January 2007/$4

AIR FORCE

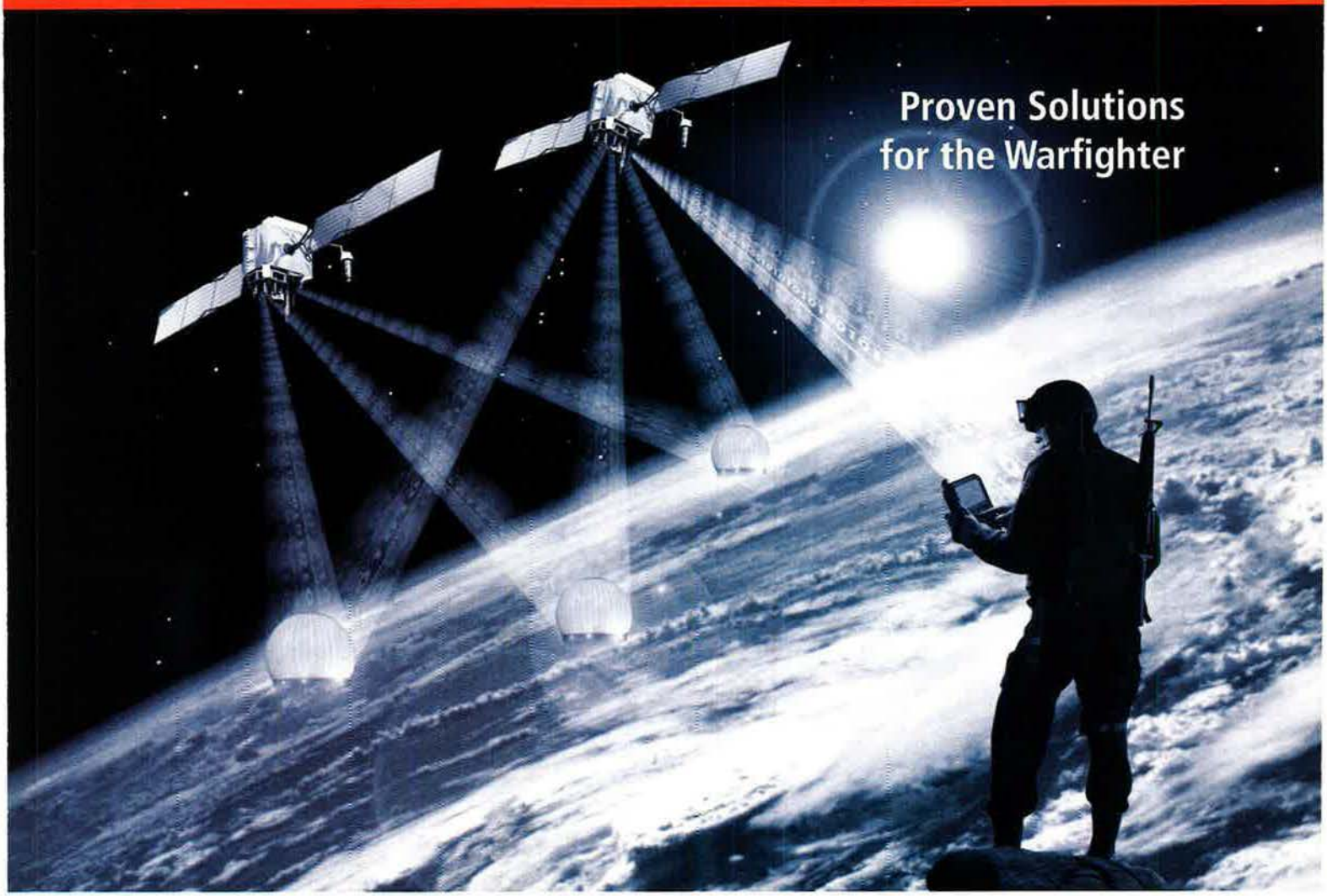
JOURNAL OF THE AIR FORCE ASSOCIATION MAGAZINE

The New Aggressors

Victory in Space
The Men Who Make The Saves
Eagle Flag
UAVs With Bite

NSOM

Network and Space Operations & Maintenance



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January 2007, Vol. 90, No. 1

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About the cover: F-15 aggressor aircraft fly over Nellis AFB, Nev. See "The New Aggressors," p. 52. Photo by Rick Llinares.

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Editorial

By Robert S. Dudney, Editor in Chief

Second Opinion

UNDERWHELMED by the Pentagon's Quadrennial Defense Review, Rep. Duncan Hunter had the House Armed Services Committee conduct its own in-depth look at US defense needs. The result—a dense and detailed 121-page report—hit the streets on Dec. 6.

It deserves more attention than it has received. Hunter, the California Republican who chaired the panel until the Democratic takeover of Congress, produced an impressive document. It pulls no punches. Indeed, it sets a benchmark for future debate.

This "Committee Defense Review" warns flatly that the US has insufficient military forces. Unlike the QDR, the CDR did not set a budget level and back into its force levels. Rather, it looked at requirements first, unconstrained by fiscal "realities."

This politically dangerous technique produced eye-watering force structure conclusions. The US, said the report, should have:

- Fifteen Air Force air and space expeditionary forces—not 10, as the QDR authorized—requiring some 500 additional fighters.
- More long-range bombers, airlifters, tankers, and ISR systems.
- Seventy-eight Army brigade combat teams, eight more than the QDR thought was needed.
- Fifteen Navy carrier battle groups (not the 11 blessed by the QDR), at least 55 attack submarines (up from 48), and many more amphibious ships.
- Forty-three Marine Corps infantry battalions—not the 33 that were prescribed by the QDR.

This huge force expansion would consume scores of billions of dollars. The CDR said the additions would permit the US to wage a Global War on Terrorism and, if need be, fight and win two regional wars at the same time. Otherwise, it warned, the US couldn't hack it.

Not since the Reagan buildup of the early 1980s has DOD sought force structure increases, mostly because they are costly. This, however, did not faze CDR members, who noted, "The United States is a wealthy country. Such expansion is hardly unprecedented."

The CDR's "second opinion" about force structure stemmed from two bedrock strategic conclusions.

First, the House panel warned, the GWOT is a long-term mission. The "nexus of terrorism and radical Islam" poses "one of the gravest threats" we face, it said, yet, strangely, "defense and budget planners appear to believe that the current demand for military forces in the GWOT is an aberration" and that it "will subside over time." This is unlikley, said the CDR.

Second, said the CDR, conventional "state-on-state conflict remains a significant element of the security environment." It is not, as some argue, being replaced by "irregular" GWOT missions. In fact, said the CDR, "the [conventional] requirement may have increased" because aggressors "see opportunities to exploit the US commitment" to fighting global terror networks.

"The United States is a wealthy country. Such expansion is hardly unprecedented."

In this vein, the panel presented four "scenarios of concern" it saw as "drivers for US military force structure." They were: a conventional North Korean invasion of South Korea, a US-China military showdown over Taiwan, regime collapse in nuclear-armed Pakistan, and development of nuclear weapons in Iran.

Though the US realizes it might have to fight two of these conflicts at the same time, "force structure reductions and low modernization budgets during the 1990s created unacceptable levels of risk" for the nation today, said the CDR.

For all that, the armed services themselves are not likely even to seek—much less get—more force structure.

There is a myth that defense budgets are built around valid requirements, but the opposite is true. Politicians come up with an acceptable budget amount and expect the armed forces to live within it. In this situation, an increase in force structure here would only shift the pain elsewhere, and, for that reason, the services always fall in line.

The true problem is the concept of "affordability," and the way in which official Washington defines it.

Today, one commonly hears complaints about "record" defense budgets and "heavy" war costs. Many requests for validated defense needs—new weapons, more force structure, and so forth—are shot down on grounds they are "unaffordable."

That being the case, we would like to make a few points about affordability.

For the taxpayer, defense has rarely been more affordable, because the economic burden rarely has been lighter. True, DOD spends lots of money—$512 billion last year on the basic force program and the cost of the wars in Iraq and Afghanistan.

Even that expenditure, however, consumed only 3.9 percent of the nation's $13 trillion gross domestic product—a far smaller share than in most of the past 65 years.

In 1944—the height of World War II—the military consumed 36 percent of a much smaller economy. The figure during the Korean War was about 11 percent and in Vietnam about nine percent. It was not until 1991, after the Cold War, that the figure even dipped below five percent of GDP.

While military spending today consumes less than four percent of GDP, federal outlays on entitlement and benefits programs are at historic highs, taking about 13.1 percent of all national wealth. That is a rise of more than two full percentage points since the end of the Cold War.

The fact that social spending now more than triples defense outlays says a lot about American priorities, not to mention the whole question of what is, or is not, "affordable."

Hunter said that 55 House Armed Services Committee members participated in the CDR process.

Note that, in the end, the CDR report was signed by Republican members only. The Democrats withheld their names from the final document. In explanation, a Democrat spokesman uttered a vague comment about "unrealistic force structure outcomes."

Raising the defense share of GDP by a single percentage point—from four to five percent—would generate a $130 billion boost this year. That would be enough to start rebuilding the force as the CDR suggests.

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Letters

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The Magnificent Memorial

On Oct. 22, while on an RV trip to our nation's capital, I visited our Air Force Memorial. Wow, what an awe-inspiring, motivational, provocative, thoughtful, and downright beautiful and meaningful monument to all our Air Force members. I was very moved. I feel the Air Force Association performed outstandingly on this project and every penny was well spent! I am proud to say I am a member of the finest Air Force in the world—and of an outstanding association representing that Air Force.

Lt. Col. Mark Schaffler,
USAF (Ret.)
Maitland, Fla.

Lavelle

On p. 44-55 of the November 2006 issue is a beautiful depiction of the dedication of the Air Force Memorial. Prominently in it are displayed the names of Air Force Medal of Honor recipients Young, Jackson, Jones, Fleming, Levitow, Bennett, Day, and Sijan. Their acts of valor exemplified the best in man and in the Air Force. Turn the page and you find the worst in man and officer. The expose on General Lavelle proved his conduct was unbecoming of an officer. General Ryan's failure to court-martial him proves his own lack of backbone and integrity. Generals Gabriel and O'Malley joined with General Lavelle in violating a direct legal order. I personally knew and highly respected Generals Ryan, Gabriel, and O'Malley all these years. Now I find they were unworthy. They clearly violated their oath of office and their command responsibility by illegally ordering pilots under them into "harm's way" and then compounding that act by ordering the falsification of mission reports. I feel betrayed!

Brig. Gen. Gerald E. McIlmoyle,
USAF (Ret.)
Venice, Fla.

I am the son of General Lavelle and read with great interest the article by John T. Correll in the November issue. It was an excellent review of a complicated and for us a still very painful incident. My father was heartbroken, and I saw him physically and mentally broken by the ordeal. He fought back with the help of my mother and recovered his strength, confidence, and pride before he died of a heart attack five years later. In the end, I think he found comfort in knowing that what he did saved some airmen's lives, and that was worth more to him than four stars.

I would appreciate it if you could pass on my comments to Mr. Correll.

John D. Lavelle Jr.
Foreign Service Officer
US Embassy, New Delhi

I'm still shaking after reading the article about Gen. John D. Lavelle's ouster as 7th Air Force commander and his subsequently being busted down to major general and getting booted out of the Air Force.

After I reported for duty with the 345th Tactical Airlift Squadron as a C-130E aircraft commander and started flying missions in SEA (October 1971 to November 1972) under 7th Air Force, I learned that our "in-country" boss was a four-star named Lavelle. So I've trod the same ground as General Lavelle, at the same time.

I didn't know much about him at the time, or the politics over at MACV, but I learned soon that he had quietly disappeared and was replaced by a General Vogt. I didn't think much about it at the time as I was trying to take care of my C-130E crew and complete our missions, too. So General Lavelle and I had the same priorities, at the same time also—"taking care of our crews."

We used expressions like "The Puzzle Palace" and "Pentagon East" half jokingly when referring to MACV; we grunts had no way of knowing just how right, apparently, we were.

But it seems political correctness reared its ugly head, even back then, before it was ever defined as such. Political correctness—rules of engagement—won out over leadership, efficiency, and victory. Robbed again! We live, burdened by this vicious specter, this hideous apparition, even today.

General Lavelle was also apparently a warrior who wanted to do his best job of taking the war to the enemy, the North

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Vietnamese. At the same time, he wanted to give his fighter pilots their best chance of mission success and of survival. For being a warrior and a leader of men, General Lavelle's character is assassinated by his own people, and by us all collectively who give in to political correctness for personal advancement.

I would like to see all the senior officers who took part in this destruction of a man's reputation—and who might have turned the knife that was stuck in General Lavelle's back by Melvin Laird (then Secretary of Defense) even a little bit—make a pledge and a life's mission to resurrect his reputation and his stature as a warrior and a leader of men. Shame on you all!

And shame on you, Air Force Association, for not printing a portrait of General Lavelle in his four-star uniform for the article. PC wins again!

Michael W. Rea
Savannah, Ga.

Reading John Correll's piece on Gen. John Lavelle brought forth wisps of memories of that time. First, I will claim that General Lavelle disrupted North Vietnamese plans to stage "Tet '72;" for doing that, he was fired.

It is impossible for me to believe that everyone in the chain of command did not know what the North Vietnamese were up to, given the information that had to be available to them. Whether or not [their] level of detailed information extended into the civilian leadership I have no way of knowing, but I will guess that it did.

Was there some political reason not to nip an incipient North Vietnamese offensive in the bud? I don't know. Certainly there was no military reason not to, and I can only imagine the grand time the mainstream media of the day would have had if the North had launched its offensive on February 15th rather than 45 days later. It's hard for me to believe that our senior military leaders were content to stand idly by while the North Vietnamese were preparing for an attack that would have been as much political as it was military. If the North Vietnamese had planned on a Tet Offensive for 1972, General Lavelle certainly put a big crimp in their plans.

Reading Mr. Correll's account of events, clinical as it was, convinces me even more that Gen. John Lavelle was made a scapegoat after some buck sergeant from Udorn wrote his Senator and the plan to spike the North Vietnamese buildup was unraveled.

Lt. Col. Gerald P. Hanner,
USAF (Ret.)
Papillion, Neb.

John Correll's "Lavelle" brings back memories. In March 1972, when General Lavelle was relieved of command, I was a captain in the 7th AF staff judge advocate's office. Col. Donald W. Brewer was deputy SJA. Following his DEROS in July 1972, Colonel Brewer was legal counsel to General Lavelle as he prepared to testify before the Senate Armed Services Committee in September.

After General Lavelle's death in July 1979, Colonel Brewer spent nearly 20 years researching and writing about the Lavelle case. His goal was to clear the name of his former commander and client. I spoke with Colonel Brewer one last time before he passed away in September 2005. He knew that death would prevent him from reaching his goal and he died deeply disappointed.

Colonel Brewer would be pleased with Mr. Correll's article. It gives General Lavelle a fair shake. *Air Force* Magazine, with "Lavelle," provides vital information not previously publicized.

Over those years, as Colonel Brewer researched and wrote, he and I had many "Lavelle conversations." Having studied Colonel Brewer's manuscript, I have a firm grasp on the points of contention. The Correll article is an accurate and fair representation of both sides of the Lavelle case and is an excellent historical analysis.

I have Colonel Brewer's research materials. Those materials answer the central question posed in the caption accompanying the photo of then Lt. Gen. John W. Vogt Jr.—"What did [General Vogt] really say at the January 1972 Pacific Command meeting in Honolulu?" General Vogt's statements were critical. He presided at the conference, directly representing Adm. Thomas H. Moorer, Chairman of the Joint Chiefs of Staff. The Vogt Conference (referred to as the "Arc Light Conference," the correct dates of which are Dec. 4-5, 1971) came as a result of CINCSAC Gen. Bruce K. Holloway's unilateral decision, in late November 1971, to order a stand-down of B-52 missions engaged in Operation Arc Light over Laos in response to a growing MiG threat—a threat to aircrews for which the rules of engagement permitted no adequate response. No minutes were kept—or other record made—of Arc Light Conference proceedings. However, Maj. Gen. Winton W. Marshall, 7th AF vice commander, who attended the conference as General Lavelle's representative, prepared a memorandum for the record of General Vogt's remarks for General Lavelle.

In testimony before the Senate Armed Services Committee, Maj. Gen. Alton D. Slay, 7th AF deputy chief of staff, operations, confirmed the existence of the Marshall Memorandum: "General Marshall came back [from the Arc Light Conference] and wrote a little memo for the record."

[In an oral history, Lavelle said he] tried

to get a copy of the Marshall Memorandum with no success. By the time he tried to get a copy of it, General Vogt was the commander of the 7th Air Force having been promoted to four-star grade and having replaced General Lavelle, and General Lavelle couldn't get it released. He was not sure 7th Air Force even had it by then, because HQ Air Force was grabbing all of the files pertinent to this and controlling them.

After testifying for two days, Sept. 11 and 12, 1972, General Lavelle followed up with a Sept. 26, 1972 letter to the committee in which he detailed General Vogt's Arc Light Conference remarks. General Lavelle's letter contained his recollection of the contents of the Marshall Memorandum.

The Marshall Memorandum must be released by those who have that authority so that the question—"What did General Vogt really say at the Arc Light Conference in Honolulu?"—can be answered once and for all.

Brig. Gen. Edward F. Rodriguez Jr.,
USAFR (Ret.)
Fairfax, Va.

Flying Hours Down, Simulators Up

It was very interesting to read the article "Flying Hours Cut at ACC" and to see that Air Combat Command and USAF are finally giving high-fidelity simulators the credit they deserve *["Washington Watch," November 2006, p. 12].* Not only do they enhance flying training, but they prolong the life of the aircraft.

As a former aircrew training device superintendent, I worked in the career field for 20 years, of which eight years were on the Hq. TAC/ACC Directorate of Requirements staff. So I feel I am qualified to speak on the subject.

The USAF "leading edge" can be directly attributed to the quality of the aircrew training devices and services they provide. The [article] stated, "Pilots of the F-15C are already using simulators 'to reduce live-fly training requirements' [according to an ACC spokeswoman], and 'similar initiatives are expected in other weapons systems once high-fidelity simulation is available.'" The high-fidelity simulation is available today for all weapon systems.

The problem in the past has been how simulators were supported by the flying commands. ACC never wanted simulators to compete with their training flying hours. ACC has long stated they wanted simulators that will enhance the flying program, but not replace any training flying hours, until General Hawley came on line with his support for Distributed Mission Training (DMT). He agreed to pay for DMT with the flying hours he would save by utilizing the high-fidelity simulators, and the F-15C was the first to reap the rewards of this effort.

In 1990, the average amount spent on training devices for any given ACC platform was about two to three percent of the overall aircraft program. We found as we requested higher fidelity simulators the cost would increase to approximately four to five percent of the overall aircraft program; however, ACC would not support the increased cost.

High-fidelity simulators are available today. Air Mobility Command has procured or is procuring FAA Level D equivalent training devices for all of its aircraft programs. AMC is transferring training tasks from the aircraft into these high-fidelity simulators. ACC too can procure high-fidelity simulators today; all ACC has to do is support their need in the budget.

SMSgt. Gary R. Lewis,
USAF (Ret.)
Dayton, Ohio

Thanks for the Pictures

I am a life member of AFA and enjoy reading each issue. I see where many excellent aircraft are used in the calendar, including my last aircraft, the B-52, which is still serving so well.

I think that one of the workhorses of SEA is often not given its due. The F-100 was the workhorse I, a forward air controller with the 11th Armored Cavalry Regiment from 1967 to 1968, used whenever we had troops in contact. I saw many superb fighter pilots engage with accuracy targets in close contact with our forces. It is something to see when a "Hun" is in an extreme dive, with tracers going over the cockpit as he engages with 20 mm. There were other fighters that did not generate the confidence of the F-100 when we required close attack, with our guys going nose to nose with the [Viet Cong] and NVN [North Vietnamese] forces. I would be remiss if I did not recognize the A-1E and A-37 crews who were as brave and accurate in their delivery, but the F-100, with its larger number of resources served USAF well during the period I was in country.

Thanks for the recognition of the Bird Dog in the November edition. *["Airpower Classics: O-1 Bird Dog," p. 104.]*

George R. Hyatt III
Seguin, Tex.

More on the Astronauts

I sincerely regret that I made two important omissions among Air Force astronauts, and would like to make amends with this letter *["Air Force Astronauts," October 2006, p. 72]* .

Despite my attempts to locate all Air Force astronauts, I overlooked two very important people, Dr. Ronald M. Sega, undersecretary of the Air Force, and Mr. Gary E. Payton, deputy undersecretary of the Air Force for space programs.

Dr. Sega was an instructor pilot in the Air Force and accumulated 420 hours of time in space on two shuttle missions. He retired from the Air Force Reserve as a major general in 2005.

Mr. Payton is a retired colonel, an Air Force pilot, and flew as a payload specialist on the first military shuttle mission.

Obviously, I wish that I could have included this information in the article.

Walter J. Boyne
Ashburn, Va.

Thanks for your October '06 article recognizing the Air Force's contribution to the NASA astronaut corps, but some corrections are in order to set the record straight. You listed Rusty Schweickart as "the first non-test pilot astronaut." Rusty (MIT/Physics) was a civilian from the Massachusetts Air National Guard. He was selected in 1963 in the third ("Apollo") group of astronauts along with five other non-test pilots: USN lieutenants Eugene Cernan (Purdue/Aero) and Roger Chaffee (Purdue/Aero); USMCR Capt. Walter Cunningham (UCLA/Physics); Buzz Aldrin; and me, USAF Capt. William Anders (AFIT/Nuclear Engineering). Cernan flew first in the Gemini program and later on Apollos 10 and 17; Chaffee was killed in the Apollo 1 ground testing fire; Cunningham flew on Apollo 7 (first manned test of the Apollo command and service modules in Earth orbit); I flew on Apollo 8 (first manned test of the Saturn V booster and first flight to the Moon); and Rusty flew last on Apollo 9 (first manned test of the lunar module in Earth orbit). Though not test pilot school grads, all of us had fighter backgrounds as well as advanced technical degrees.

Maj. Gen. William Anders,
USAFR (Ret.)
Deer Harbor, Wash.

The $120 Billion Cut

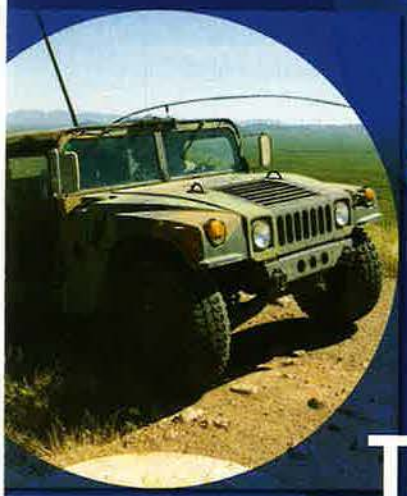
Mr. John A. Tirpak's article "The $120 Billion Cut," as well-written and informative as it is, failed to fully describe the current and future state of the United States Air Force *[November 2006, p. 28].* Mr. Tirpak could write an entire book on the subject and fail to get it all in.

Cutbacks have been happening for over 15 years now.

Base closures have been affecting all of the military branches. The US has been at war in two different regions of the world. And threats from North Korea and Iran, among others, have increased many times over.

Has anyone realized that our government is doing the one thing the USSR could not do? Our own government is dismantling itself. Even the newest fighters, the F-22 and F-35, can't fight a war without people and all the resources to support it.

Joseph Carroll
Warner Robbins, Ga.



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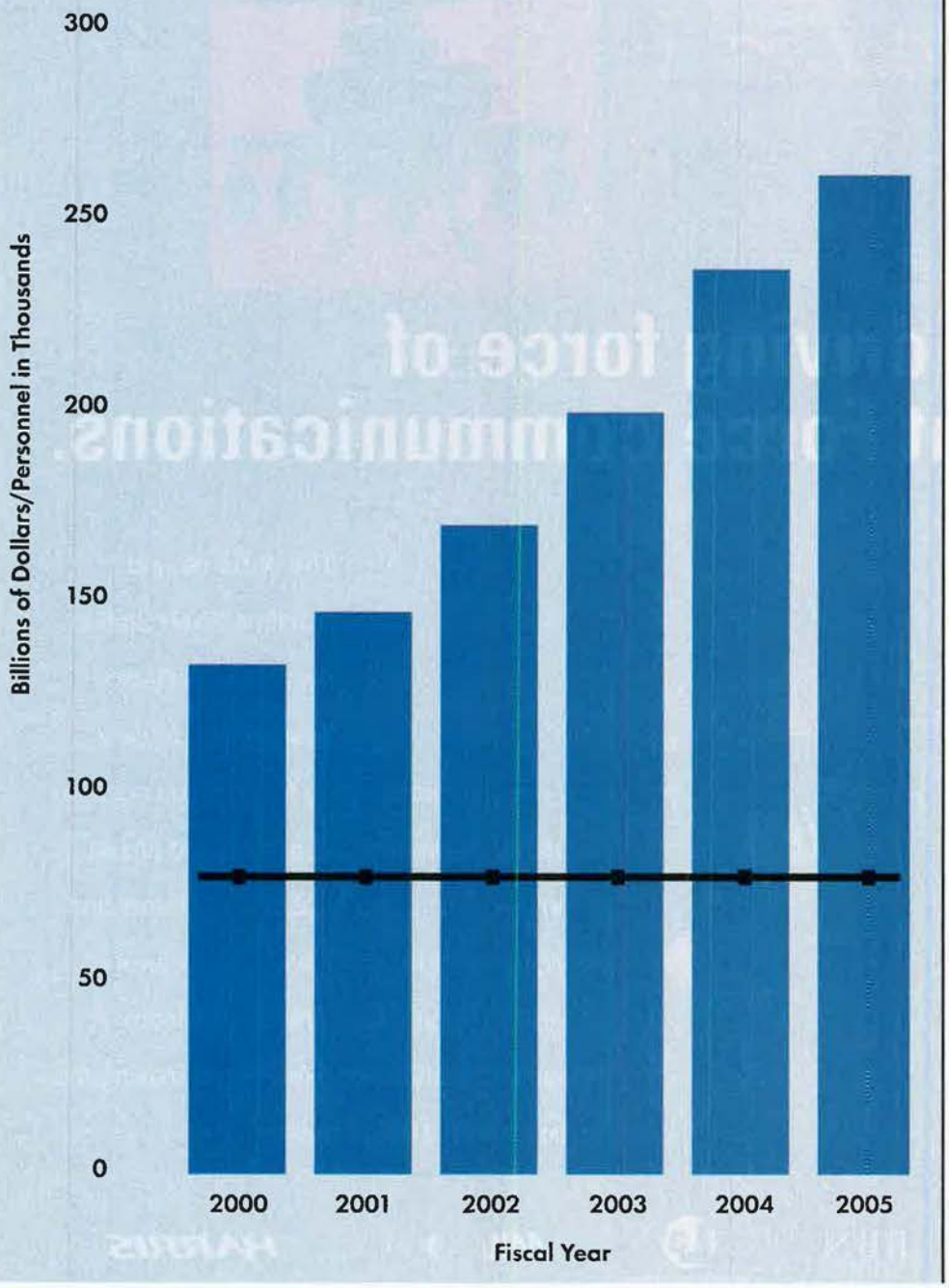
The Chart Page

By Tamar A. Mehuron, Associate Editor

Tidal Wave?

Contracts, Workforce Go in Opposite Directions



In recent years, DOD has presided over an increase in spending on goods and services, the amount of which has risen from about $140 billion in 2000 to some $270 billion in 2005 (the last year of complete data). That's an 88 percent boost in five years.

Even as the magnitiude of DOD acquisition management needs has grown, the management workforce itself has lagged both in numbers and necessary skills, according to the Government Accountability Office. As the chart shows, the number of workers in DOD's acquisition workforce has remained virtually unchanged, meaning the work load for each person has gone up. GAO argues that this increases the risk of "poor acquisition outcomes" as a result of the thinning out of contractor oversight.

Obligations increased by 88 percent.

Acquisition-related workforce generally unchanged at about 75,000 employees, according to GAO.

Sources: Contract obligations: DD350 database. Workforce: GAO analysis of OPM data of 14 acquisition-related job series.

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Washington Watch

By John A. Tirpak, Executive Editor

All Eyes On the New SECDEF; Who Runs Capitol Hill?; A Harder Look at Directed Energy ....

The Gates Dossier

When Robert M. Gates was nominated to become the next Pentagon chief, Washington was swept with speculation about how the move would affect the Air Force. Opinions varied, but the strongest current was optimism about the Air Force's new situation.

Many officers and analysts suggested that the Air Force would receive more attention from Gates than it had gotten from Donald H. Runsfeld, if only because Gates had a reputation for being a good listener—not Rumsfeld's long suit. Moreover, Gates, as a longtime intelligence professional and onetime Air Force officer, spoke the service's language.

Gates got the nod from President Bush on Nov. 8, the same day that Rumsfeld announced his resignation under fire. A former CIA director, Gates faced the Senate Armed Services Committee on Dec. 5 and received quick affirmation and nearly unanimous approval from the full Senate the next day. Gates was viewed as a thoughtful and pragmatic bureaucrat, not overly impressed by his own significance. In writings and public comments, he frequently offered the observation that leaders and their pet projects come and go, but the institutions endure.

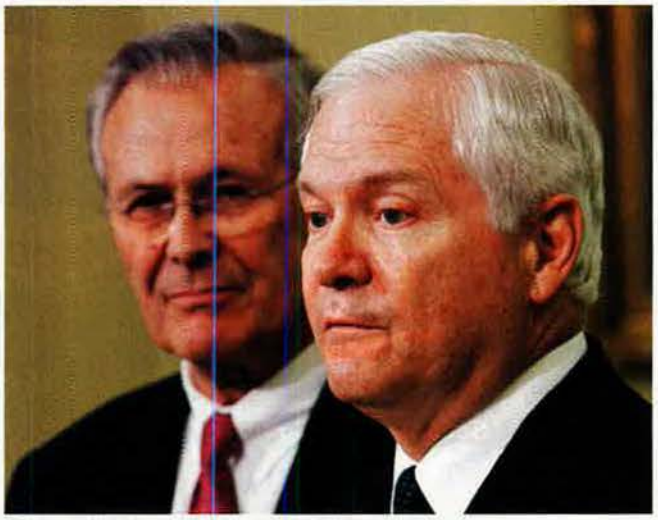
Nevertheless, as head of the CIA and as president of Texas A&M University, Gates generated cultural reforms that actually stuck, and although there was some dissent, few now complain that his changes were wrong. Rumsfeld attempted the same kind of transformation during his six years at the Pentagon. Whereas Rumsfeld handed down changes by executive fiat, stepping on toes and deliberately breaking rice bowls along the way, Gates has demonstrated that he wants the buy-in of the rank and file. He has usually gotten it done by letting those affected by his reforms participate in their development and execution.

Such an approach would be a refreshing change for those whose expertise has been ignored or scorned by Rumsfeld, who disdained anything that smacked of tradition or conservative planning. One finds many of these kinds of officials in the services, the Pentagon, and on Capitol Hill.

According to senior USAF officials, Rumsfeld never took a single briefing on the F-22 program, which was at various times held out as the Defense Department's No. 1 acquisition priority. Nor did he take much interest in the service's tanker replacement program, until an abortive attempt at leasing the aircraft became a political problem in Congress.

Rumsfeld also sought to garner a major portion of the national intelligence mission and created a new undersecretary post to handle intelligence. He and his intelligence deputy, Stephen A. Cambone, held the Air Force at arm's length and treated it as, at best, an errant child and, at worst, an adversary.

The only person in the CIA ever to rise through the ranks from entry-level analyst to director, Gates objected to the restructuring of the intelligence community and turned down the job of director of national intelligence later accepted by John D. Negroponte.



AP photo by Gerald Herbert

Rumsfeld (l) and Gates: Study in contrasts.

It appeared that Gates and the Air Force would have common cause in the intelligence-surveillance-reconnaissance field. He long held that good, vetted intelligence was the bedrock of policy, while the Air Force has in recent years elevated ISR to practically its dominant consideration in all operations. All new programs must pass muster for connectivity to other systems and organizations, which is key to rapid dissemination and action.

Gates also looked to be an ally to the Air Force in the acquisition of programs for major theater war. Under Rumsfeld, such programs were consistently raided to pay for more special operations forces or the cost of wars in Iraq and Afghanistan. The logic voiced by many of Rumsfeld's top lieutenants was that the days of major theater war may have passed and that the urban combat and irregular threats had become dominant. Gates, on the other hand, was a hardline anti-Communist and was not likely to discount the increasing threat from China.

Even as the Cold War thawed in the 1980s, Gates tended to view the world in worst-case scenarios. He pushed for a national posture that would be able to deal with a militant, Stalinist Soviet Union if Mikhail Gorbachev's reforms had floundered. In fact, he drew criticism at the time for favoring intelligence that discounted the effect of *glasnost* and focused on Soviet military capabilities.

Gates has a charter to change course in Iraq and Afghanistan. He is well-prepared for that task, having served on the Baker Commission/Iraq Study Group, but many of the duties of setting and achieving force goals and sorting out doctrine were to be borne by Gates' inherited deputy, Gordon England, who executed Rumsfeld's vision without demur.

However, Gates the pragmatist faced the reality that any large-scale withdrawal of ground forces in Iraq or Afghanistan would have to be balanced by an increase in American airpower to protect those countries from threats within and without.

Meet the New Bosses

Although the November election put control of the House and Senate into Democratic hands, there probably won't be any tectonic shifts in the way the major defense committees treat the Air Force.

Taking over from John W. Warner (R-Va.) as chairman of the Senate Armed Services Committee will be Carl Levin (D-Mich.), who in recent years has focused his attention mainly on the wars in Iraq and Afghanistan and the multiple supplemental bills required to pay for it.

Levin, 72, has styled himself a Pentagon watchdog who would like to spend defense dollars on commercial products wherever possible, rather than on purpose-designed equipment at greater cost. He has consistently criticized the Air Force for programs that are over budget and behind schedule, and he joined with Warner and new ranking member John McCain (R-Ariz.) in an attempt to block approval for a multiyear buy of the F-22. They were not successful.

Upon being named the new SASC chairman, Levin said he expected to launch a "very structured, very thorough review" of defense procurement. He also commended McCain for the Arizona Senator's probing of major programs such as the Air Force's aerial tanker program and the Army's Future Combat System. Levin said he hoped McCain would continue the watchdog tactics, should he be able to do so while running for President.

"I hope he has time, given his other goals, to really keep doing what he has been doing," Levin said.

Still, Levin has not campaigned to abolish any major USAF programs and has generally joined a bipartisan consensus on the committee to demand stricter oversight on problem programs. However, he has voiced concerns that the high operating tempo of military operations is stressing the armed forces to their breaking point.

Levin was also instrumental in passing legislation creating the modern method to get rid of unneeded defense facilities, the Base Realignment and Closure, or BRAC, process. The Air Force has said that it would like to reduce its base infrastructure even more than the last BRAC round suggested. Levin may prompt another round of BRAC when the dust settles from the 2005 round of closures.

Sen. Robert C. Byrd (D-W.Va.) was tapped to run the Senate Appropriations Committee. He voted against the war in Iraq but has not called for the setting of a timetable for US withdrawal, as many of his Democratic colleagues have. Byrd is generally supportive of defense programs, and of the F-22 in particular, because he has been highly successful in steering defense contracts to his constituents. Those funds are generally deducted, however, from overall defense spending through Byrd's use of earmarks, and he has been personally criticized by outgoing Defense Secretary Rumsfeld as making the defense budget harder to manage because of it. The earmarks put Pentagon money into projects the Pentagon "doesn't need," Rumsfeld said.

AP photo by Jeff Geninar

An aged Byrd may share duties with Inouye.

At 89, Byrd is the longest-serving member of the Senate. His advanced age suggests his appropriations chairmanship duties may be shared with ranking Democrat Sen. Daniel K. Inouye (D-Hawaii), who has also struck a strongly bipartisan note in most of his defense oversight.

Inouye, who at 82 is not much younger than Byrd, has complained about what he calls "the B-2 syndrome," in which cutting the buys of major weapon systems has resulted in unit costs that make those systems prohibitively expensive. Such thinking bodes well for the F-35 program, which is predicated on fast, efficient production to achieve cost savings. Inouye received the Medal of Honor for his World War II service and is generally hawkish.

Rep. Ike Skelton (D-Mo.) was chosen to head the House Armed Services Committee. Like Levin, Skelton, 75, said that he plans to make better Pentagon oversight a cornerstone of his tenure. Skelton, also considered a hawkish Democrat, helped ensure that the B-2 bomber would be based in his state. Skelton said he supports reviving the House Oversight and Investigations subcommittee, which was instrumental in creating the Goldwater-Nichols military restructuring of 1986. (See "A Better Way to Run a War," October 2006, p. 36.) House Republicans abolished the committee in 1994.

David R. Obey (D-Wis.) will chair the House Appropriations Committee. Obey, 68, frequently sides with the Government Accountability Office in demanding slowdowns of weapon systems that are not achieving solid results in development and is usually among the first to be loudly critical of any suspected illegalities in government contracting. He has supported the procurement of the F-22, but has criticized the Air Force for wanting to sell it—or any advanced aircraft technology—overseas, arguing that the US wouldn't have to spend so much on defense if it didn't create such threats in the first place. (See "Aerospace World: F-22 Exports Debated," September 2006, p. 20.) Of the main defense oversight committee chairmen, Obey is the least hawkish.

AP photo by Haraz N. Ghanbari

Levin, replacing Warner, will be a "watchdog."

AP photo by Evan Vucci

Skelton is a hawkish Democrat.

John P. Murtha (D-Pa.) will likely chair the House appropriations defense subcommittee. Murtha, 74, a former marine, made national headlines in 2005 when he called for the immediate withdrawal of US troops from Iraq. He has expressed concern that the costs of the wars in Iraq and Afghanistan are devouring funds that should be spent on future readiness. He has voiced opposition to a Democratic call to include war operations costs in regular defense appropriations bills (rather than in supplementals), saying such a move would be difficult to manage.

Reining In Directed Energy

The Pentagon's many and disparate directed energy programs—ranging from pain rays to destructive lasers—are advancing rapidly and have huge potential, but need to be rationalized and probably reduced in number. Foreign powers may also have more directed energy capabilities than is widely known.

That's the apparent motivation behind the creation of a new Defense Science Board task force on directed energy weapon systems and technology applications, which is to report back to the Pentagon's top leadership by the end of May. The panel is to be co-chaired by former USAF Chief of Staff retired Gen. Larry D. Welch and Robert J. Hermann, former director of the National Reconnaissance Office. Key staff members of the group are also serving Air Force officers. Pentagon acquisition, technology, and logistics director Kenneth J. Krieg launched the task force in late October.

In a lengthy memo outlining what he wants from the panel, Krieg noted that directed energy systems may be mature enough for the services "to begin integration into operational forces at all levels of military operations." The document also hints at the Pentagon's long-term goals and hopes that directed energy can substitute for some of today's expensive weapon systems.

Boeing photo

The Airborne Laser is the biggest venture.

Directed energy, or DE, programs are typically thought to encompass technologies such as high-powered microwaves and lasers but also include exotic devices such as particle beam accelerators. The largest unclassified DE program is the Airborne Laser, which has been downscoped from a weapons program to a technology demonstration, at least until it shoots down a tactical ballistic missile next year. (See "The Airborne Laser Narrows Its Beam," December 2006, p. 30.)

Krieg noted that the military departments are pursuing DE for "a wide variety" of uses.

"Interest has grown in the operational use of DE technology for mission areas such as airborne- and ground-based precision attack, missile defense, expeditionary installation defense, homeland critical infrastructure defense, and nonlethal applications," Krieg wrote.

While DE systems offer "unique opportunities" to improve capabilities, the same systems or those with "equal or greater lethality" may soon be available to US adversaries, Krieg asserted.

Thus, Krieg wants the task force to conduct a comprehensive review of all the "surface, sub-surface, air, and space DE programs" and identify any that are "duplicative and/or redundant." The panel is to consider three other documents in doing so: a 2004 Pentagon strategic study of DE programs, the Office of the Secretary of Defense "DE Roadmap," and the net assessment of DE programs made by the director of defense research and engineering.

Krieg asked the panel to review the state of the art in DE technology, as it can be applied to weapons both tactical and strategic, and to say how these potentials can be exploited. It is to determine "what remains to be done to 'weaponize' DE systems and technologies," as well as what would be needed to support them in a combat theater. He asked the group to think about concepts of operation and what issues the use of DE weapons would raise with regard to "legal, treaty, and policy compliance."

Michael W. Wynne, Secretary of the Air Force, said last fall that he sees great potential for nonlethal DE weapons, but worries that the US will suffer in world opinion if the technologies are not first employed in domestic US law enforcement before being used in foreign combat.

Krieg also tasked the group to determine "vulnerabilities and capability gaps" should DE weapons be used "by state and non-state actors" against US personnel, systems, installations, or weapon platforms.

Beyond presenting a comprehensive review of the DE situation, Krieg wants the panel to make a series of recommendations. Specifically, he wants the group to suggest research into areas of DE weaponization that are now being neglected. The panel is to say what impact DE might have on future military operations, as compared with today's "kinetic and electronic systems," and the potential strategic advantages of DE weapons "with regards to the delivery of precision effects, decreased collateral damage, limiting unintended effects, and decreasing post-combat reconstitution costs and efforts."

The panel is also to say whether the US defense industry is up to the task of developing a new generation of DE weapons; suggest roadmaps for their inclusion into forces; say how systems and forces could be hardened or protected against DE effects; suggest legal, treaty, or policy action that would remove constraints on US DE weapons; and suggest "the optimum way forward to fuse DE efforts within the department and outside organizations."

But in wrapping up his wish list for the task force, Krieg mentioned the dollar angle, asking it to set DE priorities for the Pentagon "to preclude unnecessary expenditure of human and fiscal resources." ■

Aerospace World

Marc V. Schanz, Associate Editor

F-16 Crashes in Iraq

An Air Force F-16CG fighter crashed Nov. 27 while on a combat mission in Iraq. The Air Force confirmed Dec. 3 that the pilot was killed in action.

The pilot was identified as Maj. Troy L. Gilbert, of the 309th Fighter Squadron at Luke AFB, Ariz. He had been assigned to the 332nd Expeditionary Wing at Balad AB, Iraq.

The crash is under investigation. It occurred 20 miles northwest of Baghdad. The fighter went down while supporting land forces, according to a US Central Command Air Forces statement.

The Air Force confirmed that insurgents were in the area immediately after the impact. Following combat operations in the area, coalition troops secured the crash site, and investigators collected DNA samples that were identified on Dec. 1.

According to wire reports, Iraqi insurgents claimed to have shot down the fighter with a shoulder-fired surface-to-air missile. Coalition spokesman US Army Maj. Gen. William B. Caldwell cast doubt on the claim.

Lockheed Martin photo

The F-35 Lightning II made its first flight on Dec. 15 from Lockheed Martin's Fort Worth, Tex., plant. During the 40-minute hop, the airplane proved more powerful and responsive than in simulations, said company test pilot Jon Beesley. The flight kicked off a six-year test program; the test force will number 15 airplanes.

DOD Identifies Air Force Casualty

The Department of Defense announced Dec. 5 the death of an airman in Iraq.

Capt. Kermit O. Evans, 31, of Hollandale, Miss., died when the Marine Corps CH-46 helicopter in which he was a passenger made an emergency water landing in the western portion of Iraq's Al Anbar Province on Dec. 3.

Evans was assigned to the 27th Civil Engineer Squadron at Cannon AFB, N.M., and was deployed with the 332nd Air Expeditionary Wing at Balad AB, Iraq. The crash is under investigation.

Keys: Resurrect B-52 Jammer

Gen. Ronald E. Keys, head of Air Combat Command, said Nov. 9 that he is ready to see the Air Force restart the B-52 standoff jammer program, as long as it can avoid requirements creep.

Keys told reporters in Washington, D.C., that reviving the program may be the best way to meet USAF's requirement for the kind of jamming now provided by Navy EA-6 Prowlers. Those systems are expected to age out in the next few years.

Gen. T. Michael Moseley, USAF Chief of Staff, killed the SOJ program in 2005, largely because its cost had ballooned. (See "Washington Watch: Affording the F-22," March 2006, p. 14.)

The plan calls for equipping a number of the venerable bombers with powerful electronic jammers. Their purpose would be to bombard enemy radars and air defenses with massive bursts of radiated energy, thereby disrupting or blinding them.

Vietnam War Pilot Identified

The Pentagon announced Nov. 9 that the remains of an Air Force officer missing in action from the Vietnam War had been identified and returned to his family for burial with full honors.

Col. Charles J. Scharf of San Diego was buried Nov. 30 at Arlington National Cemetery.

Scharf and a fellow crew member, based at Ubon AB, Thailand, were lost in October 1965, when their F-4C Phantom II was shot down over North Vietnam. Two other aircraft reported seeing a parachute, but there was no further communication from the crew. Subsequent searches turned up nothing.

In 1990, the government of Vietnam gave information to US officials about two men buried near the crash site. A joint US-Vietnamese team interviewed three witnesses to the crash and located scattered wreckage. In 1992, an excavation of the site yielded human remains and personal effects.

After more excavations in 1993 and 2004, additional evidence, including a metal captain's insignia and life support artifacts, were found.

Using DNA from envelopes sent by Scharf during the war, JPAC scientists were able to match it with the remains and confirm Scharf's identification.

Even stealth aircraft will need protection against advanced air defense systems, say military officials.

Moseley said the SOJ started out performing "a very narrow slice" of the SOJ requirement—at a cost of about $1 billion—and ended with many more missions and a $7 billion price tag. Keys noted, "We got enamored with everything it could do instead of just filling the gap that needed to be filled."

The ACC chief said he wants a "meat-and-potatoes, core component jammer," but he did not say when such a program might reappear in USAF's budget.

Air Force Forges New Command for Cyber-War

Senior Air Force leaders announced in November that they are taking formal steps to establish a Cyberspace Command.

The new organization would be a major command comparable to Air Combat Command and Air Force Space Command. It would be charged with providing forces to ensure freedom of access to the cyber world. A four-star summit on the subject was convened two weeks after the announcement.

Secretary of the Air Force Michael W. Wynne, speaking at a defense industry conference in Arlington, Va., praised the work of the Chief of Staff of the Air Force Cyberspace Task Force, led by Lani Kass, special assistant to the CSAF, Gen. T. Michael Moseley. The panel has been gathering data with the aim of defining the new command's mission.

It is a mission already being handled by USAF personnel. Initially, 8th Air Force at Barksdale AFB, La., will function as the lead agency for the cyber command. Its commander, Lt. Gen. Robert J. Elder Jr., will develop a framework for the new major command over this year. The 8th has a primary bomber mission but also has conducted information operations since 2000.

It provides both types of forces to US Strategic Command.

Kass said Cyber Command will handle offense, defense, and management of the infrastructure of cyberspace and other aspects of the electromagnetic spectrum.

Kass and Elder emphasized that the command would be a warfighting command prepared to defeat any enemy attacking US and allied computer networks. No types of networks would be off-limits to Cyber Command's portfolio.

The Nov. 16 "cyberspace summit" was the latest in Moseley's round of four-star meetings. (See "Aerospace World: Moseley Wants Frequent Gatherings of Generals," November 2006, p. 15.) The meeting focused on strategic planning for the cyberspace command's implementation.

Osprey No. 1 Arrives at Hurlburt

USAF's first CV-22 Osprey tilt-rotor aircraft arrived on Nov. 16 at its duty base of Hurlburt Field, Fla.

The aircraft was flown by Army Gen. Bryan D. Brown, head of US Special Operations Command, and USAF Lt. Gen. Michael W. Wooley, commander of Air Force Special Operations Command.

The CV-22's arrival was staged as part of a simulated behind-enemy-lines mission, with AC-130 gunships firing overhead and nearby MH-53 Pave Low helicopters inserting ground forces. The Osprey converted from airplane to helicopter mode before a crowd of several hundred guests.

Once on the ground, the "keys" of the aircraft were turned over to Lt. Col. Ed Corallo, commander of the 8th Special Operations Squadron.

The Air Force is slated to receive 50 CV-22s by 2017.

San Francisco Drops JROTC

The San Francisco Board of Education voted in November to phase out its Junior Reserve Officer Training Corps over the next two years. The program, in which about 1,600 area students participate, has existed for 90 years.

The program was dominated by the Army; there are no Air Force JROTC units in the area.

Opponents of the program said they objected to a military influence in the schools, as well as the Defense Department's intolerance of gay service members. Dan Kelly, a member of the board who voted for the phaseout, told the *San Francisco Chronicle* that JROTC is "basically ... a recruiting program for the military."

The board voted four-to-two to eliminate the program and created a task force to come up with alternatives. Its action withdraws about $1 million in funding from the program, which is a cost-sharing arrangement between DOD and the city. Students, parents, and instructors protested outside the meeting before the vote.

USAF photo by SrA. Ali E. Flisek

USAF's first CV-22 Osprey hovers over the Hurlburt Field, Fla., flight line during its unveiling ceremony Nov. 16. (See above, "Osprey No. 1 Arrives at Hurlburt.")

China, Israel Get B-2 Secrets

A former Northrop Grumman B-2 engineer arrested in October 2005 for spying is now under indictment for passing secrets to as many as eight countries—including China and Israel.

According to the primary allegations revealed in an indictment unsealed in November, Noshir S. Gowadia, a US citizen and resident of Hawaii, regularly transmitted data and documents filled with classified information to foreigners. He also went overseas to teach courses on stealth technology such as that used to hide aircraft exhausts from infrared seekers.

Gowadia did it for money, not political reasons, according to the FBI.

Earlier last year, prosecutors indicated the charges would expand in another indictment against Gowadia that details his sharing of information

with Chinese officials and business sources in Israel. The identities of the Israelis have not been disclosed, nor has it been revealed whether they were private individuals or representatives of companies.

The indictment reveals that Gowadia received approximately $2 million from China for his services.

CAS Demands Drive A-10 Upgrade

The urgent need to fix a potentially deadly time lag in delivering close air support is driving the modification of A-10 aircraft with new digital radios.

Air Combat Command said in October that money pressures had forced it to drop a planned replacement of Warthog radios with a new digital model. However, it reversed that decision based on combat experience.

Gen. Ronald E. Keys, ACC chief, said when A-10 pilots switch to an encrypted mode on their current radios, troops on the ground have to turn switches, too, and wait two to five seconds before talking. If the pilot or ground operator doesn't pause, the transmission can be cut off or not heard at all. The digital radio solves the delay problem.

The new radios will also improve communications at high altitudes, such as in Afghanistan, where mountainous terrain can impede transmissions, Keys told reporters in November.

The first buy of approximately 62 digital radio kits will prove that the Air Force can put the new equipment in the A-10, Keys said. Crews began installing the new digital radios for aircraft flying in Afghanistan and Iraq in November, but the installation of more will have to await funding, Keys said. He wants to make sure that there are enough radios to train with.

Boeing Wins CSAR Contract, but Competitors Protest

The Air Force on Nov. 9 selected Boeing to build the next combat search and rescue helicopter, known as the CSAR-X, in a program potentially worth up to $15 billion.

In the competition, Boeing offered the HH-47, a variant of the twin-rotor CH-47 Chinook flown by the Army. The basic design has been in service nearly 50 years.

Lockheed Martin and Sikorsky protested the choice, triggering a Government Accountability Office review of the USAF award. Lockheed offered a version of the EH-101, recently selected by the Navy as the new Presidential transport aircraft. Sikorsky proposed the HH-92 Superhawk.

GAO will provide a finding in February.

Lockheed said it protested "with reluctance" but wants "the opportunity to more fully understand the reasons for the decision that was made." Sikorsky said it wanted to make sure government officials properly evaluated its aircraft.

The Air Force said it selected the HH-47 because Boeing's proposal offered best value and fastest delivery, not necessarily the most advanced design. Sue C. Payton, USAF's acquisition chief, said Boeing will deliver the HH-47 "several months earlier" than would be the case with the other two CSAR-X competitors. She said the best value criteria included cost and schedule factors.

She went on to say that the Air Force discounted platforms offering more advanced designs in favor of one that didn't "hold us hostage" to technology that has not matured and could take longer to deliver. There was no attempt, she said, to seek out "the most elegant, grand solution."

With the HH-47, Payton said, USAF would "vastly improve what we have today in the HH-60 helicopters, but we have some growth potential in the future." She added, "What was proposed by Boeing met that [need] better than any other proposal."

With Boeing, the first production HH-47 would arrive in 2011. USAF wants 141 aircraft, along with training and logistics support. Initial operational capability with 10 aircraft is forecast for the end of 2012. If the first 10 aircraft prove satisfactory, full production would continue through 2019.

Boeing would use its Ridley Park, Pa., facility to build the aircraft.

Gen. T. Michael Moseley, Air Force Chief of Staff, lauded the Boeing aircraft as the better choice because it had superior range and payload, which is "the soul of an air force." The HH-47 "exceeds our requirements in both areas," he said.

He said the modernized Chinook would be capable of flying faster, over longer ranges, and at higher altitudes. It could do this during day or night and in poor weather, while carrying loads bigger than those carried by today's HH-60 Pave Hawk.

"Constant Peg" Declassified

One of the Air Force's oldest "open secrets" was declassified in November, when the service revealed that it acquired, tested, and flew Soviet-designed fighters during the Cold War.

The program's code name was "Constant Peg," and it ran from 1977 to 1988. The Air Force said its 4477th Test and Evaluation Squadron, nicknamed the "Red Eagles," flew MiG-17, MiG-21, and MiG-23 aircraft from various bases in Nevada, including Tonopah Test Range, home of the then-secret F-117 stealth fighter.

The program provided intimate knowledge of MiG design and capabilities. The MiGs were flown against US fighters, toward developing better tactics. They also participated in "Aggressor"-style programs like Red Flag.

The Air Force declined to say how it had obtained the MiGs, offering only that they were "communist built." Some are known to have been provided by Israel, which captured them during various conflicts. USAF officials have privately confirmed that some were also provided by Egypt and Pakistan.

Since 1988, though, the Air Force has acquired more advanced Russian-designed aircraft. In 1997, the US openly purchased 21 MiG-29s from Moldova. As recently as 2003, in Operation Iraqi Freedom, the Air Force acquired MiGs captured in Iraq—some of which had been buried to hide them from US aerial attack.

The Air Force wouldn't say whether the April 1984 death of Lt. Gen. Robert M. Bond was connected with Constant Peg. Bond was killed on the Nevada Test Range in an aircraft USAF has never officially identified. Rumors at the time had Bond flying a secret stealth aircraft, but USAF officials later said Bond was killed in a MiG-23 accident. At the time of his death, Bond was vice commander of Air Force Systems Command.

Dutch To Buy JSF

The Netherlands announced Nov. 14 that it will move from simply participating in development of the F-35 Joint Strike Fighter to actually purchasing the aircraft. It is the first of the partner nations to do so.

Officials from the Pentagon and the Dutch Ministry of Defense signed a production, sustainment, and follow-on development memorandum of understanding which extends cooperation in the program beyond the current system development and demonstration phase. (See "Aerospace World: Dutch Approve JSF Pact," December 2006, p. 16.)

Once the signing process is complete, the partners will cooperatively develop, produce, test, train with, and operate the F-35 Lightning II. The Neth-

erlands joined the program as an SDD partner in 2002 and has been involved in the JSF program since 1997.

C-130s Get New Wing Boxes

Some 155 C-130s crippled by wing box cracks are getting repairs at Warner Robins Air Logistics Center, Ga. The ALC began replacing the structures in November and hopes to complete 12 airlifters by 2009 and a total of 155 by 2020, said Dusty Dodd, chief of C-130 programs at the 330th Aircraft Sustainment Group.

The Air Force has 47 C-130s under flight restriction; another 30 are completely grounded due to cracks. Dodd said he hopes to get ahead of "grounding-restriction curve" by 2012. By that, he means that the ALC will be replacing wing boxes faster than the fleet is being restricted.

The wing box replacement costs about $7 million an aircraft, depending on the model, but Dodd added that a new aircraft would cost 10 times as much.

The Air Force is loath to allow any of its C-130s to remain down for long due to repairs, as they are in heavy demand. The new wing boxes are identical to those on new C-130J versions of the Hercules.

New Spaceplane Advances

An unmanned, reusable spaceplane, based on the X-37 technology demonstrator, will continue on into full-scale development and orbital testing, the Air Force announced in November.

The new effort, called the Orbital Test Vehicle, builds on investments made by the Air Force, NASA, and the Defense Advanced Research Projects Agency in the X-37 so far. The Air Force Rapid Capabilities Office will lead the initiative, with help from NASA and the Air Force Research Laboratory.

The project, known as the Approach and Landing Test Vehicle, recently wrapped up a series of captive-carry and free-flight tests from a commercial aircraft. The tests validated flight dynamics and extended the flight envelope beyond what NASA had already accomplished.

The OTV program will now focus on risk reduction and experimentation, as well as developing a concept of operations.

An orbital test flight of the vehicle is slated for Fiscal 2008, with a launch from Cape Canaveral AFS, Fla., on an Atlas V booster. Objectives for the first flight include the demonstration and validation of guidance, navigation, and control systems, as well as autonomous re-entry and landing. Lightweight high-temperature structures and landing gear will also be tested.

USAF Hit With Kyrgyz Claim

Kyrgyzstan is pressuring the US for compensation, charging that the crew of an Air Force tanker was responsible for a September collision with a Kyrgyz

Air Force Expanding Aggressor Operations to Alaska

The Air Force's cadre of dedicated "Red Air" adversaries is preparing to expand operations by standing up another squadron at Eielson AFB, Alaska. It is part of an overall increase in the spectrum of threats simulated in Red Flag-Alaska. (See "Washington Watch: Exercises on the Rim," December 2006, p. 10.)

Col. Terrence J. O'Shaughnessy—the 57th Adversary Tactics Group commander—told reporters in November that Red Flag-Nellis and the newly renamed Red Flag-Alaska at Eielson will field complementary and compatible aggressor squadrons to train US and allied forces in all aspects of aerial combat.

The new squadron at Eielson will get F-16C Block 30 aircraft for its Red Flag operations, said Brig. Gen. David J. Scott, commander of the 354th Fighter Wing at the base. In the future, there might be opportunities to bring Nellis F-15 aggressors to Eielson and Eielson's F-16s to Nellis, but not until operations begin in 2008.

Eielson aggressors will be more operations-oriented and will work at the tactical level, while Nellis will be responsible for the strategic operations for the Red Flag exercises, Scott added.

As for the kinds of threats being simulated in the air, O'Shaughnessy noted that a full range of air to air threats can be modeled by both squadrons—from Flankers to some of the older MiG-21s—and not all aircraft are the same.

"It might be an older airplane with newer avionics, and we try to replicate that," he said. Aggressor pilots are able to use the F-16 very handily and can be "handcuffed" to simulate many different aircraft configurations.

Eielson's aggressor squadron plans to be operational by March 2008, Scott said. Despite the expansion, O'Shaughnessy added that there are no plans to take the aggressor training on the road.

The 57th ATG also is working on diversifying the simulated threats in its Red Flag exercises. "We want to present threats in a very integrated fashion," O'Shaughnessy said, noting that the 57th ATG is working on expanding training aggressors in ground threats, space, cyberspace, and information operations.

passenger airliner at the country's Manas Airport. No one was injured in the accident.

The Kyrgyz Airlines Tu-154 was taking off in darkness when it grazed the wing of a KC-135 also operating out of the airfield. The Tu-154 made an emergency landing. The KC-135's left wing caught fire and one of its engines was destroyed.

Transport Minister Nurlan Sulaimanov said the accident was the fault of the KC-135 crew and that Kyrgyz authorities were negotiating with the US on possible compensation for damage. He said the Kyrgyz crew could not see the KC-135 because of darkness and an uneven runway surface.

The Air Force maintains a tanker presence at Manas Airport, which is located outside of the capital, Bishkek, and serves as a refueling hub for operations in and around Afghanistan.

USAF, Australia Seek Hypersonics

The Air Force and Australian Department of Defense will jointly develop hypersonic technologies, with an eye toward developing future high-speed missiles, under an agreement signed in November.

The Hypersonic International Flight Research Experimentation program—or HiFIRE—will be a six-year project aimed at basic and applied research. However, it will involve up to 10 flights of test vehicles at speeds greater than Mach 5.

Douglas Dolvin of the Air Force Research Lab's air vehicles directorate, said there's potentially huge payoff from the extremely high speeds offered by hypersonic vehicles, which offer game changing possibilities in prompt, precision strike at long standoff distances.

The $54 million deal is one of the largest collaborations of its kind between the two allies. The AFRL and the Australian Defense Science and Technology Organization will lead the effort. Research will also be conducted with NASA, American industry, the Australian Hypersonics Consortium, and the University of Queensland in Australia.

The test flights will be conducted at the Woomera Prohibited Area test range in Australia—the largest land weapons range in the world.

DOD Seeks Fuel Savings

As the biggest consumer of energy in the Defense Department, the Air Force is trying a variety of approaches to reduce both its energy appetite and the kinds of fuel it can use.

Michael A. Aimone, USAF assistant deputy chief of staff for logistics, installations, and mission support, told industry officials in November that USAF is making energy consumption a consideration at every step in the buying and operations process and, where possible, will switch to a renewable, less costly, or more efficient alternative.

More than 80 percent of USAF's energy use is in aviation operations—42

Senior Staff Changes

RETIREMENTS: Maj. Gen. Kenneth M. **Decuir,** Maj. Gen. Bob D. **Dulaney,** Brig. Gen. David L. **Stringer,** Lt. Gen. Garry R. **Trexler.**

CHANGES: Brig. Gen. David W. **Eidsaune,** from Cmdr., AF Security Assistance Center, AFMC, Wright-Patterson AFB, Ohio, to Cmdr., Air Armament Center, AFMC, Eglin AFB, Fla. ... Maj. Gen. (sel.) Ronald R. **Ladnier,** from Vice Cmdr., TACC, AMC, Scott AFB, Ill., to Cmdr., TACC, AMC, Scott AFB, Ill. ... Maj. Gen. Jeffrey R. **Riemer,** from Cmdr., Air Armament Center, AFMC, Eglin AFB, Fla., to AF PEO, F-22 Prgm., Office of the Asst. SECAF for Acq., Pentagon ... Brig. Gen. Katherine E. **Roberts,** from Principal Dir. for Forces Policy, Office of the Dep. ASD for Forces Policy, Pentagon, to Spec. Asst. to the Dep. Dir., NRO, Office of the Undersecy. of the AF, Chantilly, Va. ... Maj. Gen. Winfield W. **Scott III,** from Cmdr., TACC, AMC, Scott AFB, Ill., to DCS, Strat. Comm., MNF-Iraq, CENTCOM, Baghdad, Iraq ... Maj. Gen. Johnny A. **Weida,** from Dir., Intel. & Rqmts., AFMC, Wright-Patterson AFB, Ohio, to Cmdr., AF Security Assistance Center, AFMC, Wright-Patterson AFB, Ohio ... Brig. Gen. Janet C. **Wolfenbarger,** from Spec. Asst. to the Cmdr., AFMC for Command Transformation, AFMC, Wright-Patterson AFB, Ohio, to Dir., Intel. & Rqmts., AFMC, Wright-Patterson AFB, Ohio ... Brig. Gen. Daniel P. **Woodward,** from Dep. Dir., Force Mgmt., Jt. Staff, Pentagon, to Dir., Regional Affairs, Office of the Dep. Undersecy. of the AF for Intl. Affairs, USAF, Pentagon ... Maj. Gen. Thomas B. **Wright,** from DCS, Strat. Comm., MNF-Iraq, CENTCOM, Baghdad, Iraq, to DCS, Ops., SHAPE, NATO, Casteau, Belgium ... Brig. Gen. Scott E. **Wuesthoff,** from Dep. Dir., P&P, AMC, Scott AFB, Ill., to Vice Cmdr., TACC, AMC, Scott AFB, Ill.

SENIOR EXECUTIVE STAFF CHANGES: Patrick G. **Carrick,** to Dir., Physics & Electronics, AF Office of Scientific Research, AFRL, AFMC, Washington, D.C. ... Yvonne T. **Jackson,** to Dep., AF PEO, Combat & Mission Spt., Office of the Asst. SECAF for Acq., Pentagon ... Susan J. **Thornton,** to Dir., Directed Energy, AFRL, AFMC, Kirtland AFB, N.M. ■

The War on Terrorism

Operation Iraqi Freedom—Iraq

Casualties

As of Dec. 14, 2006, a total of 2,933 Americans had died in Operation Iraqi Freedom. This total includes 2,787 troops and seven Defense Department civilians. Of those fatalities, 2,357 were killed in action by enemy attack, and 576 died in noncombat incidents.

There have been 22,229 troops wounded in action during OIF. This includes 12,257 who returned to duty within 72 hours and 9,972 who were unable to quickly return to action.

Air Strike Takes Out IED Cell

A coalition air strike killed three terrorists in Yusifiyyah, Iraq, during a Nov. 13 operation that tracked an improvised explosive device cell in the city.

Coalition forces had tracked the terrorists' movement on a dirt road on the outskirts of the city, according to a statement by the Multinational Force-Iraq. Based on intelligence linking one of the terrorist vehicles to a local IED network, aircraft in the area engaged and destroyed the vehicle with precision munitions.

The operations will "significantly disrupt" vehicle-borne IED production in the Baghdad region, MNF-Iraq officials said.

Nonlethal Checkpoint Technology

A competition to find an effective and nonlethal way to stop vehicles approaching military checkpoints was held in Arizona in November.

Two six-person teams from the Air Force Research Laboratory, members of which have five or less years' experience, competed to offer a winning technology solution in the competition.

The two teams each had six months to develop their ideas. One team was from Kirtland AFB, N.M., and the other was from Wright-Patterson AFB, Ohio.

Violence at checkpoints has been a major issue for US forces in Iraq and Afghanistan because of uncooperative drivers and passengers.

Maj. Gen. Ted F. Bowlds, AFRL chief, put out a call to resolve the checkpoint problem by using new, nonlethal methods. The competition was aimed at giving younger AFRL staff a chance to voice their ideas. It was called Junior Workforce Challenge Project.

Operation Enduring Freedom—Afghanistan

Casualties

As of Dec. 14, 2006, a total of 352 Americans had died in Operation Enduring Freedom, primarily in and around Afghanistan. The total includes 194 troops killed in action and 158 who died in nonhostile incidents such as accidents.

A total of 1,066 troops have been wounded in Enduring Freedom. They include 426 who were able to return to duty in three days and 640 who were not.

USAF Takes Over Bagram Hospital Operations

The Air Force took over operations at the biggest US hospital in Afghanistan in December, toward providing seamless care from the battlefield to Stateside recuperation.

The combat support hospital in Bagram had been run by the Army, but since the Air Force is in charge of caring for patients for the rest of the trip home, through Ramstein AB, Germany, to Stateside bases, it made sense for USAF to take over the hospital operations.

The freshly built $24 million facility opened its doors in December. It has 83,000 square feet of space and a staff of up to 200 doctors, nurses, and medical support personnel. The hospital has an intensive care unit, three operating rooms, an emergency room, CT or CAT-scan x-ray equipment, a radiology lab, blood bank, and other facilities.

The Air Force also runs the theater hospital at Balad AB, Iraq, which is the largest hospital supporting Operation Iraqi Freedom. By comparison, Balad's hospital has approximately 377 personnel and is growing to about 100,000 square feet.

Weapons Releases Up Fourfold

The pace of air attacks in Iraq and Afghanistan spiked sharply in October, compared with the same month in 2005, according to US Central Command Air Forces. Aircraft flying close air support sorties in Operation Enduring Freedom made 397 weapons releases in October, up fourfold from the 86 releases reported in October 2005. Coalition and NATO International Security Assistance Force troops have been calling for more close air support than ever before.

percent for mobility alone, Aimone said. Only 16 percent of the Air Force's energy is used by installations, which are more easily converted to alternatives than aircraft.

He pointed out that the Air Force has reduced its energy consumption at its facilities by 30 percent over the last 20 years, but more needs to be done with aviation operations, especially in light of the increasingly tight global energy market. USAF uses more than three billion gallons of aviation fuel annually.

US Leads World Arms Sales

World arms sales in 2005 hit their highest level since 1998, with the US alone providing almost half the weapons sold to developing nations, the Congressional Research Service reported in October.

The CRS said the US supplied $8.1 billion in weapons, related equipment, and services to developing countries in 2005, amounting to 46 percent of all sales to such countries as Egypt, India, Israel, Kuwait, Saudi Arabia,

Index to Advertisers

Buying Air Force Equipment on Time, on Cost, and Faster

The Air Force, in a review of the way it buys equipment, is thinking about adding a new step to ensure the systems will come in on time and at the expected cost. It also wants to cap development time at six years between contract award and delivery of a usable asset.

The ideas were unveiled at an industry day held by the Air Force in November.

The first new concept, called "time certain development," would demand that once a system is chosen from among several competitors, it would have to pass a preliminary design review before advancing to full development. As it stands now, system development and demonstration—SDD for short—begins as soon as a winner is chosen.

The change would give higher confidence in program cost and schedule, and better identify areas of risk, according to Maj. Gen. Mark Pillar, of the office of the Air Force's assistant secretary for acquisition.

Service officials also said the change would help curb requirements creep, assure that technology was ready to progress to the manufacturing stage, and give contractors a clear understanding of what is expected of them.

Other initiatives planned to speed up the acquisition process include standardizing the buying process across the various USAF commands, improving the training of source-selection teams, and making cost realism a prime consideration at every step in the process, Pillar said.

The Air Force may also shift the way it pays incentive fees on contracts, reducing rewards for merely adequate performance.

and the United Arab Emirates. Russia came in second, with 15 percent of the sales, valued at $2.7 billion. Britain, with just over 13 percent, made $2.4 billion worth of arms transfers. It was the eighth year in a row the US has led in the value of arms deliveries. In 2005, the US made worldwide weapons deliveries valued at about $11.6 billion altogether.

Overall, arms sales worldwide are up over the period 1998 to 2005. The CRS noted that some of the major weapons orders in 2005 reflect deferred purchases that were finally consummated by several nations.

Reservist's Remains Are Identified

Remains discovered off the California coast this past September have been identified as those of Air Force Reserve SSgt. Jonathan R. Leonard, a passenger on an HC-130 that crashed into the Pacific Ocean on Nov. 22, 1996.

Also aboard were 10 other members of the 939th Rescue Wing from Portland Arpt., Ore. Only one crew member survived. The Coast Guard recovered two bodies after the crash; Navy efforts to retrieve the remains were only partially successful.

In September, a fishing boat dredging waters west of Punta Gorda, Calif., discovered Leonard's remains along with an aircrew survival suit and a partial name tag bearing his name. The remains were identified by the Armed Forces' Medical Examiner's Office using DNA and forensic tools. The remains have been returned to his family for burial.

Leonard was an intelligence specialist from LaGrande, Ore., and joined the Air Force Reserve Command rescue unit in July 1991.

Missing in Action

Missing World War II Airman Identified

The Pentagon announced Nov. 8 that the remains of four servicemen missing from World War II had been identified and returned to their families for burial with full honors.

The identified airmen are SSgt. Joseph A. Berube, of Fall River, Mass.; 2nd Lt. Robert L. Hale of Newtonville, Mass.; SSgt. Glendon E. Harris of North Monmouth, Maine; and 1st Lt. Robert H. Miller of Providence, R.I. All were in the US Army Air Forces.

On an October 1943 bombing run over Rabaul, the B-25 in which the men were flying was attacked by Japanese fighters and shot down. Crews from other aircraft said they saw the B-25 crash near a plantation at Kabanga Point. There were no survivors.

In 1946 and 1947, Australian teams recovered some of the crew's remains from the site, but identifications were not possible at the time and remains were buried at the Manila American Military Cemetery in the Philippines. The Joint POW/MIA Accounting Command led a team back to the crash site beginning in 1999, eventually discovering wreckage, human remains, and personal effects. In 2004, a JPAC anthropologist exhumed the graves in Manila where the remains buried in the 1940s were recovered.

Japanese Boomers Come to Travis

Three members of the Japan Air Self-Defense Force completed a four-month training program at Travis AFB, Calif., in November, making them the first tanker boom operators in the JASDF.

MSgt. Randy Kawasaki, MSgt. Etsuro Mizokami, and TSgt. Masaaki Takahashi were picked from the JASDF headquarters for the assignment, due to their previous experience as aircraft loadmasters and language skills. After a six-month course in English at Lackland AFB, Tex., they completed a three-week basic boom operators course at Altus AFB, Okla. The three Japanese airmen then went to Travis for KC-10 boom operator basic qualification work.

Japan will soon get KC-767Js, but Kawasaki said the aerial refueling procedures and essence of boom operating skills are the same as with the KC-10. Japan is not scheduled to get its own boom simulator until 2009 and plans to send more than 12 future operators for training at Travis.

Poland Receives Advanced F-16s

Gen. William T. Hobbins, head of US Air Forces in Europe presided over ceremonies marking the delivery of advanced new F-16s to Poland in November.

The rollout ceremony of the F-16 Block 52 aircraft took place at Poznan. The F-16s are being provided under the Peace Sky foreign military sales program.

Hobbins said acquisition of the new fighters cements the relationship between the US and Polish Air Forces. Polish officials said the F-16s will improve efforts to transform the country's old Soviet-era inventory into one more interoperable with the advanced systems in Europe and NATO.

Poland will use the F-16s to fulfill its alliance obligations in air policing and as part of the NATO Response Force. As the F-16s are delivered, they will replace Soviet-era MiG-29s.

Polish pilots and maintainers are in training with the 162nd Fighter Wing of the Arizona Air National Guard, and the Air Force is assisting with rotating mobile training teams to assist with aircraft maintenance.

Under the Peace Sky program, Poland will get 36 single-seat F-16Cs and 12 two-seat F-16Ds. The first four include three single-seat and one tandem version. The remainder of the Polish fleet is scheduled for delivery through 2008. ■

News Notes

■ Air Force B-52 bomber crews and the Navy's Mobile Mine Assembly Unit 8 in early November completed a week-long joint sea-mine-laying exercise off the coast of Guam. It was the largest number of weapons released by B-52s since the current bomber rotation arrived at Andersen Air Force Base in August. The 10-sortie exercise featured release of 92 Mk 62 mines and four Mk 56 moored mines into a pair of three-mile-long training mine fields over the Marianas Trench off Guam.

■ The Air Force Office of Special Investigations, working with the government of Thailand, in November captured its most wanted fugitive—a former Air Force sergeant suspected of killing his pregnant wife in 1994. The joint effort produced the arrest of Saner Wonggoun, 59. He was based at Travis AFB, Calif., in 1994 and disappeared soon after his wife's body was found dumped along a deserted road in Marin County, Calif. Authorities got a break when Thai officials were tipped off to Wonggoun's location. The tip came after announcement of a reward for information.

■ Lt. Gen. Stephen G. Wood on Nov. 6 assumed command of 7th Air Force. In the change of command ceremony at Osan AB, South Korea, Wood took over from Lt. Gen. Garry R. Trexler. Trexler retired Jan. 1. Wood most recently had served as Air Force deputy chief of staff for strategic plans and programs at the Pentagon.

■ Brig. Gen. Douglas H. Owens, the new commander of the 36th Wing at Andersen AFB, Guam, told the *Pacific Daily News* in November that officials from Pacific Rim countries have been invited to Guam and Hawaii to observe an early 2007 demonstration of the Global Hawk UAV. The first of Guam's permanently stationed Global Hawks will arrive in 2009, said Owens.

■ The Air Force in late October processed about 700 households through the evacuation center at Osan AB, South Korea. The drill was part of Courageous Channel 06-2, a noncombatant activity that tested all aspects of US Forces Korea's evacuation programs. The average processing time for evacuees was 15 minutes. In all, 1,470 evacuees were processed and more than 60 percent were handled on the first day. The exercise helped test the response time and preparedness level of every evacuee, from in-processing to the actual evacuation process.

■ Unified Engagement 2006—one of the largest multiforce, multinational wargame simulations of the year—wrapped up Nov. 9 at the US Army's Schofield Barracks, Hawaii. More than 300 troops and civilians from five countries gathered at the Command Battle Training Center to take part in a scenario set 12 to 15 years into the future. The exercise featured cooperation between the Air Force and services from Australia, Britain, and Canada. Military leaders exchanged ideas and put them to work in various scenarios such as terrorist attacks, natural disasters, and humanitarian emergencies.

■ Boeing has received a $78.2 million contract from Northrop Grumman Mission Systems to deploy a replacement environmental control system for more than 550 Minuteman ICBM launch, alert, and training facilities. The ECS regulates climate and ensures that electronics and ground support equipment are maintained at specified preset temperatures. The contract calls for work completion in 2011.

■ Five former Army Air Forces members who took part in the legendary Doolittle Raid on Japan in early 1942 traveled to Washington, D.C., in November to participate in Veterans Day events, including wreath laying ceremonies at the Air Force and Navy Memorials. The Doolittle Raiders also met with service members at the Pentagon and Bolling AFB, D.C. During a wreath laying ceremony at the Air Force Memorial, Secretary of the Air Force Michael W. Wynne paid tribute to the raiders. Of the 80 original airmen who took part in the raid, 16 survive today.

■ Boeing has received a $299.8 million contract from the Air Force to produce the fourth Wideband Gap-filler System satellite(now renamed Wideband Global System)—the first option to be exercised on the WGS Block II contract finalized in October. The Block II contract is valued at $1.067 billion if all options are exercised. WGS-4 will be similar to the three Block I satellites, but will have a radio frequency bypass capability to support airborne intelligence-surveillance-reconnaissance platforms. WGS-4 is expected to launch in early 2011.

■ BAE Systems has been selected by the Air Force to produce electronic attack pod testing equipment to protect F-15, F-16, and A-10 aircraft. The $3.3 million contract for the Electronic Attack Improved Avionics Intermediate Shop transitions a full-scale tester to a production ready station to test ALQ-131 and ALQ-184 electronic attack pods. The pods provide protection for aircraft and aircrews against radio frequency threats such as radar-guided missiles. The EA-IAIS is a portable tester designed for rapid deployment and helps provide fast repairs of electronic warfare pods. The work on the testers will be preformed at BAE's San Diego facility through 2008, with the next phase of the program to produce up to 100 testers.

■ Travis AFB, Calif., firefighters came out on top for the third consecutive time at the World Firefighter Combat Challenge in Henderson, Nev., in November. Attracting hundreds of US and Canadian municipal fire departments from more than 25 locations, the competition encouraged firefighter fitness with a range of tasks such as tower climbing, hoisting and chopping, dragging hoses, and rescue techniques. In addition, participants have to wear full-bunker gear, including an air-breathing apparatus.

■ As part of consolidation efforts related to the "superbase" merging of McGuire Air Force Base and Ft. Dix, N.J., the 305th Medical Group Clinic physical therapy department recently joined with Ft. Dix—marking the first joint physical therapy clinic where Air Force and Army therapists are located under the same roof. The troop medical clinic on Ft. Dix will be relocating to the 305th Medical Group in 2007 and will enable the Air Force and DOD to save $880,000 in physical therapy referrals to civilian providers. Once all programs are collocated in the McGuire clinic, savings are projected at $2.4 million a year.

■ Air Force and Singapore officials are in the process of working out a deal to bring up to 10 Singapore F-15 Eagles to Mountain Home AFB, Idaho, to establish a training squadron. Pending the completion of an environmental analysis and negotiations between the air forces, a decision is expected by March 2007. Mountain Home is slated to lose its fleet of F-16s and F-15Cs, and will gain F-15E Strike Eagles from Elmendorf AFB, Alaska. No date has been proposed for the standup of the squadron, according to Mountain Home officials. ■

Action in Congress

By Tom Philpott, Contributing Editor

Rangel's Angle?; Congress Losing Its Veterans; Military Coalition Wish List ....

Draft, Anyone?

Rep. Charles B. Rangel (D-N.Y.) promised to introduce in the new Congress legislation to resume a military draft, despite stiff opposition to the idea by Defense Department civilians, military leaders, and a majority of lawmakers—including the leaders of Rangel's own Democratic Party.

Rangel claims the invasion of Iraq would not have occurred had conscription been in place, thereby exposing the sons of decision-makers to the dangers of war.

Rangel showed apparent disregard for the benefits of an all-volunteer, professional military, also saying, "I don't see how anyone can support the war and not support the draft."

Rangel's chances of success are considered microscopic.

Veterans Vanishing on Hill

The proportion of Congress made up of military veterans continues to fall. When the new Congress convened this month, the percentage of veterans had slipped below 25 percent.

Six veterans were newly elected, but this does not offset the veterans who retired or lost their seats.

Thirty years ago, only about 25 percent of lawmakers weren't veterans.

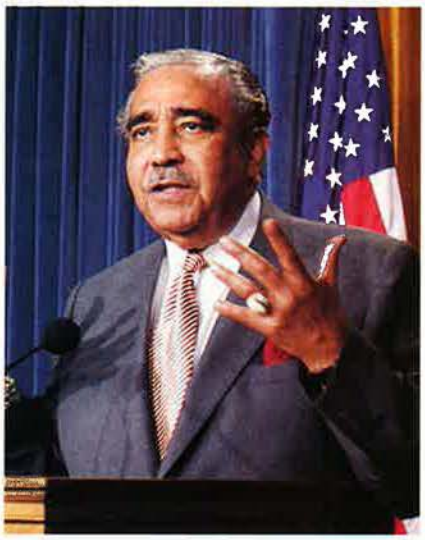
Fixing Damaged Goods

By March 2008, service members who report household goods damaged or lost in shipment to new assignments are to receive full replacement value (FRV)—not a reimbursement amount based on the item's depreciated value.

Congress set the deadline in the 2007 defense authorization act signed Oct. 17.

Air Force Col. Steven L. Amato, director of passenger and personal property for the Military Surface Deployment and Distribution Command, said FRV might take effect sooner, perhaps by November 2007, if DOD can get its Families First plan to re-engineer the personal property program.

DOD is the moving industry's largest customer. Officials have worked for more than a decade on Families First, a comprehensive plan to improve quality of moves, reduce claims, and quicken claim payments. But a drumbeat of complaints over low reimbursements sparked Congress to order a change in formula.



AP photo/Terry Ashe

Rangel wants YOU!

About a fifth of military moves result in damage claims, and damage to personal goods tops the list of military move complaints.

Under FRV reimbursement, if a moving company loses or destroys an item the service member will get a new one. Exceptions will be made for cars, motorcycles, and boats, because replacements of equal value are easy to find.

Where's the Money?

The military surgeons general said they would use a provision in the 2007 authorization act to increase stipends for student physicians and dentists under the military Health Professions Scholarship Program. (See "Action in Congress: Medical Recruiting Incentives," September 2006, p. 34.) Soon after authority to raise the stipend was enacted last October, however, the service medical departments reviewed their budgets and couldn't find the money to support the higher stipend.

Congress, it seems, had not funded the change.

The only current plan to raise the HPSP stipend is a 2.2 percent cost-of-living increase next July.

Military Coalition Priorities

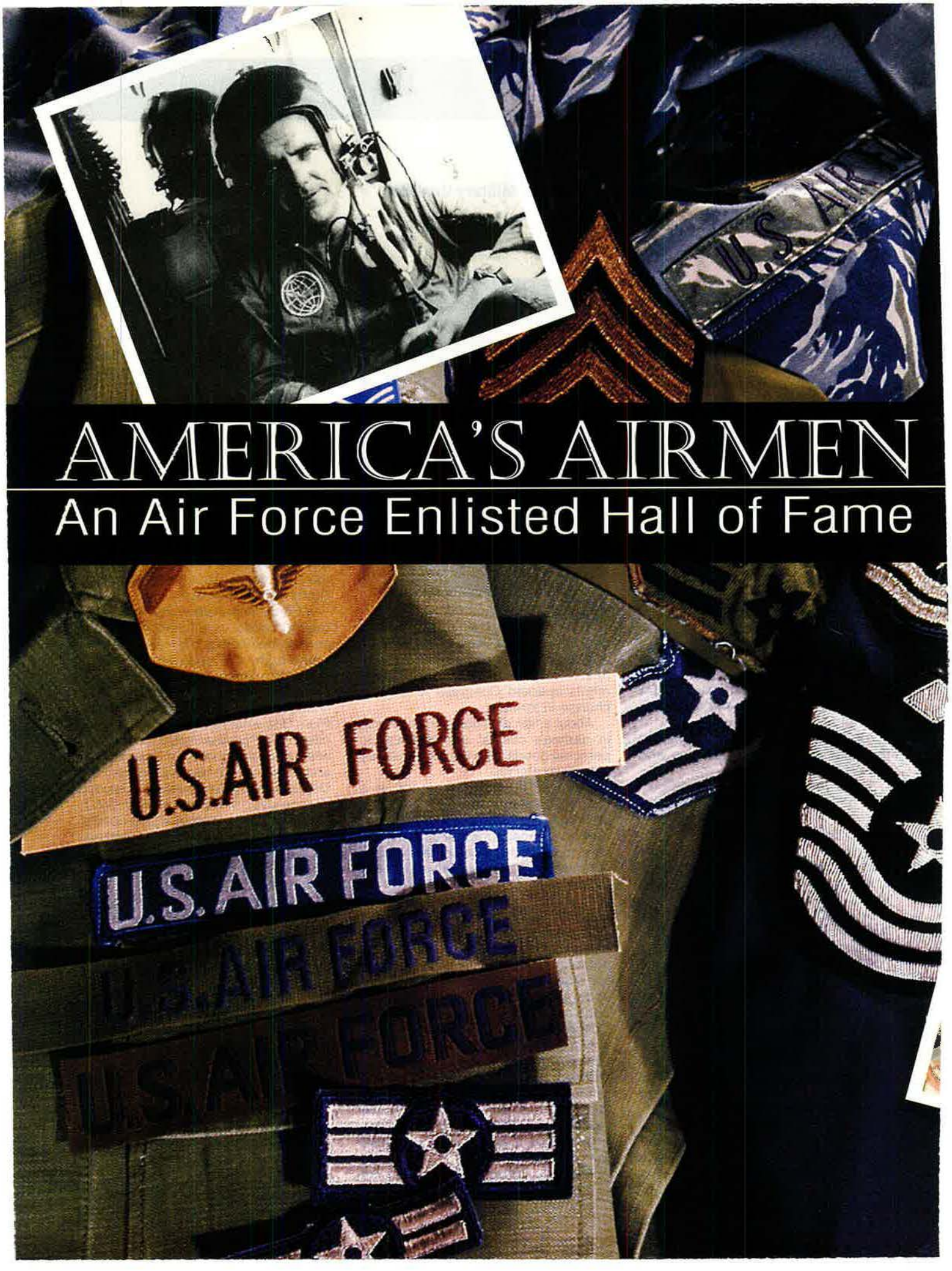
In early December, The Military Coalition, an umbrella group of three dozen service associations and veterans' groups including the Air Force Association, was preparing to unveil its legislative priorities for the first session of the 110th Congress.

TMC co-chairman Joseph Barnes, also of the Fleet Reserve Association, said some issues certain to top TMC priorities include:

- Tricare costs: Protecting beneficiaries from whatever hikes in Tricare fee and co-payments that are proposed in the 2008 defense budget presented to Congress in February.
- Force expansion: Particularly of ground forces, to relieve the strain on service members and families resulting from lengthy and repeated tours in Iraq and Afghanistan.
- SBP reforms: Two long-sought changes to the military Survivor Benefit Plan. One would end a dollar-for-dollar offset in SBP payments that spouses see when they also qualify for Dependency and Indemnity Compensation from the Department of Veterans Affairs. A second change would move forward from Oct. 1, 2008 the effective date of a "paid-up rule" for premiums for retirees who reach age 70 and have paid premiums for at least 30 years. (See "Action in Congress: Left on the Shelf," December 2006, p. 21.)
- Concurrent receipt: More progress on the concurrent receipt issue so that additional numbers of retirees with disabilities are able to receive both VA disability compensation and military retirement.

Promises to Keep?

In the last Congress 172 House members—all but three of them Democrats—pushed a major package of initiatives for service members and veterans called the New GI Bill of Rights for the 21st Century. Some of its provisions were enacted as parts of other legislation. Now, with Democrats in the majority, analysts expect the effort to be renewed. ■



AMERICA'S AIRMEN

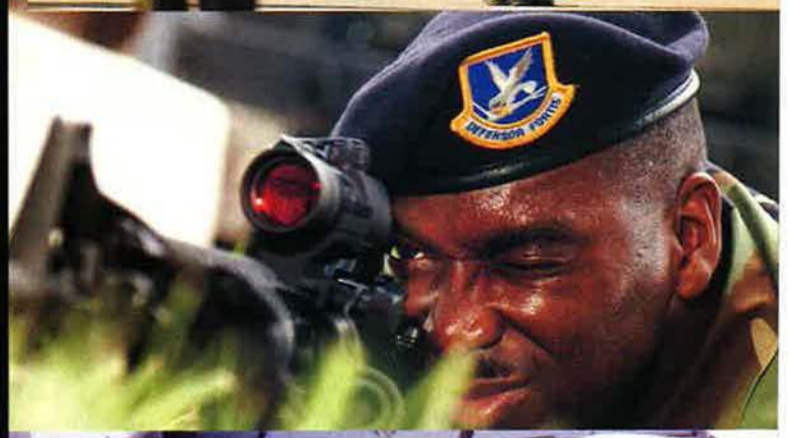
An Air Force Enlisted Hall of Fame

America's first enlisted airman reported for duty on Aug. 1, 1907—100 years ago this year. In the century since, the nation's airmen have served at the very forefront of airpower, helping to forge an awesome air weapon and performing conspicuous acts of bravery.

While thousands have gone above and beyond the call of duty, a select few stand out because of the scope and magnitude of their valor, dedication, and leadership. *Air Force* Magazine in these pages spotlights these individuals. Our list is highly selective—only 201 airmen.

In the 60th year of the Air Force and the 100th year of the airman, we dedicate our Hall of Fame to the millions of men and women who have worn stripes. Their stories are the stories of the Air Force.

—Robert S. Dudney, Editor in Chief



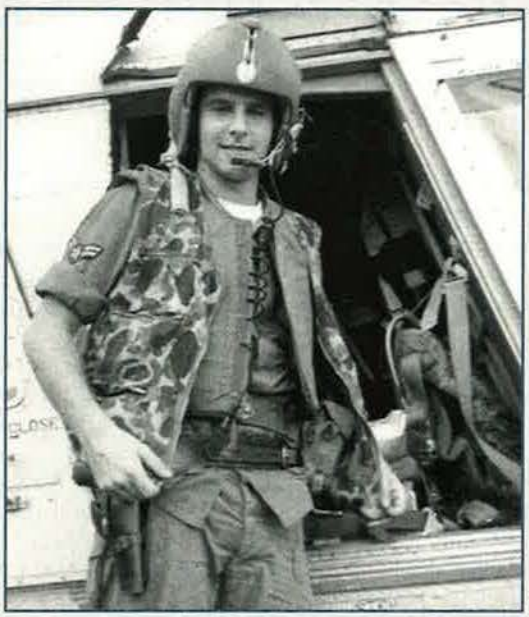
AIR FORCE MEDAL OF

SSgt. Henry E. Erwin
On April 12, 1945, Erwin was radio operator on a B-29 mission over Japan. He was dropping phosphorous smoke bombs through a chute in the floor to guide other B-29s to a rendezvous point, when a faulty bomb blew up and exploded back into the aircraft. It was burning at a temperature of 1,300 degrees and filling the aircraft with smoke. Erwin seized it, felt his way around obstacles and through a narrow passageway to a window, where he threw it out. He was burned severely and was expected to die. His Medal of Honor was rushed through—but he lived to retire as a master sergeant and work for the Veterans Administration for another 37 years. MOH awarded April 19, 1945.

A1C John L. Levitow
On Feb. 24, 1969, Levitow was loadmaster on an AC-47 gunship that was suppressing a mortar attack on Long Binh Army post in South Vietnam. The aircraft flew into the path of a mortar shell, which blew a hole in the right wing and riddled the fuselage with shrapnel. Levitow and another airman who were dropping magnesium illumination flares from the open cargo door were knocked down. A live flare fell inside the airplane and was seconds away from exploding. Levitow threw himself on the flare, crawled to the door, and tossed it outside, where it exploded. Levitow lived, but he had more than 40 shrapnel wounds. MOH awarded May 14, 1970.

Sgt. Archibald Mathies
On Feb. 20, 1944, Mathies was a gunner on a B-17 mission over Germany. An enemy fighter attack killed the copilot and severely injured the pilot, rendering him unconscious. Mathies was first into the cockpit and brought the airplane under control. He and the navigator guided it back toward England, where other crew members bailed out. Unwilling to abandon the injured pilot, Mathies and the navigator waved off instructions to bail out themselves. They attempted to land the crippled B-17, but it crashed and they were killed. MOH awarded posthumously June 22, 1944.

HONOR



A1C William H. Pitsenbarger

On April 11, 1966, Pitsenbarger, a pararescue jumper, descended from an HH-43 helicopter into the jungle near Bien Hoa in South Vietnam to help US soldiers wounded in an intense firefight. As casualties increased, he passed up an opportunity to get out. He exposed himself to enemy fire at least three times, collecting ammunition from the dead and wounded and redistributing it, pulling soldiers to safer positions, and taking part in defense of the site. He was wounded several times before he was killed. Pitsenbarger was awarded the Air Force Cross in 1966 and, upon reconsideration, the Medal of Honor 34 years later. MOH awarded posthumously Dec. 8, 2000.

Sgt. Maynard H. Smith

On May 1, 1943, Smith was ball turret gunner on a B-17 mission over France. The aircraft took extensive battle damage from flak and enemy fighters. The oxygen and intercom systems were shot out, and fires were burning in several locations. The waist gunners and radio operator bailed out into the sea, but Smith stayed aboard, manning the waist guns, fighting the fires, and aiding the injured tail gunner. When the fire extinguishers ran empty, he wrapped himself in protective clothing and put out fires with his hands. He threw out everything that wasn't bolted down to lighten the structurally weakened aircraft, which made it back—barely—to a landing in England. MOH awarded July 16, 1943.

TSgt. Forrest L. Vosler

On Dec. 20, 1943, Vosler was radio operator and gunner on a B-17 mission over Germany. With two engines lost to flak, the bomber dropped behind the formation and was repeatedly attacked by enemy fighters. The tail gun was destroyed, and although wounded himself, Vosler remained at the top turret gun to defend the airplane. The radio was knocked out. When ditching of the aircraft in the North Sea short of England became inevitable, Vosler—his eyesight impaired by glass fragments—fixed the radio by touch. The distress signal got through and a ship picked up the crew. Doctors were able to restore some of Vosler's sight, and he went on to become one of the first national directors of the Air Force Association when it was founded in 1946. MOH awarded Aug. 31, 1944.

CHIEF MASTER SERGEA OF THE AIR FORCE

CMSAF Paul W. Airey. April 3, 1967-July 31, 1969.
During World War II, Airey was a radio operator and waist gunner on a B-24 bomber. He had logged 28 combat missions over Europe when his aircraft was shot down in 1944. He was a prisoner of war until 1945. During the Korean War, Airey was awarded the Legion of Merit—an uncommon decoration for an enlisted man—for devising a corrosion control assembly line that saved radio and radar equipment from deterioration. In 1953, he became a first sergeant, the specialty in which he spent much of his career. In 1967, he was chosen from a field of 21 candidates to be the first Chief Master Sergeant of the Air Force. At the end of his term, Airey remained on active duty for another year, the only CMSAF to take a follow-on assignment.

CMSAF Paul W. Airey

CMSAF Donald L. Harlow. Aug. 1, 1969-Sept. 30, 1971.
Harlow was an aircraft armament instructor during World War II, but left service and remained in the Reserve until recalled for the Korean War. He transferred to the personnel specialty, where he served for the rest of his career. He served on the committee that shaped the charter for the new office of Chief Master Sergeant of the Air Force. After his tour as CMSAF, Harlow put his abilities to work as senior lobbyist and executive director of the Air Force Sergeants Association. In 1980, Harlow became the only enlisted man to ever receive the Order of the Sword, which is awarded by Air Force enlisted members for outstanding support of the enlisted force. Most recipients have been general officers, but Harlow's contributions stood out as special.

CMSAF Richard D. Kisling. Oct. 1, 1971-Sept. 30, 1973.
Kisling began his military career in the infantry. In 1945, he reached France in time for the last two weeks of World War II in Europe. After VE Day, he remained in Europe, working on repatriation of persons displaced by the war. Thereafter, he served mostly in the personnel field and was senior enlisted advisor for Air Force Security Service when selected in 1971 to be CMSAF. Kisling was known as "the GI's man in Washington," a title bestowed on him by *Air Force* Magazine. After his retirement, he remained in the Pentagon in civil service status, retiring just before his death in 1985. Kisling Hall at the Senior NCO Academy is named for him.

CMSAF Thomas N. Barnes. Oct. 1, 1973-July 31, 1977.
Barnes joined the Air Force in 1949 and became a hydraulics specialist on C-54 aircraft. During the Korean War, he flew 750 hours over enemy territory as a flight engineer on C-54s and was awarded the Air Medal. He continued in flight engineer and aircraft maintenance duties. He was a B-52 crew chief and later served in F-4 maintenance in Thailand during the Vietnam War. He was a wing senior enlisted advisor and at the time of his selection to be CMSAF in 1973, he was senior enlisted advisor for Air Training Command. Barnes was CMSAF for four years, being appointed to two one-year extensions at the end of his regular tour.

CMSAF Donald L. Harlow

NTS

CMSAF Richard D. Kisling

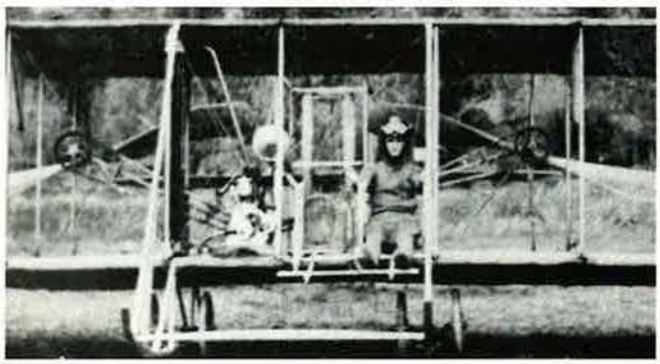
CMSAF Thomas N. Barnes

WARRIORS AND ACHIEVERS

TSgt. Arthur Benko was the highest scoring aerial gunner to be officially recognized as an ace by his command in World War II. He is credited with destroying 18 enemy aircraft, nine in the air and nine on the ground.

SSgt. Esther M. Blake was the first woman to enter the Air Force. She enlisted on the first minute of the first hour of the first day regular Air Force service was authorized for women, July 8, 1948.

Cpl. Vernon L. Burge was the first enlisted pilot. He was the mechanic on the Army's first airplane, learned to fly, and made his first solo flight March 1, 1912. He retired in 1945 as a colonel.

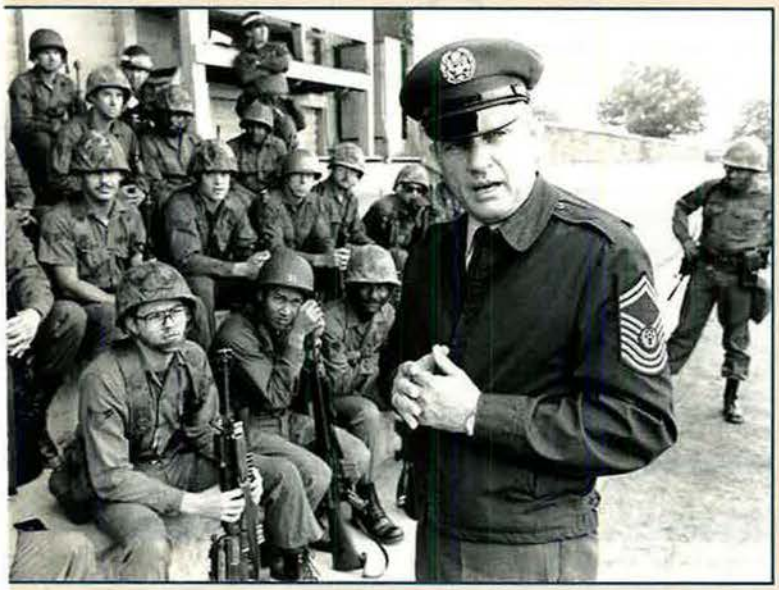


Burge in an Army Wright "B" airplane.

CHIEF MASTER SERGEANTS OF THE AIR FORCE

CMSAF Robert D. Gaylor. Aug. 1, 1977-July 31, 1979.
Gaylor, who joined the Air Force in 1948, spent the first part of his career as an air policeman, with an intervening tour as a basic military training instructor. After graduating with honors from the 2nd Air Force NCO Academy, he stayed on as an instructor. He subsequently assisted in reopening the SAC NCO Academy. Assigned to US Air Forces in Europe, Gaylor attracted top level attention when he established the USAFE Command Management and Leadership Center. He served as senior enlisted advisor in Europe, and in 1974, he was assigned to the Military Personnel Center as a one-man traveling training and leadership team. From there, he was selected to be CMSAF.

CMSAF James M. McCoy. Aug. 1, 1979-July 31, 1981.
McCoy joined the Air Force in 1951. He was initially a radar operator, but soon moved into training and leadership roles, including tours as a basic military training instructor and in AFROTC at Notre Dame University. In 1960, he became commandant of the SAC NCO Preparatory School and after that, he was sergeant major of the 2nd Air Force NCO Academy. Assigned to SAC headquarters, he established the SAC NCO Academy. McCoy was SAC senior enlisted advisor before his selection as CMSAF. After he retired, he served two terms as president and chairman of the board of the Air Force Association and was the first enlisted chairman of the Air Force Retiree Council.

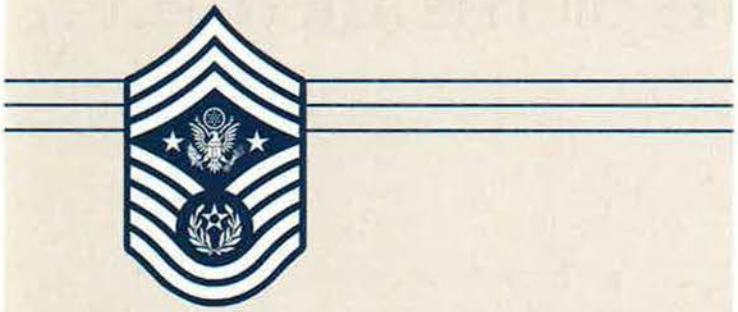


CMSAF James M. McCoy talks with the troops.

CMSAF Arthur L. Andrews. Aug. 1, 1981-July 31, 1983.
Andrews enlisted in the Air Force in 1953 and was in the air police for 12 years, eight of them as an investigator. He had a break in service after his first enlistment, but back home in Boston, he found the same people doing the same dead-end things they had been doing when he left to join the service years before, so Andrews decided to return to the Air Force. He became a first sergeant—a job Andrews described as "a laboratory for learning"—in 1967. He moved to senior enlisted advisor when that post was created and was senior enlisted advisor for Air Force Systems Command when selected to be CMSAF in 1981.

CMSAF Sam E. Parish. Aug. 1, 1983-June 30, 1986.
Parish joined the Air Force in 1954 and spent the early part of his career in the weather specialty, including six years in Air Research and Development Command with the 433L weather observing and forecasting system program office. In 1973, he graduated with the first class at the new Senior NCO Academy, where two other future CMSAFs—Tom Barnes and Jim McCoy—were among his classmates. After that, he was senior airman advisor at Air Weather Service. He served three tours in Europe, including assignments as sergeant major of a combat support group and USAFE senior enlisted advisor. He was senior enlisted advisor for SAC before his selection as CMSAF in 1983.

CMSAF James C. Binnicker. July 1, 1986-July 31, 1990.
Binnicker was a member of the Civil Air Patrol when he was in high school and he wanted to be a pilot. When a hearing problem ruled that out, he joined the Air Force in 1957. Most of his assignments were in base and wing operations. While he was senior enlisted advisor for 12th Air Force in 1977, he was chosen to represent the Air Force on the President's Commission on Manpower and Compensation. He spent four years at the Manpower and Perrsonnel Center working on enlisted issues. Binnicker was senior enlisted advisor for Pacific Air Forces and Tactical Air Command before his tour as CMSAF. Today, Binnicker is the head of Air Force Enlisted Village, which provides housing and services for widows of Air Force enlisted retirees.



CMSAF Gary R. Pfingston. Aug. 1, 1990-Oct. 25, 1994. Pfingston joined the Air Force in 1962 and entered the aircraft maintenance field. He was a crew chief on B-52s and KC-135s before moving up to maintenance management. Throughout his early career, Pfingston continued to play team sports, at which he excelled. A tour as a basic military training instructor led, in 1979, to his assignment as commandant of the Military Training Instructor School. He became a first sergeant in 1982 and served a series of tours as senior enlisted advisor—at the 831st Air Division, 12th Air Force, and PACAF—after which he was selected to be CMSAF in 1990.

CMSAF Arthur L. Andrews in his Pentagon office.

Sgt. 1st Class Fred C. Graveline was awarded the Distinguished Service Cross for valor as a volunteer gunner on 15 combat missions over France in 1918. On two occasions, he drove off superior numbers of German aircraft. He engaged one of them at a range of 75 yards and shot it down.

MSgt. Roy Hooe was the "airborne mechanic" on the Fokker C-2 *Question Mark,* kept aloft for more than 150 hours by primitive aerial refueling in 1929. At one point during the flight, Hooe went outside the aircraft on a catwalk to make engine repairs.

Question Mark ***crew: (l-r) Maj. Carl Spaatz, Capt. Ira Eaker, Lt. Harry Halverson, Lt. Elwood Quesada, Sgt. Roy Hooe.***

CMSgt. Dick Red, legendary maintenance leader in the Air National Guard, was the first enlisted man to receive the Legion of Merit, awarded for his work in support of air operations in North Africa in World War II. The Air Force Association's annual award for aerospace maintenance in the Air National Guard is named for him.

CHIEF MASTER SERGEANTS OF THE AIR FORCE

CMSAF David J. Campanale. Oct. 26, 1994-Nov. 4, 1996.
Campanale joined the Air Force in 1970, partly on the advice that "it would be a good way for me to get some direction in my life." The direction turned out to be strong indeed. Campanale was assigned to the aircraft maintenance field, became a B-52 crew chief, and pulled several tours in Guam supporting B-52 "Arc Light" missions in Southeast Asia. He later became a C-130 crew chief and flight and line chief for FB-111s and KC-135s. He was senior enlisted advisor at the wing level and for Military Airlift Command/Air Mobility Command before his selection in 1994 as CMSAF.

CMSAF David J. Campanale visits the 9th Bomb Squadron.

CMSAF Eric W. Benken. Nov. 5, 1996-July 30, 1999.
Benken joined the Air Force in 1970. His first specialty was administration, and he served in operational, maintenance, and support units at every level from squadron through major command. In 1993, he became senior enlisted advisor for 12th Air Force, moving the next year to USAFE as senior enlisted advisor. While there, he instituted the concept of the NCO professional development seminar to fill the gap between Airman Leadership School and the Senior NCO Academy. Such seminars soon spread and are now held at bases Air Force wide. On Benken's tour as CMSAF, the titles of senior enlisted advisors changed to command chief master sergeants.

CMSAF Frederick J. Finch. Aug. 2, 1999-July 1, 2002.
Finch joined the Air Force in 1974 and served in the missile maintenance field at every level of command. In 1980, his career emphasis shifted to professional military education. Finch taught at TAC's NCO Professional Military Education Center for four years and spent another four years in a series of assignments at the Leadership and Management Development Center at Maxwell AFB, Ala. He was superintendent for noncommissioned officer PME at the Military Personnel Center, the commandant of the PACAF NCO Academy, and senior enlisted advisor for 11th Air Force. In 1995, he became command chief master sergeant at Air Combat Command, a position he held for four years before his selection as CMSAF.

CMSAF Gerald R. Murray. July 1, 2002-June 29, 2006.
Murray joined the Air Force in 1977 because, he said, he "needed a job." He did not intend to remain in service, certainly not for the next 29 years. It soon became apparent that Murray and the Air Force were an excellent match, and he moved ahead steadily. He had 11 assignments in the aircraft maintenance field, working on and supporting F-4, F-16, and A-10 aircraft. After reaching the maintenance superintendent level, he moved into command chief master sergeant roles at two wings, at 5th Air Force, and at PACAF. He was selected in 2002 to be CMSAF.

CMSAF Rodney J. McKinley. June 30, 2006-
McKinley joined the Air Force in 1974 and served his first hitch as a medic. He had a break in service from 1977 to 1982, and when he returned, it was in the aircraft maintenance field. He became a squadron first sergeant in 1991, serving in that capacity in four assignments. He was then command chief master sergeant in airlift, fighter, and air expeditionary wings. In 1999, McKinley earned his master's degree in human relations. He was command chief master sergeant at PACAF when selected to be CMSAF in June 2006.

CMSAF Rodney J. McKinley in the field with airmen.

Some former Chief Master Sergeants of the Air Force gather in 2006. From left, front row: Paul W. Airey, Gerald R. Murray (then serving), Robert D. Gaylor, Gary R. Pfingston. Middle row (l-r): Sam E. Parish, James C. Binnicker, James M. McCoy. Top row (l-r): Frederick J. Finch and Eric W. Benken.

CMSgt. Bobby G. Renfroe was a pioneer in enlisted professional military education and became, in 1983, the first enlisted commandant of the Air Force Senior NCO Academy. In the years before Renfroe, the commandant had been a colonel.

MSgt. Jake H. Schuffert began drawing Air Force cartoons when he was an airborne radio operator during the Berlin Airlift. He went on to draw his enormously popular "It All Counts for 30" and "Here's Jake" in *Airman* Magazine, *Air Force Times,* and elsewhere.

CMSgt. Walter E. Scott, a loadmaster with combat tours in Korea and Vietnam, was noted for leadership, in later years, of veterans organizations. He was international president of the Air Force Sergeants Association, 1978-80, and went on to be chairman of the board of the Aerospace Education Foundation 1994 to 1996 and its president from 1996 to 1998.

Cpl. Edward Ward was the first enlisted airman, assigned to the Aeronautical Division of the Army Signal Corps, Aug. 1, 1907. He helped unpack the first military airplane, delivered by the Wright brothers to Ft. Myer, Va., for testing in 1908.

SSgt. Benjamin F. Warmer, waist gunner on a B-17, shot down seven German fighters, Me-109s and Me-110s, on a single mission over Sicily, Italy, July 5, 1943. Lt. Gen. Carl A. "Tooey" Spaatz, commander of Fifteenth Air Force, decorated Warmer with the Distinguished Service Cross and declared him an ace.

AIR FORCE CROSS

TSgt. Victor R. Adams was an aerial gunner on a UH-1F helicopter that was inserting a special forces team in Southeast Asia on Nov. 27, 1968. The Huey was shot down and crashed in flames. Disregarding enemy fire and his own safety, Adams pulled two people from the burning wreckage. He and four other survivors then escaped and were rescued.

SSgt. Eugene L. Clay was flight engineer on an HH-3E Jolly Green Giant helicopter, attempting a night rescue of a special forces patrol trapped on a hillside in Laos on Nov. 8, 1967. Two helicopters had already been shot down by strong enemy fire, but Clay and his colleagues decided to make an attempt. They had gotten two survivors aboard when their helicopter was shot down, killing Clay and several others.

A3C Arthur Neil Black was the pararescue jumper on an HH-43B rescue mission over North Vietnam on Sept. 20, 1965. Despite intense ground fire and vulnerability of the small Pedro helicopter, the rescue team persisted and was extracting the downed pilot on a hoist when the aircraft was shot down. Black and other members of the crew were held as POWs until 1973.

SrA. Jason D.Cunningham was a pararescueman on an MH-47E helicopter in Afghanistan, March 4, 2002, on a mission to rescue two servicemen who were evading al Qaeda and Taliban forces. The helicopter was shot down, but Cunningham remained in the burning fuselage to treat the wounded. He exposed himself to enemy fire seven times while moving his patients to more secure locations before he was killed.

TSgt. John A. Chapman was a combat controller, part of a team directing close air support for ground forces and attempting to rescue a wounded Navy SEAL in Afghanistan during Operation Anaconda on March 4, 2002. When the team came under intensive attack, Chapman destroyed one enemy position, engaged another, and killed two enemy soldiers before he was mortally wounded.

CMSgt. Richard L. Etchberger. On March 11, 1968, the North Vietnamese Army overran Lima Site 85, a secret Air Force radar site on a remote mountaintop in Laos. Some of the Americans survived because Etchberger held the enemy at bay with his rifle until a rescue team arrived. He helped the wounded aboard the helicopter but was mortally wounded as the helicopter was pulling away from the mountainside.

Sgt. Theodore R. Gamlin was a ground radio operator, and on Oct. 25, 1969, he coordinated the evacuation of wounded soldiers in South Vietnam. He was hit by enemy fire but disregarded his wounds, lighted the landing site for a helicopter, got the wounded aboard, and remained to fight side-by-side with the rest of the soldiers until all were brought out the next morning.

Sgt. Michael E. Fish was a pararescue jumper on an HH-43B helicopter on a rescue mission near Tuy Hoa, South Vietnam, Feb. 18-19, 1969. On the ground, he treated and rescued four crewmen from a downed UH-1 helicopter, but the pilot was trapped in the wreckage. Facing the risk of enemy attack, Fish remained with the pilot overnight until both of them were extracted 15 hours later.

AIR FORCE CROSS

A2C Duane D. Hackney was a pararescue jumper on an unarmed HH-43E rescue helicopter operating in North Vietnam on Feb. 6, 1967. The crew had taken a survivor aboard when the aircraft was rocked by flak. Hackney put his own parachute on the survivor, and before he could buckle another one on himself, he was blown out of the aircraft by an explosion. He managed to open the parachute that he held, unbuckled, and descended to the ground. He was subsequently rescued. Hackney is shown in this 1967 photo with AFA Chairman of the Board Jess Larson.

SSgt. Jon D. Harston was a flight mechanic on a CH-53 helicopter shot down off the shore of Cambodia May 15, 1975, during the rescue of crew from the merchant ship SS *Mayaguez,* seized by the Khmer Rouge. Harston was shot in the leg, but helped the survivors out of the burning helicopter, covered their escape with his rifle and handgun, and paddled them to deeper water where they were picked up by a Navy destroyer.

Sgt. Russell M. Hunt was a flight mechanic on a UH-1F helicopter shot down while evacuating ground troops in Vietnam March 31, 1967. Although injured himself, Hunt helped carry the critically wounded aircraft commander some distance to the rescue landing zone. He directed the approach of the recovery helicopters and remained on the ground himself until the other wounded were aboard the helicopters.

Sgt. Nacey Kent Jr. was a flight engineer on an AC-47 gunship, defending Pleiku AB, Vietnam, from attack May 5, 1968. The aircraft was hit by ground fire and crashed. Although his leg was broken in the crash, Kent helped other crewmen out of the burning gunship, then went back aboard to help bring out the severely wounded navigator. He went back in yet another time to help fight the fire.

Sgt. Larry W. Maysey was a pararescue jumper on an HH-3E Jolly Green Giant helicopter, attempting to extract a special forces patrol from a hillside in Laos, Nov. 8, 1967, even though two other helicopters had already been shot down. Exposing himself to enemy fire, Maysey dropped to the ground, recovered two survivors, and lifted them into the helicopter. However, as the HH-3 lifted away, it was shot down. Maysey and several others were killed in the crash.

Sgt. Charles D. McGrath, a pararescueman on an HH-53C Super Jolly Green Giant, was on the ground in North Vietnam to rescue a pilot who had been injured severely June 27, 1972, when his F-4 was shot down. McGrath dragged the pilot through thick brush to the hoist, but the helicopter was hit by hostile fire and lost the hoist. McGrath directed strikes against the enemy until a backup helicopter arrived.

A1C Charles D. King was a pararescueman on a helicopter attempting to rescue a downed and wounded pilot in Laos, Dec. 25, 1968. He descended to the ground and secured the pilot to the rescue hoist. The enemy opened fire, wounding King and hitting the helicopter. Even though he was not yet on the hoist, King radioed the helicopter to get away. As it did so, the hoist snagged in the trees and pulled loose from its mounting. The search for King was unsuccessful. He was listed as missing and later declared killed in action.

AIR FORCE CROSS

Sgt. Thomas A. Newman was the pararescue jumper on an HH-3E on a night mission to rescue a pilot shot down in Laos, May 30, 1968. Newman went on the jungle penetrator to get him. Hampered by darkness and enemy fire, Newman asked the helicopter to pull away to a safer orbit while he searched for the wounded pilot. Locating the pilot and recalling the helicopter, Newman secured the survivor to the hoist and shielded him on the way up.

A1C William H. Pitsenbarger. See Medal of Honor. His Air Force Cross, awarded in 1966, was not rescinded.

SSgt. Charles L. Shaub was loadmaster on a C-130 dropping ammunition to troops in the Vietnamese jungle April 15, 1972. The aircraft took a hit and fire broke out in the cargo area. Robinson quickly jettisoned the ammunition crates, which exploded in the air seconds later. He was severely burned, but fought the fire and brought it under control. His actions saved the airplane and the crew.

A1C William A. Robinson was a helicopter mechanic on an HH-43B mission to recover a pilot down in North Vietnam on Sept. 20, 1965. Robinson and the crew proceeded with the effort despite intense enemy fire. They were hoisting the pilot aboard when the aircraft was hit by ground fire and went down in Laos. Robinson and his colleagues were captured and held as POWs for seven-and-a-half years.

TSgt. Donald G. Smith was a pararescue jumper who had descended to the ground to pick up a wounded pilot in Southeast Asia Oct. 24, 1969. Hostile fire damaged the hoist, forcing the crew to sever the cable, dropping Smith and the pilot to the ground. He helped the pilot, who had a broken leg, to where the damaged HH-3E helicopter made an emergency landing 1.5 miles away, then took part in defense of the site until a backup rescue helicopter arrived.

A1C Joel E. Talley was a pararescue jumper on a mission to extract an F-105 pilot shot down in North Vietnam July 2, 1968. The enemy had the pilot surrounded and several attempts to bring him out had failed already. The Jolly Green Giant helicopter lowered Talley to the ground, where he found the pilot, who was severely injured. The ground fire was intense, putting 40 holes in the helicopter and forcing it to pull away with Talley and the pilot dangling from the hoist.

TSgt. Timothy A. Wilkinson was a pararescueman on a team attempting to extract Army Rangers whose helicopter had been shot down in the streets of Mogadishu, Somalia, Oct. 3, 1993, in the famous "Black Hawk Down" incident. Wilkinson repeatedly risked enemy fire to reach, treat, and rescue wounded Rangers during the 15-hour firefight.

TSgt. Leroy M. Wright was a flight engineer on an HH-3 rescue helicopter in the raid on the Son Tay POW camp in North Vietnam, Nov. 21, 1970. Enemy fire forced the HH-3 to make a rough landing, in which Wright's ankle was broken. Rather than slow down the operation by disclosing his injury and pain, Wright used his rifle to lay down covering fire for the search party, took his regular part in the action, and returned to the recovery area on his own.

DISTINGUISHED SERVICE

Before Congress established the Air Force Cross in 1960, the Air Force primarily used the Distinguished Service Cross to honor the heroic actions of its enlisted members. In most cases, the details are not available, but here are the names.

WORLD WAR I

Sgt. 1st Class Fred C. Graveline
Sgt. 1st Class Harold O. Nicholls

Graveline was the first airman to receive the DSC.

WORLD WAR II

SSgt. Johnnie J. Able Jr.
Cpl. Raymond H. Alsip
Cpl. William T. Anderson
SSgt. Michael Arooth
Cpl. Earl D. Ashley
TSgt. Samuel S. Barbiero
Cpl. Vincente R. Barbosa
TSgt. Salvatore Battaglia
TSgt. George H. Bengel
TSgt. Marcus A. Bourdeaux
SSgt. James C. Bright Jr.
Sgt. David W. Brown
SSgt. Walter L. Brown
SSgt. Clayton C. Burdue
Sgt. Wilbert R. Burns
SSgt. James L. Cannon
TSgt. John R. Carrington
SSgt. Albert L. Catallo
SSgt. Edward H. Caton
SSgt. Guy W. Clary
Sgt. James R. Cockriel
SSgt. Howard G. Collett
TSgt. George P. Corl
SSgt. Donald O. Crandall
Sgt. Chester M. Czechowski
SSgt. Pat J. Dadson
SSgt. Malcom C. Dalton
SSgt. Edison K. Danver
1st Sgt. Robert R. Davis
SSgt. Richard C. Decker
TSgt. Forrest E. Dillman
Sgt. Jack D. Dunn
SSgt. Frederick W. Durand
SSgt. Hoy D. Embree
Pvt. Robert J. Endres
SSgt. George D. Faires
SSgt. Robert W. Fegan
SSgt. Joseph J. Forti
TSgt. Edward K. Fox
SSgt. James L. Frazier Jr.
TSgt. Liford E. French
Cpl. Robert A. Fries
TSgt. Paul E. Galloway
SSgt. Richard O. Gettys
TSgt. Harry V. Glades
SSgt. John Gogoj
SSgt. William K. Guilfoil
TSgt. Arizona T. Harris
Sgt. James A. Harrison
MSgt. Alva S. Hascall
Pvt. Ivan W. Henderson
TSgt. Maurice V. Henry
TSgt. Frank A. Herlevic
SSgt. Thomas A. Hoff
Cpl. Robert L. Holliday
TSgt. Anthony Holub
Cpl. Benjamin F. Huefstickler
SSgt. Harold R. Inman
MSgt. John P. Irons
SSgt. Joseph H. James Jr.
SSgt. Theron E. Johnson
SSgt. Thomas E. Johnson
Cpl. John D. Joyce
TSgt. Louis N. Kase
Sgt. Robert P. Kaufman
TSgt. Arthur G. Kelly
TSgt. George E. Kendrick
SSgt. Doyle Kimmey
TSgt. Allen Kosters
TSgt. Steve H. Kovacik
SSgt. Peter Ladisic
SSgt. James V. Lambert
Cpl. Louis A. Lannon

CROSS

Sgt. Alvar A. Liimatainen
Cpl. Joseph D. Lillis
SSgt. Weston A. Loegering
SSgt. Louis G. Lonsway
TSgt. Nicholas J. Lopresti
SSgt. John F. Mahoney
SSgt. Ernest V. Martin
SSgt. Maynard L. Martinson
Pfc. Ray J. Matchitt
SSgt. Rex J. Matson
Pfc. John E. Matthews
TSgt. Jimmy E. McCurdy
Pfc. Joseph G. McElroy
SSgt. Thomas J. McGrath
Sgt. Stanley A. McLeod
Cpl. Frank L. Melo
TSgt. Joseph E. Mix
TSgt. William A. Mohler
TSgt. Ernest M. Mohon Jr.
Sgt. Carl W. Moore
Sgt. Charles D. Mulligan
Cpl. Philip J. Murphy
SSgt. Slavomir Nepil
Sgt. Fred W. Oettel
SSgt. Eugene B. O'Leary
TSgt. James A. O'Neal
Sgt. Albert E. Owen
SSgt. Augustus R. Patrick Jr.
SSgt. Jacob Petersen
TSgt. Claude B. Phillips
TSgt. Hubert E. Phillips
SSgt. A.J. Potter
TSgt. William H. Prince
Sgt. Herbert W. Pugh
TSgt. Charles T. Reeves
SSgt. Peter J. Ridolfi
SSgt. John R. Roller
Sgt. James T. Sanford
SSgt. Charles H. Sans
SSgt. Lester W. Saunders
SSgt. Roy L. Schellin
Cpl. Bernard C. Seitz
SSgt. Harry R. Shirey
MSgt. Louis T. Silva
TSgt. William E. Skinner
SSgt. Edmond H. Smith
Sgt. Jack E. Smith
SSgt. Mack H. Smith
TSgt. Donald L. Snyder
SSgt. Zerrill J. Steen Jr.
SSgt. Leon D. Stipe
SSgt. John O. Stireman
SSgt. Robert D. Storovich
Sgt. Andrew J. Swain
SSgt. Billy M. Tidwell
SSgt. Winston M. Toomey
SSgt. Edward P. Troy
TSgt. James Vanness
Sgt. William Vaughan
Sgt. James E. Via
SSgt. Charles E. Vondrachek
SSgt. Raymond J. Voss
Cpl. Roy W. Walters
SSgt. Benjamin F. Warmer
SSgt. William T.L. Werner
TSgt. William B. Wherry
TSgt. Raymond S. White
Pfc. Greeley B. Williams
SSgt. Frederick M. Wilson
TSgt. Elmer R. Winters
Sgt. Clifton J. Wright
SSgt. Edward S. Yevich

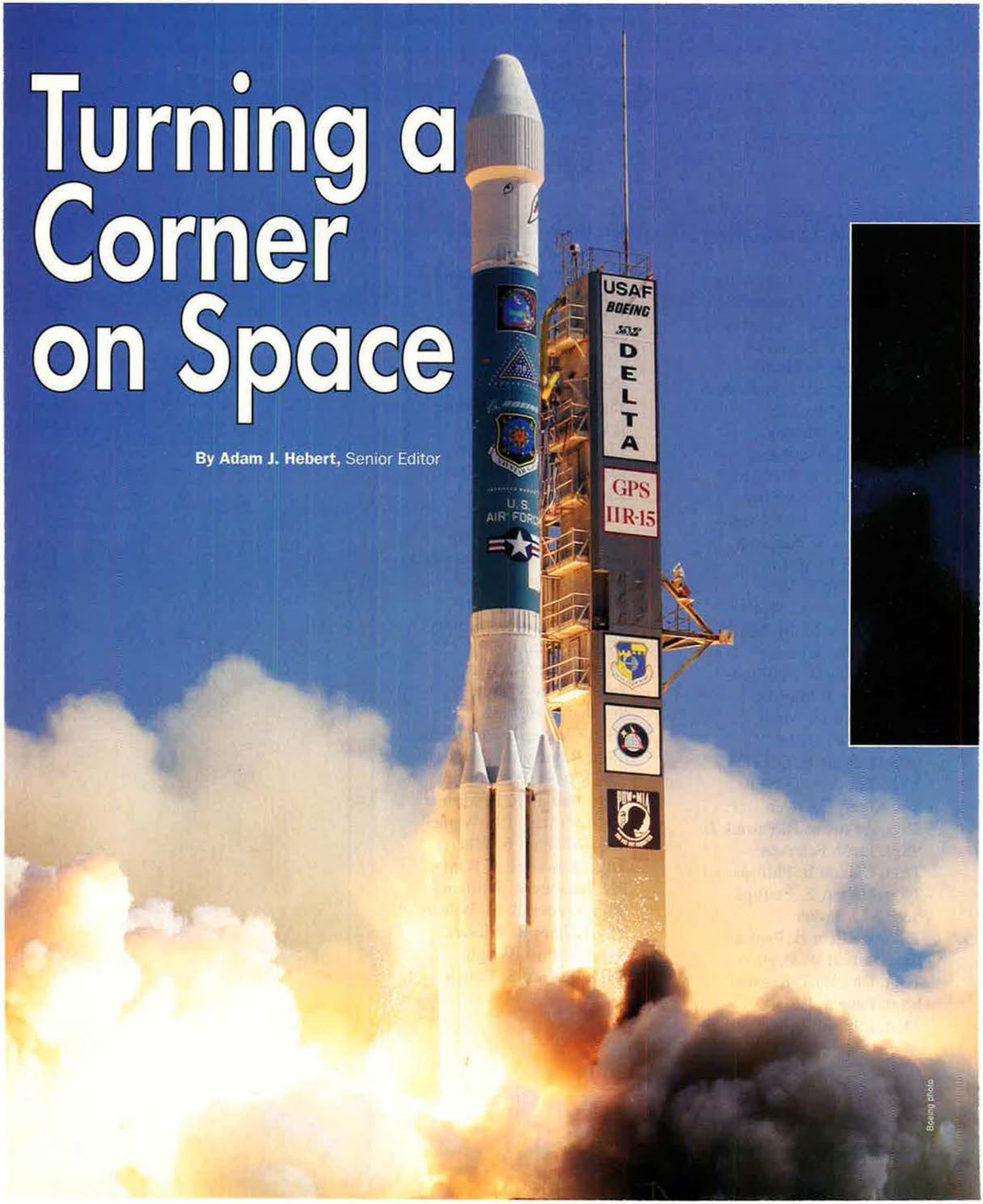
KOREAN WAR

TSgt. James H. Ledford
Pfc. Desmond R. Wilkerson

When it comes to space, the bad old days are over, top USAF leaders tell AFA's Los Angeles Symposium.

Turning a Corner on Space

By Adam J. Hebert, Senior Editor



Boeing photo

Air Force space programs, badly tarnished by serious technical and financial troubles throughout the 1990s, are in the midst of a far-reaching comeback. Even Air Force critics concede that the service largely has overcome the sorts of acquisition woes that sent the service's major space programs spiraling off course into huge delays and cost overruns.

Today, the space community has put together a string of noteworthy successes. Top civilian and uniformed officials claim that the nation's military space capabilities are probably at a historic peak, though the public is mostly unaware of this.

The turnaround has been triggered by a space cadre that has ever-increasing real world experience and a "back to basics" acquisition approach that features a return to the sort of highly focused attention to detail seen in Cold War space efforts.

Despite the accomplishments of that era, however, it is "not enough to go back to the Cold War architecture" for developing space capabilities, said Gen. Kevin P. Chilton, commander of Air Force Space Command.

Left, a Delta II launch vehicle lifts off from Cape Canaveral AFS, Fla., with a GPS-IIR navigation satellite aboard. Above, an artist's conception of a SBIRS High missile-warning satellite.

The Cold War model was highly focused, but it addressed a largely unchanging threat and the priorities of a different era. Chilton and others spoke at the Air Force Association's annual National Space Symposium, held Nov. 17 in Los Angeles.

Past space systems were built to support the Cold War concept of deterrence, with "long planning cycles" but "very short execution" periods, noted Air Force Lt. Gen. C. Robert Kehler, deputy commander of US Strategic Command. The priorities changed with Operation Desert Storm in 1991, when real-time response became the norm.

Combat Focus

Since Desert Storm, the Defense Department has developed a considerable amount of practical space experience—personnel have repeatedly forward deployed to serve in combined air operations centers or with ground force units in the US Central Command region.

Kehler said one younger space operator recently told him that he had "spent more time in the last two years in Kevlar than he has in a flight suit." Space operators are "forward deployed with Army and Marine units, no different than anybody else that we would describe as being on the firing line."

This operational immersion pays considerable dividends for the space community, Kehler noted, because if the space and combat communities speak different languages, space personnel and their initiatives inevitably will be marginalized.

The space community is quickly aware when the combat commander's needs are not being met. Maj. Gen. William L. Shelton, commander of 14th Air Force at Vandenberg AFB, Calif., said that CENTCOM is engaged and using space assets every day. The operators there provide "almost instantaneous" feedback on space support that is "no holds barred," Shelton said.

What is needed today for the end-users is responsiveness, such as through improved bandwidth to provide for battlefield communications, unmanned vehicle command and control, and video-intensive intelligence distribution systems. This drives requirements for more satellites; faster development of new systems; and a need to attract, develop, and retain top-notch scientific talent.

"This is the command to come into for recapitalization," Chilton said. AFSPC's modernization plans affect every on-orbit capability. "There is not a single constellation in Air Force Space Command we are not recapitalizing today."

These systems are expensive and difficult to develop, but the demand is unrelenting. In the late 1990s in particular, "we had some tough times, obviously," with Nunn-McCurdy breaches, said Chilton, as space development programs went well over budget and repeatedly failed to meet their schedules.

Despite the difficult past, however, critics are "bringing up history," when they paint today's space development

USAF photo

SSgt. Nathan Lett, maintenance technician, adjusts the Joint Combat Camera Imagery Transmission Satellite System terminal at dusk in Baghdad, Iraq.

efforts with a broad brush that tarnishes the programs with the legacy of past failures. Space professionals need to "focus on today and what we're doing tomorrow," Chilton said. "There are always engineering and technical challenges, because if there weren't, we wouldn't be pushing the envelope."

The end users have constantly evolving requirements, which makes a "block" acquisition approach desirable. Air Force Undersecretary Ronald M. Sega noted that by developing several iterations of a space system simultaneously, the block approach allows operational forces to utilize new capabilities faster, while work continues on more advanced versions of systems.

Rapid change mandates that Air Force space developers stay on the leading edge of technology, especially if you accept the premise that the rate of change will continue to accelerate, Sega said.

Thousands Needed

We need "more talent in the pool," and this is a "tough challenge" because everybody needs more experienced talent, said Chilton. The aerospace industry itself is thousands of scientists, technicians, and engineers short of its requirements, and the Air Force is competing for the same small pool of experts.

Fortunately for the developers of space systems and the eventual users, however, there is little opposition to plans to modernize the space-based systems "Everybody understands that we need to do this," he said.

Officials cautioned that it is not a solution to return to the good old days of Cold War space system development, however.

Even the space-based capabilities of Desert Storm, sometimes referred to as the first space war, would be unacceptable today. The Army in 1991 was able to race through unmarked Iraqi deserts thanks to Global Positioning System location devices, and GPS also enabled the first widespread use of precision weapons in that conflict.

But looking back, the limitations in that war are eye-opening by today's standards. For example, Chilton noted that bandwidth was in such short supply that Desert Storm's daily air tasking orders—thousands of pages long—were faxed, printed, and physically flown around to operating bases and carriers throughout the theater.

Air Force Space Command's modernization efforts have gotten so much negative attention in recent years that Chilton said his vision is for AFSPC to become the "acknowledged experts and leaders in fielding, launching, and employing air and space power" in the 21st century.

"The key word in my mind is 'acknowledged,'" he said. There are various reasons the recognition does not currently exist. "Some of that has to do with baggage."

The baggage had a very real cause. Lt. Gen. Michael A. Hamel, commander of USAF's Space and Missile Systems Center, said the culprit was "the grand experiment in acquisition reform" during the 1990s. During that period, government took a hands-off approach to space acquisition, performed limited oversight of the contractors, and failed to rigorously enforce its standards. As a result, many space development programs became case studies in acquisition mismanagement, as costs soared and schedules went out the window.

Hamel said AFSPC's back to basics approach to space acquisition involves rebuilding skill levels and mandating high standards that are "ruthlessly enforced."

Roger A. Krone, president of Boe-

Photo by Christopher J. McCartin

AFSPC "is the command to come into for recapitalization," said Gen. Kevin Chilton, commander of Air Force Space Command. "There is not a single constellation ... we are not recapitalizing today," said Chilton, who spoke at the Air Force Association's Los Angeles Space Symposium in November.

The Slow Road With China

The US has had long-standing relationships with Russia that grew out of many years of negotiation and confidence building measures, noted Lt. Gen. C. Robert Kehler, deputy commander of US Strategic Command. Cold War negotiations with the Soviet Union, and along with more recent agreements, created "a number of routine forums" for dealing with the Russian military to share launch information, verify arms control agreements, and build bilateral confidence and cooperation.

The US would like to have similar cooperation with China, but it has been slow going. "We're not there yet; it's [still] a good idea at this point," Kehler told *Air Force* Magazine. He said that no Chinese delegations had come to STRATCOM headquarters in Omaha during his time with the command.

The "exact nature" of a military relationship with communist China "remains to be seen," Kehler said. "At this point, we are trying to open the dialogue in the lane that we have as a combatant commander—which is with our military counterparts. Those dialogues are ongoing," he said. "We'll see what nature that truly takes."

ing's network and space systems division, noted in an industry panel that award fees are increasingly being used as a financial motivator for industry, in order to drive accountability down to the contractors.

Successful modernization is a team effort between government and industry, Chilton stressed. The military space industry and the Air Force failed together in the past, and they are succeeding together today.

The results are undeniable.

Recent Successes

During the industry panel came word that Boeing had successfully launched a GPS-IIR satellite aboard a Delta II rocket out of Cape Canaveral AFS, Fla.

This was noteworthy because it was the 48th consecutive military space launch that successfully put its payload into orbit, expanding on a record that grows with every launch and stood at 44 consecutive launches a year ago. The current run began in May 1999; the previous record for successful military space launches had ended in 1971.

Later on Nov. 17th, Sega announced that the first SBIRS High satellite was on orbit and performing well. The Space Based Infrared System High is a next generation missile warning and tactical intelligence system that will eventually replace the Defense Support Program constellation. This was the first of two SBIRS satellites that will be placed in highly elliptical orbit; the payload should be fully operational in 2008.

The SBIRS High bird had completed its early on-orbit checkout and was "meeting or exceeding" all performance expectations, Sega said.

Compared to the DSP constellation, which was originally designed to detect large Soviet ballistic missile launches, SBIRS High promises finer warning and cuing capabilities, SMC's Hamel said. It is designed for the threats of the future world, he said.

The example of the long-troubled SBIRS program raises a relevant point. Lt. Gen. Brian A. Arnold (Ret.), now vice president of strategic systems for Raytheon, said there have been no failures of satellites on orbit during the current run of successful space launches.

Arnold, who previously commanded SMC, noted that the space acquisition system has rightly been criticized for its past failures to meet cost and schedule requirements, but once the systems are operational, they perform magnificently—and often for years longer than their expected design lives. Getting the systems operational has frequently been challenging, but the satellites have clearly been built right.

Space Command is also moving forward with the development of two major new communications systems. First is the Wideband Global System (WGS), which was recently redesignated from its previous name of Wideband Gap-filler System. Chilton told reporters in a press conference that WGS was renamed from "Gap-filler" to "Global" because the system is not merely filling a gap, it is providing a major new capability.

Huge Expansion

The first WGS, which supplements the existing Defense Satellite Communications System, is scheduled for launch this year. Chilton said the system will be much more capable than DSCS, providing as much bandwidth as the entire DSCS system.

And AFSPC is getting ready for the first launch of the Advanced Extremely High Frequency (AEHF) Satellite Communications System, Chilton noted. With a launch planned for next year, AEHF will offer 10 times the bandwidth of the Milstar satellites it will replace.

Work also continues on the bandwidth system after next, the Transformational Satellite Communications

DOD photo

Lt. Gen. Robert Kehler, STRATCOM deputy commander, said the space community has benefited tremendously from having space personnel forward deployed with ground force units and into air operations centers.

USAF illustration

Above, an artist's conception of an Advanced Extremely High Frequency satellite deployed in space.

System, or TSAT. While the Air Force is responsible for developing, building, and sustaining these on-orbit systems, dispersed forces from all the services rely on them. Chilton said the Army's Future Combat System will be a major driver of space-based bandwidth requirements. Current plans call for TSAT to be operational in about a decade.

Even with the enormous growth in bandwidth that is coming, the military is adept at quickly expanding its usage to soak up every bit of capacity. "I don't think we'll ever have enough bandwidth," observed Shelton. "There are some who said that TSAT is going to take away bandwidth as a constraint—I don't think that will ever be true."

Kehler said new space systems can help address "some of the toughest warfighting challenges," such as mobile targets. "We're counting on the space team to deploy new capabilities quickly." That is not to say, however, that "big space" programs are bad and "little space" programs good, "which is the way this is sometimes characterized."

Yet another announcement during the symposium was that Boeing was awarded a $674 million launch services contract for a "sustaining" amount of launch-service work. A separate contract will fund the actual equipment for the launches.

With space-launch financial security, the contract should allow Boeing and Lockheed Martin to move closer toward their goal of consummating the United Launch Alliance—a joint launch services company. (See "Washington Watch: Now, a Space Monopoly," December 2006, p. 9.)

In another grand acquisition experiment from the 1990s, defense officials had arranged for competing medium-lift launch providers, on the theory that numerous commercial space launches would pay for the program and allow the Air Force to buy inexpensive "additional" launches. But the hoped-for commercial space launch business never materialized, making the dual provider arrangement economically unsupportable.

Because of the national security requirement for assured access to space—through two separate launch systems, so that a failure in one would not prevent new satellites from going into orbit—the Air Force has been footing the bill to keep the two providers in business ever since.

Defense officials feel that merged launch operations will still be able to offer assured access to space, while reducing costs. The ULA merger recently received regulatory approval—"we're making progress and moving toward completing that," said Chilton.

Even with AFSPC's back to basics approach, the collapse of the space launch business case exemplifies the continuing problems the military space industry still feels because of actions taken in the 1990s. For the legacy space programs, industry still has to deal with the plans, budgets, and expectations of the past, noted Leonard F. Kwiatkowski, vice president of military space programs for Lockheed Martin.

The acquisition system has built-in problems. Boeing's Krone observed that cost tends to become the dependent variable once a contract is awarded, meaning the price of a system depends on the requirements and schedule it is being held to.

Officials always say they want to "CAIV" programs—make cost an independent variable—but it is exceedingly hard to get commanders to agree to slower schedules or reduced requirements in order to hold the line on price.

Defensive Imperative

Several speakers stressed the need for the United States to be prepared to defend its space capabilities if necessary. There are gaps in space situational awareness, and Chilton noted that the US lacks the ability to judge potential adversaries' intent when they launch a satellite into orbit. Shelton added that every medium the US operates in has eventually become a medium of conflict—"should we believe that space is going to deviate from this historical pattern?"

Kehler said the advantages the US gains from space systems, and its reliance on these systems, has "not gone unnoticed by friends and foes alike. It is a competitive environment, and I don't mean that to sound sinister, but that happens to be a fact."

The three-star added that STRATCOM has "been directed for a number of years to watch carefully, adjust accordingly, and—if directed—to be prepared to deny space capabilities to potential adversaries."

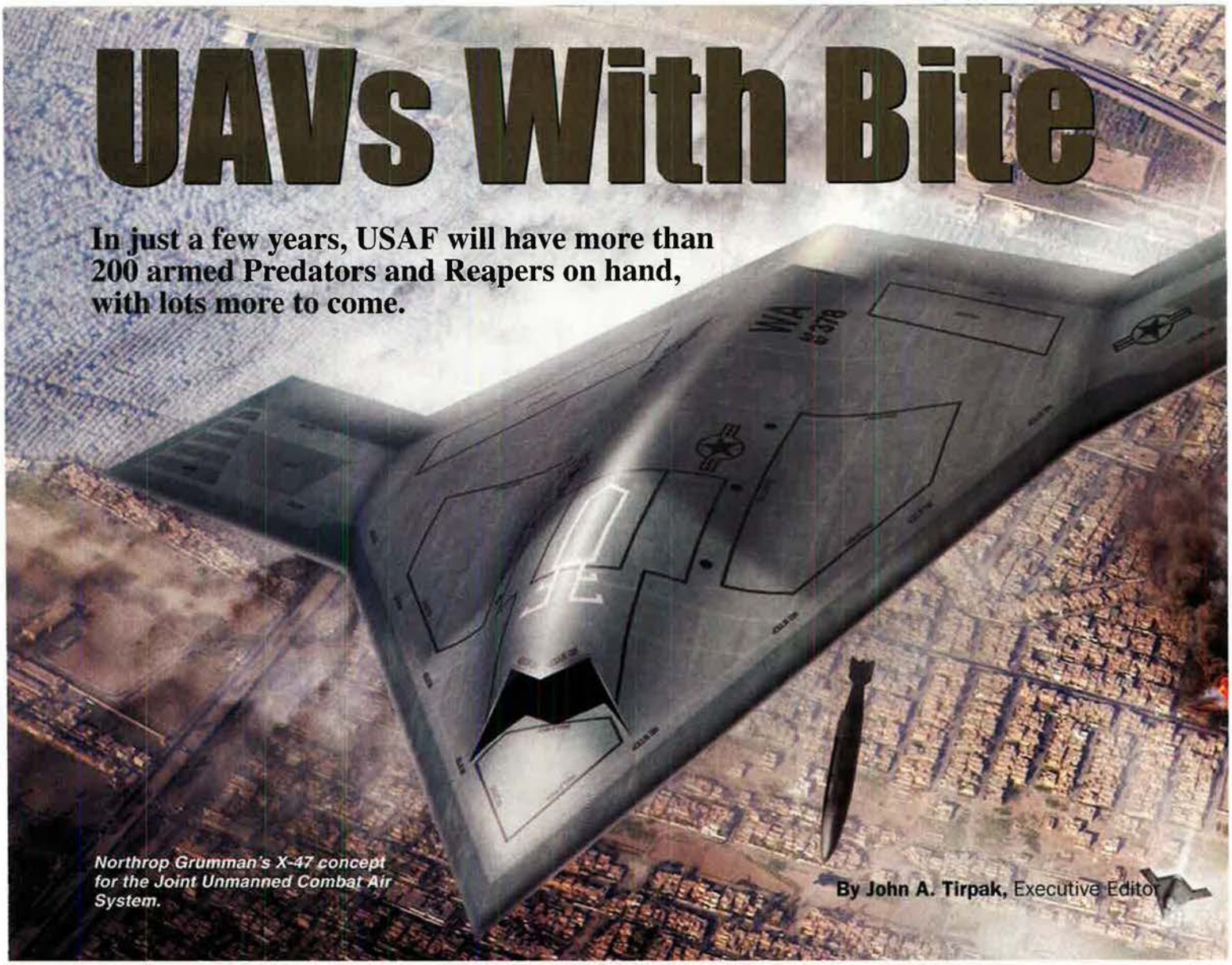
The consequences of not defending the space realm could be severe. "If we didn't have our space capabilities today, you would almost drive yourselves back to an industrial kind of warfare," said Shelton, "a force on force kind of thing instead of being able to fight in the smart way we fight today."

Most of the speakers agreed that military space has turned the corner and moved beyond the problems of the last decade. Jeffrey D. Grant, vice president of space technology business development for Northrop Grumman, cautioned that the industry cannot rest on its laurels, however, because "there are other corners" out there. Further, the military space community needs to keep looking for the next breakthrough to stay on the cutting edge, because merely protecting and improving existing products will not deliver revolutionary capabilities.

He gave the example of people using buckets to draw water from wells. A better bucket can improve the process, but is not a transformational capability—indoor plumbing with a faucet is. The space community must continue to look for those sorts of revolutions. ■

UAVs With Bite

In just a few years, USAF will have more than 200 armed Predators and Reapers on hand, with lots more to come.



Northrop Grumman's X-47 concept for the Joint Unmanned Combat Air System.

By John A. Tirpak, Executive Editor

Robotic air vehicles are beginning to replace some of the Air Force's manned combat aircraft. Soon, they will be handling a major share of the service's strike mission. The first steps in this transition already have been taken in the field of fighter-class aircraft. Classified projects now in development seem sure to cut into the manned medium and heavy bomber roles, as well.

The Predator MQ-1 is leading this transition. A familiar feature of Air Force combat operations for more than a dozen years, the spindly Predator has evolved dramatically. It is no longer simply a loitering "eye in the sky" but rather a versatile weapon system capable of destroying a couple of ground targets on its own or in collaboration with other aircraft. It is in great demand, and the Air Force is acquiring Predators as fast as it can absorb them.

Now in early production is a souped-up version of the Predator, the MQ-9 Reaper. Its combat payload—missiles and bombs carried on underwing hardpoints—roughly equals that of an F-16 fighter. In the Reaper, the Air Force has found a craft that truly combines the powers of a potent strike fighter with the capabilities of a reconnaissance drone.

Both Predator and Reaper will be joining the Air Force's inventory in increasing numbers over the next decade, even as the service divests itself of older manned fighters such as F-15s and F-16s. In fact, many Air National Guard units will be trading in their aircraft for Predators.

220 Combat Drones

The Air Force envisions fielding 15 Predator squadrons by 2010. For some years, the first squadrons have been active at the Air Force's unmanned aerial vehicle "schoolhouse," Creech AFB, Nev. More recently, the 163rd Air Refueling Wing at March ARB, Calif., began swapping its KC-135 tankers for Predators. The first Reaper unit, the 42nd Attack Squadron, was activated at Creech in November. This unit will train MQ-9 pilots and sensor operators.

The Air Force now has provisional plans to buy some 170 Predator MQ-1s by 2010 and acquire 50 to 70 MQ-9s by around 2012, for a total of 220 or more of the combat-capable drones. At present, the service plans on retiring a comparable number of F-16s over the same period.

With UAVs taking on new importance, USAF has acted to straighten out its terminology. The service in recent years took to using the term "system," which meant a constellation of four

Predators, a ground control element, and a launch-and-recover element. This description was confusing and has now been dropped. USAF, instead, refers strictly to individual air vehicles.

"My guess is, we'll probably crank out about 40 more Predators this year," said Thomas J. Cassidy Jr., president of General Atomics Aeronautical Systems, which makes the Predator and Reaper. He estimated that the Air Force, in filling out its squadrons already slated to buy Predator, will acquire 250 MQ-1s and "maybe quite a bit more than that." He also forecast a demand for 150 Reapers just for USAF. Once the service sees what they can do, Cassidy claimed, "there's going to be a lot of demand for them."

That's not just idle talk. Cassidy noted that General Atomics last year used its own money to build 10 Reapers—which it calls Predator Bs—and sold all of them. It is anticipating orders from the militaries of Australia and Britain as well as US users ranging from the Department of Homeland Security to the Department of Agriculture. As a result, General Atomics is building capacity that exceeds what is needed strictly to fill the Air Force's orders.

The company is building two Reapers per year now. Plans call for ramping up to four systems in 2008 and eight in 2009. There are 21 on order so far. Each year, moreover, General Atomics has been retrofitting six older Predators to a newer configuration.

"Since the original airplane [MQ-1], we've added upgraded computers, fuel-injected engines, different propellers, ... upgrades to the ground stations," and reliability enhancements, Cassidy said.

USAF officials say that Predator and Reaper, despite their developmental relationship, are not comparable systems. Predator still is viewed mainly as an intelligence-surveillance-reconnaissance (ISR) platform with a bit of strike ability; USAF calls it a "killer scout." On the other hand, the muscular Reaper is described as a "hunter-killer" and is grouped in with USAF's other attack aircraft. At 6,000 pounds, the heavyweight Reaper is far beefier than the under-1,000-pound Predator. The Reaper also costs twice as much as the MQ-1, say industry officials.

"It is a standard strike-attack aircraft, so it is an additive capability to the F-15s, F-16s, F-15Es, and, of course, the bombers," noted Col. Steven Pennington, the operations group commander on the Air Staff in Washington, D.C.

In Pennington's view, the Reaper does not represent "a new mission." The MQ-9 "I think of [as having] an F-16's strike-like capability," but it just "doesn't have a man in it," said Pennington. "When I think of the Predator, I think of an RC-135/U-2-like capability that happens to also have two AGM-114s [Hellfire missiles] on it."

Like an F-16

The Reaper is deemed comparable to the F-16, in that it flies at about the same altitude, has sensors comparable to the F-16's Sniper or Litening pods (see "Eyes of the Fighter," January 2006, p. 40), and carries a similar weapons load.

Unlike the F-16, however, the Reaper can remain on station "18 to 24 hours, minus transit time" to and from the target area, Pennington said. That is an advantage over the manned fighter. The F-16's comparative advantages, besides the inherent flexibility of being manned, are its speed and ability to engage in a turning dogfight.

Like any other aircraft, effective use of the Reaper requires that its operators strike a balance between endurance, weapons load, and altitude. Fuel and weapons can be traded, if need be, to achieve a desired flight altitude or time on station. In its max-load state, the MQ-9 can't reach its maximum altitude.

The Reaper can carry as much as 3,000 pounds of external payload. That payload typically is depicted as eight Hellfires, two 500-pound Joint Direct Attack Munitions, and two Sidewinder air-to-air missiles. However, the aircraft can also carry laser guided bombs and other types of ordnance.

At present, USAF officials expect eventually to fit the Reaper with the 250-pound-class Small Diameter Bomb, giving it ability to hit 16 targets with precision on one mission. That is about where the B-2 bomber was during Operation Allied Force in 1999.

Each Reaper costs about $7 million, far less than the F-16, which cost more than $30 million each. However, the low cost of the Reaper isn't the big attraction for the Air Force, Pennington said. The attraction is its persistence.

"An F-16 in the target area, assuming you have to penetrate, is going to be [there] five to 10 minutes, and then it's going to leave," explained Pennington, who added that, in the close air support mission, an F-16 could orbit the battlefield for perhaps 30 minutes before having to leave to refuel. The Reaper, though, could hang around above the target area for many hours, either in the "CAS stack" or "physically overhead if you think you know where the bad guys are." The Reaper could act as a persistent forward air controller for other airplanes, too.

"When the bad guy shows up—in a vehicle, a person, or a tank—you take care of him, or ... act as an air FAC" and call in other strikers, Pennington said.

The big drawback to the Reaper is that it flies slowly. Covering roughly 500 miles from a home base to an operating area will take it three hours, with the return trip taking another three hours. Even so, it could still put in as much as 24 hours over the target area.

Why it Grew

The Reaper grew larger than the Predator because the Air Force wanted

USAF photo

A Predator is checked at Balad AB, Iraq, after a mission. USAF will buy 170 MQ-1s over the next few years.

to take the aircraft well above the threats posed by anti-aircraft artillery and man-portable anti-aircraft missiles, Pennington noted. Also, going to a higher altitude permitted "wider sensor coverage of the ground."

The Air Force has considered giving the Reaper an air refueling capability, looking especially at refueling the airplanes from the back of tanker helicopters using the probe-and-drogue fueling technique employed by the Navy. Given that it already can stay airborne for a very long time, however, USAF officials have dropped those plans.

The Reaper is still in its operational infancy. The Air Force will keep on buying the Predator MQ-1 for another four years, at which time operational testing of Reaper will be nearing completion. During that time, 15 squadrons, along with Air Force Special Operations Command, will be fitted out with Predator and develop operational expertise. USAF has yet to decide on the final mix of MQ-1 and MQ-9 aircraft, Pennington said.

Although a single Predator was flown to the point of fuel exhaustion during the early days of Operation Iraqi Freedom in 2003, neither the Predator nor the Reaper are considered expendable munitions, Pennington said. "We plan to sortie them frequently and get the maximum we can out of them," he said, adding that the Air Force doesn't view the UAV as a "kamikaze."

USAF has put the electronic attack mission off limits, though. The service once thought that mission would go to a Joint Unmanned Combat Air System, or J-UCAS, which it was developing with the Navy. The J-UCAS was to have been a stealthy platform able to fly at high subsonic speed, with onboard sensors and the ability to carry an F-16-like weapons load. It was to have performed the "stand-in" electronic attack role, as well as that of a penetrating strike aircraft which could also loiter over enemy territory.

In last year's Quadrennial Defense Review, however, senior Pentagon leaders ordered the Air Force out of the J-UCAS program and directed the service to take what it had learned on the effort and apply it to a new long-range strike platform. The Air Force's J-UCAS money was to go there, too.

Darryl W. Davis, Boeing's general manager for advanced precision engagement systems and a former manager of the company's X-45C J-UCAS, said his team was "within seven days" of completing the stealthy drone when the Air Force ordered the company to "cease and desist."

Davis told *Air Force* Magazine in November that it looked like the X-45C and associated technology developed under the J-UCAS would now be transferred to the Navy, but "those details are still being worked between the Air Force, the Navy, and the Boeing Company."

Strike Package

Earlier versions of the J-UCAS, being developed in concert with the Defense Advanced Research Projects Agency, explored the operation of multiple autonomous unmanned combat air vehicles (UCAVs) by a single operator. Boeing simultaneously flew two X-45A models in cooperative missions. The aircraft demonstrated the ability to take off, reach a target, cooperate, and return to base autonomously, feats that earned them permanent homes at the Smithsonian and the National Museum of the US Air Force in Ohio.

Northrop Grumman is also in development with a UCAS for the Navy, and its version is called the X-47. Both aircraft are of a similar, stealthy arrowhead configuration.

The Navy derivative of J-UCAS was in November still nameless but likely to be called something like the NUCAS-D, for Naval UCAS Demonstration. The next phase of the program will seek to demonstrate that a tailless, stealthy unmanned aircraft can safely be operated on, launched from, and recovered aboard aircraft carriers.

USAF photo

SSgt. Sean Pietre (l) and SrA. Rothschild Pierre-Louis III unload a Hellfire from an MQ-1 in Iraq.

USAF photo

The MQ-9 Reaper can carry a battle load similar to that of the F-16 but stay in the target area upwards of 18 hours. The Air Force plans to buy up to 70 "hunter-killers."

After that, the Navy is expecting to continue on with development, but its requirements differ from those of the original J-UCAS. The Navy is seeking primarily a persistent stealthy reconnaissance platform with some amount of strike capability. As one industry official said, "big ISR/little strike." Various options are being considered. While the aircraft likely will have indigenous sensor systems, it may also have a "transparent" weapons bay allowing it to carry additional sensors instead of munitions, or possibly additional fuel.

Since being kicked off the J-UCAS project, the Air Force has been unable or unwilling to be very clear on how it will address the two roles the aircraft was to have filled—electronic attack and loitering deep strike (See "The 2018 Bomber and Its Friends" and "Where Next With Electronic Attack?" October 2006, p. 24 and p. 30.)

Industry and Air Force officials privately confirm part of the reason for the ambiguity is that the Air Force is pursuing one or more classified aircraft programs to address these mission areas.

Such projects may be, as one industry official said, "unmannable"—i.e., available in both crewed and uninhabited versions, but they will in some ways rival the capabilities of frontline combat aircraft such as the F-22 and F-35. Development of such systems has been under way for a number of years, predating the QDR process.

Black Programs

Asked in November whether there might be a secret program that could meet these missions, Gen. Ronald E. Keys, head of Air Combat Command, said the Air Force has "spent a lot of money on programs like that. And these are very important programs to us because our adversaries don't understand what those capabilities are. They suspect that we're working on certain things."

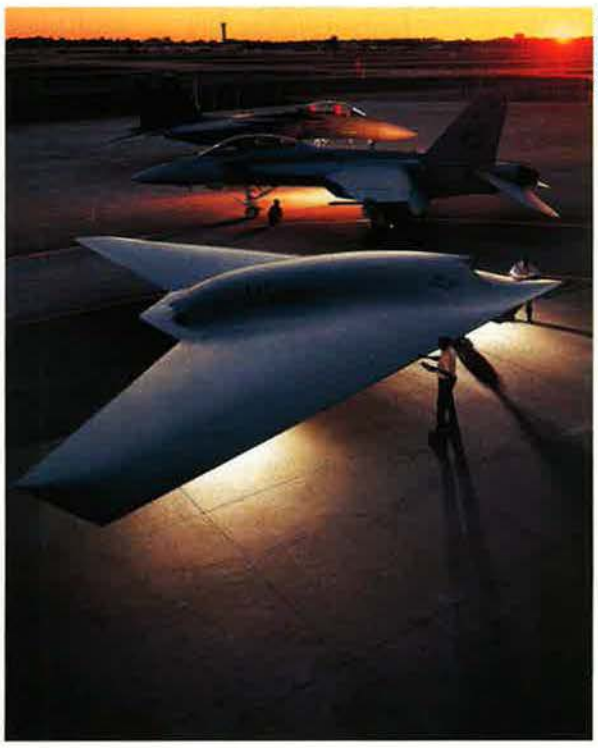
At AFA's Washington Air & Space Conference in September, Keys had said that the solution to the long-range strike program would probably start out "like we've started a number of our high-end technical things, ... as a 'black' program, until we understand where we're going." He forecast that the timetable and cost of the system would probably be open for public discussion, but "the details of what it's going to look like, how fast it's going to go, how far it's going to go, ... its real capabilities ... I'm not sure that we're interested in letting a lot of people know what those ... are going to be anytime soon."

There are two backup plans if the secret aircraft don't pan out or are delayed. General Atomics, which builds the Predator and Reaper is readying an improved model that the company calls Predator C, having all the capabilities of the Reaper but packaged in a new airframe with low observable, or stealth, qualities.

"We're not really advertising it or talking about it at this point," Cassidy said in November. "We're going to fly it before we advertise it." However, he acknowledged that it will look different from the now-classic profile of the Predator family and that the Air Force has shown interest in it.

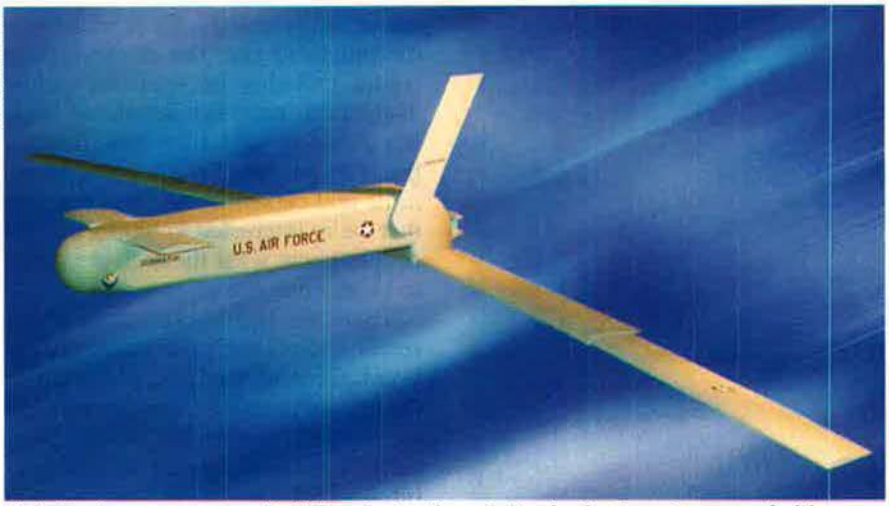
Another fallback would be for the Air Force to adopt a version of the Navy's UCAS, although that aircraft is not expected to be available until 2020, two years after USAF is supposed to have its new long-range strike platform operational. Industry officials, however, said that the two-year difference wouldn't be onerous and might actually permit some synergy of design, development, and production.

Boeing photo



The J-UCAS was to have been about the size of a standard fighter, as shown in this photo of Boeing's X-45C with an F-15E and F/A-18F. The Air Force is working on classified programs that will address some of the J-UCAS mission.

Boeing Illustration



This Boeing concept, called "Dominator," can loiter in the target area and either use small submunitions or attack directly. USAF is considering the idea.

It had long been suspected that Lockheed Martin was building the classified UCAV, because it alone among the major airframe houses doesn't appear to be involved in any overt UCAV work. However, when it unveiled its secret "Polecat" stealth UAV concept last July, the aircraft seemed more adapted to a high-altitude, long-endurance mission rather than a low-flying dispenser of munitions.

For the time being, UCAVs are not easily exported, not only because they represent a low-entry-cost combat aircraft, but because they can be counted as cruise missiles under international arms control regimes.

The biggest issues facing the Air Force with regard to mainstreaming UCAVs involve fairly mundane matters, such as giving credit for "flying hours" to ground-based pilots and getting approval to allow UCAVs to routinely operate in civilian airspace.

Two Kinds of Operators

There are two kinds of operators involved with Predators: pilots and sensor operators, Pennington said.

"What we're doing is taking current units that had iron [aircraft], or recently had iron, and they're getting an unmanned air vehicle. And they're taking their pilots, or their navigators that get a private pilot license and go through MQ-1 training," and making them Predator pilots.

"Then they've got the sensor operators, who will be intel people trained to operate the sensors."

The Air Force is now trying to plot how it will train UAV pilots in the future, he continued, "namely, how do we select [them], do the initial training, and then provide those folks to [a UAV] squadron." He added that "currently and for the foreseeable future, they're all winged people, whether they're [wearing] pilot or navigator wings." However, the service is considering the future unmanned aircraft pilot who comes out of undergraduate pilot training as "a UAS lieutenant."

Pilots who have come into UAVs from other systems, like fighters or transports, get "gate credit" for their flying hours, which counts for upgrades and promotions, Pennington noted.

One of the goals of the J-UCAS program was to make the unmanned aircraft operator more of a manager of vehicles rather than a hands-on pilot, and it was expected that a single operator would supervise several UCAVs on a mission, getting involved mainly to give consent for weapons release.

With the Predator and Reaper, there's a similar goal, but it hasn't been defined yet.

"There were some people who thought one pilot could do four or six, [but] that doesn't appear to be the case," Pennington said. He said the right number is probably two or three per operator.

Predator sensors—electro-optical and infrared equipment—were used in Hurricane Katrina, lashed to high roofs because there was no precedent for flying the unmanned aircraft over populated areas. That loophole has been closed, and rules have been established allowing UAVs to fly through special US air corridors to reach an operating area. (See "Aerospace World: Predator Cleared for US Airspace," November 2006, p. 18.)

Gen. William T. Hobbins, commander of US Air Forces Europe, has set a high priority on integrating UAVs into the NATO structure. The Air Force is developing "standards and requirements for the use of unmanned air vehicles inside the various ... types of controlled airspace," Pennington noted, although there's no deadline for doing so.

Perhaps the biggest hurdle facing the smooth transition to a larger UCAV force lies in deconflicting their use among the military services. Each branch has enthusiastically embraced UAVs, and to some extent UCAVs, but has had a hard time coordinating their purchase and use. (See "Smashing the UAV Stovepipe," February 2006, p. 50.)

Key Battle

A key battle in this turf war is whether and how the Air Force and Army would coordinate purchase of Predators. The Army selected a Predator variant, called Warrior, to conduct some of its own UCAV-type missions. However, it wants the aircraft to run on diesel—Predator MQ-1 uses aviation fuel—and be under the control of field commanders, operated from ground stations in the field, rather than on a grand air tasking order, operated by reachback controllers at Creech. The two services were supposed to resolve their differences on the issue by May 2006, but had failed to do so by mid-November. However, they had agreed on how to network their systems and make sure that ground troops could just as easily see imagery from a Predator as from a Warrior on field laptops.

Even as that debate was ongoing, the Joint Unmanned Aerial Vehicles Center of Excellence at Creech was putting the final touches on a concept of operations for multiservice UCAV close air support missions. The CONOPS was expected to improve the speed of answering such calls for CAS and to reduce fratricide among the services.

The new long-range strike program represents the greatest possibilities for the UCAV. The Air Force is conducting an analysis of alternatives on ways to address the requirement, and Pentagon officials have said the service will invest some $5 billion in the program over the next six years. All the major military aircraft companies expect to offer at least some options involving unmanned aircraft. ■

Verbatim

By John T. Correll, Contributing Editor

Hooey

"That's a bunch of hooey. I mean, it seems to be a collection of actually old hooey brought into a piece of new hooey."***—Press Secretary Tony Snow, denying newspaper reports of a "course correction" on strategy in Iraq, White House news briefing, Oct. 19.***

Not Hooey

"The idea of 'stay the course' is you've done one thing, you kick back and wait for it. And this has always been a dynamic policy that is aimed at moving forward at all times on a number of fronts. ... So what you have is not 'stay the course.' ... That is not a 'stay the course' policy."***—Press Secretary Snow, confirming that the President has stopped using the slogan "stay the course," White House news briefing, Oct. 23.***

Cakewalk Man Recants

"I just presumed that what I considered to be the most competent national-security team since Truman was indeed going to be competent. They turned out to be among the most incompetent teams in the postwar era. Not only did each of them, individually, have enormous flaws, but together they were deadly dysfunctional."***—Kenneth Adelman, neoconservative activist and former Administration insider who predicted in February 2002 that the war in Iraq would be "a cakewalk,"*** **Vanity Fair,** ***Nov. 3.***

Honest Scrub

"We need to give ourselves a good, honest scrub about what is working and what is not working, what are the impediments to progress, and what should we change about the way we're doing it to ensure that we get to the objective that we've set for ourselves."***—Marine Corps Gen. Peter Pace, Chairman of the Joint Chiefs of Staff, on Iraq strategy, "The Early Show," CBS, Nov. 10.***

The Whole Story

"Senior military officers in Rumsfeld's watch felt their counsel was only welcomed when it was congenial to Rumsfeld's view, and they now want the whole story, good and bad, to be reflected in whatever strategy the Administration pursues."***—Loren B. Thompson, Lexington Institute, on the Pentagon after the departure of Secretary of Defense Donald H. Rumsfeld,*** **Washington Post,** ***Nov. 11.***

Soul of the Force

"General Moseley [T. Michael Moseley, USAF Chief of Staff] likes to say, 'The soul of an Air Force is range and payload.' I would salt and pepper 'persistence' in there as well. That is why after 53 years we are again seeking strategic assets in the form of new tankers and bombers to meet our strategic responsibilities."***—Secretary of the Air Force Michael W. Wynne, speech to Precision Strike Association, Oct. 19.***

Assertiveness in Space

"Freedom of action in space is as important to the United States as airpower and space power."***—Introduction to new National Space Policy, released Oct. 6.***

The Pols and the Polls

"Last week an *NBC-Wall Street Journal* poll reported the lowest public approval rating for Congress since 1992. What I wondered about was this: Who are the 16 percent who approve?"***—Columnist Ruth Marcus,*** **Washington Post,** ***Oct. 25.***

Future of Unmanned Aircraft

"We need for unmanned aircraft to act like manned aircraft. We need unmanned aircraft to be tasked like manned aircraft. We need unmanned aircraft to fly in strike packages with manned aircraft. We need to refuel them in the air. We should be capable of flying both manned and unmanned platforms together, to include multiple unmanned airframes controlled by one operator. And we need commanders to have the confidence that unmanned or manned, it doesn't make a difference, as they are equally effective."***—Gen. William T. Hobbins, commander of US Air Forces in Europe, speech at Joint Air Power Competence Center in Germany, Oct. 18.***

Oops, Again

"This letter is to inform you that you were among a number of veterans we provide pulmonary care service for at the VA New York Harbor Healthcare System, New York campus, whose personal information is on a computer that was stolen from the facility."***—Letter from Department of Veterans Affairs to veterans in New York, about yet another theft of a VA laptop, this one having happened on Sept. 6, almost two months before the letter was sent on Oct. 20.***

Why We Lose

"Great powers have often performed poorly in wars against weaker enemies waging irregular warfare—so-called small wars. Such enemies have a greater will to win because they have a greater stake in the war's outcome. In Vietnam, the Americans waged a limited war while the Vietnamese communists waged a total one. The communists sacrificed the lives of 1.1 million soldiers to win, whereas the United States quit after losing a comparatively paltry 58,000."***—Jeffrey Record, professor of strategy at the Air War College,*** **Baltimore Sun,** ***Oct. 15.***

Can't Win 'Em All

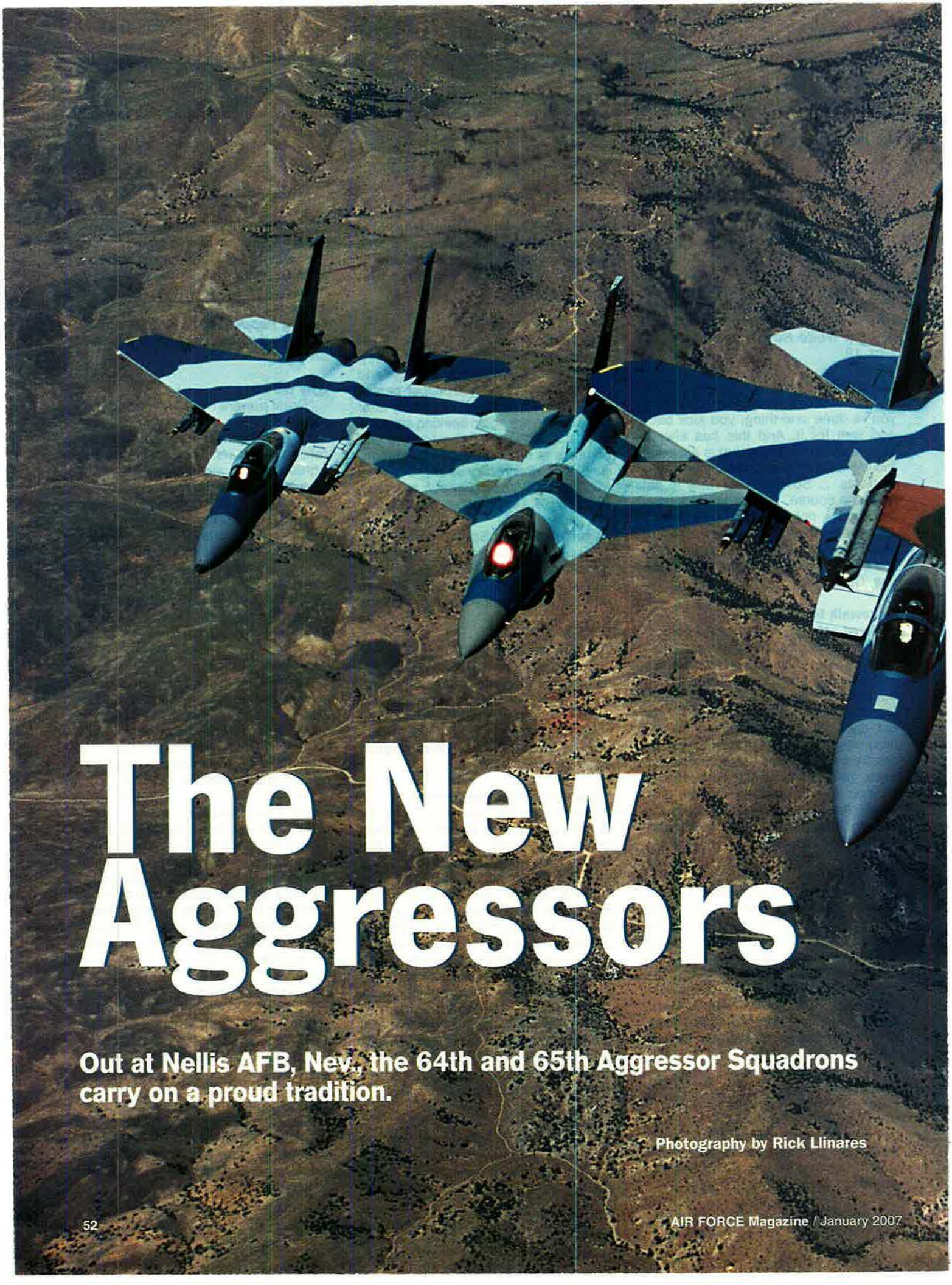
"Would Defeat in Iraq Be So Bad?"***—Headline on commentary by Leslie Gelb, study director in the 1960s of the secret "Pentagon Papers," later*** **New York Times** ***correspondent and president of Council on Foreign Relations,*** **Time** ***magazine, Oct. 23.***

Noam Picks His Side

"North Korea faces the threat of the nuclear weapons the United States has in the region and, therefore, it needs to defend itself."***—Noam Chomsky, radical US academician and activist, justifying North Korea's nuclear tests to reporters during a visit to South America, eluniversal.com, Caracas, Venezuela, Oct. 16.***

The Change in War

"The Wrights invented the plane in 1903, but only 11 years after Kitty Hawk, in the first months of World War I, airplanes not only shaped the war but triggered a series of cascading events. There was a profound military effect. With air reconnaissance, commanders realized very quickly they had to deny the skies to the enemy."***—Richard P. Hallion, former chief historian of the Air Force, PBS television series "Warplane," Nov. 8.***



The New Aggressors

Out at Nellis AFB, Nev., the 64th and 65th Aggressor Squadrons carry on a proud tradition.

Photography by Rick Llinares

Aggressor aircraft form up in a four-ship display. Left to right: F-15 flown by Maj. Eric Hassinger, F-16 flown by Maj. Derek Routt, F-15 flown by Maj. Phil Stodick, and F-16 flown by Lt. Col. Paul Huffman.

Nellis is the "Home of the Fighter Pilot." It's also the home of the USAF Warfare Center, with five wings and some 150 aircraft. Aggressors play a key role in USAF fighter training, acting as a realistic opposing force by using adversary tactics, techniques, and procedures. One year ago, USAF reactivated the 65th Aggressor Squadron, as an F-15 unit, to team up with the 64th AGRS, an F-16 unit. Both are part of the 57th Adversary Tactics Group.

Right: Aggressor aircraft line the Nellis ramp. Out in Nevada, the flying is good, with clear weather and mostly empty airspace.

Below: An F-16 of the 64th AGRS sports a special lizard camouflage, one of several exotic paint schemes found on the Aggressors. At the controls is Lt. Col. Paul Huffman.

Above: Airman Timothy Molleo assists as a 65th AGRS F-15 starts engines and undergoes a preflight examination. The desert heat is stultifying; both Aggressor squadrons use protective canopies to protect the airmen and aircraft from the sun.

Left: An Aggressor F-15 (foreground) and F-16 display the "Flanker Blue" paint scheme seen on both types of fighters in both units. In size and shape, the F-15 is somewhat similar to Russia's superb fourth generation Su-27 Flanker. The compact F-16's size, power, and extreme maneuverability make it a good representative of smaller aircraft such as the MiG-29.

Counterclockwise, from left: The F-16 (foreground) and F-15 aircraft vary greatly in size and capability and therefore in their ability to simulate certain maneuvers. During training engagements, the Aggressor aircraft use in-flight call signs such as MiG, Ivan, and Flanker. ● A sun-washed F-15 Aggressor aircraft awaits its call to action. ● In a USAF Weapons School training enagement, F-15s flown by Maj. Phil Stodick (foreground) and Maj. Eric Hassinger turn into the fight. ● A KC-135 tanker aircraft of the Ohio Air National Guard prepares to gas up a Flanker Blue F-15. The Aggressor squadrons borrow tankers for their training exercises.

Right: One of the F-15s assigned to the Aggressors is in line for the day's action. The F-15 entered service in the mid-1970s, replacing the F-4 Phantom II. Though it has been around for three decades, the old warhorse will keep going on for years, not only in Aggressor units but also in active and ANG squadrons.

Below: An F-15 in desert camouflage paint scheme gets airborne.

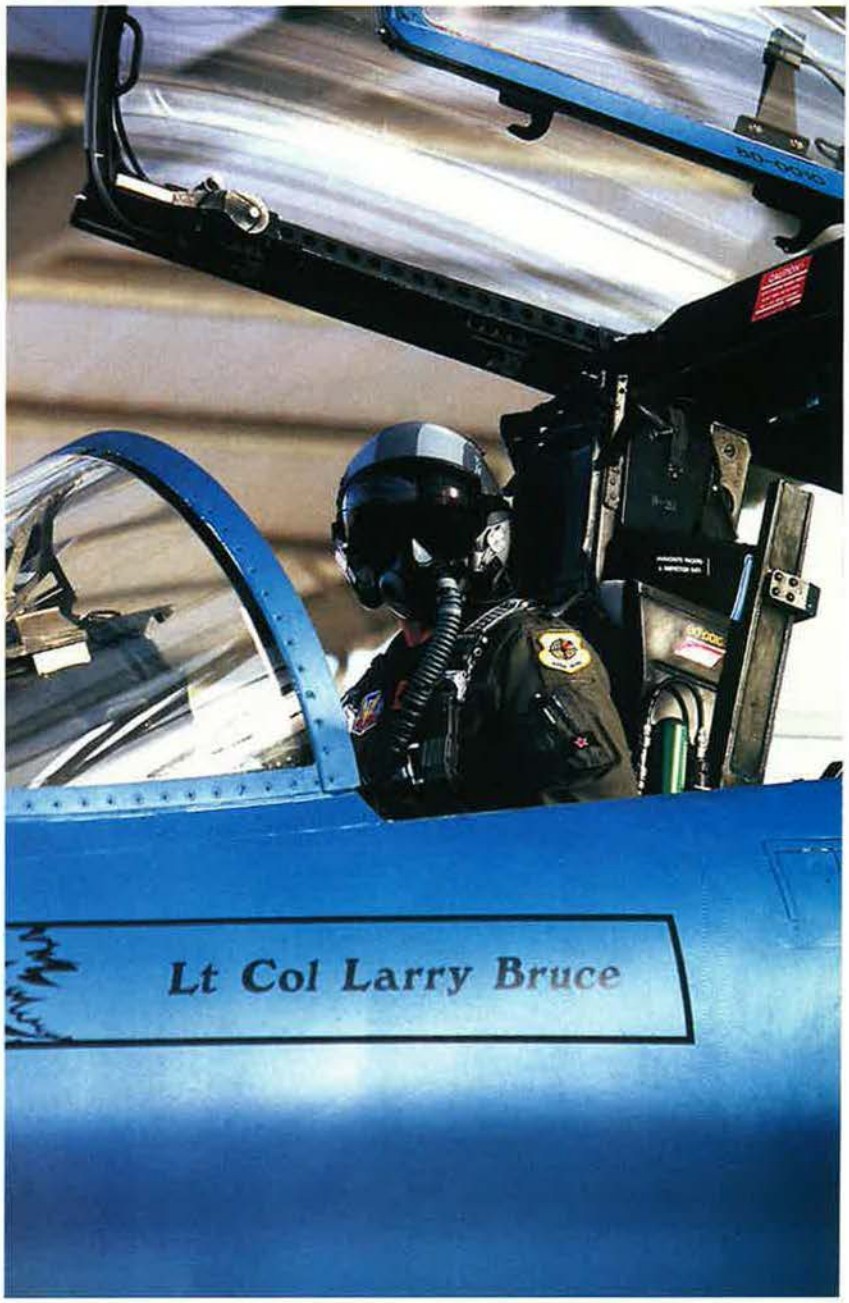
Above: SrA. Chris Bennett (c) and A1C Alex Bower (r) assist Lt. Col. Greg Franklin in preflighting an Aggressor F-15.

Far left: The 65th AGRS received a first batch of a dozen F-15s and is expected to acquire another 12, making a full squadron's worth of Eagles. The unit first stood up at Nellis in 1975, flying the F-5E. It was later deactivated but was brought back last year.

Left: The presence of several F-16s with dramatically different paint schemes, such as these, are a common sight at Nellis.

Aggressor pilots are highly experienced, having at least 600 hours in the F-15 or F-16 and with backgrounds as instructor pilots. Aspiring Aggressors must work through a formal syllabus of 23 sorties and classroom training. The goal: pilots who can offer academic and airborne instruction on adversary tactics. Aggressor pilots continue their education at Nellis, often devoting more than 100 hours of research time to a single "threat" topic.

Clockwise, from right: F-15s of the 65th AGRS head to "the fight." ● Lt. Col. Larry Bruce, commander of the 65th, saddles up his F-15. ● An in-trail formation of Aggressor F-15s thunders over "The Farms," a unique section of the Nellis ranges. ● An Aggressor F-15 moves out.



Clockwise, from right: F-15s such as this one are filling out the 65th AGRS, now going into its second operational year since reactivation. ● Maj. Derek Routt looks up from the cockpit of his F-16 Viper as it takes on fuel from a KC-135 overhead. ● This view of Aggressor F-15s definitely is not what "Blue Force" pilots want to see in the rearview mirror. ● An Aggressor F-15 (top) and F-16 complement each other. Pilots say the F-15 excels at high altitude, whereas the F-16 has the edge down low.

The US Air Force created its first Aggressor squadrons in the 1970s, a result of disappointing air warfare results in the Vietnam War. The idea was to give novice pilots the kind of real-world experience that, in the past, could be gained only in actual—and deadly—combat. The move brought immediate and positive results.

Right: A four-ship of Aggressor F-15s and F-16s prepare to mix it up with "Blue Force" fighters.

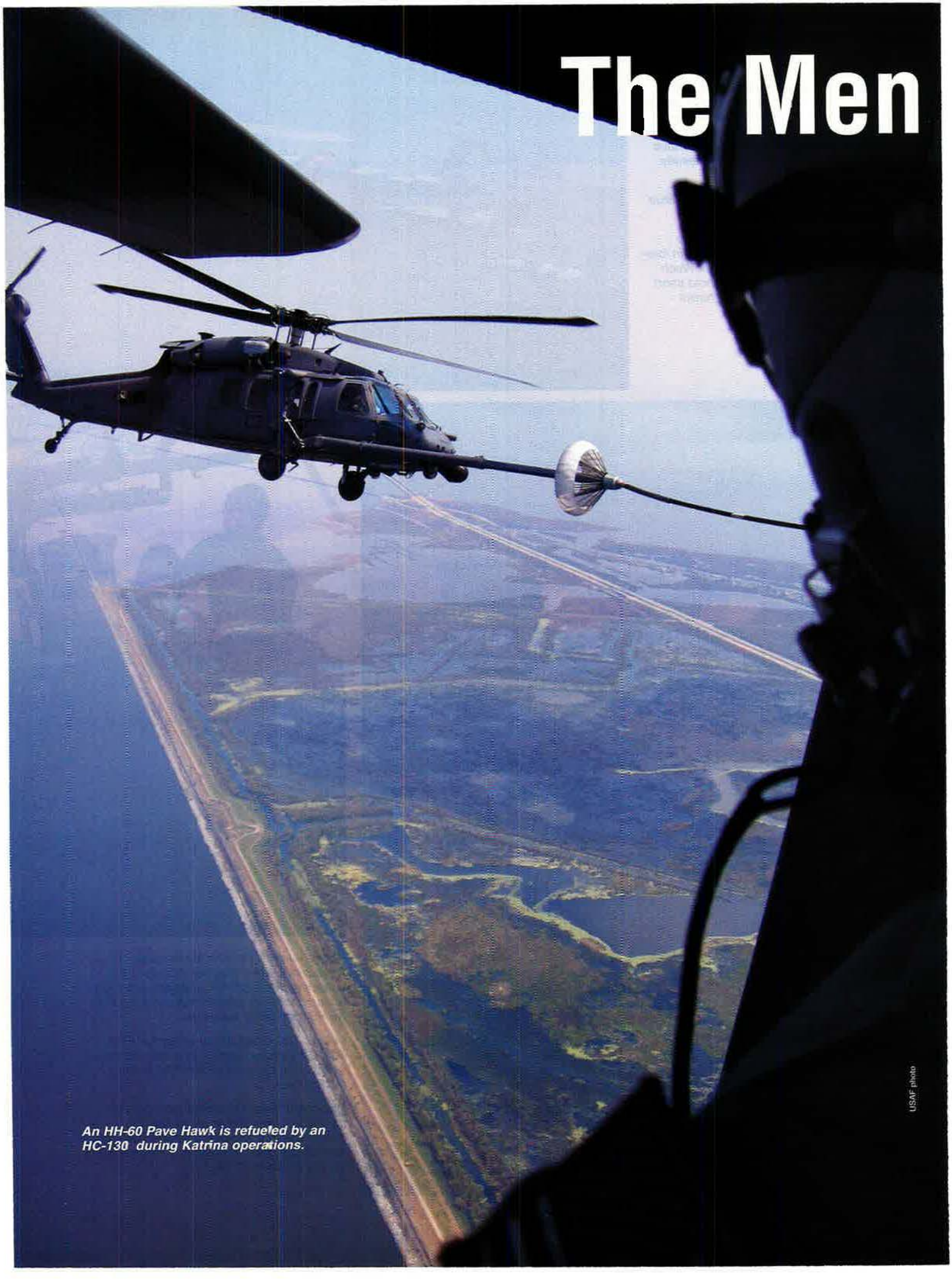
Below: With Sunrise Mountain in the background, Lt. Col. Greg Marzolf (in foreground F-16) and Lt. Col. Patrick Wech (partially hidden in rear F-16) hold short of the active runway for final checks.

Above: Airman Timothy Molleo assists Squadron Leader Stephen Chappell in strapping into his F-15. Chappell is an Australian exchange pilot serving with the 65th AGRS as chief of weapons.

Left: Lt. Col. Craig Jones taxies his F-15 out to the active runway for a late afternoon flight, to be followed by the F-15 in the background.

Dedicated "Red Air" assets have proved their worth time and again at Red Flag exercises. Together, the 64th and 65th will create even better opportunities for Air Force pilots to train for combat. ■

The Men



An HH-60 Pave Hawk is refueled by an HC-130 during Katrina operations.

USAF photo

Who Make the Saves

At Moody AFB, Ga., USAF's combat search and rescue troops train for missions in bad-guy territory.

By Breanne Wagner, Associate Editor

When the HH-60G Pave Hawk helicopter lifted off, the temperature was a stifling 97 degrees. Mile after mile of muddy, snake-infested Georgia swamp passed below. Inside the chopper, heat and engine noise reached oppressive levels. It was, in short, an ideal day for combat search and rescue training.

Inside the Pave Hawk's cabin, two gunners stood ready at their GAU-2/B miniguns. Pararescue jumpers—PJs—swung their legs out each door, M-4 carbines held across their laps. At the proper moment, the pilot brought down the chopper, dropped off two PJs, and got airborne again. It took 20 seconds. The PJs located the target—an abandoned truck—relayed coordinates and waited.

Soon, the helicopter returned and its guns blasted away, raking the target with 7.62 mm rounds. "Enemy destroyed," said one PJ, as if to say, "That's a wrap." He was already packed up and prepared to move on to the next target.

So it went on a routine combat search and rescue—or CSAR—training mission held not long ago at Moody AFB, Ga. In the world of CSAR, "routine" is a relative term. On one day, routine could mean rescuing a family trapped somewhere in the inundated Mississippi River Delta. On another, it could mean treating a wounded patient in a helicopter that's evading enemy fire.

Whatever the specific conditions, these airmen are in the business of saving lives. And as the exercise at Moody showed, it often goes beyond the pickup. Sometimes, it requires a bit of assertiveness.

For the Air Force, the world of CSAR begins at Moody, the home of the only active duty CSAR wing in the Air Force. (Until October, the unit was called the 347th Rescue Wing. However, after a reorganization and merger with assets that include A-10 attack aircraft, it was given a new name—the 23rd Wing. The latter title is used hereafter.)

The 23rd Wing includes the 347th Rescue Group at Moody, the 563rd Rescue Group at Davis-Monthan AFB, Ariz., and the 23rd Fighter Goup.

"Saves" and "Assists"

In Iraq and Afghanistan, where the fighting is deadly and unpredictable, the CSAR professionals perform a vital function. They are in high demand. The Air Force credits the wing's members with carrying out some 720 "saves" and more than 250 "assists" throughout Iraq and Afghanistan since 9/11.

Now, Gen. T. Michael Moseley, Air Force Chief of Staff, has made the CSAR mission an even higher priority, and with that will come new and improved aircraft.

In early 2006, the Chief elevated combat search and rescue to "primary mission" status. In the process, he transferred the CSAR mission back to Air Combat Command. For two-and-a-half years, CSAR fell under control of Air Force Special Operations Command, where it was a secondary mission. The most recent move gave ACC administrative control of all CSAR assets except for those in Europe and the Pacific. (See "Aerospace World: CSAR Mission Is On the Move—Again," April 2006, p. 17.)

"There's nothing higher on an air commander's list of priorities than the ability to go pick up an airman or someone at risk on the surface," said Moseley. "It is an ethical and moral imperative. [CSAR] is a big deal for us morally, and it's a big deal for us doctrinally, and it's a big deal for us as airmen."

The change better aligns the CSAR mission with the combat air forces. "We can better present our forces to

USAF photo

An HH-60 Pave Hawk from the 301st Rescue Squadron flies over the streets of Baghdad, Iraq. The combat search and rescue unit is active in Iraq.

USAF photo by Capt. Tom Montgomery

Air Force HH-60 pilots study a topographical map of the Gulf Coast region as they prepare for a rescue mission after Hurricane Katrina.

the combatant commanders through ACC, because that's their business," said Col. Kenneth E. Todorov, vice commander of the 23rd Wing.

Todorov says that, because of Moseley's action, CSAR has regained visibility and attention in the higher echelons of Air Force leadership. "I think the fact that we've got advocacy at multiple levels now and multiple [major commands] is an advantage," Todorov said.

The first tangible sign of this came in November, with the selection of a new helicopter to replace old and worn out HH-60s. The Air Force on Nov. 9 awarded Boeing a contract to build 141 HH-47s to replace the service's fleet of 101 Pave Hawks. Plans call for Boeing to deliver the first production HH-47 in 2011, with initial operational capability set for late 2012. The Boeing award shocked some defense analysts, and the two competitors—the Lockheed Martin-Agusta Westland team and Sikorsky—have lodged protests. The Air Force maintains that it chose Boeing because the company could meet USAF's aggressive timetable.

The Air Force also chose to increase the size of its rescue force, which is considered one of its most low-density, high-demand assets. Todorov says that acquiring 141 new helicopters "is required to get us out of LD/HD, to fix rescue, so our airmen can get back, reconstitute, properly train, and be trained."

CSAR has been around a long time, but it draws much of its legacy from the HH-3 "Jolly Green Giant" rescue operations during the Vietnam War. The traditional CSAR mission—saving of downed pilots in enemy territory—was common and filled with danger. CSAR airmen today still wear the Jolly Green Giant patch as a reminder of this heritage.

"We have a long history of doing this mission, before Vietnam, but we really cut our teeth in Vietnam," Todorov remarked.

Sky King 61

Even in a very different wartime setting, CSAR is vital. This fact is underscored almost daily in Iraq and Afghanistan but no more so than on April 16, 2004, during a mission called Sky King 61, which unfolded in Iraq.

On that day, a formation of three Army CH-47 Chinook helicopters took off on a mission but soon encountered a massive sandstorm. One of the choppers, paralyzed by the storm, attempted to land near Kharbut, but the right landing gear collapsed. The helicopter rolled over on its side, stranding the five Army crew members. Two Air Force HH-60G Pave Hawk helicopters, Jolly 11 and Jolly 12, picked up the CSAR mission and, because the stormed blotted out all visual references, the crews navigated to the crash site using instruments. The flight out was made under attack from surface-to-air missiles and rocket-propelled grenades.

Everybody made it back. For this action, the crews of Jolly 11 and Jolly 12 were awarded the Mackay Trophy, which recognizes the most meritorious and noteworthy flight of the year by an Air Force person or organization. (See "Aerospace World: Moody Crews Awarded Mackay Trophy," February 2006, p. 24.)

Even so, this type of rescue was unusual for Iraq, where insurgents most often do their damage against ground troops, not aircraft crews. CSAR units today pick up very few downed airmen, said Capt. Dave Anderson, 41st Rescue Squadron pilot. CSAR airmen mainly rescue coalition ground forces after vehicle accidents or roadside attacks.

In Iraq, there are more water recover-

USAF photo

An HH-60 Pave Hawk with the 101st Expeditionary Rescue Squadron kicks up dust during a combat search and rescue exercise. CSAR airmen continue training even while deployed to Southwest Asia.

USAF photo by Capt. Tom Montgomery

Two HH-60s take off from Jackson, Miss., on Sept. 1, 2005 to perform combat search and rescue missions along the Gulf Coast after Hurricane Katrina.

ies than land rescues, according to Lt. Col. Lee J. Pera, deputy commander of the 347th RQG. One such underwater operation took place in October 2005, when a roadside bomb planted near Fallujah badly damaged a Marine Corps humvee. The blast, which instantly killed two marines riding in the vehicle, hurled the humvee into an irrigation canal. Air Force PJs were tasked to recover remains, calling into play the scuba diving skills PJs must learn during a six-week combat diver course. They also practice underwater recovery operations and searches and how to gain covert entry into enemy territory.

Sometimes, the action gets closer to home. When Hurricane Katrina demolished the Gulf Coast in August 2005, the Air Force, the only military service with a dedicated combat search and rescue mission, quickly mobilized its forces and got them flying nearly nonstop rescue missions.

Teams drawn from the entire Air Force rescue community, including Air Force Reserve Command's 920th RQW at Patrick AFB, Fla., the 106th RQW with the New York Air National Guard, as well as the 20th Special Operations Squadron at Hurlburt Field, Fla., deployed along with Moody and Davis-Monthan forces. Those units are credited with saving more than 4,000 lives during the Katrina operation. They flew 759 sorties, totaling 1,617 hours of flying time. (See "Storm Surge," December 2005, p. 38.)

Two Out of 101

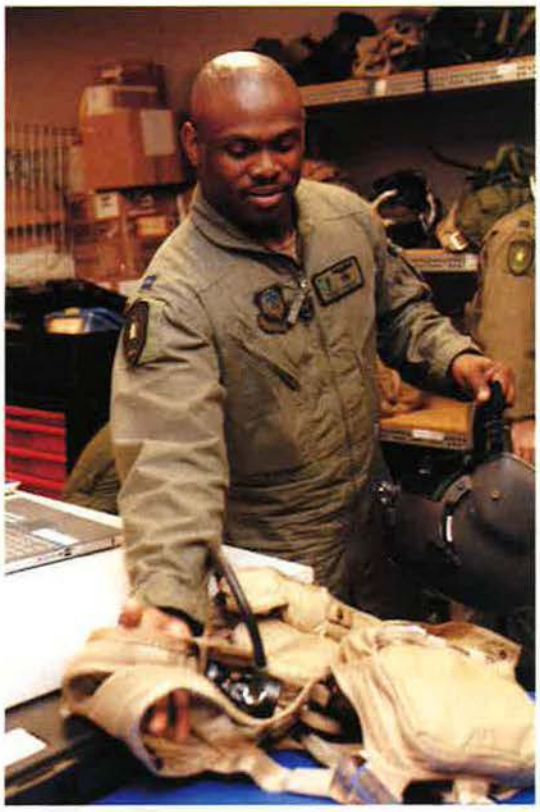
The demand for CSAR capability is high—a fact amply demonstrated by a quick look at the Moody flight line on a recent day. The Air Force owns a total of 101 Pave Hawk helicopters, most of them assigned to the Georgia military base, yet, on that particular day, only two HH-60s were in sight. The others were all deployed. So was about two-thirds of the wing's rescue operators.

The reason for this is clear enough: CSAR assets have been constantly deployed since the 1991 Gulf War, after which the Air Force almost immediately took up Operation Southern Watch and Operation Northern Watch enforcement of the no-fly zones in Iraq. And this continuous deployment has put tremendous stress on the HH-60 equipment and the airmen performing the mission. According to Todorov, the rescue force has been low-density, high-demand for 15 years.

Since the Global War on Terror began, the operations tempo in Southwest Asia has markedly increased. Search and rescue air crews typically see multiple 60-day deployments with 120 days spent at home. For maintainers, 120 days are spent deployed and 120 days at home. A wing spokesman estimates that 17 to 20 percent of the wing is deployed at any given time.

The situation is particularly tough for PJs, who have the highest deployment rates of all CSAR troops, according to TSgt. Kenneth Marshall, a 41st RQS PJ. The high pace of operations coupled with a rigorous selection process has left the career field chronically undermanned.

The Pave Hawk platform is no longer well-suited for action in the Global War on Terrorism, which plays out mostly in areas that are rugged, high-altitude, or both. The location of the current conflicts, along with increasing mission requirements and needs, has created serious problems for



USAF photo by SSgt. Manuel J. Martinez

Capt. Chad Thomas suits up to fly a search and rescue mission during the Katrina emergency. He is with the 41st Rescue Squadron at Moody.

USAF photo by Capt. Tom Montgmery

Maintainers deployed to Jackson, Miss., fix Pave Hawks as more HH-60s take off in the background.

the small- to medium-lift helicopter, which now sustains only a 62 percent operational readiness rate.

The problem became only too apparent in summer 2005, during a mission in the mountains of Afghanistan. An Air Force CSAR crew was tasked to rescue survivors of a firefight with local insurgents. After reaching 15,000 feet, the crew faced a tough decision: Should they try to save all of the troops and perhaps lose all of them? Or should they save some and make sure they succeeded? The problem was excessive weight, which badly reduced effectiveness at that altitude. They could dump fuel, but that might keep them from reaching friendly territory.

In the end, the airmen removed the heavy Kevlar floor armor that protected them from small- or medium-arms fire. The airmen took off what was protecting their own lives and went "into harm's way knowing full well that now they're naked," said Todorov. "They had to do that because of the limitations in the aircraft."

Black Hawk Up

The Pave Hawk is an adaption of the Army's 1980s-era UH-60 Black Hawk utility helicopter. The Army designed it for a standard gross weight of 16,000 pounds, but today the Air Force routinely flies at the airframe's maximum weight of 22,000-plus pounds. Problems first started to crop up when the mission and requirements called for the addition of heavy new systems such as the forward-looking infrared (FLIR) system, a new gun package, and an air refueling hookup. All added weight.

With the increased weight, performance suffered, and it has become harder and harder to get into certain areas in Southwest Asia. Power is also limited because of extreme temperatures, dust intensity, and related problems. Todorov said, "In today's environment, it has much less utility."

Another problem: Limited cabin space. An internal fuel tank was added to the helicopter to increase range, but the tank takes up space—up to one-third of the cabin. This poses problems, given the usual presence of PJs, an engineer, gunners, and wounded, along with litters and medical equipment. "It's very confining back there," Todorov said.

Marshall said that, even in a normal configuration, the HH-60 accommodates only two litters. The new CSAR-X platform will be able to transport up to four litter patients. A future version should carry up to six, according to Lt. Col. Dave Morgan, combat search and rescue specialist in Air Force acquisition.

Air crews say they need aircraft with longer legs. USAF anticipates flying missions beyond the Pave Hawk's flying range, Maj. Gen. Stanley Gorenc said in March, as director for operational capability requirements on the Air Staff. Its combat radius is about 180 miles. USAF expects the new helicopter to have a range of at least 340 miles.

For Moody's maintenance crew members, keeping the Pave Hawk flying is a big task. They are finding structural cracks and other problems that require extra attention, because of the current harsh operating environments.

Lack of time is also a big problem for the maintainers. CMSgt. Ron McAtee, the 347th Maintenance Group superintendent, says the unit has difficulty finding time to reconstitute an aircraft and put it back in the schedule for local training flights. The HH-60 requires a minimum turn around time of two days.

When the Pave Hawk returns from a deployment, "we have to assume it's been put down in the worst possible scenarios, and we have to look for everything," said McAtee.

Think Ahead

Maintainers always have to think one step ahead, finding high-use parts before the Pave Hawks return for repair. It often requires working through the night to keep the helicopter on schedule.

After thoroughly washing the aircraft and pulling the panels off, maintainers first look for "heavy hitting" items, including the power plant. Keeping the Pave Hawk at optimum power is a high priority; it must meet certain power requirements for combat use. The rotor blades require lots of service, especially after they have flown missions in sandstorm conditions.

"The environment we're operating in, ... the dust, the talcum powder, just tears up the turbine blades and we're having a lot of difficulty with that," remarked Todorov. "By nature, helicopters are beasts—there are so many moving parts and so much wear and tear on the airframe."

Another major concern is the current high cost of maintenance, rising year by year. The ratio of flying hours to maintenance man hours has increased by 45 percent since 1999, according to Maj. Brenda Campbell, an Air Force spokeswoman, while the cost per flying hour has also increased by 42 percent.

For all the equipment problems, the CSAR community has no qualms about the mission. It has evolved into a force of men and women who deploy, train, and operate in a different theater, against a different enemy, in a different political environment. Yet the motto—and the spirit—is as it was in Vietnam and in all wars before and since: "That Others May Live." ■

Leave It to the Guard

In a recent AEF rotation, Air National Guard units pretty much controlled air ops in Iraq.

By Lt. Col. Braxton Eisel

Two Air National Guardsmen, operating somewhere in Iraq last summer, designate targets and communicate with aircraft.

USAF photo by TSgt. Scott Reed

In overseas combat operations, Air National Guard units usually wind up augmenting active duty forces. Usually, but not always. Sometimes, it's just the Guard, period.

For more than four months in 2006, in fact, Air National Guard units provided the only tactical air control for the entire Iraqi theater. Other Guard units provided most of the close air support.

This heavily ANG-centric rotation lasted for an entire Air and Space Expeditionary Force cycle. It wasn't a conscious Air Force plan but just a normal swap of units.

In this cycle, Georgia ANG forces controlled all of the air operations. New Jersey and Vermont Air National Guard F-16s flew combat missions supporting ground forces. Other state ANG units contributed C-130 airlift, medical care, and logistic support.

Maj. Gen. Scott A. Hammond, Georgia ANG commander, recalled flying in an E-8C Joint Surveillance Target Attack Radar System aircraft above troops belonging to the Army's 48th Brigade Combat Team. Hammond was listening to aircraft controlled by the 117th Air Control Squadron being handed off to the 165th Air Support Operations Squadron. All of these were Georgia-based Guard units.

"For a brief second," Hammond said, "I wondered if Georgia might be fighting the whole war."

Since Operation Enduring Freedom began in Afghanistan in late 2001, E-8 Joint STARS of the 116th Air Control Wing, Robins AFB, Ga., have been heavily engaged. The 116th is USAF's only "blended wing," made up of ANG and active duty airmen. (See "The Blended Wing Goes to War," October 2003, p. 26.)

The wing's duties were many and varied. Said Lt. Col. William Young, mission crew commander, "We've even had to do the coordination to recover damaged vehicles. Essentially, we called for a tow truck and monitored the area until recovery forces arrived."

The ANG crews of the 116th ACW flew missions over Iraq averaging 13 hours in duration. These missions sometimes would stretch to more than 15 hours. For the 117th ACS of Hunter Army Airfield at Savannah, Ga., daily operations in Iraq also ran to some 13 hours, but any risk of monotony was broken up by mortar and rocket attacks.

Wasting Away

Maj. Sherry Eliason, air surveillance officer, recalled, "Sometimes there'd be nothing for several days. Then there'd be the days that four or five rounds would hit." So frequent were the attacks that the units referred to their position as "Mortaritaville."

Maintenance for the 117th proved challenging. According to the squadron's maintenance superintendent, CMSgt. Richard Rife, "I saw more rain on this trip than on all my Middle Eastern deployments combined." Heavy rain followed by sandstorms created a cement-like coating on an airplane, which had to be carefully and thoroughly cleaned off after each storm.

"Large portions of the site were under water, and wooden pallets became a huge commodity for a while," he said.

When air support was required, the 117th ACS, operating in three Iraqi locations, controlled all of the assets. The Guard unit replaced the active duty's 729th ACS from Hill AFB, Utah, in early January 2006 and was subsequently relieved by the active duty 728th ACS from Eglin AFB, Fla., at the end of a four-month rotation. The transitions were problem-free, according to members of all three units. This pleased the Savannah-based Guard unit members, who had heard questions about whether a Guard squadron would be able to carry out control and reporting center duty.

Responsible for the 277,000 square miles of airspace, the 117th handled its normal repertoire of missions—close air support, aerial refueling, air traffic control liaison, and air defense—for all coalition aircraft in the theater, and then some. The 117th is a mobile unit comprising operators, maintainers, vehicle specialists, computer technicians, and virtually everything else a unit needs to operate in the field independently.

Due to the geographically dispersed sites and the need for long-term sustained coverage, the 117th was joined by personnel from the 141st ACS from the Puerto Rico Air National Guard. The two units had practiced working together since 2001.

Coordinating with deployed air traffic control units, however, proved to be an unexpected challenge. Although handing aircraft off is a routine procedure, running live CAS missions in metropolitan areas isn't.

With the need to continually move tankers, adjust fighter altitudes, respond to air support requests, and coordinate handoffs to ATC, "sometimes, we had so many aircraft on the radio that it sounded like Atlanta Center," recalled the senior director, Lt. Col. Ron Speir.

One task new to the 117th was providing control to unmanned aerial vehicles. "Prior to this deployment, we'd not worked with UAVs," said the then squadron commander, Lt. Col. Richard Austin, who noted that he was "skeptical of the need to have a pilot driving something my 11-year-old could do in front of his PlayStation."

Airmindedness Needed

Austin said the aircrews soon became converts to the need to have someone with "airmindedness" controlling UAVs. "When a nonaviator was flying other UAVs, we had numerous violations of the airspace," he said. "Adhering to the airspace control order is pretty important to keep folks from running into each other during operations. I had to rap some knuckles sometimes."

The joint terminal attack controllers, JTACs, also played crucial roles in Iraq, noted Lt. Col. Paul G. Havel, commander

SrA. Kenneth Bland (left) and A1C Jason Meyer—of the 116th Air Control Wing, Robins AFB, Ga.—check the engine of an E-8C Joint STARS aircraft. The 116th ACW is USAF's first "blended wing," comprised of both active duty and Air National Guard airmen.

Northrop Grumman photo

Since the start of Operation Enduring Freedom, E-8 Joint STARS aircraft of the 116th ACW have been heavily engaged in missions over Iraq, some lasting for more than 15 hours.

of the 165th Air Support Operations Squadron, based in Brunswick, Ga. Havel said the battlefield airmen focus on meeting the ground commander's requirements, and "the bottom line is that we are responsible for putting bombs on target, on time."

During the first half of 2006, the 165th ASOS deployed as part of the Army's 3rd Infantry Division, an active duty unit based at Ft. Stewart, near Savannah. This ANG unit was preceded by active duty JTACs of the 20th ASOS from Ft. Drum, N.Y., and relieved by active duty airmen from the 19th ASOS, Ft. Campbell, Ky. Havel said there was never a question of the Guard airmen being "different" from active duty units.

For example, when Joint STARS operators picked up suspicious movement, a Predator UAV was diverted to take a look. If the Predator spotted something, either a JTAC team or other ground forces were directed to the site. The terminal attack controllers might then request strike aircraft, which would contact the JTAC team, receive target updates, and receive permission to drop weapons.

The JTACs would also provide real-time battle damage assessment. Other than their call signs, officials said there was no difference between active or Guard units.

The JTACs were awarded several Bronze Stars for their support to ground combat units. One of the more dramatic of those episodes involved Maj. A.J. Gaston of the New York ANG's 274th ASOS, Hancock Field. In April 2006, Gaston was with the 165th, working with a 101st Airborne Division Scout Element patrol in Ramadi.

Improvisation

The 20-man nighttime foot patrol was advancing along Ramadi's darkened streets when it was struck by an improvised explosive device. One soldier was seriously wounded by the blast and lay bleeding while the other troops took cover and attended to him. Orbiting overhead were two F-15E fighters, called to the scene by Gaston. Enemy fire poured in on the Americans.

Enemy fire was close to the friendly troops and coming from a built-up area, so the use of air-to-ground ordnance ran the risk of "blue on blue" casualties. Instead, Gaston conjured some "psyops" tactics to make the insurgents retreat. He directed the Strike Eagles to fly over low and fast. The F-15Es performed three 500-mile-an-hour passes at rooftop height, dropping white-hot flares normally used to confuse heat-seeking missiles. The insurgents got the message and broke off the engagement.

Members of the 117th ran the primary Operation Iraqi Freedom data link; the squadron provided the air picture to everyone in the theater. The 117th's Guardsmen fed data to all the air combatants, from those watching a display in the combined air operations center to one relied on by the joint force air component commander and out into the fighter cockpits.

By using a complex system of links, controllers in the various units could monitor numerous aircraft. They could send text messages, as needed, to a specific flight without tying up the voice radio frequency.

Other users, such as intelligence specialists, used their classified systems to update and disseminate perishable targeting information. Strike aircraft directed to destroy fixed targets were often re-roled to attack new targets in only minutes.

You've Got Mail

New Jersey's ANG F-16s were particularly impressed by the greater situational awareness capability. The data links and text capability "really shortened the kill chain," recalled Lt. Col. Kerry Gentry, then the 332nd Expeditionary Fighter Squadron commander. "At times, due to either frequency overload or being outside voice frequency range, we were re-roled to a new target—like a troops in contact situation—without a word being spoken aloud."

Text messaging was frequently called "mail," Gentry continued. "Often times, we were flying a planned mission per the [air tasking order] or would be pulling ground alert, and the call would come like, 'Two's got mail.'"

Gentry said the system would provide the pilots with the new target, coordinates, and the controller frequency directly on their head-up display, with less chance of information being garbled compared to voice communications. The data link helped the personnel in the joint operations center and the air liaison officers with the infantry divisions to see real-time where aircraft actually were. This allowed them to better allocate resources to unexpected situations.

"One night, while flying to a preplanned target, we 'got mail.'" Troops under fire were calling for CAS, Gentry said. He and his wingman were sent the targeting information, which was displayed on their HUDs. "That one text and target symbol saved probably five to 10 minutes from doing everything voice only."

From high overhead in an E-8C, to the 24/7 coverage of a ground-based air control squadron, to joint terminal attack controllers directing strike missions often flown by Guardsmen in F-16s, the Air National Guard did it all. ■

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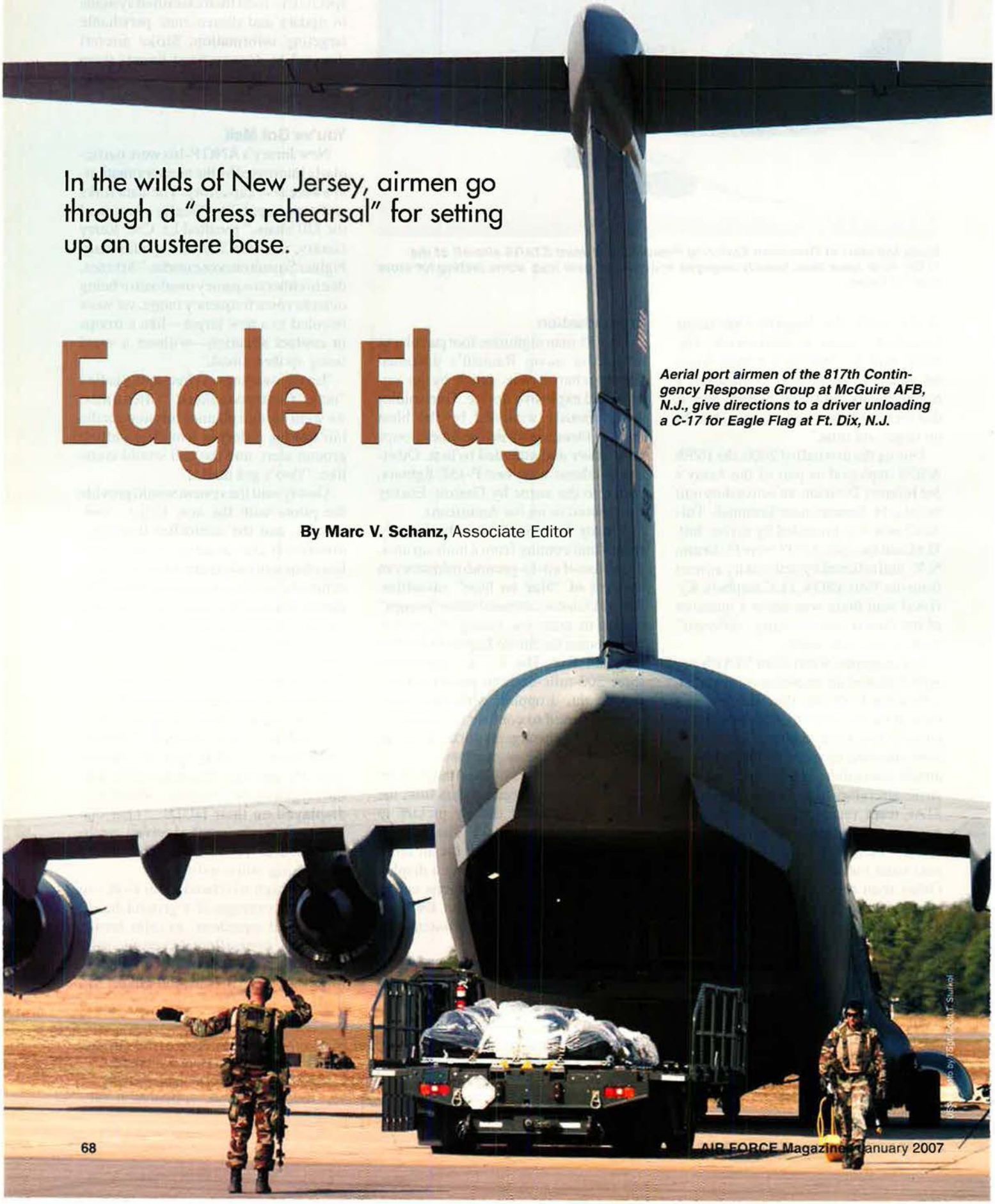
In the wilds of New Jersey, airmen go through a "dress rehearsal" for setting up an austere base.

Eagle Flag

By **Marc V. Schanz,** Associate Editor



Aerial port airmen of the 817th Contingency Response Group at McGuire AFB, N.J., give directions to a driver unloading a C-17 for Eagle Flag at Ft. Dix, N.J.

Watching several US airmen grapple with a tense political situation in Chimaera, you get a close-up look at how USAF trains to run its austere expeditionary bases.

In this case, USAF security forces became alarmed when a suspicious-looking individual ignored warnings and came too close to a security fence around a new US base. Forced to act quickly, the security forces fired at the intruder, only to learn later that he was a hunter from the nearby village of Citheron.

To head off a major row, the airmen quickly met with the village's angry leaders and explained the incident in detail. The swift action helped them defuse a volatile situation.

Don't bother looking on a map for either Chimaera or Citheron; they don't exist. Nor do the hunter and village elders. They were merely props in an innovative Air Force program to train its mobility support forces for duty abroad.

This event, which unfolded in New Jersey in October, was the latest installment of Eagle Flag, a high-tempo expeditionary exercise to prepare mobility airmen to open and operate austere bases in often-dangerous areas.

This time, the setting was the nation of Chimaera, a poor land devastated by a tsunami. Citheron, a Chimaeran village, became the hub of US air relief activities. The hunter and all other "locals" were role-players—airmen used to simulate the look and behavior of Chimaerans.

The exercise strives to ready USAF support forces for the shocks and surprises of expeditionary force deployments. Airmen normally go through the nine-day sequence about 45 days before they become vulnerable for overseas duty.

In the view of USAF's Air Mobility Warfare Center, Eagle Flag is a dress rehearsal staged before the real thing. "We have to make sure that the [classroom] translates into the field," said Maj. Gen. David S. Gray, the AMWC commander.

Perfect Site

The task for these airmen was to build a functioning air base from little more than a vast, muddy field and a simple airstrip—and do it in a week. The site is on the grounds of Naval Air Engineering Station Lakehurst, N.J., a military reservation close by McGuire AFB, N.J., and Ft. Dix, N.J. The whole area is enfolded in New Jersey's Pine Barrens, a heavily forested 1.1-million-acre tract of coastal plain spread across southern and central New Jersey.

The place seems well-suited to the task. Largely rural and undeveloped, it features carnivorous plants, rare pygmy Pitch Pines, and silt-like dirt that locals call "sugar sand." When Orson Welles scripted his 1938 radio adaptation of H.G. Wells' "War of the Worlds," he chose the Pine Barrens as the scene of battle between the aliens and National Guard troops.

The first thing you notice on a cold, rainy October day is the concertina wire blocking the service roads winding through the area. At one guard post, three poncho-clad servicemen keep watch. A turret gunner on a security forces humvee scans the tree line from behind his M-60. They have come to this site because security forces at the perimeter have just "captured" a man wearing a vest of explosives.

Within an encampment tent, the handcuffed would-be suicide bomber awaits interrogation. SSgt. Jason Kreider, an explosive ordnance disposal airman and instructor with the 421st Combat Training Squadron, watches the scenario develop. The situation is tense and uncomfortable.

"This is the best part," he said, watching the captive. "It gives these airmen a real threat experience." They see "pretty realistic scenarios they won't see anywhere else."

Kreider's unit in the past few days has come up against a steady stream of mortar attacks, uncovered unexploded ordnance, and ensured clear routes for vehicles coming and going from the small base, airstrip, and village.

Less than a mile down a dirt road, one finds the mock village of Citheron—where role-players are doing their best to portray a village recovering from a disaster. On the site are houses of worship, several stores, a village administration hall, and even a local newspaper. The role-players are a key part of the exercise, and their actions are documented on several hidden cameras placed around the village.

"People become aware of their actions and reactions," said SSgt. Dean Steele, a supervisor of the locals. Steele has been observing how activities have looked on camera—misunderstandings with villagers to how many times a security forces patrol comes past a certain point in the town—even how airmen interact with locals.

It's Always Something

First Lt. John Carlo, Maxwell AFB, Ala., said the tempo of the operation can be felt day and night and can rise and fall in a moment. On Monday night, a package began emitting gas—which meant every airman had to suit up in full protective chem-bio gear. "There's always something going on, and you never know what it's going to be," Carlo said.

Col. Raymond Torres, the commandant of AMWC's Expeditionary Operations School—the caretaker of Eagle Flag—says that's deliberate. "We're

Airmen with the "421st Air Expeditionary Group" begin constructing small shelter tents used to house troops during an Eagle Flag exercise.

USAF photos by TSgt. Scott T. Sturkol

Capt. Kevin Montavani of McGuire prepares an all-terrain vehicle for a field survey as part of an Eagle Flag exercise. Before airmen can begin setting up an air base, a small group evaluates the location.

trying to make the experience more realistic all the time," he said. "We want people to be challenged."

SrA. Joanna Houston, an enlisted services airman from Minot AFB, N.D., has been busy finding fuel to run generators and provide the electricity needed to run kitchen equipment. The rain has also picked up. "Keeping things clean is a challenge," she said.

Such demands are helping sharpen up what the mobility community already considers a strong capability—opening air bases in any environment.

That community has been busy for years. The 1990s saw the Air Force build serviceable air bases in Rwanda, Haiti, Bosnia, and Kosovo. In the wake of the Sept. 11 terrorist attacks, the need for new bases expanded, and USAF opened up 38 new sites, principally in Central and Southwest Asia.

In the past 24 months, it staged massive humanitarian operations following the 2004 Indian Ocean tsunami and 2005 earthquake in Pakistan. Then there were actions after Hurricanes Katrina and Rita in 2005 and the July 2006 noncombatant evacuation of Americans from Lebanon. (See "Air Mobility's Never-Ending Surge," September 2006, p. 46.)

Eagle Flag is both a training opportunity and a proving ground for the skills that are being demanded of today's mobility airmen and tomorrow's austere mobility environments.

"It's difficult to marry up cargo and people, especially in this kind of environment," said Maj. Brian May, a communications airman of the 5th Civil Engineering Squadron from Minot. "You have to sort out a lot of priorities [and see] how your job fits into a much larger picture."

May, a veteran of two overseas deployments, believes Eagle Flag offers precious opportunities for airmen to unpack their tools and supplies and see how they work in the real world. "This is about as comprehensive as it gets," he said.

The war in Afghanistan, which got under way on Oct. 7, 2001, showed that it took USAF too long to set up forward locations, according to Torres. The requirement was 45 to 60 days. Air Force leaders ordered AMC to drastically compress that time frame and cut all fat from the operations.

In September 2002, Gen. John P. Jumper, then USAF Chief of Staff, designated AMC to create a program to train expeditionary combat support airmen. The result was Eagle Flag.

"We know how to operate an installation," said Torres. "We do it well. What we're practicing here is how to get it up and running."

Three Packages

Eagle Flag breaks down that task into blocks, or "modules." The whole process should take about one week. At that point, the base should be fully functioning, with operations, command and control, base security, services, and so forth.

At Lakehurst, the first element in was a small Air Force assessment team. It determined the types of repairs, upgrades, and facilities that would be needed to make the site operational.

The first main force—module one—was responsible for opening the base for certain minimal operations. It consisted of fuels, security, and supply personnel. This is a "contingency response group," a small team of generalists.

Air Force leaders have pushed for small teams of multidisciplinary airmen that could respond on short notice to any site and quickly prepare a location and then turn it over to a follow-on expeditionary force. USAF now has two contingency response wings, one at McGuire and the other at Travis AFB,

An Air Force explosive ordnance disposal technician works to defuse a simulated suicide bomb during a scenario at Eagle Flag. Expeditionary skills are put to the test during the exercise.

Calif. Two additional CRGs are based in PACAF and USAFE.

At Lakehurst, members of McGuire's 816th Contingency Response Group open a warehouse near the airstrip and start to move gear: palletized generators, blankets, lifts, tents, airfield lighting, and medical supplies. These are the basics; the unit builds only what is absolutely necessary.

"The expeditionary concept is today's environment," said 1st Lt. Sean Hoggs, an aerial port flight commander with the 816th CRG. "There are no more grand World War II-type wars."

Hoggs is experienced at his work, having deployed in 2004 as part of Operation Unified Assistance in the wake of the Asian tsunami. "They're not looking for you to drag a long logistical tail," he said of such deployments. "You're expected to go from [Day 1 to Day 6] and resupply that base on the seventh day."

CRGs of some 110 rapid response specialists have to do everything, so versatility is ingrained into unit thinking. Any airman might be tasked to unload an aircraft or run a forklift.

The broad-gauged training has turned the CRGs into go-to units. Since March 2005 the units have participated in a Bright Star exercise in Egypt, assisted in the shutdown of operations at Rhein-Main AB, Germany, led the Air Force response to Hurricane Katrina, and opened relief operations in Pakistan.

"Everything has changed," said SSgt. Bryan McDonald, a security forces journeyman with the 816th CRG. "There are no more specialized skills in a unit like this. You'll get a [security forces airman] out there pushing pallets and porters fixing aircraft with maintainers."

The Growing Role of the Air Mobility "Schoolhouse"

The Air Mobility Warfare Center, established in 1994, costs roughly $60 million a year to operate and has some 500 airmen on staff. What began as a single course in June 1994 has to grown to 51 courses for 5,000 resident students and more than 8,000 distance learning students per year across five locations.

The center is commanded by Maj. Gen. David S. Gray, who had spent most of his Air Force career in mobility before arriving at AMWC in 2005. "I really thought I knew what [AMWC] was and what they did," Gray said. "I was wrong."

The center, at Ft. Dix, N.J., is AMC's clearinghouse for education, training, and testing. Since its establishment by Gen. Ronald R. Fogleman, then commander of Air Mobility Command and later USAF Chief of Staff, the center has divided its efforts into four areas: the resources directorate for the center's activities, the Air Mobility Battlelab, Mobility Operations School, and the Expeditionary Operations School. The battlelab, one of the newest in the Air Force, finds off-the-shelf technology capable of improving mobility operations. According to Col. Phil Bradley, the lab commander, his mission is to reduce the cost and size of expeditionary operations. "You can only buy so many airlifters," he said.

Central to the center's efforts are the actions of the Mobility Operations School. The school—the air mobility component of the Joint Readiness Training Center—offers courses, including a global mobility wargame and tactics courses for senior officers.

The Expeditionary Operations School teaches airmen how to get ready to deploy, with a focus on contingency skills training, advanced logistics, and anti-terrorism training. EOS hosts not only Eagle Flag but also Phoenix Raven and Phoenix Warrior.

"We touch ... everything that AMC does," Gray said.

Stripped Down

The lean mind-set is on display at Eagle Flag. Looking at the simulated assault landing zone at Lakehurst, there's not a lot of logistical fat visible and not many airmen, either. Fuel bladders are lined up near the runway, not far from a command and control apparatus where CRG airmen are beginning to wind down their initial operations. A follow-on force of some 60 airmen continue to establish the base in module two—building vital command and control capability.

In the early days of the deployment, a C-17 touched down and simulated an aeromedical evacuation.

"Until the blood goes into the soldier or the bullet goes into the gun, the mission isn't over," said Col. Robert Swisher, vice commander of the 621st Contingency Response Wing at McGuire.

After six days, the work of the second module transitions into follow-on forces of an air expeditionary group. The third module comprises civil engineers, logisticians, public affairs personnel, and others needed to expand the base's infrastructure into a fully operational airbase.

The airmen come from the 5th Mission Support Group at Minot and are led by Col. Glenn Lang, commander. Lang's force of some 300 airmen make up, for the purpose of the exercise, the "421st Air Expeditionary Group"— whose airmen who will turn the now functioning airstrip into a full forward operating base.

"You're working long hours out here; it takes a lot out of you physically and mentally," Lang said. Normally, an AEG would be coming in and taking over a base that is already operating. "Here," he said, "I'm dealing with a whole new skill set."

His AEG was on pace for a scheduled

USAF photo by TSgt. Scott T. Sturkol

An airman renders aid to civilians "injured" in a vehicle-borne improvised explosive device. With a mock village not far from the main encampment, airmen and role-players come into frequent contact, just as on a real deployment.

USAF photos by TSgt. Scott T. Sturkol

resupply point, despite some logistic snags and some difficulty getting enough tents up.

TSgt. Jeff Sattizahn, a heating and cooling craftsman, is relieved to be wrapping up his electrical work. He has spent the past several days getting the base's heating and air-conditioning systems to function. That was difficult in its own right, but the crew encountered surprises along the way.

"We were trying to set everything up in here," said Sattizahn, "and this woman just walked right in."

The woman, one of the many role-playing airmen at Eagle Flag, was said to have been attempting to take a shortcut across the base and wound up detained. She was sent to inject some unpredictability of the type seen in real deployments. The airmen did not expect her to show up, but, now that she had done so, they had to do something.

Sattizahn said the intruder was questioned and then escorted off the base. "You don't get to deal with these types of situations at home."

MSgt. Timothy Blake, the Eagle Flag superintendent, made certain that such cultural training was a big part of the exercise. Dressed in desert BDUs and wearing a red beret, Blake played the role of Col. Abraham Marius—the nation's top commander. He pushed the role-players to draw airmen into unfamiliar situations, managing incidents with host nation media and dealing with religious and cultural difficulties that deployed forces have experienced firsthand.

The AEG is nearly done with its task, and a pair of A-10s are due to land at the air base this afternoon.

The base won't necessarily be flying Air Force assets. It could be used by Army or Marine Corps aircraft bringing in supplies or running disaster evacuations.

"It doesn't really matter who's flying out of that installation," said Torres. "It's our responsibility."

At top, A1C Renee Verdecchio from McGuire guards a perimeter area during an Eagle Flag exercise. Above, a Pennsylvania ANG A-10 touches down at Lakehurst as part of Eagle Flag.

Fast Learner

Security, as always, is a major factor in training. SMSgt. Curtis Berge, in an earlier Eagle Flag, spotted an unauthorized person near a base security gate. Though he should have waited for a special interrogation team, he approached the man anyway and was "killed" in a blast.

"You learn pretty quickly that way," said Berge.

Troops have faced more than a few close calls. They have come up against deadly improvised explosive devices. Insurgent forces have kidnapped an aid worker. Troops have practiced clearing routes for convoy operations.

Security forces also participate in an exercise called Phoenix Warrior. Before a deployment, they test tactics in Eagle Flag scenarios. The AMWC also runs the Phoenix Raven course, a more intense three-week session that draws security forces airmen from across the service.

Back in the field at Lakehurst, TSgt. Todd Cooper, an instructor with the Phoenix Warrior security forces exercise, believes the entire Eagle Flag experience pays dividends not just in operations—but in perspectives.

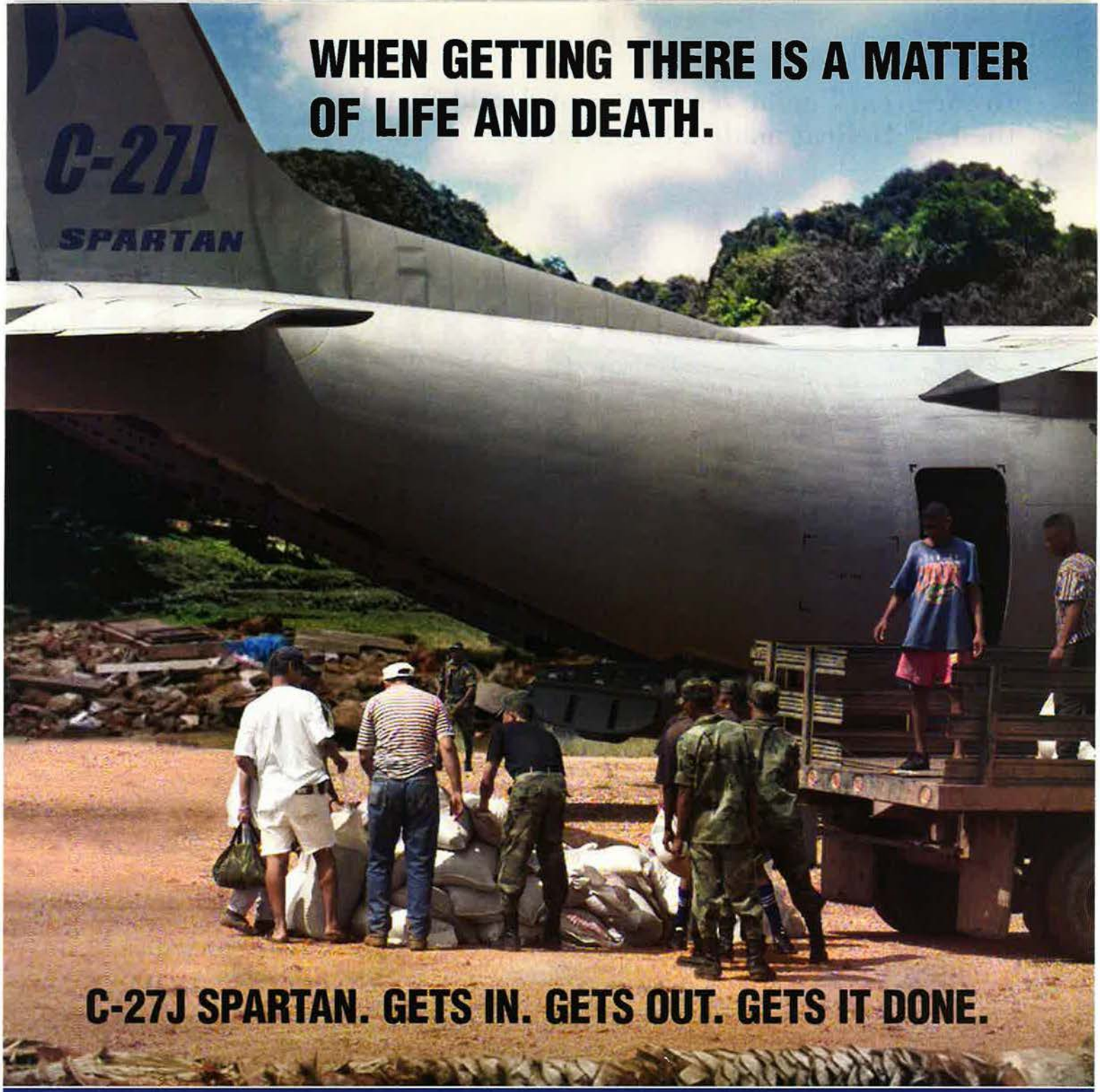
Cooper has been supervising convoy drills, standoff threat scenarios, and reconnaissance tactics training, with many of his younger troops getting ready for their second deployment. While training on a range is one thing, it's another to be in a full-on operation, where they may have to help perform a new duty if the situation calls for it.

"They see firsthand that nobody has the most important job in the Air Force," he said.

In a real deployment, two more modules would follow. They would consist of experts needed to generate sorties and operate the air base.

With an average of six Eagle Flags a year now being held at Lakehurst, cadre instructors and officers are thinking about what the exercise and the Air Mobility Warfare Center can do to better prepare airmen for the leaner, more flexible state of mobility warfare in the future.

"I just don't see this going away," said Gray. ■



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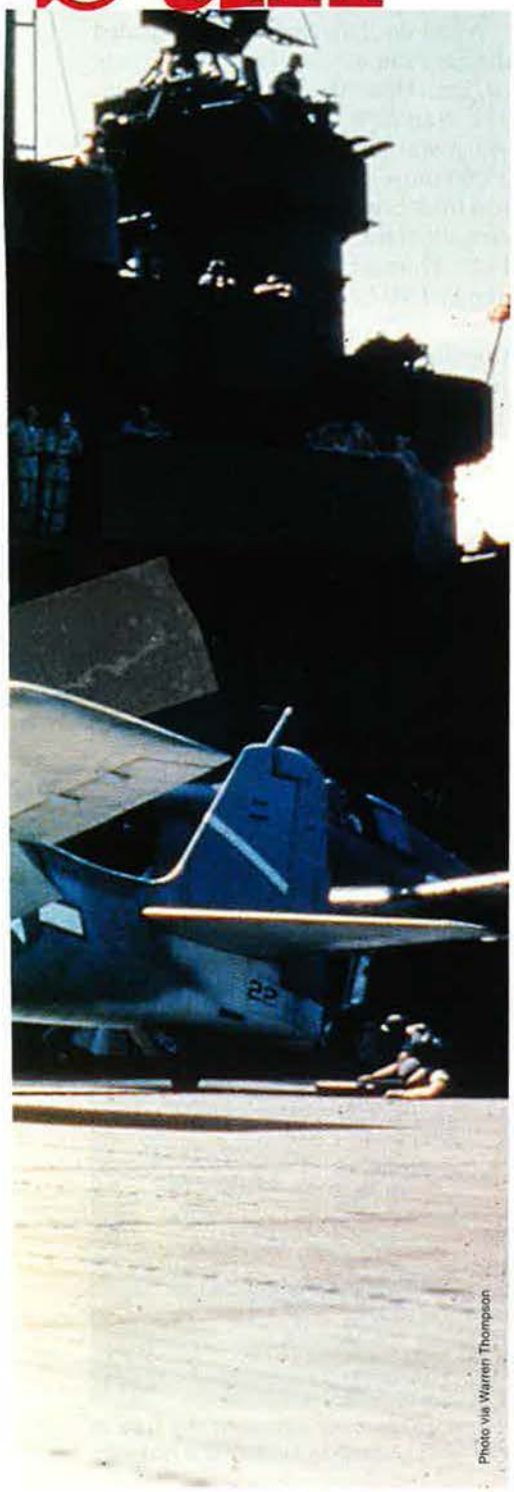
Cat Against the

By Rebecca Grant

Sun



At dawn on Oct. 24, 1944, US Navy Cmdr. David McCampbell, along with his wingman, Lt. Roy W. Rushing, took off from the carrier *Essex*. Just 22 miles away and closing fast was a force of some 60 Japanese fighters and dive-bombers. They had launched from Philippine bases to attack the American carrier task force.

McCampbell hadn't been on the flying schedule for that morning, but he was the air wing commander so he went into action anyway. He sent five other patrolling fighters to intercept the bombers while he and Rushing attacked the incoming fighters.

Within mere minutes, McCampbell shot down nine Japanese airplanes. Rushing had bagged six more. This was at the start of action in the famous Battle of Leyte Gulf. It remains a feat that is unmatched in the annals of US Navy fighter aviation and ranks among the great fighter actions anywhere.

McCampbell was a stellar pilot (he became the top Navy ace of all time and recipient of the Medal of Honor), yet there was more to that story than the pilots. The fighter that McCampbell and Rushing flew turned out to be America's greatest acemaker: the Grumman F6F Hellcat.

Hellcat pilots logged 5,156 aerial victories, and 305 of them became aces. The US Army Air Forces partisans could counter with a similar claim for the P-51 Mustang—like the Hellcat, a late entrant in the second World War. The Mustang flew a good 50 mph faster than the Hellcat and outdid it in ceiling and range. The Mustang shot down 4,950 enemies in the air and destroyed more than 4,000 more on the ground, along with 230 V-1 vengeance weapons. Some 275 Mustang pilots became aces. (See "Airpower Classics," April 2006, p. 96, and December 2006, p. 88.)

King of the Pacific

However, while the Mustang was the dominant fighter in Europe, there is no doubt the Hellcat dominated the Pacific. It was the Hellcat that beat back the Japanese Zero, defended US Navy warships, and gave the lethal American dive-bombers and torpedo aircraft their path to sink Japanese carriers and ships of the line.

The tale of the Hellcat isn't just a hardware story, though. It's about a winning change in tactics. The fighter arrived just in time to unleash the offensive power of the Navy's carrier task forces. The 1944 success of McCampbell and Rushing could hardly have been anticipated even two years earlier.

When the war began, naval aviation was in a tough spot. America's fleet entered World War II with substandard aircraft, junior aviation leadership, and a bureaucracy that still favored the battleship over mobile airpower. Carrier concepts were slow to mature.

Ever since the mid-1920s, the Navy leadership had been toying with aircraft carrier operational concepts during regular fleet exercises. However, a 1937 exercise persisted with old school methods and tied aircraft carriers to providing cover for landing forces. In this exercise, the carriers were promptly "sunk" by enemy forces. It was not until 1939 that a carrier demonstrated underway refueling, critical to extending the ship's operational reach.

In aircraft, the Navy was in even worse shape. Knowledge about valuable techniques such as dive-bombing emerged from Navy interwar experiments. However, plans for a potent aircraft arm lagged far behind. Historian Clark G. Reynolds has noted that the Navy's Bureau of Aeronautics was "woefully unprepared" to handle wartime production and training. As late as 1941, the carrier *Ranger* put to sea for wargames with a deckload of biplanes.

When the Navy entered World War II after Japan's attack on Pearl Harbor, its top air superiority fighter was the Grumman F4F Wildcat. The Wildcat, joked one pilot, was "a little beer bottle of a plane with a battery of .50-caliber guns in its tiny wings." With a 1,200 horsepower engine, its speed topped out at 318 mph, compared to the 331 mph of its adversary, the Mitsubishi A6M Zero. (See "Airpower Classics: A6M Zero," p. 96.) The Wildcat also had a range of just 770 miles—barely a third of the 1,950-mile range of the Zero.

The year 1942 rudely pointed up the fact that, against Japan's first team, the Wildcat was not up to snuff. This became only too apparent in the Battle

An F6F prepares to launch from USS* Yorktown *in August 1943, shortly after Hellcats began reaching the fleet in large numbers.

DOD photo

A Hellcat zooms past US troops. Larger, faster, and more heavily armed than the F4F Wildcat, the Hellcat put new punch in carrier aviation.

of Midway, a struggle in which three US carriers launched decisive attacks on June 4, 1942 on an unsuspecting Japanese fleet. US Navy torpedo airplanes became separated and attacked alone. Only eight of the 29 Devastators returned, but they drew the Japanese Zeros down toward sea level, leaving other US Navy dive-bombers a clear field to sink three Japanese carriers. The F4Fs turned out to be practically nonfactors in the fight.

Midway—although a great victory—was also a wake-up call about air superiority. Three senior Navy aviators—Edward H. "Butch" O'Hare, John S. "Jimmy" Thach, and James H. Flatley Jr.—later met with President Roosevelt and told him the Navy needed a fighter more powerful than the Wildcat, something that could "get upstairs faster."

Marine Corps and Navy pilots flying over Guadalcanal a few months later had to agree. It took exceptional pilot performance to win the day in a Wildcat.

Toward a Better 'Cat

Ever since 1938, Grumman engineers also had been thinking about ways to improve the Wildcat. A new 14-cylinder, 2,600 horsepower Wright engine promised to increase take-off power by one-third. The best option, though, was production of a new fighter. Although Grumman engineers sketched a prototype design, they shelved it temporarily to concentrate on producing more Wildcats to meet large Navy orders. In 1940, though, the company had a Hellcat prototype ready. A year later, the Navy awarded a contract. The XF6F-1 first flew just weeks after Midway.

Then the fortunes of war intervened. During the Battle of Midway, a Japanese pilot participating in the diversionary attacks on the Aleutians landed belly-up on an island. While the impact killed the pilot, it barely damaged his airplane.

Flight tests of the intact Zero confirmed what already was known by those who had fought against it: The Zero was fast, agile, and unbeatable in low-altitude climb. Mitsubishi achieved all this with an engine generating a mere 1,000 horsepower. The catch, though, was that the design sacrificed weight and thus protection for both pilot and aircraft. The conclusion was that a fast and more rugged US fighter could take on even the nimble Zero and its highly experienced Japanese pilots.

Analysis of the captured Zero sealed the decision to give the Hellcat a new engine. Here the Navy lucked out. The Pratt & Whitney R-2800 Double Wasp was an air-cooled engine with 2,000 horsepower. Hellcat engineers had their eye on it, but the engine was already slated to equip the Republic P-47 Thunderbolt and the Chance-Vought F4U Corsair. Luckily for carrier pilots, both the Thunderbolt and the Corsair were behind schedule. That freed up Double Wasp engines for the Hellcat.

Grumman made a test flight with the new engine on July 30. Just three months later, the first production F6F-3 Hellcat rolled off the assembly line. Production soon rose to 500 aircraft per month, and more than 12,200 of the airplanes would be produced.

By the spring of 1943, Hellcats were in service on Navy carriers such as the new Essex-class *Yorktown*. Unlike the Zero, the Hellcat was fortified with 200

DOD photo

The Hellcat made more aces and accounted for more air-to-air kills than any type of American aircraft in World War II. Here, pilots of USS* Lexington *celebrate a November 1943 aerial victory near Tarawa.

DOD photo

Catapult officer Lt. Walter Chewning scrambles to the aid of Ensign Byron Johnson in this stricken F6F. That pilots could walk away from disasters such as this was a testament to the Hellcat's ruggedness and safety features.

pounds of armor plating around the cockpit. The windscreen was made of bullet-proof Plexiglas, and more armor protected vital engine components. The Hellcat was also powerfully armed. Each wing had three .50-caliber machine guns capable of firing 1,000 rounds per minute. Later Hellcat variants upped firepower with 20 mm cannon in place of two .50s. Hellcats also carried high-speed rockets later in the war.

Perfect Fit

The new engine turned out to be a perfect fit. The Hellcat's top speed of around 380 mph outpaced the Zero at optimum altitude. The Hellcat's 37,000-foot service ceiling also translated into an operational altitude edge. Above 10,000 feet, the F6F climbed as quickly as the lighter Zero. It was faster in a dive. Hellcats routinely flew strike missions up to 300 miles combat radius and could conduct search missions out to 400 miles away from their carriers.

The Hellcat arrived just in time to help the US carriers grab a bigger piece of the action. Basic strategy in 1942 was to stop the Japanese advance. The plan succeeded but left the Navy reeling. Epic sea battles around Guadalcanal between August and October claimed the carriers *Wasp* and *Hornet* and damaged *Enterprise* and *Saratoga* on multiple occasions.

Most of 1943 went by before the tide began to turn. Japan withdrew from Guadalcanal in February. USAAF's Gen. George C. Kenney in March 1943 dispatched land-based aircraft to destroy an enemy convoy sent to reinforce Japanese forces in New Guinea, winning the so-called Battle of the Bismarck Sea. Then, in April, P-38s intercepted and killed Adm. Isoroku Yamamoto, the mastermind of the Pearl Harbor attack. (See "Magic and Lightning," March 2006, p. 62.)

The Navy had launched nine new carriers and dispatched them to the Pacific. Equally important, the Navy changed tactics and grouped several aircraft carriers together into what became known as the fast carrier task forces. These task forces typically featured a dozen big-deck and escort carriers and sometimes more. Each big-deck carrier was equipped with up to 54 Hellcats.

The Hellcats leaped to the forefront of the biggest sea battles of the war. This new phase of the Pacific conflict opened on Nov. 5, 1943 when US Navy Adm. William F. "Bull" Halsey Jr. launched a massed attack on Rabaul. On Nov. 20, Halsey's carriers covered the Tarawa landings, and the drive through the Pacific toward Japan was on.

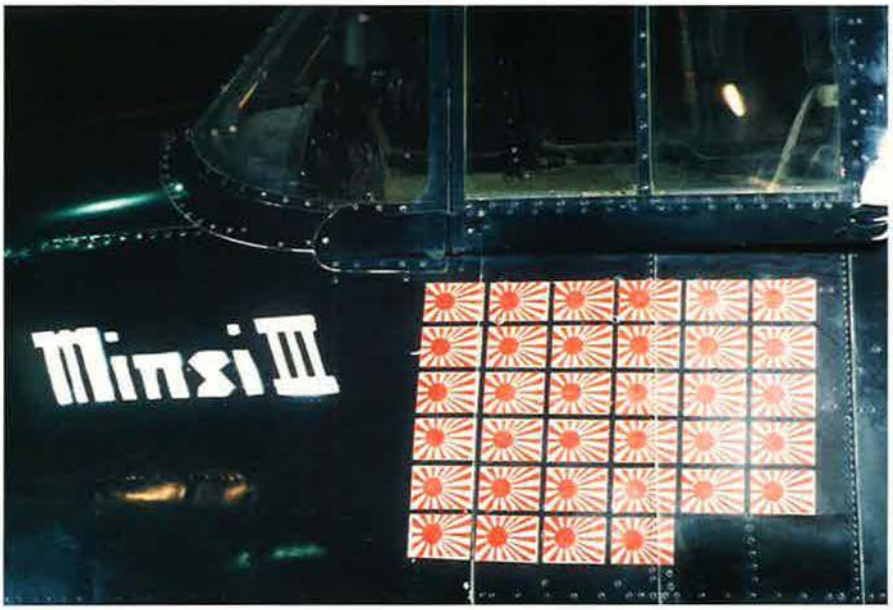
The edge was shifting to the Hellcats, for two reasons. First, the average US naval aviator now had greater training and combat experience than his Japanese counterpart. Navy pilots, according to historian Reynolds, "encountered increasingly inferior enemy pilots and aircraft."

Second, the Hellcat's resilience often made a life-or-death difference in combat. In a February 1944 attack on the Japanese stronghold of Truk, Lt. Eugene A. Valencia escaped attacking Zeros then turned for a head-on run against them that brought down three fighters. Good gunnery counted, but the Hellcat's armor and speed made such feats possible even for new pilots.

Turkey Shoot

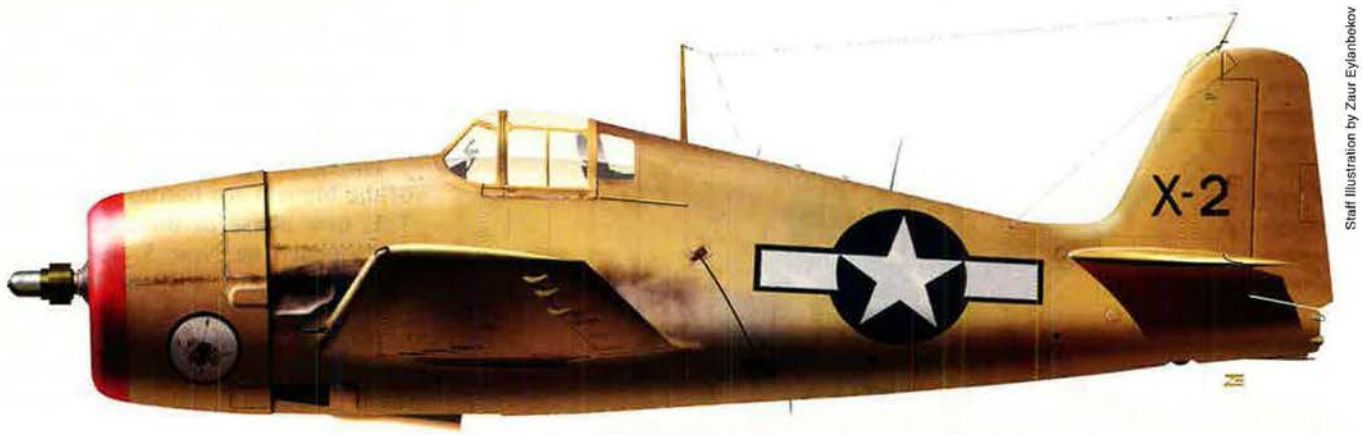
The virtues of the Hellcat were on full display at the Battle of the Philippine Sea in June 1944, better known as

DOD photo



Cmdr. David McCampbell scored 34 aerial victories in the Hellcat, the most of any Navy ace. This Hellcat, painted with his kill markings, is on display at the National Museum of Naval Aviation at NAS Pensacola, Fla.

After the war, Hellcats took on some strange missions. This yellow F6F-3K Hellcat served as a test drone controller for nuclear weapons tests.



Staff Illustration by Zaur Eylanbekov

"The Great Marianas Turkey Shoot." Adm. Marc A. Mitscher dispatched 80 Hellcats to knock out Japanese aircraft on Guam. Japan launched two waves of fighters—about 200 airplanes—from carriers. Within minutes, 140 Hellcats had entered the fray. When the battle was over, US aviators had shot down 373 Japanese aircraft while losing only 23 of their own to enemy action. The next day, Hellcats struck four Japanese carriers and sank one.

Night fighter work became a Hellcat specialty. Ultimately, about 1,500 F6Fs became dedicated night fighters. They did everything from providing night air defense to tracking strays to keeping tabs on the location of Japanese ships.

Another job for the Hellcats was to suppress and destroy land-based Japanese Navy aircraft. The Hellcats did more than strafe. The F6F could also carry two 1,000-pound bombs and high-velocity rockets mounted under the wing.

Successful as the Hellcat was, the Battle of Leyte Gulf in October 1944 shot a dose of caution through the Navy high command. Four separate sea battles saw fierce engagements with the Japanese fleet. The US won, but three escort carriers were sunk. Looking ahead, admirals wondered if they'd have enough punch for the upcoming drive to Japan itself.

For a fix, the Navy turned to master aerial tactician, Jimmy Thach, who decided to rely more than ever on Hellcats. He constructed a multilayered stratagem called the "big blue blanket." As carrier task forces closed in on Japan, they would maintain defensive Hellcat patrols up to 60 miles out from the carriers. Other Hellcats would keep up constant, disruptive attacks on Japanese airfields. As one group attacked, another formed up for attack, and a third prepared to launch.

The Navy tested the big blue blanket in late 1944 during action in the Philippines. Then the service doubled the number of embarked fighter squadrons, adding F6F-5 Hellcats armed with bombs and rockets, and bringing F4U Corsair squadrons aboard carriers en masse.

In spring 1945, kamikaze attacks reached a peak around Iwo Jima and Okinawa. The suicidal air attacks did not sink any big-deck US carriers, but they caused extensive damage and loss of life and sank smaller ships. Kamikaze attacks caused fires and damage that took some big decks out of action.

Kamikaze Killer

Off of Okinawa on April 17, 1945, four Hellcats from *Yorktown* countered with a remarkable feat. The Hellcat pilots, perched at about 25,000 feet, spotted a formation of about 40 Japanese light bombers and Zeros closing on the carrier task force. One two-airplane Hellcat section dove and attacked while the other section covered them. Then, the aircraft sections reversed course. This "mowing machine" maneuver broke the kamikaze formation, leading to 17 confirmed kills. The Navy repeated this tactic many times.

Beyond question, the Hellcat was the right fighter at the right time for the Navy's Pacific drive. It seized control of the air and proved versatile enough to balance the game of offense and defense to maximize the strike power of the fast carriers.

The short glorious life of the Hellcat ended soon after the war. Not even fielded until 1943, the F6F was obsolete five years later. The postwar Grumman F8F Bearcat took over in the Navy until early jet aircraft made their air wing debut.

To be sure, Hellcat pilots had the good fortune to be operating in a target-rich environment during the summer and fall of 1944 and then in 1945. US Navy carriers were challenging not only the remains of Japan's Pacific carrier fleet, but hordes of land-based naval aircraft were also being taken out.

None of that changed the fact that the Hellcat was the most successful Navy fighter of World War II and first in the hearts of its pilots. It chewed up Japan's airpower at the crucial point of the war and played a key role in beating back a metastasizing kamikaze threat.

Valencia, returning in his shot-up but airworthy Hellcat after his harrowing February 1944 mission over Truk, summed up the thoughts of many pilots about Hellcats: "If they could cook, I'd marry one." ■

Rebecca Grant is a contributing editor of Air Force *Magazine. She is president of IRIS Independent Research in Washington, D.C., and has worked for RAND, the Secretary of the Air Force, and the Chief of Staff of the Air Force. Grant is a fellow of the Eaker Institute for Aerospace Concepts, the public policy and research arm of the Air Force Association. Her most recent article, "The Billy Mitchell Syndrome," appeared in the December 2006 issue.*

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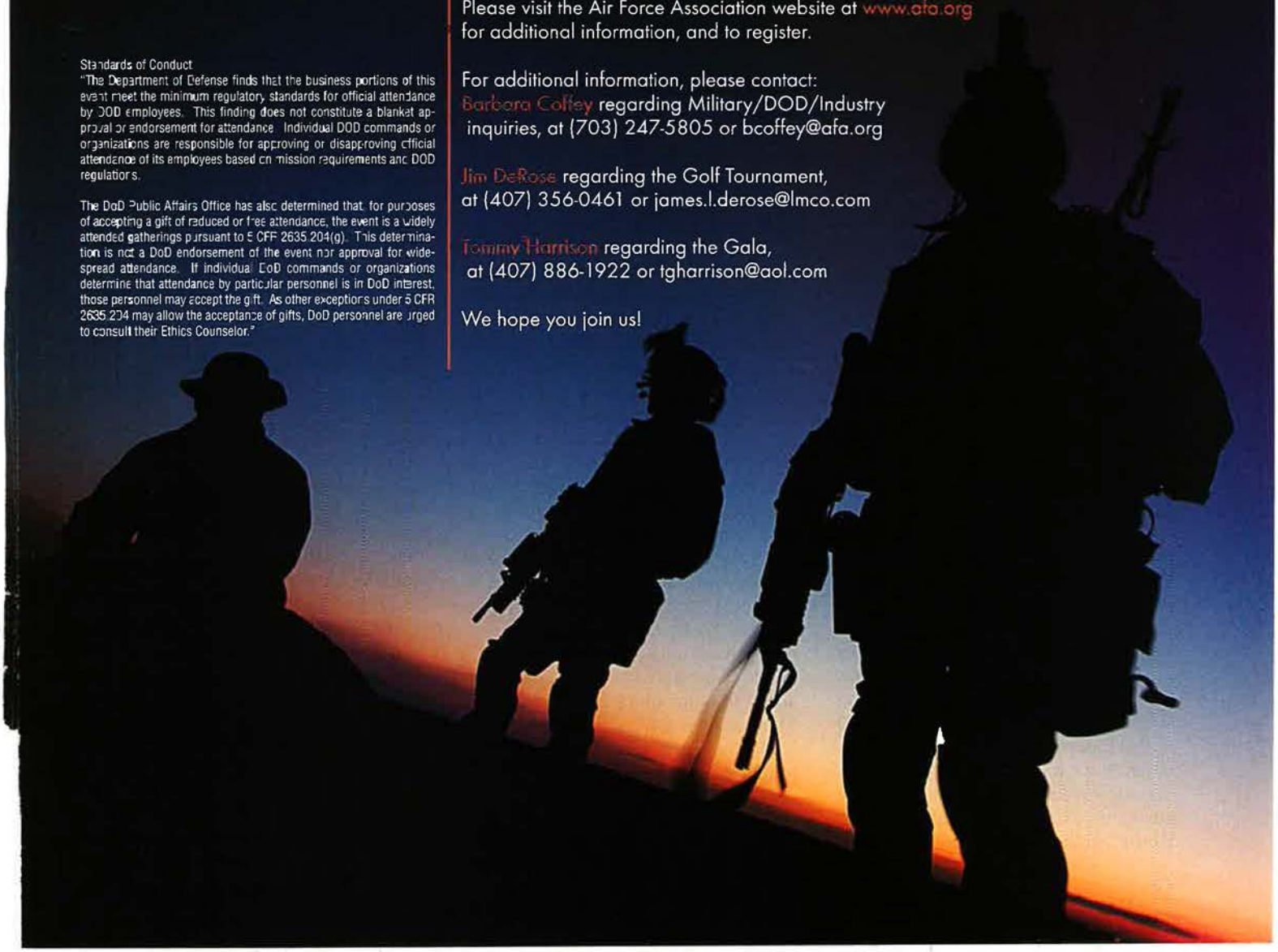

THAT FIRST LOOK

Airborne early warning is a critical capability, but it took a while to get it in the force.

By Walter J. Boyne

FOR modern military forces, the significance of airborne early warning was clear right from the beginning. In World War I, visual detection in the daylight hours did not exceed 15 miles. Even in the late 1930s, defending forces heard attacking aircraft long before they saw them. This situation, in the view of military leaders, was intolerable.

The first attempts to see "over the next hill" featured balloons and then observation aircraft. These became useful in the World War, despite limits imposed by night and poor weather. Primitive listening devices, used in cooperation with ground observers, helped detect raids by Zeppelins and bombers.

Invention of radar on the eve of World War II caused a radical shift in the balance of power in the air. By 1940, radar could spot incoming aircraft at a distance of more than 100 miles. Early detection gave defenders much more time to organize their air defenses and to intercept attacking airplanes. The famous English "Chain Home" radar system was vital to the Royal Air Force's victory in the Battle of Britain.

Yet the power of radar, by itself, wasn't sufficient. Ground-based systems had a vulnerability that could be ruthlessly exploited by opponents, and air forces learned to do so in the years following World War II. Because its beams travel only in straight lines, radar's detection capabilities could be blocked with the proper tactics. Aircraft could hug the ground and take advantage of the curvature of the Earth, getting close to transmitters before popping up to attack. Reaction time was greatly shortened.

Thus, getting radars airborne, where they would not be limited by line-of-sight obstacles, became a key objective. Indeed, the US already had embarked on this task in the final few months of World War II, when it put primitive airborne radar sets into night fighters. They were of limited utility.

Not until the 1960s did electronics miniaturization make it possible for a single airframe to transport a powerful search radar plus computers to differentiate between moving aircraft and ground clutter. The aircraft would also contain communication equipment sophisticated enough to give commanders a real-time view of the battlespace.

However, that's getting ahead of the story.

The Beginning

In early 1944, studies by Navy Capt. Frank Akers and Lt. Cmdr. Lloyd V. Berkner of the US Navy's Bureau of Aeronautics focused on an airborne aerial warning system. The two naval officers, working with the Radiation Laboratory of the Massachusetts Institute of Technology, helped the nation build the first production AEW system in only 13 months.

The capability of the new airborne radar equipment, designated APS-20, was even more remarkable than its speed of delivery. The system was used with little modification for many years in a wide variety of airframes and applications.

The APS-20 was tested initially in the TBM-3W, a version of the Avenger torpedo airplane. The radar's eight-by-

USAF's first airborne early warning aircraft—the RC-121, shown here, was used extensively in the Vietnam War.

three-foot paraboloid dish antenna was housed in a huge ventral dome. The need for greater range and endurance—as well as some command and control capability—led to the APS-20 being installed in the PB-1W. Some 25 of these converted B-17Gs were delivered.

The new radar system began one revolution in warfare while suggesting yet another. The first—airborne early warning—immediately allowed fleet commanders to see hostile forces long before they could attack. The second revolution—service as an airborne combat information center—was foreseen but not realized for many years.

The APS-20 provided a search capability two to six times greater than that of ship-based radar, depending on the target, but the system also had developmental and technical teething issues. The aircraft had a radar receiver and IFF (identification friend or foe) receiver and a complex synchronizer. The two-man crew used three radar consoles to correlate information. Instead of today's familiar array of symbols, returns on the radar screens were yellow flashes, jokingly termed "fluorescent bananas." These were tracked by grease pencil, and establishing a target's course and speed took as much as three minutes.

The other half of the system was on board ships, where the additional space, power, and cooling capacity allowed it to be much more elaborate. The shipboard equipment included a radar relay service to the combat information centers on other ships, conveying data on units of the fleet as well as on unidentified targets.

In the early years of the Cold War, the Soviet Union developed a fleet of several hundred Tupolev Tu-4 bombers, giving Moscow the power to launch a massive nuclear attack. The United States needed an air defense system to detect such an attack in its early stages and muster the weaponry to defeat it. (See "A Line in the Ice," February 2004, p. 64.)

This system, strung out across the US, Canada, and Greenland, was largely in place by the mid-1950s. As expensive, extensive, and effective as these land-based radar lines were, they could be outflanked by attacks coming across the ocean. The need for picket ships and early warning aircraft was clear.

Navy Initiative

In the early 1950s, the Navy accepted the challenge of an AEW barrier by acquiring 142 WV-2 Warning Stars. The APS-20 radar was housed in a plastic radome underneath the aircraft and was supplemented by a height-finding radar.

The Air Force followed suit, adapting the WV-2 to its needs and naming it the RC-121C, USAF's first AEW aircraft. Ten of these were delivered in late 1953 and were used with Navy radar picket ships as an extension of the US Continental Air Defense System. Within two years, the Air Force's AEW force had grown to six squadrons and 50 aircraft operating in two wings.

Duty on board the RC-121 was arduous. Crews were nominally five officers and 13 enlisted personnel, but they could be more than doubled for longer missions.

Tracking the APS-20's fluorescent bananas was demanding, and operators at the five radar consoles were relieved often during a 16-hour mission. Because of the need to maintain a constant defense, takeoff and on-station times were made largely without regard to prevailing weather conditions. Some 60 percent of the barrier missions were flown in icing conditions, while 50 percent encountered storm-force winds. Engine malfunctions and fires were common, as were hydraulic leaks. These often occurred when the aircraft were on station, hundreds of miles out to sea. Over the years, at least 50 crew members were lost supporting this massive early warning effort. (See "The Fall of the Warning Stars," April 2005, p. 78.)

By the 1960s, it was apparent that the principal Soviet threat was from ICBMs. The combined maintenance problems of the Super Constellation and the increasingly antiquated APS-20 produced calls for a new system.

The Navy selected the E-1B as an "interim" aircraft, one that served for 20 years. Known colloquially as the "Willy Fudd" or the "Stoof with a Roof," the E-1B used the APS-82 radar installed in a fixed, air-foil-shaped housing mounted over the fuselage. Later came the E-2 Hawkeye, equipped with a rotating radar dome over the fuselage.

The Air Force continued to use its redesignated EC-121s to track and recover space vehicles and provide command and control for nuclear tests. Other duties included shepherding fighter aircraft on long over-water deployments, filling in for inoperative land-based radar sites, and acting as a control vehicle for Air Force One. The EC-121 was especially effective during the 1962 Cuban Missile Crisis, helping U-2s avoid MiG attacks.

Vietnam Pressures

The Vietnam War forced a different American approach; the EC-121s were pressed into service to augment surface-based radar. Aircraft based in Taiwan, South Vietnam, and Thailand rotated into and out of the theater on a continuous basis, flying combat missions until 1973. During that time they provided control to 210,000 aircraft, issued 3,297 threat warnings, and assisted in the rescues of more than 80 downed aircrew members.

EC-121s flew a race-track orbit over the Gulf of Tonkin, with initial emphasis on monitoring enemy air activity and controlling US fighter aircraft in the area. Duties were expanded to include battle management of combat air patrol, strike and support missions, coordinating search and rescue operations, controlling air refueling operations, and acting as an airborne radio relay for poststrike reports.

By 1967, the EC-121s were operating over Laos, to provide navigational

USN photo by Photographer's Mate 3rd Class Jonathan Chandler

A Navy E-2 Hawkeye awaits takeoff from USS* Kittyhawk *in the South China Sea in December 2005. The E-2 replaced the E-1 and provides an all-weather AEW and command and control function.

assistance to US aircraft and to prevent incursions across the border to China. Later these aircraft moved closer to North Vietnam, where—operating under the call sign Disco—they directed airborne intercepts against North Vietnamese fighters.

The veteran EC-121 crews wrung all they could from their outdated equipment, which had difficulty discriminating aircraft from the clutter of the Vietnamese land mass. On July 10, 1965, Disco vectored two F-4 Phantoms in an attack that shot down two MiG-17s. It was the first radar-assisted kill of the war.

The 552nd Airborne Early Warning and Control Wing—first activated at McClellan AFB, Calif.—won six Air Force Outstanding Unit Awards, including two for valor, for its operations in the Vietnam War. Perhaps even more important, the antiquated, oil-leaking, prone-to-failure EC-121s validated the need for a new AEW aircraft.

The Navy's Hawkeye went through a long development period but finally emerged as an exceptionally capable AEW aircraft. However, it was too small and short-ranged to fulfill Air Force requirements. Meanwhile, upgrades had turned the EC-121 into an AEW system that could also serve as a command and control aircraft.

A new Airborne Warning and Control System program office established the ground rules for a long, complex competition for both airframe and radar manufacturers. The 707 won the airframe competition on July 10, 1970. The APY-1 radar was declared the winner in 1972, and the official AWACS production effort began on Jan. 26, 1973.

Almost from its inception, the AWACS program came under scathing attacks. The *New Republic* famously labeled it in April 1974 as "The Plane That Would Not Die." The magazine stated that the AWACS looked like a "mushroom with elephantiasis," a reference to the 30-foot diameter rotating radar dome stationed 11 feet above the aircraft's fuselage.

The General Accounting Office—now the Government Accountability Office—leveled criticism of its own. One GAO report questioned the ability of the AWACS to operate in a hostile environment, while another criticized the ability of the AWACS to function in the face of Soviet electronic jamming equipment. Much of the hostility was generated by the fact that the AWACS was the first weapon system to cost $100 million a copy.

On July 1, 1976, the Air Force moved the 552nd AEW&C Wing to Tinker AFB, Okla. The 552nd (now the 552nd Air Control Wing) served in many operations and wars over the next three decades.

The First E-3

The first production E-3 was rolled out in October 1976, only 23 months after Boeing was ordered to proceed. The following March, the first aircraft was delivered to Tinker. There, Gen. Robert J. Dixon, commander of Tactical Air Command, christened the E-3 the "Sentry."

The Air Force hoped to buy 42 E-3s, but budgetary restrictions reduced this to 33, the last them delivered in 1984. The E-3 fleet is far smaller than the scores of EC-121s that it replaced. Outfitted with 14 computer and radar workstations, the modern AWACS carries 20 to 30 mission crew members and four flight crew.

The E-3 crews see the airspace and can notify friendly aircraft where the enemy is—and direct him there. "I love the mission. I love the fact that we're the eyes and ears," said Airman Nicholas Cotter, a radar technician with the 552nd Air Control Wing.

The Sentry's higher altitude capability endowed its superior radar with a far greater range. The much greater available electrical power permitted additional equipment to be installed as it was developed. With its million-watt Doppler radar system, the AWACS was the first successful example of look-down, shoot-down capability. It is particularly useful against low-flying, earth-hugging air targets, and is capable of precision tracking and control of both airborne and maritime targets while remaining highly resistant to electronic countermeasures.

Northrop Grumman photo

The E-8C Joint Surveillance Target Attack Radar System airplane, shown here landing, detects and tracks targets on the ground.

The APY-1 radar was exceedingly complicated by today's standards, containing some 78,000 parts. It offered a range of 250 miles, however, and could distinguish aircraft tracks from ground clutter. It could operate in five different modes, including detecting targets at low altitudes, detecting targets and their elevation, looking beyond the horizon for long-range surveillance, with receivers only for passive surveillance, and in test and maintenance mode.

For the operators, the most obvious improvement was the introduction of symbols on the radar screens rather than the raw data of fluorescent flashes. To offset fears about its ability to operate in the face of Soviet jamming, the Sentry's radar operators had their own sophisticated electronic countermeasures equipment.

DOD photo by TSgt. Olivo Reynaldo

Maintenance personnel service E-3 Sentry Airborne Warning and Control System aircraft on the flight line at Tinker AFB, Okla., in 1984.

New Era

The AWACS signaled a new era in the concept of airborne battle management even as it became the flagship of aerial diplomacy. The 552nd's E-3s were at once perceived as essential to any combat operation and were immediately in constant demand for training exercises. Missions ranged from passive duties such as surveying border disputes between North and South Yemen to battle action in Grenada, Panama, the Middle East, and the Balkans.

The 552nd particularly distinguished itself during Operations Desert Shield and Desert Storm, flying more than 7,000 combat hours and controlling 31,924 strike sorties. In addition, the AWACS controlled 20,401 air refueling sorties where tankers offloaded 178 million gallons of gas to 60,453 receivers.

When the Gulf War ended, the E-3s were essential to peacekeeping in Operations Provide Comfort, Northern Watch, and Southern Watch.

In 1995, NATO E-3s monitored the 3,515 NATO sorties in Operation Deliberate Force.

When the Air and Space Expeditionary Force became USAF's standard deployment system, the 552nd was well-positioned to support it, despite the relatively small number of aircraft in its fleet. The wing's long experience in sending small numbers of E-3s to all corners of the globe for long periods of time served the wing well, enabling it to meet each major requirement as it happened. An unrelenting acceleration in operations tempo became a way of life for the 552nd.

In 1999, more than a score of E-3s took part in Operations Allied Force, flying 500 missions averaging almost ten hours each. The AWACS contributed to the destruction of about 85 percent of the Yugoslav Air Force's fighters.

The terrorist attacks on Sept. 11, 2001 brought new work to the 552nd. Tasked to protect the airspace over North America, the wing flew hundreds of missions as part of Operation Noble Eagle. Yet the demand for AWACS support worldwide was so great that five NATO E-3s had to be summoned to assist in defending the United States. These NATO birds flew more than 360 missions as part of Operation Eagle Assist.

Operation Enduring Freedom and Operation Iraqi Freedom have brought home the importance of the AWACS as a force multiplier. In both of these campaigns, the E-3s, the epitome of the low-density, high-demand assets, have been key instruments in establishing air dominance.

It is a testament to the AWACS that it can ably perform both the early warning mission to defend the skies and as a battle management force multiplier during air wars. The E-3s possess the requisite long loiter time, extraordinary communication capability, long-range radar, and, most of all, the ability to integrate information derived from satellites with ground- and air-based assets.

The AWACS continues to be a keystone in the United States' military capability, and it now has an almost exact counterpart for ground operations in the E-8C Joint Surveillance Target Attack Radar System. Also a modified 707, Joint STARS detects and tracks targets on the ground.

The history of AWACS has been that of continual improvement through upgrade programs, and this will continue into the future.

As the 707-320 airframe is no longer in production, however, future AWACS, will have to be based on more modern airframes. For example, the four AWACS aircraft purchased by the Japanese Air Self-Defense Force are based on the 767.

Other examples of AWACS variants, with alternate electronic systems and smaller airframes, are being put forward in various countries around the world.

In the United States, it may be that the functions of AWACS and Joint STARS eventually will be combined in a single aircraft—one that might even have a tanker capability. Alternatively, future airborne warning and control functions may be divided among a whole range of assets, including manned and unmanned types, located on the ground, in the air, or in space. These developments are perhaps two decades in the future, and until then, there will be no letup in demands for AWACS services. ■

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Gen. George C. Marshall helped clear the path for development of a powerful US air arm.

Soldier for Airpower

By Herman S. Wolk

Historians often describe Gen. George C. Marshall, United States Army Chief of Staff during World War II, as the "organizer of victory." Usually, these words refer to his role in formation of the nation's massive wartime ground forces, but that does not tell the whole story. Just as important, though less well known, was his role in the development of American airpower.

His strong support of the US air weapon had a decisive impact before and during World War II. Afterward, Marshall played a big part in the creation of an independent Air Force.

The leaders of the wartime Army Air Forces, including Gen. Henry H. "Hap" Arnold, Gen. Carl A. "Tooey" Spaatz, and Gen. Ira C. Eaker, each noted Marshall's leading role in the prewar buildup of United States air capabilities. These early Air Force leaders considered Marshall an enormously important figure in the evolution of American airpower.

Arnold said that, when Marshall became Chief in 1939, War Department attitudes toward airmen underwent sharp change.

Marshall knew that the air arm would play a critical role in any conflict and insisted that the Army Air Forces be granted autonomy during the war. Marshall had agreed with Arnold that, once the war ended, a United States Air Force should be created, and he pledged his support for that effort. Marshall kept that promise.

The Andrews Influence

In the summer of 1938, with war coming both in Europe and the Far East, Marshall got a firsthand look at the Air Corps' contemporary problems. Maj. Gen. Frank M. Andrews, commander of General Headquarters Air Force, flew Marshall to Langley Field, Va., and invited him to inspect Air Corps installations across the country.

Andrews subsequently took Marshall on a tour of Air Corps bases as well as the Boeing plant in Seattle, site of B-17 bomber production. Marshall was impressed. The nine-day tour gave the Chief of Staff a new perspective on the Air Corps and cemented his relationship with Andrews. (See "The First Air Staff," June 2001, p. 66.)

The importance of Andrews' tutelage of Marshall cannot be overstated. Marshall learned a great deal about the status of the air arm and its requirements. With a global war on the horizon, he soon was applying this newfound knowledge to Army programs and reorganization.

Marshall became Army Chief of Staff in 1939. He named Andrews to head operations and training for the War Department General Staff, making Andrews the first airman to hold this position. During the war, and before his death in 1943 in an airplane crash in Iceland, Andrews was appointed by Marshall to three theater commands, the last being as commander of all US forces in the European Theater.

This appointment as European commander has fueled speculation that Marshall ultimately intended to appoint Andrews as commander of the Overlord force being assembled to invade German-occupied Europe. In his memorial service eulogy, Marshall described Andrews as one of the Army's "few great captains" and indicated that, had Andrews lived, he would have been charged with even greater responsibilities. (See "The Influence of Frank Andrews," February 2002, p. 84.)

Marshall and Arnold faced large obstacles to building up American airpower. The issue of aircraft production was among the most difficult. Their nemesis, oddly enough, was none other than President Franklin D. Roosevelt.

During the period 1939-41, when US entanglement in the world war seemed increasingly likely, Arnold's top priority was to build up a US air force. Roosevelt, like Arnold, was committed to heavy bomber production, noting that "no single item of our defense today is more important than a large four-engine bomber capacity." Roosevelt's prewar calls for massive aircraft production put great pressure on Arnold, who in turn placed enormous heat on his staff.

Roosevelt, wanting to shore up Britain in its desperate struggle with the Nazis, included US aircraft production as part of Lend Lease—the program in which American weapons were made available on concessionary terms to US allies. Arnold meanwhile, desperately tried to build up his own air forces, worrying that in "giving everything away," he would end up commanding a paper air force.

This tension between the President and Arnold put Marshall in an uncomfortable position. The Army Chief said the attempt to fill British aircraft requirements presented "a tremendously complicated task here in Washington." (See "When Arnold Bucked FDR," November 2001, p. 86.)

Strangled?

Arnold noted, "On top of other headaches, [there] was the daily business of satisfying White House, Congressional, and War Department superiors who were constantly receiving phone calls, visits, and letters from people, official and unofficial, American, British, French, Dutch, Chinese, Polish, Russian, ... and what not, criticizing the Air Forces' procedures, offering free advice and recommendations, or demanding a priority share of our equipment."

As one historian commented, "American airpower was getting strangled in the cradle by an excess of Presidential generosity."

Marshall's biographer wrote that "the President's requirements were almost more than he could bear." Strongly supporting Arnold, Marshall informed Roosevelt that it was not possible to give the British, Soviets, French, and Chinese everything they wanted—and simultaneously to build an American Air Force.

The Army Chief determined that Arnold's requirements would command top priority while he would give the Allies whatever he could.

In late 1940, Marshall played a key role in a little-known episode with major significance. FDR planned to send B-17s to the Chinese Air Force. The President, outraged at the Japanese Imperial Army's rampage through East Asia, expressed the desire to bomb Tokyo. Treasury Secretary Henry Morgenthau Jr. discussed this subject with Chinese officials, including T.V. Soong, who would become Foreign Minister. In November and December 1940, Claire L. Chennault and the Chinese Air Force were brought into the discussions. Roosevelt was enthusiastic about the plan.

In late December, however, Marshall weighed in, sinking the plan. He emphasized to Roosevelt that the Air Corps did not have sufficient B-17s for its own purposes and thus could not afford to send any to China. Washington dropped the idea of sending B-17s, agreeing instead to ship 100 fighters.

The Marshall-Arnold relationship was crucial to solving difficult problems facing the air arm in its massive buildup. Marshall and Arnold had first become acquainted in 1914 in the Philippines. "Marshall was always senior, but I never heard of his pulling rank over Arnold," said Maj. Gen. Laurence S. Kuter, who later was Arnold's assistant. "Arnold was free to announce his intentions and plans. I never heard of him asking Marshall's permission. Theirs was a unique top-side relationship."

In mid-1940, Arnold's view dovetailed with Marshall's. "It looks to me," the Air Corps Chief emphasized, "as if it might be a serious mistake to change the existing setup when we are all using every facility available in order to take care of the present expansion of the Air Corps."

Arnold also agreed with Marshall that air independence should be put off, especially as Marshall had ensured the air arm had received autonomy, flexibility, and equipment.

Left to right: Marshall, Lt. Gen. Frank Andrews, Lt. Gen. Henry Arnold, and Maj. Gen. Oliver Echols in July 1942. Marshall, Andrews, and Arnold are considered key architects of independent US airpower.

The Unseen Guest

With war raging in Europe and the Far East, the problem of air organization turned critical during the period 1939-41. Arnold commented that in the 1930s, "airpower was the unseen guest at those grim conferences which marked the Nazi rise to power."

Marshall, in 1939, had inherited a General Staff organization dating back to the National Defense Act amendments of 1920. Adequate for peacetime, it was clear after Pearl Harbor that a radical reorganization was required.

On the eve of American entry into the

Bettmann/Corbis photo

Left, Marshall and FDR at the Casablanca conference in 1943. Their close working relationship allowed Marshall to curb Roosevelt's desire to send huge numbers of aircraft to allies.

war, the problem faced by Marshall and Arnold was twofold: first, to streamline the General Staff, in line with FDR's desire to quickly build up airpower, and secondly, to reorganize to foster efficient and effective wartime operations, should the US become involved in the conflict.

Among objectives of this reorganization would be to provide Arnold and the Air Staff, formed in June 1941, sufficient clout and flexibility to be able to move their requirements through the War Department General Staff.

The specific difficulty was that the General Staff was unable to make decisions. In late 1940, Arnold, deputy chief of staff for air, and Maj. Gen. George H. Brett, acting Chief of the Air Corps, pointed out to Marshall that it was exceedingly difficult to ram air requirements through the General Staff.

Marshall thought that the General Staff had "lost track of its purpose" of its existence. It had become a "huge, bureaucratic, red-tape-ridden operating agency." He added, "It slowed down everything."

Moreover, the Army Chief was convinced that officers on the General Staff "had little interest in the air, mostly antipathy, and it was quite marked." Marshall felt "everyone" on the staff was hostile to the airmen. He concluded that the airmen had something to complain about.

Arnold, of course, kept Marshall informed of the problems confronted in the effort to build up the air forces. Marshall, for his part, was sensitive to air requirements and to the movement within the Air Corps and in Congress to legislate an independent air arm.

Influenced by Andrews and Arnold, and realizing that the air forces would play a major role in the global war, Marshall was far more receptive to the needs of airmen than the typical ground officers of the War Department General Staff. Marshall needed "plenty of indoctrination about the air facts of life," Arnold said, but what set him apart "was his ability to digest what he saw and make it part of as strong a body of military genius as I have ever known."

Once the United States entered World War II, Marshall informed the General Staff that it needed to move requirements with dispatch and that "the time was long past when matters could be debated and discussed and carried on ad infinitum."

The fact was that the War Department simply could not cope with the demands of this rapid buildup. In late 1941 and early 1942, Marshall moved to reorganize the department.

Whirlwind

Forrest C. Pogue, Marshall's biographer, called it "a whirlwind campaign that was to shake the War Department as it had not been shaken since the turn of the century."

Sensitive to Arnold's needs during the critical buildup, Marshall made a special effort to give his air chief as much flexibility as possible. "I tried to give Arnold all the power I could," the Army Chief emphasized. "I tried to make him as nearly as I could Chief of Staff of the air without any restraint although he was very subordinate."

Having agreed to put off the question of an independent Air Force until after the war, Marshall and Arnold devoted their energy to organizing for victory.

With revision of Army Regulation 95-5, the Army Air Forces had been established in June 1941. The change made Arnold Chief of the AAF and provided him an Air Staff—but the larger issue of reorganization of the War Department General Staff remained unresolved.

Marshall stated in the fall of 1941 that the air forces enjoyed autonomy "within the framework" of the War Department. He emphasized that Arnold now had responsibility for all aviation matters and that the AAF could proceed with "unrestricted development."

Just before the Pearl Harbor attack, Marshall had asked the War Plans Division to look into reorganization. The General Staff had become so bogged down in details that it couldn't get

The Boeing B-17 production line in Seattle, Wash. Marshall insisted on independence for the air arm. Arnold made sure the AAF, and not China, got the B-17s.

After serving as a postwar Secretary of State, Marshall led the Defense Department, for which he laid the groundwork. Here, President Harry Truman meets with Marshall and new Defense Secretary Robert Lovett in September 1951.

much done nor make timely decisions. Maj. Gen. Joseph T. McNarney, whom Marshall chose to head the 1942 reorganization committee, emphasized that the General Staff "must not operate and be bothered by minor details." The staff, McNarney said, should make policy and stay out of operations.

The March 1942 Marshall Reorganization officially gave the Army Air Forces virtual autonomy within the War Department. It reduced the General Staff, making it—as Marshall desired—a policy-making staff focused on strategic direction.

The reorganization created an Army composed of the War Department General Staff and co-equal Ground Forces, Air Forces, and Service Forces under the Army Chief of Staff—a recommendation proposed by Arnold and Spaatz before the attack on Pearl Harbor.

A few months removed from Pearl Harbor, the AAF had essentially gained autonomy and equality with the ground and naval forces. Marshall's rapid reorganization after US entry into the war catapulted the AAF into position to make an enormous contribution to ultimate victory.

After the war, Marshall kept his word and became a strong voice arguing for a separate Air Force and a "single department system for the armed forces." Like Gen. Dwight D. Eisenhower—to succeed Marshall in November 1945 as Army Chief of Staff—Marshall's postwar view was influenced by the wartime performance of the Army Air Forces. (See "Ike and the Air Force," April 2006, p. 84.)

Immense Contribution

"The Air Forces have developed in a remarkable manner," he said. "In personnel, in planes, technique, and leadership, the Army Air Forces of more than two million men made an immense contribution to our victory."

Marshall made a strong case for a single department with co-equal air, ground, and naval services. The arguments resonate even today: Control of the air was essential to victory. Airmen should be in charge of the development of "basic airpower." Unified command was a necessity in the postwar world. Moreover, Marshall envisioned a single department of national defense, with an independent Air Force, as the fulcrum of an integrated program of national security. No longer could the nation's security program evolve on a piecemeal basis.

Like Eisenhower and Arnold, Marshall emphasized the military forces as a team. National security is "measured by the sum, or rather the combination of land, air, and naval forces," he said. "The urgent need is for an overall, not a piecemeal, appraisal of what is required to solve the single problem of national security with the greatest economy compatible with requirements."

Marshall thought that the military services needed to work out their requirements before presenting them to Congress and the President. He opposed the wartime system of relying on the JCS and its joint committees for coordination and elimination of duplication. This system was no substitute for unified direction. The Joint Chiefs could not be effective as a peacetime coordinating agency.

"Committees," Marshall emphasized, "at best are cumbersome agencies. Even under the stress of war, agreement has been reached in the Joint Chiefs of Staff at times only by numerous compromises and after long delays. With the end of the war, there is no longer a compelling necessity to reach at least compromise agreements on major matters."

Based on the wartime experience with combined operations, Marshall stated that "no one will suggest that we should now revert to the complete separation of the Army and Navy which prevailed in the years before the war."

Moreover, noted Marshall, it was important that in resolving the question of unity of command, the details not be allowed to obscure the fundamental principles. Once agreement was reached on the fundamentals, larger problems could be rapidly resolved.

Marshall however, did support continuation of the Joint Chiefs of Staff within a unified department. The Chiefs would submit policy and budgetary recommendations to the President, but through the civilian head of a unified department. Thus, Marshall's vision of the Joint Chiefs was basically a policy-making entity, divorced from operations and administration.

The Navy opposed the Truman Administration's effort to establish a separate Air Force and single Department of National Defense, fearful that a separate Air Force would aggrandize naval aviation. Navy Secretary James V. Forrestal emphasized that merging the two departments into a single Department of Defense would be a mistake, and that the job of Defense Secretary was too broad to allow one man to have the needed breadth of knowledge.

With the great leverage possessed by Marshall and Eisenhower, the Air Force prevailed on the issues of writing roles and missions into the National Security Act—and on the major point of establishing an independent Air Force. ■

Herman S. Wolk retired as senior historian in the Air Force History Support Office. He is the author of Fulcrum of Airpower *(2003). His most recent article for* Air Force *Magazine, "Lovett," appeared in the September 2006 issue.*

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AFA National Report

natrep@afa.org

By Frances McKenney, Assistant Managing Editor

AFA Reaches Out to Europe

Air Force Association Chairman of the Board Robert E. "Bob" Largent in late October visited several US Air Forces in Europe installations as part of a major outreach effort.

In addition to taking briefings on Air Force operations in Europe, Largent listened to the concerns of airmen and commanders, gathering information that will help determine the association's Statement of Policy and its Top Issues.

Heading first to Kaiserslautern, Germany, he spoke at the Airman Leadership School and went to Landstuhl Regional Medical Center, visiting Air Force, Army, and Marine Corps patients there.

At Ramstein Air Base, Largent met with Gen. William T. Hobbins, USAFE commander; Brig. Gen. Danny K. Gardner, director of installations and mission support; and CMSgt. Gary G. Coleman, the USAFE command chief. He participated in a videoconference between USAFE headquarters and Incirlik AB, Turkey.

The AFA Board Chairman also toured Ramstein flight operations facilities, including the new passenger terminal, and looked into quality of life issues, such as billeting.

At Aviano AB, Italy, he spoke at the First Term Airmen Center, at the Airman Leadership School, and at a company grade officers' call. He had lunch with the wing's chiefs and first sergeants and discussed quality of life concerns with the senior staff.

AFA's top elected official flew from Aviano to RAF Mildenhall, Britain, to learn about 100th Air Refueling Wing operations. The wing's first sergeants joined Largent for lunch that day.

Largent flew to Spangdahlem AB, Germany, where, at the 52nd Fighter Wing he conducted a question and answer session with wing personnel, including first term airmen. He later focused on housing at Spangdahlem, touring family housing units as well as a dormitory.

Information gathered on this tour helps determine AFA's focus, Largent told Air Force Print News. "We look at all of the issues that affect the United States Air Force," he said.

White House photo by Kimberlee Hewitt

President Bush and First Lady Laura Bush met AFA Board Chairman Bob Largent (left) and Becky Largent (right) at the White House during the Nov. 11 Veterans Day breakfast reception. AFA's elected leader thanked the President for his leadership and support of the military. Largent later attended a memorial service at Arlington National Cemetery and laid a wreath, on behalf of AFA, at the Tomb of the Unknowns.

Revitalizing Ramstein

Largent's week in Europe had an immediate impact on Ramstein's AFA chapter, reported SMSgt. Kenneth E. Gammons, president of the **Lufbery-Campbell Chapter.** Gammons, who is superintendent of the Long-Haul Communications Branch in the USAFE Computer Systems Squadron, had a dinner and breakfast meeting with Largent to discuss re-energizing this overseas AFA chapter. Chapter members CMSgt. Mark Gajewski and SMSgt. Steven P. Hartman joined in the strategy sessions.

Largent provided practical guidance, such as leads on where to recruit Community Partners. He gave the chapter a copy of the AFA 60th Anniversary DVD, which recounts the association's founding and some of its accomplishments. The DVD turned out to be a hot commodity. In an e-mail Gammons wrote, "I had it long enough to show at our monthly AFA meeting, and then I had to hand it off to our public affairs officers to rush it up to Spangdahlem, since that was the only copy in theater."

Most important, Largent gave the chapter a specific project: During his visits to Landstuhl, with USO volunteers, and with airmen at the Contingency Aeromedical Staging Facility, he had learned that 250 to 400 wounded service members pass through Ramstein each month. They are authorized $250 each to buy civilian clothing to be worn while they're undergoing evaluation or traveling to a medical facility or home station. But they cannot use the money for toiletries or for something to carry the clothing in.

"I've found duffel bags we can purchase for $2 each," Gammons said, and the chapter is now trying to raise funds to buy them.

Care Packages to Iraq

The **Brig. Gen. Harrison R. Thyng Chapter** in New Hampshire has been contributing to care packages that are sent to troops in Southwest Asia.

Chapter President Louis A. Emond began the effort a year ago, through a Nashua-based volunteer nonprofit organization called Moore-Mart. The group's name came about when the family of New Hampshire Guardsman

Brian Moore began sending care packages to him in Iraq. They soon began sending packages to other service members—packages filled with so many popular items that Moore's fellow troops began to joke that the family stocked more than Wal-Mart.

What's in the packages? Among the gifts are a letter to the service member, candy and other snacks, basic clothing such as socks, and toiletries such as talcum powder, soap, and shaving cream. Some packages go to specific GIs and might include things on their wish list.

What the care packages lacked, though, was Air Force T-shirts. So the Thyng Chapter donated $500 to have some made. Emond wrote about the project in the chapter newsletter and said he received "a tremendous response" from chapter members: offers to help with the project, donations for more T-shirts, donations for care package goodies, and letters to be enclosed in the packages.

Emond heard from the troops on the receiving end, too. A USAF master sergeant e-mailed him from Ali AB, Iraq, "I don't think there's anything in the care packages that doesn't get used."

By mid-November, the Moore-Mart group already packed off 1,600 packages that month, Emond said, and he was organizing chapter members to help prepare more over the Thanksgiving weekend. Chapter members Stephen J. Chimelski and Wayne E. Balcom joined him in manning a booth that drummed up more than $500 in donations during Nashua's annual holiday parade and festival Nov 25.

Worked for Them

The **Gold Coast Chapter (Fla.)** sponsored its first aerospace education workshop in October, with assistance from the **Miami Chapter,** the **John W. DeMilly Jr. Chapter,** the Coast Guard, and the Civil Air Patrol.

The workshop took place at US Coast Guard Air Station Miami in Opa Locka, thus giving the 22 teachers (from three counties) an opportunity to examine Coast Guard and CAP rescue airplanes and helicopters on static display.

The teachers proved to be typical students: The highlight of their day, according to the evaluation sheets filled out at the end of the workshop, was a hands-on outdoor activity—building and launching model rockets fashioned from plastic soda bottles.

A $1,000 AFA matching grant funded the workshop, with other funds coming from Community Partners, the Miami Chapter, chapter members MDM Group and Shirley Uricho, and other businesses.

Gold Coast Chapter President Ransom Meriam credits member Fran C. Shaw with organizing the workshop. Shaw, in turn, was inspired by a workshop conducted by Kathleen A. Foy, a seventh-grade teacher recently named AFA State Teacher of the Year. Shaw recruited Foy to become a chapter member and persuaded her to help plan the workshop.

Meriam said Region President E. Max Friedauer attended the event and was so impressed that he invited the organizers to the AFA state meeting in Orlando next month, to conduct a seminar on how to conduct a successful workshop.

Partners With Industry

In October, Utah's three chapters—**Northern Utah, Salt Lake,** and **Ute-Rocky Mountain**—held a luncheon to

At their November meeting, the Tarheel Chapter (N.C.) hosted AFROTC cadets from four detachments: Duke University, North Carolina State University, University of North Carolina, Chapel Hill, and North Carolina Central University.

AFA In Action

The Air Force Association works closely with lawmakers on Capitol Hill, bringing to their attention issues of importance to the Air Force and its people.

AFA Hosts Panel Discussion on Fighter Aviation

On Dec. 4, the Air Force Association and the Air Force Office of Legislative Liaison hosted a panel discussion for Congressional staffers to learn about the evolution of fighter aviation, from the Vietnam War to today. The panelists pointed out that the public often assumes that the Air Force has always fielded superior capabilities, but this was not always the case and has been realized through diligent application of lessons learned.

Panelists included retired Gen. John P. **Jumper,** the former USAF Chief of Staff; retired Lt. Gen. Donald L. **Peterson,** AFA's president; retired Col. Peter M. **Gavares;** and retired Lt. Col. Stephen G. **Gress Jr.**

They represented a tremendous level of experience, Jumper and Peterson having flown F-4s in combat over Vietnam and Gavares and Gress having flown missions over Iraq in Operation Desert Storm. Gavares is also president of the Donald W. Steele Sr. Memorial Chapter in Virginia, and Gress is a chapter member.

AFA Sponsors an Education Reception

On Dec. 5, several members of Congress and more than 200 of their professional staffers attended AFA's winter Congressional education event.

Air Force senior leaders present included Ronald M. **Sega,** the undersecretary of the Air Force, and Gen. John D.W. **Corley,** the USAF vice chief of staff.

The gathering gave members of Congress and their staff an opportunity to speak directly to Air Force officials.

AFA's National Committees for 2006-07

Executive Committee. Robert E. "Bob" Largent *(Chairman)*, Craig E. Allen, L. Boyd Anderson, David T. Buckwalter, Judy K. Church, David R. Cummock, Steven R. Lundgren, Joseph E. Sutter, Donald L. Peterson *(ex officio)*.

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Membership Committee. James R. Lauducci *(Chairman)*, Mary Feightner, Elizabeth McLaughlin, Gerald R. Murray, Jerry Needham, Paul W. Schowalter, Marvin Tooman, Joseph E. Sutter *(ex officio)*.

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At the Hurlburt Chapter's awards and teacher recognition banquet in Florida, US Rep. Jeff Miller (R-Fla.) (at left) and Lt. Gen. Michael Wooley (at right), commander of Air Force Special Operations Command, presented David Schantz, chapter vice president, with an AFA Medal of Merit. See "Florida Honors," p. 93.

commemorate the 25th anniversary of a partnership with companies that support Hill Air Force Base.

Utah AFA's Industrial Associates program was established in 1981 by Nuel Sanders, now a member of the **Frank Luke Chapter (Ariz.).** The program aimed to improve communication between the Air Force and industry, provide a forum specifically for the Ogden Air Logistics Center at Hill to get together with businesses, and to support USAF personnel and programs.

Grant Hicinbothem, Utah state president, pointed out another merit: The program gets defense contractors involved in AFA activities.

Utah's IA group sponsors luncheons, the annual Focus on Defense symposium and its fund-raising golf tournament, and a biennial Requirements Symposium, where businesses learn what ALC needs they could fill. Today the IA consortium numbers 51 members, representing 38 aerospace and local companies. Some two dozen of them attended the anniversary luncheon, held at a hotel in Layton.

Walter Saeger leads the IA program.

Idaho Teachers

When the **Snake River Valley Chapter (Idaho)** honored its Teachers of the Year, it received coverage in the local newspaper and on Web sites for the school district and one that promotes city businesses.

Angela Fish, a special education teacher from Hacker Middle School in Mountain Home, received the State Teacher of the Year award, while Bruce Bedell, from Glenns Ferry High School, was selected as Chapter Teacher of the Year. The chapter recognized the two educators at its annual TOY banquet at the Gunfighter Club on Mountain Home Air Force Base in November.

The state superintendent of public instruction, Marilyn Howard, was guest speaker for the meeting. She noted that Bedell just about covered the waterfront when it came to science education, teaching anatomy, biology, chemistry, earth science, and physics. She and Chapter President Roger B. Fogleman presented Bedell with $250.

They presented Fish, the State Teacher of the Year, with $1,000. Starting as a science teacher eight years ago, Fish was asked to become a special education teacher and brought dedication, energy, and enthusiasm to the assignment, the *Mountain Home News* weekly reported.

The newspaper quoted Fogleman as saying, "AFA chapters nationwide work

very hard to ensure our youth receive education in math and the sciences and that those who teach and support the educators are recognized."

Florida Honors

On Oct. 19, the **Hurlburt Chapter (Fla.)** hosted its annual awards banquet, with President James B. Connors welcoming 100 guests, including US Rep. Jeff Miller (R-Fla.) and Lt. Gen. Michael W. Wooley, commander of Air Force Special Operations Command.

Also on hand were Col. Norman J. Brozenick Jr., the 16th Special Operations Wing commander, Raymond Turczynski Jr., who is an AFA national director, and E. Max Friedauer, Florida region president.

Guest speaker Wooley described AFSOC operations and the delivery to Hurlburt of the Air Force's first CV-22 Osprey tilt-rotor. He joined Miller in presenting Teacher of the Year awards to Robert Smith, of Gulf Breeze Middle School, Jacque Whittle of Longwood Elementary School in Shalimar, and Cherie Chrisco of Pensacola High School.

Other awards that evening went to Richard Schaller, David A. Schantz, Danny Webb, chapter treasurer, Frederick Gross, Col. Lida D. Dahnke, Glenn Rutland, Kenneth Poole, Monty D. Sexton, and Dann D. Mattiza, chapter VP.

In Arlington, Va., the next night, physical science teacher Jeri Ann Martin—who is also the chapter's aerospace education VP—received the Crown Circle leadership award from the National Conference on Aviation and Space Education. Martin had been nominated for the honor by Connors, who highlighted her efforts to improve the aerospace education curriculum at Thomas L. Sims Middle School in Pace and, through teacher workshops, in northwest Florida.

At the same NCASE gathering, chapter member Ricardo V. Soria received the A. Scott Crossfield Aerospace Education Teacher of the Year award. He teaches at Choctawhatchee Senior High School in Fort Walton Beach and has been conducting student aviation summer camps, supported in part by the chapter. Chapter member Schaller, whose company has cosponsored the camps, accompanied the award winners to the event. AFA was among the sponsors of the NCASE conference.

Middle East Experience

In Newport, R.I., faculty and students at the Naval War College were in the audience when USAF Col. Kevin S.C. Darnell spoke at the September **Newport Blue & Gold Chapter** meeting.

Former president of the chapter and now the senior Air Force advisor at the NWC, Darnell had just returned from 31 months in the Middle East—19 as an attaché in Saudi Arabia and the last 12 as a multinational force division chief.

In his presentation, Darnell spoke about stabilization efforts, the challenge presented by the Shiite militia, and the contributions of Air Force augmentees filling staff positions. His PowerPoint presentation included photos of the Green Zone in Baghdad, a Kurdish palace, and other sites.

Chapter President Lt. Col. Mark Harysch said the audience asked Darnell some straightforward—and difficult—questions: Are we succeeding? What are the major obstacles?

More Chapter News

■ In October, the **Brig. Gen. James R. McCarthy Chapter (Fla.)** hosted a dinner for Arnold Air Society cadets from Embry Riddle Aeronautical University, Daytona Beach. It was one of the many ways that the chapter enhances its partnership with the school and with AAS, an affiliate of AFA. The chapter has also teamed up with the local Experimental Aircraft Association chapter for projects that include orientation and incentive flights for these cadets and other students. In October, for example, Chapter Vice President David R. Cummock flew his SIAI Marchetti with cadet Katrina M. Morgan on board, while he was taking part in a photo shoot for an EAA calendar. Another McCarthy Chapter member, Keith Phillips, flew his homebuilt SX300 as the photographer's chase airplane.

■ The office of the mayor of Orlando, Fla., turned to **Central Florida Chapter's** aerospace education VP, Richard A. Ortega, when it needed a protocol advisor for its Veterans Day parade. Ortega, a retired chief master sergeant, provided the office with information on the proper sequence of events and correct display of the American flag and on parade day served as master of ceremonies.

■ In October, the **Tucson Chapter** visited the boneyard—the Aerospace Maintenance and Regeneration Center at Davis-Monthan AFB, Ariz. More than 50 chapter members began their tour with an in-depth briefing on the facility's mission. Nicknamed the "boneyard," it stores some 4,500 aircraft and covers 2,600 acres. The chapter members observed operations of a fabrication and a rehabilitation shop and looked into the A-10 service life extension program. Chapter President Karen Halstead says that the group learned that the SLEP adds 20 years to the life of the attack aircraft.

Nathan H. Mazer, 1911-2006

Retired Col. Nathan H. Mazer of Roy, Utah, died Dec. 6, 2006. He was a former AFA National Secretary (1970-72),

the 2002 recipient of the prestigious AFA Gold Card, and at the time of his death an AFA National Director Emeritus. At age 95, he was also the oldest known charter member of the association, according to Bob Largent, AFA Chairman of the Board.

Born in Philadelphia, Colonel Mazer joined the Army in July 1941 and flew 52 missions as a machine gunner on B-26 anti-submarine patrols. After Officer Candidate School, he served with the 544th Bomb Squadron, 384th Bomb Group, Eighth Air Force, based at Grafton Underwood, Britain. The Salt Lake City *Tribune* newspaper reported that Colonel Mazer was an armament officer but "stowed away" on 17 missions over Germany and received a Bronze Star for defusing a live bomb that fell onto the flight line.

Before retiring from the Air Force in 1964, Colonel Mazer also served in Japan, Turkey, and Norway and with Strategic Air Command at Ellsworth AFB, S.D., and Malmstrom AFB, Mont.

His AFA leadership positions included National Vice President (now called Region President).

He is to be buried at Arlington National Cemetery on Jan. 16. ■

Have AFA News?

Contributions to "AFA National Report" should be sent to *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Phone: (703) 247-5828. Fax: (703) 247-5855. E-mail: natrep@afa.org. Digital images submitted for consideration should have a minimum pixel count of 900 by 1,500 pixels.

Reunions

4th FIS, Misawa AB, Japan. May 10-13 at the Ramada Inn in Fort Walton Beach, FL. **Contact:** Troy Dent, 95 Meigs Dr., Shalimar, FL 32579 (850-651-4618).

8th AF, all years. Jan. 31-Feb. 3 at the Marriott Riverfront Hotel in Savannah, GA. **Contacts:** Henry Hughey, GA Chapter, 8th AF Historical Society, PO Box 73, Tucker, GA 30085 (770-939-2462) or Albert McMahan (770-448-8513).

79th/966th AEW&C Sq. April 26-29 in Fort Walton Beach, FL. **Contacts:** David Bilodeau (352-797-0962) (davidbilodeau@bellsouth.net) or James Speight (334-265-4242) (sp8@knology.net).

485th TMW. June 7-10 at the La Quinta Inn & Suites in Tacoma, WA. **Contacts:** John Rudzianski (570-278-2482) (jrudz@epix.net) or Bill Albro (360-455-9048) (wambro1@aol.com).

494th BG (WWII). June 6-10 at the Holiday Inn in Fairborn, OH. **Contacts:** Marshall Keller, 7412 A. Vassar Dr. East, West Bloomfield, MI 48322 (phone/fax: 248-626-3684) or John Loser, PO Box 661, Battle Creek, MI 49016 (269-565-3124) (fax: 269-660-8901).

601st & 615th AC&W Sqs, Germany. April 15-20 in San Antonio. **Contact:** Francis Gosselin, 10645 Cup Dr., San Antonio, FL 33576 (352-588-9295) (fxpapagoose@earthlink.net).

USAF SERE Instructors. June 7-9 in Reno, NV. **Contact:** Don Wertz (801-779-4077) (dcwertz@juno.com).

Veterans of Underage Military Service. April in Chattanooga, TN. **Contact:** R. Thorpe, 6616 E. Buss Rd., Clinton, WI 53525 (608-676-4925).

Seeking members of the **90th TFS** for a reunion in Las Vegas. **Contact:** Jack Doub (229-259-9399) (wgfp@mchsi.com). ■

E-mail unit reunion notices four months ahead of the event to reunions@afa.org, or mail notices to "Unit Reunions," *Air Force* Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information. We reserve the right to condense notices.

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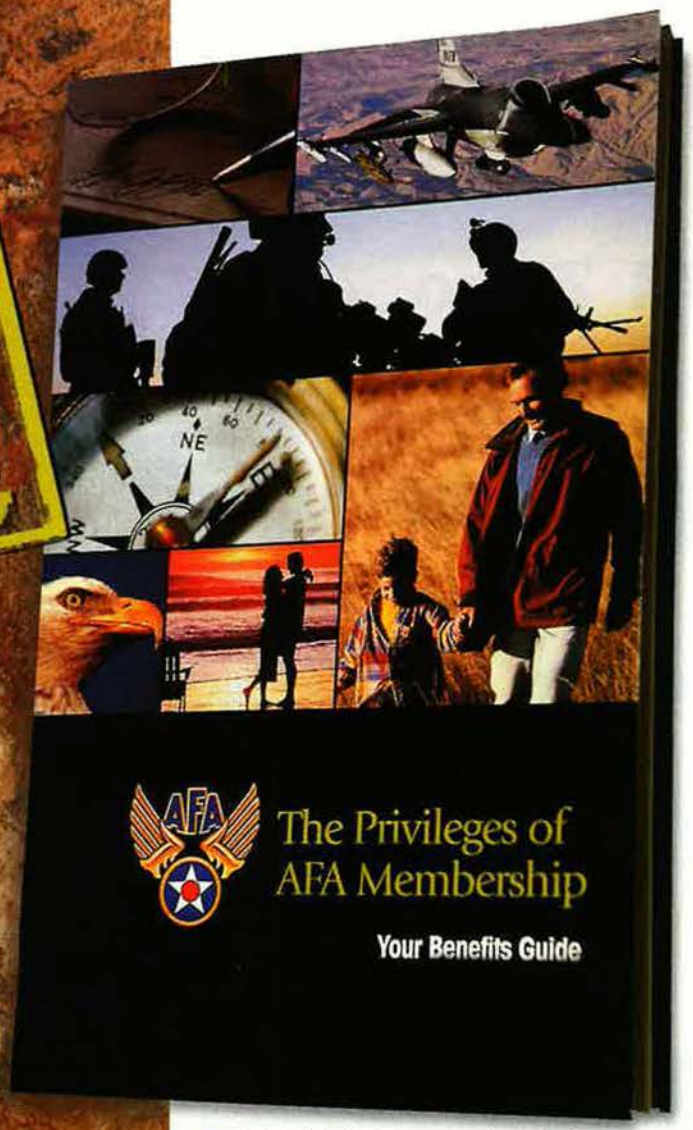

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A6M Zero

The Zero was, when it appeared, the world's best carrier-based fighter. At the outset of the Pacific War, the Japanese Imperial Navy Air Service fielded 521. Its performance in the Dec. 7, 1941 Pearl Harbor attack and the months immediately afterward, when it showed phenomenal speed and agility, gave it legendary status. Months later, when a captured Zero was examined, it was evident that the Zero was no miracle weapon but was, rather, the embodiment of intelligent design compromises focused on specific requirements.

Its genesis was in 1937. In that year, Tokyo specified that Japan's next carrier fighter should have high speed, swift climb, major armament, long range, and excellent maneuverability. Zero designer Jiro Horikoshi fulfilled all of those requirements in a fighter that combined elegant aerodynamic shape and light weight structure, but he did so by employing every conceivable weight-saving measure. The airplane had no heavy armor or self-sealing tanks. It was a fighter built for expert pilots, flying offensive missions, but the lack of toughness proved to be a major combat vulnerability.

Japan produced more Zeros than any other type of aircraft. It came in nine major variants, used by both carrier-based and land-based forces. It was modified extensively during the war to compete with potent new American aircraft and their well-trained pilots. However, the Zero was essentially obsolete by 1943, and Allied pilots flying Navy F6F Hellcats and USAAF P-38 Lightnings began to score heavily. Still, Zeros fought on to the end, increasingly flown by *kamikaze* pilots. In fact, *kamikazes* sank the escort carrier *St. Lo* and damaged three more. For those forced to face these fighters in combat, the Zero was and always will be the very symbol of the Rising Sun's airpower.

—*Walter J. Boyne*

This aircraft: Japanese Imperial Navy Air Service A6M2 Model 11 #3112 as it looked in 1941 when piloted by Lt. Minoru Suzuki. Tail fin bears markings for 28 kills by Suzuki and an earlier pilot.

In Brief

Designed by Mitsubishi ★ built by Mitsubishi, Nakajima ★ first flight April 1, 1939 ★ crew of one ★ number built 10,449 (3,879 by Mitsubishi; 6,570 by Nakajima) ★ **Specific to A6M5:** one 14 cylinder Nakajima Sakae radial engine ★ typical armament, 7.7 mm and 13.2 mm machine guns in cowling, two wing-mounted 20 mm cannons ★ max speed 351 mph ★ cruise speed 207 mph ★ max range 1,194 mi ★ weight (loaded) 6,025 lb ★ span 36 ft 1 in ★ length 29 ft 11 in ★ height 11 ft 6 in.

Famous Fliers

Many "Zero Aces," including: Lt. (j.g.) Tetsuzo Iwamoto (202 victories claimed); CPO Shoichi Sugita (120 claimed); WO Hiroyoshi Nishizawa (87 claimed); Ens. Saburo Sakai (64 claimed); WO Takeo Okumura (54 claimed). **Other notable:** Test pilot Katsuzo Shima.

Interesting Facts

Named "Type 0" for last digit of Imperial Year 2600, when it entered service ★ built of T-7178 aluminum, top-secret type made for the Zero ★ *kamikaze* versions carried a 250 kg bomb ★ 79 took part in Pearl Harbor attack ★ called "Zeke" by Allied intel ★ several on display in Japan, China, Britain, US ★ first action (1940) came against China, not against US.

Early in the war, the Zero ruled the sky.

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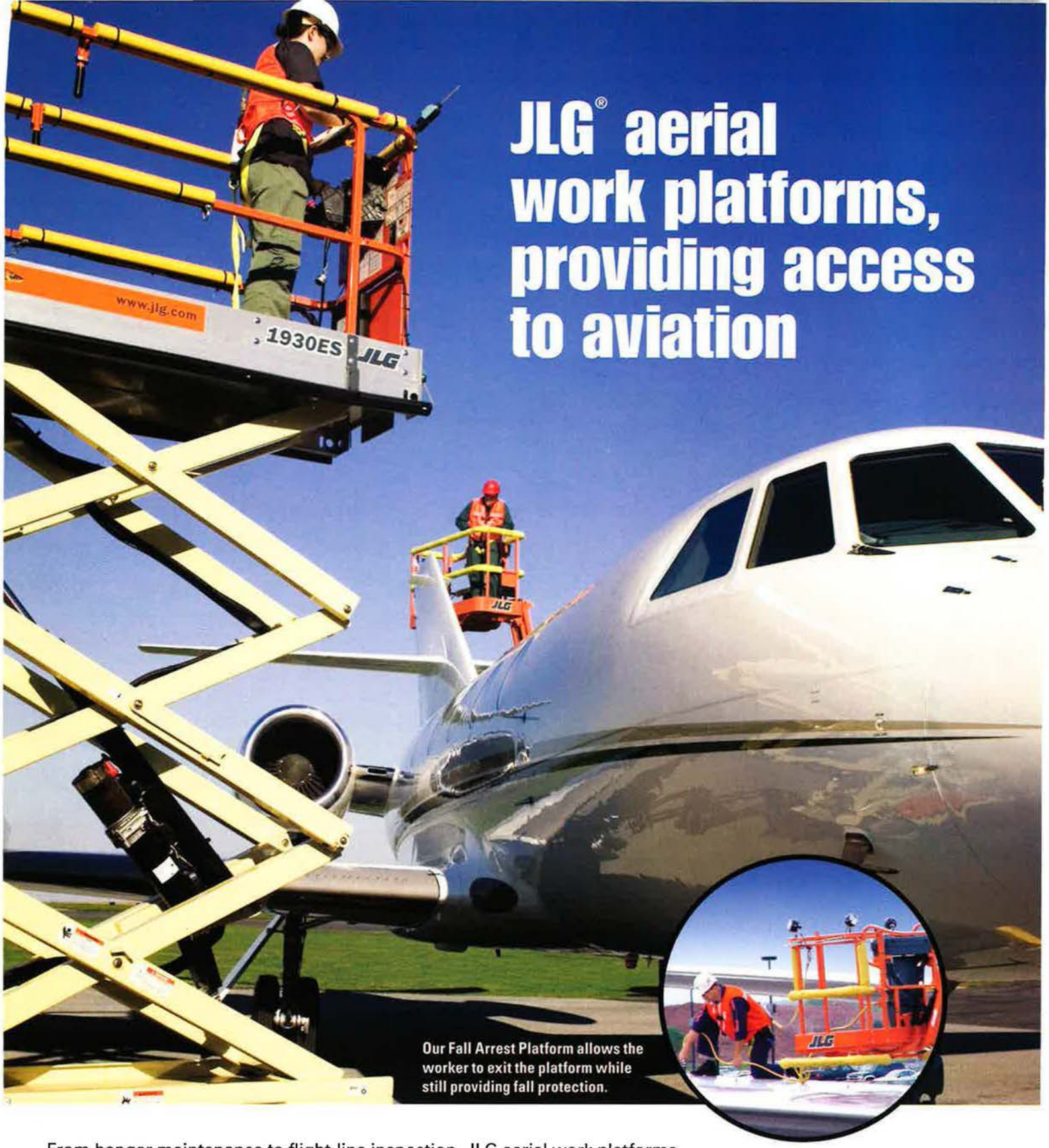

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