and our aircraft against these attacks."

Gen. Anthony C. Zinni, USMC, commander in chief of US Central Command, in a Jan. 25, 1999, Pentagon press conference regarding Iraqi air defense threats.

Call the Claims Adjuster

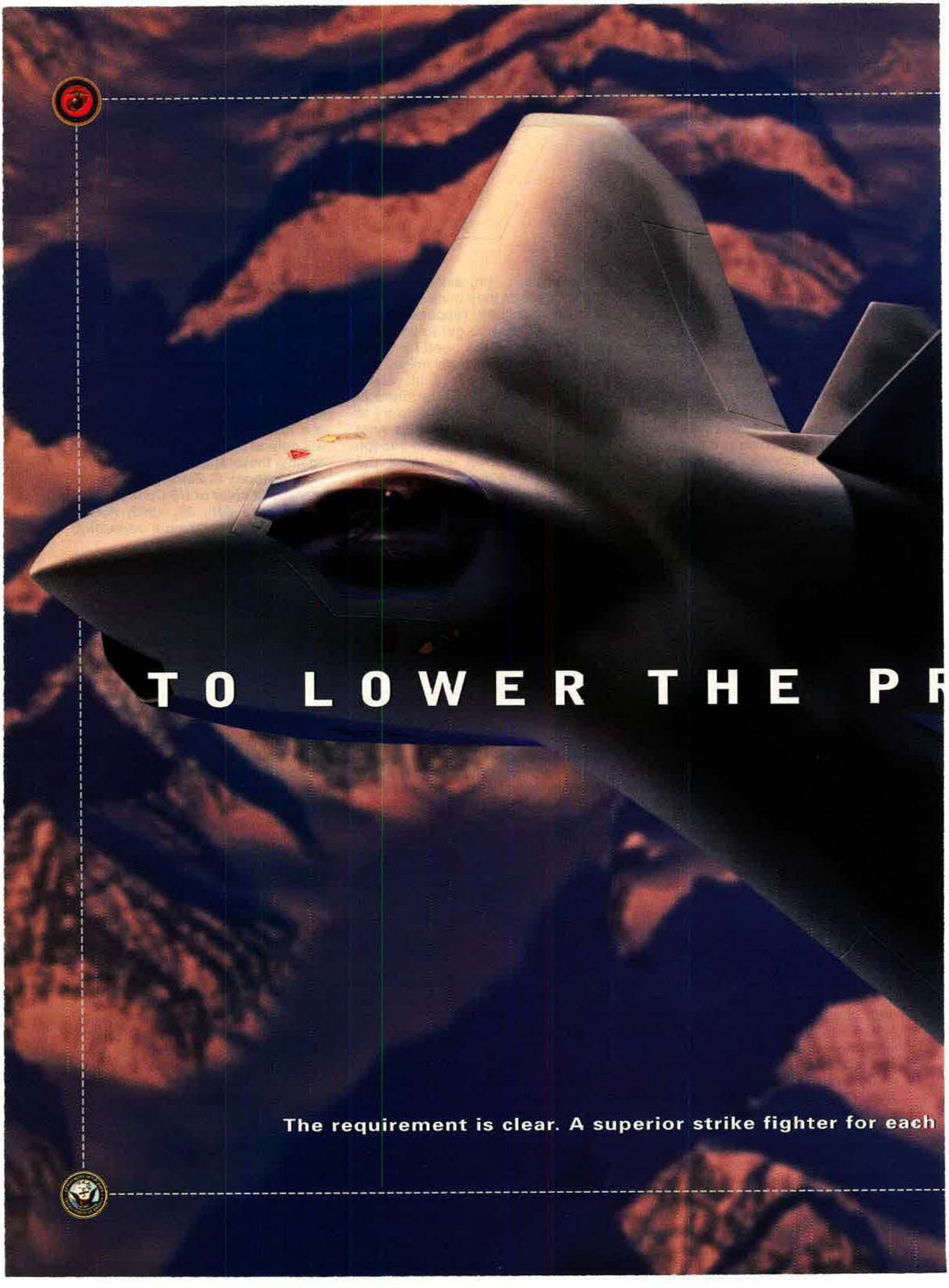
"This [defending commercial space assets] is something we have looked at hard for a number of years, now, because you can't advocate increased use of commercial space without addressing the issue of vulnerability [of commercial spacecraft]. If we are going to put commercial systems on the critical path of the execution of military operations, then we've got to have adequate assurance. ... When you put that question to a businessman, who is worried about return on assets employed, the two things that you will get back are (a) show me the validated threat, [and] (b) that is what insurance is for."

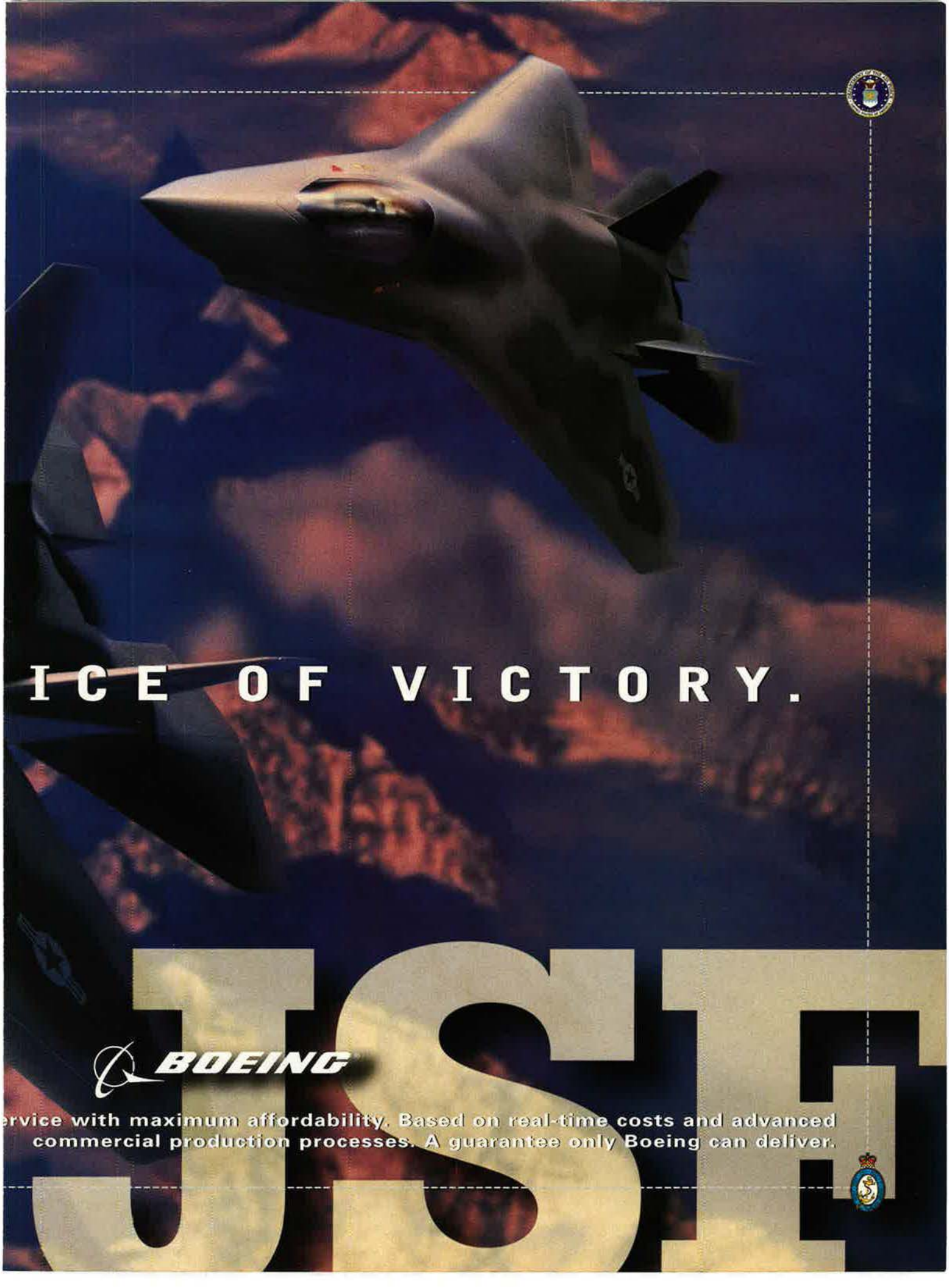
John M. "Mike" Borky, member of the Air Force Scientific Advisory Board, in a Jan. 12, 1999, statement to the Eaker Institute Colloquy in Washington.

Love, Al

"The absence of missile defense forces nations into the position of having to consider pre-emption. I mean, Al Capone said it. 'I'm from Chicago,' he said. 'You know, you get a lot more with a kind word and a gun than you do with a kind word alone.' ... Just substitute 'ballistic missile' for 'a gun,' and substitute a couple of Al Capones in another part of the world, and you've got it all figured out."

Donald H. Rumsfeld, former Secretary of Defense, at the same conference.


TO LOWER THE PR
The requirement is clear. A superior strike fighter for each


ICE OF VICTORY.
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ervice with maximum affordability. Based on real-time costs and advanced
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AMERICA

AND ITS ALLIES

WANT A JOINT

STRIKE FIGHTER

WITH A BUILT-IN

GUARANTEE.

Valor

By John L. Frisbee, Contributing Editor

They Said It Couldn't Be Done

John Alison's first combat mission added a new element to the air war in China.

On July 4, 1942, Claire L. Chennault's American Volunteer Group, better known as the Flying Tigers, went out of business, turning its planes and bases over to the newly formed AAF China Air Task Force, later to become Fourteenth Air Force. A few of the AVG pilots stayed on, among them Maj. David L. "Tex" Hill and Capt. Robert "Ajax" Baumler, who had been an ace in Spain. Even before the turnover, AAF pilots began arriving to man the CATF's 23d Fighter Group. One of them was Maj. John Alison, fresh from a year in Russia, introducing our erstwhile Allies to the P-40, A-20, and B-25.

The 23d, like its AVG predecessor, was strictly a frontier air force, operating at the end of the war's longest and most difficult supply line. Everything—fuel, ammunition, spare parts for its obsolescent P-40s—had to be flown in over the Hump. There was no ground radar and little in the way of radio aids. At one point, the 75th Fighter Squadron, to which Alison was assigned as Tex Hill's deputy, had nothing but five-gallon cans to refuel its fighters.

Alison's first few missions were relatively uneventful, with no Japanese aircraft showing up. Then about 3 a.m. on July 18, the warning net of Chinese ground observers reported bombers heading for the 75th's field at Hengyang. Alison and Hill stood outside their barracks about a mile from the runway and watched the bombs explode.

Alison asked Hill if the AVG had ever attacked Japanese bombers at night. It seems they had tried early on, but with no success, and had given it up. Whenever there was a moon, the Japanese enjoyed a free ride against Chinese towns and American airfields. "If they come over tomorrow night," said Alison, "I'm going to be up there waiting."

New-guy Alison convinced veteran Baumler that he was onto a good idea, and sure enough, the warning net reported approaching bombers the next night. Alison took up a position in his P-40 at 12,000 feet with Baumler below him, while warning-net position reports were relayed to them by radio.

The bombers, expecting another free ride, made two leisurely passes over the Hengyang runway before Alison was able to pick up the faint flame from their engine exhausts above him as the bombers turned on their bombing run. He pulled up the nose of his P-40, firewalled the throttle, and at the last moment saw he was closing too fast in this unpracticed nighttime maneuver. Chopping the throttle, Alison sideslipped to kill his speed and slid smack into the middle of a three-bomber V formation.

The top turret of the bomber on his right opened up at point-blank range, stitching Alison's P-40 from nose to tail. His radio was knocked out, one slug went through the seat, and another grazed his left arm. Almost immediately the P-40's engine began to run rough. In that situation, any fighter pilot could have been forgiven for thinking the AVG was right, and now was a good time to head for home. Not Alison. He kicked his fighter around and blasted the bomber on his left with the P-40's six .50-caliber guns. Oil covered his windshield as the bomber pulled straight up and disappeared. Swinging back to the right, he exploded the bomber that had hit him. By that time, flames were popping out from his aircraft's engine cowling as he turned on the lead bomber and blew it up.

Alison at last pointed the nose of his wounded fighter down, heading for the blacked-out 3,500-foot runway as the engine threatened to jump out of its mountings and flames spewed from the cowling. There wasn't time for a planned approach. He came in too fast with only one viable alternative—to overshoot and crash-land in the river about two miles ahead. Clearing a railroad trestle by inches, he hit the water with a resounding crash, climbed out of the sinking P-40, and swam to a log raft near the shore. A young Chinese man pulled the bleeding Alison out of the water.

While all this was going on, Baumler had shot down two more bombers. As a result of Alison's experiment in night interception, for which he was awarded the DSC, Japanese bombers didn't come back in darkness for almost a year.

Alison ended his tour with the colorful 23d Fighter Group as an ace with six air-to-air victories and several probables. He then became Col. Philip G. Cochran's deputy commander of the equally colorful 1st Air Commando Group in Burma.

But don't go away. There's a sequel to that first night interception. After the war, Alison served as an assistant secretary of commerce, president of AFA, a major general in the Reserve, and a vice president of Northrop Corp. On a visit to one of Northrop's research organizations near Boston, he was introduced to its chief engineer, a Dr. Tsien. It came out that Tsien had lived near Hengyang while Alison was stationed there.

"Were you a bomber pilot?" asked Tsien. Alison replied that he had been deputy commander, then commander of the 75th Fighter Squadron. "Then we have met before," said Tsien. "I'm the man who pulled you out of the river." ■

First appeared in September 1983 issue.


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8. Buell, A.
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USAF
Art Exhibit
WORLD WIDE
SPECIAL PRESENTATION
Photo by Paul Kennedy

The US Air Force asked a group of artists to take a different look at the force. The rest is history.

History on Canvas

In 1954, Gen. Nathan F. Twining, Air Force Chief of Staff, formally established the USAF art program. Many of the better known artists and illustrators of the day were asked to use their creative talents to take a fresh look at the service, record their impressions, and contribute the result to what would, in time, become an amazing store of art. By 1963, the USAF Art Collection contained more than 700 works. A selection of 50 paintings traveled from base to base, sometimes in the form of a metal box of slides, as shown at left. What follows is a small part of that first traveling collection.

Artist Reynold Brown created this painting, called "Green Light—Go," after visiting an F-102 alert base in Japan. Here he shows some of the tension as the crew chief and pilot wait for the signal for the aircraft to take off. An artist for North American Aviation during World War II, Brown also assisted Hal Forrest with the popular comic strip "Tailspin Tommy."

Today, Keith Ferris is one of the best known artists in the field of aviation art. This painting, "B-52 Air Refueling," was the first in a long line of work he has created for the program.

Claude Coats portrayed a serene landscape of rice paddies near Beppu, Japan, and included the jets as a way of showing airpower as a protector of postwar Japan. Coats got started as an illustrator at Walt Disney Studios in 1935. He created some of the background pieces for "Snow White and the Seven Dwarfs," "Pinocchio," and "Cinderella."

Carl Bobertz was known for his corporate advertising art and children's book illustrations. Here he captures the drama of an air rescue mission in Alaska in 1957. On submitting the painting he noted, "Nine men jumped. Jumpmaster (in white cap) was first to go. Man with earphones relayed information from pilot to jumper. After putting on parachutes, two or three quietly bowed their heads."

Homer Hill graduated from the Parsons School of Design in New York City. He commented, "I should like to feel that this painting, by its color and design, conveys to the viewer a feeling of complete isolation and the problem of survival in the jungle." Hill portrayed a scene from an Air Force jungle survival training program held in Panama at the time.

Attilio Sinagra admitted to being impressed with these Boeing BOMARC surface-to-air missiles standing ready as a line of defense against enemy bombers. These weapons were an important part of USAF's Cold War arsenal.

Charles J. Kuderna captured the rush of rescue forces racing to Nagoya, Japan, flooded in the aftermath of Typhoon Vera in September 1960. It was just one of countless humanitarian missions Air Force crews have conducted. Kuderna attended the Art Institute of Chicago and was a corporate Illustrator.

Robert Lavin portrayed the scene inside a climate control hangar, which is still in operation today at Eglin AFB, Fla. Lavin chose to depict this B-52 undergoing a wintry subzero test. He commented that "in this enormous structure all conceivable forms of weather can be reproduced in testing planes under any condition." A Marine fighter pilot during World War II, Lavin was a commercial artist.

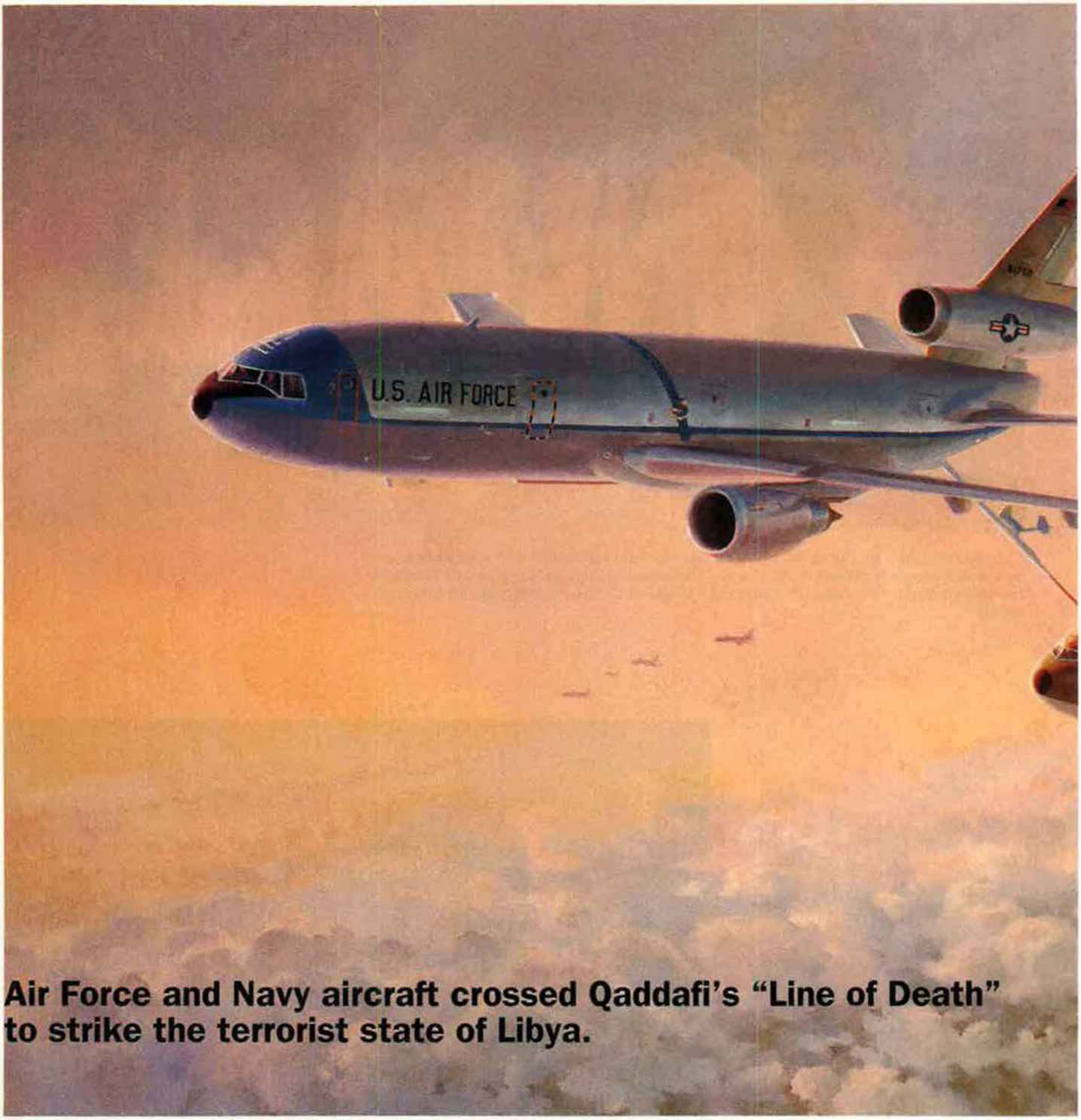
The Cold War couldn't get much colder than duty on the DEW Line. In this landscape of a remote radar site in Alaska, artist Robert Fawcett shows the kind of lonely vigil that Air Force crews routinely endured.

Robert McCall is probably best known for his futuristic illustrations for the movie "2001: A Space Odyssey" and the two huge murals at the entrance of the National Air and Space Museum in Washington. When he saw the then-new C-133 Cargomaster he noted how large the aircraft was. He chose to show the airplane on the ground at Dhahran, Saudi Arabia, to "best dramatize the great globe girdling range of this magnificent airplane."

"The Spectators," by Barye W. Phillips, depicts the fascination with airplanes shown by the natives near Wheelus AB, Libya. The painting contrasts a group of people in the foreground with a mass of troops boarding the C-124. Phillips was an editorial artist.

This beautiful clouoscape by Ren Wicks depicts the midair recovery of the Discoverer 14 satellite. The recovery crew flew Wicks on an additional mission so he could complete the research for the painting. Wicks' works hung in the corporate offices of several aircraft companies.

Editor's Note: Thanks to Dick Yates, who donated the metal presentation box containing slides of these works of art.



Air Force and Navy aircraft crossed Qaddafi's "Line of Death" to strike the terrorist state of Libya.

El Dorado Canyon

By Walter J. Boyne

THE United States on April 14, 1986, launched Operation El Dorado Canyon, a controversial but highly successful mission that hit Col. Muammar Qaddafi squarely between the eyes. Working with carrier aircraft of the US Sixth Fleet, Air Force F-111s of the 48th Tactical Fighter Wing flew what turned out to be the longest fighter combat mission in history. The crushing strikes caused a remarkable reduction in

During El Dorado Canyon, KC-10s refueled KC-10s, which in turn refueled F-111s for the 6,400-mile round trip from the UK to Libya. Keith Ferris based this painting—called "The Lesson"—on eyewitness accounts from F-111 crews.

Photo via Denis Giangreco

The April 1986 bombing of a Berlin discotheque frequented by American servicemen helped convince President Reagan that it was time for the US to take action against Libyan–sponsored terrorism.

Libyan–sponsored terrorist activity.

In the mid-1980s, the F-111s of the 48th TFW, stationed at RAF Lakenheath in Britain, formed a key element of NATO power. If war came, the Aardvark's long range and night, low-level bombing capability would have been vital in defeating a Soviet attack. To the south, in the Mediterranean, the Sixth Fleet engaged Soviet warships in a constant game of mutual surveillance and stayed in more or less permanent readiness for hostilities.

Fate would dictate that the 48th TFW and Sixth Fleet carriers would be teamed in a totally unexpected quarter against a very different kind of enemy. They would strike not in or around Europe but on the North African littoral. They would go into action not against Soviet conventional forces but against an Arab state bent on sponsoring deadly terrorist acts.

Western nations had long been alarmed by state-sponsored terrorism. The number of attacks had risen from about 300 in 1970 to more than 3,000 in 1985. In that 15-year period, a new intensity had come to characterize the attacks, which ranged from simple assaults to attacks with heavy casualties such as the Oct. 23, 1983, truck bombing of the Marine Barracks in Beirut.

Qaddafi, who seized power in a 1969 coup, had long been an American antagonist. Each year, Libya trained 8,000 terrorists, providing false passports, transport on Libyan airliners, and access to safe houses across Europe. Libyan support for terrorist operations exceeded all nations except Iran. It disbursed $100 million to Palestinian terrorists eager to strike Israel.

"Heroic" Actions

Qaddafi joined forces with one of the most notorious terrorists of the time, Abu Nidal. In November 1985, Abu Nidal's operatives hijacked an EgyptAir transport; 60 passengers were killed, many in the rescue attempt staged by an Egyptian commando team. On Dec. 27, 1985, Abu Nidal terrorists launched simultaneous attacks on airports at Rome and Vienna; 20 passengers and four terrorists were killed in these events. Qaddafi publicly praised the terrorists, called them martyrs, and applauded what he described as "heroic" actions.

President Ronald Reagan at about this time gave his approval to National Security Decision Directive 207, setting forth a new US policy against terrorism. He had decided that the US needed to mount a military response to Qaddafi and his brethren, but first he wanted to obtain cooperation from the Western Allies and allow time for the removal of US citizens working in Libya.

Meantime, the Sixth Fleet, based in the Mediterranean Sea, began a series of maneuvers designed to keep pressure on Libya. Two and sometimes three aircraft carriers (*Saratoga, America,* and *Coral Sea*) conducted "freedom of navigation" operations that would take US warships up to and then southward across a line at 32 degrees 30 minutes north latitude. This was Qaddafi's self-proclaimed "Line of Death."

The Line of Death defined the northernmost edge of the Gulf of Sidra and demarcated it—in Qaddafi's mind, at least—from the rest of the Mediterranean. The Libyan leader had warned foreign vessels that the Gulf belonged to Libya and was not international waters. The message was that they entered at their own risk and were subject to attack by Libyan forces. Thus Qaddafi, by drawing the Line, unilaterally sought to exclude US ships and aircraft from a vast, 3,200-square-mile area of the Med which always had been considered international.

The skirmishing soon began. On March 24, 1986, Libyan air defense operators fired SA-5 missiles at two F-14s. The Tomcats had intercepted an intruding MiG-25 that came a bit too close to a battle group. The next day, a Navy A-7E aircraft struck the SAM site with AGM-88A HARM missiles. At least two of the five threatening Libyan naval attack vessels were also sunk.

Tension further increased on April 2, 1986, when a terrorist's bomb exploded on TWA Flight 840 flying above Greece. Four Americans were killed. Three days later, a bomb exploded in Berlin's La Belle Discotheque, a well-known after-hours hangout for US military personnel. Killed in the blast were two American servicemen, and 79 other Americans were injured. Three terrorist groups claimed responsibility for the bomb, but the United States and West Germany independently announced "incontrovertible" evidence that Libyans were responsible for the bombing.

It's Time

President Reagan decided that it was time for the US to act.

In the months leading up to the Berlin bombing, planners at USAF's 48th TFW had developed more than 30 plans for delivering a punitive blow against Libya. Most were variations on a theme—six or so Air Force F-111 fighter–bombers would fly through French airspace and strike

selected military targets in Libya. Planners assumed that the attack would have the benefit of surprise; the small number of F-111s made it probable that the bombers would be in and out before the Libyan defenses were alerted.

Later, when detailed speculation in the Western media lessened the probability of surprise, attack plans were changed to include support packages that would carry out suppression of enemy air defenses. These packages were to comprise Air Force EF-111 electronic warfare aircraft as well as Navy A-7 and EA-6B aircraft. This was the start of an Air Force–Navy liaison that would prove essential in the actual mission.

However, all the 48th's plans had been rendered obsolete by April 1986. Continuous media coverage, apparently fueled by leaks from very senior and knowledgeable sources in the White House, had rendered surprise almost impossible. Moreover, the US was having serious trouble with its Allies. Britain's Prime Minister Margaret Thatcher approved US use of British bases to launch the attack. However, Washington's other Allies lost their nerve. The fear of reprisals and loss of business caused France, Germany, Italy, and Spain to refuse to cooperate in a strike.

The faintheartedness of these countries forced the US to prepare a radically different attack plan. USAF F-111s would now navigate around France and Spain, thread the needle through the airspace over the narrow Strait of Gibraltar, and then plunge on eastward over the Mediterranean until in a position to attack.

It would prove to be a grueling round-trip flight of 6,400 miles that spanned 13 hours, requiring eight to 12 in-flight refuelings for each aircraft. Inasmuch as a standard NATO F-111 sortie was about two hours, the El Dorado Canyon mission placed a tremendous strain on crews and complex avionic systems at the heart of the aircraft.

US authorities crafted a joint operation of the Air Force and Navy against five major Libyan targets. Of these, two were in Benghazi: a terrorist training camp and the military airfield. The other three were in Tripoli: a terrorist naval training base; the former Wheelus AFB; and the Azziziyah Barracks compound, which housed the command center for Libyan intelligence and contained one of five residences that Qaddafi used.

Eighteen F-111s were assigned to strike the three Tripoli targets, while Navy aircraft were to hit the two Benghazi sites. Navy aircraft also were to provide air defense suppression for both phases of the operation. US authorities gave overall command to Vice Adm. Frank B. Kelso II, commander of the Sixth Fleet.

USAF photo via Craig Brown

Inside a shelter at RAF Lakenheath, this F-111F, call sign Lujac 23, receives a thorough checkout. The Aardvark's long range and nighttime, low-level bombing capability made it a key element of NATO airpower in the mid-1980s.

F-14, A-7, and EA-6B poised on USS* America's *flight deck. Between* America *and USS* Coral Sea, *the Navy launched 14 A-6Es and six A-7Es for the attack, with F-14s for protection and six F/A-18Cs and an EA-6B for strike support.

Enter the Air Force

The composition of the El Dorado Canyon force has stirred controversy. In his 1988 book, *Command of the Seas,* former Navy Secretary John F. Lehman Jr. said the entire raid could have been executed by aircraft from *America* and *Coral Sea.* This claim cropped up again in 1997; in a letter to *Foreign Affairs,* Marine Maj. Gen. John H. Admire, an operations planner in US European Command at the time, said, "Sufficient naval forces were available to execute the attacks." Both attributed USAF's participation to a bureaucratic need to placate the Air Force.

The fact of the matter, however, is the Air Force had long been prepar-

Photo by Dale Woodward via Jim Rotramel

F-111F Remit 31 receives a last check before takeoff from RAF Lakenheath. Eighteen Aardvarks were tasked to strike three targets in Tripoli. Remit 31 was among the F-111s that attacked Azziziyah Barracks.

ing for such a raid. When Washington decreed that there would be only one attack, it became absolutely necessary to mount a joint operation because only the inclusion of heavy USAF attack aircraft could provide the firepower needed to ensure that the operation would be more than a pinprick attack.

The Navy had only *America* and *Coral Sea* on station. According to Air Force officials involved in the plans, these two carriers did not have sufficient aircraft for effective attacks against all five targets in both Tripoli and Benghazi. At least one more carrier, and perhaps two, would have been required, said these officers.

The act of calling in a third or even a fourth carrier to handle both targets would have caused a delay and given away any remaining element of surprise. This fact was pointed out to the Chairman of the Joint Chiefs of Staff, Adm. William J. Crowe Jr. Crowe himself recognized that F-111s were needed if both Tripoli and Benghazi were to be struck at more or less the same time. They would also add an element of surprise and a new axis of attack.

For these reasons, the JCS Chairman recommended to Reagan and the National Security Council that the United States use both Air Force and Navy aircraft in the raids.

The F-111Fs of the 48th were special birds, equipped with two Pratt & Whitney TF-30 P-100 turbofan engines of 25,100 pounds of thrust each and a highly classified AN/AVQ-26 Pave Tack bombing system. Pave Tack consisted of an infrared camera and laser designator. It enabled the F-111 crew to see the target in the dark or through light fog or dust obscurations (not heavy dust and smoke). When the target was seen, it was designated by the energy of a laser beam. The 2,000-pound GBU-10 Paveway II laser-guided bomb tracked the laser to the illuminated target. Pave Tack imparted to the F-111s a limited standoff capability, achieved by lobbing the bombs at the target. As events unfolded, the Pave Tack equipment would be crucial to the mission's success.

On April 14, at 17:36 Greenwich Mean Time, 24 Aardvarks departed Lakenheath with the intent that six would return after the first refueling about 90 minutes out. Also launched were five EF-111 electronic warfare aircraft. This marked the start of the first US bomber attack from the UK since World War II. The tanker force was launched at roughly the same time as the F-111s, four of which joined up on their respective "mother tankers" in radio silence, flying such a tight formation that radar controllers would see only the tanker signatures on their screens. At the first refueling, six F-111Fs and one EF-111A broke off and returned to base. Beyond Lands End, UK, the aircraft would be beyond the control of any international authority, operating at 26,000 feet and speeds up to 450 knots.

To save time and ease navigation, tankers were to accompany the fighters to and from the target area. KC-10 tankers, called in from Barksdale AFB, La., March AFB, Calif., and Seymour Johnson AFB, N.C., were refueled in turn by KC-135s, assigned to the 300th Strategic Wing, RAF Mildenhall, and the 11th Strategic Group, RAF Fairford, UK.

Drastic Changes

What had been drafted as a small, top secret mission had changed drastically. The force now included 18

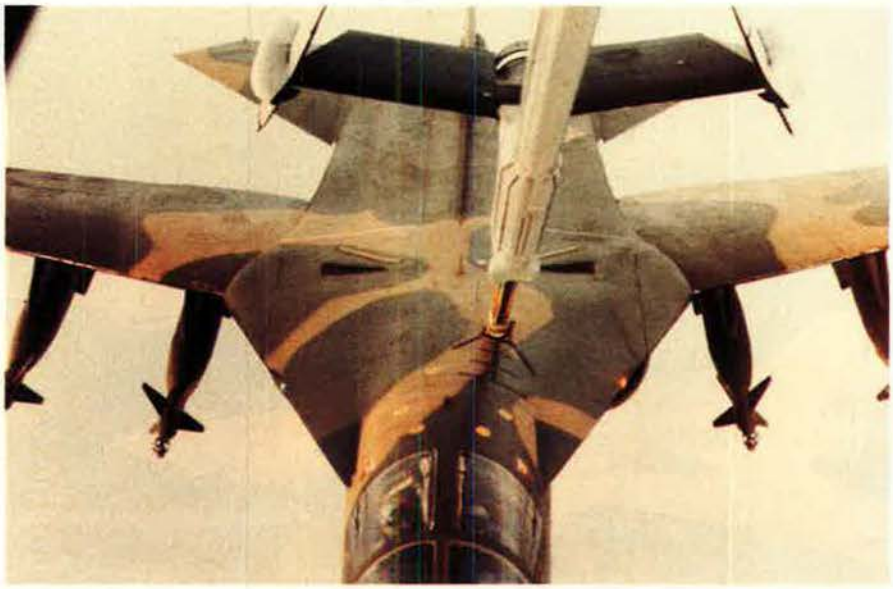


Photo via Jim Rotramel

With only the UK offering use of its bases, US aircraft faced a long flight to Libya. The round trip required eight to 12 in-flight refuelings for each airplane—this one, from Karma Flight, armed with 2,000-pound laser-guided bombs.

USAF strike aircraft and four EF-111F electronic warfare aircraft from the 42d Electronic Combat Squadron, RAF Upper Heyford, UK. The lead KC-10 controlled the F-111s.

The size of the attack force went against the judgment of the 48th's leadership, including that of its commander, Col. Sam W. Westbrook III. With the possibility of surprise gone, the 48th felt that the extra aircraft meant there would be too much time over target, particularly for the nine aircraft assigned to strike the Azziziyah Barracks. Libyan defenses, already on alert, would have time to concentrate on the later waves of attackers.

Secretary of Defense Caspar Weinberger, however, was an advocate of a larger strike, and he was supported in this by Gen. Charles A. Gabriel, Chief of Staff of the Air Force, Gen. Charles L. Donnelly Jr., commander of United States Air Forces in Europe, and Maj. Gen. David W. Forgan, Donnelly's operations deputy.

The three USAF officers believed the large force increased the possibility of doing substantial damage to the targets.

On the Navy side, the Sixth Fleet was to attack with the forces arrayed on two carriers. *Coral Sea* launched eight A-6E medium bombers for the attack and six F/A-18C Hornets for strike support. *America* launched six A-6Es for the attack and six A-7Es and an EA-6B for strike support. F-14s protected the fleet and aircraft.

A high alert status characterized Soviet vessels in the Mediterranean monitoring ship and aircraft movement. Libya's vast air defense system was sophisticated, and its operators were acutely aware that an attack was coming. In the wake of the raid, the US compared the Libyan network with target complexes in the Soviet Union and its satellites. Only three were found to have had stronger defenses than the Libyan cities.

The difficulties of the mission were great. Most of the crews had never seen combat. Most had never refueled from a KC-10, and none had done so at night in radio silence. The strike force did benefit from the presence of highly experienced flight leaders, many of them Vietnam combat veterans. They were flying the longest and most demanding combat mission in history against alerted defenses—and doing it in coordination with a naval force more than 3,000 miles distant.

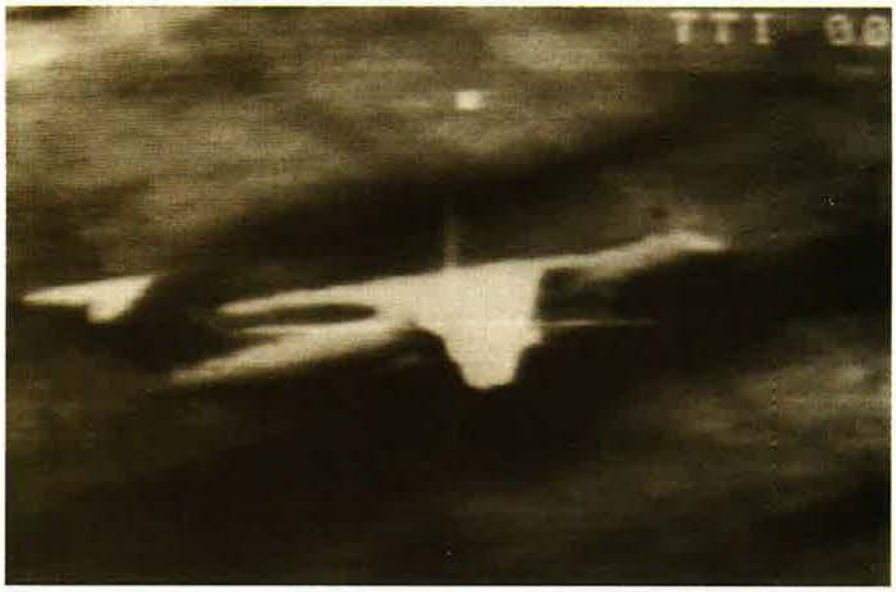


Photo via Denis Giangreco

The Pave Tack bombing system, with an infrared camera and laser designator, allowed the F-111 WSO to see the 500-pound bombs approaching the target, an IL-76 transport at the former Wheelus AB, Libya.

Timing was absolutely critical, and the long route and multiple refuelings increased the danger of a disastrous error. The Air Force and Navy attacks had to be simultaneous to maximize any remaining element of surprise and to get strike aircraft in and out as quickly as possible.

Rules of Engagement

Mission difficulty was compounded by rigorous Rules of Engagement. These ROE stipulated that, before an attack could go forward, the target had to be identified through multiple sources and all mission-critical F-111 systems had to be operating well. Any critical system failure required an immediate abort, even if an F-111 was in the last seconds of its bomb run.

At about midnight GMT, six flights of three F-111Fs each bore down on Tripoli. Fatigue of the long mission was forgotten as the pilots monitored their terrain-following equipment. The weapon system officers prepared for the attack, checking the navigation, looking for targets and offset aiming points, and, most important of all, checking equipment status.

The first three attacking elements, code-named Remit, Elton, and Karma, were tasked to hit Qaddafi's headquarters at the Azziziyah Barracks. This target included a command and control center but not the Libyan leader's nearby residence and the Bedouin–style tent he often used. Westbrook proved to be prescient in his belief that nine aircraft were too many to be put against the Azziziyah Barracks, as only two of the nine aircraft dropped their bombs. These, however, would prove to be tremendously important strikes.

One element, Jewel, struck the Sidi Balal terrorist training camp where there was a main complex, a secondary academy, a Palestinian training camp, and a maritime academy under construction. Jewel's attack was successful, taking out the area where naval commandos trained.

Two elements, Puffy and Lujac, were armed with Mk 82 Snakeye parachute-retarded 500-pound bombs, and they struck the Tripoli airport, destroying three Ilyushin IL-76 transports and damaging three others as well as destroying a Boeing 727 and a Fiat G. 222.

Flying in support of the F-111 attacks were EF-111As and Navy A-7s, A-6Es, and an EA-6B, using HARM and Shrike anti-radar missiles. Similar defense suppression support, including F/A-18s, was provided across the Gulf of Sidra, where Navy A-6E aircraft were to attack the Al Jumahiriya Barracks at Benghazi, and to the east, the Benina airfield. The Navy's Intruders destroyed four MiG-23s, two Fokker F-27s, and two Mil Mi-8 helicopters.

Puffy and Lujac attack elements, armed with Mk 82 Snakeye parachute-retarded 500-pound bombs like these, struck the Tripoli airport. The operation led to F-111 changes that would make the aircraft invaluable in the Gulf War.

The Air Force F-111Fs would spend only 11 minutes in the target area, with what at first appeared to be mixed results. Anti-aircraft and SAM opposition from the very first confirmed that the Libyans were ready. News of the raid was broadcast while it was in progress. One aircraft, Karma 52, was lost, almost certainly due to a SAM, as it was reported to be on fire in flight. Capt. Fernando L. Ribas–Dominicci and Capt. Paul F. Lorence were killed. Only Ribas–Dominicci's body was recovered; his remains were returned to the US three years later.

Adrenaline Rush

As each F-111 aircraft exited the target area, they gave a coded transmission, with "Tranquil Tiger" indicating success and "Frostee Freezer" indicating that the target was not hit. Then the crews, flushed with adrenaline from the attack, faced a long flight home, with more in-flight refuelings, the knowledge that one aircraft was down, and the incredible realization that the raid's results were already being broadcast on Armed Forces Radio. The news included comments from Weinberger and Secretary of State George P. Shultz. One F-111F had to divert to Rota AB, Spain, because of an engine overheat. The mission crew was returned to Lakenheath within two hours.

Early and fragmentary USAF post-strike analysis raised some questions about the performance of the F-111s. Even though all three targets had been successfully struck, only four of the 18 F-111s dropped successfully. Six were forced to abort due to aircraft difficulties or stringencies of the Rules of Engagement. Seven missed their targets and one was lost. There had been collateral damage, with one bomb landing near the French Embassy.

The combined Air Force–Navy raid resulted in 130 civilian casualties with 37 killed, including, it was claimed, the adopted daughter of Qaddafi.

Yet events were soon to prove that the raid had been a genuine success, and as time passed, its beneficial effects would be recognized. It quickly became obvious that Qaddafi, who had exultantly backed the bombing of others, was terribly shaken when the bombs fell near him. His house had been damaged and flying debris had reportedly injured his shoulder. He disappeared from the scene for 24 hours, inspiring some speculation that he had been killed. When he did reappear—on a television broadcast—he was obviously deeply disturbed, lacking his usual arrogance.

Libya protested but received only muted support from Arab nations. In its comments, Moscow was curiously nonjudgmental and withheld a strong endorsement of Qaddafi. More importantly, the following months would see a dramatic decrease in the number of Libyan–sponsored, anti–American terrorist events. The Red Army Faction, one of the groups that had claimed responsibility for the La Belle disco bombing, reduced its activities. Other Libyan–sponsored groups followed suit.

Slight Praise

It became evident that the F-111s and the carrier attack aircraft, ably assisted by Air Force and Navy support units, had achieved a signal success. Ironically, that success was not to receive much formal recognition. There was slight praise for the aircrews. The Air Force declined a nomination for a Presidential Unit Citation, although the Navy awarded its forces a Meritorious Unit Citation. This situation, with an excellent description of the attack, is covered in Robert E. Venkus' book, *Raid on Qaddafi*.

Operation El Dorado Canyon was carried out in the finest tradition of the Air Force. Its crews and aircraft were pushed to the absolute limits of their capability. Yet they prevailed, destroying key targets and shocking Qaddafi as a raid on Benghazi alone would never have done. More important, the effect of El Dorado Canyon went far beyond Libya, registering with the entire terrorist world.

Moreover, the raid demonstrated that the United States had the capability, using fighters and large numbers of land-based tankers, to make precision strikes from land bases at very great distances.

Perhaps as important, F-111 problems surfaced during El Dorado Canyon and the Air Force set about fixing them. This was to pay great dividends five years later when, during Operation Desert Storm, the F-111F Pave Tack system flew more missions and destroyed more targets than any other aircraft in that war. ■

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, "Stuart Symington," appeared in the February 1999 issue.*

Air Force U-2s, AWACS, and Rivet Joints have provided the eyes and ears of the no-fly zone operation.

Watch on the Desert

By William H. McMichael

Photo by William H. McMichael

A legend in reconnaissance, the U-2 has flown more than 70,000 feet above Iraq.

It was midmorning at 29,000 feet, where the dull gray, four-engine aircraft droned over northern Saudi Arabia. Back in the windowless gut of the loudly humming airplane, past two radio operators and a bank of computer hardware, 12 crewmen stared at green radar screens dotted with colored marks

Photo by Ted Carlson

E-3 Sentry (AWACS)
Function: airborne surveillance, C^3
Contractor: Boeing
Power Plant: four Pratt & Whitney TF33-PW-100/100A turbofans
Thrust: 21,000 pounds each engine
Length: 152 feet, 11 inches
Wingspan: 145 feet, 9 inches
Height: 41 feet, 9 inches
Speed: 530+ mph
Ceiling: above 29,000 feet
Weight: 335,000 pounds (gross)
Endurance: 6 hours (unrefueled)
Flight Crew: four
Mission Crew: 20 specialists
Date Deployed: 1977
Inventory: 32

The E-3B AWACS helps provide a detailed picture of Iraqi air activity.

floating over electronic maps of Saudi Arabia, Iraq, and Kuwait.

One of the marks moved every few seconds as its position received regular electronic updates. It denoted a high-flying Air Force U-2 reconnaissance aircraft soaring over Kuwait on its way into Iraqi airspace. On the screen, a red horizontal line marked the 33d parallel. To the north of that line, another four marks indicated the presence of Iraqi aircraft—some identified, some not. At least one was a military jet. To the south of the line lay the southern third of Iraq.

Another mark on the screen—an X just south of Iraq—represented the location of the Air Force E-3C Airborne Warning and Control System airplane, in which I was a passenger. It is one of the keys to United States surveillance of Iraqi military activity south of the 33d. Still another mark indicated the presence of an RC-135 Rivet Joint, the Air Force's electronic reconnaissance aircraft. The Rivet Joint also was orbiting south of Iraq and searching for signals from Iraqi Surface-to-Air Missile sites.

The airliner-sized AWACS gave US military forces a broad, all-weather electronic snapshot of airborne objects and a wide-ranging ability to communicate and to command and control friendly air forces. Data from the AWACS, communications signals gathered by the equally large RC-135, and information from other classified intelligence sources provided a comprehensive and detailed sense of Iraqi military activity.

One-Minute Line

Baghdad's military aircraft are not permitted to fly over the southern third of Iraq, nor over the northern third. This is part of the fallout from the 1991 Persian Gulf War and Saddam Hussein's subsequent attacks on his own people. On this morning, a second Iraqi fighter appeared bent on testing the prohibition. It dipped across the "one-minute line"—meaning that, after one more minute of southward flight, it would cross the 33d parallel and "become a bad guy," as one airborne technician termed it.

Below the 33d, two F-15 fighters of the 27th Fighter Squadron, Langley AFB, Va., were weaving back and forth within "the box," as the southern third of Iraq was known. Pilots in the air superiority aircraft waited as the Iraqi aircraft headed south.

An AWACS operator drew an electronic line between the positions of

Photo by William H. McMichael

Inside the AWACS these specialists track aircraft over Saudi Arabia, Iraq, and Kuwait. The AWACS also gives coalition forces an ability to communicate to aid command and control of friendly air forces.

the Iraqi fighter and the nearest F-15, instantly calculating the heading of the interloper, its range, and the time it would take for it and the F-15 to close on each other. It was information that would simplify the US fighter pilot's job in the event he were called on to shoot.

SSgt. Rich Holley, an AWACS radar operator, pointed to the screen and indicated a narrow triangle of space to the front of the F-15s. "They [the pilots] are only seeing this, right here," he said. He added, "We're seeing everything."

That sort of information has always given American fighters a huge advantage during operations over the largely flat desert. "The bad guy has nothing to hide behind," explained Lt. Col. Jimmy Clark, an F-15 pilot who was serving then as the 27th FS's operations officer.

The conflict was not to be on that day. After a few more seconds, the Iraqi fighter pilot folded his cards, turned, and headed back northward. For an AWACS crew in the Middle East, it was a typical mission, spent watching and waiting. SrA. Jason Rucker, an airborne computer technician, summed up the daily duty as "waiting for it to hit the fan." Capt. Craig Campbell, a veteran F-15 pilot with the 27th, said, "We see a lot of nonsense."

The level of air activity, however, has picked up considerably since the start of the new year as US and Iraqi forces clashed on numerous occasions in both no-fly zones. Sporadically, Iraq has challenged no-fly zone enforcement. In the aftermath of Operation Desert Fox in December 1998, these challenges have increasingly taken the form of threats to coalition aircraft from Iraqi aircraft operating in the no-fly zones and SAM sites on the ground. As a result, contributions of USAF's surveillance and reconnaissance aircraft have become more valuable than ever.

Inside the unarmed AWACS, marked by a distinctive rotating radar dome mounted over its rear section, the operators sat quietly, staring at their radar screens, occasionally murmuring a comment into a microphone or to a colleague. Their focus was on the big picture—a constant, real-time assemblage of intelligence from a variety of sources.

Photo by William H. McMichael

F-15s taxi out for another sortie. Since Desert Fox, coalition aircraft have faced increasing threats from Iraqi aircraft and SAM sites, making information from the E-3s and other reconnaissance aircraft even more important.

Lords of the Dance

"All the assets are choreographed," said Maj. Sean Mercadante, director of operations for the 4405th Airborne Air Control Squadron (Provisional), the AWACS unit then conducting no-fly zone missions out of Prince Sultan AB, Saudi Arabia. "We're kind of the glue that holds it all together."

Photo by Ted Carlson

The RC-135V is a mass of specialized antennas and equipment.

RC-135V/W (Rivet Joint)
Function: electronic reconnaissance
Contractor: Boeing, Raytheon
Power Plant: four Pratt & Whitney TF33-P-5/9 turbofans
Thrust: 18,000 pounds each engine
Length: 134 feet, 6 inches
Wingspan: 130 feet, 10 inches
Height: 38 feet, 4 inches
Speed: 500+ mph
Ceiling: 45,000 feet
Weight: 299,000 pounds (gross)
Endurance: more than 8 hours (unrefueled)
Flight Crew: four
Mission Crew: 25–35 specialists
Date Deployed: 1973
Inventory: 14

The onboard AWACS crew was divided into four sections. Three crew members were in charge of flying the airplane. A group of technicians made sure that the electronics were functioning. The weapons section controlled the fighters that were flying farther north. The surveillance group studied various sectors of the area of responsibility.

"We're looking for any tracks approaching us," said Capt. Mark Hahnert, a surveillance officer responsible for radar operations. "You look at the speed, look at the altitude, how he's flying. Is he acting like an airliner or a military jet out there doing proficiency flying?"

Radar alone can't identify specific aircraft, the observers said.

Photos by William H. McMichael

Two technicians help a U-2 pilot prepare for his flight; prebreathing oxygen is vital to helping him survive in the high altitudes at which the U-2 flies. The photo at top shows a camera mounted below and just aft of the cockpit. The reconnaissance aircraft's collection of high-resolution cameras and sensors can map everything on the surface of Iraq.

Knowing the lay of the land, such as the locations of Iraqi military airfields, helped narrow the possibilities that one blip could represent. However, it was the combination of intelligence not only from AWACS but also from various other platforms that helped the spotters determine whether a track represented a MiG-29 or a civilian airliner.

The RC-135 was one major source. The information collected and processed by the Rivet Joint was used "to fill a lot of gaps" in the air picture, said Lt. Col. John Preisinger, then the commander of the 4416th Intelligence Squadron (P).

Not much can be said about operations of the Rivet Joint. The aircraft's systems are highly classified, and those who work with the aircraft are a tight-lipped bunch. Asked if the system could intercept, say, cellular phone calls, Lt. Col. Garry Evans of the 4407th Reconnaissance Squadron (P) stonily replied, "That's too much detail."

The officers said the US had two Rivet Joints in the theater and that they each carried a mission crew of 22 to 33 people. The onboard airborne mission supervisor and analyst are almost always linguists. In December, the Rivet Joint system passed the milestone of 3,000 continuous days of service in the Middle East. Information collected by RC-135s is shared with the AWACS, all US, British, and French fighters operating in "the box," and "all the command and control folks" as Evans termed them.

The Rivet Joint crews generally come to the desert for 30-day visits; unit staffers spend four months at Prince Sultan AB. The visits are frequent. "This is my 22d trip," said TSgt. Steve Rasmussen, an airborne maintenance technician on the Rivet Joint. He made his first trip to the desert in October 1990, during the buildup to the Gulf War.

Onboard directors in both AWACS and the Rivet Joint have spent as many as 200 days a year flying out of Prince Sultan. The systems, as well as the fighters, are kept aloft by KC-135 fuel tankers, which fly the same orbit patterns and whose crews come here for an average of 120 days annually.

Bad Guys Aren't Boring

The intelligence gathering work is quiet, cerebral. Like the AWACS, the Rivet Joint crews patiently cruise far above the desert floor, often for 10 or more hours at a stretch, watching and listening for anything out of the ordinary. "It's not boring, routine, or mundane," Evans said. "Those are bad guys, and they're out to get us."

Meanwhile, the U-2 continued to make its way north on a search for evidence of Iraqi weapons of mass

Photo by William H. McMichael

U-2R/S
Function: high-altitude reconnaissance
Contractor: Lockheed
Power Plant: one General Electric F-118-GE-101 turbojet
Thrust: 17,000 pounds
Length: 63 feet
Height: 16 feet
Wingspan: 103 feet
Speed: 430+ mph
Weight: 40,000 pounds (gross)
Range: more than 4,500 miles
Ceiling: above 73,500 feet
Crew: one
Date Deployed: 1955
Inventory: 35

The U-2s bore UN markings when they were conducting tasks for the United Nations.

destruction. Such missions were so typically uneventful that the pilot, USAF Maj. Greg Dotter, said he often turned to taped music to pass the time and fend off boredom. This mission called for Dotter to fly across nearly all of Iraq and make many turns—so many, he said, "I'll be busy today for most of the flight."

As Dotter soared along at altitudes exceeding 70,000 feet, the U-2's classified collection of high-resolution cameras and sensors mapped everything on the surface of Iraq. Every time that he flew, for more than nine hours running, Dotter knew that he and his large airplane formed a big target—and, undoubtedly, a temptation for Iraqi SAM operators. Information gathered during the overflights was used to help track the Iraqi military.

In all of those operations, the U-2s were conducting tasks for the United Nations, under the control of US Central Command. Chief UN weapons inspector Richard Butler on Jan. 11 announced a temporary suspension of UN requests for U-2 spy flights over Iraq while the UN Security Council debated what to do about Iraq's refusal to cooperate with arms inspectors.

Butler said the U-2 flights had provided vital information to inspectors trying to track Iraqi weapons. For that reason, the flights had been roundly condemned by Baghdad. The Iraqi regime always was given formal advance notification of each U-2 mission and was asked to formally acknowledge receipt of the notification.

The Iraqis, however, always issued those receipts through clenched teeth; Saddam Hussein had even threatened to shoot down a U-2. US officials knew that two of Iraq's three anti-aircraft missile systems were capable of reaching the U-2 in its lofty perch. Iraqi radar tracked the flight but did not "lock on" to the U-2 with missile-firing radars.

All of which meant that Iraq and Saddam Hussein were never far from Dotter's thoughts. "It certainly heightens your awareness when you fly into the missile rings," he said, "and they've got active missiles sitting down there." It also made the mild-mannered airman fully aware of just how vulnerable a pilot actually was. Said Dotter: "It's just a matter of them not turning on the switch, that keeps you safe."

Cramped

U-2 flights always put harsh demands on the pilots. Whether in the Gulf or someplace else, the glider-like U-2 is notoriously difficult to fly, a problem made worse by the fact that the pilot is cramped into a motion-limiting space suit. Missions are very long; pilots must urinate into a special tube and eat specially prepared food out of tubes.

Late in the mission, when fatigue begins to set in, the pilot then has to land the wide-winged jet without being able to see the runway. A chase car speeding down the runway behind the U-2 calls out the height of the landing gear and talks the pilot down to the ground. Landing, Dotter said, is "all hit or miss." He added: "It's the most difficult airplane I've ever flown."

Dotter, as well as the other 34 Air Force U-2 pilots, admitted that he liked the sense of flying so high. "Well, I'll tell you, the view is fabulous," said Dotter, as others attended to the helmet to the orange space suit. "When you're just east of Lake Tahoe, you can see, on a good day, Salt Lake [City] and San Francisco at the same time."

That's hardly the same as flying over Iraq, but Dotter said he doesn't fly scared. "It's the job. It's what I signed up to do," he said. "If that's what the President and the good people of the United States think we should do to protect our interests, I have no problem being here." ■

William H. McMichael, the military reporter for the Newport News, Va., Daily Press, *recently visited US Air Force units in Saudi Arabia. His most recent article for* Air Force *Magazine, "Desert Stronghold," appeared in the February 1999 issue.*

DOD Senior Leadership

As of Feb. 1, 1999

Compiled by Chanel Sartor, Editorial Associate

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PDUSD	Principal Deputy Undersecretary of Defense
DUSD	Deputy Undersecretary of Defense
ASD	Assistant Secretary of Defense
PDASD	Principal Deputy Assistant Secretary of Defense
DASD	Deputy Assistant Secretary of Defense

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Lucky Lady II

By Bruce D. Callander

On July 25, 1909, Louis Bleriot took off from a field in France, flew his flimsy monoplane northward for half an hour, and landed near Dover Castle in England. The flight—at the time, daring beyond belief—caused a sensation in Britain.

Forty years later, Capt. James G. Gallagher and a 13-man crew took off from Carswell AFB, Texas, in a B-50 bomber named *Lucky Lady II*. Four days later—50 years ago this month—they landed back at Carswell. This achievement, the first nonstop flight around the world, also stirred the public imagination.

Neither event involved a major breakthrough in technology, but each was significant for other reasons.

Bleriot's flight lasted a mere 37 minutes. In several demonstration flights in France during the previous year, Wilbur Wright had stayed aloft much longer. What caught the public's imagination was that Bleriot had actually *crossed* the English Channel. This narrow waterway separating England and Europe had not been traversed this dramatically since the invasion of William the Conqueror in 1066.

"Britain's impregnability has passed away," warned a London newspaper. "Airpower will become as vital as sea power."

Similarly, *Lucky Lady II* was not the first airplane to circumnavigate the Earth. That feat had been accomplished 25 years earlier by two

Fifty years ago this month, a production-model B-50 with a regular crew made the first nonstop flight around the world.

Air Service biplanes dubbed the "Douglas World Cruisers." In fact, *Chicago* and *New Orleans* had flown a route almost 3,000 miles longer than that covered by the *Lady,* and they logged almost four times as much air time.

Nor was *Lucky Lady's* 94 hours, one minute aloft a record for flight duration. Twenty years earlier, a Fokker C-2 named *Question Mark* had stayed airborne for more than 150 hours. In that case, Maj. Carl A. Spaatz and his crew did all their flying in circles over southern California, but, in the process, they pioneered the refueling techniques that would make it possible for *Lucky Lady II* to circle the globe nonstop.

Timing Was Everything

What made the flight of *Lucky Lady II* more than just another record-setting event was its timing. Like the achievement of Bleriot's little airplane, the big B-50 flight demonstrated that distance and geographical barriers no longer offered sanctuary from airpower.

Consider the political climate of the late 1940s. World War II was over, but the Cold War was just beginning. The Soviet Union had blocked land access to Berlin and Allied airplanes were struggling to keep the city supplied by air through the Berlin Airlift. Meanwhile, the Soviets were rebuilding their forces and tightening their grip over most of Eastern Europe.

The war had demonstrated the effectiveness of strategic bombing, but the US had scrapped much of its wartime air armada and demobilized most of its troops. It still had substantial numbers of the B-29s, the airplanes that had pounded Japan into final submission, and it was stepping up deliveries of an advanced Superfortress, the B-50.

For the moment, at least, Washington still also held a monopoly on nuclear weapons. However it still was years away from developing an intercontinental ballistic missile delivery system, and, although the long range B-36 bomber was in development, much of the world remained beyond the unrefueled range of any US–based aircraft then in quantity production.

Needed, air leaders decided, were some dramatic demonstration flights to convince the Soviets that the US still could mount a credible attack with on-hand forces and that the USSR was not invulnerable. Such demonstrations also would help the Air Force at home. Less than two years old, the new service still was struggling for public recognition and still competing with the Navy for a share of the strategic mission.

No one realized the importance of imagery better than Air Force Gen. Curtis E. LeMay. He had taken over Strategic Air Command in October 1948 and begun to reorganize and rebuild it. Early on, he realized it was important to showcase SAC's capabilities, both to discourage Soviet aggression and to win the support of a war-weary US public reluctant to spend heavily on peacetime forces.

Just months before LeMay had taken command, SAC had sent three B-29s on a world flight, but it had not been the unqualified success the Air Force had hoped for. One of the bombers crashed. The other two, *Gas Gobbler* under Lt. Col. R.W. Kline and *Lucky Lady* under 1st Lt. Arthur M. Neal, completed the trip in less than 104 hours but a commercial airliner already had done it faster.

LeMay's Demonstrations

In late 1949, LeMay launched a series of demonstration nonstop flights from Texas to Hawaii and back. One B-50 on the runs dropped a dummy bomb in the harbor on Dec. 7, the anniversary of the Japanese attack on Pearl Harbor. It was refueled in midair by a B-29 modified into a tanker. If a B-50 could fly that far by refueling en route, it followed that it could reach any point on Earth the same way. To prove it, the Air Force began planning a nonstop flight around the world.

Refueling during a four-day mission would be the main challenge. State-of-the-art fuel transfer still had not advanced far beyond that which had kept *Question Mark* aloft for six days in 1929. Called a drogue system, it involved one airplane's letting out a cable which the other grabbed and brought on board. A hose attached to the cable then was reeled in and connected at one end to the tanker's system and at the other to the receiver's tank. Gravity did the rest.

With radar still unreliable, this process was best accomplished in daylight. This meant scheduling four hookups, spaced about equally along the route so the B-50 could reach each of them in the morning hours. Accordingly, SAC dispatched the tankers to existing US bases at Lajes Field in the Azores, Dhahran Field in Saudi Arabia, Clark Field in the Philippines, and Rogers Field in Hawaii.

Lucky Lady II's crew, home from the first nonstop around-the-world flight, receive congratulations from a host of USAF officials, including Secretary of the Air Force Stuart Symington, shaking hands with aircraft commander Capt. James Gallagher.

Picked as the primary aircraft for the mission was a B-50 dubbed *Global Queen*. Selected as a backup aircraft was a second bomber bearing the tail #B-5046010. It was called *Lucky Lady II*.

The *Queen* took off from Carswell on schedule and flew eastward. It crossed most of the Atlantic before engine troubles forced the pilot to abort the mission and land in the Azores. *Lucky Lady II*, the understudy now in a position to become the star, took off from Carswell in a low overcast on the next morning, Feb. 26, 1949.

Except for modifications required for the trip, the *Lady* was an off-the-shelf B-50, complete with armaments. She carried a normal crew, manned two deep in most positions. Gallagher was the aircraft commander and Neal, who had commanded the original *Lucky Lady* on her world flight, was second pilot. Capt. James H. Morris was copilot.

The crew included two navigators, Capt. Glenn E. Hacker and 1st Lt. Earl L. Rigor, and two radar operators, 1st Lt. Ronald B. Bonner and 1st Lt. William F. Caffrey. Capt. David B. Parmalee, who had been on one of the earlier flights to Hawaii, was project officer for this flight and flew as chief flight engineer. Flight engineers were TSgt. Virgil L. Young and SSgt. Robert G. Davis. Radio operators were TSgt. Burgess C. Cantrell and SSgt. Robert R. McLeroy. Gunners were TSgt. Melvin G. Davis and SSgt. Donald G. Traugh Jr. All except for Parmalee were with the 63d Bomb Squadron, 43d Bomb Group.

Unblushing Promotion

While the flight was an unblushing attempt to promote USAF and SAC, the Air Force took pains to keep it secret while it was in progress. The ground crews who modified the bombers and tankers were not told about the mission. Nor did USAF inform the news media, which later protested the service's unwarranted secrecy.

To preserve the illusion that the flight was nothing out of the ordinary, the Air Force worked out an elaborate system for filing dummy flight plans. The *Lady* was to switch tail numbers with a tanker at each refueling point to

give the impression that it was going only a short distance. The Air Force wanted to be able to publicize a spectacular success, not have to explain a costly failure.

The first refueling began over the Azores the morning after takeoff. It took two hours, during which time the bomber and the tanker remained linked and had to maintain a tight formation. It was tiring work.

Later that day, the *Lady* flew past Gibraltar and across the Sahara Desert. The next morning, it made its second refueling over Saudi Arabia. This time, the transfer was complicated by turbulence as the airplanes moved through a line of thunderstorms. The operation went off without incident, but, as the B-50's log noted, the crew members were beginning to show signs of fatigue.

Heavy weather over the Philippines made the third refueling difficult as well and the operation had other problems. First, a chain on the hose reel broke and had to be repaired. Then, a tanker returning to Clark let down too soon and crashed, killing all aboard.

Here, too, the effort to disguise the nature of the flight almost failed. One of the tankers out of Clark had filed a flight plan for Honolulu, intending to switch tail numbers so the *Lady* could fly that leg undetected. When a sharp-eyed operations officer at Clark realized the distance was beyond the range of the B-29, however, he tried to recall the airplane. He was talked out of it and the Air Force's cover story remained intact.

Bad weather followed the crew to Hawaii and beyond. The fourth refueling was complicated again by mechanical problems, and crew fatigue aboard the *Lady* had increased. Still, the B-50 continued to perform well and the end of their ordeal was in sight.

The crew saw their fourth sunrise over El Paso, Texas, and at 9:22 a.m. on March 2, the *Lady* circled Carswell and landed. On hand to greet her were not only LeMay but Air Force Secretary Stuart Symington, Chief of Staff Gen. Hoyt S. Vandenberg, and a number of other dignitaries. And, when it had become clear that the mission was going to succeed, the media had been alerted, so the welcoming group included reporters and photographers.

Each crew member was awarded the Distinguished Flying Cross for the mission. Together, they later received the MacKay Trophy, given annually for the most meritorious flight of the year by an Air Force member, members, or organization. The first MacKay had gone to 2d Lt. Henry H. Arnold for a 30-mile flight in 1912, and later winners had included Capt. Edward V. Rickenbacker, Lt. Jimmy Doolittle, and LeMay himself. Appropriately, the crews of the two Douglas airplanes that had circled the Earth in 1924 also had received the MacKay.

A KB-29 refuels Lucky Lady II during a training mission for the B-50's historic flight. On the actual around-the-world journey, the Superfortress was refueled four times using the drogue system.

Among other things, the B-50's flight showed that, while aerial refueling was practical, something more efficient than the drogue system was needed. It spurred development of the flying boom and faster transfer systems.

The Main Point

The more important result, however, was to demonstrate that the Air Force's land-based bombers could reach any spot on Earth. The significance of that fact was not lost on the media. The Associated Press noted that potential enemies "may reason that no single one of their cities, should war come, would be safe."

The message was underscored less than eight years later when three SAC B-52s retraced the route of *Lucky Lady II* in less than half the time, making a simulated bomb run en route.

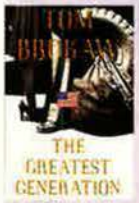
It was not until 1986, however, that an ultralight airplane named *Voyager* circled the Earth nonstop without refueling. Flown by Richard G. Rutan and Jeana L. Yeager, it was made of plastic and paper and carried more than five times its own weight in fuel. That trip took nine days and, by then, astronauts were circling the Earth in 90 minutes and several had circumnavigated the moon

Today, the flight of *Lucky Lady II* is ancient history. Its commander retired from the Air Force as a colonel. SAC itself disappeared in an Air Force reorganization. The *Lady* herself was all but destroyed in an accident not long after the world flight. Her fuselage was salvaged and toured for a time as a recruiting exhibit before going on display at an air museum in Chino, Calif. ■

Bruce D. Callander, a regular contributor to Air Force *Magazine, served tours of active duty during World War II and the Korean War. In 1952, he joined* Air Force Times, *serving as editor from 1972 to 1986. His most recent story for* Air Force *Magazine, "How Compensation Got Complicated," appeared in the January 1999 issue.*

Books

Compiled by Chanel Sartor, Editorial Associate



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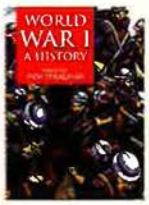

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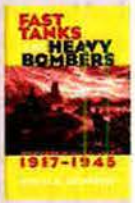

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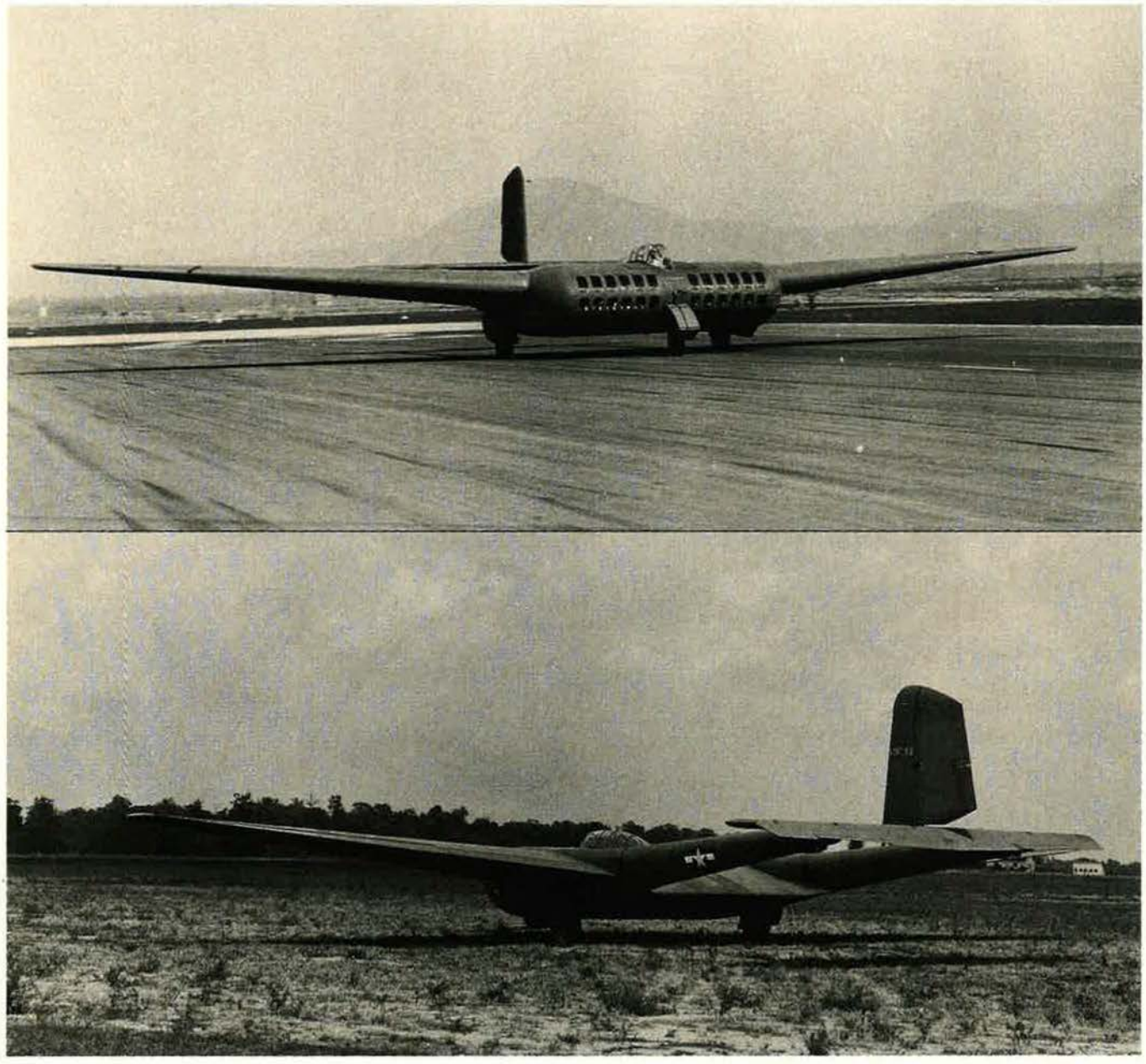
On a Wing



Sailplane and glider manufacturer William Hawley Bowlus began designing this flying wing glider, the XCG-16, in February 1942. It was a departure from the usual single-fuselage design of American gliders and introduced a twin boom. An early test flight of a full-scale model proved disastrous when it became unbalanced from weighted bags that were not tied down—the pilot and several passengers were killed. Despite this, Hawley's General Airborne Transport Co. received a contract in November 1943. The first glider was delivered six months late and at three times the cost estimate. The front of its wing opened like jaws, with the bottom swinging down to rest on the ground as a ramp. It could carry 42 troops or two howitzers. It had retractable landing gear, a 91.8-foot wingspan, and weighed 9,500 pounds empty. Testing at Clinton AAF, Ohio, and Orlando, Fla., revealed several shortcomings, such as inadequate crash protection, insufficient personnel exits, and restricted pilot visibility. The Army Air Forces terminated the contract in November 1944.

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AFA/AEF National Report

By Frances McKenney, Assistant Managing Editor

AFA Supports Full Burial Honors

Families seeking military honors at the funerals of veterans and retirees have had a difficult time securing a well-earned final salute for their loved ones. The Air Force Association is working to make sure that the family of every veteran or retiree wishing this honor receives it.

Correcting this problem has been a key item of interest for the association's Veterans/Retiree Council since February 1998.

In June, the council received a briefing and issue update from Gail McGinn, acting deputy assistant secretary of defense for personnel support, families, and education. According to McGinn, 537,000 veterans and retirees died in 1997. By 2008, that number is expected to rise to 620,000. With several rounds of base closures and a continuing decline in the number of active duty personnel, military honors have been increasingly unavailable to those who request them.

USAF photo by Lynn Davis

AFA National President Thomas McKee (right) presented MSgt. Gary Zimmerman with the AFA Academic Achievement Award at the Air Force Senior NCO Academy Class 99-A graduation at Maxwell AFB, Ala. At left is Col. William Shields, commander, College for Enlisted Professional Military Education.

AFA, the council, and, now, Congress have received numerous complaints about the need to correct this problem.

Sen. Patty Murray (D–Wash.), who had difficulty securing honors for her veteran father, said, "It is a final time for our country to show our appreciation to [veterans] and their families."

AFA agrees. In its 1999 Statement of Policy and Issue Papers on Personnel and Force Capabilities, the association said, "AFA believes veterans who request burial honors should not be denied. AFA supports enabling legislation and funding for burial honors."

The association brought the issue to the attention of members of Congress and their staffs during frequent Capitol Hill visits. At the AFA National Convention in September, the 587 delegates going to the Hill for the Congressional Breakfast Program

AFA Membership Directory Available Online—To Members Only

The *Air Force Association 50th Anniversary Directory of Members 1996,* which was printed in 1997, is now going to be accessible in a searchable format in the Members Only section of AFA's World Wide Web site.

The association is making this data available online to help respond to numerous member requests for help in locating old friends and compatriots.

The data about each individual is the same information he or she provided for the listing in the 1996 membership directory (with any address or telephone updates an individual may have already provided to AFA headquarters). The entries include name, address, home and work telephone numbers, fax number, e-mail address, rank/title, and AFA chapter affiliation.

If a member has notified AFA headquarters of address and telephone changes they will be incorporated into the online directory. If any of the other information has changed since the printing of the directory, a member can correct the data personally via the web site. (Visit AFA at www.afa.org, enter the Members Only area, and follow the instructions for correcting the listing.)

AFA plans eventually to include members not already listed in the 1996 membership directory in the online membership directory. However, automatic inclusion will not take place until each member has been notified and given a chance to opt out of the online directory.

NOTE: If for any reason a member does not want to be included in the online membership directory, he or she should contact the AFA Customer Service Department immediately. The record will be hidden from view. Customer Service can hide records at any time.

Telephone: 703-247-5800
Toll Free: 1-800-727-3337
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personally delivered to members and their staffs an AFA–prepared information card on the burial honors issue.

The Congressional education effort yielded results when the issue was included in the Fiscal 1999 Defense Authorization Act. DoD was told to assess the need and present a plan for resolution to Congress. The legislation said that the Secretary of a military department shall, upon request, "provide an honor guard detail for any veteran death that occurs after Dec. 31, 1999." The legislation specified, "The honor guard will consist of not less than three persons."

Since the act was passed, DoD has found that 45 percent of all veterans want honors. DoD also has established a joint working group to work with the services, Veterans Affairs, and military associations to define rules and procedures for a new system.

AFA has been active at these meetings to ensure the final plan meets the goals laid out in the association's issue paper. It is also working to ensure the final plan is disseminated widely to news outlets, veterans service organizations, and funeral directors.

—Kenneth A. Goss

Senior Advisors Meet

An Eaker Institute symposium on integrating air and space was the main event for AFA's senior advisors, who held their first meeting under the association's 1999 leadership in January in Arlington, Va.

The symposium's panelists were retired Gens. Thomas S. Moorman Jr., former USAF vice chief of staff; and Howell M. Estes III, former commander in chief, US Space Command; and John M. "Mike" Borky, deputy chairman, Air Force Scientific Advisory Board. Rebecca Grant, president of Independent Research and Information Services Corp., served as moderator.

Following the morning symposium, the senior advisors engaged in debate on how AFA can be an even more active advocate for the Air Force. They discussed issues such as how AFA should respond to the challenge of aerospace integration. They also received a briefing on the self-imposed limits of airpower and were updated on the Air Force Memorial.

National President Thomas J. McKee announced to the group that retired Gen. Lawrence A. Skantze is the new chairman of AFA's Science and Technology Committee. Skantze headed Air Force Systems Command before his retirement.

AFA's nine senior advisors, who were appointed from the association's roster of national directors emeriti in November 1997, are John R. Alison, Russell E. Dougherty, George M. Douglas, Jack B. Gross, Martin H. Harris, H.B. "Buzz" Henderson, William V. McBride, Julian B. Rosenthal, and William W. Spruance. National Director Emeritus R.L. Devoucoux was invited to join this session to add a New England perspective to the discussions.

History Revisited

As part of a highly successful historical lecture series sponsored by the **Palm Springs (Calif.) Chapter,** two F-15Es and their crews spent three days at the Palm Springs Air Museum, drawing enthusiastic crowds.

According to John W. Lynch, chapter past president, the crews, from the 333d Fighter Squadron, Seymour Johnson AFB, N.C., spoke to the audience about the fighter aircraft's capabilities and the Air Force mission.

Lynch said Capt. Andrew D. "Dan" Spires, one of the F-15E pilots, is a graduate of the local high school and had stopped by the museum on a previous visit home. Spires suggested that he could bring an F-15E from the squadron—whose mission is to train Strike Eagle aircrews—to the museum, and Lynch took up the offer.

The visit focused attention on the historical lecture series that the Palm Springs Chapter has been cohosting at the museum for more than a year.

Every other Saturday, the chapter has alternated with an Association of Naval Aviation chapter in presenting a 50-minute program. They have covered topics such as

John Lynch (second from left), past president of the Palm Springs (Calif.) Chapter, arranged for F-15E crew members (l–r) Capt. Andrew Spires, Capt. Karl von Luhrte, RAF Flight Lt. Graeme Davis, and Maj. Wiliam Mullins, from Seymour Johnson AFB, N.C., to participate in a program cosponsored by the chapter, now headed by John Hill (second from right).

Rep. Terry Everett (R–Ala.) (center) spoke at a Montgomery (Ala.) Chapter meeting, where (l–r) Lt. Col. Jimmie Varnado, Nancy Zehrer, Mark Dierlam, and Col. Robert Kraynik received Medals of Merit. Varnado and Kraynik are AFA presidential advisors. Zehrer is chapter vice president for AFROTC affairs, and Dierlam is chapter secretary.

World War II aces, Operation Market Garden, attacks on ball-bearing plants at Schweinfurt, Germany, the Battle of Leyte Gulf, and the Grumman F6F Hellcat. One lecture featured former President Gerald R. Ford, who was a Navy lieutenant commander in World War II.

Preparing the programs takes a tremendous amount of work, Lynch acknowledged. He researches the topic, writes a narrative, rounds up speakers, and rehearses chapter members who can give firsthand accounts. The program "B-17 Target Schweinfurt," for example, called on three-minute oral histories from chapter members Marne Wilson, pilot, Donald L. Venne, ball turret gunner, and Faber H. Cripps, crew chief.

By tying the program to an anniversary, such as the September lecture that recalled the Sept. 17, 1944, Market Garden airborne landings, Lynch said he is able to interest local media in covering the events. A local TV station and a newspaper covered that presentation.

Little King Dedicated

A B-25J Mitchell was dedicated in a ceremony sponsored by the **Carl Vinson Memorial (Ga.) Chapter** at the Museum of Aviation at Warner Robins, Ga.

According to the museum, the bomber was among the last of a 1944 production run by North American Aviation in Kansas City, Kan. Delivered in August 1945, this B-25J never saw combat. However, it was restored and painted by museum staff and volunteers—including some from the 19th Air Refueling Group at Robins AFB, Ga.—to replicate *Little King,* a 310th Bomb Group bomber that flew 121 combat missions over Italy, France, Austria, Yugoslavia, and the Mediterranean Sea.

Ribbon-cutters at the dedication ceremony were Jack H. Steed, national vice president (Southeast Region); Martin Jubelt, chapter president; and chapter members Frank L. Cross and Patrick M. Bartness.

The dedication included a luncheon and a program featuring speeches by veterans Cross, who was a pilot with 50 B-25 combat missions over North Africa, and Frank Dean, a B-25 crew chief. The original *Little King* ended its combat career in 1945 at Fano, Italy. The new *Little King* is on display in the museum's Century of Flight Hangar.

In Two Air Forces

A former Romanian fighter pilot spoke to a meeting, hosted by the **Ladewig–Shine Memorial (S.C.) Chapter,** about his experiences flying against Russia during World War II and flying with USAF after he became an American citizen.

Leonid I. Maximciuc graduated at age 16 from the Romanian Air Force Academy in 1942 and volunteered a few months later for a group which attempted to fight the Soviets. By the age of 20, he had more than 2,800 combat flying hours and some 57 decorations. In December 1947, he was arrested by Romania's new communist government. He escaped, spent four years in Britain, then immigrated to the US. He worked as a mechanical engineer and joined the Civil Air Patrol. In 1954, he was drafted into the Army, then commissioned

A generous donation from Jack Gross, national director emeritus, has made it possible over the past six years for AFA to honor a staff member each quarter. Joining John Shaud (center), AFA executive director, are the 1998 winners (l–r) Cynthia Samuels of Customer Service, Patricia Brownelle from Administration, Suzann Chapman of Air Force *Magazine, and Don Whetstone from Management Information Systems. Chapman also won the 1998 Staff Award of the Year.*

and assigned to flight duty on L-19s, L-20s, and L-23s. Maximciuc eventually retired from the Air Force Reserve as a lieutenant colonel.

About 75 people attended this joint meeting in Myrtle Beach, S.C., of the AFA chapter and the local Daedalian chapter. Maximciuc is a member of the **Cape Fear (N.C.) Chapter.**

Honors for Aviano Work

For his organizing and leadership of the first Air Force JROTC unit at Aviano AB, Italy, James C. Harding received an AFA Citation at a **Ghost Squadron (Texas) Chapter** meeting in December. Thomas J. Kemp, national vice president (Southwest Region), presented the award.

A retired Air Force colonel, Harding flew 596 combat missions during the Vietnam War, as an air liaison officer/forward air controller and as commander of the 1st Special Operations Squadron at Nakhon Phanom, Thailand. He retired from active duty in 1979 and began starting up AFJROTC units from Kailua, Hawaii, to Ramstein AB, Germany.

By the time then–AFA National President Doyle E. Larson met him last summer during AFA outreach activities at Aviano, Harding had gotten 44 percent of Aviano High School's students involved in AFJROTC. The unit was cited by inspectors from AFJROTC headquarters as a model program, and Harding was named outstanding instructor for his three years at Aviano. Impressed by Harding's work, Larson recommended him for an AFA Citation.

According to Herbert Ames, Ghost Squadron Chapter president, Harding moved to the Brownsville, Texas, area last summer and will become commandant of a local AFJROTC unit. He is a chapter member.

Pearl Harbor Day Roses

New York's tricounty chapters—the **Nassau Mitchel Chapter,** the **Queens Chapter,** and the **Francis S. Gabreski Chapter**—hosted the Dec. 7 annual Dropping of the Roses ceremony, commemorating the anniversary of the attack on Pearl Harbor.

According to Fred DiFabio, Nassau Mitchel Chapter president, 500 people gathered at Republic Airport in Farmingdale, N.Y., for ceremonies.

Roy Pitter, Gabreski Chapter president, presented 57 American Beauty roses to Rose Rassmussen. They represented the 57 years since Pearl Harbor. Rassmussen flew in one of five SNJ-2 Texans in a flight of 18 aircraft that took off from Farmingdale and headed for the Statue of Liberty. She released the roses at precisely 12:55 p.m.—the same time the Pearl Harbor attack took place—as the aircraft flew over the waters by the statue.

This tradition was started in 1970 by Joseph S. Hydrusko, who was serving on a Navy hospital ship at Pearl Harbor at the time of the attack. Hydrusko dropped the roses from his own airplane in the first commemoration. Since his death in 1983, the ceremony has been carried out by his friends.

Edward W. Keil, Queens Chapter president; William G. Stratemeier Jr., New York downstate vice president; and representatives of local, state, and national legislators were on hand for the ceremonies at the airport.

Black Tie for the Cadets

At a December dining-in, the **Ark–La–Tex (La.) Chapter** presented eight $500 AFROTC scholarships to cadets from Louisiana Tech University in Ruston, La., and Grambling State University in Grambling, La.

The joint university black-tie affair was held at Grambling, with Brig. Gen. Regner C. Rider, 8th Air Force vice commander at Barksdale AFB, La., as guest speaker.

The cadets from Grambling were Anquenetta Blount, Gradie Moore, Lynnitha Velasques, and Rodney Wall. From Louisiana Tech, the cadets were Eric Faulk, Robert Fitzpatrick, Carl Huxley, and Quiana Royal.

Ivan L. McKinney, chapter project officer, said, "We're pleased to be able to help our future Air Force leaders when they need it most."

Luncheons in Tucson

Retired USAF Chief of Staff Gen. Ronald R. Fogleman told the audience at a **Tucson (Ariz.) Chapter** luncheon in October that support from organizations like AFA means a great deal to the troops in the field.

According to James I. Wheeler, chapter president, the general kept the audience laughing as he described his activities in retirement.

During the luncheon the chapter presented AFA Citations and $50 savings bonds to Amn. Rachel Saleric, 355th Wing Airman of the Quarter, and Joanne Squire, 355th Logistics Group Civilian Supervisor of the Quarter.

Brig. Gen. Barry W. Barksdale, commander, 37th Training Wing, at Lackland AFB, Texas, spoke to a November meeting of the chapter, outlining the wing's many training missions. He showed a video on the latest basic training curriculum for airmen, which, Wheeler said, "brought the older members of the audience up to date."

At the lunch, SrA. Ronald J. Ferris received an AFA Citation as distinguished graduate of Davis–Monthan's Airman Leadership School, Class 98-G. In addition, the chapter contributed $50 to the school's unit fund, as it does to honor the distinguished graduate in each of the school's eight classes per year.

AFA–Eaker Institute Colloquium

The Air Force Association and the Eaker Institute for Aerospace Concepts are sponsoring the "Defense Colloquium on Information Operations" in San Antonio, March 24–25, 1999.

In no other area is the pace and extent of technological change as great as in the realm of information. In the information age, increasingly complex information systems are critical to the conduct of military operations, and at the same time they open the door to a wide range of new vulnerabilities for military commanders. There is a need to attack an enemy's information systems and to protect one's own. However, it is not clear that organizational issues have been resolved that will ensure that information operations are effectively led and carried out coherently across the spectrum of concerned government and private agencies.

Invited speakers:

John J. Hamre, deputy secretary of defense

Gen. Lloyd W. "Fig" Newton, commander, Air Education and Training Command

Lt. Gen. Kenneth A. Minihan, commander, National Security Agency

John M. "Mike" Borky, deputy chairman, Air Force Scientific Advisory Board

Maj. Gen. John H. Campbell, vice director, Defense Information Systems Agency

Brig. Gen. John R. Baker, commander, Air Intelligence Agency and Joint Command and Control Warfare Center

The "Defense Colloquium on Information Operations" is one in a series of AFA–Eaker Institute defense colloquia that highlight key issues affecting national security.

For information, please contact Nikki Whitlock at 703-247-5838 or e-mail nwhitlock@afa.org.

To receive a complimentary registration form by fax, call AFA's Fax on Demand service 24 hours a day at 800-232-3563, and order document #0360, or visit the AFA website at www.aef.org/eak24mar.html

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Blue & Gold Celebrations

The **Newport Blue & Gold (R.I.) Chapter,** headed by Col. David T. Buckwalter, hosted the annual Air Force birthday celebration at the Naval War College in Newport, R.I. It included a flyover of F-15s from the 102d Fighter Wing, Otis ANGB, Mass.

Rhode Island AFA later held its first State Awards Dinner, with Charles L. Cragin, acting assistant secretary of defense for reserve affairs, as guest speaker. Phillip J. Sleeman, Aerospace Education Foundation treasurer, presented an AEF Educator Grant to Kathleen Mariano–Fleenor and a 1998 AEF Air Force Spouse Scholarship to Darcy Lynch. Dr. Eugene M. D'Andrea, state president, presented awards to Buckwalter, Susan Hanley, Donald Lagor, and Frank A. Romano.

Sleeman, R.L. Devoucoux, national director emeritus, and Joseph A. Zaranka, national director, presented a 1998 Exceptional Service Award to D'Andrea, who hosted the awards dinner with Buckwalter and Romano, **Metro Rhode Island Chapter** president.

More AFA/AEF News

■ The **Red River Valley (N.D.) Chapter** donated $250 worth of books-on-tape to the Fargo Veterans Affairs Medical/Regional Office Center in Fargo, N.D. With suggestions from the facility's Volunteer Services staff, the chapter got ideas on what kinds of books the medical center's patients would enjoy. Chapter members Capt. John F. Price Jr. and Capt. Stephanie P. Price headed the chapter's project.

■ Twenty-one teams from Hill AFB, Utah, participated in the fourth annual Chili Cook-Off sponsored by the **Northern Utah Chapter.** The event raised the largest amount yet—$3,700—donated to Hill's Family Support Center. The 75th Operations Support Squadron cooked up the Best Chili, while the Most Unusual Chili Award went to the Base Contracting team. The 388th Command Section were the People's Choice. The event raised the largest amount yet—$3,700. The funds help enlisted, single parents, and a parent whose spouse is deployed pay for babysitting services.

■ Georjean A. Bush received an AFA jacket at a **Fort Wayne (Ind.) Chapter** awards banquet, recognizing her as Great Lakes Region Teacher of the Year. Capt. Norris Cunningham, 122d Medical Squadron (ANG), was a guest speaker at the event. ■

AFA Conventions

April 30–May 2	**New Jersey State Convention,** Cape May, N.J.
May 7–8	**South Carolina State Convention,** Columbia, S.C.
May 7–8	**Tennessee State Convention,** Knoxville, Tenn.
May 13–16	**California State Convention,** Sacramento, Calif.
June 4–6	**Arizona–Nevada State Convention,** Laughlin, Nev.
June 4–6	**Iowa State Convention,** Sioux City, Iowa
June 4–6	**New York State Convention,** Binghamton, N.Y.
June 4–6	**Ohio State Convention,** Dayton, Ohio
July 17	**Minnesota–So. Dakota–No. Dakota State Convention,** Minneapolis, Minn.
July 17–18	**Virginia State Convention,** Arlington/Alexandria, Va.
July 23–25	**Pennsylvania State Convention,** Trevose, Pa.
July 23–25	**Texas State Convention,** McAllen, Texas
July 30–31	**Florida State Convention,** Daytona Beach, Fla.
July 30–31	**Washington–Oregon State Convention,** McChord AFB, Wash.
Aug. 14	**Georgia State Convention,** Warner Robins, Ga.
Aug. 20–21	**Colorado State Convention,** Colorado Springs, Colo.
Aug. 21	**Indiana State Convention,** Indianapolis, Ind.
Sept. 13–15	**AFA National Convention,** Washington, D.C.

Unit Reunions

2d Chemical Mortar Battalion and 461st Infantry Battalion (Korea 1950–53). Sept. 22–26, 1999, at the Radisson Inn & Suites, Colorado Springs, CO. **Contact:** William R. Thomas, 7418 Overdale Dr., Dallas, TX 75240 (972-387-1247).

Fourth Ferrying Group Assn, Air Transport Cmd (WWII). May 12–15, 1999, at the Holiday Inn, Downtown/Market Square in San Antonio. **Contact:** Rick and Gail Ravitts, 2410 Devonshire Dr., Rockford, IL 61107 (815-229-1122).

9th BG Assn. Aug. 20–23, 1999, at the Sheraton Needham, in Needham, MA. **Contact:** Herbert W. Hobler, 295 Mercer Rd., Princeton, NJ 08540 (800-244-1945).

15th Troop Carrier Sq (WWII). Sept. 19–21, 1999, at the Hanalei Hotel in San Diego. **Contact:** Dick Home, PO Box 2609, Wrightwood, CA 92397 (760-249-5237).

20th and 81st TFWs (RAFs Woodbridge and Bentwaters, UK). Sept. 23–25, 1999, in Altus, OK. **Contact:** Danny King, 1705 Crain Dr., Altus, OK 73521-1805 (580-482-3114).

27th FW (1947–58). Oct. 7–10, 1999, in Tucson, AZ. **Contact:** O.C. Van Hoesen, 4240 Lason Ln., Tucson, AZ 85749 (520-749-4030).

47th BW, 84th BS (B-45, B-66, and all units). Oct. 13–17, 1999, in San Diego. **Contact:** Charles Palmer, 511 Wellington Ave., Newark, OH 43055 (phone or fax: 740-345-3229) (crpalmer37@juno.com).

47th BG, A-20s (WWII). April 22–25, 1999, in Kansas City, MO. **Contact:** Costa Chalas, 64 Trapelo Rd., Belmont, MA 02178 (617-484-5620).

53d FDS/TFS F-100C pilots. April 30–May 1, 1999, at The Menger Hotel in San Antonio. **Contact:** C.M. Burns, 3301 Carter Creek Pkwy., Bryan, TX 77802 (409-846-0906) (cburns@cy-net.net).

68th Air Service Gp (China, WWII). Oct. 20–24, 1999, in Sacramento, CA. **Contact:** Leland Rasmussen, 2295 Whitney Blvd., Rocklin, CA 95677 (916-315-8016).

68th FIS (1950–55). June 3–5, 1999, at the Marriott Hotel Dayton in Dayton, OH. **Contact:** Lee Skinner, 11602 Grigsby Chapel Rd., Farragut, TN 37922-1612 (423-966-6488) or Jim Johnson, 54943 CSAH 16, Grove City, MN 56243 (320-857-2480).

69th FS (WWII, Korea). April 15–18, 1999, at the Holiday Inn in Valdosta, GA. **Contact:** George E. Mayer, 7445 Thomas Ave. S., Richfield, MN 55423-3513 (612-866-6073).

90th BS (LNI) (Korea). Sept. 30–Oct. 3, 1999, in Portland, OR. **Contact:** Mick Hogan, 1375 Quinn Rd., Woodburn, OR 97071 (503-981-0026) (2HOG2@OPEN.ORG).

303d ARRS (Long Beach and March AFB, CA, 1956–83). April 23–25, 1999, at the Primadonna Resort & Casino in Las Vegas. **Contact:** Herb Spencer, 303d ARRS Assn, PO Box 8339, Green Valley Lake, CA 92341-8339 (909-867-3061).

312th BG (A-20s, Pacific Theater). Sept. 30–Oct. 3, 1999, at the Regency Plaza Hotel in San Diego. **Contact:** William R. Hayman, 1478 Salem Ct., Oceanside, CA 92057-1810 (760-967-6918).

351st BG, Polebrook, UK (WWII). June 2–6, 1999, at the Quality Inn & Suites in Savannah, GA. **Contact:** Clint Hammond, PO Box 281, Mechanicsburg, PA 17055 (717-766-1489).

352d FG Assn and **1st Service Gp.** May 24–June 2, 1999, in the UK and Sept. 30–Oct. 3, 1999, in Nashville, TN. **Contact:** Dick DeBruin, 234 N. 74th St., Milwaukee, WI 53213-3629 (414-771-0744).

386th BG Assn, Eighth and Ninth AF (WWII). Oct. 14–17, 1999, at the Sheraton Park Central Hotel in Dallas. **Contact:** Skip Young, 5594 Buring Ct., Fort Meyers, FL 33919 (phone or fax: 941-482-5059) (skip386@aol.com).

406th Fighter–Bomber Gp, including the 512th, 513th, and 514th FBSs (RAF Manston, UK, in the 1950s). Sept. 23–26, 1999, in Dayton, Ohio. **Contact:** Dick Grace, 5609 Princeton Rd., Hamilton, OH 45011 (513-777-3591).

410th BG (ETO, WWII). May 5–8, 1999, at the Holiday Inn Old Town in Scottsdale, AZ. **Contact:** John Raths (602-274-6683).

474th FG Assn (WWII). July 1–5, 1999, in Seattle. **Contact:** Lloyd Wenzel, 204 Turtle Creek Dr., Tequesta, FL 33469 (561-747-2380).

Mail unit reunion notices well in advance of the event to "Unit Reunions," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information.

530th FS of the 311th FG (CBI, WWII). Sept. 24–27, 1999, at the Holiday Inn Hotel Tanglewood in Roanoke, VA. **Contact:** F.H. Wilbourne, 4118 Keagy Rd., Salem, VA 24153 (540-387-0562).

555th FS ("Triple Nickel"). May 14–16, 1999, in Las Vegas. **Contact:** William M. Goldfein, 2008 Faywood St., Las Vegas, NV 89134-6210 (702-233-8765) (rube@juno.com) with cc to: mark.coan@aviano.af.mil.

601st Aircraft Control and Warning Sq (Germany, 1954–61). Sept. 1–4, 1999, at the Marriott Portland Downtown in Portland, OR. **Contact:** Glen Griffitts, 7565 Ridgewood Dr., Gladstone, OR 97027-1460 (503-656-3161) (Gunpost@aol.com).

7330th Flying Training Wg (MAP) (Germany, 1953–60). June 24–27, 1999, at the Doubletree Guest Quarters Atlanta Galeri in Marietta, GA. **Contact:** Dick Mackel, 4969 Dewberry Cir., Acworth, GA 30101 (770-974-5631).

Aeromedical Evacuation Assn (1942–99). June 9–13, 1999, at the Pensacola Grand Hotel, Pensacola, FL. **Contact:** Wayne Everingham, 9750 Old Placerville, Rd., #229, Sacramento, CA 95827.

AF Postal and Courier Assn. June 1–4, 1999, at the Hope Hotel, Wright–Patterson AFB, Ohio. **Contact:** Jim Foshee, 3509 Deer Trail, Temple, TX 76504 (254-774-7303).

AGM-28 Hound Dog and ADM-20 Quail missile maintainers (SAC). April 30–May 2, 1999, at Robins AFB, GA. **Contact:** Carl Tischer (912-922-3735) or Maxcy Lewis (912-922-2759) (miminol@aol.com).

Air Rescue Assn. Sept. 22–25, 1999, in San Diego. **Contact:** ARA, 4853 Del Aire Dr., Del City, OK 73115-4803 or Emil P. Walke (405-672-1600).

ATC Hump Pilots, Ltd. April 28–May 2, 1999, in Mobile, AL. **Contact:** Arthur Sutton, 2154 Tudor Castle Way, Decatur, GA 30035-2164 (770-981-4640).

Aviano Reunion Assn. Dec. 12–19, 1999, Caribbean cruise. **Contact:** Emily Povey, 626 E. Davis Blvd., Tampa, FL 33606-3922 (813-251-4664) (empo@tampabay.rr.com).

Bolling AFB, B-25 Bunch. May 17–20, 1999, in Biloxi, MS. **Contact:** Clifford Smith, 5249 Old A & P Rd., Ripley, Ohio 45167-9747 (937-375-4671).

Boom Operators Assn. May 21–23, 1999, at Altus AFB, OK. **Contact:** SSgt. Kevin Beccard (580-481-7108 or DSN 866-7108) (beccardk@intplsrv.net).

China–Burma–India Veterans Assn. April 8–10, 1999, in Tucson, AZ. **Contact:** Bud Shipley (520-887-3473).

Christmas Island Task Force, central Pacific area, APO 915, all services. Sept. 9–12, 1999, in Bloomington, IL. **Contact:** Dorothy A. Garrels, PO Box 343, Benson, IL 61506 (309-394-2273).

OCS 58-B. April 28–May 1, 1999, in San Antonio. **Contact:** Jim Colvig, 716 Oak Hollow Dr., Kerrville, TX 78028 (830-257-4280).

Pilot Class 45-A, Enid, OK (basic and advanced) and Foster, TX (advanced). March 22–25, 1999, in Fort Worth, TX. **Contact:** Joe Engle, 6512 Arlington Webb Rd., Arlington, TX 76018 (817-465-6268).

Pilot Training Class 53-C. May 27–29, 1999, on the French Riviera. **Contact:** Class 53-C, 7741-A S. Curtice Dr., Littleton, CO 80120 (303-797-0420) (KCE7741@aol.com).

Santa Ana Army AB, CA (WWII). April 24, 1999, at Orange Coast College, Costa Mesa, CA. **Contact:** S.A.A.A.B. Wing, PO Box 1764, Costa Mesa, CA 92628 (949-631-5918).

SAC Data Systems Organization. April 15–17, 1999, in Austin, TX. **Contact:** James L. Crouch, 4010 Long Champ Dr., #26, Austin, TX 78746 (512-328-7311) (jcaustx@flash.net).

Seeking former **Bergstrom AFB, TX,** personnel for a reunion April 17–18, 1999, in Austin, TX. **Contact:** Kathy Pillmore, Public Relations, AeroFest '99 (phone 512-292-1194 or fax: 512-292-1163) (pillmore@texas.net).

Seeking members of **Pilot Class 49-A** (Randolph AFB, TX) for a reunion. **Contact:** Earl Steeb, 1302 S. 6th St., St. Joseph, MO 64501-3637.

Seeking members of the **United Nations Partisan Forces (Korea),** 8240th AU, 8242d AU, 6004th AISS, and associated units for a possible reunion. **Contact:** Bob Dewey, 4341 Thomas Dr., Box D5, Panama City Beach, FL 32408 (850-722-8397). ■

Bulletin Board

For a book, seeking war stories from **veterans** of all wars. Especially interested in hearing from those who trained in California. **Contact:** Joseph Freitus, 770 Green Cir., Venice, FL 34285.

Seeking **William F. "Bill" Johnston** of Pennsylvania, who was stationed at RAF Upper Heyford, UK, 1973–74. **Contact:** Val Maloney Alexander, 53 Hunt Rd., Tonbridge, Kent, UK TN10 4BE (01732-351894).

Seeking contact with **MSgt. Kenneth E. Palmer** of the 85th FIS, Scott AFB, IL, 1945–57. **Contact:** Ronald L. Laing, 19264 Fink Rd., Spartansburg, PA 16434 (814-654-7848).

Seeking old copies of ***Air Force* Magazine,** particularly from the 1980s. **Contact:** John M. Ford, 3630 S. Barrington Ave., Los Angeles, CA 90066 (310-397-6745).

Seeking the whereabouts of a display on the **AGM-28 Hound Dog and ADM-20C Quail** missiles carried by the B-52. **Contact:** Carl Tischer (912-922-3735) (miminol@aol.com).

For a permanent exhibit, seeking donations of artifacts from the **Mayaguez** rescue, **Somalia** (Restore Hope and Provide Relief), **Grenada** (Urgent Fury), **Haiti** (Uphold Democracy), **Panama** (Just Cause), and **Bosnia** (Provide Promise, Deliberate Force, Deny Flight, and Joint Endeavor) operations, as well as items from the Korean War. **Contact:** Charles Worman, US Air Force Museum/MU2, 1100 Spaatz St., Wright–Patterson AFB, OH 45433-7102 (937-255-8042) (cworman @afmsmtp.wpafb.af.mil).

Seeking **William "Billy" Sloan,** a P-38 pilot from Richmond, VA, who was living in Salmos, CA, 1943–44. **Contact:** Paul Burkhardt, PO Box 369, Atascadero, CA 93423-0369.

Seeking contact with **8th and 13th BSs,** 3d BG, members who flew the B-57 Canberras on missions over Vietnam in the mid-1960s, as well as information, patches, photos, and other memorabilia from these missions. **Contact:** Al Mark, PO Box 291, Sharpsburg, GA 30277 (almark52 @yahoo.com).

Seeking information on the **3928th Air Base Gp (SAC)** and detailed maps of the **RAF Sturgate,** UK. Also seeking contact with former **"Sturgate Farmers." Contact:** Ray Hunter, 1601 Dicken Dr., Ann Arbor, MI 48103 (rayhunt@engin.umich.edu) or Don Wilkinson, 122 Foxglove, Universal City, TX 78148 (laverl@gateway.net).

Seeking information on 92d BG pilot **Maj. Samuel P. Logan,** whose B-29 crashed in Korea Sept. 9, 1950, and his crew, Maj. Marvin J. Spence, Capt. Don Hyatt, and SSgt. Clarence M. Cherry. **Contact:** Don Wade, 560 Campbell Hill, Marietta, GA 30060-1316 (770-426-7883 or 770-432-3632).

Seeking **patches** from the 7th, 95th, and 97th BWs, the 341st BS, and the 95th Organizational Maintenance Sq. Also seeking all B-52 Southeast Asia patches. **Contact:** Ed Yingst, 224 Shadowoak Dr., Burleson, TX 76028-9030.

Seeking former crew members and personnel interested in nose art photos of **B-17s *Sad Sac* and *Gooney* and B-24 *Tough Titty*** taken at Henderson Field, Guadalcanal. **Contact:** Charles H. Easley, 19281 Forest Park Cir., Foley, AL 36535 (ceasley@gulftel.com).

Seeking contact with **Stephen Cotter,** who was stationed at Loring AFB, ME, in 1967. **Contact:** Sandra Ashworth, 527-895 Maple Ave., Burlington, Ontario, Canada L7S 2H7.

Seeking former members of the **37th FIS,** 14th FG, who were stationed at Ethan Allen AFB, VT, 1952–60. Also seeking unit memorabilia for display at the Vermont Veterans' Military Museum and Library. **Contact:** Walter E. Houghton, PO Box 658, Shelburne, VT 05482 (954-346-9249).

Seeking contact with **William J. Fisher,** a WWII fighter pilot from Greenwood, CT, assigned to the 45th FS, 15th FG, 7th FC, Seventh AF. He was last seen on Iwo Jima in June 1945. **Contact:** Robert E. Lehnherr, 3631 S. 257th St., Kent, WA 98032-5669 (253-854-2415).

For a book, seeking stories and photos from former USAF members stationed in **France. Contact:** Jean–Pierre Hoehn, 11 place des Halles, Strasbourg, France 67000.

Seeking contact with USAF personnel who spent time at **Amberley Field,** Australia, during WWII. **Contact:** Peter Playsted, Chaplains' Centre, RAAF Base, Amberley, Queensland, Australia 4305 (075-461-3288).

Seeking contact with anyone who served with **Harley Stremming,** a C-46 crew chief in the China–Burma–India Theater during WWII. **Contact:** Ken Stremming, PO Box 386, Lexington, VA 24450-0386 (540-464-1719).

Seeking stories, photos, and other memorabilia for histories of the **77th and 55th FSs. Contact:** For 77th: Ray Rider, 7800 Harrington Cir., Amarillo, TX 79121 (806-355-8240) (rlrider@arn.net). For 55th: Dennis Schaan, 5645 Nicole Ct., Las Vegas, NV 89120 (dlschaan@compuserve.com).

Seeking information, photos, and stories about the 318th FIS's **F-106.** Primarily interested in F-106A #56-0459's career in early F-106 testing, as well as her career with the 11th and 318th FISs from 1957–83. Also seeking information on or contact with **Capt. Randy Neville and SrA. Ahmand McGee. Contact:** Ernest White II, 2107 S. Sheridan Ave., Tacoma, WA 98405-3455 (253-404-0039) (ernest.white@boeing.com).

Seeking contact with anyone associated with the **F-5 Lightning** flown by the 5th, 12th, and 23d Photorecon Sqs, 3d Photorecon Gp, 12th AF. **Contact:** Bill Burton, Fox-Two! Aviation, 350A-304 Prospect Blvd. Frederick, MD 21701 (301-682-4646).

Seeking information on **B-29** bombing missions against Korean targets between July and September 1950. **Contact:** Don Wade, 560 Campbell Hill St. N.W., Marietta, GA 30060-1316.

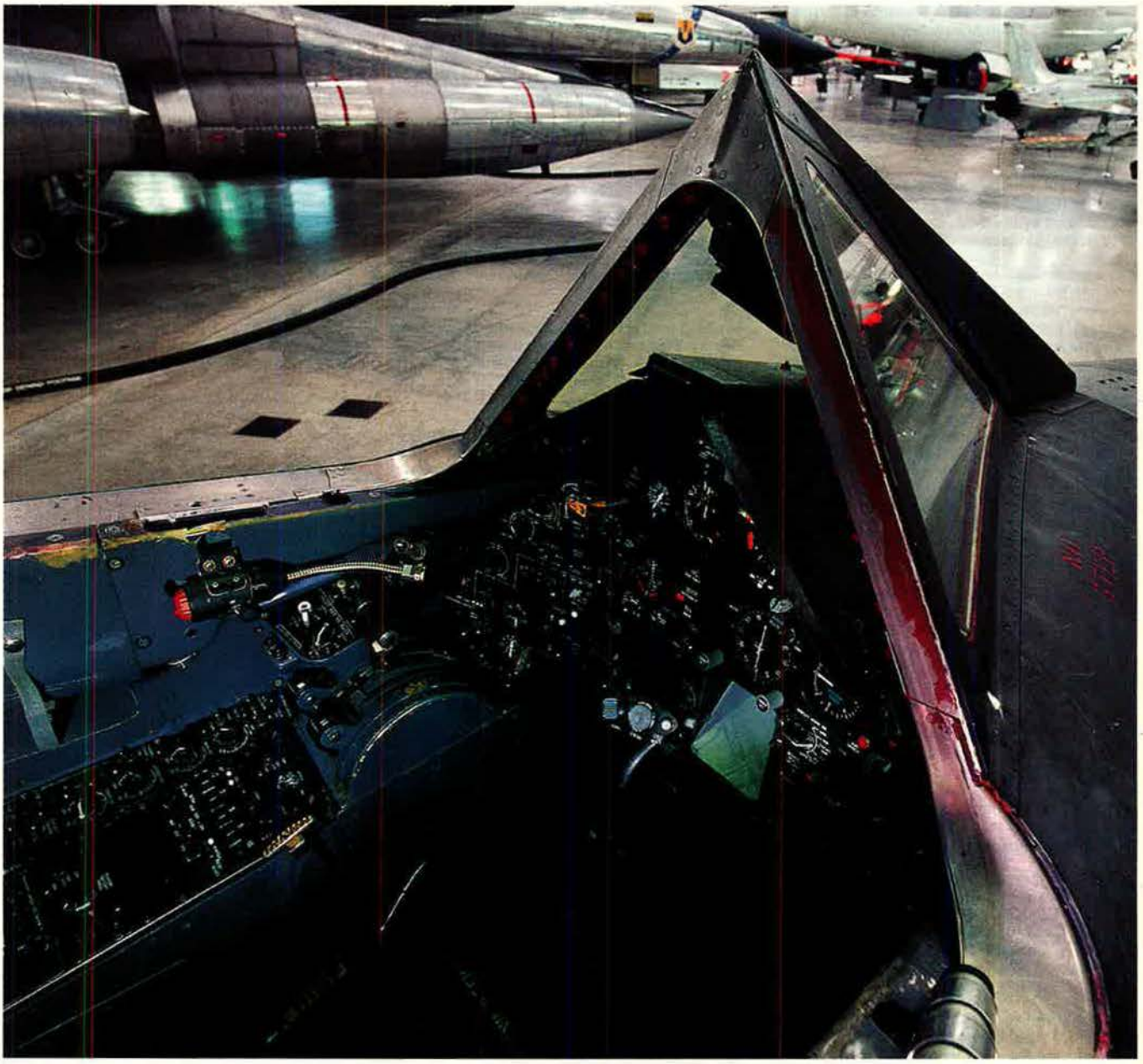
Seeking **Lt. Stanley R. White,** who was in Pilot Class 52-C at Bryan, TX, and flew with the 6148th Mosquitos out of K-47 (Chunchon AB), Korea. **Contact:** Ray Prozinski, 2959 Ewing Ave. N., Robbinsdale, MN 55422 (612-588-6648).

Seeking **Donald C. Smith,** a P-47 pilot during WWII, who served with 310th FS, 58th FG, Fifth AF, at Porac, Philippines, in May 1945. **Contact:** Kermit M. Bjorlie, 575 1st Ave., Zumbrota, MN 55992 (507-732-5252). ■

Pieces of History

Photography by Paul Kennedy

A Class by Itself



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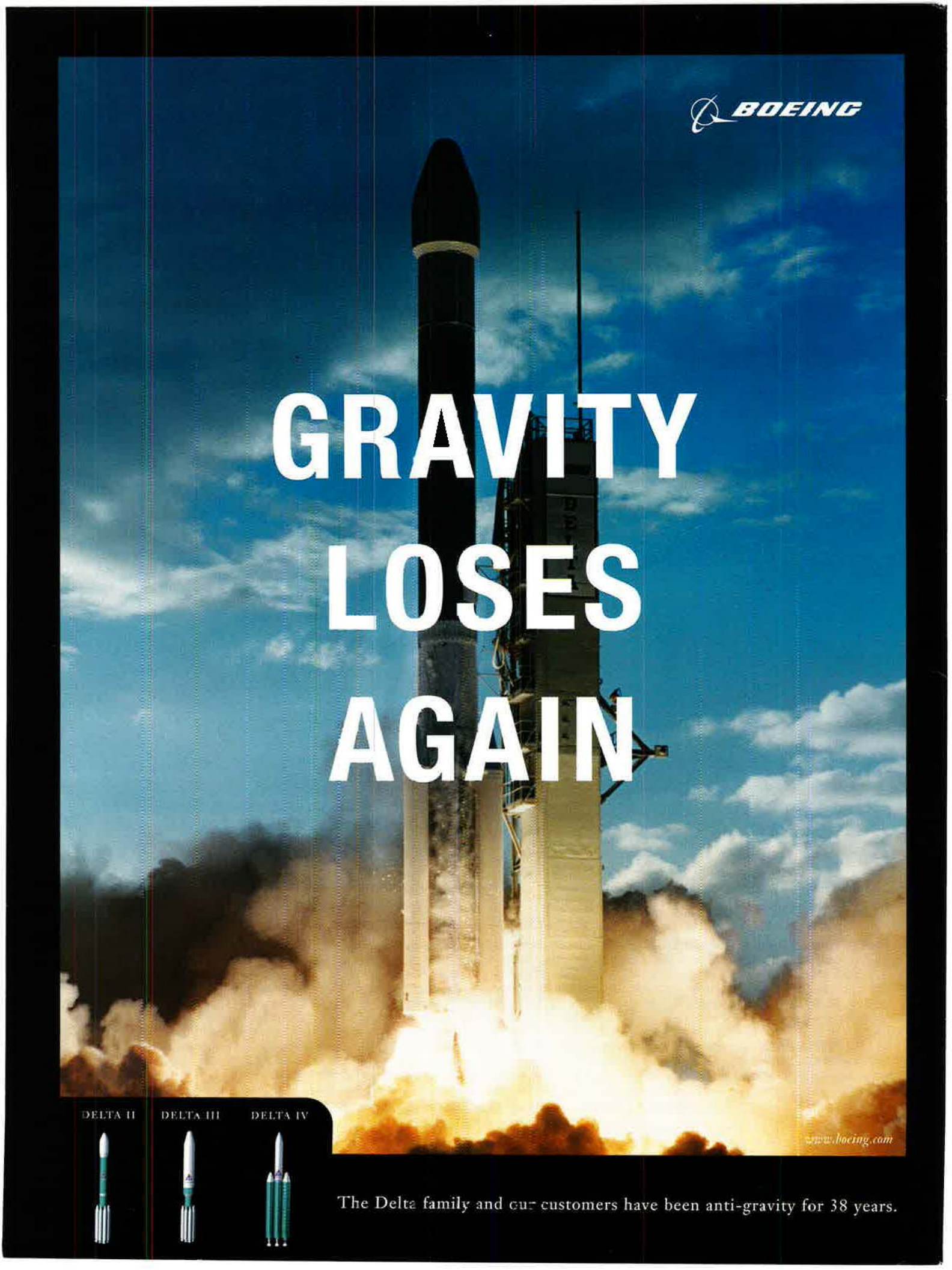
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